

# DATA BUOY COOPERATION PANEL

## Thirty-first Session

Geneva, Switzerland  
19 – 23 October 2015

JCOMM Meeting Report No. 124



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## 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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Chair, Publications Board  
World Meteorological Organization (WMO)  
7 bis, avenue de la Paix  
P.O. Box No. 2300  
CH-1211 Geneva 2, Switzerland

Tel.: +(41 22) 730 84 03  
Fax: +(41 22) 730 80 40  
E-mail: Publications@wmo.int

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WORLD METEOROLOGICAL ORGANIZATION

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INTERGOVERNMENTAL OCEANOGRAPHIC  
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**DATA BUOY CO-OPERATION PANEL**  
***THIRTY-FIRST SESSION***

Geneva, Switzerland  
19 – 23 October 2015

FINAL REPORT

JCOMM Meeting Report No. 124

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Note: The following complementary information will be provided in the DBCP Annual Report for 2015

- 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.



## EXECUTIVE SUMMARY

The Thirty-First Session of the Data Buoy Co-operation Panel (DBCP-31) was held in the Salle Obasi conference room of the WMO Headquarters, Geneva, Switzerland, from 19 to 23 October 2015. Jon Turton, Chairperson elected in 2014, opened the meeting and thanked the WMO hosts and participants for their support of DBCP.

During the technical and scientific workshop organized during the first day of the session, 16 presentations were delivered on data buoy operational and scientific applications, technology, instrumentation, buoy programme implementation, including data monitoring and quality. Approximately 50 participants from 16 countries attended the meetings. The Panel concurred with the 3 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 Jon Turton, Chairperson, summarized chair's activities of the past year, including his participation with OCG. The Technical Coordinator, Ms Champika Gallage (Canada) presented some of the activities of the JCOMMOPS in support of the DBCP. The Panel commended Ms Champika Gallage for exceptional progress made in her first year as DBPC Technical Coordinator.

The Panel noted the recommendations from OCG-6 concerning critical importance of mooring metadata and JCOMMOPS metadata services.

The Panel discussed the report of the current status of the data buoy network. During the intersessional period the average number of drifting buoys reporting on the GTS was 1504 per month, 407 moored buoys and 102 fixed platforms, for an increase of 14% in drifting buoys. The Panel noted the importance of developing better performance metrics for the DBCP networks, and requested its Task Teams and Action Groups to develop Key Performance Indicators.

Reports were provided by the DBCP Task Teams, Action Groups and Pilot Projects, and decisions were taken according to their recommendations. The Panel was encouraged by progress reported by Task Teams toward implementation of metadata and data formatting recommendations, and the advice given to buoy manufacturers to adhere to approved DBCP data formats. Cooperation with manufacturers has largely solved the drifter lifetime problems reported in DBCP-29 and DBCP-30. The Panel responded to a request from JCOMM OCG to evaluate emerging autonomous surface vehicle (ASVs) technology for weather station.

The Panel noted the delivery of Capacity Building workshops held or planned in 2014-2015. Reports on these workshops were given: First Pacific Islands Training Workshop on Ocean Observations and Data Applications (PI-1) Republic of Palau, 4-7 May, 2015; Inaugural Session of the DBCP Tropical Cyclone-Ocean Interactions Training Center at Pusan National University; Fourth North Pacific Ocean and Marginal Seas (NPOMS-4) "Applications of Ocean Observations for Improving Society's Understanding and Forecasting of Typhoons, 2-4 November 2015 at Korea Maritime and Ocean University (KMOU) in Busan, Republic of Korea. The Panel endorsed NPOMS-5 and PI-2 in 2016. The DBCP recognizes the efforts of the 2nd International Indian Ocean Expedition (IIOE-2) and wishes to be part of this initiative with the aim to maintain and enhance in-situ met-ocean platforms in the Indian Ocean. This includes increased collaboration, capacity building initiatives and coordination with the IIOE-2 research activities.

The Panel noted the Action Group support for drifting buoy deployments in regions and in particular the coordination of deployments with moored buoy maintenance cruises. Tropical Moored Buoy arrays have been greatly improved over previous years by the addition of deep temperature/salinity sensors on many existing moorings and the resumption of annual service of sites that has resulted in annual data return comparable to historical norms.

Follow up of earlier recommendations of the panel, International Tsunami Partnership established closer coordination established with IOC Intergovernmental Coordination Groups for Tsunami and other Coastal Hazards Warning Systems. The Draft Standard & Guidelines on Tsunami Equipment Performance will be passed through the TOWS Working Group and its Task Team on Tsunami Watch Operations meeting to be held in February 2016 for its review and approval. Also the Panel noted the importance of common data format for water level, developing a methodology for the sensing of ocean bottom temperature data from BPR for future decadal climate variability study.

The Panel evaluated the final work of the Pilot Project on the Impact of Sea Level Pressure measurements from drifters on Numerical Weather Prediction (NWP). WMO/ECMWF OSE control experiments were performed using an accurate list of WMO drifter IDs corresponding exclusively to barometer drifters. The data denial experiments were launched during the summer of 2014. The runs were completed, a report was submitted and the main findings of the study, describing the significant beneficial effect of the SLP data from drifters on NWP, were submitted to the Bulletin of the American Meteorological Society. The Panel recommended closing the PP-SLP.

Regarding DBCP/ETWCH Pilot Project on Wave measurement Evaluation and Test (PP-WET), the Panel noted that intercomparison studies, including the July 2015 deployment of FLOSSIE (Field Laboratory for Ocean Sea State Investigation and Experimentation) at Monterey buoy farm, represent a key cornerstone of the PP-WET objectives. The Panel noted with interest preliminary results of the project to develop spectral wave measurements from the drifting buoys in the Global Drifter Program (GDP) and recommended that this development should continue. The Panel also appreciated that presentations would be made to the science community by PP-WET at the 14<sup>th</sup> International Workshop on Wave Hindcasting and Forecasting.

DBCP-TC reported on review of the content of the DBCP and OceanSITES web pages and the new JCOMMOPS website under development and planned for review by JCOMM network representatives in November 2015 and to be opened for the public in December 2015.

The Panel was pleased with the report of the JCOMMOPS Ship Coordinator on developments regarding new deployment opportunities and activities. A new JCOMMOPS on-line system permits registration and management of cruises of research and commercial vessels allowing better coordination of deployment opportunities. A top-down management method for commercial and volunteer ship deployments has greatly facilitated these opportunities, making operations routine. The Panel applauded the efforts to develop innovative deployment platforms, such as the Kon-Tiki rafts in the Southern Pacific, OceanoScientific Campaign, several yacht racing consortiums as well as the sailing vessels, Bark Europa and Lady Amber. The Panel appreciated the public outreach value of these projects and encourages the DBCP to exploit this value.

Buoy data availability delays (data timeliness) are now routinely monitored and posted to the DBCP web pages. During the year, about 40% the drifting buoys reported to the GTS in less than 60 minutes and 84% reported in less than 120 minutes after observation time, with greatest delays in South Atlantic and South Pacific. Improvements in the Argos real-time stations network with 2 new stations (Ascension Island and Libreville, Gabon), and progress in implementing the Real-time Antenna Upgrade Project will improve data availability delays.

The Working Group on Vandalism circulated a new DBCP form for reporting incidents of vandalism on data buoys to promote the collection of systematic statistics on vandalism. The Group reported 63 vandalism events on 42 moored buoys and 62 identified drifter buoy vandalism incidences from the GDP. The Panel noted the efforts made against vandalism, but agreed that efforts remain to be made on anti-vandalism data buoy technologies, awareness programmes and national policies. The recommendations of the working group were endorsed by the panel and annexed to this report.

Recognizing the importance of receiving metadata for plans of deployments, the Panel encouraged all buoy operators to provide metadata of plans and deployment information for drifting and moored buoys. JCOMMOPS is developing metadata capturing and re-formatting tools for the newly developed web site which will also allow flexible response to needs of WIGOS/OSCAR metadata collection and dissemination standards. The Panel encouraged inclusion of fixed platform metadata into these efforts.

The Panel received updates on the Argos and Iridium satellite data telecommunication systems. The Panel noted with appreciation the recent developments through the WMO Congress-17 and WMO Commission for Basic Systems (CBS) with regard to the establishment of the International forum of users of satellite data telecommunication systems as a joint CBS and JCOMM forum.

The Panel reviewed activities and developments of JCOMM and considered recommendations of WMO Cg-17 to contribute to the WIGOS pre-operational phase implementation (2016 - 2019). The Panel noted recommendations by Expert Team on Marine Climatology (ETMC) regarding establishment of a wave GDAC or a moored buoy GDAC, and the recurring theme of providing adequate metadata. The Panel agreed upon the importance of increased collaboration between JCOMM programmes such as DBCP, SOT and OceanSITES and use of shared resources like JCOMMOPS.

The Panel noted with appreciation the firm establishment of the JCOMMOPS office in Brest in March 2015 and thanked CLS and Ifremer for their generous infrastructure support. The Panel noted with appreciation the stabilization of the JCOMMOPS staff after this long transition period to five permanent staff following the addition of 3 new permanent staff in the last 3 years.

The Panel noted the concerns of the WMO Cg-17 and IOC-28 Assembly on the Tropical Pacific Observing System mooring arrays and noted the positive outlook afforded by successes of TPOS2020. The Panel took note of the highest priority areas of WIGOS implementation and encouraged its members and JCOMMOPS to contribute to the development of the WIGOS Data Quality Monitoring System for the met-ocean observing systems, including contributions to the OSCAR Platform metadata databases.

The Panel acknowledged that the Global Framework of Climate Services (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 from data buoys.

The Session was informed of the work done through the Observing System Monitoring Center on Integrated Data Management, the emerging open data access paradigm of today, which integrates information and data across observing system networks. The Session noted the pilot project that supports this integrated view of ocean data in support of the Tropical Pacific Observing System (TPOS) 2020 effort.

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 2015. 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. The Panel agreed on funding NPOMS-5, PI-2, support of JCOMMOPS logistics and completing work on DBCP retrospective. In view of the increasing DBCP activities especially expanded JCOMMOPS activities, 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 31 December 2015.

The Panel agreed that its next Session should take place in USA, from 17 – 21 October 2016.

The Panel re-elected Mr Jon Turton (United Kingdom) as its Chairperson, and Shannon McArthur (USA) as Vice-chairperson for North America. New members were elected: Johan Stander (South Africa) as Vice-chairperson for the Southern Hemisphere, and Dr Ting Yu (China) as vice-Chairperson for Asia. The panel thanked Mr. Al Wallace (Canada), Prof David Meldrum (UK), Mr Graeme Ball (Australia) and Dr R Venkatesan (India) for their outstanding contributions to the DBCP.

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## GENERAL SUMMARY OF THE WORK OF THE DBCP-31 SESSION

### 1. OPENING AND WELCOME OF THE DBCP SESSION

1.1. The Chairperson of the Panel, Mr Jon Turton (UK), opened the Thirty-First session of the Data Buoy Co-operation Panel (DBCP) and its associated Scientific and Technical Workshop at 09:00 hours on Monday, 19 October 2015, at the Salle Obasi conference room of the WMO Headquarters, Geneva, Switzerland.

1.2. On behalf of the Panel, Mr Turton welcomed all participants to the session and to the workshop, and expressed his appreciation for the commitment of the Panel Members. He complimented the preparations of the WMO for hosting and organizing the Session.

1.3. Opening addresses were given by the following officials: Peiliang Shi, Director of WIS Branch of the Observing and Information Systems Department of the WMO, 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.
- WMO speakers hoped that the participants will enjoy the ambiance of Geneva and the WMO facilities would support a productive DBCP Session.
- The DBCP is expected to contribute to the WMO Integrated Global Observing System (WIGOS) Pre-Operational Phase during the next financial period (2016-2019).
- The Global Framework of Climate Services (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 from data buoys.
- The efforts of the Panel have resulted in a more cost-effective way of collecting observations through observing systems that are now better standardized and addressing a wide range of meteorological and oceanographic applications, including the GFCS. However, despite the success, the DBCP is still facing a number of challenges, and key issues are on the agenda for this year's Session.

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 WMO Secretariat, 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 Turton then introduced the co-chairs for the Scientific and Technical Workshop, Mr Johan Stander (South Africa) and Mr Kai Herklotz (Germany), to lead that session.

## 2. SCIENTIFIC AND TECHNICAL WORKSHOP

2.1. The workshop opened at 9:30 on Monday, 19 October 2015 in Salle Obasi, WMO Headquarters, and ended on the same day at 17:00 hours. The theme of the Workshop covered “Buoy Science, Technology, and Instrumentation”, and included presentations covering the following areas: (i) sustainable Ocean Observations in support of Numerical models (ii) marine meteorological and oceanographic instrumentation, calibration, and traceability; (iii) technical development; (iv) operational enhancements; (v) marine forecast and disaster risk reduction (DRR); and (vi) research applications.

2.2. Fifteen presentations and a poster were delivered to approximately 50 participants from 16 countries. These included the following topics:

- (0) *Large Moorings Arrays around South Africa – Development in Deep Ocean Mooring Systems, (Poster by Tamaryn Morris et al);*
- (1) *New European initiatives in support of better drifter SST for satellite validation, (by Anne O’Carroll);*
- (2) *Variability of the surface circulation and associated freshwater fluxes in the Bay of Bengal, (by Verena Hormann and Luca R. Centurioni);*
- (3) *A New Global Dataset of Hourly Drifter Positions, (by Rick Lumpkin);*
- (4) *Directional surface gravity wave properties from low-cost drifting buoys, (by Luca Centurioni and Lancelot Braasch);*
- (5) *OCTOPUSEA : A new High Power Stabilized Buoy, (by Philippe Magaldi);*
- (6) *Evaluating new drogue detection methodology and comparing results from various manufacturers, (by Erik Valdes);*
- (7) *2015 Drifter developments at SIO, (by Lance Braasch, Luca Centurioni);*
- (8) *Field Laboratory for Ocean Sea State Investigation and Experimentation: FLOSSIE, (by R.E. Jensen, T.J. Hesser, V.R. Swail, and R. H. Bouchard);*
- (9) *The Benefits of Real Time Metocean Data in Port Operations, (by Chad MacIsaac & Mark Blaseckie);*
- (10) *EUMETSAT Data Collection Platform (DCP) Services, (by Wil Doran);*
- (11) *Latest Technologies, (by Lance Curtiss, Lance Braasch, and Luca Centurioni);*

- (12) *Cheap and cheerful BGC sensors: the current state of the art, (by David Meldrum, and Maciej Telszewski);*
- (13) *EUMETSAT Data Collection Platform (DCP) Services, (by Wil Doran)*
- (14) *Projecting Oil Dispersion in the Gulf of Mexico, Straits of Florida, and Caribbean Sea Using Climatological Data from Drifting Buoys and Surface Winds, (by Shaun R. Dolk);*
- (15) *Study on Performance of Sensors in Indian Moored Buoys, (by R Venkatesan);*
- (16) *DBCP – A Retrospective, (by Al Wallace);*

2.6. Recommendation: It is recommended that Panel support the work necessary to further update the publication of the "DBCP - A Retrospective", and that a presentation on the finished product be made at DBCP 32.

2.7. The Panel noted the aim of the initiative to assess and establish the benefit of HRSST-2 incremental improvements of drifting buoy for satellite SST validation (including Sentinel-3 SLSTR validation activities, and FRM4STS workshop for discussion of initial results). If benefit is established then discussion and coordination with the DBCP to understand how any further deployments may be facilitated including the funding situation (recommendation).

2.8. It was noted that there are plans for organizing a Technical workshop hosted by IFREMER in Feb. 2016 on in situ satellite validation. Another workshop is planned in late 2016 to develop a best practices guide,

2.9. The Panel expressed its appreciation to all presenters for their contributions to the workshop, and the workshop co-chairpersons, Mr Stander, and Mr Herklotz 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 are 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 2015 (**action; S&T workshop authors; 30 November 2015**).

2.10. The Panel noted with appreciation that Mr Stander and Mr McArthur would act as the Workshop Co-chairpersons for 2016.

Action 1. Act as the Workshop Co-chairpersons Science &Tech Workshop for 2016 (**action; J. Stander & Mr McArthur; DBCP-32**).

### **3. OPENING OF THE DBCP BUSINESS SESSION**

#### **3.1. Opening addresses for the main DBCP Session**

#### **3.2. Adoption of the agenda**

3.2.1. Following the Workshop on 19 October 2015, and side meetings of the DBCP Task Teams, Pilot Projects, and some of the Action Groups on 20 October, the Thirty-First

Session of the Data Buoy Co-operation Panel (DBCP) was re-convened by the Panel Chairperson, Mr Jon Turton, at 0900 on Wednesday 21 October 2015, in the Salle Obasi conference room of the WMO Headquarters, Geneva, Switzerland. The Chairperson welcomed participants to the session and thanked WMO for hosting it and providing excellent facilities. The Chairperson requested the participants to introduce themselves to the session.

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

### **3.3. Working arrangements**

3.3.1. 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 (20 October 2015). The Joint Secretariat then introduced the documentation in accordance with the provisional agenda.

3.3.2. 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 Chairperson of the DBCP, Mr Jon Turton, reported on a number of his activities during the last inter-sessional period. Specifically, he had represented DBCP at the 6<sup>th</sup> session of the JCOMM Observations Coordination Group (OCG-6) in Cape Town (27 to 30 April 2015) and reported on DBCP and the state of the drifting and moored buoy networks, and pilot projects looking at and evaluating new technologies and sensors for buoys. During the year, he also participated in a number of OCG WebEx/telecom meetings to progress the actions agreed at OCG-6. The OCG had emphasized the critical nature of complete metadata being made available for moored platforms; and encouraged the continued development and population of a metadata service at JCOMMOPS with a report on progress to OCG-7. The recovery of TAO was welcomed, although it was noted that the TRITON array is undergoing a planned reduction in the number of platforms. Alternate observing technologies (e.g. wave gliders) will likely be explored and OCG recommended that the DBCP were involved in the coordination of these and other candidate technologies. OCG were also developing a workplan targeting progress towards two major events during the next five years: JCOMM-V and OceanObs19.

4.1.2. The following week he also attended the PI-1 Training Workshop on Ocean Observations and Data Applications in Palau (4 to 7 May 2015), this being the first such event in the Pacific Islands region. The workshop had proved a great success with a number of recommendations/actions to follow up on. He thanked the host country (Republic of Palau) and in particular Dr Sidney Thurston (Chair of the DBCP Capacity Building Team) for their efforts and support for organizing the workshop.

4.1.3. In addition to his duties as DBCP Chair he noted that he continued to Chair the E-SURFMAR Expert Team on Data Buoys (who met in June 2015) where efforts continue

to involve new countries (e.g. Portugal) in the team. During the year he also attended the Argo Steering Team meeting in Brest in March 2015, and the JCOMMOPS inauguration that was arranged during that week, and various Euro-Argo Council (as Vice-Chair) and Management Board meetings.

4.1.4. The DBCP Executive Board members are distributed widely around the world (India, Australia, Europe and North America) and with the support of the WMO and IOC Secretariats and the Panel's Technical Coordinator, communications, information and decisions are made efficiently and effectively. The Board was scheduled to meet later in the evening. He noted that the vice-Chair for Asia, Dr R Venkatesan (India), had completed four years as an Executive Board Member and would be standing down, and thanked Dr Venkatesan for his support and contributions to the Board over the last four years. He also expressed thanks to Mr Graeme Ball (Australia) who was about to retire. Mr Ball has made a huge contribution to JCOMM, through both DBCP and SOT, both since (and before) its inception in 2001. On behalf of the Panel he wished Graeme an enjoyable and well-deserved retirement.

4.1.5. The DBCP continues to demonstrate international leadership on meeting its objectives for observing the state of the global oceans using data buoys, and provides a model for other emerging observing systems to follow. This is only possible with the continuing support of all the Panel's members.

#### **4.2. Reports by the vice-Chairpersons of the DBCP**

##### *Report by the vice-Chairperson for Southern Hemisphere*

4.2.1. The DBCP Vice Chairperson for the Southern Hemisphere, Mr Graeme Ball (Australia) reported on his activities during the last inter-sessional period. These activities were mainly conducted through the Executive Board in providing guidance to actions and issues arising at and since DBCP-30.

4.2.2. Mr Ball noted that this session of the DBCP was to be the last international meeting he attends as he will officially retire in mid-November 2015. He recalled that the first international meeting he attended was a session of the DBCP (DBCP-6, Melbourne, 1990) and fittingly his last meeting will also be a session of DBCP (DBCP-31, Geneva, 2015).

4.2.3. Mr Ball thanked his DBCP colleagues, some of whom he had known since DBCP-6 for their friendship, help and guidance.

##### *Report by the vice-Chairperson for North America*

4.2.4. The DBCP vice-Chairperson for North America, Mr Shannon McArthur, reported on activities during the last inter-sessional period noting an increased level of cooperation in observing system planning, architecture and design and network operations. He noted specific examples of such cooperation among operators and researchers of observing systems in the tropical Pacific and along the continental shelf of North America. He attributes this increased cooperation to the targeted coordination efforts afforded by such forums as the [Data Buoy Cooperation Panel](#), the [Tropical Pacific Observing System 2020](#)

[project](#), the [Global Ocean Observation System](#), the [Integrated Ocean Observing System](#) and [Regional Associations](#), and the growing network and activities of [Regional Marine Instrumentation Centers](#). He recommended our community continue to be engaged and participate actively in these forums to promote the spirit of cooperation, coordination and the sharing of lessons learned among owners of marine observation networks not only to advance our community in the themes of engineering and scientific achievement but also to promote our collective awareness toward improvements in operational safety and environmental stewardship best practices.

4.2.5. The Region IV (North America, Central America, Caribbean) Regional Marine Instrumentation Centre (RMIC) at the NOAA National Data Buoy Centre is organizing a workshop to share best practices on ocean waves observations during February 2016 on the Mississippi Gulf Coast, USA. The workshop organizing committee is seeking workshop participation interest from ocean wave measurement subject matter experts as well as regional members seeking to grow expertise in their ocean waves measurement program.

*Report by the vice-Chairperson for Asia*

4.2.6. The DBCP Vice-Chairperson for Asia, Dr R. Venkatesan (India), reported on his activities during the last inter-sessional period. The moored buoy network is being maintained by Japan (JAMSTEC), India (NIOT) and USA NOAA PMEL (RAMA), China (SOA- National Ocean Buoy Observation Network) and Republic of Korea.

4.2.7. Under Indo US collaboration a new Buoy called “Monsoon Buoy” was installed by WHOI in Bay of Bengal. Indian Research Vessel Sagar Nidhi and US Research Vessel Roger Revelle have carried out a joint study in Bay of Bengal and collected vast amount data and 53 drifters were deployed by Scripps Institute of Oceanography USA.

4.2.8. India also reported deployment of Gliders in Bay of Bengal, Drifters and Argo floats thereby increasing observational platforms. India also signed LOI with WHOI USA to work on ocean observational program.

4.2.9. NOAA PMEL reported that the number of implemented RAMA sites stands at 34 (74% complete). Two new moorings sites are planned for the coming year. Between July 2014 and June 2015, 153 sea days were provided by India, Japan, Indonesia, and China in support of RAMA. During this period 23 RAMA moorings were deployed. Several RAMA sites have not been maintained for 2-3 years due to lack of deployment opportunities. PMEL has identified a small ship in the Seychelles with the potential for mooring maintenance on a limited number of sites near 55°E. A test cruise in November 2015 is planned during which 2 RAMA ATLAS moorings will be deployed. A new initiative, the Second International Indian Ocean Expedition (IIOE-2, 2015-2020) is under development. The Indian Ocean Observing System (IndOOS) of which RAMA is a major component will provide basin-scale, multi-year observations for IIOE-2. IIOE-2 in turn presents an opportunity to complete and enhance RAMA. A new Implementing Arrangement between NOAA and Indonesia’s Meteorological, Climate, and Geophysical Agency (BMKG) has been developed for support of RAMA sites in the eastern Indian Ocean from Indonesian research vessels.

4.2.10. India reported installation of moored observatory in Arctic called IndARC and

collected one year of data on current temperature and salinity and has now added instruments to measure passive acoustics, pH, DO and PAR.

4.2.11. Under US- Sri Lanka collaboration ADCP moorings were deployed on southern coast of Sri Lanka by NOAA USA and NARA Sri Lanka. First year data sets are showing very encouraging results. Training was organised to staff of NARA Sri Lanka on ADCP.

4.2.12. Tsunami Buoy network is being maintained by India, China, Japan, Thailand, Indonesia and Malaysia. Technological advancement and preparedness level in this region have improved. Most of these countries are making data available through NOAA NDBC.

4.2.13. Capacity Building exercises successfully completed were: Third Capacity Building Workshop of the WMO/IOC Data Buoy Cooperation Panel (DBCP) for the North Pacific Ocean and Its Marginal Seas (NPOMS-3) - Application of Regional Ocean Observations for Increasing Society's Understanding and Forecasting of Typhoons 6 - 8 October 2014, Kyoto, Japan and; Underwater technology symposium supported by IEEE OES at Chennai India February 2015. It is proposed to conduct Fourth Capacity Building Workshop of the WMO/IOC Data Buoy Cooperation Panel (DBCP) for the North Pacific Ocean and Its Marginal Seas from 2 - 4 November 2015 in Busan, Korea Rep

4.2.14. The DBCP Vice-Chairperson Asia reported very encouraging interactions and newer developments in Asia and ocean observational measurements and data handling expertise in this region have improved in recent years due to more interactions and collaboration. He also placed on record his appreciation to member countries for supporting him as a Vice-Chairperson for Asia where he has seen enormous growth in the field of observation, modelling and assimilation of data and interaction among member countries. High among the achievements was hosting DBCP 30 session in Asia – Weihei China.

## **5. REPORT BY THE TECHNICAL COORDINATOR**

5.1. The Technical Coordinator (TC), Ms Champika Gallage reported on her activities on behalf of the Panel during the last intersessional period from 1 September 2014 to 31 August 2014. Ms. Champika Gallage began her posting as the new TC of the Data Buoy Cooperation Panel (DBCP) on 27<sup>th</sup> October 2014 by attending the DBCP-30 meeting held in Weihai, China as a fixed-term employee at United Nations Educational, Scientific and Cultural Organization (UNESCO).

5.2. The panel noted that new TC recruitment process took longer than expected. Thus there was no overlap period for training. New TC, Ms. Gallage received two days training from the outgoing TC Ms Kelly Stroker on the last week of Ms Stroker's employment with DBCP. TC also received guidance from Etienne Charpentier, WMO Secretariat and by Robert Weller and Uwe Send, co-chairs of OceanSITES program.

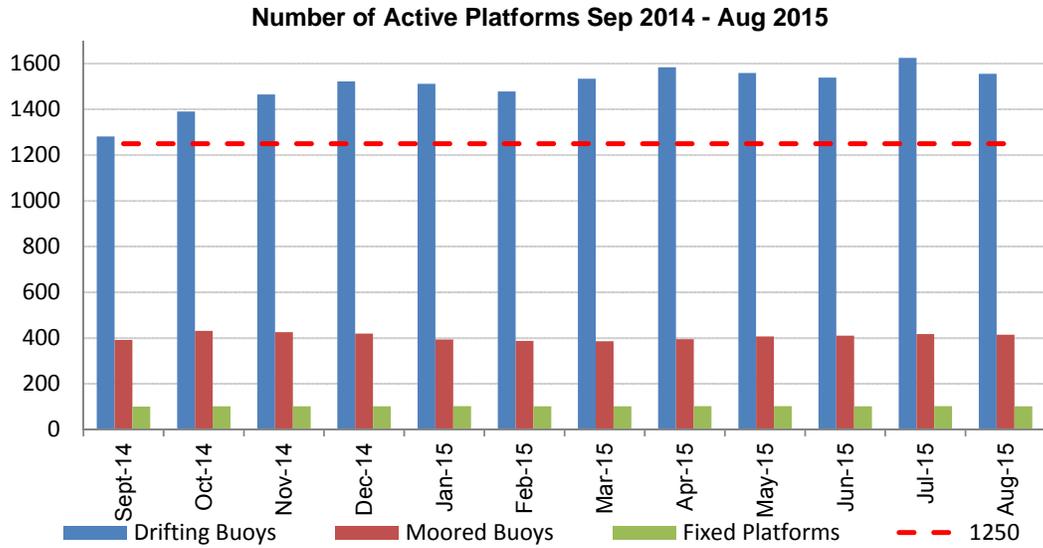
5.3. The first several months of Ms Gallage's time were spent getting familiar with routine TC tasks and administrative work with UNESCO. During this time the JCOMMOPS office was moved from the CLS Brest building to the IFREMER Campus, Brest, which is the new permanent office location for JCOMMOPS.

5.4. On average, the TC spends 70% of her time on DBCP-related matters and 30% of her

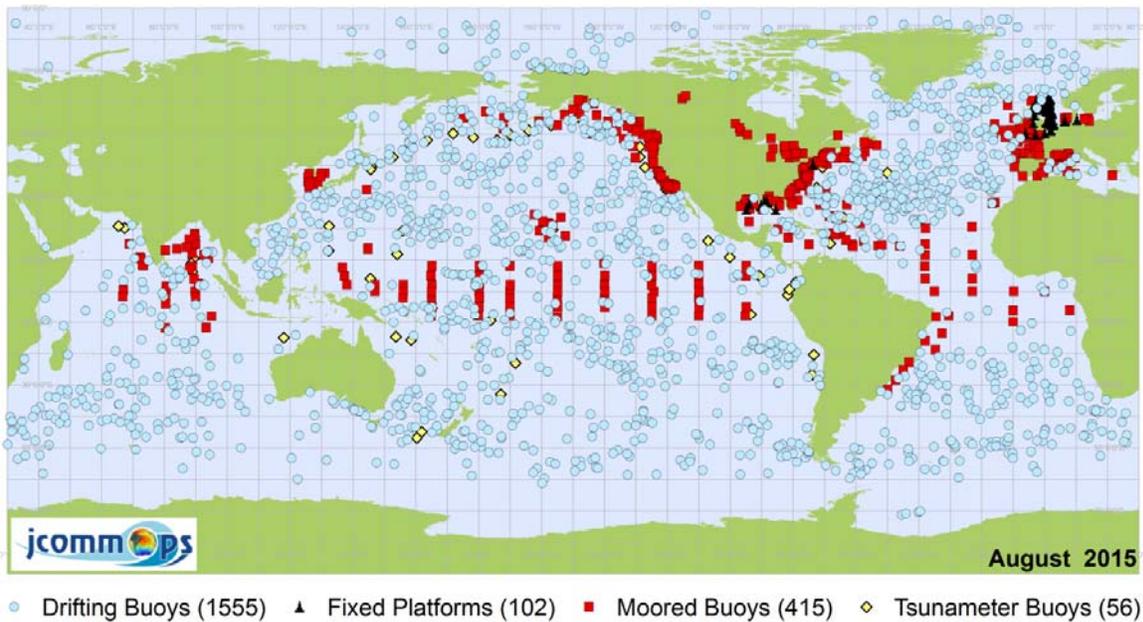
time as OceanSITES Project Office. During the previous year, Ms. Gallage's time as TC was spent on the following:

- Familiarizing with JCOMMOPS database and tools
- Familiarizing with DBCP community , platforms, operators and networks
- Travelling to meet with various DBCP Members, Action Groups, and Teams
- Review database design, metadata loading and reporting on new JCOMMOPS website
- Collecting, and preparing metadata to ingest to the new JCOMMOPS database
- Maintaining metadata in the JCOMMOPS database
- Producing monthly maps and GTS timeliness reports
- Provide user assistance
- Assisting Panel members with technical and programmatic issues
- Updating and maintaining DBCP and OceanSITES websites
- Maintaining mailing lists, contact details and user groups on DBCP, JCOMMOPS, and OceanSITES websites
- Monitoring the Quality-Control Relay traffic
- Tracking all buoy deployments, and mooring maintenance/installations
- Preparing for and attending meetings
- Preparing meeting reports and documents

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 Global Telecommunications System (GTS) was 1504 per month, 407 moored buoys and 102 fixed platforms (Figure 1). During the intersessional period, the average number of drifting buoys has increased by 14%. The current number of operational drifters on the GTS for August 2015 is at 1555 (Figure 2).



**Figure 1 - Number of operational drifting and moored buoys during the last intersessional period**



**Figure 2 - Status of the operational array in August 2015.**

5.6. The number of barometer drifting buoys is around 55%, which is a 5% increase from the previous reporting period. While the total number of drifting buoys reporting on the GTS has increased marginally throughout the intersessional period, the percentage increase of barometer buoys has been steady at 55% (Figure 3). For the moored buoys, the number of

barometer equipped platforms has not changed significantly throughout the intersessional period.

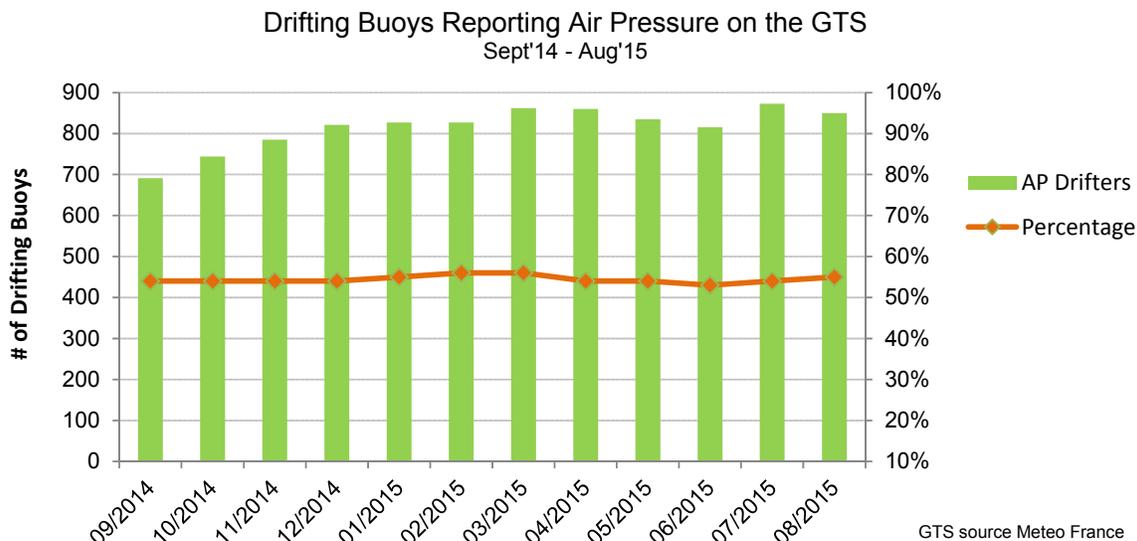


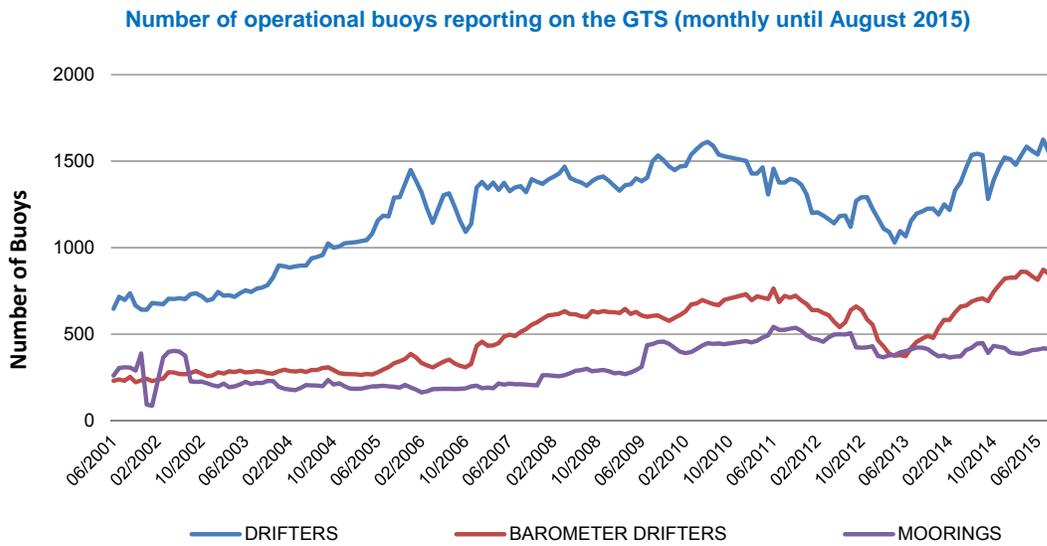
Figure 3 - Status of Barometer drifting buoys during the last intersessional period.

