

DATA BUOY COOPERATION PANEL

Thirty-Third Session

Plouzane, France
14- 17 November 2017

JCOMM Meeting Report No. 137



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**WORLD METEOROLOGICAL
ORGANIZATION**



**INTERGOVERNMENTAL
OCEANOGRAPHIC COMMISSION
(OF UNESCO)**

DATA BUOY CO-OPERATION PANEL
THIRTY-THIRD SESSION

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FINAL REPORT

JCOMM Meeting Report No. 137

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Note: The following complementary information will be provided in the DBCP Annual Report for 2017;

- Report by the Technical Coordinator
 - Full reports by the Action Groups
 - Reports by the Task Teams;
 - National reports
 - Data Management Center Reports
 - Executive Board Meeting Report
 - DBCP Implementation Strategy;
 - Other financial and administrative papers;
 - DBCP Technical Document list, including available electronic versions
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DBCP-33, Plouzane, France
14-17 November 2017

EXECUTIVE SUMMARY

The Thirty-Third Session of the Data Buoy Co-operation Panel (DBCP-33) was held at the IFREMER Campus in Brest, France from 14 to 17 November 2017. Mr. Jon Turton, Chairperson opened the Thirty-Third DBCP Session, and the Scientific and Technology Workshop.

The Scientific and Technology Workshop was held during the first half day of the session on the 14 November. The theme of the DBCP-33 Science and Technology Workshop this year was "Buoy Science, Technology and Emerging Technologies. The workshop was organized and co-chaired by Mr. J. Stander and Mr. J. Swaykos. There were a total of 8 presentations delivered at the session.

The national report session was for the first time held in the afternoon of the first day. The Panel received 20 national reports. Thirteen national reports were presented in the session.

Mr. Turton reported on the respective activities on behalf of the Panel during the last intersessional period. This includes his participation in several meetings and his involvement in regular OCG and DBCP Executive teleconferences. The Chair reported on the decisions made by the Executive Board (EXB) on the DBCP Trust Fund management. The EXB agreed to the proposal of distributing authority of funds management to the DBCP, SOT and OCG for JCOMMOPS. Starting from 2018 contributions to the DBCP TF will be distributed among DBCP, SOT and JCOMMOPS at the ratio of 31%, 8%, and 61% respectively. The DBCP Operating Principles has been amended to reflect these changes. The Vice-Chair, Ms. Yu Ting for the Southern Hemisphere provided a written report on the activities and challenges in the region. The new Technical Coordinator (TC), Mr. Long Jiang presented some of the activities and challenges of the JCOMMOPS in support of the DBCP. The total number of buoys globally has been stable last year and the spread across the globe had been relatively even. However, there is a decline in the number of drifting buoys with air pressure observations and increase in unknown buoys. The TC will take immediate actions concerning the matter.

The Panel welcomed the proposal by Mr. Johan Stander to develop a tool to collect the risks of observing networks at national level to be included in future national reports.

Mr. David Meldrum reported on the history and recent developments of the DBCP Pilot Project on High Resolution Sea Surface Temperature (PP-HRSST). Recently, the European satellite community has become proactive on the evaluation of PP-HRSST. DBCP needs to reactivate the PP-HRSST, revise the ToR, and approve new work plan.

Reports were provided by the DBCP Action Groups focusing on challenges, opportunities and risks and recommendations. Some of the key actions and recommendations of the DBCP Action Groups include: addressing the observation gap in the Eurasian Arctic as part of the International Arctic Programme; adopting a drifter program as part of the DBCP community outreach/education activities; better understanding of the socioeconomic benefits of moored buoys; identifying new partnerships in the Tropical moored buoy array; continued interaction of the International Tsunami Programme with the Joint Task Force for SMART Subsea Cables.

Reports were provided by the DBCP Task Teams (TTs) and decisions were taken according to the recommendations. The TT on Instrument Best Practices and Drifter Technology Development reported on the evaluation of methods for improving lifetime of drifter drogues, the definition of a common format for drifting buoy specification sheets and the evaluation of new drifters to measure the directional wave properties. Evaluation results suggest the need to use tethers of appropriate materials and thickness to resist the harsh ocean environment

and paying attention to connect the tether to the surface buoy and to the drogue wheel which should be of sufficient quality in order to improve lifetime of drifter drogues. In the case of TT-MB, it was reported that no progress was achieved to define metadata standards for fixed platforms. Moored Buoys operators who are not issuing their data in BUFR were requested to do so at the earliest opportunity. In regards to the TT-Wave Measurements (WM), Dr. Robert Jensen reported on the continued work on the evaluation of wave measurements, which remains a critical activity of the TT-WM. A key recommendation is that the three Programme Areas of JCOMM engage in the cross-cutting activities of TT-WM. The Panel agreed that Dr Jensen will assume chairperson of the TT-WM for the intersessional period. Dr. Sidney Thurston, Chair of the TT-CB reported on the Capacity-Building activities, in particular the Fifth North Pacific Ocean and Marginal Seas (NPOMS-5) CB workshop on Applications of Ocean Observations for Improving Society's Understanding and Forecasting of Typhoons held in Tianjin, China from 4-7 July. Dr. Thurston informed the Panel that he will step down after a decade when a successor can be identified during 2018. The DBCP EXB will need to start succession planning for new Chair TT-CB. As of next year, the TT-CB needs to coordinate and report on DBCP TT-CD activities with the two new JCOMM-CD coordinators.

Ms. Mayra Pazos, Chair of TT-Data Management, reported on table driven coding requirements, for data buoy observations, migration to BUFR, real time and delayed mode distribution of data and metadata. All drifters are providing data on the GTS using the new BUFR format, except for a few drifter buoys from JMA. Meteo France /CMM is providing weekly computed currents derived from buoys drift. AOML and OSMC worked on providing streamlined access to GTS data from drifters. The Panel agreed that Ms. Mayra Pazos would continue as chairperson of the TT-DM, and collaborate with the GDAC for drifting buoys. Mr. Mathieu Ouellet reported on the activities of the Global Data Assembly Center (GDAC). For Drifting Buoys managed by MEDS, a new website layout is available with links to Coriolis data selection tool, AOML GDP data archive and ICOADS through EDS GDAC. Key challenges includes structural problems between NMC/WMC and TAC and BUFR data reconciliation.

Mr. Venkatesan and Mr. McArthur reported on the implementation of the outreach strategy to reduce damage to ocean data buoys from vandalism. All actions from DBCP-32 Session have been implemented. The IOC and WMO adopted a resolution on data buoy vandalism in June 2016 and at the JCOMM 5 session, Geneva, 24-29 October 2017. DBCP and partners need to work together in order to translate the strategy into actions. In particular, DBCP request JCOMM to establish a cross-cutting TT to discuss the strategy; provide any existing materials, tools and products of communication on vandalism awareness in order to prepare a guideline for new outreach materials.