5.7. The Technical Coordinator reported that among the drifting and moored buoys reporting on the GTS in BUOY or BUFR formats, the following variables were measured in Aug 2015. Wave measurements are not available due to a data decoding error at the source. TC is working with Meteo-France to resolve this issue and the wave data information will be available in coming months. The problem has been received and data will be available from the first of October.

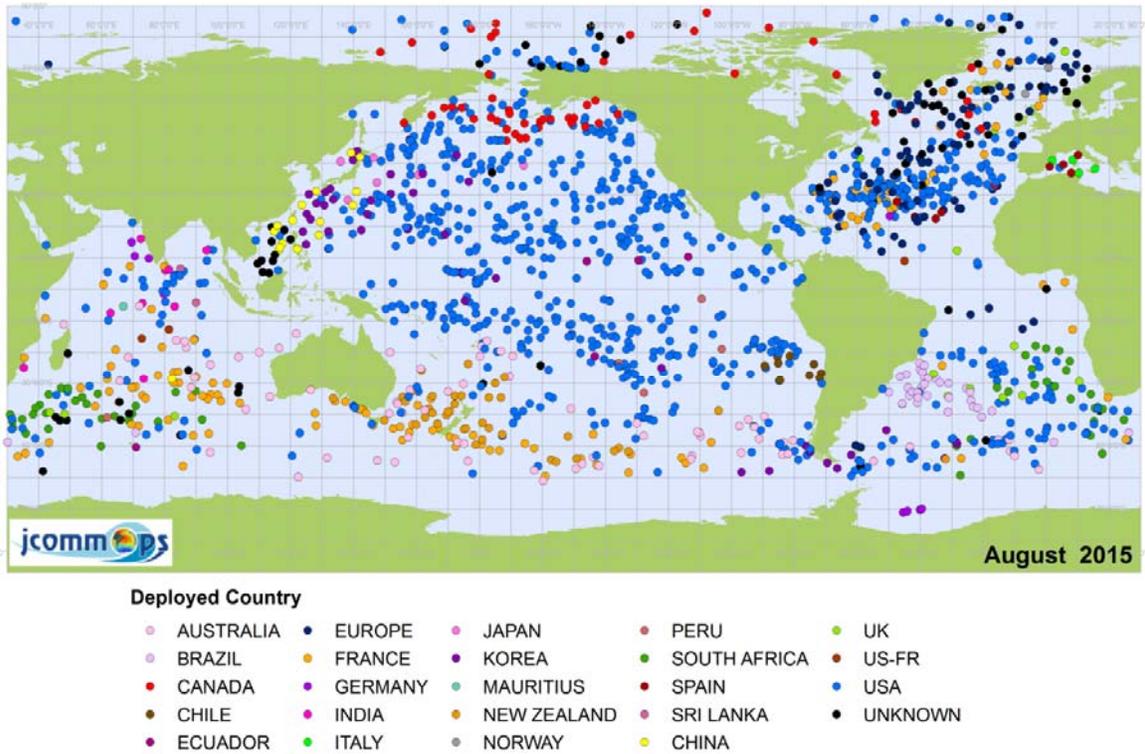
Variable	Any	Air P	P Tend	SST	Air T	Hum	Wind Dir	Wind Speed	Sub/T	SSS	Sub/Sal	Sub/Cur
<b>Drifting Buoys</b>	1555	850	597	1453	57	6	6	3	19	256	14	0
<b>Moored Buoys</b>	415	249	215	364	318	161	310	310	114	54	105	16
<b>Fixed Platforms</b>	102	90	90	9	89	83	92	64	3	0	0	1

5.8. TC pointed out the growth of drifting buoy and moored buoy networks together with number of barometer drifting buoys (Figure 4). It is apparent that there is a steady increase in total number of drifting buoys and the barometer drifters over the years after the significant decrease in 2012-13. Drifting buoy array has now reached the same level it was in 2010 with much higher number of barometers drifters. Total number of moored buoys has not changed significantly over the past few years.

5.9. The TC reported that she modified few monthly maps in this intersessional period. Deploying Country map has been updated with the entire array of active drifting buoys with their country of deployment, which is a better representation of countries contribution to their coastal waters and the Global Drifter Program (GDP). As the GDP relies heavily on its international partnerships for the deployment of instruments, it was agreed that international partnerships should be recognized. (Figure 5)

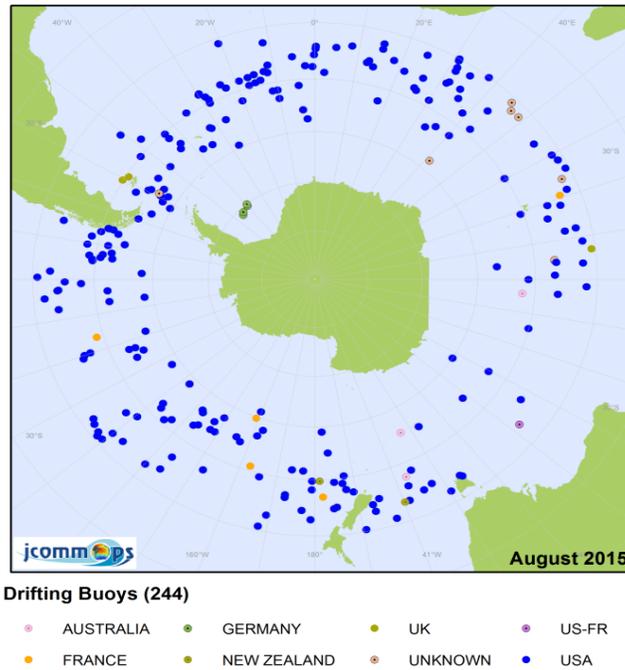


**Figure 4 – Growth of drifting buoys, moored buoys and drifters with barometers over the years from 2001**



**Figure 5 - Map showing country of deployment for drifting buoys active during August 2015.**

5.10. In addition to the changes shown above, the DBCP TC has also created separate maps with sensor information. Network maps with sensor information on DBCP website were replaced with single maps for each sensor type. This will provide easy access and improved readability.



**Figure 6 – Southern Ocean Drifting Buoys in August 2015.**

5.11. TC informed the panel that she created two new maps to better focus on the Southern Ocean deployments. New maps are with polar view showing the currently active drifting buoys with their last location and the drifter buoy density in the area. (Figure 6)

5.12. The TC reminded the panel that Deep-Ocean Assessment and Reporting of Tsunami (DART) Buoys will continue as usual to the JCOMMOPS database. The locations of these buoys are included on the monthly maps and in the reporting. The data for these buoys is not collected by Météo-France or Fisheries and Oceans Canada’s Marine Environmental Data Section (MEDS, Canada). Currently TC is relaying information received from National Data Buoy Center (NDBC). An automated process for receiving this information or adding all the Tsunami buoys to the GTS is required. TC is investigating possibilities.

**Action 2. Investigate distributing data from Tsunami buoys on the GTS (*action; TC, with NDBC or Météo France; DBCP-32*).**

5.13. The TC reported on the status of the Tropical Atmospheric Ocean (TAO) buoy array. Starting from November 2014, the TAO array has been operating around 80% data availability throughout the rest of the period. This is 30% progress in TAO data availability from last reporting period. TC also highlighted the changes to the TAO data which is currently reporting in BUFR format. NDBC announced its move to report TAO data in BUFR format starting from 2<sup>nd</sup> March 2015. In the meantime, ASCII formatted messages in FM 18 BUOY format will continue to be distributed under the same headers as usual from the TAO array.

5.14. 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 40°S. As of August 2015, there were 244 drifters in the Southern Ocean and 221 (90%) of these were barometer drifters. Little progress has been made compared to the

August 2014 number which was 216. There were a total of 117 drifting buoys deployed in the Southern Ocean during the last intersessional period and DBCP members should continue to look for deployment opportunities in this region.

Action 3. Look for deployment opportunities in Southern Ocean (**action; DBCP Members; asap**).

5.15. The TC emphasized the importance to get the notifications on network and service changes out to a broader community who use the data flowing through the GTS in downstream. Most of the time the network/platform/data flow change notification information only gets to the meteorological centres who has direct access to the GTS.

Action 4. Provide network and service change notices to DBCP to post them on different notification streams (**action; Buoy Operators; DBCP-32**)

5.16. The Panel noted the importance of developing the performance metrics for the DBCP networks. The TC outlined the organization of such metrics with proposed indicators. A single Key Performance Indicator (KPI) can be applied across the various network Categories (i.e. Network data availability). Further, secondary KPIs can be defined for each different network; global drifter array, tropical moored buoy array, national/coastal moored buoy network, Arctic/Antarctic buoys, and Tsunami buoys. Appropriate Task Teams (TT) or Action Groups (AG) can work on the secondary KPI development. The KPIs should capture the performance of network status, data delivery, and international cooperation, instrumentation, and operation aspects of the buoy arrays. TC requested the panel to review the proposed approach and provide feedback.

Action 5. Review and provide feedback to TC on categories of networks and draft indicators list (**action; Appropriate Task Teams and Action Groups and TC; Dec. 2015**)

5.17. The TC reported on the progress of data submitting in the Binary Universal Form for the Representation of Meteorological Data (BUFR). Migration to BUFR was scheduled to be complete at the end of Nov 2014. In April DBCP requested all drifting buoy data providers to use latest BUFR template TM315009 starting from July 01<sup>st</sup>. Many members provide drifting buoy data in BUFR format with multiple element descriptors which have become a challenge for the DBCP Global Data Assembly Center (GDAC). Details of these challenges are discussed in the document no.10.2. TC provided statistics on the percent of drifting and moored buoys currently reporting to the GTS using Traditional Alphanumeric Codes (TAC) and BUFR and mentioned that if there are questions regarding the migration please contact TC.

5.18. With increasing number of data providers moving to BUFR, there have been several changes to the bulletin headers. TC has updated the bulletin header file and made it available through the DBCP website. DBCP members are encouraged to review the document and provide updates to the TC.

5.19. One of the high priority activities for TC during the intersessional period was to establish a method to collect moored buoy metadata. Accordingly, TC established a process to collect moored buoy metadata and provided the information to the community with a request to submit data. Following the DBCP request in February 2015, 15 agencies from 13

countries have provided metadata on moored buoys. Compiled metadata files and data submission instructions are accessible through a FTP site.

5.20. The TC highlighted the importance of receiving metadata and deployment information in timely fashion at the DBCP. Timely platform metadata availability has become more important with the new JCOMMOPS website to provide up-to-date and accurate information to the community. TC has reminded the community to provide deployment information and metadata through usual channels until the new website is launched, which will provide tools to upload this information.

Action 6. Provide deployment and platform metadata information to DBCP (**action; Buoy Operators; DBCP-32**)

5.21. The TC reminded the panel the importance of correct handling of WMO identifications to report the data on to the GTS. DBCP platforms use five-digit WMO identification (WMO ID) numbers to report data in TAC format to the GTS. WMO IDs can be reassigned within the guidelines provided by the WMO. However, there were instances that members were not following the WMO ID reassign guidelines that lead to difficulties in data archiving and metadata management. Therefore, the TC proposed to have more centralized and controlled WMO number management by WMO secretariat or within JCOMMOPS.

5.22. The Technical Coordinator reiterated current and future priorities:

- Moored buoy metadata ingestion to new JCOMMOPS database
- Continue working with JCOMMOPS colleagues on new website
- Continue to work with Iridium VAR's to obtain drifter, mooring, and float information.
- Link with IABP to get a metadata feed to JCOMMOPS (similar to AOML feed)
- Ensure loading procedures (e.g Tsunameter data) are accurate. Work with OSMC and/or MeteoFrance
- Continue to update Meteorologists Cookbook
- Other products and services as requested by the community

5.23. The DBCP Technical Coordinator, Champika Gallage, thanked the DBCP Members, for their support and understanding during this intersessional period which has been an on-the-job learning period for her new position.

5.24. **The meeting made the following recommendations:**

- Rec. 1. The panel recommended for the drifter manufacturers to provide information to JCOMMOPS on models, formats, and shipments;
- Rec. 2. The panel recommended it's members to continue providing buoy deployment information to the Technical Coordinator in the agreed upon format;
- Rec. 3. The panel recommended it's members to continue providing buoy metadata information to the Technical Coordinator in the agreed upon format;

Rec. 4. The Panel recommended to follow guidelines proposed to better handle WMO IDs;

Rec. 5. The panel recommended members who are not yet transmitting data to the GTS in BUFR format to start doing so using appropriate data formats; and

Rec. 6. The panel recommended the moored buoy operators to provide Moored Buoy metadata in the appropriate data format to the TC

**5.25. The meeting decided on the following action items:**

Action 7. The TC to work with NDBC or Météo France on an automated process for receiving tsunameter information. (**action; TC, NDBC or Météo France; DBCP-32**);

Action 8. The Panel requested the Technical Coordinator to work with Iridium VARs to obtain drifting buoy data (**action; TC; DBCP-32**);

Action 9. DBCP members should provide deployment information to the TC in timely manner. (**action; Buoy Operators; continuous**)

Action 10. DBCP members should look for deployment opportunities in the Southern Ocean (**action; DBCP Members; asap**).

Action 11. Panel review and provide feedback on categories of networks and draft indicators list (**action; Panel members; asap**)

5.26. The Panel and the Secretariat thanked Ms Gallage for her informative and high quality report on the activities of the TC DBCP. The Panel congratulated Ms Gallage on her rapid development as TC DBCP and thanked her for efforts beyond the call during this difficult transition year.

Action 12. The Panel requested the Technical Coordinator in liaison with some Panel members to discuss the rules for allocating WMO numbers with the Secretariat in the view to make a proposal to the next Panel Session for updating those rules (**action; TC DBCP; DBCP-32**).

5.27. The Panel recalled that JCOMM Technical Report No. 72, an Oceanographers' and Marine Meteorologists' Cookbook for Submitting Data and Metadata in Real-time and Delayed Mode (the data Cookbook) was owned by the JCOMM Data Management Coordination Group (DMCG), while the DBCP is offering the services of its Technical Coordinator for keeping it up to date. The Panel agreed to continue this arrangement.

5.28. The Panel noted that the switch to Iridium is interrupting the meta data flow which has been used by JCOMMOPS to monitor and track all platforms.

Action 13. The Panel invited the Iridium VARs and the buoy operators to facilitate the provision of the required buoy data to JCOMMOPS allowing JCOMMOPS to routinely produce its monitoring information (**action; Iridium VARs & buoy operators; 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 chairperson reporting on problems encountered with data streams, almost all of which, were quickly resolved with cooperation of CLS, CLS America, MEDS and Meteo-France. Migration to BUFR is progressing, most centers are applying the new template, but some are also reporting in the old template. CLS agreed with Meteo-France to temporarily report observations of each drifter using the 3 different formats (Two BUFR and TAC). 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 meeting agreed on the following:

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

Rec. 8. To keep the "Oceanographer's Marine Meteorologist's Cookbook for submitting Data in Real Time and In Delayed Mode JCOMM Technical Report No. 72 up to date as a living document with assistance from the Technical Coordinator.

Action 14. The trial JCOMM Global Data Assembly Centres (GDACs) for drifting buoys of Météo-France (former SOC) and ISDM (former RNODC/DB) to continue to work towards the implementation of a routine procedure to compare GTS Bulletin Headers between the two centres. (*action; GDACs of Canada & France; DBCP-32*).

Action 15. Buoy operators to make sure that all the buoy manufacturers adhere to the standard and approved DBCP data formats (*action; DBCP members; ongoing*).

Action 16. Centers must switch to using BUFR template for drifting and moored buoys (templates TM315009 for drifters and TM315008 for moorings) as soon as possible. (*action; DBCP members; asap*)

Rec. 9. JCOMM trial Global Data Assembly Centers (GDACs) for drifting buoys, Meteo-France and MEDS, should continue to work together comparing GTS bulletin headers received by the two centers to resolve problems.

Rec. 10. Make sure all buoy manufacturers adhere to the standard approved DBCP data formats.

Rec. 11. To push forward and complete the BUFR migration by March 2016 and make sure all centers are informed of the final switch date.

Rec. 12. Identifying oil rigs, drill ships and light vessels from the data going out on GTS is not trivial. It has been suggested to have unique WMO numbers and clearer WMO rules for those types of fixed platforms.

Action 17. The Task Team invited its members to review the "Keeley" report (Data Systems

Relevant to JCOMM Activities<sup>1</sup>) and to provide their feedback to the Chair of the Task Team on Data Management (**action; TT-DM; end 2015**).

6.1.3. Panel noted that WMO region specifications which are designed for continental use, are not appropriate for oceanographic usage. However the Panel expressed the opinion that it was a small point which should not be cause to vary from WMO procedures.

6.1.4. The Panel thanked Mrs. Pazos and members of the Task Team for their efforts. It was agreed that Ms. Mayra Pazos would continue as chairperson of the Task Team for the intersessional period and that Mr Christophe Billon (France) should be added to the membership of the Task Team in replacement of Mr Pierre Blouch (France). The full report of the Task Team is provided in Appendix A of DBCP-31 preparatory document No. 6.1, and will be included in the DBCP annual report for 2015.

## **6.2. Task Team on Instrument Best Practices & Drifter Technology Developments (TT-IBPD)**

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

### *6.2.2. Drifter lifetime*

6.2.3. Since the DBCP-30 Drifter Best Practices report it appears that the issue of drifter lifetimes has been fixed. The global array now enjoys a very large number of active drifters (1,478, +18% of the nominal size), and 54% of the drifters are equipped with barometers. The TT-IBPD stresses the importance of constantly monitoring the status of the global array to detect early sign of technical issues.

6.2.4. The TT-IBPD noted that testing drifters after delivery, but before deployment, may often result in more complications than benefits.

Rec. 13. Properly packaged drifters should not be tested before deployment. The drifters should be stored in proper conditions (not too hot, not too humid) and with magnets properly attached. Also storage and handling instructions should be included along with the deployment instructions. Storage instructions should include magnets checks, acceptable temperature ranges etc.

### *6.2.5. Drogue detection and retention*

6.2.6. 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 below show a marginal improvement of drifter drogue lives for the period 2012-2014, with the exception of Clearwater that is no longer in business.

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<sup>1</sup> [http://www.jcomm.info/index.php?option=com\\_content&view=article&id=331](http://www.jcomm.info/index.php?option=com_content&view=article&id=331)

**DROGUE HALF-LIFE (DAYS)**

<u>Manufacturer</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Clearwater	72	101	104	95	84	>293	>452	>312
DBi	*	*	*	*	279	227	244	>228
Marlin-Yug	152	72	57	167	*	0	*	20
Metocean	>373	269	224	77	89	110	211	>187
Pacific Gyre	210	206	241	248	207	>228	241	>202
SIO	*	*	*	*	*	66	>142	>137
Technocean	45	33	63	74	154	>62	0	>14

**PERCENT THAT HAD DROGUE OFF <90 DAYS**

<u>Manufacturer</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Clearwater	55%	36%	30%	36%	39%	14%	4%	13%
DBi	*	*	*	*	25%	11%	12%	7%
Marlin-Yug	0%	41%	46%	40%	*	43%	*	71%
Metocean	13%	17%	26%	40%	45%	35%	14%	21%
Pacific Gyre	20%	21%	17%	10%	16%	21%	9%	15%
SIO	*	*	*	*	*	40%	23%	13%
Technocean	65%	78%	53%	46%	27%	31%	29%	44%

**PERCENT THAT HAD DROGUE OFF <10 DAYS**

<u>Manufacturer</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
Clearwater	7%	4%	7%	7%	5%	3%	2%	1%
DBi	*	*	*	*	0%	4%	3%	0%
Marlin-Yug	0%	24%	33%	10%	*	43%	*	43%
Metocean	8%	13%	6%	12%	6%	8%	4%	4%
Pacific Gyre	8%	11%	8%	2%	4%	7%	0%	1%
SIO	*	*	*	*	*	24%	1%	0%
Technocean	10%	11%	10%	9%	3%	14%	14%	29%

6.2.7. One recommendation is to increase the diameter of the tether to ¼" spacelay and to the construction of the drogue harness. Experimentation with different tether materials and drogue harness stiffening is continuing and some results were presented at DBCP-31.

6.2.8. The Panel noted that the distribution of drifters with longer lifetime will converge and the spatial distribution of the drifters will be less uniform and biased by ocean currents. The drifter lifetime problem is largely fixed. The statistics provided by AOML are encouraging. Long half-life and low death rate. The death rate is expected to grow as the array ages. As the drifters live longer, the spatial distribution of the drifters will be less uniform and biased by ocean currents. It is anticipated that, if the trend continues a larger number of drifters (>1,250) will be operated to preserve uniform coverage, important for SST cal/val and NWP. Short drogue lives continue to be an issue. No consistent failure points are observed by manufacturers. The GDP engineers at the Scripps Institution of Oceanography are actively working to explore new technical solutions, by systematically isolating suspicious failure points.

6.2.9. The 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-31 preparatory document No. 6.2, and will be included in the DBCP Annual Report for 2015.

### **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. Over the last few years the metadata needing to be collected for moored buoy systems has been defined and an initial system for its submission to JCOMMOPS was set up in February, with documentation and submitted metadata available via <ftp://ftp.jcommops.org/DBCP/metadata/>. At time of writing moored buoy metadata have been submitted by Brazil, Canada, Chile, France, Germany, Greece, India, Italy, Japan, South Korea and US. Other moored buoy operators are requested to generate and provide their metadata to the DBCP-TC. Note there is an action from OCG-6 for DBCP to provide a summary of its strategy for development and completeness of metadata records for OCG-7 in April 2016.

6.3.2. The Task Team was instrumental in the development and validation of the BUFR template (TM 315008) for moored buoy data, which is now operational. Up until now most metocean moored buoys have been reporting their data onto the GTS in FM13 SHIP code and some of these data are being converted to BUFR template 3-08-009 (B/C10 – originally developed for ship data) and are being transmitted in both codes. At the same time, the tropical moored buoys (TAO, PIRATA and RAMA networks) have reported their data in FM18 BUOY and the legacy un-validated (deprecated) template for data buoys. In time, all moored buoy BUFR data issued to GTS should transition to using template 3-15-008. At present only US/PMEL, NDBC and Ireland (Met Eireann) are known to be doing so.

6.3.3. It has not been possible during the last year to progress the validation of the new BUFR template (3-08-017) for data from fixed platforms (e.g. offshore rigs and light vessels) which was developed as neither the templates for moored buoys or ships (VOS) are well suited to fixed platforms. This should be progressed during the next inter-sessional period.

6.3.4. 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 an alternative to operating moored buoys. Almost all ASVs presently use the AirMar all-in-one weather station. However, there are questions whether the ASVs are sufficiently robust, cost effective and able to deliver data of equivalent accuracy. The JCOMM Observations Coordination Group has recommended that DBCP coordinate (or at least suggest JAMSTEC coordinate with others) the evaluation of these and other candidate technologies, possibly taking advantage of TPOS and/or related activities. The Panel discussed whether this should fall to the TT-MB or whether to establish a new Pilot Project on Autonomous Surface Vehicles (PP-ASV) and agreed that a pilot project would be more appropriate.

6.3.5. In parallel, 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 this will need to be progressed during the coming year.

6.3.6. During the year a number of technical developments to the various moored buoy systems and networks have been made, including:

Brazil: The Brazil National Buoy Program comprises 10 moored meteoroceanographic bouys operating along the coast; with 7 moored buoys (Axys 3M) currently in operation. It is planned for the deployment of one more moored buoy in 2015.

India. Under the Ocean Observation Network program of the Ministry of Earth Sciences, National Institute of Ocean Technology (NIOT) has established the moored buoy network in the Indian Seas. Currently 18 moored buoys are working in Northern Indian Ocean region. Out of which 12 are having meteorological and oceanographic sensors up to 500m depth transmitting data in real time though INMARSAT with a data return of more than 93%. India has developed moored buoy called "Prakruti" to transmit 106 parameters in real time. Under Indo US collaboration a new buoy called "Monsoon Buoy" by WHOI was installed in the Bay of Bengal.

UK: Further deployment of new design moored buoys with spectral wave capability to replace legacy designs, with sub-hourly data reported from one new system. Evaluation of moored buoy wave measurements is continuing as a contribution to the PP-WET. Initial evaluations of several ASV have been carried out as part of the MASSMO (Marine Autonomous Systems in Support of Marine Observation) project.

US: Testing of PMEL's T-Flex mooring system, intended to replace the legacy ATLAS moorings in RAMA and PIRATA, has been completed. The first replacement of an ATLAS system occurred in August 2015 at a RAMA site. Additional replacements of ATLAS with T-Flex systems in RAMA and PIRATA are planned for later in 2015 and in 2016.

USACE: Three dual sensor payloads onboard NOAA/NDBC 3D buoys (two in the Pacific, one in the Atlantic) continue to collect wave data for the intra-measurement evaluations. FLOSSIE (Field Laboratory for Ocean Sea State Investigation and Experimentation) a 6N (NOMAD) buoy was deployed 07/2015 in Monterey Canyon as part of the Buoy Farm inter-measurement evaluation. This is a collaborative effort between the USACE, NOAA/NDBC, Environment Canada and the AXYS™. Multiple sensor/payload packages onboard FLOSSIE will provide valuable data used in the intra-measurement evaluation. This deployment complements the 3D NOAA/NDBC dual sensor system, a Datawell™ directional Waverider buoy, and a TRIAXYS buoy to be deployed in the future provided by AXYS™. Additional information regarding the dual sensor buoys and FLOSSIE are documented as part of the DBCP-ETWCH Joint Pilot Project on Wave Measurement Evaluation and Testing.

6.3.7. The meeting agreed on the following:

- Rec. 14. Recommendation: that all centres issuing moored buoy data to the WMO GTS transition to BUFR template 3-15-008 as soon as possible, with dual BUFR/TAC dissemination to summer 2016 to allow operational centres to be ready for the change.
- Rec. 15. Recommendation: to progress work on validating the BUFR template for offshore platforms (3-15-017) and to develop a suitable template for ASVs.
- Rec. 16. Recommendation: to help coordinate work being carried out by various panel members on the evaluation of ASVs and to use its annual Scientific and Technical Workshop as a forum for presenting latest results.

6.3.8. The Panel noted the recommendations made during the TT-MB side meeting:

- Rec. 17. By summer 2016 all moored buoy data on GTS to be in TM 3-15-008 (generated from the measured data and not by TAC conversion)
  - Rec. 18. New BUFR template submitted to WMO IPET-DRMM for fixed offshore platform data (3-08-017) to be validated
  - Rec. 19. Define metadata content for fixed platforms (action 16 from DBCP-30)
  - Rec. 20. TT-MB to define performance metrics for national/coastal buoy networks
  - Rec. 21. Capture best practice for sampling/time stamping in a DBCP Technical Document
  - Rec. 22. Capture knowledge and lessons learned on use of met and oceanographic sensors in a DBCP Technical Document
  - Rec. 23. Action 17 (from DBCP-30) to develop a suitable BUFR template for Autonomous Surface Vehicle (ASV) data
  - Rec. 24. Recommendation to establish a group within the TT-MB to facilitate exchange of information on ASV test and evaluation
- Action 18. The Panel recommended correcting time stamp data according to WMO-8, draft CIMO guide and WMO-544 for meteorological data. A DBCP Technical Document should be

produced to clarify these issues.(action; TT-MB; DBCP-32)

6.3.9. The Panel agreed that DBCP guidelines on instrument standards ought to be developed. The Panel agreed that the following should initially be undertaken: (i) checking existing materials (e.g. WMO No. 8, Guide to Meteorological Instruments and Methods of Observation), (ii) agreeing on the scope of the guidelines document, and the methodology for producing it, and then (iii) proposing a work-plan, and who should contribute. The guidelines document could include instrument classes, and information on traceability requirements, while certification could simply be undertaken at the DBCP level through a committee to be established for that purpose.

Action 19. The Panel requested R. Venkatesan to lead such developments, with assistance from Luca Centuriani, David Meldrum, and the Secretariat in the view to make a proposal (possibly a draft guidelines document) at the next Panel Session (**action; R. Venkatesan; DBCP-32**).

6.3.10. The Panel thanked Mr Turton and the members of the Task Team for the report. The Panel elected Bob Jensen (USA) to Chair the Task Team with Shannon McArthur (USA) as vice-Chair during the next inter-sessional period. The full report of the Task Team is provided in Appendix A of DBCP-31 preparatory document No. 6.3, and will be included in the DBCP Annual Report for 2015.

#### **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 First Pacific Islands Training Workshop on Ocean Observations and Data Applications (PI-1) Republic of Palau, 4-7 May, 2015 2) Outcome of the Inaugural Session of the DBCP Tropical Cyclone-Ocean Interactions Training Centre at Pusan National University, 3) Preparations for the Fourth North Pacific Ocean and Marginal Seas (NPOMS-4) “Applications of Ocean Observations for Improving Society’s Understanding and Forecasting of Typhoons, 2-4 November 2015 at Korea Maritime and Ocean University (KMOU) in Busan, Republic of Korea.

6.4.2. The meeting noted with appreciation that the preparations for NPOMS-4, which was decided by DBCP-30, are now well underway, and thanked the Republic of Korea and KMOU for their support to the event.

6.4.3. The Panel noted the coherent Capacity Building policy and activities that align with IOC and WMO Capacity Building mandates, and emphasize the value of communication with host country’s policy makers.

6.4.4. The Panel thanked Korea for housing the DBCP NPOMS Training Centre at Korea Maritime and Ocean University.

6.4.5. The meeting agreed on the following actions for TT-CB:

- Action 20. To explore with the IOC Sub-Commission for Africa and the Adjacent Island States for a possible future (2017-2020) session of a DBCP Western Indian Ocean (WIO) Capacity Building Workshop to focus on developing the contributions of WIO region to the 50<sup>th</sup> Anniversary of the International Indian Ocean Expedition (IIOE-2) 2015-2020. (**action; TT-CB; DBCP-31**);
- Action 21. 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**);
- Action 22. To Enhance Coordination and Cooperation between TT-CB and WMO Regional Associations (**action; TT-CB; DBCP-31**);
- Action 23. 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**);
- Action 24. To commence planning, through TT-CB, in 2016 for the organization of the “Second Pacific Islands Workshop on Ocean Observations and Data Applications” (PI-2). 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. Several venues have already been identified. (**action; TT-CB; DBCP-31**).
- Action 25. To commence planning, through TT-CB, in 2016 for the organization of the fifth “North Pacific Ocean and Marginal Seas Workshop” (NPOMS-5) hosted in Taiwan, province of China. (**action; TT-CB; DBCP-31**).

6.4.6. The Panel agreed that priority activities for 2016 should be NPOMS-5 (Taiwan, province of China) and PI-2 (New Caledonia), second Busan DBCP Summer School Training in Pusan, Korea. Limited involvement in the IIOE-II is advised for 2016 as the IIOE-2 is a five year programme which can be joined in later years.

6.4.7. The Panel thanked Dr. Thurston and the members of the Task Team for the report. The Panel re-elected Dr. Thurston to Chair the Task Team during the next intersessional period. The full report of the Task Team is provided in Appendix A of DBCP-31 preparatory document No. 6.4, and will be included in the DBCP Annual Report for 2015.

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## 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.

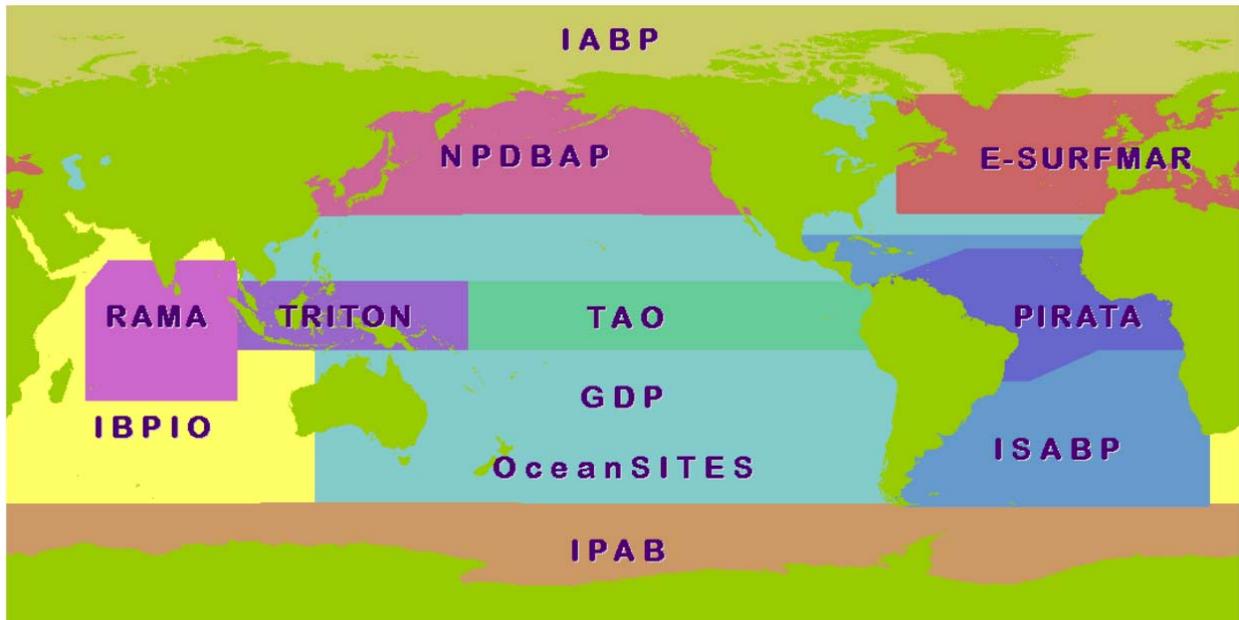


Figure 1: The regional extent of several of the DBCP Action Groups.

7.2. The reports included:

- (i.) **E-SURFMAR**: Surface Marine programme of the Network of European Meteorological Services, EUMETNET (verbal presentation by Jon Turton (UK), representing the E-SURFMAR officers). E-Surfmar is engaged in the Surface Drifters component of Work package 3 of AtlantOS. 133 E-SURFMAR drifting buoys were in operation (91 Iridium including 4 AtlantOS and 42 Iridium upgrades) + 69 others reporting Air Pressure. Four E-SURFMAR supported moored buoys are in operation, plus a further 30 others operated by members. Plans for 2016 are to maintain a network of 100 drifting buoys in North Atlantic, a network of 15 drifting buoys in South Atlantic, and the 4 reference moored buoys in operation. Use of Iridium has helped to improve data timeliness to greater than 90% reporting in 50 min or less. Monthly and annual reports are available on <http://ww.eumetnet.eu>.
- (ii.) **GDP**: Global Drifter Programme (verbal presentation by Rick Lumpkin (USA) on behalf of the GDP). GDP work on improving drifter lifetime has brought death rates down from 160 to 72 per month implying a cost savings of \$1.8M per year. A total of 1117 drifters were deployed during the period Sept. 2014 – Sept. 2015, compared to 1660 drifters last year (when the array had fallen below 1250 drifters and needed to be replenished). The array began this period at 1395 drifters. In the coming year, the GDP Deployment Plan is deploy

- 1000 drifters (800 operational, and 200 under consortium research buoy deployments). The goal of GDP is to transition to 80% Iridium + GPS by mid 2019.
- (iii.) **IABP:** International Arctic Buoy Programme (verbal presentation by Dr. Ignatius Rigor (USA), representing IABP). Dr Rigor reported on the IABP Arctic Observing Experiment which included several SVPs, ice mass balance buoy, thermistor string and other instruments deployed on the sea ice. As of mid 2015, 162 buoys were reporting. Participants plan deployments of 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.
  - (iv.) **IBPIO:** International Buoy Programme for the Indian Ocean (verbal presentation by Mr Shaun Dolk (USA, Chairperson of the IBPIO). Recently India and Kenya have greatly facilitated delivery and deployment of drifters in the Indian Ocean. Currently IBPIO has 154 drifters (131 with Air Pressure) and 48 moored buoys (34 for RAMA 74% of the planned 46 site array). Future plans are to maintain a network of at least 150 drifters and continue coordinating deployments with RAMA moored buoy maintenance cruises.
  - (v.) **IPAB:** WCRP-SCAR International Programme for Antarctic Buoys (verbal presentation by Ignatius Rigor (USA) on behalf of the IPAB). 16 buoys were deployed during AWI Polarstern cruise PS89/02 in the Weddell Sea, including SVP, IMB, and snow buoys contributed by AWI. The Meteorological Services of South Africa, Australia, and New Zealand continued to operationally deploy numerous SVP's in the Southern Ocean, primarily north of the sea ice edge. Next year main deployments will be during a German icebreaker cruise to the Weddell Sea in Dec 2015/Jan 2016. It is planned to deploy 9 snow buoys, 9 SAMS IMBs, 10 SVPs (with contributions from AAD), and 2 Bio-Phys buoys. NOAA GDP is considering deploy
  - (vi.) **ISABP:** International South Atlantic Buoy Programme (verbal presentation by Mayra Pazos (USA), representing the ISABP). As of August 24, 2015, there were a total of 184 drifters in the South Atlantic Region (49 SVP and 135 SVPB), a total of 27 more than last year around the same time of the year. The Brazilian Navy plans to have 10 moored buoys along the coast, as of August 2015, 7 are operational, one 1 was just deployed in Oct. 2015. The GDP deployment plan for 2015-16 is: SVP=170, SVPB=80 in Tropical Atlantic; SVP=25, SVPB=25 in Extra Tropical Atlantic; and SVP=0, SVPB=100 in Southern Atlantic.
  - (vii.) **NPDBAP:** DBCP-PICES North Pacific Data Buoy Advisory Panel (verbal presentation by Mr Shaun Dolk (USA), technical coordinator of the NPDBAP). NPDBAP goals include accessing deployment opportunities through cooperation with DART , PX37 and PX38 programmes, as well as expanding and supporting membership with recruitment documentation and web site improvements. From 01 September 2014 to 31 August 2015, 110 drifters were deployed in the North Pacific Ocean. Of the 110 drifter deployments, 74 units were equipped with barometer sensors and the remaining 36 drifters were standard SVP type drifters. The goal for 2016 is to deploy 100 drifters, of which, 70 drifters will be equipped with barometer sensors.
  - (viii.) **OceanSITES:** OCEAN Sustained Interdisciplinary Timeseries Environment observation System (verbal presentation by the Technical Coordinator, Champika Gallage, representing OceanSITES project office). The OceanSITES members decided to develop a new structure to communicate the project with a sequence of separate documents. The OceanSITES Network consists of over 200 reference sites in the deep-ocean plus an additional 94 standard meteorological sites (TAO, RAMA, PIRATA). Currently there are 82 sites transmitting data in real-time to a local or regional data centres. Currently only around 34% of these sites submit data to one of the Global Data Assembly Centers (GDAC) in DM team NetCDF format. OceanSITES PIs have pledged to add deep temperature/salinity sensors to their 56 existing moorings with deep sensors and as of August 2015 26 sensors were installed with an additional 10 planned in the coming year(s).

- (ix.) **TIP:** Tropical Moored Buoys Implementation Panel (verbal presentation by Rick Lumpkin (USA) on behalf of the TIP). The Tropical Moored Buoy Implementation Panel (TIP) oversees the design and implementation of the TAO/TRITON, PIRATA and RAMA mooring arrays and contributes to the TPOS 2020 project. Of the TAO/TRITON array, 51 of 55 TAO and 8 of 8 TRITON surface moorings are reporting data. PIRATA has 18 of 18 surface moorings reporting data and RAMA has 16 of 27 surface moorings reporting data. Future plans are to maintain the levels of 61 for TAO/TRITON, 18 for PIRATA and 34 for RAMA including 2 new sites. Resumption of annual service of all sites in 2014 has resulted in annual data return comparable to historical norms. Primary reasons for prior data loss in RAMA were a high incidence of vandalism coupled with long mooring deployment periods at some sites. Across all arrays Research Partnerships with Blue Ocean Initiative, IIOE-2, AtlantOS and others contribute to upgrades and additional instrumentation on many moorings.
- (x.) **ITP:** International Tsunameter Partnership (verbal presentation by Dr Venkatesan (India) on behalf of the ITP). Great technological improvements have improved system lifetimes from original designs for 1.6 year, to new systems which may reach 10 years. The global Tsunameter network now includes 54 units out of the planned network of 88 units. A significant portion of the users are making their real time data available through the GTS. There continues to be a positive trend and is a notable event in international collaboration. Approximately, 77 percent of the deployed Tsunameters are providing data through the GTS. India is making data available through GTS to NDBC website

7.3. The Panel noted the recommendations of the ITP ([Annex V ITP](#)) presented in session.

7.4. The DBCP recognizes the efforts of the 2<sup>nd</sup> International Indian Ocean Expedition (IIOE-2) and wishes to be part of this initiative with the aim to maintain and enhance in-situ met-ocean platforms in the Indian Ocean. This includes increased collaboration, capacity building initiatives and coordination with the IIOE-2 research activities.

7.5. The DBCP recognizes the efforts of the North Pacific Data Buoy Advisory Panel (NPDBAP) to increase participation with members from the North Pacific Marine Science Organization (PICES) community and wishes to support these efforts in the following ways:

Action 26. Together with the NPDBAP TC, the DBCP will create/issue invitation letters with DBCP letterhead. (action; NPDBAP TC; as needed)

Action 27. The DBCP will authorize the use of a DBCP brochure for NPDBAP activities, including access to said document on the NPDBAP webpage.(action; chair DBCP; asap)

7.6. The full reports of the action groups are provided in DBCP-31-Doc. 7, Appendices A to J, and will be reproduced in the Panel's Annual Report.

## 8. REPORTS BY 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 a 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. The Work Began in May 2015. 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.

8.1.3. The data denial experiments were launched at the beginning of summer 2014.. The runs were completed, a report was submitted and the main findings of the study, describing the significant beneficial effect of the SLP data from drifters on NWP, were submitted to the Bulletin of the American Meteorological Society. The Panel recommended closing the PP-SLP. An essay outlining the main finding of the study was submitted to the Bulletin of the American Meteorological Society.

8.1.4. It is herein proposed to close the PP-SLP.

8.1.5. The meeting made the following recommendations:

Rec. 25. to close the PP-SLP

Rec. 26. to add barometers to all the drifters and also deploy them at low latitudes.

Rec. 27. Categories used for Forecast Sensitivity to Observation (FSO) studies should be more carefully chosen and should allow to discriminate between various sources of SLP observations from the oceans, such as moored buoys, drifting buoys, voluntary observing ships.

Rec. 28. Other impact studies could be undertaken on a regional basis.

8.1.6. The Panel thanked Luca Centurioni for having completed the Pilot Project, and the Secretariat for having provided administrative support.

### 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 / JCOMM Expert Team on Waves and Coastal Hazard Forecasting Systems (ETWCH) 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-31 meeting report.

8.2.2. As noted during the DBCP-30 session, the PP-WET Steering Committee had 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 intercomparison activities by submitting co-located spectral wave data to the Coastal Data Information Program (CDIP) at the Scripps Institution of Oceanography.

8.2.3. A meeting of the Pilot Project co-chairs and CDIP was held May 13-14, 2015 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 intercomparison data sets for inclusion, including dual (or more) sensor hulls. Future evaluation opportunities were also discussed. 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, and urged the wave measurement agencies to ensure that high-quality wave data was measured for the benefit of a wide range of users, and not to sacrifice quality for quantity (**recommendation**).

8.2.4. The Panel noted with appreciation that the buoy farm at Monterey had become a reality, with a large number of platforms deployed and providing data either in real time or delayed mode. This included the July 2015 deployment of FLOSSIE (Field Laboratory for Ocean Sea State Investigation and Experimentation), a 6m NOMAD buoy instrumented with a large number of current and historical wave sensors and processing systems for both Canadian and US systems. This deployment represents a key cornerstone of the PP-WET objectives. Preliminary results were presented by Dr. Robert Jensen, PP-WET Co-Chair, at the Technical Workshop preceding DBCP-31. Other intercomparisons were also carried out, from other platforms within the buoy farm, dual sensor buoy deployments, and a co-deployment of two identical Datawell waveriders at the Harvest location off the California coast. Data were also obtained from a UK waverider, co-deployed with two operational measurement systems, which will be provided to CDIP for analysis and posting to the web site. The Panel expressed its appreciation to Canada, US, United Kingdom for their continued participation in the intercomparison projects. 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 intercomparison methodology, web site and metadata criteria, and in carrying out individual intercomparisons. The Panel encouraged its member countries and RMIC with marine responsibilities, to participate in the intercomparison activities that were led by this pilot project (**recommendation**).

8.2.5. Mr Swail noted that three sessions on wave measurement, two on in situ measurement and one on remotely sensed measurements, have been convened as part of the 14<sup>th</sup> International Workshop on Wave Hindcasting and Forecasting (WW-14, November 8-13, 2015, Key West, USA) to present evaluation results to the scientific community and further develop guidelines and participation in the Pilot Project (<http://www.waveworkshop.org>).

8.2.6. Mr Swail also noted several other upcoming opportunities to promote

participation in, and understanding of, the Pilot Project, including the Regional Marine Instrumentation Center (RMIC) wave workshop February 29 to March 2, 2016 (Mississippi), and the JCOMM International Workshop on Advances in the Use of Historical Marine Climate Data (MARCDAT-4), July 18-22, 2016 (Southampton, UK). A section on wave measurement evaluation is also being written for the WMO Guide to Wave Analysis and Forecasting (WMO No. 702), which is presently being revised.

8.2.7. The Panel noted that evaluation results continue to be routinely added to the intercomparison 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 well on the wave measurements from drifting buoys component of the Pilot Project. Evaluation of the Scripps GPS sensor is ongoing, including the dual sensor data retrieved from the Canadian 3m discus buoy at East Dellwood. The preliminary results of the project to develop spectral wave measurements from the drifting buoys in the Global Drifter Program (GDP) were presented by Dr. Luca Centurioni at the Technical Workshop proceeding the DBCP-31 session, and are available on the DBCP web site. The Panel noted this with interest, and recommended that this development should continue, in cooperation with the GDP to further the evaluation of the technology. **(recommendation)**.

8.2.9. The Panel encouraged the project by noting the value of drifters enhanced with wave sensors. The cost per buoy for instrumentation will be marginal, impact on power supply may be problematic, but development costs will be significant.

8.2.10. 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, in particular to the activities noted in sections 8.2.5 and 8.2.6 above. **(recommendation)**.

8.2.11. 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 and consideration should be given to the long term status of this activity, possibly as a Task Team on Wave Measurement. The revised work plan for the project is given in Appendix A of DBCP-31 Doc. 8.2 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.

8.2.12. **The meeting made the following recommendations:**

Rec. 29. Urge the wave measurement agencies to ensure that high-quality wave data is measured for the benefit of a wide range of users, and not to sacrifice quality for quantity — action all DBCP members

Rec. 30. Encourage member countries, and RMICs with marine responsibilities, to participate in

the Pilot Project Intercomparison activities, and specifically to explore options for involvement of RMIC-AP

Rec. 31. Encourage co-Chairs and Pilot Project members to actively outreach the results of the intercomparison exercise to relevant activities, and to JCOMM and WIGOS in developing standards and best practices

Rec. 32. Continue the development of wave measurements from drifting buoys, in cooperation with the GDP, to further the evaluation of the technology

Rec. 33. Continue the Pilot Project for another year, with no funding support, and consider possible transition in long term to a Task Team on Wave Measurement

8.2.13. **The meeting decided on the following action items:**

Action 28. The future plans and membership of the Pilot Project will be reviewed in November 2015, at the ad hoc meeting during the 14<sup>th</sup> Wave Workshop (**action; PP-WET co-chairs, Secretariat; November, 2015**);

Action 29. 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 February 2016 RMIC workshop (**action; PP-WET co-chairs; DBCP-32**).

## 9. ISSUES FOR THE PANEL

### 9.1. Information Exchange

#### **Websites**

9.1.1. The New Technical Coordinator, Ms Gallage reported on website developments during the last intersessional period. The Panel was reminded of the official address for the DBCP website<sup>2</sup>.

9.1.2. The Panel noted that JCOMMOPS also normally maintains some JCOMM Observations Programme Area content on the JCOMM web site<sup>3</sup> for the DBCP and OceanSITES.

9.1.3. The TC reported that the following has been achieved:

- Review of the content of the DBCP and OceanSITES web pages to fix broken links and outdated content, and add update FAQs as needed; and
- Changes and updates were made to the OceanSITES website reorganizing content as per the community's request.

9.1.4. Ms. Gallage reported the status of new JCOMMOPS website under development. The website is planned to open for the public in December 2015. Currently JCOMMOPS staff is transitioning and uploading the data and information from the old to the new site.

Action 30. Links to be checked on JCOMMOPS website (some are broken), and add update FAQs as needed (action; JCOMMOPS; asap)

#### **News**

9.1.5. Ms Gallage reported that the news items on the JCOMMOPS website were not regularly updated. This feature will be available on the new website where the news features will be implemented via twitter and other more streamlined tools.

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

#### **Publications**

9.1.7. Ms Gallage 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 Brochure; Few updates were made to the DBCP Brochure<sup>4</sup>:

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2: <http://www.jcommops.org/DBCP/> - the following alias can also be used: <http://dbcp.jcommops.org>

3: <http://www.jcomm.info>

4: <http://www.jcommops.org/dbcp/>

- DBCP Technical Document No. 48<sup>5</sup>, DBCP Annual Report for 2014
- DBCP Technical Document No. 51<sup>6</sup>, Presentations at the DBCP Scientific and Technical Workshop, Weihai, China, 27 October 2014
- Updated the List of GTS Bulletin Headers file added to the DBCP website<sup>7</sup>,
- JCOMM Technical Report No. 72<sup>8</sup>, "An Oceanographer's and Marine Meteorologist's Cookbook for Submitting Data and Metadata in Real Time and In Delayed Mode". Version V1.0 was published and made available to the community. However, some sections of this document are still to be completed.
- JCOMM Technical Report No. 79<sup>9</sup>: Proceedings of the Fourth JCOMM Workshop on Advances of Marine Climatology
- JCOMM Technical Report No. 84<sup>10</sup>, Final Report, JCOMM Pilot Intercomparison Project for Seawater Salinity Measurements.

### **Information Products**

9.1.8. Ms Gallage then reported the following throughout the year as regular informational products to the community:

- Added WMO approved versions of BUFR format information to DBCP website<sup>11</sup>, and
- BUFR/CREX checker application made available on the DBCP website<sup>12</sup>
- Created Moored buoy metadata submission instructions document and collected metadata available through the DBCP website<sup>13</sup>
- Modified few map products for better data representation; i.e. provided deployed country information for all active drifter buoys as oppose to new deployments<sup>14</sup>
- Email lists and communications:
  - Maintained email lists relevant to DBCP and OceanSITES
- Regular emails to the DBCP list with updated maps and products available.

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5: <http://www.jcommops.org/dbcp/>

6: [http://www.jcomm.info/index.php?option=com\\_oe&task=viewDocumentRecord&docID=14402](http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=14402)

7: <http://www.jcommops.org/dbcp/data/sharing.html>

8: [http://www.jcomm.info/index.php?option=com\\_oe&task=viewDocumentRecord&docID=16012](http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=16012)

9: [http://www.jcomm.info/index.php?option=com\\_oe&task=viewDocumentRecord&docID=15293](http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=15293)

10: [http://www.jcomm.info/index.php?option=com\\_oe&task=viewDocumentRecord&docID=14738](http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=14738)

11: <http://www.jcommops.org/dbcp/data/sharing.html>

12: <http://www.jcommops.org/dbcp/data/sharing.html>

13: <http://www.jcommops.org/FTPRoot/DBCP/metadata/>

14: <http://www.jcommops.org/dbcp/network/maps.html>

9.1.9. DBCP TC mentioned that the static content of the DBCP website (information and reference documents, manufacturer details, etc.) will be gradually transferred to the new JCOMMOPS website with an integrated perspective whenever possible. This information transfer is planned for 2016. Existing website will of course be maintained until its full content is transferred.

9.1.10. **The meeting made the following recommendations:**

Rec. 34. For the DBCP TC to continue to provide regular updates on maps and statistics to the community;

Rec. 35. For JCOMMOPS to work proactively on developing tools required to update and enter new platforms in the new website and to keep the community informed of the progress;

9.1.11. **The meeting decided on the following action items:**

Action 31. DBCP Members to submit any relevant news items to the DBCP TC (**action; Panel members; ongoing**);

Action 32. DBCP National Focal Points to submit all relevant publications corresponding to DBCP activities to Technical Coordinator for compilation into a continuing DBCP Bibliography (action; DBCP Working Groups; ongoing)

Action 33. DBCP Members to try out the new website after launch in December 2015 and report on any issues to the DBCP TC (**action; DBCP members; ongoing**);

Action 34. Investigate the addition of a DBCP FAQ to the JCOMMOPS website. (action; DBCP TC; Dec. 2015)

## 9.2. Deployment Opportunities and Strategies

9.2.1. Mr. Mathieu Belbeoch, JCOMMOPS Technical Coordinator, reported on behalf of the JCOMMOPS Ship Coordinator, Mr. Martin Kramp, on activities and developments in JCOMMOPS regarding deployment opportunities and highlighted several items of interest to the meeting.

9.2.2. Mr. Belbeoch reported that the new JCOMMOPS system now permits the manual registration and management of: i) cruises from core JCOMMOPS panels that use reference sections (GO-SHIP, SOOP) and have an implementation plan; ii) cruises from research, commercial and private ships on any route, in particular through the help of an interactive free-hand mapping tool, and; iii) automated gathering and processing of research cruise information from external sources. The International Research Ship Operators (IRSO) community, with members such as UNOLS, has proven to be an excellent forum for information exchange in this regard. The new JCOMMOPS system will be available to the wider community in December 2015.

9.2.3. The JCOMMOPS Ship Coordinator, Mr. Martin Kramp, helped to establish deployments from various volunteer ships in the last intersessional period. In addition to

rather common deployments from research and commercial vessels, the meeting also noted the successful establishment of innovative top-down pilot projects, which i) involved ship suppliers to facilitate logistic issues, ii) used sailing ships in organized events to better access areas without regular shipping, and iii) now permit regular deployments in the piracy zone off Somalia.

9.2.4. The meeting noted that the involvement of the Hamburg Süd ship supplier and DWD PMO in Hamburg had significantly reduced shipping costs for the instrument operator, and also facilitated logistics for the PMO. The instruments had been received, stored, and eventually brought onboard the identified ship by the ship supplier together with other goods, and the PMO only came onboard for a courtesy visit. Mr. Belbeoch stressed that the top-level agreement achieved between Hamburg Süd and JCOMMOPS targeted repeat operations of the same kind from all ships of the company and on all routes they occupy, but has not been requested anymore by the community in the meantime; it risks disappearing again.

9.2.5. The meeting noted that the mandatory deployment of floats and drifters in the Southern Ocean by all yachts participating in the Barcelona World and Volvo Ocean Races resulted in huge media coverage on ocean observing. The involvement of private yachts in the Blue Planet Odyssey allowed: i) the de-routing of these ships from the ideal course through the Southern Pacific (approximately 3 additional days at sea) for deployments in perfect positions and conditions, free of any ship-time cost for the operators (NOAA and SIO), and; ii) a direct contact between the involved family crews and instrument operators. This is also the case for deployments with the NGO Voiles sans Frontières (VSF, Sailors without Borders): The 5<sup>th</sup> JCOMMOPS coordinated VSF deployment campaign is now underway and operations are routine.

9.2.6. The meeting noted with appreciation that the successful pilot projects with the ocean racing community permitted the establishment of a long-term partnership agreement between IOC-UNESCO and the International Monohull Open Class Association (IMOCA), with technical coordination support from JCOMMOPS. Beyond contributions as volunteer vessels, this partnership comprises significant financial support by third party sponsors, organized through IMOCA's partner Open Sports Management (OSM) for e.g. the funding of instruments, or realization of scientific conferences.

9.2.7. Mr. Belbeoch highlighted the commitment of the Dutch three master Bark Europa: The ship i) has been sailing in the Southern Ocean every season for many years, thereby following traditional, under sampled trade wind routes, ii) contributes to SOT (VOS and SOOP), Argo and DBCP (deployments), takes riders free of charge on crucial legs, and recently even welcomed the whole JCOMM – OCG at its last session for a courtesy visit in Cape Town.

9.2.8. The meeting noted that based on a request from SIO to find a ship for repeat deployments off the coast of Somalia, JCOMMOPS had identified a suitable container vessel (monthly route UAE-Kenya-Somalia-UAE) run by CMA CGM and established a high-level agreement with the company. With support from the likewise involved PMO office in Mombasa (Kenya), this agreement allows loading and deploying instruments recurrently in an area subject to piracy, and extremely difficult to service. The agreement was achieved under the JCOMM-OPA umbrella, with IOC/ WMO secretariats and OCG co-chairs, for

high-level recognition and reliability.

9.2.9. With regard to other innovative deployment platforms, Mr. Belbeoch also reported on upcoming deployments of floats and drifters from Kontiki rafts in the Southern Pacific, and the OceanoScientific Campaign from Europe around Antarctica back to Europe. Both projects target scientific applications and contribute through various contributions to the Global Ocean Observing System; they take place during the COP21 UN Climate Conference in Paris and will have increased media visibility. These and similar projects require a clear and cross-cutting communication strategy, in particular on importance, impacts and issues with autonomous oceanographic instruments (e. g. vandalism).

9.2.10. Mr. Belbeoch also reported on the planned involvement of sailing vessel Lady Amber in the SPURS-2 project (2016-17, approximately 150 instruments on 9 planned legs between Mexico and Hawaii with a total of 400 days at sea). He stressed that through a memorandum of understanding, established with Captain Peter Flanagan, owner Doug Wilcox, the marine operator ProLarge and JCOMMOPS in August 2013, all operations of the ship under the GOOS umbrella are coordinated through JCOMMOPS, and implemented through ProLarge as contractual partner, in order to provide an appropriate framework and security for all involved parties, including the crew of the ship.

9.2.11. Beyond Lady Amber operations, the meeting noted that the JCOMMOPS-ProLarge consortium can provide deployment solutions through chartered vessels of various kinds in all ocean areas. In particular the development of a cost-effective multihull survey vessel (OE43) has progressed well with sea trials in the last intersessional period. Different scenarios exist, i) free-of-cost on the regular route of the ship(s), ii) with costs only for additional days at sea /de-routing the ship, or iii) complete dedicated deployment missions of the ship. Coordinated operations across all observing networks could help to make such dedicated missions achievable in terms of funding.

9.2.12. The Panel noted that the ability for JCOMMOPS to contract with companies is limited by their coordinator role. Deployment contracts will be facilitated by JCOMMOPS, but made between the deploying agency and the vessel company.

9.2.13. The Panel expressed great interest in the development of the comprehensive listing of all research cruises., which will include deployment opportunities in association with the IIOE-2 which are being actively pursued in coordination with IOC involvements with IIOE-2.

9.2.14. The Panel commended Martin Kramp for the efforts undertaken by him as Vessel Coordinator at JCOMMOPS to develop these deployment opportunity activities. The meeting thanked JCOMMOPS for the good progress with regard to deployment opportunities and strategies, and made the following recommendations:

Action 35. Use JCOMMOPS services more actively, and provide feedback to JCOMMOPS  
(action; Members; continuously)

Action 36. Share deployment opportunities, in particular through JCOMMOPS cruise registration  
(action; Members; continuously)

Action 37. Continue with the development of cooperation agreements with shipping companies

and research ship operators, in particular through IRSO (action; Ship TC; ongoing)

Action 38. Continue with the development of innovative deployment solutions, in particular with the sailing community, and better exploit outreach (communication/education) potential (action; Ship TC; ongoing)

Action 39. Foster the professional approach with ProLarge to develop a standard for deployment missions with chartered vessels, which cover all aspects of such operations appropriately (action; Ship TC; ongoing)

Action 40. Consider setting up cross-cutting deployment missions with chartered ships through the JCOMMOPS-ProLarge consortium (action; Members; ongoing)

### **9.3. Data Timeliness**

9.3.1. The DBCP Technical Coordinator, Ms Gallage, presented an overview of the pattern of buoy data availability delays (timeliness) for the past year. TC 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 40% the drifting buoys reported to the GTS in less than 60 minutes and 84% reported in less than 120 minutes after observation time. There was an unusual delay in January due to identified problems with Argos system.

9.3.2. The Panel is reminded that the moored buoys are removed from the timeliness reports. The proper way to analyse and represent moored buoys in a timeliness map has not been decided yet. This task should be focused on during the next intercessional period.

9.3.3. The Panel noted that CLS is continuing its efforts to improve the coverage of the real-time antennas in the regions where they are needed. The area of focus for DBCP requirements is the South-East Pacific and the Atlantic with the installation of a new antenna on Easter Island. The new antenna on Easter Island in the South-East Pacific became operational on 05th September 2015. A new antenna in Guyana will install in the near future. CLS is still waiting for authorization to upgrade the Australian, New Zealand and Antarctic antenna.

9.3.4. 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).

9.3.5. JouBeh Technologies reported, the activation of the BUFR system in conjunction with the normal FM18 buoy codeform in the month of August 2015 resulted in an increase in processed buoy reports during the month. This in turn produced a corresponding increase in Scotia Weather Services Inc. (SWSI) transmission time. Although, system performance as a whole demonstrated significant improvement compared to previous years in part due to the JouBeh Direct IP Data Delivery (LINC) system and refinements made to processing. SWSI is presently optimizing their processes, which should further improve system performance.

9.3.6. The Panel was interested in the variance of sources of timeliness delays in the data. Possibilities of the delays include variance between the issuing centres, BUFR vs.

TAC formats, and GTS transmission efficiency. The ability to trace the source of the delays has become more complicated and requires more metadata to describe the systems.

**9.3.7. The meeting made the following recommendations:**

Action 41. To continue to deploy Iridium drifting buoys in areas where Argos delays are greater than 120 minutes (**action; DBCP members; ongoing**);

Action 42. DBCP should perform regular (every 6 months) assessments with CLS and JouBeh of the global data buoy timeliness by comparing JCOMMOPS delay maps with Argos Data Mean Disposal Time Maps and JouBeh timeliness statistics (**action; CLS and JouBeh assisted by TC DBCP; ongoing/semestrial**);

Action 43. To investigate timeliness of the moored array and determine the best way to represent these in the reports (**action; TC DBCP; DBCP-32**).

**9.4. Vandalism**

9.4.1. The Chair of the DBCP Working Group on Vandalism, Dr Venkatesan (India), reported 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.

9.4.2. During the last intersessional period, the Working Group circulated the DBCP form for reporting incidents of vandalism on data buoys (DBCP-31 Doc. 9.4 Appendix A) 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 health, life, and social and economic impacts of vandalism and damage to ocean observing networks and data systems. The Panel was grateful for this feedback mechanism.

9.4.3. USA (NOAA PMEL and NOAA NDBC), Japan, India, China, Spain, Brazil and Iran have reported 63 vandalism events on 42 moored buoys during the last intersessional period. Among them were 30 from TAO array, 21 Met-buoys, 6 wave buoys, 3 from RAMA array and 2 are tsunameter buoys. There were 62 identified drifter buoy vandalism incidences reported from the Global Drifter program (NOAA AOML).

9.4.4. India and Spain reported continued efforts of societal awareness and community interaction campaigns similar to previous years. Both countries continued with the community awareness and dissemination campaign explaining the uses of the information and buoy characteristics and positions. These sessions were focused on fishermen associations and many other sea users. Brazil has installed fake cameras and warning signs on their buoys.

9.4.5. The Panel also noted the efforts made against vandalism, including: (i) Improvements to anti-vandalism cameras for buoys (e.g. new generation BuoyCAM with night pictures); (ii) anti-theft hardware on some moorings (e.g. PMEL, China); (iii) fake cameras and warning signs (Brazil); (iv) reduction of the resolution of the moored buoy position on the GTS reports and the NDBC websites, and; (v) 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. The Panel also noted that in many cases the most effective practice has been policies enacted along with technology used to enforce them. Work with marine policy agencies is encouraged, as part of a multi pronged approach to vandalism control.

9.4.7. The Panel noted that among the countries provided information on vandalism for this report, the total number of incidences had decreased during last intercessional period compared to the period before. All countries reported less number of incidences except Spain where there were 12 incidences in last intercessional period compared to only 8 during the period before.

9.4.8. The Panel concurred with the following recommendations and actions of the Working Group on Vandalism.

Rec. 36. The WG expressed concern on loss of components replacement cost involved and loss of data.

Rec. 37. The WG is appreciative of various technological developments attempted by countries including Camera system antivandal fixtures and modification of buoy

Rec. 38. Economic evaluation of vandalism should be considered in future deliberations.

Rec. 39. Incidents of collision of ships could be avoided by proper communication to appropriate authorities

Rec. 40. Overall considerable reduction of events is observed by the WG compared to previous year

Rec. 41. WG advises countries to furnish null vandalism data as per country report format

Action 44. The WG recommends to issue a letter from WMO/IOC to member countries sensitizing importance of protection of Buoys against Vandalism This would help to take up this issue at the Governmental level by Buoy Operators. WG shall prepare draft letter and supporting material. (action;WG Vandalism, Secretariat; asap)

Action 45. The outreach program is highly appreciated and should be pursued. Also Poster Banners Stickers and Pamphlet prepared by various countries could be compiled. (action; DBCP TC; continuing)

## **9.5. Metadata, Including Moored Buoys, Rigs and Platforms Metadata**

9.5.1. The DBCP Technical Coordinator (TC), Ms Champika Gallage 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 do the same. 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 Gallage 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 who 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. 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 is working towards said target in its new website design.

9.5.4. Some operators of Iridium platforms have continued to actively report metadata to each other and JCOMMOPS upon deployment even beyond the Iridium Pilot Project. This is valuable and it was recommended that they continue to do so beyond the life of the Iridium Pilot Project

9.5.5. TC reported that JCOMMOPS is in communication with Iridium VAR providers to create a metadata feed similar to the situation with the Argos system. The TC has started to receive regular metadata reports in an email from Scotia Weather that is the beginning of such reports. TC has had number of discussions with Scotia Weather and Scotia Weather agrees to establish a metadata feed to JCOMMOPS. Completion of this activity is planned for the next intersessional period.

9.5.6. JCOMMOPS is currently redesigning the database with more capabilities to address user and WMO OSCAR (Observing System Capability Analysis and review Tool) requirements. TC has spent a lot of time organizing the DBCP metadata to transfer to the redesigned database. The database transfer is not yet completed and will require further IT support which is a limitation for the progress of the work.

9.5.7. The TC with the support from TT-MB has made good progress in collecting moored buoy metadata. Over the last few years the metadata needing to be collected for moored buoy systems has been defined and finalized by the TT-MB. An initial system for moored buoy metadata submission to JCOMMOPS was set up in February. TC requested the moored buoy operators to submit metadata in CSV format. Metadata submission instruction documents with CSV format templates were made available to the DBCP moored buoy operators (<http://www.jcommops.org/FTPRoot/DBCP/metadata/>). By the end of July 2015, 15 organizations from 13 countries have submitted 556 records. TC request other moored

buoy operators to generate and provide their metadata.

9.5.8. 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. Some of the fixed platforms (i.e. rigs, light vessels, etc.) are currently providing metadata on ship metadata collection template, PUB47. TC has initially transferred some of the fixed platform metadata on PUB47 into DBCP database. TC needs to devote more time to identify the rigs and platforms and seeking out metadata.

9.5.9. The TC emphasized the importance of properly identified and archived metadata for fixed platforms. Therefore, it is required to identify the essential metadata from fixed platforms. The Panel requested a small group coordinated by the TC DBCP, and comprised of J. Turton, S. McArthur, Serge Deschamps to lead this project to develop templates to collect metadata from fixed platforms.