Mr. Johan Stander reported on behalf of the Chair of Satcom Forum pointing out that the key challenge is how to integrate the existing 30 year old JTA into the SatCom Forum without causing adverse impact.

The Panel received a report from Mr. Yann Bernard, concerning CLS processing activities for the intersessional period. The number of data messages from drifting buoys continue to decrease due to less Argos GDP drifter deployed. CLS continues to improve the coverage of the real-time antennas in the regions needed. A new generation satellite instrument Argos-4 will be launched by the end of 2018 by ISR on OceanSat-3.

Mr. Shannon McArthur gave a presentation on environmental stewardship and compliance of buoy operators. The Panel agreed to solicit views on amending the DBCP ToR on the matter.

Mr. Jon Turton reported on OCG engagement with emerging technologies, particularly HF radar and gliders. OCG is seeking to establish a vice-chair on new technology to lead this effort. DBCP members were requested to consider to provide nominations to the Chair and Secretariat. The use of ocean gliders, and HF radar have increased and expanded significantly in the recent years. Sub-surface ocean gliders and HF radars are being coordinated by the Ocean Gliders Steering Team and GEO HF radar community respectively, thus there is no need for DBCP involvement, aside evaluating the potential of Unmanned Surface Vehicles (USVs) to enhance the ocean observing system.

Mr. Johan Stander presented an overview of the synergies between DBCP and SOT under the DBCP strategic planning session. The Panel discussed the synergies between the two programmes. It was decided that there is a need to start a discussion and develop a SWOT analysis to assess the advantages, disadvantages and consequences of having joint or back-to-back meetings of DBCP and SOT. The analysis is scheduled to be presented to the SOT 2019 meeting. Dr. Sidney Thurston introduced the Global Framework for Climate Service (GFCS) and potential contributions from the DBCP. The Panel pointed out the DBCP is already contributing to all the five components of GFCS one way or another. Ms Champika Gallage reported on the recent developments of the WMO Integrated Global Observing System (WIGOS) and the obligations of the members in achieving the WIGOS implementation targets. The full implementation of WIGOS in the year 2020 is expected to strengthen the global observing system. In regards to the DBCP implementation strategy, the Panel agreed that the document will be updated, reviewed and finalized after the session.

Dr. Sidney Thurston reported on the SWOT assessment for the DBCP program. The Panel noted the strengths, weaknesses, opportunities and threats to DBCP; as well as the different time scales for recommendations proposed. The Panel decided there is a need to invite comments on the SWOT assessment so that further decisions can be adopted intersessionally by the EXB.

Ms. Gallage reported on the JCOMMOPS Management. The Panel noted the changes made to the JCOMM management practices, especially regarding the joint WMO-IOC agreement to transfer most JCOMMOPS Management functions from IOC of UNESCO to the WMO Secretariat and the ongoing effort to establish a JCOMMOPS lead position (JCOMM-5 Recommendation 7.2/2). Furthermore, the Panel welcomed the OCG proposal for an external review of JCOMMOPS to be undertaken.

Mr. Denis Chang Seng and Ms. Champika Gallage reported on the IOC and WMO governing bodies of relevance to the DBCP. Mr. Chang Seng discussed the IOC resolution XXIX-I adopted on a proposal for an international (UN) Decade of Ocean Science to be established for the period 2021-2030 for Sustainable Development; as well as the GCOS new implementation plan (Global Observing System for Climate: Implementation Needs) at the IOC Twenty-ninth session assembly. Ms. Gallage reported on the decisions of the WMO Governing Body on the results of the Inter-Commission Coordination Group on the WMO Integrated Global Observing System (ICG-WIGOS-6, Geneva, Switzerland, 12-14 January 2017), Thirteenth session of the JCOMM Management Committee meeting (JCOMM-13, Geneva Switzerland, 18-21 January, 2017), Sixty-ninth Session of the WMO Executive Council (EC-69, Geneva, Switzerland, 10-17 May 2017).

The Panel discussed the financial activity over the last 12 months and proposed budget for 2018. Mr. Eric Locklear, DBCP Financial Advisor stressed that significant progress has been achieved in simplifying the budget and improving the clarity and transparency. He underlined that the five-year financial summary shows that the DBCP total cost for DBCP activities have continually decreased. The Panel adopted the basic budget for DBCP expenses for 2018. In

light of reduced annual closing balance and uncertainty in carrying forward obligations, it is necessary to be cautious about expenditures. WMO has made improvements to the DBCP TF tracking by introducing different projects to track the expenses.

The Panel reviewed the draft actions prepared by the Secretariat to be included in the forthcoming intersessional workplan as appropriate.

The Panel agreed and thanked Mr. Johan Stander for the offer to hold the DBCP-34 in Cape Town, South Africa during October 2018.

The Panel unanimously re-elected Jon Turton as the Chair of the DBCP for next intersessional period. The previous vice chair for the Asia Region, Ms. Yu Tin was re-elected unanimously to continue in her duties as the vice chair for the Asia Region during next Intersessional period. Dr. Rick Lumpkin was appointed as the vice chair for the North American Region and the Panel thanked the outgoing vice chair Mr, Shannon McArthur for the North American Region. Mr. Boris Kelly-Gerreyn was elected as the vice-chair for the Southern Hemisphere and the Panel thanked Mr. Johan Stander for his dedicated contribution to the Panel as the outgoing vice chair.

The DBCP-33 session was closed at 13:30 on Friday 17 November 20

GENERAL SUMMARY OF THE WORK OF THE DBCP-33 SESSION

1. OPENING AND WELCOME OF THE DBCP SESSION

1.1 The Chairperson of the Panel, Mr. Jon Turton, opened the Thirty-Third DBCP Session, and Scientific and Technical Workshop at 09:00 hours on Tuesday, 14 November 2017, in Brest, France. Ms. Champika Gallage and Mr. Denis Chang Seng provided opening remarks on behalf of WMO and IOC of UNESCO respectively. The Secretariat thanked JCOMMOPS and IFREMER for organizing and hosting the DBCP-33 in Best, France.

2. SCIENTIFIC AND TECHNICAL WORKSHOP

2.1 The Workshop opened at 09:30 on the 14 November and ended at 13:00 hours. The workshop was organized and co-chaired by Mr. J. Stander and Mr. J. Swaykos. The Scientific and Technical Workshop preceding the annual Data Buoy Cooperation Panel (DBCP) meetings was an important forum for stimulating discussion among data buoy operators, designers, and data users. The aim of the workshop was to provide an opportunity for scientist, operators and manufacturers to relate their experience, to exchange knowledge, and to build on or learn from innovations, developments and good practices of peers.

2.2 The theme of the DBCP-33 Science and Technology Workshop this year was “Buoy Science, Technology and Emerging Technologies”. Presentations focused in the following:

- Unmanned surface vehicle operations - strengths, weaknesses, lessons learned and suggested way forward
- Advances in coastal observations - buoy hulls, instrumentation, moorings
- Advances in data management and communications
- Emerging methodologies applied to automated data quality control
- Research applications

2.3 There were nine abstracts submitted:

- SMART subsea cables sensing the pulse of the planet, by **Bruce Howe**, University of HAwai'i at Mania, USA
- Introduction of the FO cruise over the tropical Indian Ocean in 2017, by **Liu Lin**, First Institute of Oceanography, State Oceanic Administration, China (cancelled)
- Early insight into Argo floats measurements in Banda Sesa Indonesia, by **Agus Atmadipera et al**, Bogor Agricultutral Univerisity, IPB Bogor Indonesia
- Technological advancement in Indian moored buoy systems, by **R, Venkatesan**, National Institute of Ocean Technology, Ministry of Earth Sciences, Chennai
- Towards improved drifter SST : A collaboration between the satelliite community and the Data Buoy Cooperation Panel, by **David Meldrum et al**, DML, Taynuilt, Scotland, UK
- Enhancing the accuracy if current profiles from surface buoy-mounted systems, by **David W. Velasco, Norteck AS**
- Evaluating drifter and drogue lifetimes for all manufacturers, by **EriK Valdes**, NOAA Atlantic Oceanographic and Meteorological Laboratory
- Dynamic drifter population lifespans explained, **Andy Sybrandy**, Pacific Gyre, Inc
- Seasonal variability of the Somali current system in the western Arabian Sea, by **Verena Hormann and Luca. R. Centurioni**, Scripps Institute of Oceanography, UC San Diego, La Jolla, USA

2.4 Oral presentations were made during the session with the exception of (2) which was cancelled.

2.5 Mr. J. Stander and Mr. J. Swaykos thanked the presenters for their excellent talks.

2.6 The Panel commented on the need to include an introduction and overview of DBCP in future sessions for the benefit of new participants. In addition, the Panel members suggested that the S&T session was too short and there is a need to focus on what needs to be achieved by the DBCP Panel in the future.

The meeting made the following recommendations:

Rec 2.0/1: Provide an introduction and overview of DBCP in future DBCP sessions

Rec 2.0/2: Need for more S & T contributions and presentations with a focus on what needs to be done

Rec 2.0/3: DBCP noted the requirements of GOOS EOY ocean sensor development and needs to be addressed in the future

3. NATIONAL REPORTS

3.1 Country Reports

3.1.1 Mr. Sidney Thurston chaired the National Reports session. He pointed out that based on the request made at the DBCP-32, and results of the SWOT analysis, there was a recommendation to move the national reports from the last day to first day of the session and this has been implemented at DBCP-33 session.

3.1.2 The Panel received 20 National reports on current and planned buoy programmes from [Australia](#), [Brazil](#), [Canada](#), [China](#), [Finland](#), [France](#), [Germany](#), [Honk Kong](#), [India](#), [Japan](#), [Kuwait](#), [Malaysia](#), [Morocco](#), [New Zealand](#), [Portugal](#), [South Africa](#), [Spain](#), [Sweden](#), [UK](#) and the [USA](#).

3.1.3 Oral presentations were made during the session on national activities by the following countries: Australia, Brazil, Canada, China, France, India, Korea, Morocco, New Zealand, Portugal, Spain, UK and the USA.

Action 3.1/1: To provide a template for national report presentation (5-6 slides with network information, challenges and opportunities) **(DBCP EXB; June 2018)**

3.2 National Risk Analysis Information Format

3.2.1 Mr. Johan Stander proposed a tool (e.g. EXCEL) to be developed to capture the risks of observing networks at national level and how to collect this information for a quantified risk analysis. The risk analysis is suggested to be included in future national report. It was underline that it is important to define common risks that can be reported at a higher level using a bottom-up approach.

3.2.2 The session welcomed the proposal to develop a risk register. The Group agreed that the risk register may be managed by JCOMMOPS/Secretariat.

Action 3.2/1: Discussion on the need to develop a quantified risk analysis and management system of the observing networks at national level and EXB decide/develop a mechanism to collect this information **(DBCP-EXB/TC; DBCP-34)**

4. OPENING AND WELCOME OF THE DBCP SESSION

4.1 Adoption of the Agenda

4.1.1 The Panel adopted its agenda as reproduced in Annex I. The Chair mentioned that only actions and recommendations will be discussed and finalized at the end of the Session rather than going through the draft report of the session which used to be the previous practice. Therefore, the Panel is requested to review the report and provide their feedback to the Secretariat after the meeting.

4.2 Working Arrangements

4.2.1 The Panel agreed to work as per session agenda. The joint Secretariat introduced the documentation in accordance with the provisional agenda.

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

5. REPORT BY THE EXECUTIVE BOARD

5.1 Verbal reports on the inter-sessional activities of the Chair and the Vice-chairs were not given during the session. Written reports from the Chair Mr. Jon Turton and the Vice-chair for Asia Ms Yu Ting were available on the meeting website.

5.2 The Chair reported to the session the discussions on the DBCP Executive Board (EXB) meeting (meeting report available on Annex IX). The Chair presented the decisions made by the (EXB) on the DBCP Trust Fund (TF) management. He mentioned that over the years the DBCP Trust Fund has evolved and been used by other Panels/networks (i.e. Ship Observing Team, JCOMMOPS). After careful analysis of previous expenditures and future needs for better management of the DBCP TF, the Executive Board agreed to the proposal of distributing authority of funds management to DBCP, SOT and OCG for JCOMMOPS. Furthermore, he explained that starting from 2018, contributions to the DBCP TF will be distributed among DBCP, SOT and JCOMMOPS at the ratio of 31%, 8% and 61% respectively consistent with previous expenditures. The Chair will now sign budget expenditures only for DBCP activities, not for SOT or JCOMMOPS or any other activities. He pointed out that this will improve financial clarity and accountability. The operating Principles have been updated to reflect these changes.