9.5.10. The TC attended the Annual IABP and ESURFMAR meetings and encouraged the participants to share their metadata with DBCP. TC continued discussions with IABP coordinator to establish a metadata feed from IABP similar to the arrangements with Global Drifter Program (GDP).

9.5.11. The Panel recalled that the WMO 17th Congress has adopted the WIGOS Metadata Standard as part of the WIGOS Manual. The standard includes mandatory, optional, and conditional elements, and many of the mandatory and optional elements are not actually collected by JCOMMOPS for buoy metadata. The Panel requested the above small sub-group to also take into account the WIGOS requirements for making proposals on metadata submission by DBCP members, and their collection by JCOMMOPS (action; WG metadata; DBCP-32).

9.5.12. **The meeting made the following recommendations:**

Rec. 42. The Panel encouraged all buoy operators to provide a website of plans and deployment information for drifting and moored buoys or as e-mail notifications. Preferred templates are provided in Appendix 1 and 2 ; and

Rec. 43. 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 recommend to continue to do so beyond the life of the Iridium Pilot Project.

9.5.13. **The meeting decided on the following action items:**

Action 46. Provide JCOMMOPS with planned deployment metadata in the format specified  
**(action; Panel members; asap)**

Action 47. JCOMMOPS to develop a method in the new website to report moored Buoy and drifter buoy metadata **(action; JCOMMOPS)**.

Action 48. The Panel recognized the importance of collecting metadata from fixed platforms and formed an ad-hoc Task Team to develop the metadata template for fixed platforms.  
(action: J. Turton, S. McArthur, Serge Deschamps, and TC DBCP; DBCP-32)

**9.6. Other Issues to be Discussed, as Proposed by the Task Teams**

9.6.1. The Panel had no other technical issues requiring international coordination or action.

## 10. INFORMATION REPORTS

### 10.1. Argo Steering Team and Argo Information Centre

10.1.1. Mathieu Belbeoch, Argo Technical Coordinator, presented on behalf of the Argo Steering Team, and the Argo Data Management Team. Despite fixed or falling investment by 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 increase in the use of high-bandwidth satellite communications is driving a change in the Argo data set from relatively low vertical (50-70 points) to high (~500 points) vertical resolution, and more accurate surface locations.

10.1.4. The Panel expressed its concern on the recent decrease on float lifetimes and that this together with the diversification of effort into new float domains (Deep Argo and Bio-Argo) could lead to degradation of the core Argo array. The meeting decided on the following action items:

Action 49. Improve coordination between DBCP and Argo during planning of deployment cruises by providing draft deployment plans to JCOMMOPS and using JCOMMOPS deployment planning web tools. (action; DBCP Panel; continuing)

### 10.2. Buoy Data Management Centres

10.2.1. Mathieu Ouellet (Canada) reported on the activities of the Marine Climate Data System (MCDS) trial Global Data Assembly Centres (GDACs), operated by MEDS.

10.2.2. The Panel then 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).

10.2.3. The Panel noted that of the 400 or so moorings, only about 200 moorings are distributing data on the GTS in FM 18 code form. It was explained that there is no similar GDAC for moored data. The need for a moored buoy GDAC may be satisfied by a NOAA data centre interested in taking this role. The Panel noted with appreciation an offer from

the USA to investigate feasibility of establishing a GDAC for Moored Buoys at the NOAA National Data Buoy Centre (NDBC).

10.2.4. MCDS is working on the marine climatology data, mainly VOS data. JCOMM-4 has decided to replace the MCSS with the MCDS, by creating a system of CMOCs of which the China CMOC was approved this year.

10.2.5. There must be more DACs and GDACs for different platform types to complete the system. There needs to be a process for recognizing the existing infrastructure and approving new GDACs.

10.2.6. The Panel thanked both centres for their reports. The full reports are provided in Appendices A and B respectively of DBCP-31 Doc. 10.2 and will be included in the DBCP annual report for 2015.

### **10.3. Satellite Data Telecommunications**

#### ***Argos Operations and Developments***

10.3.1. Yann Bernard (CLS) and Michel Guigue (CLS) reported on the Argos 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, EUMETSAT and ISRO, and continues to maintain and improve an operational service for all Argos users, especially for the meteorology and ocean community, with a level of availability exceeding 99%.

10.3.2. Today the Argos space segment is comprised of six operational satellites, with three NOAA POES (15, 18, 19), 2 EUMETSAT spacecrafts (METOP-A & B) and 1 ISRO satellite (SARAL). The ground segment is made of 7 global receiving stations (6 in the northern polar region and 1 in Antarctica) and 62 local real-time stations worldwide.

10.3.3. Operational highlights from the last 12 months include major upgrades for both CLS France and CLS America processing centers, with reinforced security, upgraded cartography servers and Oracle database and improved traffic management, among other enhancements. In addition, the implementation of a new orbitography processing chain, of a new digital earth elevation model (ACE3) for Kalman location processing, of BCH-based message error detection and correction, and of new functionalities for ArgosWeb (observation, program/platform detail, PMT command) have been key achievements to keep improving the Argos system. In 2014-2015, the Argos real-time stations network was enhanced with 2 new stations (Ascension Island and Libreville, Gabon), and 3 stations were upgraded with Saral reception capability, in Muscat (Oman), Monterey and Hawaii (USA). In addition, 2 ground stations were removed: Manas (Kirghizstan), by order of the US Air Force, and Oslo (Norway) due to recurring technical issues. These actions combined with substantial progress in implementing the Real-time Antenna Upgrade Project (14 HRPT stations currently fully -A4 operational, 2 new stations scheduled in the coming months, and 7 upgrades scheduled for 2015-2016) all contribute to the continuous improvement of the global timeliness with Argos data collection.

10.3.4. Major improvements in terms of data mean disposal time have been made over

the past 12 months, due to the newly installed station of Ascension Island receiving all Argos satellites, which improves the real time coverage in South Atlantic Ocean, and due to the continuous enhancement of the HRPT Stations network. Our efforts will continue to improve and maintain the coverage of the real-time antennas in the regions where it is needed, namely in the South-East Pacific/South America area (where 2 new stations are planned before the end of 2015) and in the Indonesian/South-West Pacific area (upgrade plan in progress). The Argo constellation will be enhanced by launches over the next few years of four new satellites providing additional Argos-4 capability.

10.3.5. CLS continues to provide GTS processing for all DBCP Argos equipped drifters and moored buoys in compliance with WMO and DBCP TT-DM recommendations. A new BUFR sequence for drifting & moored buoys in the Argos processing chain was integrated in 2015 into the CLS GTS processing system. Additionally, the data quality of the entire Argos system performance is monitored 24/7.

10.3.6. Argos system improvements also include software and monitoring tools. New Kalman Filter Smoother processing of the Argos Doppler location system greatly improves the quality of positioning data. CLSApp and ARGOSWEB will provide improved user interfaces to the ARGOS data.

10.3.7. The “Argos chipset” / SHARC project (Satellite High-performance ARGOS-3/-4 Receive/transmit Communication), implemented by a European consortium to minimize the power consumption requirements for Argos data communications, has made good progress during 2014-2015, despite some delays. 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. Significant improvements in power usage have been achieved over previous PTTs, including a very low power transmission mode at reduced baud rate. A second batch of units which will include upgrades will be manufactured, tested and certified. The Argos hand-held direction finder (RXG-134 Goniometer) manufactured by Xerius was upgraded in 2014 with an internal compass and now features GPS positions decoding capabilities.

10.3.8. The Panel gratefully recognized the contributions to the DBCP community by Bill Woodward who has retired this year.

***Other satellite data telecommunication systems***

10.3.9. 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 throughput and timeliness, ease of implementation, energy efficiency, future availability and cost.

10.3.10. The current Block-I 66-satellite constellation was said to be complete, but there was some evidence that one of the satellites was not functioning correctly, leading to a small hole in the overall coverage. The number of on-orbit spares had fallen to one. 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 operational beyond the commencement of the rollout of the replacement constellation in late-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.

10.3.11. The replenishment constellation, called Iridium NEXT, was fully funded and under construction by prime contractors Thales. The rollout schedule, involving launching nine satellites at a time on board the new Falcon vehicle, had been delayed significantly over the last 12 months, and the first deployment of two satellites was expected to be completed using a Russian launcher. 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.

10.3.12. Iridium was also engaged with many partners in the development of new products and services, including higher-bandwidth services that would allow it to challenge the supremacy of Inmarsat in the shipping sector. Of particular interest to the environmental observation community were new and smaller modems, such as the 9603N, and the new modem chipset, which would offer the potential to build highly integrated and miniaturised sensor/communication packages. There were also indications that the geolocation algorithm and call set-up delays would be improved. In due course, these would be exploited by many observational communities, including animal trackers.

10.3.13. 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' and 'random' mode might be preferable. There had also been some serious issues caused by a firmware bug within certain models of the 9603 SBD modem, but these had now been resolved. A new version of this modem, the 9603N, was now available, offering a number of performance enhancements, but unfortunately retaining the same fragile connector as the 9603.

10.3.14. 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 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 JTA arrangements.

10.3.15. More recently, the US DISA had offered Iridium services through the US DoD gateway to US government agencies. These very inexpensive services were now available

to US users through a provisioning arrangement at NOAA-PMEL. It remained to be seen how efficient this arrangement might be, but it had already stimulated a marked increase in the migration rate of the US buoy community to Iridium.

10.3.16. 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).

#### **10.4. JCOMMOPS Activities**

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

10.4.1. M. Belbéoch, JCOMMOPS/Argo Technical Coordinator, presented the JCOMMOPS activities and infrastructure update.

10.4.2. The Panel noted the achievement of the implementation of the new Information System and was invited to consider TC's proposal for unique identifier for all DBCP/OceanSITES platforms, including historical (since 2000). JCOMMOPS has progressed on this regard with the set of unique identifiers for all ship hulls via collaboration with Seadatanet and ICES/BODC.

10.4.3. The Panel noted that the DBCP TC was leading a review of the synchronization of metadata with Meteo-France to handle properly the switch to BUFR code and new requirements for miscellaneous platforms and parameters (meeting planned on Sep. 2015 30<sup>th</sup>).

10.4.4. He mentioned that the substantial work anticipated for the management of DBCP and SOT metadata (see DBCP-30. 10.4) was achieved.

10.4.5. The Panel noted the important progress achieved by the team in collaboration with WMO for providing support and dedicated metadata services to the WIGOS/OSCAR initiative. Marine metadata from JCOMMOPS were some of the first ones to enter in the OSCAR system and were used for the demonstration booth aside WMO congress #17. Regular exchanges between the teams were also fruitful on the technical (I.T.) plan.

10.4.6. The Panel welcomed the anticipated release of the new JCOMMOPS website (Dec. 1<sup>st</sup> 2015) and agreed on the list of key testers to work with the TC (for DBCP and OceanSITES) and JCOMMOPS during the review process. (see DBCP-31 Doc. 10.4 Appendix A). JCOMMOPS mentioned that an external audit of the website was also performed by ALTRAN Company since September, while the survey with testers from each network, and from a broader perspective, will start October 2015. Review will be launched through a teleconference by the TC presenting the website features and review roadmap.

10.4.7. M. Belbéoch presented an overview of the new JCOMMOPS website and the Panel welcomed such important step forward integrating information and monitoring tools on all in-situ and sustained elements of the GOOS.

10.4.8. M. Belbéoch recalled the importance of defining accurate targets for the development of network performance indicators, in the context of JCOMM OCG, and invited the Panel to designate some members to work with the TC DBCP on this task.

10.4.9. He mentioned that a number of partnerships set with civil society (sailing community in particular) have become operational (4 campaigns for float deployment with *Voiles Sans Frontières* achieved), while other initiatives have been very innovative (deployments of instruments by *Barcelona World* and *Volvo Ocean Race* skippers) and promoted the GOOS elements through international media coverage. Some of these partnerships might develop into a real sponsoring of instruments so that JCOMMOPS keeps on building its experience with regard to instrumentation and relationship with manufacturers, and plays a tangible role in the implementation of the arrays, with a cross programme and integrated perspective, together with developing outreach initiatives (see agenda item 11.1). The close relationship between JCOMMOPS and this sailing community will be highlighted during the COP21 conference, through dedicated booth and roundtables organized by the IOC/UNESCO. Panel congratulated JCOMMOPS for this innovation and noted that a new dedicated staff will follow up on these initiatives (see agenda item 11.1).

10.4.10. The Panel thanked M. Belbéoch for his presentation, and expressed satisfaction with the developments at JCOMM-OPS the past year.

10.4.11. M. Belbéoch summarized the centre priorities for the next inter sessional period:

- i) New database content (SOOP, GOSHIP, GLOSS)
- ii) Website finalisation
- iii) Core deliverables production (monthly/yearly reports to panel, steering and data teams)
- iv) Cruise Information Centre finalisation
- v) Work on indicators and network performance metrics

10.4.12. The meeting made the following recommendations:

Rec. 44. DBCP TC continues to be involved in the website review as suggested in the JCOMMOPS work plan (see 11.1);

Rec. 45. Agreed on the principles of the initial proposal made by TC on unique identifiers for DBCP, and invited Panel members;

10.4.13. **The meeting decided on the following action items:**

Action 50. Confirm [website key testers] for the review of the JCOMMOPS website in October 2015 (action; website key testers; asap);

## 11. ORGANIZATIONAL ISSUES

### 11.1. JCOMM activities and management

11.1.1. The JCOMM Co-President, Mr Johan Stander (South Africa) reported on the activities and developments of JCOMM, including WMO CG-17, OCG-6, ETMC-5, PMO-5 and SOT-8 during the last DBCP intersessional period.

#### ***JCOMM related outcomes from WMO Congress (CG-17)***

*See DBCP-31 Doc. 11.1(1) Appendix A: WMO Cg-17 JCOMM Actions*

11.1.2. Mr Stander highlighted Action items agreed to by the CG-17 which concern the JCOMM. The Panel noted the following Cg-17 decisions of particular interest to the DBCP.:

- Cg-17 approved the establishment of Satcom Forum as a joint CBS and JCOMM forum. During congress discussions it was agreed that: Mike-Prior Jones will be the chair; Satcom Forum will now reside under WMO Observing and Information Systems Department; and that the OPAG ISS should prepare for a meeting of the SATCOM Forum alongside the CIMO Technical Conference in September 2016. See document 11.4 for details.
- Congress encouraged the WMO Marine Meteorology and Oceanography Programme (MMOP) and JCOMM to continue to sustain and grow the relevant observational programmes including the investigation of new methods and technologies (e.g. the use of submarine cables for climate monitoring and disaster warning). Congress urged Members to maintain and enhance their essential marine meteorological and oceanographic observation systems and to make available in real-time of the data collected by the systems, including ship-based sounding system, weather buoys, oil-rigs and the tide gauge network to WIGOS.
- Congress encouraged Members to participate in the Second International Indian Ocean Expedition (IIOE-2), reflecting the importance of Indian Ocean observing arrays and the potential of this science to improve marine products and services. Congress requested JCOMM to coordinate with interested Members to develop a coherent plan of collaboration.
- Congress appreciated the JCOMM capacity development activities to support Members in the conduct of marine meteorological and oceanographic observations, marine monitoring and the provision of services in support of marine safety. Congress requested JCOMM, with the support of the Secretary-General, to continue to evaluate national and regional requirements for Capacity Development and to develop strategies for addressing identified deficiencies for the delivery of met-ocean programmes including observations, communications, data management, forecasting and services. Congress further encouraged Members to identify their developmental requirements and to participate actively in capacity-building activities including through the enhancement of national and regional training facilities and programmes as well as through partnerships between Members.

Action 51. The Panel requested its members to promote the execution of the above Congress decisions at the national level (***action; Panel members; DBCP-32***).

11.1.3. Mr Stander also addressed WMO Congress related resolutions concerning the EC Panel of Experts on Polar Observations, Research and Services, (EC-PORS) and GTS coding for polar applications, which may be linked to DBCP.

## **JCOMM Strategy on Integrated Marine Meteorological and Oceanographic Services within WIS**

See DBCP-31 Doc. 11.1(1) Appendix B: TT-MOWIS Principle Objectives and Terms of Reference

11.1.4. Mr Stander reported on the development of the JCOMM Strategy on Integrated Marine Meteorological and Oceanographic Services within WIS, and the creation of the task team to implement the project, TT-MOWIS. The Task Team is currently being constituted under the guidance of co-chairs, Erik Buch (EuroGOOS) and Rabia Merrouchi (Morocco). The continuation of TT-MOWIS shall be decided at JCOMM-5 in 2017.

### **Sixth Session of the JCOMM Observations Coordination Group (OCG-6)**

See DBCP-31 Doc. 11.1(1) Appendix C: Summary OCG-6 Actions

11.1.5. The Panel was informed of the outcome of the sixth Session of the JCOMM Observations Coordination Group (OCG-6), which was held in Cape Town, South Africa, from 27 to 30 April 2015 at the kind invitation of the South African Weather Service (SAWS). Subsequent OCG activities after OCG-6, including preparations of OCG-7 in April 2017 were also reported.

11.1.6. The Panel noted that at OCG-6, the observing network representatives, including Jon Turton (UK) for the Data Buoy Cooperation Panel (DBCP) had reported on their activities, focusing on (i) status against targets, (ii) outlook status (anticipated changes in the next 18 months against targets), (iii) risk assessment, (iv) plans for design evolution, (v) progress against the “Keeley report”<sup>15</sup> actions, and (vi) data interoperability standards in use.

11.1.7. Following OCG guidance and in line with the OCG workplan, the Panel agreed to review its own priorities and workplan. The Panel noted the OCG recommended actions for DBCP (Appendix C), and integrated the actions into the DBCP-31 actions list, noting overlap with existing DBCP actions. In particular, the Panel noted the OCG priority for the DBCP to improve engagement with IOCCP and OceanSITES.

Action 52. The Panel decided to set up an ad hoc task team to work on these issues and make a proposal to the Executive Board before the next OCG Session (**action; ad hoc TT; OCG-7**)

### **Fifth session of the JCOMM Expert Team on Marine Climatology (ETMC-5)**

11.1.8. Mr Stander also reported on the outcome of the fifth session of the Expert Team on Marine Climatology (ETMC), held at the WMO Secretariat headquarters in Geneva, Switzerland, from 22 to 25 June 2015. The Panel noted the substantial progress made by the ETMC regarding the development of the new Marine Climate Data System (MCDS), and the rewrite of the marine climatology chapters of WMO Publications No. 558, and 471, Manual on and Guide to Marine Meteorological Services. The ETMC meeting particularly

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15 The Keeley report, i.e. Data Systems Relevant to JCOMM Activities is available on the JCOMM website at : [http://www.jcomm.info/index.php?option=com\\_content&view=article&id=331](http://www.jcomm.info/index.php?option=com_content&view=article&id=331)

reviewed the potential contributions and roles of the various actors and stakeholders in the MCDS, particularly concerning foreseen role of the existing MCSS Responsible Members to possibly become Data Acquisition Centres (DACs), or Global Data Assembly Centres (GDACs), including the drifting buoy GDACs in Canada and France. The ETMC reviewed the role of DACs and GDACs, proposed Terms of Reference for such centres, and identified potential candidates. The Panel noted the following ETMC decisions of Particular interest to the Panel:

- (i.) **ETMC noted that it would be useful if an agency or institute could volunteer to establish a wave GDAC or a moored buoy GDAC.**
- (ii.) ETMC discussed instrument/platform metadata related to marine climatological data-sets, and particularly reviewed the status of the ship metadata, buoy metadata, rigs and platform metadata, and WMO Integrated Global Observing System (WIGOS) metadata. DBCP efforts with regard to collecting buoy metadata were noted, and further progress encouraged.
- (iii.) Good progress was made with regard to the Extreme Wave Data Set (EWDS) where various databases have been scanned to identify records of interest to the EWDS. EWDS has then been used in model validation. However, it was noted that there was a lack of metadata in the EWDS, and that the sustainability of the database hosting remained to be addressed. The ETMC considered options for the future of the EWDS and agreed that further consideration should be deferred until after JCOMM-5 (fall 2017) when the metadata base may be more complete. Since buoy metadata are essential to all wave applications, it was recommended that the ETMC follow the lead proposed at DBCP-30, and encourage member countries to take action to remedy this situation.
- (iv.) ETMC noted that not all operational wave observation systems currently appear on the JCOMMOPS status maps, e.g. for Australia, Brazil and others, and that further investigation of this issue is needed. ETMC invited the Technical Coordinator of the DBCP to investigate this problem, and ensure that the maps include all wave observing buoys.
- (v.) ETMC discussed the status of migration to table driven codes. ETMC invited the TT-TDC Chair to coordinate with the DBCP on the development of templates for glider observations and the submission of a proposal to the WMO Commission for Basic systems (CBS) Inter Programme Expert Team on Data Representation Maintenance and Monitoring (IPET-DRMM). In addition, the ETMC requested Dr Berry to coordinate with the JCOMM Expert Team on Sea-Ice (ETSI) and Jon Turton (DBCP) to modify / develop a BUFR template for the representation of data from ice buoys.

11.1.9. **The Panel agreed on these actions relative to ETMC:**

- Action 53. NDBC to consider hosting a GDAC for Moored Buoys (**action; NDBC; DBCP-32**);
- Action 54. Requested the Technical Coordinator to investigate the problem that not all operational wave observation systems currently appear on the JCOMMOPS status maps, and ensure that the maps include all wave observing buoys (**action; TC DBCP; asap**);
- Action 55. Requested the Task Team on Data Management to collaborate with the JCOMM Task Team on Table Driven Codes for developing BUFR templates for glider and ice-buoy data (**action; TT-DM; asap**).

**Fifth International Workshop of Port Meteorological Officers (PMO-5)**

11.1.10. The Panel noted that the fifth International Workshop of Port Meteorological Officers (PMO) was held in Viña del Mar, Chile, from 20 to 24 July 2015 at the kind invitation of the Servicio Meteorológico de la Armada de Chile. The workshop was attended by 49 participants from 20 countries. The workshop proposed 57 recommendations covering a wide area of topics (e.g. ship recruitment, operations, procedures, quality management, PMO Health and safety, ship metadata, collaboration, training, capacity development, and marine services), and targeted to the PMOs, the JCOMM Observations (OPA) and Services and Forecasting Systems (SFSPA) Programme Areas, the JCOMM in situ Observations Programme Support Centre (JCOMMOPS), and the WMO and IOC Secretariats.

#### ***Eighth Session of the JCOMM Ship Observations Team (SOT-8)***

*See DBCP-31 Doc. 11.1(1) Appendix D: Eighth Session of the JCOMM Ship Observations Team (SOT-8)*

11.1.11. Finally, the Panel noted that the Eighth Session of the JCOMM Ship Observations Team (SOT) was held from 20 to 24 April 2015 in Cape Town, South Africa at the kind invitation of the Government of South Africa, and the South African Weather Service (SAWS). As for previous SOT Sessions, a Technical and Scientific Workshop was organized during the first day of the meeting. Among issues agreed to by SOT-8, Mr Stander highlighted to the Panel the need for increased collaboration between SOT and DBCP and coordination of the shared resources of JCOMMOPS.

#### **JCOMMOPS management and budget**

*Note: for JCOMMOPS activities, and planned developments, see agenda item 10.4. JCOMMOPS Infrastructure & Budget*

11.1.12. The Panel noted with appreciation the firm establishment of the JCOMMOPS office in Brest in March 2015. It thanked the continuous support provided by *Collecte Localisation Satellites* (CLS) and Ifremer to the infrastructure. In particular CLS is now providing by contract (80 k€/ year) a complete support for I.T. requirements (office, and operational), and Ifremer (Centre Bretagne) is providing office space and general means in Brest for the staff. The Panel noted in particular that Ifremer is providing such support at no cost for the office. It congratulated JCOMMOPS and IOC/UNESCO for this fruitful negotiation.

11.1.13. The Panel noted that the office was inaugurated on March 18<sup>th</sup> in presence of local authorities representatives: Ifremer, CLS, IOC/UNESCO (executive secretary, V. Ryabinin; GOOS Director, A. Fischer), *WMO (Director Observing and Information System Department and Space programme System, W. Zhang; Chief, Marine Meteorology and Ocean Affairs Division, E. Cabrera)*, *NOAA (Director Climate Observation Division, D. Legler)*, and local ocean observation programmes representatives. Inauguration was set aside the yearly Argo Steering Team meeting, and in conjunction with the establishment of the EuroArgo infrastructure.

11.1.14. As stated by the IOC/UNESCO executive secretary, the Panel noted that “JCOMMOPS finally has the means to achieve its full potential, with a strategic position in one of the world capitals of the blue economy, with an information system anchored in an

operational structure in Toulouse, with a closely-knit and dedicated team that is as creative as it is experienced, and with the strong support of local communities, the centre will start a new adventure at the service of ocean observation”.

11.1.15. The Panel commended JCOMMOPS for:

- i) this structural and strategic achievement
- ii) for the important staff increase (3 new permanent staff in the last 3 years)
- iii) for innovative I.T. developments.

11.1.16. In particular, it thanked M. Belbéoch for his dedication and long run vision in the development of the structure for the benefits of all programs. The Panel thanked as well all supporters of the Centre, and in particular C. Clark (NOAA/OCO, retired) that “*wished JCOMMOPS to continue to grow and prosper in support of the ocean observing system*”.

11.1.17. The Panel noted the reviewed vision for the centre mandate, by JCOMMOPS co-chairs: “JCOMMOPS occupies a unique place as the focal point for the practical co-ordination of the in-situ ocean observing system defined by JCOMM. Its role includes:

- *To assist in the implementation and deployment of the observing networks through close interaction with programme managers and platform operators;*
- *To assist in establishing, maintaining and verifying mechanisms for the timely exchange of data and metadata, including the facilitation of quality control and archival functions;*
- *To develop the tools needed to monitor the status of the observing system, its attendant data and metadata distribution, and to improve the overall effectiveness and development of the system.”*

11.1.18. The Panel noted that the commitments made by the 3 Brittany local authorities to fund the office was accomplished, via a funding of 100 k€ per year to IOC/UNESCO and that will be renewed for two more years until 2017.

11.1.19. The Panel noted that JCOMM Observation Coordination Group agreed on the spending of such support (see Appendix A).

11.1.20. M. Belbéoch thanked C. Gallage for her excellent team work and integration into the JCOMMOPS staff. He recalled that the transition to a new Information System created heavy workload for the TC (and I.T. staff), while the two former DBCP TCs have used an operational system in place.

11.1.21. The Panel noted with appreciation the stabilization of the JCOMMOPS staff after this long transition period. In particular it welcomed the recruitment of Emanuela Rusciano (PhD Physical Oceanography) as “Coordinator, Science and Communication”. JCOMMOPS permanent staff is now made of 5 persons, plus on subcontractor still working in Toulouse for the website finalisation. In addition, JCOMM OCG work plan tasked JCOMMOPS to establish on the medium run (about 2017) a new position for regional and coastal observing systems (mainly gliders, GLOSS, marine mammals, and various platforms).

11.1.22. Following up on M. Belbéoch's suggestion, the Panel suggests its members to consider providing internships at JCOMMOPS (beyond the opportunities with local Universities). In particular, an internship to work along the TC DBCP/OceanSITES would be most welcome. A list of potential subjects for 6 months minimum internships will be prepared.

11.1.23. The Panel noted the work plan set up for the JCOMMOPS staff for 2015-2017, and was invited to provide further inputs and guidance as necessary for its TC. (see DBCP-31 Doc. 11.1(2) Appendix B). In particular, it noted the important work to be accomplished by the TC for the review and survey of the new website for DBCP/OceanSITES perspective. An important workload was evaluated at the level of 20 days and should be considered in the work plan. The Panel noted that JCOMMOPS was doing weekly meetings and providing reports and tracking of key actions items (from all sources) on line (see DBCP-31 Doc. 11.1(2) Appendix C).

11.1.24. The Panel noted the summary on staff time per programme provided by JCOMMOPS (see DBCP-31 Doc. 11.1(2) Appendix D) and in particular the value added of the synergetic nature of the office, providing 1.5 FTE for DBCP, 0.7 FTE for SOT and 0.7 FTE for OceanSITES.

11.1.25. The Panel executive board was invited to consider JCOMMOPS request for extra support for website finalisation, including a complete management and distribution of mooring metadata (representing a substantial work).

11.1.26. Secretariats reported on JCOMMOPS budget (see DBCP-31 Doc. 11.1(2) Appendix E), and Panel thanked the working group for this important step forward in the clarification of the complex JCOMMOPS budget. In particular, he thanked J. Rolland for his precious assistance, and encouraged the team to continue the effort with 2015 analysis, and 2016 anticipated budget.

11.1.27. The Panel was interested to know how the 100K/yr euros donated by Brest to JCOMMOPS, upon the move to Brest would be allocated in coming years. : *The TC indicated that OCG had approved the spending plan for those funds, and that the details of the 3 years spending plans are available on line<sup>16</sup>. The spending plans include mainly I.T. Developments and support for one FTE coordinator (science & communications), and some minor budget liner to cover communication, ship related activities and miscellaneous small expenses.*

11.1.28. The Panel expressed concern over the possibility of duplicative efforts, and the sustainability of the finances of the office. The TC indicated that all products available throughout our community are considered to avoid duplication. The funding of the expansion of the JCOMMOPS is as stable as the donations of member states to the panels supported by JCOMMOPS.

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16 <https://drive.google.com/open?id=1UNz5KafLbQ5xzNw5i8lSSFhbyociSJQLwkLergobCPc>

11.1.29. **The meeting made the following recommendations:**

Rec. 46. TC DBCP continue to work as required on website review

Rec. 47. Platform operators to consider using the new website for platform registration, including deployment plans, **and at least CC the TC on every implementation plan.**

11.1.30. **The meeting decided on the following action items:**

Action 56. Prepare a list of subjects for internships (**action; TC; Oct. 2015**);

Action 57. Platform operators to cc the TC on every deployment plan (**action; Platform operators; on-going**);

Action 58. Propose to JCOMMOPS candidates for internships, students to be recruited late 2015 and provide support if possible (Action; Panel; continuing);

**11.2. Report on Decisions of WMO and IOC Governing Bodies**

11.2.1. *Twenty Eighth Session of the IOC Assembly*

11.2.1.1. The IOC Secretariat representative reported on the proceedings of the Twenty Eighth Session of the IOC Assembly (IOC-XXVIII, Paris, France, 18-25 June 2015). The Assembly noted the importance of Operational Oceanography in deliberations on the "Future of IOC". The IOC Assembly noted and endorsed several IOC and GOOS projects which will require coordination with the DBCP observation networks: TPOS2020 which seeks to improve the tropical Pacific TAO mooring array and drifter arrays; the new European Commission Horizon 2020 funded project, AtlantOS, focused on optimizing and enhancing the Integrated Atlantic Ocean Observing System and; JCOMM's new Cross Cutting Task Team on Integrated Marine Meteorological and Oceanographic Services for WIS (TT-MOWIS) to improve the interoperability with WIS of the near real time and delayed mode data sets of ocean observations.

11.2.2. *Seventeenth World Meteorological Organization Congress*

11.2.2.1. The WMO Secretariat representative reported on the outcome of the seventeenth World Meteorological Organization Congress (Cg-17, Geneva, Switzerland, 25 May – 12 June 2015). In particular, the Panel noted the following decisions of Cg-17 and urged its members to take them into account when developing their activities in support of the Panel:

- (i) Members to contribute to the DBCP Implementation Strategy, use the opportunity of the DBCP barometer drifter upgrade scheme; and fund and install barometers on all newly deployed drifters; Members to commit appropriate resources to the tropical moored buoy arrays; and NMHSs<sup>17</sup> to collaborate with partner organizations;
- (ii) Members to enhance through partnership 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

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17 National Meteorological and Hydrological Services

- years. Of particular interest is the provision of ship time to assist in the deployment and servicing of tropical moored buoys;
- (iii) Recalling Resolution 25 (Cg-16), Members urged to follow the recommendations of the DBCP Technical Document No. 41, Ocean Data Buoy Vandalism – Incidence, Impact and Responses and appreciated the advances Member States have made in data buoy vandalism prevention;
  - (iv) Cg-17 recognized that there is a clear need to forge closer links between the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) and the satellite observation community. In particular, a better dialogue needs to be established concerning the requirements of the satellite community for in situ observations used for calibration and validation purposes. Cg-17 noted the offer from the WMO Commission for Basic Systems (CBS) to JCOMM to collaborate on this issue, and requested that this be taken forward as a priority by both Commissions;
  - (v) Cg-17 recognized the importance of collecting and sharing instrument/platform metadata for ocean observations, with a view to enhanced traceability of the observations to standards, bias correction, and improved data consistency. It requested Members to ensure that the metadata are collected, recorded, and distributed in both real-time (for the required sub-set) and delayed mode through the Marine Climate Data System (MCDS), which is under development.

Action 59. Members to take decisions of Cg-17 into account when developing their activities in support of the Panel (**action; Panel members; ongoing**)

11.2.2.2. The Director of the Global Framework for Climate Services (GFCS) Project Office, Mr Filipe Lucio (Secretariat), reported on the status and recent developments of the GFCS in light of the decisions of Cg-17, of the Sixty-seventh Session of the WMO Executive Council (Geneva, Switzerland, 15-17 June 2015), and of the second session of the Intergovernmental Board on Climate Services (IBCS) held in Geneva, Switzerland in November 2014. The Panel noted that Cg-17 adopted a Resolution on the WMO Policy on the International Exchange of Climate Data and Products to Support the Implementation of the GFCS, and decided to add “Energy” as the fifth GFCS Priority. Cg-17 also recognized the role of Energy in supporting the initial four priority areas (health, disaster risk reduction, agriculture and food security, water) and a low carbon development path.

11.2.2.3. The Panel recalled that the developing Marine Climate Data System (MCDS) under the JCOMM Data Management Programme Area (DMPA) is regarded as one of JCOMM's contribution to the GFCS. It further recalled that drifter data inserted on the GTS are routinely archived by Marine Climate Data System (MCDS) trial 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 should actively encourage all buoy operators to forward their data to one or other of these responsible global archives. The Panel also encouraged its,

Action 60. Members to consider providing infrastructure for the function of GDAC for moored buoy data in liaison with the Chair of the Expert Team on Marine Climatology (ETMC) (**action; Panel members; DBCP-32**).