5.3 The Chair also mentioned that DBCP EXB agreed on the fund settlement between IOC and WMO caused due to the DBCP TC being recruited by IOC during October 2014 to March 2016 and paid by IOC while funds for salaries of DBCP TC were being received in WMO due to donor agreement limitation. The Panel agreed with this decision.

5.4 The Vice-Chair Ms Yu Ting for Southern Hemisphere (Asia) provided a written report on the network operation, capacity building, relevant meetings attended and challenges in the region during this intersessional period. The report is available on the meeting website¹.

¹ http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=20423

6. REPORT BY THE DBCP TECHNICAL COORDINATOR

6.1 Mr. Long Jiang, the new DBCP-Technical Coordinator (TC) was recruited on 1 November 2017. He reported on key activities, recommendations and challenges of DBCP-TC including data timeliness, metadata, deployment opportunities and strategies.

6.2 The TC outlined the current status of the data buoy network, noting that the total number of buoys globally had been stable during the last year. The spread across the globe had been relatively even. Compared to the last reporting period, the average number of monthly drifting buoys and moored buoys increased slightly, while number of fixed platforms dropped by 3.8%. The number of barometer drifting buoys during the intersessional period is 855, compared with 856 for the last intersessional period, however, he noted that the overall trend was declining and there is a need to investigate the underlying causes of the declination and work with the community to address the decline.

6.3 The session noted that considerable number of buoys whose details were unknown, due to the vacant period for TC recruitment. The Panel requested the TC to update and keep track of the unknown buoys as a priority.

6.4 The TC reported that during last intersessional period, the Key Performance Indicators have been developed and analyzed at JCOMMOPS with a dedicated webpage (www.jcommops.org/dbcp).

6.5 The Panel invited members to explore the webpage and provide feedback to the TC and JCOMMOPS, as necessary. The TC pointed out that there is a need to develop KPIs for the polar regions, and the Panel invited IABP and IPAB to work on this matter.

Action 6.0/1: Investigate the underlying causes of the decline in the number of drifting buoys with air pressure observations and work with the community to address the decline **(TC; March 2018)**

Action 6.0/2: Develop moored buoy metadata standards in line with WIGOS Metadata Standards and ensure timely ingestion to new JCOMMOPS database **(TC/TT-MB (J Turton); March 2018)**

Action 6.0/3: Further refine KPIs and targets for the Polar regions **(IABP & IPAB/ TC; DBCP-34)**

7. PILOT PROJECT

7.1 Pilot Project on High Resolution Sea Surface Temperature (PP-HRSST)

7.1.1. Mr. David Meldrum reported on the history and recent developments of the DBCP Pilot Project on High Resolution Sea Surface Temperature (PP-HRSST). He informed the Panel regarding a dialogue between the DBCP and the Group for High Resolution Sea Surface Temperature (GHRST). At the 26th session of the DBCP, 27 - 30 September 2010, Oban, United Kingdom, it was recognized that drifter SST was critical for the validation of satellite-derived SST, and that the resolution and accuracy of currently reported drifter SST was inadequate.

7.1.2. The Panel decided to establish a Pilot Project for HRSST, overseen by a Steering Group (SG), and with a defined workplan and a three-year duration. Despite considerable investment by the Panel, ESURFMAR and the Met Office, initial deployments of HRSST drifters did not demonstrate a significant improvement in satellite SST retrievals, largely because of the failure of ENVISAT during the evaluation phase. Furthermore, the satellite community proved unable to contribute to the exercise. Consequently, the Panel suspended PP-HRSST's activities at its 30th DBCP session, Weihai, China 27 - 31 October 2014.

7.1.3. The Panel noted that more recently, the European satellite community has become proactive in supporting the rollout and evaluation of HRSST drifters through specific funded actions by ESA and EUMETSAT.

7.1.4. The Panel was requested to reactivate the PP-HRSST, and that a revised ToR for membership and workplan be approved. DBCP Panel approved the work plan and ToR¹ and, Mr. David Meldrum was appointed as Chair of PP-HRSST.

Action 7.1/1: Provide a list of PP-HRSST members. Chair will relate with David Meldrum and send letters out to the EUMETSAT and ESA (**David Meldrum/Chair; Feb 2018**)

Action 7.1/2: Approve PP-HRSST budget request for travel support (**DBCP-EXB; March 2018**)

Action 7.1/3: Integrate the metadata database from HRSST to the JCOMMOPS database (**JCOMMOPS/TC; DBCP-34**)

8. RECOMMENDATIONS BY ACTION GROUPS

8.1 Global Drifter Programme (GDP)

8.1.1 Mr. Rick Lumpkin reported on the Global Drifter Programme (GDP) for the intersessional period. In summary, the annual size of array was 1419 drifters. The current size as of 25 September 2017 is 1469 drifters. The plan for next intersessional period is to maintain the array at around 1300 drifters.

8.1.2 A total of 1193 drifters were deployed during the period 25 September 2016 through 25 September 2017, compared to 878 drifters last year and 1117 drifters the year before. The total number of deployments planned for the next intersession period is 1000. More deployments may be needed to fill gaps in the global array as they develop, and will be conducted if more drifters are available for deployment. In addition, to the regular deployment opportunities provided by vessels of opportunity and regularly occurring research cruises, several deployments are planned for August 2017-July 2018.

8.1.3 GDP array started its transition to Iridium telecommunication a few years ago primarily to benefit from the data timeliness, high accuracy position information which allows drogue detection and reduced cost. The goal is to achieve 80% GDP drifters transition to Iridium telecommunication with GPS by mid-2019. The Panel noted that under a NOAA

¹ http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=20424

funded project “Big Earth Data Initiative for the Year 2018”, the GDP DAC will be collaborating with NOAA’s Observing System Monitoring Center and NOAA National Centers for Environmental Information (NCEI) to make the quality controlled data fully discoverable.

8.1.4 The Panel was also informed on the significant advancements of the program: real-time graphs and data are now being provided through NOAA’s Observing System Monitoring Center web page; a pilot array of Directional Wave Spectrum drifters was deployed in 2016; drogue presence using TTFF (from GPS) has been validated as more robust than tether strain and is now being used operationally by the GDC; real-time drogue detection is being developed as more drifters transition to Iridium with GPS, thus allowing operational near-surface currents to be released to the GTS. Further, it was mentioned that a few modifications to the SIO drifter design were introduced to evaluate their value in extending drogue lifetime.

8.1.5 The session was informed that the GDP array size is expanding. In general, the drifters are living longer and maintain a healthy array with 84% coverage with 5x5 degree spacing. The key challenge is to address the existing gaps while sustaining the expanding GDP

The meeting made the following recommendation:

Rec 8.1/1: *Recognizing that the Global Drifter Program provides a unique opportunity to involve countries with fewer resources for marine observations and the potential for improving the GDP coverage recommended that special attention be given for the GDP engagement in capacity building efforts and workshops hosted in areas with drifter gaps, such as the Pacific Islands*

8.2 International Arctic Buoy Programme (IABP)

8.2.1 Mr. Ignatius Rigor reported on the International Arctic Buoy Programme (IABP). As of June 2017 108 buoys were reporting compared to 142, and 162 on June 2016 and 2015 respectively.

8.2.2 Most of the meteorological and oceanographic data from the Arctic Region is available on the GTS. Much of the ice and atmospheric chemistry data are also available from the participants’ web pages. Efforts continue to have those using Iridium communication to find means to post data to the GTS.

8.2.3 The deployment plans for the next intersessional period will be similar to 2017. Participants will deploy more than 70 buoys ranging from: SVPs 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.

8.2.4 Mr. Rigor presented the new in-house Arctic buoys under development; a low cost automatic weather station named Drifting Arctic Meteorological Platform (DAMP), and platform to monitor the freeze up and growth of ice named Microstructure of Ice Salinity and

Temperature (MIST). It was suggested that IABP collaborate with the Global Cryosphere Program (GAW) in areas such as standards and best practices (S&BP), data dissemination and product development.

8.2.5 The Panel was informed that the primary challenge for the IABP is to maintain the network of buoys in an ocean of increasingly dynamic sea ice, and deploying buoys in the Eurasian Basin of the Arctic Ocean. Collaboration with the Arctic and Antarctic Research Institute and other Russian Agencies is critical. US sanctions have been lifted, however, new hurdles appear such as difficulty in obtaining permits for research cruises.

Action 8.2/1: WMO/IOC Secretariats send a letter, co-signed by the JCOMM Co-Presidents to the Russian Federation to remind them of the signed resolution in support of the IPY regarding the need to fill the noteworthy and sizable observation gap in the Eurasian Arctic as part of the International Arctic Buoy Programme (IABP) **(WMO/IOC, Co-Presidents of JCOMM; March 2018).**

8.3 International Buoy Programme for the Indian Ocean (IBPIO)

8.3.1 Mr. Shaun Dolk reported on behalf of the International Buoy Programme for the Indian Ocean. The current status of IBPIO includes 260 drifters (183 with air pressure) and 29 moored buoys (14 from RAMA array). Efforts are aimed at filling data gaps in the tropical regions, primarily during the tropical cyclone season. In the southern tropical area, buoys are provided by NOAA/GDP, by the US Office of Naval Research and will include about 15 Iridium barometer upgrades funded by Météo-France. In addition to the drifters upgraded by Météo-France, GDP plans to provide SVP-B drifters for deployment in the Southern Indian Ocean. ABOM plans to deploy 6 drifting buoys in early December from the Japanese Antarctic re-supply vessel.

8.3.2 DBCP noted the ongoing challenges including continued vandalism and theft to buoys, especially at sites near areas of intense fishing activity.

8.3.3 The Panel was informed that the IBPIO plans for 2018 include maintaining a network of 150 drifters, adopt a new RAMA design (RAMA-2.0) and expand the moored buoy arrays.

8.3.4 DBCP appreciated the national programs such as India's IOON and Australia's IMOS in the Indian Ocean, which have evolved and sustained to support global ocean Observations.

8.3.5 The Panel noted that [Trello](#) as an interactive software tool has helped the team to better organize, communicate among each other internally. IOBP invited DBCP members to join Trello.

Action 8.3/1: Add the IBPIO Trello webpage <https://trello.com/b/QRNleOqD> to the JCOMM and JCOMMOPS website **(Secretariat/ TC; March 2018)**

The meeting made the following recommendation:

Rec 8.3/1: Need for continued support from JCOMMOPS (DBCP TC and Ship Coordinator TC) to encourage participation from DBCP members for instrument deployment/ship recruitment JCOMMOPS **(DBCP TC and Ship Coordinator TC)**

8.4 International Programme for Antarctic Buoy (IPAB)

8.4.1 Mr. Ignatius Rigor reported on the International Programme for Antarctic Buoy. Poor ice condition in the Eastern Weddell Sea caused two snow depth buoys to die off. The South African National Drifting Weather Buoy Programme deployed 14 NOAA drifters, New Zealand deployed 15 GDP SVP buoys from tourist ships, Alfred Wegener Institute (AWI), Germany, deployed 7 drifters and USA deployed 2 SVP drifters during the 2016/17 period.

8.4.2 The Panel noted that GTS transmission of data remains a challenge and there is a need to raise awareness of buoy operators. The small number of buoys and short survival times remain important challenges. It is required to deploy more buoys within the targeted network grid of 500 km x 500 km to maintain an appropriate observational coverage in the region.

8.4.3 The Panel was informed that for 2018 the IPAB/USA is planning to deploy several SVPs in the Ross & Amundsen Sea. Alfred Wegener Institute (AWI), Germany, will carry out a massive deployment campaign in the Southern Weddell Sea in February 2018 during Polarstern cruise PS111, including 6 snow buoys, 8 IMBs, and 8 SVPs. The South African Weather service plans to deploy 10 drifters for 2017/18, pending provision by NOAA. New Zealand and Australia also plan to assist in deployment of drifters in the southern ocean.

8.5 International South Atlantic Buoy Programme (ISABP)

8.5.1 Ms. Mayra Pazos reported on the ISABP pointing out that presently there is a total of 229 drifters in the South Atlantic region, 7 more compared to last year at this same time of reporting, of which 103 are SVP (68 Iridium), 126 SVPB (83 Iridium). Of the total, 66% are Iridium, compared to 22% iridium last year.

8.5.2 The next intersessional plan is to continue to address observational gap areas, increase the number of SVPB drifters in the region and transition from all Argos to Iridium drifters. In addition, ISABP will continue to partner with South African Weather Service (SAWS), Tristan da Cunha Fisheries, Brazilian Navy and GDP for deployment opportunities and participation in the barometer upgrade program.

8.6 DBCP-PICES North Pacific Data Buoy Advisory Panel (NPDBAP)

8.6.1 Mr. Shaun Dolk reported on the North Pacific Data Buoy Advisory Panel (NPDBAP). He mentioned that the goals of the NPDBAP are to deploy 60 SVPB drifters a year, and maintain 75 active buoys in the region. Further, he informed the Panel that from 1 September 2016 to 31 August 2017, 85 drifters were deployed in the North Pacific Ocean. Of the 85 drifter deployments, 48 units were equipped with barometer sensors and the remaining 37 drifters were standard SVP drifters.