11.2.2.4. See also agenda item 11.4 for Cg-17 decisions related to the WMO Integrated Global Observing System (WIGOS).

### **11.3. User Requirements**

#### **11.3.1 GCOS / GOOS / WCRP Ocean Observing Panel for Climate (OOPC)**

11.3.1.1. The Panel appreciates that National contributions have enabled the GOOS-SC to meet for its fourth session, GOOS SC-4, with the newly developed Biogeochemistry Panel, coordinated by IOCCP, and a new Biology and Ecosystems Panel hosted by AIMS, Australia, supported by OBIS and additional in kind support through the US Consortium for Ocean Leadership and NOAA . The Panel welcomed reports of improvements in maintenance of the tropical Pacific TAO mooring array and drifter arrays, bringing the monitoring metrics of GOOS back to 2012 levels. GOOS SC-4 identified the need to work with an expanded JCOMM Observations Coordination Group which will include existing biogeochemistry and biological observing networks, and builds on the core JCOMM OCG with additional GOOS and GRA networks. GOOS requirements are being clarified by the development of the GOOS Strategic Mapping, a tool which visualizes the network of GOOS priorities, products, EOVs and observation networks. The Mapping will be used in communicating about the interdependence and integration of the observing system, as well as the key place the individual observing networks hold.

11.3.1.2. In addition to OOPC contributions to the GOOS Strategic Mapping process, the OOPC is developing Variable and Network Specifications. OOPC recognizes the key priority for networks to clearly articulate the network missions and targets. This information will then enable OOPC to develop actions for the next GCOS Implementation Plan, as well as to better articulate the connections within the GOOS Strategic Mapping.

11.3.1.3. The WMO-IOC-ICSU-UNEP Global Climate Observing System (GCOS) is midway through the 5 year work plan reporting process. A Status Report, currently under public review, assesses progress against the 2010 Implementation Plan, and the adequacy of the observing system to meet requirements will be presented to the UNFCCC COP-21 in December 2015 in Paris, France. The GCOS Project Office has been hosting the OOPC technical secretariat since early 2013, and has in doing so deepened its cooperation with GOOS.

11.3.1.4. See also agenda item 11.1 (JCOMM activities and management) regarding the JCOMM Observations Coordination Group (OCG) perspective with regard to observational user requirements and how these should be addressed by the observing Panel under JCOMM and the associated programme.

#### **11.3.2 WMO Rolling Review of Requirements update**

11.3.1.5. The Panel recalled its discussion under agenda item 11.2 regarding the seventeenth World Meteorological Congress decisions urging WMO Members to install barometers on all newly deployed drifters, to enhance their support to the Tropical Pacific Observing System (TPOS), and to reinforced the dialogue with the satellite observation community concerning their requirements for *in situ* observations used for calibration and validation purposes. The Panel agreed that recent efforts undertaken in the framework of the DBCP Pilot Project for high resolution SST were addressing such latter requirements.

11.3.1.6. The Panel recalled the discussion under agenda item 8.1 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 the results of the impact study that has been undertaken for the Panel by the European Centre for Medium-Range Weather Forecasts (ECMWF) in this regard (see agenda item 8.1 for the Panels decisions in this regard). The results reinforced the need to

Action 61. Install barometers on all newly deployed drifters (**action; Panel members; ongoing**).

11.3.1.7. The Panel noted that the review is done on a yearly basis, but all fourteen application areas do not report well each year. There is a focus each year on a couple of the applications, with a focus on ocean applications the past few years. GCOS requirements setting is a special case, but is accepted as a part of the RRR.

11.3.1.8. 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, also reflected in Appendix A). The Panel agreed that these recommendations remain valid.

#### **11.4. WMO Integrated Global Observing Systems (WIGOS)**

##### *WIGOS Regulatory Materials*

11.4.1. Igor Zahumensky (WIGOS-PO) reported on the WMO Integrated Global Observing Systems (WIGOS). The Panel noted the adoption by the seventeenth World Meteorological Congress (Cg-17, Geneva, Switzerland, 25 May – 12 June 2015) of new Technical Regulations relevant to WIGOS and urged its members to pay attention to those, which shall in principle take effect as of 1 July 2016.

Action 62. Pay attention to Cg-17 Technical Regulations relevant to WIGOS (**action; Panel members; July 2016**).

##### *Pre-operational Phase of WIGOS (2016-2019)*

11.4.2. The Panel noted that Cg-17 decided that the development of WIGOS will continue during its Pre-Operational Phase in the seventeenth financial period building upon and adding to those key building blocks of the WIGOS Framework that have already been implemented, while shifting the emphasis from the global level toward implementation activities at the regional and national levels. The goal is to have Members and their partners benefit from a fully operational system from 2020 per Resolution 4.2.2(1)/1 (Cg-17) – Pre-operational Phase of WIGOS (DBCP-31 Doc. 11.4 Appendix A).

11.4.3. The Panel particularly took note of the highest priority areas of the pre-operational phase of WIGOS i.e.: (i) national WIGOS implementation; (ii) WIGOS Regulatory Material complemented with necessary guidance material to assist Members with the implementation of the WIGOS technical regulations; (iii) further development of the WIGOS Information Resource (WIR), with special emphasis on the operational deployment

of the OSCAR<sup>18</sup> databases; (iv) development and implementation of the WIGOS Data Quality Monitoring System; and (v) concept development and initial establishment of Regional WIGOS Centres). The Panel requested the JCOMM *in situ* Observations Programme Support Centre (JCOMMOPS) to contribute to the development of the WIGOS Data Quality Monitoring System for the met-ocean observing systems part of that system. It further invited Panel members to consider how some data buoy related activities could be undertaken as part of the developing Regional WIGOS Centres.

Action 63. Contribute to the development of the WIGOS Data Quality Monitoring System for the met-ocean observing systems (**action; JCOMMOPS; 2019**)

Action 64. Consider how some data buoy related activities could be undertaken as part of the developing Regional WIGOS Centres (**action; Panel members; 2019**).

#### *OSCAR Platform developments*

11.4.4. The Panel noted with appreciation that the OSCAR<sup>18</sup> Platform is now operational, and that JCOMMOPS has been contributing to its development by making sure that the marine meteorological and oceanographic observing systems metadata are routinely and automatically submitted to OSCAR. The Panel urged its members to make sure that their data buoy (both drifting and moored), and the Rigs and Platform metadata are routinely being provided to JCOMMOPS. The Panel noted that as part of the new WIGOS technical regulations, the WIGOS Metadata Standard (WDS) had been adopted by Cg-17. The Panel stressed that the collaboration of the manufacturers is key for collecting the full range of WIGOS metadata which are mandatory, optional or conditional (when the condition is met), and requested Panel members to negotiate with the manufacturers, and make the provision of their platform and instrument metadata to JCOMMOPS as a contractual condition.

Action 65. Negotiate with the manufacturers, and make the provision of their platform and instrument metadata to JCOMMOPS as a contractual condition (**action; Panel members; ongoing**).

#### *International Forum of Users of Satellite Data Telecommunication Systems*

11.4.5. The Panel noted that the International Forum of Users of Satellite Data Telecommunication Systems (Satcom) had been established by Cg-17. The Panel noted that Mr Michael Prior Jones (British Antarctic Survey, United Kingdom) had been nominated as chair the Satcom Forum. The first meeting of the Forum should in principle be organized in conjunction with the WMO Commission on Instruments and Methods of Observation (CIMO) Technical Conference in late September 2016 in Madrid, Spain. Recalling the importance of satellite data telecommunication systems for the collection of observations from data buoys, the Panel invited its members to consider attending the Satcom Forum.

Action 66. Consider attending the Satcom Forum (**action; Panel members, Sep. 2016**).

### **11.5. Financial Reports**

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18 Observing System Capabilities Analysis and Review tool – <http://oscar.wmo.int>

### *Introduction*

11.5.1. The Panel recalled that as for the previous year, the DBCP Trust Fund essentially includes contributions of Members/Member States to the DBCP activities, including for the post of Technical Coordinator of the DBCP and OceanSITes. Other contributions are also made to the DBCP Trust Fund for JCOMMOPS, the JTA, and the SOT.

11.5.2. The JCOMM Trust Fund includes the US contribution to the DBCP and other non DBCP-related activities. For the purpose of simplifying the financial reporting to the DBCP, this US contribution to the other activities such as GCOS, Argo, SOT, GO-SHIP, and JCOMMOPS are not regarded as direct contributions to the DBCP, and financial reports are provided to the sponsors through other mechanisms (e.g. see JCOMMOPS financial reporting under agenda item 11.1).

### *2014 financial report*

11.5.3. The Panel noted the 2014 Final Statement of Accounts as presented in Appendix A, Table 8 (DBCP Trust Fund) and Table 9 (JCOMM Trust Fund). They are based on the WMO Final Statement for the period 1 January-31 December 2014 (Tables 3 and 4 of Appendix A) and the IOC Final Statement for the period 1 January-31 December 2014 (Table 1 of Appendix A). The Panel noted with satisfaction the positive and secure cash balance of DBCP funds (WMO+IOC) totalling USD 153,908 as of 31 December 2014, as shown in Appendix A, Table 8. No expenditure directly related to the DBCP were made from the JCOMM Trust Fund in 2014.

### *Interim financial report as of 31 July 2015, and estimates for 2015*

11.5.4. The IOC DBCP Trust Fund Interim Statement for the period 1 January – 31 July 2015 is provided in Table 2 of Appendix A. It shows a small positive balance of USD 25.80 as of 31 July 2015. 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.

11.5.5. The WMO DBCP Trust Fund Interim Statement for the period 1 January–31 July 2015 is shown in Table 4 of Appendix A. It shows a positive unobligated balance of USD 56,931. The WMO JCOMM Trust Fund Interim Statement for the same period is shown in Table 6 of Appendix A. It shows a positive balance of CHF 572,732 .

11.5.6. An estimate of the 2015 financial situation for the DBCP Trust Fund based on WMO and IOC financial statements for the period 1 January 2015 to 31 July 2015, and on DBCP-30 budget decisions and remaining planned expenditures for 2015, is provided in Table 8 of Appendix A. It shows an expected positive balance of USD 81,105 by the end of 2015.

11.5.7. An estimate of the 2015 financial situation for the JCOMM Trust Fund based on the WMO financial statement for the period 1 January 2015 to 31 July 2015, and on DBCP-30 budget decisions and remaining planned expenditures for 2015 is provided in Table 9 of Appendix A. It shows an expected positive balance of USD 362,842. Only a small portion of the JCOMM Trust Fund, in the order of USD 95,238, and unspent in 2015 at this point,

should account for the DBCP activities (i.e. TC DBCP and OceanSITES post).

*Contributions of Members/Member States and budget for 2016*

11.5.8. The Panel noted with appreciation the provisional table of contributions for 2016 as detailed in Table 7 of Appendix A. 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 previous DBCP Sessions, 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 Panel reviewed the draft budget proposed by the Financial Advisor for 2016. Taking the Panel's discussions and decisions at this Session into account, the Panel approved its budget for 2016 (maximal expenditures) as detailed in Table 10 of Appendix A. The Executive Board, authorized by the Panel, and taking in account the decisions and recommendations made at this 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. 2016**).

11.5.12. The Panel requested the joint Secretariats and the Financial Advisor to work together to distribute the final statement for the year 2015 to the Panel members as soon as the IOC and WMO Final Statement of Accounts for the year 2015 are finalized and made available (**action OP/a38; Secretariat & Financial Advisor; 1 March 2016**).

*Argos Joint Tariff Agreement (JTA) budget*

11.5.13. The Panel recalled that the Argos Joint Tariff Agreement (JTA) budget is managed within the DBCP Trust Fund, including the CLS contribution made on behalf of the JTA, and the expenditures for the JTA chairman, the JTA Executive Committee, and the support of the Secretariat to the JTA.

11.5.14. The status of Income and Expenditure for the JTA as of 1 October 2015 was presented in Table 11 of Appendix A. 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.

### *Ship Observations Team (SOT) Budget*

11.5.15. 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. The Panel agreed to keep track of SOT income and expenditures from the DBCP Trust Fund Separately as of 2015. Status of the SOT budget within the DBCP Trust Fund for 2015, and based on the WMO Financial Statements, contributions and estimated expenditures for the rest of the year is provided in Table 12 of Appendix A.

11.5.16. The Panel thanked the financial advisor for a most interesting viewpoint and thorough analysis of the financial report. Some Panel members noted that their country's contributions were not reported in the 2015 June financial report. The explanation is that WMO financial reports have considerable delays in registering some transactions. The Panel looked favourably on considering a longer horizon of three to five years for the budget planning process.

#### **11.5.17. The Panel reiterated these recommendations and actions:**

Rec. 48. Members still contributing in their national currency (other than Euro) to consider contributing to the DBCP Trust Fund in Euros (recommendation OP/r7).

Rec. 49. pay their contributions in a timely fashion (recommendation OP/r8).

Rec. 50. 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)

Rec. 51. 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)

Action 67. 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. 2016**).

Action 68. The joint Secretariats and the Financial Advisor to work together to distribute the final statement for the year 2015 to the Panel members as soon as the IOC and WMO Final Statement of Accounts for the year 2015 are finalized and made available (**action OP/a38; Secretariat & Financial Advisor; 1 March 2016**).

### **11.6. DATA Integration**

11.6.1. Mr Kevin O'Brien introduced the topic of Integrated Data Management to the Panel. The term "Integrated data management" is best understood by contrasting it with today's norms for ocean data management. Today each platform assembly centre typically provides its own web site at which users (humans, but not machines) can select data of interest. Data can then be downloaded in the file format(s) favoured by that network. A user desiring data from more than one network must learn to navigate independently designed Web sites and deal potentially with different format types.

11.6.2. With the emerging open data access paradigm of today, users would prefer to

use their own tools to access data, and not have to fuss with format differences and user registrations. General users are also most often interested in observing-system based parameters as a whole (ie, temperature), rather than analyzing data on a network-by-network basis.

11.6.3. In addition to user requirements for integrated data, funding agencies are also imposing stricter requirements related to data access, data documentation and data archival. These additional requirements impose a burden on scientists that can distract them from their main goal, which is research. Sufficient integrating of data and information can help to ease these burdens on data providers, while also allowing them to meet or exceed data management requirements

11.6.4. The Session was informed of the work done through the Observing System Monitoring Centre (<http://www.osmc.noaa.gov>) to integrate information and data across observing system networks leveraging current standards and conventions. Utilizing a software tool called ERDDAP, the OSMC are able to provide standards-based, interoperable access to observation collections that span these various networks. The Session noted the pilot project that supports this integrated view of ocean data in support of the Tropical Pacific Observing System (TPOS) 2020 effort.

11.6.5. 11.6.5 The Panel expressed its concern that there has been a proliferation of integration activities. The future lies with these interoperable systems, but we should assure that these are complementary systems, and that the effort is not duplicative. The Panel expressed concern that simple access to the multiple datasets would create problems when incompatible data sets were too simply joined ignoring metadata specifications. This integrated data management system should be thought of as a framework used to serve data and metadata through interoperable services and is not intended to override any metadata concerns of the Panel.

11.6.6. The Panel noted the potential overlap of this work with the development of the Marine Climate Data System (MCDS), and recommended that the Integrated Data Management developed by the OSMC for the OCG should complement and not duplicate the MCDS.

Action 69. OSMC to liaise with the Task Team on the MCDS in the view to address this issue (action; OSMC, TT-MCDS; asap).

11.6.7. **The session was invited to consider the following recommendations:**

Rec. 52. It is recommended that the DBCP delayed mode data centers, such as AOML and Fisheries and Oceans Canada work with OSMC representatives to configure and install an ERDDAP server to provide public access to the DBCP delayed mode data

Rec. 53. It is recommended that DBCP delayed mode data centres, as mentioned above, work with OSMC project to rewrite data archives in CF compliant NetCDF format which utilizes the modern CF discrete sampling geometries to describe the trajectory feature types that the data represents;

Rec. 54. It is recommended that once delayed mode data is available via ERDDAP, DBCP delayed mode data centres work with OSMC representatives to create web

accessible folders of DBCP metadata that is ISO 19115 compliant and meets the recommendations of the Earth Science Information Partners (ESIP) Attribute Conventions for Dataset Discovery (ACDD) ([http://wiki.esipfed.org/index.php/Attribute\\_Convention\\_for\\_Data\\_Discovery](http://wiki.esipfed.org/index.php/Attribute_Convention_for_Data_Discovery)). This will allow DBCP dataset information to be harvested by data discovery systems and more easily found by users;

## 12. EXECUTIVE DECISIONS

### Rec. 55. 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 21 October 2015 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. With regard to a possible pilot project for biogeochemical (BGC) sensors on drifters, which had been mentioned during the Scientific and Technical Workshop, the DBCP Executive Board felt that it was too early to allocate a budget to this activity. It nonetheless noted the kind offer of Luca Centurioni to pursue this initiative in the intersessional period and asked him to investigate the feasibility of the proposed project and to report back to the next session with a suggested workplan and budget if deemed appropriate.

*Action 70.* Pursue initiative for pilot project for biogeochemical (BGC) sensors on drifters and report to next session with a suggested workplan and budget (action; Luca Centurioni; DBCP-32)

12.1.3. 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.

### 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<sup>19</sup>) and to forward any comments to the Chairperson by the end of November 2015. The Executive Board was invited to propose how the implementation strategy could be reviewed by selected Panel members.

*Action 71.* Panel to review the draft DBCP Implementation Strategy (available from the web<sup>20</sup>) and to forward any comments to the Chairperson. (***action; Members; 31 Dec. 2015***).

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[19 DBCP-31 Doc. 12.2 Draft Implementation Strategy](#)

[20 DBCP-31 Doc. 12.2 Draft Implementation Strategy](#)

Action 72. The Executive Board 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** and on the web<sup>21</sup>.

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 73. Panel to review the draft DBCP Operating Principles (available from the web ) and to forward any comments to the Chairperson (**action; Members; 31 Dec. 2015**).

### 12.4. Review of action items from the previous DBCP Session

12.4.1. The chair decided that the action items from the twenty-ninth DBCP Session, Paris, France, September can be reviewed off session. There are no continuing items which would be moved to the Operating Principles. The tables (Annex XXX) focused on actions and recommendations that were still underway. The plan also included some outstanding actions from previous Panel sessions. 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. The Panel requested the Technical Coordinator to then undertake the tasks as proposed by the Chairperson and to report at the next Panel Session.

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**).

Action 74. Revise the list of prioritized tasks for the Technical Coordinator as agreed at the previous Session, and discuss execution details with TC (**action; Chairperson, TC; ASAP**)

Action 75. Undertake the tasks as proposed by the Chairperson and to report at the next Panel Session (**action; TC DBCP; ASAP**).

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<sup>21</sup> [DBCP-31 Doc. 12.3 Draft Operating Principles](#)

### 13. NATIONAL REPORTS

13.1. Mr Shawn Dolk chaired the National Reports Session. The Panel received written reports on current and planned buoy programmes from, Australia, Brazil, Canada, , China, France, India, Iran, Japan, Kenya, Netherlands, New Zealand, Republic of Korea, Slovenia, South Africa, the United Kingdom, and the United States of America. As usual, these written reports, as well as others submitted to the Secretariat before 31 December 2015, would be published in the Panel's Annual Report.

13.2. Oral presentations were made during the Session on national activities by the following countries: Australia, Brazil, Canada, China, India, New Zealand, Republic of Korea, and the USA.

13.3. **The Panel agreed on the following:**

Action 76. 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. 2015**).

Action 77. To publish National Reports with the Panel's Annual Report (**action; Secretariat; Early-2016**).

Action 78. The Panel urged the DBCP task team on moored buoys to consider an agenda item to explore options and cooperative mechanisms toward the international operational cooperation for recovering moored buoys gone adrift (action; TT-MB; on-going).

### 14. ELECTION OF THE CHAIRPERSON AND VICE CHAIRPERSONS

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:

- Dr Jonathan Turton (UK), DBCP Chairperson, first elected at DBCP-30, October 2014;
- Mr Shannon McArthur (USA), DBCP vice-Chairperson for North America, first elected at DBCP-30, October 2014;
- 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 Sid Thurston (USA), appointed by Mr Wallace (past DBCP Chairperson), to serve in the Executive Board in 2010.

14.3. The Panel noted that Mr Graeme Ball and Dr R. Venkatesan were stepping down from the Executive Board, and warmly thanked them for their many years of supportive and active contributions to the Panel.

14.4. As the position for vice-Chairperson for Asia had two candidates, Dr Ting YU (China) and Prof. B. G. LEE (Rep. Korea), representatives of member states, facilitated by the Secretariat, held an election. The majority vote favoured Dr Ting YU.

14.5. The Panel elected Mr Johan Stander (South Africa) as its vice-Chairperson for Southern Hemisphere, to serve for a first term until the end of the next Panel session.

14.6. The Panel elected Dr Ting YU (China) as its vice-Chairperson for Asia, to serve for a first term until the end of the next Panel session.

14.7. The Panel re-elected Mr Jon Turton (UK) as its Chairperson, and for Europe, to serve for a second term until the end of the next Panel session.

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

## **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 Chair introduced the question of the date and place for the next DBCP session and recalled that the Panel had agreed in principle to hold the 2016 DBCP-32 Session in North America. The delegation of USA on behalf of NOAA offered to host the DBCP-32 at a location to be determined in October 2016. The Panel thanked USA for their generous offer and gratefully accepted the proposal. Tentative dates for the session were agreed to be scheduled provisionally from 17 – 21 October 2016, ensuring minimum duplication with schedules for events of other JCOMM and related programmes.

16.2. The Panel recognized two generous offers to possibly host the DBCP-34 in 2018. The delegation of Oman expressed their country's desire to increase the awareness of Arab countries of DBCP by hosting the 34<sup>th</sup> Session. Canada wished to reinforce its long and fruitful involvement with DBCP by offering to host the 34<sup>th</sup> Session.

## **17. CLOSURE OF THE SESSION**

17.1. In closing the session, the Chairperson Mr Jon Turton expressed appreciation to the staff of the World Meteorology Organization for providing facilities, support and hospitality for the meeting. Mr Jon Turton also thanked the Secretariat, the Executive Board, the Technical Coordinator, the Chairs of the Action Groups, Task Teams, and Pilot Project Steering Groups, national representatives, manufacturers 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.

17.2. The Thirty-First Session of the Data Buoy Co-operation Panel closed on Friday, 23

October 2015 at 17:30.

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## **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 Other Pilot Activities

**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, including Moored Buoys Rigs and Platforms metadata

9.6 Technological developments in support of user requirements

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

11.6 Data Integration

**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 Work plans 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**

**LIST OF PARTICIPANTS**

**PARTICIPANTS FROM MEMBERS/MEMBER STATES**

**AUSTRALIA**

Boris KELLY-GERREYN  
Head of Marine Networks  
Bureau of Meteorology, Melbourne  
700 Collins Street  
Docklands  
GPO Box 1289  
Melbourne VIC 3001  
Australia  
Tel: +61 39669 4183  
b.kelly-gerreyn@bom.gov.au

Mr Graeme BALL  
Email: cumulus3030@gmail.com

**BRAZIL**

Mr Felipe SANTOS  
Coordinator of the National Buoy Program  
(PNBOIA)  
Brazilian Navy Hydrographic Center, Directorate  
of Hydrography and Navigation  
R. Barão Jaceguai s/n  
Niterói, Rio de Janeiro  
CEP 24048-900  
Brazil  
Tel: 55 21 2189-3228  
Email: felipe.santos@chm.mar.mil.br

**CANADA**

Mr. Serge DESCHAMPS  
Manager National Marine Networks  
Environment Canada, Meteorological Service of  
Canada, Ontario  
4905 Dufferin Street  
Toronto M3H 5T4  
Ontario  
Canada  
Tel: +1 902 426-3511  
Fax: +1 902 426-3256  
Email : serge.deschamps@ec.gc.ca

Mr Val SWAIL  
Environment Canada  
4905 Dufferin Street  
Toronto M3H 5T4  
Ontario  
Canada  
Tel: +1 (416) 739 4347  
Fax: +1 (416) 739 5700  
Email: Val.Swail@ec.gc.ca

Mr Mathieu OUELLET  
Fisheries and Oceans Canada  
200 Kent  
Ottawa, ON  
Canada  
K1A 0E6  
Email: mathieu.ouellet@dfo-mpo.gc.ca

**CHINA**

Mr Fan JIANG  
National Centre of Ocean Standard and Metrology  
No.219, the Western Jieyuan Road  
Nankai District  
300112 Tianjin  
China  
Tel: +86 022 2753 9525  
Fax: +86 022 2753 2971  
Email: JLZXWS@ncosm.gov.cn

Dr Shouhua LIU  
Associate Scientist  
National Marine Data and Information Service  
No 93 Liuwei Road  
300171 Tianjin  
China  
Tel: 022 240 10834  
Fax: 022- 240 0926  
Email: huazai950@hotmail.com

Dr Ting YU  
National Marine Data and Information Service  
State Oceanic Administration  
No 93 Liuwei Road,  
Hedong District  
Tianjin  
300171  
China  
Tel: +86 22 2401 0821  
Fax: +86 22 2401 0826  
Email: julia\_yu\_nmdis@163.com

**FRANCE**

Mr Gilbert EMZIVAT  
Météo-France, CMM  
13 rue du Chatellier – CS12804  
29288 BREST CEDEX 2  
France  
Tel: +33 256 31 2653  
Email: gilbert.emzivat@meteo.fr

**GERMANY**

Mr Kai HERKLOTZ  
Head of section Marine Networks  
Bundesamt für Seeschifffahrt und Hydrographie  
(Federal Maritime and Hydrographic Agency)  
BSH, Bernhard-Nocht-Str. 78  
20359  
Hamburg  
Germany  
Tel: + 49 40 3191 3230  
Fax: +49 40 3190 5000  
Email: kai.herklotz@bsh.de

**INDIA**

Mr Dr R. VENKATESAN  
DBCP vice-Chairperson for Asia  
National Institute Of Ocean Technology  
Pallikaranai  
Velachery - Tambaram Road  
Chennai 600100 India  
India  
Email: dr.r.venkatesan@gmail.com

**KOREA (REP. OF)**

Mr Jungil GIM  
Assistant Director  
Korea Meteorological Administration  
45 Gisangchung-gil Dongjak-gu  
Seoul 156-720  
Korea Rep  
Tel: +82 2 2181 0746  
Email: rtojong@korea.kr

Mr Jooyoung LEE  
Researcher  
Korea Hydrographic and Oceanographic Agency  
(KHOA), Ministry of Oceans and Fisheries  
#351, Haeyang-ro, Yeongdo-gu  
Busan 49111  
Korea Rep  
Tel: +82 51 400 4386  
Email: teeth@korea.kr

Prof. Byung-Gul LEE  
Professor, Director, President  
Jeju National Univ., Jeju Sea Grant Center, Korea  
Sea Grant Association  
Republic of Korea  
Tel: +82-64-754-3455  
Fax: +82-64-725-2519  
Email: leebg@jejunu.ac.kr

Mr Myungwon PARK  
Deputy Director, KHOA  
Korea Hydrographic and Oceanographic Agency  
#351, Haeyang-ro, Yeongdo-gu  
Busan  
Korea Rep  
Tel: +82 51 400 4230  
Email: pmw1959@korea.kr

Prof. Sang Kil PARK  
Pusan National University  
#San 30, Changjun-Dong, Keumjung-Ku Pusan  
Korea Rep  
Tel: 82515102427  
Fax: 82515139596  
Email: sakpark@pusan.ac.kr

**OMAN**

Ahlam Suliman AL-KHAROUSI  
Marine Ecologist  
Ministry of Agriculture and Fisheries Wealth,  
Marine Science and Fisheries Center  
P.O.BOX:427.Muscat,P.C:100  
Muscat  
Oman  
Tel:(00968)24743572  
Fax: 00968024605822  
Email: ahlamSuliman@gmail.com

**NEW ZEALAND**

Mr Ross BANNISTER  
Network Operations – Port Meteorological Officer  
Meteorological Service of New Zealand Limited  
30 Salamanca Road,  
Kelburn,  
PO Box 722  
Wellington 6140  
New Zealand  
Tel: +64 4 4700 789  
Fax: +64 4 4735 231  
Email: Ross.Bannister@metservice.com

**SOUTH AFRICA**

Mr Johan STANDER  
South African Weather Service  
Weather Office,  
P O Box 21,  
International Airport  
Cape Town  
7525  
South Africa  
Tel: +27 21 935 5700  
Fax: + 27 21 934 4590  
Mobile: +27 83 281 0993  
Email: Johan.Stander@weathersa.co.za

**UNITED KINGDOM**

Prof. David MELDRUM  
Research Fellow, Technology Development  
Scottish Association for Marine Science  
Scottish Marine Institute  
Oban, Scotland  
PA37 1QA  
United Kingdom  
Tel: +44 1631 559 273  
Fax: +44 1631 559 001  
Email: dtm@sams.ac.uk

Mr Jonathan TURTON  
Head Marine Observations  
Met Office  
FitzRoy Road  
Exeter  
Devon  
EX1 3PB  
United Kingdom  
Tel: +44 1392 886647  
Fax: +44 1392 885681  
Email: jon.turton@metoffice.gov.uk

**UNITED STATES OF AMERICA**

Mr Erik VALDES  
Research Associate, NOAA Global Drifter  
Program  
National Oceanic and Atmospheric Administration,  
Atlantic Oceanographic and Meteorological  
Laboratories ( NOAA AOML) 4301 Rickenbacker  
Causeway  
Miami FL 33149-1039  
United States  
Tel: +1 305 361 4547  
Fax: +1 305 361 4439  
Email: erik.valdes@noaa.gov

Mr Lancelot BRAASCH  
Development Engineer  
University of California, San Diego, Scripps  
Institution of Oceanography  
9500 Gilman Drive  
Mail Code 0218  
La Jolla California 92093-0218  
United States  
Tel: +1 858 534 47 70  
Email: lbraasch@ucsd.edu

Dr Luca CENTURIONI  
Associate Researcher and lecturer  
University of California, San Diego, Scripps  
Institution of Oceanography  
Scripps Institution of Oceanography 9500 Gilman  
Drive  
La Jolla CA 92093-0213  
United States  
Tel: +1 858 534 6182  
Email: lcenturioni@ucsd.edu

Mr Lance Joseph CURTISS  
Development Engineer  
University of California, San Diego, Scripps  
Institution of Oceanography  
Scripps Institution of Oceanography 9500 Gilman  
Drive  
La Jolla CA 92093-0213  
United States  
Tel: +1 858 534 1929  
Email: lcurtiss@ucsd.edu

Mr Shaun R DOLK  
Manager, Drifter Operation Center  
National Oceanic and Atmospheric Administration,  
Atlantic Oceanographic and Meteorological  
Laboratories  
4301 Rickenbacker Causeway  
Miami Florida FL 33149  
United States  
Tel: +1 305 361 4546  
Fax: +1 305 361 4439  
Email: Shaun.Dolk@noaa.gov

Dr. Verena HORMANN  
Project Scientist  
University of California, San Diego, Scripps  
Institution of Oceanography  
9500 Gilman Drive  
Mail Code 0213  
La Jolla California 92093-0213  
United States  
Tel: +1 858 534 7553  
Email: vhormann@ucsd.edu

Ms Jennifer LEWIS  
International Analyst  
National Weather Service/National Oceanic  
Atmospheric Administration  
NWS-NOAA Suite 17456  
1325 East West Hwy  
Silver Spring MD 20109  
United States  
Tel: 301- 427 9048  
Email: Jennifer.Lewis@noaa.gov

Dr Robert JENSEN  
USACE Engineer Research and Development  
Center  
(USACE ERDC)  
ATTN: CEERD-HF-CS  
Coastal and Hydraulics Laboratory  
3909 Halls Ferry Road  
Vicksburg MS  
United States  
Tel: +1 601 634 2101  
Robert.E.Jensen@erdc.dren.mil  
Robert.E.Jensen@usace.army.mil

Kevin O'BRIEN  
Software Engineer  
University of Washington/JISAO/NOAA/PMEL  
7600 Sand point way Ne  
Seattle WA 98115  
United States  
Tel: +1 (206) 526 6751  
Email: kob@uw.edu

Dr Rick LUMPKIN  
National Oceanic and Atmospheric Administration,  
Atlantic Oceanographic and Meteorological  
Laboratory  
Office of Oceanic and Atmospheric Research  
NOAA  
4301 Rickenbacker Causeway  
Miami Florida 33149  
United States  
Tel: +1 305 361 4513  
Fax: +1 305 361 4412  
Email: rick.lumpkin@noaa.gov

Mr Shannon MCARTHUR  
Program Manager  
NOAA National Data Buoy Center  
United States  
Tel: +1 228 688 2830  
Email: shannon.mcarthur@noaa.gov

Mrs Mayra PAZOS  
Computer Specialist  
National Oceanic and Atmospheric Administration  
4301 Rickenbacker Causeway  
Miami Florida 33149  
United States  
Tel: 305-361 4422  
Fax: 305-361 4412  
Email: mayra.pazos@noaa.gov

Ignatius RIGOR  
University of Washington  
7600 Sand point way Ne  
Seattle WA 98115  
United States  
Email: ignatius@uw.edu

Mr Scott ROGERSON  
Argos DCS Program Manager  
NOAA Satellite Operations Facility  
United States  
Tel: +1 301-817-4543  
Scott.rogerson@noaa.gov

Mr Christopher Kyle RUSHING  
NAVOCEANO  
Head, code NP322  
United States  
Tel: +1 228 688 5021  
Email: christopher.rushing@navy.mil

Dr Sidney W. THURSTON  
International Coordinator  
NOAA, Climate Program Office  
Climate Observations  
SSMC3  
Silver Spring MD 20910  
United States  
Tel: +1 301 427 2459  
Fax: +1 301 427 0033  
Email: sidney.thurston@noaa.gov

**INTERNATIONAL  
ORGANIZATIONS/PROGRAMMES**

***E-SURFMAR***

Mr Paul POLI  
E-SURFMAR  
Météo-France, CMM  
13 rue du Chatellier – CS12804  
29288 BREST CEDEX 2  
France  
Tel : +33 256 31 26 67  
Fax : +33 256 31 25 89  
Paul.poli@meteo.fr

***JCOMMOPS***

Ms Champika GALLAGE  
DBCP Technical Coordinator  
Coordinator of National Marine Networks  
JCOMM *in situ* Observation Programmes Support  
Centre  
c/o Ifremer centre Bretagne  
ZI de la Pointe du Diable  
1625 Route de Sainte Anne  
29280 Plouzané,  
FRANCE  
Email: cgallage@jcommops.org  
Tel : +33 2 29 00 85 88

Mr Mathieu BELBEOCH  
Argo Technical Coordinator, JCOMMOPS  
Technopole / Campus Ifremer Brest  
1625 Route de Sainte Anne  
Z. I. Pointe di Diable  
Blaise pascal Hall  
29280 PLOUZANE  
France  
Tel : +33 2 29 00 85 86  
Email: mbelbeoch@wmo.int

**EUMETSAT**

Willam DORAN  
European Organization for the Exploitation of  
Meteorological Satellites  
Eumetsat-Allee 1  
D-64295 Darmstadt  
Germany  
Tel: +4961518073610  
Email: wil.doran@eumetsat.int