8.6.2 The goal for 2018 is to deploy 75 drifters, of which, 50 drifters will be equipped with barometer sensors.

8.6.3 The Panel noted the education and outreach initiative of the NPDBAP on “adopt a drifter program”. The aim of this program is to establish scientific partnerships between schools around the world and engage students in activities and communication about ocean climate science. There are teacher resources, student resources and supporting documents

such as promotional videos of the program, links to impactful research, create/design lesson plans for students, are available through this program.

Action 8.6/1: Participate in ‘adopt a drifter program’, or other community outreach/education activities, and make materials available at the DBCP/ JCOMM website (NPDBAP, WMO/IOC/JCOMM) **(DBCP members/TC; DBCP-34)**

The meeting made the following recommendation

Rec 8.6/1: *The DBCP recognizes the efforts of the buoy community to increase participation with school children to promote the use of buoy data. Whether through the Adopt a Drifter Program, or other community outreach activities, members are encouraged to provide insight and expertise.*

8.7 Surface Marine Programme of the Network of European Meteorological Services, EUMETNET (E-SURFMAR)

8.7.1 Mr. Gilbert Emzivat reported that 141 E-SURFMAR drifting buoys and 5 others are in operation (all Iridium including 21 AtlantOS, and 32 SVP-B upgrades) where all are reporting air pressure. There are 4 E-SURFMAR supported moored buoys in operation, together with 30 others operated by members.

8.7.2 All the operational drifters are using Iridium telecommunications. This facilitated the E-SURFMAR to provide drogue status information to the GTS in the BUFR data format. It was also noted that over the past year, new development to drifter fitted with a low cost salinity sensor together with temperature and conductivity was completed with a new data template for drifting buoys to report sea-surface conductivity and temperature (and salinity).

8.7.3 The plan for 2018 is to maintain the existing network of 100 drifting buoys in North Atlantic, 13 drifting buoys in South Tropical Atlantic and 4 reference buoys in operation as well as trial experiments with drifting buoys measuring atmospheric pressure in the Mediterranean Sea, and in the Arctic in support of the Year of Polar Prediction (YOPP) and within IABP. A special effort will be made in 2018 with other international colleagues (involving the Russian Federation) and within IABP to achieve a consistent observation network of surface pressure in this region, especially in support of the YOPP.

The meeting made the following recommendation:

Rec 8.7/1: *For a socioeconomic benefit study of moored buoys, which needs to go beyond the NMHS and includes the wider community. The first step is identification of stakeholders in the UN community working with the WMO and IOC Outreach Departments. Future actions may include DBCP representatives participating in broader ocean events particularly related to SDGs.*

Rec 8.7/2: *DBCP guidelines for oceanographic instruments (draft)*¹ was presented and urged members to review and finalize before DBCP 34

8.8 Tropical Moored Buoys Implementation Panel (TIP)

8.8.1 Mr. Ken Connell reported on TIP. TAO/TRITON consist of 53 of 55 TAO and 1 of 2 TRITON surface moorings reporting data. In the case of the PIRATA, 10 of 18 surface moorings are reporting data and 20 of 23 surface moorings are reporting data for RAMA.

8.8.2 Key opportunities is TPOS 2020 moving forward to redesign and refine the TPOS to observe ENSO and advance science; efficient and effective observational solutions; and understanding of tropical Pacific physical and biogeochemical/ecosystem variability and predictability. Key challenges continue to include vandalism and ship time limitations which constrain array sustainability. Sites with frequently recurring vandalism have also been eliminated in order to promote sustainable maintenance of the array. RAMA-2.0 has been proposed and is intended to make the array more robust, cost-effective and less dependent on ship time, which is the most limiting resource for sustaining the array.

8.8.3 China (SOA) proposed plans for Western Pacific TMA during the TPOS 2020 SC-4 meeting. TIP recommends that these plans continue to be defined and refined. TIP also recommends that Data Quality Control (QC) and data serving practices remain consistent with other tropical moored buoy arrays.

8.8.4 RAMA-2.0: RAMA principal investigators in the U.S., China, India, and Japan have proposed a revised array design referred to as RAMA-2.0 in the context of the 2017-18 Indian Ocean Observing System (IndOOS) review. This re-design is intended to make the array more robust, cost-effective and less dependent on ship time, which is the most limiting resource for sustaining the array. RAMA-2.0 has fewer moorings than the original design and eliminates moorings in regions prone to heavy fishing vandalism or where it has not been possible to find reliable ship support. While TIP is proceeding with the adoption of this interim RAMA-2.0 strategy, the plan is provisional and awaits final endorsement by the IndOOS review community.

8.8.5 DBCP appreciates long-term sustenance of national programs that contribute to global data collection and its distribution on GTS such as India's IOON and Australia's IMOS in Indian ocean, and noted their contribution to the global network.

8.8.6 DBCP acknowledges the collaborative effort for the sustenance of PMEL RAMA Buoy network in the Indian ocean, as well as India, China and Thailand's extend valuable ship time, logistical support and participation in cruises.

Action 8.8/1: Work with TIP to identify the partnerships in Tropical moored buoy array and reflect such collaboration on the JCOMMOPS database appropriately (**JCOMMOPS/TC, DBCP-34**)

The meeting made the following recommendations:

Rec 8.8/1: *Establish a core TPOS 2020 Tropical Mooring Array (TMA). This should define and document the "Core TMA" similar to the "Core Argos" document. A baseline configuration*

¹ftp://ftp.jcommops.org/DBCP/Documents/standards/Draft_DBCP_Guidelines_for_oceanographic_instruments_version291017.docx

should begin with ATLAS configuration, quality control (QC), and accuracy; Incorporate developments for TAO, PIRATA and RAMA; further refinements should be made with current understanding of future requirements. Overlapping deployments should be implemented when prototyping emerging methodologies or technologies

Rec 8.8/2: *Develop Technical Specifications/Guidance for TPOS TMA.*

Rec 8.8/3: *Consider adopting RAMA-2.0 once review is complete.*

8.9 International Tsunameter Partnership (ITP)

8.9.1 Mr. R. Venkatesan reported on the International Tsunameter Partnership. He reported that two service voyages were conducted in the Coral Sea and Tasman Sea in the last 12 months. India is maintaining 7 tsunami buoys in the network. Two service voyages were conducted in the Bay of Bengal, Arabian Sea. NOAA-NDBC, USA deployed a replacement Tsunameter station east of Guam with next generation acoustic communication technology and it is performing well. China has installed two tsunami buoy and coastal seismic stations by SOA to detect earthquakes that may trigger local tsunamis.

8.9.2 The Bureau of Meteorology, Australia is planning two service voyages for the next 12 months while the India Tsunami program plans one service voyage in the Arabian Sea and two in Bay of Bengal. Thailand is also planning a deployment of an STB in the eastern Bay of Bengal. Challenges to ITP include continued vandalism in particular in the Arabian Sea and delay time in servicing of buoys in Arabian Sea due to ship time availability. The Australian Bureau of Meteorology program is also experiencing buoy mooring failures and external interference.

8.9.3 The Panel was informed that alternative technologies for deep-ocean tsunameter operation are being watched, but none seem mature enough for operational use at this time. There is moderate interest in the performance of 4th generation DART technology currently being evaluated by the PMEL.

8.9.4 DBCP acknowledges the continued efforts of member states in advancing technology for global sensing noting in particular recent development of 4th generation (4G) tsunameter by NOAA PMEL to enhance sensing quality especially for near shore tsunamis.

The meeting made the following recommendations:

Rec 8.9/1: *Vandalism to tsunameters poses a major risk to public safety. DBCP is requested to continue its efforts to address this issue at the highest levels in the local, national, regional, and global bodies to protect vulnerable communities.*

Rec 8.9/2: *The panel noted that the Joint Task Force (JTF) for SMART Subsea Cables, sponsored by the International Telecommunication Union (ITU), together with WMO and IOC, is exploring the use of undersea cables for ocean observations supporting tsunami as well as climate-quality data from the oceans has progressed well. ITP to continue to interact with JTF and report on developments to DBCP Panel.*

9. RECOMMENDATIONS BY THE TASK TEAMS

9.1 Task Team on Instrument Best Practices and Drifter Technology Development (TT-IBPD)

9.1.1 Dr. Luca Centurioni of the Task Team reported on the Panel's activities on Instrument Best Practices & Drifter Technology Developments during the last intersessional period, where the TT-IBPD has addressed the following issues: 1) methods for increasing the lifetime of drifter drogues, 2) the definition of a common format for drifting buoy specification sheets, and 3) the evaluation of new drifters to measure the directional wave properties.

9.1.2 The evaluation of methods for improving drogue retention times for drifting buoys was led by the Lagrangian Drifter Laboratory (LDL) at the Scripps Institution of Oceanography (SIO) while evaluation of drogue presence and lifetime was led by the Global Drifter Center at NOAA's Atlantic Oceanographic and Meteorology Laboratory (AOML) in Miami, FL. The available results point to the need to use tethers of appropriate materials and thickness to resist the harsh oceanic environment and also suggest that particular attention should be paid to the methods used to connect the tether to the surface buoy and to the drogue wheel. It also highlights the need to use drogue wheels of sufficient quality since there is strong evidence suggesting that drogue wheel failure is a likely cause of drogue loss.

9.1.3 Drifter specification sheets are not universally standardized and configured for easy import into a searchable electronic database, and, as such, they are under-utilized. A common format for specification sheets should be adopted with the goal to easily import them into searchable electronic databases.

9.1.4 The LDL at SIO has continued its evaluation of the in-house produced Directional Wave Spectra (DWS) drifter. A careful evaluation of errors and biases of the LDL DWS drifter is being conducted and first results have been published, suggesting that the technology is reaching a satisfactorily stage of maturity. A global pilot array of DWS drifters was also deployed by the LDL in 2016. At present, there is no bulletin format for distributing comprehensive directional wave observations from drifting buoys to the Global Telecommunication System (GTS).

Action 9.1/1: Define and adopt a universal format for drifter specification sheets during the next inter-sessional period (**TT-IBPD; 28 February 2018**)

Action 9.1/2: Define a BUFR sequence for directional wave spectral observations from drifters (DBCP chair/TT-DM/ Secretariat (**DBCP chair/TT-DM/ Secretariat; June 30th 2018**))

Action 9.1/3: To revise the METADATA structure and content with regards to drifters in cooperation with JCOMMOPS and WIGOS Task Team for Metadata (Currently Joe Swaykos - joe.swaykos@noaa.gov) (**TT-IBPD/TC/JCOMMOPS; DBCP-34**)

The meeting made the following recommendations:

Rec 9.1/1: *On Best Practices to Increase the Drifter Drogue Lifetime; the TT-IBPD task-team recommends that drifter manufacturers pay particular attention to the material, quality, and thickness of the tether, to its connection to the drogue wheel and to the surface buoy, and that they use drogue wheels of sufficient quality and strength to maximize the lifetime of the drogue.*

Rec 9.1/2: *On Best Practices for Drifter Performance Evaluation; Panel members should request life span statistics from manufacturers based on their requirements when considering ordering drifters based on different buoy types and for different ocean areas.*

9.2 Task Team on Moored Buoys (TT-MB)

9.2.1 Dr. Robert Jensen, Chair of the TT-MB reported on the Panel's Moored Buoy activities undertaken during the last intersessional period and that need particular attention by Panel Members.

9.2.2 The Panel noted that moored buoy operators who are not issuing their data in BUFR are requested to do so at the earliest opportunity.

9.2.3 There is also ongoing discussions regarding descriptors defining the directional wave spectral parameters. Contributions to the JCOMMOPS metadata archive continues, however it is not fully operational.

9.2.4 The Panel was informed that no progress was made to define metadata standards (template) for fixed platforms.

9.2.5 The Panel noted that unmanned surface vehicles (USV) or autonomous surface and underwater vehicle use has increased significantly. A web-page has been built (http://www.jcommops.org/dbcp/overview/evaluation_usv.html) to collect and disseminate information on experiences with unmanned surface vehicles.

Action 9.2/1: Send a reminder letter to the PRs identifying the issue with BUFR transition for moored buoys, and request the relevant organizations to make it a priority (**WMO Secretariat; May 2018**)

Action 9.2/2: Capture knowledge and lessons learned on use of MetOcean sensors in a DBCP Technical Document. A template capturing knowledge and lessons learned on use will be developed, distributed and submitted to DBCP Panel for final review. (Chapters 1-4 have been completed) (**R. Venkatesan ; DBCP-34**)

Action 9.2/3: The DBCP guidelines for oceanographic instruments-draft¹ was presented and members were urged to review and finalize before DBCP 34 (**DBCP Panel; DBCP-34**)

Action 9.2/4: Differentiate the Saildrone platforms from DB in the JCOMMOPS database and identify their WMO numbers (**TC; DBCP-34**)

Action 9.2/5: Publish the Saildrone WMO IDS and bulletin headers through the GTS and WMO newsletter (**TC; Jan 2018**)