Anne O'CARROLL  
EUMETSAT- Allee 1  
D-64295 Darmstadt  
Germany  
Tel: +49 6151 807 676  
Email: anne.ocarroll@eumetsat.int

***ARGOS JOINT TARIFF AGREEMENT***

Mr Eric R LOCKLEAR  
Chair, JTA  
National Oceanic & Atmospheric Administration,  
Silver Spring  
Climate Program Office  
1315 East-West Highway,  
Room 12726, SSMC 3  
Silver Spring MD 20910-5603  
United States  
Tel: +1 301 734 1236  
Fax: +1 301 713 0518  
Email: eric.locklear@noaa.gov

***WMO SECRETARIAT***

Mr Etienne CHARPENTIER  
Scientific Officer  
World Meteorological Organization  
Observing and Information Systems Department  
Observing Systems Division  
World Meteorological Organization  
7bis, av. de la Paix  
Case Postale 2300  
1211 Genève 2  
Switzerland  
Tel: +41 22 730 82 23  
Fax: +41 22 730 81 28  
Email: ECharpentier@wmo.int

**IOC SECRETARIAT**

Dr Thomas GROSS  
Programme Specialist GOOS, Web Services  
Intergovernmental Oceanographic Commission of  
UNESCO  
7, place de Fontenoy  
75732 Paris cedex 07  
France  
Tel: +33 1 45 68 39 92  
Fax: +33 1 45 68 58 12  
Email: t.gross@unesco.org

**OTHERS**

**AXYS**

Mr Mark BLASECKIE  
Technical Field Services  
AXYS Technologies Inc.  
2045 Mills Road West  
Sidney V8L 5X2  
BC  
Canada  
Tel: +1 250 655 5853  
Fax: +1 250 655 5856  
Email: mblaseckie@axys.com

Mr. Chad MACISAAC  
Sales Director  
AXYS Technologies Inc.  
2045 Mills Road West  
Sidney V8L 5X2  
BC  
Canada  
Tel: +12506555875  
Fax: +12506555856  
Email: cmacisaac@axys.com

**MetOcean Data Systems**

Ms Emily MACPHERSON  
Marketing Manager  
MetOcean Data Systems Canada  
21 Thornhill Drive  
Dartmouth B3B 1R9  
Nova Scotia  
Canada  
Tel: +1.902.468.2505 Ext. 227  
Fax: +1.902.468.4442  
Email: emily@metocean.com

**JOUBEH**

Mr. Bernie PETOLAS  
VP Sales  
1 Thornhill Drive  
Dartmouth B3B1R9  
Nova Scotia  
Canada  
Tel: +1 902-488-0708  
Email: bernie.petolas@joubeh.com

**GEPS Techno**

Mr David VALLEE  
Business Developer  
GEPS techno  
27, boulevard des Apprentis  
44600 Saint- Nazaire  
France  
Tel : +33 6 78 18 28 39  
Email: customerservice@geps-techno.com

**Pacific Gyre Inc.**

Ms Risa SYBRANDY  
Principal  
Pacific Gyre Inc.  
3740 Oeanic Way, Suite 302  
Oceanside CA 92056  
United States  
Tel: +1 760 433 6300  
Fax: +1 413 375 0914  
Email: rsybrandy@pacificgyre.com

**Data Buoy Instrumentation LLC**

Mr Jeffrey WINGENROTH  
Manager  
Data Buoy Instrumentation LLC  
75 Mid Cape Terrace  
STE 8  
Cape Coral FL 33991  
United States  
Tel: +1 941 244 8831  
Jlwing55@gmail.com

**CLS**

Mr Yann BERNARD  
Technical Manager  
Collecte et Localisation par Satellite (CLS/Service  
Argos)  
Parc Technologique du Canal  
Rue Hermès,  
31520 Ramonville Saint-Agne  
France  
Tel: +33 (0)5 61 39 39 09  
Fax: +33 (0)5 61 39 47 97  
Email: ybernard@cls.fr

Michel GUIGUE  
Geopositioning and Data Collection Mission  
Manager  
Collecte et Localisation par Satellite (CLS/Service  
Argos)  
Parc Technologique du Canal  
8-10, rue Hermès,  
31520 Ramonville Saint-Agne  
France  
Tel: +33 (0)5 61 39 47 79  
Fax: +33 (0)5 61 39 47 97  
Email: mguigue@cls.fr

***Fugro OCEANOR***

Mr Olaf SVEGGEN  
Director Sales and Projects  
Seawatch/Riverwatch & Soilwatch  
Fugro OCEANOR, Pir-Senteret, 7462  
Trondheim  
Norway  
Tel: +47 73 54 52 00 / +47 909 15335  
Fax: +73 54 52 01  
Email: o.sveggen@oceanor.com

***Other***

Mr Al WALLACE  
2-1234 West 7th Avenue  
Vancouver V1H 1B6  
BC  
Canada  
Tel: +1 604 733 5436  
Email: alton.wallace@shaw.ca



**ANNEX III**

**ACTION LIST / WORKPLAN**

**DBCP WORKPLAN FOR THE NEXT INTERSESSIONAL PERIOD (2015-16)**

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

<b>No.</b>	<b>Ref. item</b>	<b>Action item</b>	<b>By</b>	<b>Deadline</b>	<b>Update</b>
	<b>DBCP-31:</b>				
1	2	Act as the Workshop Co-chairpersons Sci&Tech Workshop for 2016	J. Stander & S. McArthur	DBCP-32	
2	5	Investigate distributing data from Tsunami buoys on the GTS	TC, with NDBC or Météo France	DBCP-32	
3	5	Look for deployment opportunities in Southern Ocean	DBCP Members	asap	
4	5	Provide network and service change notices to DBCP to post them on different notification streams	Buoy Operators	DBCP-32	
5	5	Review and provide feedback to TC on categories of networks and draft indicators list	Appropriate Task Teams and Groups and TC	Dec. 2015	

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<b>No.</b>	<b>Ref. item</b>	<b>Action item</b>	<b>By</b>	<b>Deadline</b>	<b>Update</b>
6	5	Provide deployment and platform metadata information to DBCP	Buoy Operators	DBCP-32	
7	5	The TC to work with NDBC or Météo France on an automated process for receiving tsunameter information.	TC, NDBC or Météo France	DBCP-32	
8	5	The Panel requested the Technical Coordinator to work with Iridium VARs to obtain drifting buoy data	TC	DBCP-32	
9	5	DBCP members should provide deployment information to the TC in timely manner.	Buoy Operators	continuous	
10	5	DBCP members should look for deployment opportunities in the Southern Ocean	DBCP Members	asap	
11	5	Panel review and provide feedback on categories of networks and draft indicators list	Panel members	asap	
12	5	The Panel requested the Technical Coordinator in liaison with some Panel members to discuss the rules for allocating WMO numbers with the Secretariat in the view to make a proposal to the next Panel Session for updating those rules	TC DBCP	DBCP-32	
13	5	The Panel invited the Iridium VARs and the buoy operators to facilitate the provision of the required buoy data to JCOMMOPS allowing JCOMMOPS to routinely produce its monitoring information	Iridium VARs & buoy operators	ongoing	

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<b>No.</b>	<b>Ref. item</b>	<b>Action item</b>	<b>By</b>	<b>Deadline</b>	<b>Update</b>
14	6.1	The trial JCOMM Global Data Assembly Centres (GDACs) for drifting buoys of Météo-France (former SOC) and ISDM (former RNODC/DB) to continue to work towards the implementation of a routine procedure to compare GTS Bulletin Headers between the two centres.	GDACs of Canada & France	DBCP-32	
15	6.1	Buoy operators to make sure that all the buoy manufacturers adhere to the standard and approved DBCP data formats	DBCP members	ongoing	
16	6.1	Centers must switch to using BUFR template for drifting and moored buoys (templates TM315009 for drifters and TM315008 for moorings) as soon as possible.	DBCP members	asap	
17	6.1	The Task Team invited its members to review the “Keeley” report (Data Systems Relevant to JCOMM Activities ) and to provide their feedback to the Chair of the Task Team on Data Management	TT-DM	end 2015	
18	6.3	The Panel recommended correcting time stamp data according to WMO-8, draft CIMO guide and WMO-544 for meteorological data. A DBCP Technical Document should be produced to clarify these issues.	TT-MB	DBCP-32	

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19	6.3	The Panel requested R. Venkatesan to lead such developments, with assistance from Luca Centuriani, David Meldrum, and the Secretariat in the view to make a proposal (possibly a draft guidelines document) at the next Panel Session	R. Venkatesan	DBCP-32	
20	6.4	To explore with the IOC Sub-Commission for Africa and the Adjacent Island States for a possible future (2017-2020) 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) 2015-2020.	TT-CB	DBCP-31	
21	6.4	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	
22	6.4	To Enhance Coordination and Cooperation between TT-CB and WMO Regional Associations	TT-CB	DBCP-31	

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<b>No.</b>	<b>Ref. item</b>	<b>Action item</b>	<b>By</b>	<b>Deadline</b>	<b>Update</b>
23	6.4	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	
24	6.4	To commence planning, through TT-CB, in 2016 for the organization of the “Second Pacific Islands Workshop on Ocean Observations and Data Applications” (PI-2). 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. Several venues have already been identified.	TT-CB	DBCP-31	
25	6.4	To commence planning, through TT-CB, in 2016 for the organization of the fifth “North Pacific Ocean and Marginal Seas Workshop” (NPOMS-5) hosted in Taiwan, province of China.	TT-CB	DBCP-31	
26	7	Together with the NPDBAP TC, the DBCP will create/issue invitation letters with DBCP letterhead.	NPDBAP TC	as needed	

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27	7	The DBCP will authorize the use of a DBCP brochure for NPDBAP activities, including access to said document on the NPDBAP webpage.	chair DBCP	asap	
28	8.2	The future plans and membership of the Pilot Project will be reviewed in November 2015, at the ad hoc meeting during the 14th Wave Workshop	PP-WET co-chairs, Secretariat	November, 2015	
29	8.2	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 February 2016 RMIC workshop	PP-WET co-chairs	DBCP-32	
30	9.1	Links to be checked on JCOMMOPS website (some are broken), and add update FAQs as needed	JCOMMOPS	asap	
31	9.1	DBCP Members to submit any relevant news items to the DBCP TC	Panel members	ongoing	
32	9.1	DBCP National Focal Points to submit all relevant publications corresponding to DBCP activities to Technical Coordinator for compilation into a continuing DBCP Bibliography	DBCP Working Groups	ongoing	
33	9.1	DBCP Members to try out the new website after launch in December 2015 and report on any issues to the DBCP TC	DBCP members	ongoing	

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34	9.1	Investigate the addition of a DBCP FAQ to the JCOMMOPS website.	DBCP TC	Dec. 2015	
35	9.2	Use JCOMMOPS services more actively, and provide feedback to JCOMMOPS	Members	continuously	
36	9.2	Share deployment opportunities, in particular through JCOMMOPS cruise registration	Members	continuously	
37	9.2	Continue with the development of cooperation agreements with shipping companies and research ship operators, in particular through IRSO	Ship TC	ongoing	
38	9.2	Continue with the development of innovative deployment solutions, in particular with the sailing community, and better exploit outreach (communication/education) potential	Ship TC	ongoing	
39	9.2	Foster the professional approach with ProLarge to develop a standard for deployment missions with chartered vessels, which cover all aspects of such operations appropriately	Ship TC	ongoing	
40	9.2	Consider setting up cross-cutting deployment missions with chartered ships through the JCOMMOPS-ProLarge consortium	Members	ongoing	

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41	9.3	To continue to deploy Iridium drifting buoys in areas where Argos delays are greater than 120 minutes	DBCP members	ongoing	
42	9.3	DBCP should perform regular (every 6 months) assessments with CLS and JouBeh of the global data buoy timeliness by comparing JCOMMOPS delay maps with Argos Data Mean Disposal Time Maps and JouBeh timeliness statistics	CLS and JouBeh assisted by TC DBCP	ongoing/semi-annual	
43	9.3	To investigate timeliness of the moored array and determine the best way to represent these in the reports	TC DBCP	DBCP-32	
44	9.4	The WG-Vandalism recommends to issue a letter from WMO/IOC to member countries sensitizing importance of protection of Buoys against Vandalism This would help to take up this issue at the Governmental level by Buoy Operators. WG shall prepare draft letter and supporting material.	WG Vandalism, Secretariat	asap	
45	9.4	The outreach program is highly appreciated and should be pursued. Also Poster Banners Stickers and Pamphlet prepared by various countries could be compiled.	DBCP TC	continuing	
46	9.5	Provide JCOMMOPS with planned deployment metadata in the format specified	Panel members	asap	

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47	9.5	JCOMMOPS to develop a method in the new website to report moored Buoy and drifter buoy metadata	JCOMMOPS		
48	9.5	The Panel recognized the importance of collecting metadata from fixed platforms and formed an ad-hoc Task Team to develop the metadata template for fixed platforms.	J. Turton, S. McArthur, Serge Deschamps, and TC DBCP	DBCP-32	
49	10.1	Improve coordination between DBCP and Argo during planning of deployment cruises by providing draft deployment plans to JCOMMOPS and using JCOMMOPS deployment planning web tools.	DBCP Panel	continuing	
50	10.4	Confirm [website key testers] for the review of the JCOMMOPS website in October 2015	website key testers	asap	
51	11.1	The Panel requested its members to promote the execution of the above Congress decisions at the national level	Panel members	DBCP-32	
52	11.1	The Panel decided to set up an ad hoc task team to work on these issues and make a proposal to the Executive Board before the next OCG Session	ad hoc TT	OCG-7	
53	11.1	NDBC to consider hosting a GDAC for Moored Buoys	NDBC	DBCP-32	

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<b>No.</b>	<b>Ref. item</b>	<b>Action item</b>	<b>By</b>	<b>Deadline</b>	<b>Update</b>
54	11.1	Requested the Technical Coordinator to investigate the problem that not all operational wave observation systems currently appear on the JCOMMOPS status maps, and ensure that the maps include all wave observing buoys	TC DBCP	asap	
55	11.1	Requested the Task Team on Data Management to collaborate with the JCOMM Task Team on Table Driven Codes for developing BUFR templates for glider and ice-buoy data	TT-DM	asap	
56	11.1	Prepare a list of subjects for internships	TC	Oct. 2015	
57	11.1	Platform operators to cc the TC on every deployment plan	Platform operators	on-going	
58	11.1	Propose to JCOMMOPS candidates for internships, students to be recruited late 2015 and provide support if possible	Panel	continuing	
59	11.2.2	Members to take decisions of Cg-17 into account when developing their activities in support of the Panel	Panel members	ongoing	
60	11.2.2	Members to consider providing infrastructure for the function of GDAC for moored buoy data in liaison with the Chair of the Expert Team on Marine Climatology (ETMC)	Panel members	DBCP-32	

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<b>No.</b>	<b>Ref. item</b>	<b>Action item</b>	<b>By</b>	<b>Deadline</b>	<b>Update</b>
61	11.2.2	Install barometers on all newly deployed drifters	Panel members	ongoing	
62	11.4	Pay attention to Cg-17 Technical Regulations relevant to WIGOS	Panel members	July 2016	
63	11.4	Contribute to the development of the WIGOS Data Quality Monitoring System for the met-ocean observing systems	JCOMMOPS	2019	
64	11.4	Consider how some data buoy related activities could be undertaken as part of the developing Regional WIGOS Centres	Panel members	2019	
65	11.4	Negotiate with the manufacturers, and make the provision of their platform and instrument metadata to JCOMMOPS as a contractual condition	Panel members	ongoing	
66	11.4	Consider attending the Satcom Forum	Panel members,	Sep. 2016	
67	11.5, OP/a37	The Executive Board will liaise with the Financial Advisor for updating the interim financial report with the most accurate and actual information	DBCP-EB	31 Jan. 2016	

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<b>No.</b>	<b>Ref. item</b>	<b>Action item</b>	<b>By</b>	<b>Deadline</b>	<b>Update</b>
68	11.5, OP/a38	The joint Secretariats and the Financial Advisor to work together to distribute the final statement for the year 2015 to the Panel members as soon as the IOC and WMO Final Statement of Accounts for the year 2015 are finalized and made available	Secretariat & Financial Advisor	1 March 2016	
69	11.6	OSMC to liaise with the Task Team on the MCDS in the view to address this issue	OSMC, TT-MCDS	asap	
70	12.1	Pursue initiative for pilot project for biogeochemical (BGC) sensors on drifters and report to next session with a suggested workplan and budget	Luca Centurioni	DBCP-32	
71	12.2	Panel to review the draft DBCP Implementation Strategy (available from the web ) and to forward any comments to the Chairperson.	Members	31 Dec. 2015	
72	12.2	The Executive Board to propose how the implementation strategy could be reviewed by selected Panel members	DBCP EB	ASAP	
73	12.3	Panel to review the draft DBCP Operating Principles (available from the web ) and to forward any comments to the Chairperson	Members	31 Dec. 2015	

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<b>No.</b>	<b>Ref. item</b>	<b>Action item</b>	<b>By</b>	<b>Deadline</b>	<b>Update</b>
74	12.5	Revise the list of prioritized tasks for the Technical Coordinator as agreed at the previous Session, and discuss execution details with TC	Chairperson, TC	ASAP	
75	12.5	Undertake the tasks as proposed by the Chairperson and to report at the next Panel Session	TC DBCP	ASAP	
76	13	DBCP members who had not submitted National Reports to submit their input to the Secretariat before the end of the year	members	31 Dec. 2015	
77	13	To publish National Reports with the Panel's Annual Report	Secretariat	Early-2016	
78	13	The Panel urged the DBCP task team on moored buoys to consider an agenda item to explore options and cooperative mechanisms toward the international operational cooperation for recovering moored buoys gone adrift	TT-MB	on-going	

## ANNEX IV

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

*(as adopted by DBCP-31)*

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

*(as adopted by DBCP-31)*

#### 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 the operational and research communities.
- 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 approved by the WMO and IOC Executive Bodies through proposition by JCOMM; the Panel 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 the last DBCP Session, a number of ongoing tasks and activities have been identified by the Panel for its members to undertake. They should:
  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](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 voluntary budgetary contributions to the Trust Fund in a 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 drifting 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 all new drifter and moored buoy deployments to DBCP TC and eventually via a notification webpage on the new 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](mailto:ships@jcommops.org) mailing list as well;
  12. provide info/materials for DBCP/JCOMMOPS websites (news, brochure);

13. maintain systems for record keeping for instrument calibration, replacement and validation that conform to ISO recommended specifications;
  14. review best practices prior to drifter purchase for safety, and GTS data processing purposes;
  15. follow the best practices and standards eventually proposed under WIGOS, and in particular, to provide the buoy platform/instrument metadata to JCOMMOPS;
  16. use the WMO-IOC Regional Marine Instrument Centres (RMIC) facilities as appropriate, and participate at future workshops;
  17. 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;
  18. 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:
1. to collaborate with buoy operators and JCOMMOPS
  2. investigate participating in the Association of Hydro-Meteorological Equipment Industry (HMEI - <http://www.hydrometeoindustry.org/>) as a way to be represented at JCOMM meetings;
  3. enhance buoy safety through improved design (refer recommendations) and keep the Panel informed about related changes.

Specifically, the drifter manufacturers will:

4. submit through JCOMMOPS their instrument/platform metadata, including description of drifter models, using the recommended mechanisms (paying particular attention to SST and SSS data); to comply with the drifting buoy metadata collection scheme;
5. provide Service Argos with list of most used drifting buoy models and formats they operate.

### **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 chairs 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 the DBCP Executive 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 reviews 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 establishes 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.

## 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 contributions 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 157<sup>th</sup> 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 contributions from Panel members are 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 arrangements for logistical support of the DBCP Technical Co-ordinator and JCOMMOPS will be formalized with an MoU between IOC, WMO and supporting partners in late 2015.
- 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 (see [Appendix X](#)) at their regular meetings.
- 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 should 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 annual reports on activities during the intersessional period, from:
  - the Executive Board;
  - the Technical Co-ordinator;
  - the Action Groups,
  - the Pilot Projects, and
  - the Member Countries.
- 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 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 lifetimes. 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-time, (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<sup>1</sup>). 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.

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

- 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 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.
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## 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 (current members are listed in the Annual Session Reports, and the on-line web site):

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

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

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.

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## 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 Meteo-France SOC/DB, and (ii) the ISDM, Canada RNODC/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 current membership is reported in the Annual Session Report and is given on the DBCP web-site.

**TERMS OF REFERENCE OF THE TASK 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 current membership is reported in the Annual Session Report and is given on the DBCP web-site.

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**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 current membership is reported in the Annual Session Report and is given on the DBCP web-site..

**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 current membership is reported in the Annual Session Report and is given on the DBCP web-site..

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

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2: Includes the salary and benefits;

3: This expenditure is balanced by an equivalent contribution of the JTA to the DBCP Trust Fund.

4: 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;

5: Hardware and software, and host IT support for developing, running, and maintaining the JCOMMOPS Information System;

6: Provision for the migration of the JCOMMOPS Information System;

7: Expenditure in support of the JCOMM Ship Observations Team (SOT) activities to be decided by the SOT Chairperson;

8: Includes the salary and benefits;

9: Missions on behalf of the Panel;

10: Expenses to be decided by the OPE Chair in consultation with the chairs of programmes contributing to JCOMMOPS;

11: For example, the DBCP Iridium Pilot Project;

12: For example, improving data timeliness in areas where system weaknesses are identified, Iridium, SLP;

13: DBCP and JCOMMOPS brochures and DBCP Publications;

14: Support for DBCP-related training courses: travel of trainers and / or trainees; training materials;

15: 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

16: 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<sup>17</sup> and the DBCP Chairperson<sup>18</sup>)*

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<sup>19</sup>, 9.8<sup>20</sup> and 9.9<sup>21</sup> 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 / MemberStates;
  - (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<sup>22</sup> (Resolution 37, Cg-XV); and

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17: Letter 11106-08/OBS/WIGOS/OSD/MAR/DBCP-ADM from Michel Jarraud dated 15 December 2008

18: Letter from David Meldrum dated 5 January 2009

19: 9.7: Trust funds, reserve and special accounts may be established by the Secretary-General and shall be reported to the Executive Council.

20: 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.

21: 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.

- (v) Miscellaneous income.
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:

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22: 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.

- (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.
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## APPENDIX VIII

### **Financial Regulations applicable to the Intergovernmental Oceanographic Commission (IOC)**

*(Excerpt from the Decisions by 157<sup>th</sup> 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<sup>23</sup> 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. . For moored buoy data there is no dedicated GDAC, as there is for drifter data. All drifter and moored buoy data should ultimately be incorporated into ICOADS (the International Comprehensive Ocean- Atmosphere Data Set) which is the primary dataset used for marine climate research.

#### **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 for both drifting and moored buoys and is a 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<sup>24</sup>).

#### **More information :**

- WMO data policy Resolution 40<sup>25</sup>
- IOC Oceanographic Data Exchange Policy<sup>26</sup>

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23 : <http://www.jcommops.org/DBCP/1gtsinfo.html>

24 : <http://www.jcommops.org/dbcp/2qgd.html>

25 : [http://www.wmo.int/pages/prog/www/ois/Operational\\_Information/AdditionalDataProducts/02\\_Resolution%2040.pdf](http://www.wmo.int/pages/prog/www/ois/Operational_Information/AdditionalDataProducts/02_Resolution%2040.pdf)

- CLIVAR data policy<sup>27</sup>
- 

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26 : [http://www.ioc-unesco.org/index.php?option=com\\_oe&task=viewDocumentRecord&docID=338](http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=338)

27 : [http://www.clivar.org/data/data\\_policy.php](http://www.clivar.org/data/data_policy.php)

## APPENDIX X

### Current key DBCP personnel

#### EUROPE

Mr Jon Turton (*Chairperson*)<sup>28</sup>  
Marine Observations Manager  
Met Office  
FitzRoy Road  
Exeter  
Devon  
EX1 3PB  
United Kingdom  
Tel: +44 1392 886647  
Fax: +44 1392 885681  
Email: [jon.turton@metoffice.gov.uk](mailto:jon.turton@metoffice.gov.uk)

#### ASIA

Dr R. VENKATESAN (*Vice-Chairperson*)<sup>30</sup>  
Group Head-Ocean Observation Systems  
National Institute of Ocean Technology  
Pallikaranai  
Velachery - Tambaram Road  
CHENNAI 600100  
India  
Email: [dr.r.venkatesan@gmail.com](mailto:dr.r.venkatesan@gmail.com)

#### NORTH AMERICA

Mr Shannon MCARTHUR (*Vice-Chairperson*)<sup>36</sup>  
Program Manager  
NOAA National Data Buoy Center  
United States  
Tel: +1 228 688 2830  
Email: [Shannon.mcarthur@noaa.gov](mailto:Shannon.mcarthur@noaa.gov)

#### SOUTHERN HEMISPHERE

Mr Graeme BALL (*Vice-Chairperson*)<sup>31</sup>  
Manager, Marine Operations Group  
Australian Bureau of Meteorology  
700 Collins Street  
Docklands  
GPO Box 1289  
Melbourne VIC 3001 Australia  
Tel: +61-3 9669 4203  
Fax: +61-3 9669 4168  
Email: [g.ball@bom.gov.au](mailto:g.ball@bom.gov.au)

#### TECHNICAL CO-ORDINATOR

Mrs Champika GALLAGE<sup>29</sup>  
DBCP Technical Coordinator  
Coordinator of National Marine Networks  
JCOMMOPS  
c/o Ifremer centre Bretagne  
ZI de la Pointe du Diable  
CS10070  
29280 Plouzane, France  
Tel.: +33 5 61 39 47 82  
Fax: +33 5 61 75 10 14  
E-mail: [cgallage@jcommops.org](mailto:cgallage@jcommops.org)

#### FINANCE ADVISOR

Mr Eric LOCKLEAR<sup>36</sup>  
National Oceanic and Atmospheric Administration  
Climate Program Office  
1315 East-West Highway,  
Room 12107, SSMC 3  
Silver Spring MD 20910-5603  
United States  
Tel: +1 301 734 1236  
Fax: +1 301 713 0518  
Email: [eric.locklear@noaa.gov](mailto:eric.locklear@noaa.gov)

#### IOC SECRETARIAT

Dr Tom GROSS  
Intergovernmental Oceanographic  
Commission (IOC)/ UNESCO  
1, rue Miollis  
75732 PARIS CEDEX 15  
France  
Tel: +33 1 45 68 39 92  
Fax: +33 1 45 68 58 12  
E-mail: [t.gross@unesco.org](mailto:t.gross@unesco.org)

#### WMO SECRETARIAT

Mr Etienne CHARPENTIER  
Observing Systems Division  
Observing and Information Systems Department  
World Meteorological Organization  
7 bis, avenue de la Paix  
Case postale No. 2300  
CH-1211 GENEVE 2 Switzerland  
Tel.: +41 22 730 8223  
Fax: +41 22 730 8128  
E-mail: [ECharpentier@wmo.int](mailto:ECharpentier@wmo.int)

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28 Elected at DBCP-30, China, 27-31 Oct. 2014

29 Appointed in October 2014

30 Elected at DBCP-26, Oban, United Kingdom, 27-30 Sept. 2010

31 Elected 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 <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
		<b>ADMINISTRATIVE</b>				
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 D30/11.1.39	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

<sup>1</sup> 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).

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
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 execution details with the Technical Coordinator)	Chair	EB, Panel members	Panel	asap after Panel Session
11	OP/3.8 OP/10.11 D29/12.4 D27/5.6, D27/12.4.2 D26/5.12 (iv); D30/12.5.1.,	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
12	D30/11.1.2(i), 11.1.2(ii), 10.4.1	To assist OCG co-chairs in defining a strategy for JCOMMOPS which more clearly defines its areas of activity and reasserts its priorities	DBCP			
13	D30/11.1.2(ii)	to pay close attention to succession planning and report back to OCG	DBCP			
14	D30/11.1.40.	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			
15	D30/12.1.2(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			
<b>CAPACITYBUILDING</b>						
16	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
17	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
18	OP/Apx5/CB(1) D29/6.4 D22/2.2.1.2 (xii);	To organize Capacity Building activities (training workshops, training materials, identifying lecturers) in coordination with regional activities.	TT-CB	Secretariat	Panel	Next Panel session

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
	D22/4.3.3; D22/4.3.5; D30/6.4.4(vi)					
19	OP/Apx5/CB(10) D29/6.4 D22/4.3.6; D30/6.4.4(v)	To investigate on possible cooperation with relevant Capacity Building programmes in WMO and IOC.	Secretariat	Chair	Panel	Next Panel session
20	D29/6.4	To build Observation Development Team (ODT) and Modelling Development Team (MDT) with Met/Ocean Institutes around the world	TT-CB			
21	DBCP-30 / 64.4(xiv.)	to communicate and send to the JCOMM CB coordinator all future Capacity Building workshops and reports thereof	TT-CB		JCOMM CB Coord.	Continuous
		<b>DATA COLLECTION</b>				
22	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
23	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
24	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
25	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
26	OP/Apx5/DM D26/6.1.5 (1) DBCP-30 / 6.2.11(xii)	to promote standardization of data transmission formats using 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.	TT-DM	TC	Panel	ongoing
27	OP/Apx5/DM D27/4.2.2.3	to provide special attention to buoy data reception	INMARSAT		Panel members	ongoing
28	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
29	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	Panel members	TC	Panel	ongoing

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
	D30/5.18(ii)	Iridium Pilot Project				
30	OP/Apx5/DM D22/11.1	To make recommendations to the following JTA Session.	Chair		JTA, Panel	JTA Session
31	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
32	D30/9.3.1 0(iii)	to investigate timeliness of the moored array and determine the best way to represent these in the reports	TC-DBCP			
		<b>DATA EXCHANGE</b>				
33	OP/11.3 D29/5 D23/3.3.8; D30/6.3.5	To identify sources of buoy data not currently reported on the GTS and determine reason for non-availability,	TC & CLS	Panel members & Secretariat	Chair & Panel for information	Continuous
34	OP/2.3(18) 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
35	OP/Apx5/DM D27/6.1.2 (iv); D30/6.1.3(iii)	to monitor GTS bulletin headers used for GTS distribution of buoy data, reconcile the differences found, and publish the list on the JCOMM OBS website and Météo-France QC tools	Météo France & MEDS, JCOMMOPS		Panel	ongoing
36	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
37	DBCP-30 / 11.1.2(iv)	to implement recommendations of Keeley Report to the extent possible	DBCP members	TC-DBCP, Secretariat	Panel	ongoing
38	DBCP-30 / 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			
39	DBCP-30/10.4.2. 10.4.3. 10.4.4. 10.4.7. 10.4.12 10.4.13. 10.4.14. 10.4.15.	Complete and maintain JCOMMOPS web page with enhanced database access for metadata displays to aid all JCOMMOPS missions, including DBCP metadata needs.	JCOMMOPS			
		<b>METADATA</b>				
40	OP/2.3 (9) OP/2.4(1) DBCP-30 / 6.3.7(i)	Buoy operators to provide metadata to JCOMMOPS; Manufacturers to collaborate with buoy operators and JCOMMOPS and submit the instrument/platform metadata using	Buoy operators & manufacturers	TC	Panel	Continuous

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
	D29/5 D27/11.5.3 (ii), D26/6.3.3, D24/10.5.6; D23/6.14; D21/8.6.4.5; D30 / 5.17(v), 9.5.8(i-ii)	the recommended mechanisms (paying particular attention to SST and SSS data); both to comply with buoy metadata collection scheme. DBCP-27: JCOMMOPS to negotiate metadata formats on ad hoc basis				
41	OP/2.3(15) D26/6.3.3	to regularly forward collected metadata to the ODAS metadata service (China) .	JCOMMOPS	Secretariat & China	Panel	Ongoing
42	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
43	OP/2.3(8) D27/6.2.4	to provide barometer/SLP data to the GDP/AOML	Met. Services	TC	Panel	ongoing
44	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
45	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
46	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
47	D30/6.3.7(ii)	to build on the DBCP moored buoy metadata scheme to handle metadata for fixed platforms	TT-MB			
48	D30/6.3.7(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			
49	D30/6.3.7(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-IBPD			
<b>FINANCES</b>						
50	OP/Apx4(8) D27/11.6.10, D26/11.6.12	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

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
	(1), D25/10.6.7					
51	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
52	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
53	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
54	OP/8.11 D22/10.1.8; D22/10.1.10	to request IOC and WMO to provide an Interim Statement of Accounts over the period 1 January-31 July	Finance Advisor	Secretariat & Chair	Panel	March each year
55	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
56	D30/ 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 implemented.	DBCP-EB			
<b>IMPLEMENTATION</b>						
57	OP/2.3(7) D27/5.10 DBCP-30 / 6.2.11(iv)	to make use of the barometer drifter upgrade scheme (see <a href="http://www.jcommops.org/dbcp/platforms/barometer.html">http://www.jcommops.org/dbcp/platforms/barometer.html</a> ) 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
58	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
59	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
60	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

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
61	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
62	DBCP-30 / 10.4.5.	to chase for ancillary contributions not formally under the Panels umbrella	TC-DBCP	DBCP members	Panel	ongoing
63	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
<b>IMPLEMENTATION STRATEGY</b>						
64	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
65	OP/2.3(4) D27/12.1.1, D26/12.1.1	to review the DBCP Implementation Strategy document at <a href="http://www.jcommops.org/doc/DBCP/DBCP_Impl_Strategy.pdf">http://www.jcommops.org/doc/DBCP/DBCP_Impl_Strategy.pdf</a> and to forward any comments to the Chairperson by the end of November each year	Panel members	Secretariat	Chair & Panel	Nov. each year
66	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
<b>IMPLEMENTATION / ACTION GROUPS</b>						
67	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
68	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
69	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
<b>IMPLEMENTATION / LOGISTICS</b>						
70	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; D30/5.12,	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	JCOMMOP S & Panel	Continuous

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
	5.18(iii)					
71	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
72	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
73	OP/11.16 D29/9.2 D26/11.2.11, D23/8.5.1.8; D22/8.5.1.9.;; D22/8.5.3; D30/10.4.1(v)	To implement JCOMMOPS work-plan – particularly with respect to Deployment opportunities.	TC & TC/Argo	JCOMM	Next Panel session	Continuous
74	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
<b>MONITORING</b>						
75	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
76	OP/11.15 D23/8.4.2.4	To maintain a catalogue of existing ongoing ocean data buoy programmes.	TC	Panel members & Secretariat	Chair & Panel for information	Continuous
77	OP/2.4(1) D21	To provide input on buoy models for JCOMMOPS database.	Manufacturers	TC	Panel	Continuous
78	OP/2.4(5) D21	To provide Service Argos with list of most used buoy models and formats they operate.	Manufacturers	TC	Service Argos	Before deployment
<b>REQUIREMENTS</b>						
79	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
80	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
81	DBCP-30/ 5.21.	to follow closely the development of the Global Framework for	TC-DBCP	WMO	Panel	ongoing

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
		Climate Services (GFCS) and its observational data needs as the Panel is substantially contributing to such requirements		Secretariat		
82	D30/9.6.3.	to contact the SFSPA and DMPA Coordinators, in the view to identify their requirements, and to propose possible recommendations and actions	DBCP Chair			
<b>INFORMATION EXCHANGE</b>						
83	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
84	OP/2.3 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
85	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
86	OP/2.3 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
87	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
88	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-IBPD	TC & Secretariat	Panel	Continuous
89	D30/ 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			
<b>INSTRUMENT PRACTICES</b>						
90	OP/2.3(13) 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-IBPD	Panel	ongoing
91	OP/2.3(14) D21	To review best practices prior to drifter purchase for safety, and GTS data processing purposes.	Panel members	TT-IBPD & TC	Panel	Continuous
92	OP/2.3(15)	to follow the best practices and standards eventually proposed	Panel members	TC &	Panel	Continuous

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
	D24/12.6.8.4	under WIGOS, and in particular, to provide the buoy platform / instrument metadata to JCOMMOPS, and the ODAS metadata service (China) as appropriate.		Secretariat		
93	D29/6.2	to address the instrument best practices recommendations from TT-IBPD.	Manufacturers	Secretariat	Panel	ongoing
94	OP/2.3(16) 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
95	OP/2.4 D27/11.5.3 (v), D24/10.7.3	Investigate participating in the Association of Hydro-Meteorological Equipment Industry (HMEI - <a href="http://www.hydrometeoindustry.org/">http://www.hydrometeoindustry.org/</a> ) as a way to be represented at JCOMM meetings.	Manufacturers		Panel	Continuous
96	D30/8.2.12(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			
<b>QUALITY MANAGEMENT</b>						
97	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
<b>QUALITY MANAGEMENT / INSTRUMENT EVALUATION</b>						
98	OP/Apx5/IBP (1)(7) D26/6.2.5 D29/2; D30/6.2.11(i-x)	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-IBPD	TC & Panel members	Panel	Ongoing
99	D30/12.1.2(ii)	to must remain open to developments, and possible collaboration with groups involved in coordination of glider activities, and new technological developments	DBCP-EB			
<b>QUALITY MANAGEMENT / INTERCOMPARISONS</b>						
100	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
101	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	DBCP members		Panel	ongoing

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No	Ref item <sup>1</sup>	Action Item	Who	Supported by	Reporting to	When
		minus observation time				
<b>QUALITY MANAGEMENT / QUALITY CONTROL</b>						
102	OP/11.18 ToR	To coordinate operations of DBCPQC guidelines..	TC	Panel members & Data Quality centres	Panel	Continuous
103	OP/2.3(17) 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
104	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
105	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
<b>SAFETY / VANDALISM / SECURITY</b>						
106	OP/2.4 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
107	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
108	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
<b>TECHNOLOGY DEVELOPMENT</b>						
109	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)*

<b>CAPACITYBUILDING</b>			
<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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
<b>DATA EXCHANGE</b>			
<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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
<b>FINANCES</b>			
<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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

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10	DBCP-27 / 11.6.9 DBCP-26 / 11.6.11 (3) DBCP-25 / 10.6.7 DBCP-30 / 11.5.10	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
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**

<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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 as 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 <sup>2</sup> – “ <i>Ocean Data Buoy Vandalism - Incidence, Impact and Responses</i> ” (these recommendations are also reproduced in DBCP-27/ <a href="#">Annex XIV</a> ).	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

2: [http://www.jcomm.info/index.php?option=com\\_oe&task=viewDocumentRecord&docID=7150](http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=7150)

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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
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**

<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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**

<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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	The Panel recognized that the pilot project would contribute to JCOMM in developing standards and best	PP-WET

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	DBCP-26 / 8.4.6 DBCP-30 / 8.2.11(ii)	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.	
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 by the NOAA/AOML, and recommended to continue this valuable exercise with extended involvement of all currently operating buoy manufacturers.	AOML
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**

<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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

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<b>SATELLITE DATA TELECOMMUNICATION</b>			
<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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

<b>TECHNOLOGY DEVELOPMENT, PILOT PROJECTS</b>			
<b>No.</b>	<b>Ref.</b>	<b>Recommendation</b>	<b>By</b>
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.	a small number of wave drifters from SIO (doing spectral waves, and currents using GPS) could be	DBCP members

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	DBCP-30 / 8.2.11(v)	obtained and deployed as a complement to the regular drifter program for evaluation. PP-WET to be informed in that case.	
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)

<b>Name of Action Group</b>	Global Drifter Program
<b>Date of report</b>	15 September 2015
<b>Overview and main requirements addressed</b>	Global Drifter Program (GDP). 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.
<b>Area of interest</b>	Global ocean
<b>Type of platform and variables measured</b>	Lagrangian drifters measuring surface velocity, SST; some drifters also measure sea level pressure, wind, salinity, and/or sub-surface temperature profiles
<b>Targeted horizontal resolution</b>	5 degree x 5 degree (1250 units)
<b>Chairperson/Managers</b>	Dr Rick Lumpkin, NOAA/AOML, USA Dr Luca Centurioni, SIO/CIMEC, USA
<b>Coordinator</b>	Operations Manager: Mr Shaun Dolk, NOAA/AOML, USA
<b>Participants</b>	Numerous national and international institutions
<b>Data centre(s)</b>	GDP Data Assembly Center (DAC) – Manager: Ms Mayra Pazos, NOAA/AOML, USA
<b>Website</b>	<a href="http://www.aoml.noaa.gov/phod/dac/">http://www.aoml.noaa.gov/phod/dac/</a>
<b>Meetings</b> <i>(meetings held in 2014/2015; and planned in 2015/2016)</i>	None other than DBCP
<b>Current status summary</b> <i>(mid-2015)</i>	Annual size of array was 1389 drifters. Current size as of 14 September 2015 is 1468 drifters.
<b>Summary of plans for 2015</b>	Maintain array at ~1250 drifters or more

## 2. TROPICAL MOORED BUOY IMPLEMENTATION PANEL (TIP)

Name of Action Group	The Tropical Moored Buoy Implementation Panel (TIP)
Date of report	15 September 2015
Overview and main requirements addressed	<p>The Tropical Moored Buoy Implementation Panel (TIP) oversees the design and implementation of the following components:</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• The Prediction and Research Moored Array in the Tropical Atlantic (PIRATA)</li> <li>• The Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (RAMA)</li> </ul>
Area of interest	<p>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.</p>
Type of platform and variables measured	<p>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<sub>2</sub> and O<sub>2</sub> on select moorings. Some moorings also have specialized instruments to measure turbulence dissipation and listening devices for tracking marine animals.</p> <p>Subsurface ADCP moorings measuring velocity profiles in the upper few hundred meters. Some have additional single point current meters at deeper levels.</p>
Targeted horizontal resolution	Tropical Pacific Ocean: 67 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	<p>TAO/TRITON: NOAA National Data Buoy Center (NDBC), NOAA Pacific Marine Environmental Laboratory (PMEL), Japan Agency for Marine-Earth Science and Technology (<i>JAMSTEC</i>)</p> <p>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)</p> <p>RAMA: NOAA PMEL, JAMSTEC, Indian National Center for Ocean Information Services (INCOIS), Indian National Institute of</p>

	Oceanography (NIO), the Indonesian Agency for the Assessment and Application of Technology (BPPT), the Indonesian Meteorological, Climate, and Geophysical Agency (BMKG), the Chinese First Institute of Oceanography (FIO), Agulhas and Somali Current Large Marine Ecosystems ( <a href="#">ASCLME</a> ), Bay of Bengal Large Marine Ecosystem (BOBLME) program, University of Tasmania and the Commonwealth Scientific and Industrial Research Organization (CSIRO) in Australia.
<b>Data centre(s)</b>	PMEL, NDBC, JAMSTEC, NIO
<b>Website</b>	<a href="http://www.pmel.noaa.gov/tao/global/global.html">http://www.pmel.noaa.gov/tao/global/global.html</a>
<b>Meetings</b> <i>(meetings held in 2014/2015; and planned in 2015/2016)</i>	<ul style="list-style-type: none"> <li>• CLIVAR GOOS Indian Ocean Panel 11th session, The Hague, Netherlands, 14-15 July 2014</li> <li>• CLIVAR Pacific Ocean Panel, The Hague, Netherlands, 14-15 July 2014</li> <li>• Ninth Annual Indonesia – U.S. Ocean and Climate Observations, Analysis and Applications Partnership Workshop, Jakarta, Indonesia, 20-23 August 2014</li> <li>• TPOS-2020 Steering Committee 1st meeting, Ansan, Korea, 6-9 October, 2014</li> <li>• IndoOS Resource Forum, Phuket, Thailand, 31 October 2014</li> <li>• PIRATA-19/Tropical Atlantic Climate Variability, Recife, Brazil, 3-6 November 2014</li> <li>• Tenth Annual Indonesia – U.S. Ocean - Climate Observations, Analysis and Applications Partnership Workshop, Bandung, Indonesia, 12-14 August 2014</li> <li>• PREFACE-PIRATA-CLIVAR Tropical Atlantic Conference, Cape Town, South Africa, 25-27 August, 2015</li> <li>• CLIVAR Pacific Ocean Panel 10th session, Santiago, Chile, 10-11 October, 2015</li> <li>• TPOS2020 Steering Committee 2<sup>nd</sup> meeting, Hobart, Australia, 14-17 October, 2015</li> <li>• CLIVAR GOOS Indian Ocean Panel 12th session, IndoOS Resource Forum, Goa, India, 5-9 December, 2015</li> </ul>
<b>Current status summary</b> <i>(September 2015)</i>	TAO/TRITON: 51 of 55 TAO, 8 of 8 TRITON surface moorings reporting data. PIRATA: 18 of 18 surface moorings reporting data. RAMA: 16 of 27 surface moorings reporting data.
<b>Summary of plans for 2016</b>	TAO/TRITON: Maintain 61 mooring array. (11 of 13 original TRITON/ADCP moorings retired.) PIRATA: Maintain 18 mooring array RAMA: Maintain 34 sites, including 2 new sites. Possibly implement additional sites 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 August 2015
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), the Mediterranean Sea and a part of the Arctic. In 2015, E-SURFMAR started to extend its activities in the South Atlantic in the frame of AtlantOS project.
Type of platform and variables measured	<u>Drifting buoys</u> : air pressure, SST <u>Moored buoys</u> : 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	E-SURFMAR Operational Service Manager: Mr Pierre Blouch, Météo-France Chairperson, Expert Team-Data Buoy (ET-DB): Mr Jon Turton, UK Met Office
Coordinator	E-SURFMAR 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 JCOMM/SOC DFO/OS (Canada) as RNODC/DB NOAA/AOML for DBCP/GDP
Website	<a href="http://www.eumetnet.eu/">http://www.eumetnet.eu/</a> , <a href="http://esurfmar.meteo.fr">http://esurfmar.meteo.fr</a> (restricted working area web site for E-SURFMAR participants)
Meetings	ET-DB meets once a year. ET-DB12 Rome 28-29 May 2015
Current status (mid-2015)	133 E-SURFMAR drifting buoys in operation (91 Iridium including 4 AtlantOS and 42 Iridium upgrades) + 69 others reporting AP.

	4 E-SURFMAR supported moored buoys in operation, plus a further 30 others operated by members.
<b>Summary of plans for 2016</b>	Maintain a network of 100 drifting buoys in North Atlantic, a network of 15 drifting buoys in South Atlantic, and the 4 reference moored buoys in operation.

#### 4. INTERNATIONAL BUOY PROGRAMME FOR THE INDIAN OCEAN (IBPIO)

<b>Name of Action Group</b>	<b>International Buoy Programme for the Indian Ocean (IBPIO)</b>
<b>Date of report</b>	31 August 2015
<b>Overview and main requirements addressed</b>	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...).
<b>Area of interest</b>	Indian Ocean North of 55°S and between 25°E and 120°E (130°E in the North of Australia)
<b>Type of platform and variables measured</b>	Drifting buoys: Air pressure, SST, (wind) Moorings: air pressure, wind, air temperature, SST, waves, relative humidity, radiation, rainfall, SSS, subsurface temperature and salinity, current...
<b>Targeted horizontal resolution</b>	500 km x 500 km
<b>Chairperson/Managers</b>	Mr Shaun Dolk, NOAA/AOML, USA
<b>Coordinator</b>	Mr Gilbert Emzivat, Météo-France
<b>Participants</b>	Australia (ABOM), France (Météo-France), India (NIO, NIOT, INCOIS), Kenya (KMD), Mozambique (EMU), South Africa (SAWS), TIP (Tropical Moored Buoy Implementation Panel), USA (GDP, Navocean).
<b>Data centre(s)</b>	ISDM (Canada) as RNODC/DB, Météo-France as SOC AOML, NOAA/PMEL
<b>Website</b>	<a href="http://www.shom.fr/meteo/ibpio">http://www.shom.fr/meteo/ibpio</a>
<b>Meetings</b>	Annual meetings in conjunction with DBCP meetings. IBPIO 18 in Geneva (Switzerland) in October 2015
<b>Current status (mid-2015)</b>	154 drifters (131 with Air Pressure) 48 moored buoys (34 for RAMA 74% of the planned 46 site array)
<b>Summary of plans for 2016</b>	Maintain a network of 150 drifters at least. Maintain or expand the moored buoy arrays.

## 5. NORTH PACIFIC DATA BUOY ADVISORY PANEL (NPDBAP)

<b>Name of Action Group</b>	<b>DBCP-PICES North Pacific Data Buoy Advisory Panel (NPDBAP)</b>
<b>Date of report</b>	31 August 2015
<b>Overview and main requirements addressed</b>	The goals of the NPDBAP are to deploy 60 SVPB drifters a year, and maintain 75 active buoys in the region.
<b>Area of interest</b>	North Pacific Ocean and marginal seas generally north of 30°N
<b>Type of platform and variables measured</b>	Lagrangian drifters measuring sea level pressure, SST, and sea-surface velocity
<b>Targeted horizontal resolution</b>	5° x 5°
<b>Chairperson/Managers</b>	Co-Chairperson for the NE Pacific: Chris Marshall, MSC, Canada Co-Chairperson for the NW Pacific: Position vacant and to be proposed by PICES
<b>Coordinator</b>	Mr Shaun Dolk, NOAA / AOML
<b>Participants</b>	Chris Marshall, Shaun Dolk, Ignatius Rigor, and Champika Gallage
<b>Data centre(s)</b>	Drifter Data Assembly Centre (DAC) Integrated Science Data Management (ISDM), Canada
<b>Website</b>	<a href="http://dbcp.jcommops.org/npdbap/">http://dbcp.jcommops.org/npdbap/</a>
<b>Meetings</b> <i>(meetings held in 2014/2015; and planned in 2015/2016)</i>	Yearly meetings usually held in conjunction with DBCP meetings. Next meeting planned 20 October, 2015 in Geneva, Switzerland
<b>Current status summary</b> <i>(mid-2013)</i>	From 01 September 2014 to 31 August 2015, 110 drifters were deployed in the North Pacific Ocean. Of the 110 drifter deployments, 74 units were equipped with barometer sensors and the remaining 36 drifters were standard SVP type drifters.
<b>Summary of plans for 2016</b>	The goal for 2016 is to deploy 100 drifters, of which, 70 drifters will be equipped with barometer sensors.

**6. INTERNATIONAL ARCTIC BUOY PROGRAMME (IABP)**

<b>Name of Action Group</b>	International Antarctic Buoys Programme (IABP)
<b>Date of report</b>	22 September 2015
<b>Overview and main requirements addressed</b>	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.
<b>Area of interest</b>	Central Arctic Ocean and its marginal seas, excepting Exclusive Economic Zones, where agreements of the Coastal States have not been obtained
<b>Type of platform and variables measured</b>	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)
<b>Targeted horizontal resolution</b>	250 km x 250 km
<b>Chairperson/Managers</b>	Chairperson: Christine Best, Meteorological Service Canada
<b>Coordinator</b>	Ignatius Rigor, Polar Science Center, University of Washington, USA
<b>Participants</b>	Participants range from Science Institutions to Universities to Government Agencies. <a href="http://iabp.apl.washington.edu/overview_participants.html">http://iabp.apl.washington.edu/overview_participants.html</a>  Participant contributions are shown on this site <a href="http://iabp.apl.washington.edu/overview_contributions.html">http://iabp.apl.washington.edu/overview_contributions.html</a>
<b>Data centre(s)</b>	
<b>Website</b>	<a href="http://iabp.apl.washington.edu/">http://iabp.apl.washington.edu/</a>
<b>Meetings</b> <i>(meetings held in 2013/2014; and planned in 2014/2015)</i>	Annual meetings spring or early summer in the Northern Hemisphere. 25th Annual Meeting of the International Arctic Buoy Programme [IABP], hosted by the University of Washington, Seattle, Washington, USA on June 8 – 10, 2015. We are planning to have our next meeting to coincide with KOPRI's International Polar Science Symposium in May, 2016.
<b>Current status summary</b> <i>(mid-2015)</i>	162 buoys were reporting (Fig. 1).
<b>Summary of plans for 2016</b>	Summer is the primary deployment season in the Arctic.

	<p>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.</p> <p>Plans for future years will be similar.</p>
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## 7. WCRP-SCAR INTERNATIONAL PROGRAMME FOR ANTARCTIC BUOYS (IPAB)

<b>Name of Action Group</b>	WCRP/SCAR International Programme for Antarctic Buoys (IPAB)
<b>Date of report</b>	20 Sep 2015
<b>Overview and main requirements addressed</b>	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.
<b>Area of interest</b>	South of 55°S and that region of the Southern Ocean and Antarctic marginal seas within the maximum seasonal sea-ice extent.
<b>Type of platform and variables measured</b>	Ice buoys measuring the following: <u>Minimum variables:</u> Buoy position <u>Basic variables:</u> Buoy position, atmospheric pressure and SST <u>Other variables:</u> Air temperature, ice and/or snow temperature, atmospheric pressure tendency, wind speed and direction, snow accumulation, other sea-ice properties and oceanographic variables
<b>Targeted horizontal resolution</b>	500 km x 500 km
<b>Chairperson/Managers</b>	Dr Petra Heil, AAD and ACE CRC, Hobart, Australia
<b>Coordinator</b>	Dr Christian Haas, York University, Toronto, Canada; Dr. Ignatius Rigor, University of Washington, Seattle, USA
<b>Participants</b>	<ul style="list-style-type: none"> <li>- Alfred Wegener Institut, Germany</li> <li>- Australian Antarctic Division, Australia</li> <li>- Bureau of Meteorology, Australia</li> <li>- British Antarctic Survey, UK</li> <li>- Finnish Institute for Marine Research, Finland</li> <li>- GI, University of Alaska Fairbanks, USA</li> <li>- IARC, University of Alaska Fairbanks, USA</li> <li>- National Ice Center, USA</li> <li>- National Snow and Ice Data Center NSIDC, USA</li> <li>- ISDM/MEDS, Dept. of Fisheries and Ocean, Canada</li> <li>- Meteorological Service NZ LTD, New Zealand</li> <li>- Norwegian Polar Institute, Norway</li> <li>- Polar Science Center, Univ. of Washington, USA</li> <li>- National Institute of Polar Research, Japan</li> <li>- JAMSTEC, Japan</li> <li>- Programma Nazionale di Ricerche in Antartide, Italy</li> <li>- DAMTP, UK</li> <li>- SAMS, UK</li> <li>- York University, Toronto, Canada</li> <li>- CLS/Service Argos, France</li> <li>- South African Weather Service, South Africa- Meteorological</li> </ul>

	Office, UK - CRREL, USA
<b>Data centre(s)</b>	Alfred Wegener Institute for Polar and Marine Research, Germany: <a href="http://www.pangaea.de/search?q=ipab">http://www.pangaea.de/search?q=ipab</a> National Snow and Ice Data Center NSIDC, USA: <a href="http://nsidc.org/data/docs/daac/nsidc0084_ipab_antarctic_buoys.gd.html">http://nsidc.org/data/docs/daac/nsidc0084_ipab_antarctic_buoys.gd.html</a>
<b>Website</b>	<a href="http://www.ipab.aq/">http://www.ipab.aq/</a>
<b>Meetings</b> <i>(meetings held in 2014/2015; and planned in 2015/2016)</i>	IPAB participants reported during the annual meeting of the International Arctic Buoy Programme IABP in Seattle, Washington, USA, on June 8-10, 2015. It has been considered to hold the next IPAB participants meeting together with the annual IABP meeting, possibly at the Koran Polar Research Institute KOPRI, in May or June 2016.
<b>Current status summary</b> <i>(mid-2015)</i>	1. 6 buoys were deployed during AWI Polarstern cruise PS89/02 in the Weddell Sea, including SVP, IMB, and snow buoys contributed by AWI.  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.
<b>Summary of plans for 2015/16</b>	Main deployments will be during a German icebreaker cruise to the Weddell Sea in Dec 2015/Jan 2016. It is planned to deploy 9 snow buoys, 9 SAMS IMBs, 10 SVPs (with contributions from AAD), and 2 Bio-Phys buoys.

## 8. INTERNATIONAL SOUTH ATLANTIC BUOY PROGRAMME (ISABP)

Name of Action Group	ISABP
Date of report	31 August 2015, submitted by Mayra Pazos, NOAA/AOML/GDP
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	Felipe Santos, DHN, Brazil
Coordinator	Mayra Pazos, NOAA/AOML, USA
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, USA then sent to ISDM (Canada, GDAC for drifters) for archival and further distribution. Real time data is also archived at ISDM. GTS quality control is handled by AOML GDP.
Website	<a href="http://www.jcommops.org/dbcp/isabp/index.html">http://www.jcommops.org/dbcp/isabp/index.html</a> <a href="http://www.oceanlan.org/isabp/en/">http://www.oceanlan.org/isabp/en/</a>
Meetings (meetings held in 2014/2015; and planned in 2015/2016)	Starting in 2014, ISABP meetings are held during DBCP. Last Meeting took place on October 28, 2014 in Weihai, China. A similar meeting is planned this year during DBCP-31 in Geneva, on October 20, 2015.
Current status summary (mid-2015)	As of August 24, 2015, there were a total of 184 drifters in the South Atlantic Region (49 SVP and 135 SVPB), a total of 27 more than last year around the same time of the year (Figure 1). Brazilian Navy plans to have 10 moored buoys along the coast, as of August 2015, 7 are operational, one 1 is planned for deployment in 2015 (Figure 3).
Summary of plans for 2016	Continue to address observational gap areas, continue to increase the number of SVPB drifters in the region.

## 9. OCEAN SUSTAINED INTERDISCIPLINARY TIMESERIES ENVIRONMENT OBSERVATION SYSTEM (OceanSITES)

Name of Action Group	OceanSITES
Date of report	01 October 2015
Overview and main requirements addressed	OceanSITES is a worldwide system of long-term, deepwater Ocean time series stations measuring multidisciplinary variables with an emphasis on resolving higher frequencies and with good vertical resolution. Across the whole array, observations cover from air-sea interactions down to the sea floor. Data is shared openly via two Global Data Assembly Centers.
Area of interest	Global
Type of platform and variables measured	Most of the sites are occupied by moorings, either surface or subsurface. Many sites make the basic physical measurements (pressure, temperature, conductivity, and velocity). Some sites includes optical, biological, and chemical sensors.
Targeted horizontal resolution	On the global scale, a sparse array occupying key and representative sites covering the global ocean. At select sites, arrays for the purpose of observing transport or regional processes (e.g., the equatorial moored arrays).
Chairperson/Managers	Uwe Send, SIO Bob Weller, WHOI
Coordinator	Champika Gallage Project Office
Participants	Executive Committee, Steering Team Members, and Data Management Team Members
Data centre(s)	2 Global Data Assembly Centers <a href="ftp://ftp.ifremer.fr/ifremer/oceansites/">IFREMER Coriolis</a> (FTP). <a href="ftp://ftp.ifremer.fr/ifremer/oceansites/">ftp://ftp.ifremer.fr/ifremer/oceansites/</a> <a href="ftp://data.ndbc.noaa.gov/data/oceansites">US NDBC</a> (FTP). <a href="ftp://data.ndbc.noaa.gov/data/oceansites">ftp://data.ndbc.noaa.gov/data/oceansites</a>
Website	<a href="http://www.oceansites.org">www.oceansites.org</a>
Meetings <i>(meetings held in 2014/2015; and planned in 2015/2016)</i>	<b>2014</b> 10 <sup>th</sup> Steering Committee and 7 <sup>th</sup> Data Management Team Meetings in Recife, Brazil Nov 3-6, 2014  11 <sup>th</sup> Steering Committee and 8 <sup>th</sup> Data Management Team Meetings planned for Southampton, U.K., April 2016 <a href="http://www.oceansites.org/meetings/index.html">http://www.oceansites.org/meetings/index.html</a>
Current status summary <i>(August-2015)</i>	The OceanSITES Network consists of over 200 reference sites in the deep-ocean plus an additional 94 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 34% of these sites are submitting data to one of the Global Data Assembly Centers (GDAC) in this format (Figure 2).

	<p>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 2015 26 sensors were installed with an additional 10 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.</p> <p>In 2015 OceanSITES Steering Committee has developed number of documents to organise the community;</p> <ul style="list-style-type: none"> <li>• Mission Statement</li> <li>• Benefits of joining OceanSITES</li> <li>• Charter (Governance Document)</li> <li>• How to become an OceanSITES</li> <li>• What is OceanSITES</li> <li>• Goals and Objectives</li> <li>• OceanSITES data providers Guide</li> </ul> <p>Two of the documents " Mission Statement and the "Benefits of Joining OceanSITES" are finalized and posted on the OceanSITES website. Rest of the documents are in the process of finalizing and will be available on the website in near future.</p> <p>In 2015, the OceanSITES Data Management Team reviewed the Data Format Reference Manual (formerly User's Guide). The new Reference Manual is now published on the website and the community is encouraged to follow the new guide when preparing their data.</p> <p>The OceanSITES Data Management Team welcomed a new Chair Derrick Snowden, of NOAA/US Integrated Ocean Observing System. Mr. Snowden has stepped in to replace the departure of the previous chair Julie Thomas. The DMT welcomed Mr. Snowden and his leadership. The DMT then continued to hold regular monthly meetings via Webex.</p> <p>The OceanSITES Executive Committee set regular meeting times at once a month and held these throughout the year.</p> <p>In December 2015 OceanSITES will be the subject of a GOOS Webinar.</p>
<b>Summary of plans for 2016</b>	In April 2016 OceanSITES 11 <sup>th</sup> Steering Committee and 8 <sup>th</sup> Data

	<p>Management Team Meetings in Southampton UK.</p> <p>The OceanSITES Executive Committee will continue to meet regularly as will the Data Management Team.</p> <p>Executive Committee is working on finalizing several documents 1)What is OceanSITES and 2) Goals and Objectives. Executive Committee will also develop the performance Indicators for the OceanSITES during 2016.</p> <p>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.</p> <p>Increase data holdings at the OceanSITES GDACs.</p> <p>Increase the involvement of FixO3 members in OceanSITES program</p>
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**10. INTERNATIONAL TSUNAMETER PARTNERSHIP (ITP)**

<b>Name of Action Group</b>	<b>International Tsunami Partnership (ITP)</b>
<b>Date of report</b>	15 August 2015
<b>Overview and main requirements addressed</b>	Activity since last report (DBCP-30): status of Tsunameters; (appendix A); issues/enhancements to data sharing, technological developments, challenges, other
<b>Area of interest</b>	<u>Discussion Topic 1:</u> Advancements in Sensing Technology  <u>Discussion Topic 2:</u> How Observations are used in Warning Infrastructures
<b>Type of platform and variables measured</b>	Surface expressions (buoys and autonomous vehicles) and deep ocean water level recording devices
<b>Targeted horizontal resolution</b>	IOC Tsunami Programme:
<b>Chairperson/Managers</b>	Dr. Venkatesan,; Mr. Stephen G. Cucullu
<b>Coordinator</b>	Champika Gallage
<b>Participants</b>	DBCP Representatives
<b>Data centre(s)</b>	Various
<b>Website</b>	<a href="http://www.jcomm.info/index.php?option=com_oe&amp;task=viewEventRecord&amp;eventID=1638">http://www.jcomm.info/index.php?option=com_oe&amp;task=viewEventRecord&amp;eventID=1638</a>
<b>Meetings</b> <i>(meetings held in 2015; and planned in 2015/2016)</i>	Held: <b>PTWC -- 50<sup>th</sup> International Tsunami Symposium</b> <a href="http://itic.ioc-unesco.org/index.php?option=com_content&amp;view=article&amp;id=1911:ptws-50th-international-tsunami-symposium-2015&amp;catid=2153:its-2015&amp;Itemid=2596">http://itic.ioc-unesco.org/index.php?option=com_content&amp;view=article&amp;id=1911:ptws-50th-international-tsunami-symposium-2015&amp;catid=2153:its-2015&amp;Itemid=2596</a>  <b>Meeting of International Tsunami Experts</b> June 28 - July 2, 2015; Prague, Czech Republic.  Upcoming: <b>Regional Marine Instrumentation Center (RMIC) 29 Feb 2016 - 2 March 2016 Bay St. Louis, MS</b>
<b>Current status summary</b> <i>(mid-2015)</i>	Refer to Appendix A
<b>Summary of plans for 2015</b>	Refer to Section 2.

### **Recommendations from the Eleventh Meeting of the DBCP ITP (DBCP ITP 11)**

1. The meeting appreciated the member countries for sharing data on GTS or through NDBC in real time mode and encourage all countries that deploy tsunameters to do so.
2. The committee appreciated the Industry for presenting newer technologies being evolved and previous discussions led Industry to design unit to have 10 years life which is highly appreciable.
3. The Panel is aware of the Draft Standards & guidelines on Tsunameter Equipment presented earlier
4. The meeting welcomed the recent close coordination established with ICG Intergovernmental Coordination Group for Tsunami and other Coastal Hazards Warning Systems.
5. As suggested by IOC a procedure to address the matter and get closer links between ITP and the Tsunami programme is evolved. The Draft standard & guidelines on Tsunameter Equipment Performance would be passed through the TOWS Working Group and its Task Team on Tsunami Watch Operations meeting to be held in Paris February 2016.
6. The ITP recommends a representative from ITP to present this draft Standards & Guidelines on Tsunameter Equipment Performance during the meeting of the Task Team and the TOWS-WG in Paris in February 2016 and request approval and financial support from the Panel
7. In consultation with TOWS to evolve methodology to archive in national data centres the high resolution data from instrument flash memory which is very valuable for sea-level rise, satellite altimetry and ocean bottom temperature
8. The committee also discussed about common data format for water level and decided to continue discussion
9. The committee valued the importance of additional input on ocean bottom temperature data from BPR for future decadal climate variability study and could be incorporated in instrument design
10. The meeting recorded the new technological prototype deployment of a near field tsunametry which is more relevant to societal need and opined to pursue the activity.
11. The committee is appreciative of developments and technological advancements required to utilize submarine cables under the joint initiative of ITU/WMO/IOC and noted positive developments.
12. Safety will be given a priority and suggested to incorporate best practices on safety and distribute as needed.
13. The committee is concerned about the incidences of vandalism reported and urged countries to provide data on vandalism of tsunami buoys as per DBCP format in the country report.
14. To sensitise the issue of vandalism and to evolve working mechanism with UN agencies Food and Agriculture (FAO) and International Maritime Organization (IMO) London to safe guard the buoys and to be taken in next coordination meeting of WMO & IOC
15. The committee elected R Venkatesan as Chair and Stephen Cucullu as Vice Chair to continue the activities.



## ANNEX VI

### REPORT FROM THE EXECUTIVE BOARD MEETING

*(Geneva, Switzerland 21 October 2015)*

#### Participants:

DBCP EB members:

- Jon Turton (Chair)
- Shannon McArthur (vice-Chair, NA)
- Graeme Ball (vice-Chair, SH)
- R. Venkatesan (vice-Chair Asia)
- Sid Thurston (chair, TT-CB)
- Etienne Charpentier (WMO Secr.)
- Tom Gross (IOC Secr.)
- Champika Gallage (TC DBCP)

Other invited participants:

- Eric Locklear (financial advisor, USA)
- Mathieu Belbeoch (JCOMMOPS)
- Al Wallace (former DBCP Chair)
- Bernie Petolas (Metocean)

#### Discussion

##### 1. Membership of the EB

The Board recommended keeping the current membership of the Executive Board.

##### 2. Succession planning for the Chair, and vice-Chairs

Candidates:

Chair: Jon Turton (UK) for 2<sup>nd</sup> term

Vice-Chair Asia: Two candidates for 1<sup>st</sup> term (BG Lee, Korea, and Ying YU, China)

Vice-Chair North America: Shannon McArthur (USA) for 2<sup>nd</sup> term

Vice-Chair Southern Hemisphere: Johan Stander (South Africa) for 1<sup>st</sup> term

##### 3. Panel Session format

The EB believe the current format is working well.

Perhaps delete the morning and afternoon teas for the side meeting sessions.

ITP side meeting should be given more time (1 hour at least).

Side meeting on day 2 to be organized to present the financial situation.

##### 4. Technical Coordinator's position

The EB commends Champika for the work achieved during the intersessional period.

The Boards supports the transfer of the TC DBCP post to the WMO.

The Board recognizes that the IOC of UNESCO has been supporting the position of TC DBCP for about one year, and that the DBCP owed a debt to the IOC of UNESCO in this regard. The Board requested the WMO to facilitate the transfer the corresponding funds from the DBCP Trust Fund to the IOC.

JCOMMOPS management remains an issue that the Board is recommending the OCG to clarify with proposals.

5. DBCP Budget and contributions

5.1 Status of the Trust Fund

Trust fund is healthy.

5.2 Contributions for next year and beyond

- Seeking additional DBCP contributions is needed.

5.2 Proposed maximum expenditures for next year

<b>Amount</b>	<b>Planned expenditure</b>
119,998	Transfer of funds to the IOC (TC Salary for 2015)
120,000	TC Salary 2016 (JCOMM Trust Fund)
21,000	DBCP contribution to JCOMMOPS IT Hosting (2015)
30,000	DBCP contribution to JCOMMOPS IT Hosting (per year, as of 2016, and for 4 years)
7,000	DBCP retrospective (USD 5000 for contract, and USD 2000 for travel)
5,000	Support to the NPOMS training centres (seed money for travel support for the annual summer school) – LoA with Pusan University for 5 year commitment
5,000	Travel support to TWS working group meeting in Paris, Feb. 2016
15,000	NPOMS-5
25,000	PI-2
30,000	TC DBCP travel
20,000	DBCP representative travel
10,000	RMIC/R-4
10,000	SOT
20,000	Mooring metadata management development at JCOMMOPS
	<b>TOTAL</b>

- DBCP retrospective – The Board notes with appreciation that a first version of the report prepared by Al Wallace will be available by the end of November 2015. The Board agreed to recommend continuing the effort to include additional information per DBCP-31 guidance, at a level of USD 5,000 plus required travel to DBCP-32 for presenting the outcome.

6. Implementation Strategy

Chair has proposed some changes (simplification, improved clarity). Panel members are invited to review those changes by the end of the year.

7. Working priorities for the Technical Coordinator (in additional to the TC DBCP Terms of Reference)

- Continue work on collecting moored buoy metadata
- Review of the JCOMMOPS website and monitoring tools according to DBCP requirements
- Working on Key Performance Metrics for data buoys
- Data and metadata collection for JCOMMOPS

8. Other issues

- Venkat and Graeme thank the Board for its support, since this is their last Board session.
  - The Board also thank them for their support.
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## ANNEX VII

### DBCP ANNUAL REPORT FOR 2014 AND INTERIM REPORT FOR 2015, FINANCIAL STATEMENTS AND INFORMATION

#### STATEMENTS OF ACCOUNT

TABLE 1: IOC *Final* Statement of Account for the period of 1 January 2014 to 31 December 2014

TABLE 2: IOC *Interim* Statement of Account for the period of 1 January 2015 to 31 July 2015

TABLE 3: WMO *Final* Statement of Account for the DBCP Trust Fund for the period 1 January 2014 to 31 December 2014

TABLE 4: WMO *Interim* Statement of Account for the DBCP Trust Fund for the period 1 January 2015 to 31 July 2015

TABLE 5: WMO *Final* Statement of Account for the JCOMM Trust Fund for the period 1 January 2014 to 31 December 2014

TABLE 6: WMO *Interim* Statement of Account for the JCOMM Trust Fund for the period 1 January 2015 to 31 July 2015

#### ARGOS JOINT TARIFF AGREEMENT (JTA) BUDGET

TABLE 11: Argos Joint Tariff Agreement (JTA) Executive Committee budget

#### ANNEX VIII: BUDGET FOR 2015 AND BEYOND

TABLE 8: Final Summary of Statement for the 2014 DBCP Trust Fund

TABLE 9: Final Summary of Statement for the 2014 JCOMM Support Trust Fund

TABLE 10: Draft 2016 DBCP Budget

#### ANNEX IX: NATIONAL CONTRIBUTIONS FOR 2015

TABLE 7: National Contributions for 2015

**TABLE 1: IOC *Final* Statement of Account for the period of 1 January 2014 to 31 December 2014**

Annex 1



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**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION**  
**DBCP/SOOP Technical Coordinator: Salary, Missions and Other Costs**  
 (Statement of Account from 1 January 2014 to 31 December 2014)  
 (Expressed in US Dollars)

Cash Balance Brought Forward as at 1 January 2014	25.80
<i>Debit</i>	
Disbursements	
Salary costs	-
Statutory Travel on appointment and removal	-
IOC Logistical support JCOMMOPS	-
Programme Support Costs	-
Cash balance as at 31 December 2014	25.80
Unliquidated Obligations	-
Funds available as at 31 December 2014	25.80

Financial Report issued by the Bureau of Financial Management.  
 The total income and expenditure are in accordance with UNESCO's financial records.

**TABLE 2: IOC *Interim* Statement of Account for the period of 1 January 2015 to 31 July 2015**



18309C2000

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

DBCP/ISOOP Technical Coordinator: Salary, Missions and Other Costs

(Statement of Account from 1 January 2015 to 31 July 2015)

(Expressed in US Dollars)

Cash Balance Brought Forward as at 1 January 2015	25.80
<i>Deduct:</i>	
Disbursements	-
Programme Support Costs	-
Cash balance as at 31 July 2015	25.80
Unliquidated Obligations	-
Funds available as at 31 July 2015	25.80

**TABLE 3: WMO Final Statement of Account for the DBCP Trust Fund for the period 1 January 2014 to 31 December 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  
 wmo@wmo.int – www.wmo.int

**DATA BUOY CO-OPERATION PANEL**  
**Final Statement of income and expenditure - REVISED**  
**For the period 1 January to 31 December 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		<u>313,524</u>
2. Income:		
2.1 Contributions <sup>bf</sup>		<u>126,275</u>
3. Total available funds during reporting period		439,798
4. Expenditure <sup>bf</sup>		
4.1 Direct project costs		
4.1.1 Travel	94,069	
4.1.2 Consultant - DBCP TC (Stroker)	72,900	
4.1.3 Support to the Marine Observations Systems (GBP 33,000)	51,242	
4.1.4 DBCP Capacity Building Workshop for NPOMS-3	20,000	
4.1.5 CLS 2014 Logistical Support (EUR 13,750)	18,682	
4.1.6 Postage	18	
4.1.7 Total direct costs	<u>256,911</u>	
4.2 Indirect project costs		
4.2.1 Support costs at 3%	7,707	
4.2.2 Bank charges	342	
4.2.3 Unrealized loss on currency exchange	20,930	
4.2.4 Total indirect costs	<u>28,979</u>	
4.3 Total project expenditure		<u>285,890</u>
5. Balance of fund at 31 December 2014		<u><b>153,908</b></u>

<sup>bf</sup>		Contributions
Australia		15,918
BSH, Germany		9,472
CLS, France		28,342
India		10,068
Meteo France		54,720
Meteorological Services of New Zealand		2,253
South Africa		5,502
Total contributions		<u>126,275</u>

<sup>bf</sup> Excluding obligation of USD 20,000 (relating to the Payment to CLS for 2013/2014 Logistical Support to JCOMMOPS)

*The financial statement has been prepared on the accrual basis of accounting in accordance with the International Public Sector Accounting Standards (IPSAS)*

Certified correct:  
  
 Luckson Ngwira  
 Chief, Finance Division  
 11 May 2015

**Note:** The Canadian contribution for 2014 was accounted for in the 2011 financial statement of the DBCP Trust Fund (see statement in the DBCP Annual Report for 2011, DBCP Technical Report No. 44). According to the International Public Sector Accounting Standards that WMO follows, pledges are accounted for when there is a signed agreement with the Donor, which was the case for Canada in 2011.

**TABLE 4: WMO Interim Statement of Account for the DBCP Trust Fund for the period 1 January 2015 to 31 July 2015**

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  
 wmo@wmo.int – www.wmo.int

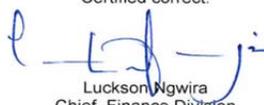
Weather • Climate • Water  
 Temps • Climat • Eau

**DATA BUOY CO-OPERATION PANEL**  
**Interim Statement of income and expenditure**  
**For the period 1 January to 31 July 2015**  
 Amounts in United States dollars

1. Balance brought forward , 1 January 2015		153,908
2. Contributions <sup>a/</sup>		55,315
3. Total available funds during reporting period		209,223
4. Expenditure		
4.1 Direct project costs		
4.1.1 Travel	83,325	
4.1.2 DBCP Iridium Pilot Project (IPP)	13,119	
4.1.3 Consultant - DBCP TC (Wallace)	13,000	
4.1.4 DBCP Capacity Building Workshop for NPOMS-3	2,000	
4.1.5 Payment to CLS for 2013/2014 Logistical Support to JCOMMOPS (SOT)	(20,000)	
4.1.6 Support to the Marine Observations Systems (GBP 33,000)	(56,770)	
4.1.7 Total direct costs		34,674
4.2 Indirect project costs		
4.2.1 Support costs at 3%	1,040	
4.2.2 Bank charges	86	
4.2.3 Unrealized loss on currency exchange	5,809	
4.2.4 Total indirect costs		6,935
4.3 Total project expenditure		41,609
5. Balance of fund at 31 July 2015		167,614
6. Less outstanding obligations		110,683
<b>7. Unobligated balance at 31 July 2015</b>		<b>56,931</b>

a/	Contributions	
Australia		11,157
Meteo France		44,158
Total contributions		55,315

The financial statement has been prepared on the accrual basis of accounting in accordance with the International Public Sector Accounting Standards (IPSAS)

Certified correct:  
  
 Luckson Ngwira  
 Chief, Finance Division  
 10 August 2015

**Note:** The Canadian contribution for 2015 was accounted for in the 2011 financial statement of the DBCP Trust Fund (see statement in the DBCP Annual Report for 2011, DBCP Technical Report No. 44). According to the International Public Sector Accounting Standards that WMO follows, pledges are accounted for when there is a signed agreement with the Donor, which was the case for Canada in 2011.

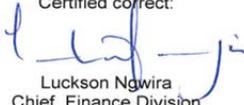
**TABLE 5: WMO Final Statement of Account for the JCOMM Trust Fund for the period 1 January 2014 to 31 December 2014**

Weather • Climate • Water  
Temps • Climat • Eau

World Meteorological Organization  
Organisation météorologique mondiale  
Secrétariat  
7 bis, avenue de la Paix – Case postale 2300 – CH 1211 Genève 2 – Suisse  
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wmo@wmo.int – www.wmo.int

**Trust Fund for JCOMM support**  
**Final Statement of income and expenditure**  
**For the period 1 January to 31 December 2014**  
(Amounts 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 Contribution of USD 87,000 to Project Global Ocean Observing Coordination Activities	(79,605)	
2.1.3 Total contributions		267,023
2.2 Interest		302
2.3 Unrealized gain on currency exchange		1,560
3. Total available funds during reporting period		555,627
4. Expenditure		
4.1 Direct project costs		
4.1.1 Salaries	67,408	
4.1.2 Post adjustment	46,136	
4.1.3 Individual consultancy honorarium	34,191	
4.1.4 Contribution to pension fund	21,067	
4.1.5 Contribution to medical insurance plan	3,861	
4.1.6 Total direct costs		172,663
4.2 Indirect project costs		
4.2.1 Support costs at 5%	8,633	
4.2.2 Bank charges	35	
4.2.3 Total indirect costs		8,668
4.3 Total expenditure		181,331
5. Balance of fund at 31 December 2014		<u>374,296</u>

Certified correct:  
  
 Luckson Ngwira  
 Chief, Finance Division  
 4 March 2015

Note: The JCOMM Trust Fund normally includes the US contribution to the DBCP and other programmes (Argo, SOT, OceanSITES, Go-SHIP, JCOMMOPS, GCOS). All JCOMM TF expenses in 2014 were for (i) the Argo Technical Coordinator's salary and benefits, and (ii) the WMO contract for the SOT Technical Coordinator (individual consultancy honorarium). There was no direct DBCP expense from the JCOMM TF in 2014.

**TABLE 6: WMO *Interim* Statement of Account for the Trust Fund for JCOMM support for the period 1 January 2015 to 31 July 2015**



**World Meteorological Organization**  
**Organisation météorologique mondiale**  
 Secrétariat  
 7 bis, avenue de la Paix Case postale 2300 CH 1211 Genève 2 Suisse  
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 wmo@wmo.int www.wmo.int

**Trust Fund for JCOMM support**  
**Interim Statement of income and expenditure**  
**For the period 1 January to 31 July 2015**  
*(Amounts in Swiss francs)*

<b>1. Balance brought forward, 1 January 2015</b>		<b>374,296</b>
<b>2. Income</b>		
2.1 Contribution of USD 504,000 (received on 28 April 2015) from Woods Hole Oceanographic Institute (WHOI), United States		486,360
2.2 Interest		5
<b>3. Total available funds during reporting period</b>		<b>860,661</b>
<b>4. Expenditure</b>		
4.1 Direct project costs		
4.1.1 Contribution of USD 150,000 to GCOS Coordination Activities	142,350	
4.1.2 Individual consultancy honorarium	54,113	
4.1.3 Salaries	42,554	
4.1.4 Post adjustment	17,692	
4.1.5 Contribution to pension fund	13,189	
4.1.6 Contribution to medical insurance plan	2,048	
4.1.7 Total direct costs		271,946
4.2 Indirect project costs		
4.2.1 Support costs at 5%	13,597	
4.2.2 Unrealized loss on currency exchange	2,280	
4.2.3 Bank charges	106	
4.2.4 Total indirect costs		15,983
4.3 Total expenditure		287,929
<b>5. Balance of fund at 31 July 2015</b>		<b>572,732</b>

Certified correct:  
  
 Luckson Ngwira  
 Chief, Finance Division  
 7 August 2015

Note: The JCOMM Trust Fund normally includes the US contribution to the DBCP and other programmes (Argo, SOT, OceanSITES, Go-SHIP, JCOMMOPS, GCOS). All JCOMM TF expenses during the period 1 January to 31 July 2015 were for (i) the Argo Technical Coordinator's salary and benefits, (ii) the WMO contract for the SOT Technical Coordinator (individual consultancy honorarium), and (iii) GCOS. There was no direct DBCP expense from the JCOMM TF during the period.

**TABLE 11: Argos Joint Tariff Agreement (JTA) Executive Committee budget (based on WMO financial statements as of 31 July 2015)**

Argos Joint Tariff Agreement (JTA) budget within DBCP Trust Fund (as of 1 Oct. 2014, estimates in blue)										
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	
<b>2010</b>	<b>Initial JTA balance</b>						<b>0</b>		<b>0</b>	
	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	
<b>2011</b>	<b>CLS Contribution to DBCP TF at WMO (2011)</b>				<b>35,269</b>	<b>25,269</b>	<b>44,836</b>	<b>10,000</b>	<b>18,177</b>	
	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	
<b>2012</b>	<b>CLS Contribution to DBCP TF at WMO (2012)</b>				<b>34,028</b>	<b>24,028</b>	<b>44,808</b>	<b>10,000</b>	<b>17,285</b>	
	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	
<b>2013</b>	<b>CLS Contribution to DBCP TF at WMO (2013)</b>				<b>32,748</b>	<b>22,748</b>	<b>45,000</b>	<b>10,000</b>	<b>26,110</b>	
	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	
<b>2014</b>	<b>CLS Contribution to DBCP TF at WMO (2014)</b>				<b>28,342</b>	<b>18,342</b>	<b>40,755</b>	<b>10,000</b>	<b>21,546</b>	Invoice FIN13-352 (12/11/2013)
	JTA-EC-10, Hamburg, 6-8 May 2014				-10,108	-10,108	30,647	0	21,546	
	CLIMAR-4, Asheville, 9-12 June 2014				-4,236	0	30,647	-4,236	17,310	
	ETDMP-4, Ostend, 23-26 June 2014				-2,878	0	30,647	-2,878	14,432	
	JTA-34, Tianjin, 3-5 Nov. 2014				0	0	30,647	0	14,432	
<b>2015</b>	<b>CLS Contribution to DBCP TF at WMO (2015)</b>				<b>25,578</b>	<b>15,578</b>	<b>46,225</b>	<b>10,000</b>	<b>24,432</b>	
	PMO-5, Valparaiso, Chile, Jul. 2015 (trainees)		1.03		-5,000	0	46,225	-5,000	19,432	
	ETMC-5 (Woodruff, Sato)				-5,261	0	46,225	-5,261	14,171	
	JTA-EC-12 (Javed, Stander)				-3,886	-3,886	42,339	0	14,171	
	JTA-35 (Locklear, Stander, Javed)				-15,000	-15,000	27,339	0	14,171	
	OPSCOM-49 (Locklear)				-1,886	-1,886	25,453	0	14,171	
<b>2016</b>	<b>CLS Contribution to DBCP TF at WMO (2016)</b>				<b>29,547</b>	<b>19,547</b>	<b>45,000</b>	<b>10,000</b>	<b>24,171</b>	
	RMIC/RA-IV				-10,000	0	46,225	-10,000	14,171	
	Satcom1				-5,000	0	46,225	-5,000	9,171	

**ANNEX VIII**

**TABLE 8: Final Summary of Statement for the 2014 DBCP Trust Fund, based on WMO Financial Information as at 31 December 2014 and DBCP-30 decisions (budgets for 2015 and 2016 updated accordingly) #'s Reported in USD\$**

	Actual			Actual			Actual			Estimate			Estimate		
	2012 Receipts	2012 Obligations	2012 Balance at 31 Dec	2013 Receipts	2013 Obligations	2013 Balance at 31 Dec	2014 Receipts	2014 Obligations	2014 Balance at 31 Dec	2015 Receipts	2015 Obligations	2015 Balance at 31 Dec	2016 Receipts	2016 Obligations	2016 Balance at 31 Dec
<b>DBCP+JCOMM</b>															
Carried over from previous year	690,374			391,673			249,354			153,908			105,105		
Contributions	72,710			110,411			126,275			274,197			289,477		
Adjustments	9,917			6,189			64,169								
<b>Expenditure</b>															
TC Contract (DBCP TF) (1)		81,967		8,100			72,900			70,000			70,000		
TC Transition (2)		90,000		7,165											
JTA (Chair, EC, Secr. Support) (3)		24,616		37,151			12,739			65,000			55,000		
Consultancy (4)				4,950						18,000					
JCOMMOPS Logistical Support (5)		47,857		17,927			82,686								
JCOMMOPS Data Development (6)															
JCOMMOPS info sys mig. (7)															
SOT (8)				11,097						10,000			10,000		
SOT Ship Coordinator-DBCP (9)				35,000						20,000			20,000		
SOT Ship Coordinator-SOT (9)															
Support of Missions ARGO TG				2,602											
Travel DBCP Chairperson (10)		39,920		37,063						50,000					
Travel DBCP TC (11)															30,000
Travel DBCP Reps (12)							40,311								20,000
Travel for the Ship Coordinator (13)															
Tech Development/Evaluations (14)		7,066													
Implementation Support (15)															
Ocean Observation Awareness SLP Pilot		6,744								10,000			10,000		
Iridium (incl. upgrades)		22,097								15,000					
Outreach and Publication Activities (16)		1,030		346						19,000			1,000		
Capacity Building (17)		43,000		24,979			48,275			50,000			50,000		
Collaborative Arrangements (18)				62,325											
Bank Charges & Support Costs (19)		17,031		10,214			28,979			10,000			8,280		
Contingency (20)										10,000			10,000		
<b>Total DBCP</b>	<b>773,001</b>	<b>381,328</b>		<b>508,273</b>	<b>258,919</b>		<b>439,798</b>	<b>285,890</b>		<b>428,105</b>	<b>347,000</b>		<b>394,582</b>	<b>284,280</b>	
Unliquidated Obligations		7,857													
<b>Balance of DBCP Trust Fund</b>			<b>391,673</b>			<b>249,354</b>		<b>153,908</b>		<b>81,105</b>					<b>110,302</b>
<i>Contingency carry over</i>											24,000				24,000
<b>Carried over</b>			<b>391,673</b>			<b>249,354</b>		<b>153,908</b>		<b>105,105</b>					<b>134,302</b>

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**TABLE 9: Final Summary of Statement for the 2014 Trust Fund for JCOMM support, based on WMO Financial Information as at 31 December 2014 and DBCP-30 decisions (budgets for 2015 and 2016 updated accordingly) #'s Reported in USD\$**

	Actual 2014			Estimate 2015			Estimate 2016		
	Receipts	Obligations	Balance at 31 Dec	Receipts	Obligations	Balance at 31 Dec	Receipts	Obligations	Balance at 31 Dec
<b>DBCP+JCOMM</b>									
Carried over from previous year	277,968			362,842			362,842		
Contributions	258,852			504,000			504,000		
Adjustments	1,805								
<b>Expenditure</b>									
TC Contract (DBCP TF) (1)**					95,238			95,238	
TC Transition (2)									
JTA (Chair, EC, Secr. Support) (3)									
Consultancy (4)									
JCOMMOPS Logistical Support (5)									
JCOMMOPS Data Development (6)									
JCOMMOPS info sys mig. (7)									
SOT (8)									
SOT Ship Coordinator-DBCP (9)									
SOT Ship Coordinator-SOT (9)									
Support of Missions ARGO TG									
Travel DBCP Chairperson (10)									
Travel DBCP TC (11)									
Travel DBCP Reps (12)									
Travel for the Ship Coordinator (13)									
Tech Development/Evaluations (14)									
Implementation Support (15)									
Ocean Observation Awareness SLP Pilot									
Iridium (incl. upgrades)									
Outreach and Publication Activities (16)									
Capacity Building (17)									
Collaborative Arrangements (18)									
Bank Charges & Support Costs (19)		8,403			24,000			24,000	
Contingency (20)									
Non DBCP Related Expenses		167,380			384,762			384,762	
<b>Total JCOMM TF</b>	<b>538,625</b>	<b>175,783</b>		<b>866,842</b>	<b>504,000</b>		<b>866,842</b>	<b>504,000</b>	
Unliquidated Obligations									
<b>Balance of JCOMM Trust Fund</b>			<b>362,842</b>			<b>362,842</b>			<b>362,842</b>
<i>Contingency carry over</i>									
<b>Carried over</b>			<b>362,842</b>			<b>362,842</b>			<b>362,842</b>

1 USD = .9694 CHF

0.9694

(#) = DBCP approved budget line items

(1)\*\* : Includes \$30,000 for OceanSITES

**Note:** There is a provision of USD 100,000 yearly in the JCOMM TF for the TC DBCP and OceanSITES position and benefits package in 2015 and 2016. The estimate figure of USD 95,238 is provided in this table for 2015 and 2016 to account for the 5% bank charges and support costs. All other planned expenses, which are not DBCP related are summed up in the row "Non DBCP related expenses".

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**TABLE 10: DRAFT DBCP Budget for 2016**

<i>Budget line item</i>	<i>WMO (DBCP TF)</i>	<i>WMO (JCOMM TF)</i>	<i>IOC</i>	<i>Sponsor(s)</i>	<i>Comment</i>
TC Contract/Salary (DBCP TF)	70,000	-	-	DBCP/OceanSITES	
TC Contract/Salary (JCOMM TF)	-	66,667	-	DBCP	US contribution to DBCP
TC Transition	-	-	-	DBCP	
JTA (Chair, EC, Secretariat)	55,000	-	10,000	JTA	
Consultancy JCOMM	-	-	-	JCOMM	
Consultancy DBCP	-	-	-	DBCP	
JCOMMOPS contract (CLS/IFREMER)	-	-	-	JCOMMOPS	US contribution to JCOMMOPS*
SOT	10,000	-	-	SOT	Essentially for SOT travel
Ship Coordinator's position(DBCP share)	20,000	-	-	DBCP	
Ship Coordinator's position(SOT share)	-	-	-	SOT	US contribution to ship coordinator's position (SOT TC)
Ship Coordinator's position(GO-SHIP share)	-	-	-	GO-SHIP	US contribution to ship coordinator's position (GO-SHIP)
Ship Coordinator's position(cross-cutting)	-	-	-	all	US contribution to ship coordinator's position (cross-cutting)
OceanSITES	-	28,571	-	OceanSITES	US contribution to OceanSITES
Travel TC	30,000	-	-	DBCP	
Travel DBCP Representatives	20,000	-	-	DBCP	
Techn. Dev/Evaluations/Inter-Comp	-	-	-	DBCP	
PP Ocean Observation Awareness	10,000	-	-	DBCP	
SLP Pilot	-	-	-	DBCP	
Iridium and barometer upgrades	-	-	-	DBCP	
Outreach, Reviews, and Publications	1,000	-	-	DBCP	
Capacity Building	50,000	-	-	DBCP	
Collaborative Arrangements	-	-	-	DBCP	
Contingency	10,000	-	-	DBCP	
<b>TOTAL</b>	<b>276,000</b>	<b>95,238</b>	<b>10,000</b>	<b>n/a</b>	
Bank Charges/Supp. Cost DBCP TF (3%)	8,280	-	-	n/a	
Bank Charges/Supp. Cost JCOMM TF (5%)	-	4,762	-	n/a	
<b>TOTAL</b>	<b>284,280</b>	<b>100,000</b>	<b>10,000</b>	<b>n/a</b>	
*Contribution for JCOMMOPS as a whole. Split between DBCP, OceanSITES, SOT, Argo, GO-SHIP is still to be determined.					

**ANNEX IX**

**NATIONAL CONTRIBUTIONS FOR 2016 TABLE 7: National Contribution for 2016**

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 48,000				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				In support of DBCP Pilot Activities
India		USD 5,000				
New Zealand	EUR 1,800					JCOMMOPS, including DBCP (50%) and SOT (50%)
South Africa		EUR 4,000				
USA	USD 59,000	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)

**\*Convert all to USD as Follows: \$1 = .91291 € \$1 = 1.29790 Canadian  
JCOMM Trust Fund = \$121,673; DBCP Trust Fund = \$274,197**

## 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)

The Session recommended closing PP-SLP.

#### 3. DBCP-ETWCH PILOT PROJECT ON WAVE MEASUREMENT EVALUATION AND TEST FROM MOORED BUOYS (PP-WET) - WORKPLAN (OCTOBER 2015 TO SEPTEMBER 2016)

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. Promote widely the pilot project goals and objectives, and results, to encourage enhanced participation and additional partners;
4. Contribute to training material to educate users about appropriate wave measurement procedures and uses of the data, including the need for high quality information for all users;
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. Develop a plan for a continuous testing and evaluation program;
7. Decide whether to continue the pilot project for a further year and investigate follow-on mechanisms;
8. Present results to DBCP-32 and other scientific fora.

## ANNEX XI

### PROPOSED GOALS FOR DBCP CAPACITY BUILDING ACTIVITIES IN 2016

Two (2) DBCP TT-CB Capacity Building Workshops and the Busan Summer School are being proposed to the Executive Board during DBCP-31 for their consideration in 2016 as follows:

I. Details for The Fifth Capacity Building Workshop of the WMO/IOC Data Buoy Cooperation Panel (DBCP) for the North Pacific Ocean and Its Marginal Seas (NPOMS-5), *Application of Regional Ocean Observations for Increasing Society's Understanding and Forecasting of Typhoons*, will be advanced during DBCP-31 and NPOMS-4.

II. During PI-1 in Palau of May 2015, several proposed locations were offered for the DBCP's Second Pacific Islands (PI-2) Training Workshop on Ocean Observations and Data Applications. These locations (in alphabetical order) will be considered at the DBCP-31 Executive Board meeting 19-23 October, 2015.

1. Apia, Samoa (Secretariat of the Pacific Regional Environment Programme, SPREP)
2. Honolulu, Hawaii (University of Hawaii)
3. Noumea, New Caledonia (French Institute of Research for Development, IRD)
4. Papeete, French Polynesia (University of French Polynesia (UPF)/IRD)
5. Suva, Fiji (University of the South Pacific, USP)

In addition to these two DBCP Capacity Building Workshops, the Second Session of International Training Program of North Pacific Ocean and its Marginal Seas (NPOMS) on Applications of Ocean Observations for the Typhoon Forecasting and Climate Change Problems Related with Coastal Inundations and Hazards will be held during the summer of 2016 at Pusan National University.

Finally, Preliminary discussions are underway with the IOC Sub-Commission for Africa and the Adjacent Island States for a possible future session of a DBCP Indian Ocean Capacity Building Workshop to focus on developing the contribution of the Indian Ocean region to the 50th Anniversary of the International Indian Ocean Expedition (IIOE-2). Details remain to be confirmed.

**ACRONYM LIST**

AAD	Australian Antarctic Division, Australia
ACDD	Attribute Conventions for Dataset Discovery
ADCP	Acoustic Doppler Current Profiler
AG	DBCP Action Groups
AOML	NOAA Atlantic Oceanographic and Meteorological Laboratory (USA)
Argo	Argo Profiling Float Pilot Project
AST	Argo Steering Team
ASV	Autonomous Surface Vehicle
ATLAS	Autonomous Temperature Line Acquisition System
AWS	Automatic Weather Station
BGC	BioGeoChemistry
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
CB	Capacity-Building
CBS	Commission for Basic Systems (WMO)
CDIP	Coastal Data Information Program
Cg	Congress (WMO)
CIMO	Commission on Instruments and Methods of Observation (WMO)
CLIVAR	Climate Variability and Predictability (WCRP)
CLS	Collecte Localisation Satellites (France)
CNES	Centre National D'Etudes Spatiales (France) / French Space Agency
COP	Conference of the Parties
CREX	Character Recognition and EXchange format (WMO)
CSV	Comma Separated Values
CTD	Conductivity Temperature and Depth
DAC	Data Assembly Centre
DART	Deep-ocean Assessment and Reporting of Tsunami (Tsunamieter)
DBCP	Data Buoy Co-operation Panel (WMO-IOC)
DCP	Data Collection Platform
DISA	Defense Information Systems Agency (USA)
DMCG	Data Management Coordination Group (JCOMM)
DMPA	Data Management Programme Area (DMPA)
DO	Dissolved Oxygen

DoD	US Department of Defense
DRR	Disaster Risk Reduction
ECMWF	European Centre for Medium-Range Weather Forecasts
ECV	Essential Climate Variable
EEZ	Exclusive Economic Zone
EOV	Essential Ocean Variable
ESA	European Space Agency
ESIP	Earth Science Information Partners
E-SURFMAR	Operational Service E-SURFMAR of the Network of European Meteorological Services, EUMETNET
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
FAQ	Frequently Asked Questions
FLOSSIE	Field Laboratory for Ocean Sea State Investigation and Experimentation
FTE	Full Time Equivalent
FTP	File Transfer Protocol
GCOS	Global Climate Observing System
GDAC	Global Data Assembly / Acquisition Centre
GDP	Global Drifter Programme
GEOSS	Global Earth Observation System of Systems
GFCS	Global Framework for Climate Services
GLOSS	Global Sea Level Observing System
GOOS	Global Ocean Observing System (IOC, WMO, UNEP, ICSU)
GOOS-SC	GOOS Steering Committee
GO-SHIP	Global Ocean Ship-Based Hydrographic Investigations Programme (GO-SHIP)
GPS	Global Positioning System
GRA	GOOS Regional Alliance
GTS	Global Telecommunication System (WWW)
HRSST	High Resolution SST
IABP	International Arctic Buoy Programme
IAEA	International Atomic Energy Agency
IBCS	Intergovernmental Board on Climate Services (WMO)
IBPIO	International Buoy Programme for the Indian Ocean
ICSU	International Council for Science

ICT	Information and Communication Technology
ID	Identification Number
IEEE-OES	Institute of Electrical and Electronics Engineers - Oceanic Engineering Society
IFREMER	Research Institute for the Exploitation of the Sea (France)
IHO	International Hydrographic Organization
IIOE	International Indian Ocean Expedition
IMB	Ice Mass Balance (buoy)
IMO	International Maritime Organization
IMOCA	International Monohull Open Class Association
IndOOS	Indian Ocean Observing System
INMARSAT	International Marine/Maritime Satellite organization
IRSO	International Research Ship Operators
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCCP	International Ocean Carbon Coordination Project
IODE	International Oceanographic Data and Information Exchange (IOC)
IPAB	WCRP-SCAR International Programme for Antarctic Buoys
IPET-DRMM	Inter Programme Expert Team on Data Representation Maintenance and Monitoring (CBS)
ISABP	International South Atlantic Buoy Programme
ISO	International Organization for Standardization
ITP	International Tsunameter Partnership
JAMSTEC	Japan Agency for Marine-Earth Science and Technology
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM <i>in situ</i> Observations Programme Support Centre
JTA	Joint Tariff Agreement (Argos)
KIP	Key Performance Indicator
LoA	Letter of Agreement
LOI	Letters of Intent
MAN	JCOMM Management Committee
MASSMO	Marine Autonomous Systems in Support of Marine Observation
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)
MMOP	Marine Meteorology and Oceanography Programme (WMO)
MOU	Memorandum of Understanding
MS	MicroSoft Inc.
NARA	National Aquatic Resources Research & Development Agency, Sri Lanka
NDBC	NOAA National Data Buoy Center (USA)

NetCDF	Network Common Data Form
NIOT	National Institute of Ocean Technology (India)
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
OBIS	Ocean Biogeographic Information System
OceanSITES	OCEAN Sustained Interdisciplinary Timeseries Environment observation System
OCG	Observations Coordination Group (JCOMM)
OCO	NOAA Office of Climate Observation (USA)
OOPC	Ocean Observations for Physics and Climate (GCOS-GOOS-WCRP)
OPA	Observations Programme Area (JCOMM)
OPAG ISS	Open Programme Area Group on Information Systems and Services (WMO)
OSCAR	Observing System Capability Analysis and Review Tool
OSE	Observing System Experiment
OSMC	NOAA Observing System Monitoring Center (USA)
PA	Programme Area (JCOMM)
PAR	Photosynthetic Active Radiation
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)
PMO	Port Meteorological Officer
POES	Polar Orbiting Environmental Satellite
PP-ASV	Pilot Project Autonomous Surface Vehicle
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
RMIC	WMO-IOC Regional Marine Instrument Centre
RNODC	Responsible Oceanographic Data Centre (IODE-JCOMM)
RNODC/DB	RNODC for Drifting Buoys
SAMS	Scottish Association for Marine Science
SAWS	South African Weather Service

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SC	Steering Committee
SCG	Services Coordination Group (JCOMM)
SCOR	Scientific Committee on Oceanic Research (SCOR)
SFSPA	JCOMM Services and Forecasting Systems Programme Area
SIO	Scripps Institution of Oceanography (University of California, USA)
SLP	Sea Level Atmospheric Pressure
SLSTR	Sea and Land Surface Temperature Radiometer
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)
SSS	Sea Surface Salinity
SST	Sea-Surface Temperature
S&T	Science and Technology
SVP	Surface Velocity Programme (of TOGA and WOCE, replaced by GDP) drifter
SVPB	SVP barometer drifter
SWSI	Scotia Weather Services Inc
TAC	Traditional Alphanumeric Codes
TAO	Tropical Atmosphere Ocean Array
TC	Technical Co-ordinator
TC-DBCP	Technical Co-Ordinator of the Data Buoy Cooperation Panel
TDC	Table Driven Code
TF	Trust Fund
TIP	Tropical Moored Buoys Implementation Panel
ToR	Terms of Reference
TOWS	Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems
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-IBPD	DBCP Task Team on Instrument Best Practices & Drifter Technology Developments
TT-MB	DBCP Task Team on Moored Buoys
TT-MOWIS	JCOMM Task Team on Integrated Marine Meteorological and Oceanographic Services for WIS
UK	United Kingdom

UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	UN Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNOLS	University-National Oceanographic Laboratory System (USA)
USA	United States of America
USD	United States Dollar
VAR	Value Added Reseller
VOS	Voluntary Observing Ship
VSF	Voiles sans Frontières
WCRP	World Climate Research Programme
WDS	WIGOS Data Standard
WG	Working Group
WHOI	Woods Hole Oceanographic Institute
WIGOS	WMO Integrated Global Observing System
WIO	Western Indian Ocean
WIR	WIGOS Information Resource
WIS	WMO Information System
WMO	World Meteorological Organization (UN)
XBT	Expendable BathyThermograph

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