Action 9.2/6: Collect and compile the MB time stamping practices from MB operators (**TC; Feb 2018**)

¹ http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=20768

Action 9.2/7: Develop a document on how the time stamp should be reported on the GTS message **(TT-MB with TC; DBCP-34)**

Action 9.2/8: The DBCP Members are requested to continue reporting on vandalism incidents. JCOMMOPS to maintain a contact list and develop mechanisms within to assist with adrift moored buoys recovery. This can be the same as the JCOMM point of contacts (IOC/WMO) **(TC/Secretariat; DBCP-34)**

Action 9.2/9: Develop template for “lessons learned use of Metocean Sensors” (modified from Vandalism) submitted to TT-MB and TC **(R. Jensen; DBCP-34)**

Action 9.2/10: Populate historical metadata for any MetOcean (Coastal Buoy network) for entire period of record **(DBCP Members/TC; DBCP-34)**

Action 9.2/11: Review the moored buoy metadata template and make necessary adjustment to comply with WIGOS metadata standard **(TC/J. Turton on behalf of TT-MB; DBCP-34)**

Action 9.2/12: Coordinate with TC on additions/modifications of the existing metadata template to include wave sensor, payload-analysis packages, and version control. Expand the metadata entries to capture all historical information.**(TT-MB/TC; DBCP-34)**

9.3 Task Team on The Wave Measurements (TT-WM)

9.3.1 Dr Robert Jensen reported on the progress of wave measurement activities undertaken during the last intersessional period. Work continues on the evaluation of wave measurements from a wide range of observing platforms and instruments. This evaluation remains a critical activity in the work plan of TT-WM. There is also a clear expression of a requirement for a wide range of wave measurement information, across a complementary spectrum of measurement techniques and platforms, thus requiring the widespread involvement and discussion across the three JCOMM Programme Areas.

9.3.2 The Panel agreed that the Task Team on Wave Measurement should continue, with the revised Terms of Reference and work plan as shown in Appendices 1 and 2. The Panel also recommended that the three Programme Areas of JCOMM engage in the activities of the cross-cutting TT-WM, addressing the priorities noted in the vision presented at the JCOMM-5. The Panel thanked Dr. Jensen and Mr. Swail and members of the Task Team for their efforts.

9.3.3 It was agreed that Dr. Jensen would take over as chairperson of the Task Team for the intersessional period.

9.3.4 India has submitted PP-WET intercomparison of DWR and NIOT Buoys. The results shows good comparison. The Panel appreciated this effort

The Panel made the following Recommendations:

Rec 9.3/1: DBCP recommended to promote complementary wave measurements from existing and new satellites through JCOMM satellite communication channels.

Rec 9.3/2: Encourage the three Programme Areas of JCOMM (JCOMM OPA, DMPA, SFSPA) to engage in the activities of the cross-cutting TTWM, addressing the priorities noted in the

vision presented at the JCOMM-5 TECO for wave measurement, data and metadata management and user requirements for services, as noted in Appendix 3 of DBCP-33-Doc 9.3, during the next intersessional period of JCOMM

9.4 Task Team on Capacity-Building (TT-CB)

9.4.1 Dr. Sidney Thurston, Chair of the TT-CB reported on Capacity-Building activities during the intersessional period and a proposal for a future DBCP capacity building workshop for 2018. Key activities included the Fifth North Pacific Ocean and Marginal Seas (NPOMS-5) Capacity Building Workshop “Applications of Ocean Observations for Improving Society’s Understanding and Forecasting of Typhoons”, 4-7 July 2017 hosted by China State Oceanic Administration (SOA) National Marine Data and Information Service (NMDIS) in Tianjin, China.

9.4.2 The State Oceanic Administration (SOA) National Center of Ocean Standards and Meteorology (NCOSM) has offered to host the Third Pacific Islands Capacity Building Workshop on Ocean Observations and Data Application” (PI-3) in June 2018 in China.

9.4.3 Dr. Thurston requested DBCP Executive Board to commence succession planning for Chair TT-CB. He will step down after a decade when a successor can be identified during 2018.

9.4.4 The Panel expressed its appreciation for the hard work and effort and great achievements by Dr. Thurston.

9.4.5 The Panel further was informed that two experts have been appointed at JCOMM-5 tasked to coordinate JCOMM Capacity Development (CD) Programme. There is need to work with the two coordinators on CD.

Action 9.4/1: Dr. Sidney Thurston (USA), who has been privileged to serve in this capacity for one decade, will step down after DBCP-33, or until a successor can be identified during 2018. Solicit nominations for new Chair of TT-CD (**DBCP EXB; 2018**)

Action 9.4/2: Coordinate and report on DBCP TT-CD activities with the two new JCOMM- CD coordinators (**TT-CD; Jan 2018**)

Action 9.4/3: TT-CD representative to be involved in the regular JCOMM CD meetings (**TT-CD; Jan 2018**)

The meeting made the following Recommendations:

Rec 9.4/1: On bringing awareness on end-use of drifter data, India agreed to involve in their ongoing ocean technology student-camp program for school children. DBCP supports such a unique CB exercise.

Rec 9.4/2: Representative from Saudi Arabia mentioned the importance and lack of Capacity building in the middle eastern region. There is a need to engage the middle eastern countries in the JCOMM Capacity Building activities; working with the DRA Program of WMO, seek future opportunities for DBCP representatives to share the work of DBCP.

Rec 9.4/3: To present or make aware of the NPOMS activities at the ESCAP/WMO Typhoon Committee meeting planned in Feb 2018 in Vietnam

9.5 Task Team on Data Management (TT-DM)

9.5.1. Recommendations of the Task Team

9.5.1.1 Ms. Mayra Pazos, Chair of TT-DM reported on Task Team on Data Management. She reported on challenges opportunities, risks and make recommendations with regard to the Task Team on Data Management's work plan for the forthcoming intersessional period.

9.5.1.2 Key issues reported to the Panel include table driven coding requirements for data buoy observations, migration to BUFR, real time and delayed mode distribution of data and metadata, formatting issues and JCOMM publications.

9.5.1.3 It was noted that nearly all drifters are providing the data on the GTS using the new BUFR format 315009 with the exception of a few drifters from JMA. For moored buoys the situation is more complex apart from two data centers (LEMM, LGAT) which are providing data in proper BUFR format 315008, all others are providing data on the GTS in few different formats (FM-13, FM-18 and deprecated BUFR 308009).

9.5.1.4 A new version of the MAWSbin package, to compress/decompress SBD messages from buoys, with examples of scripts and all the necessary documentation has been developed and published by Meteo-France/CMM, freely available to download under CeCILL license²:

9.5.1.5 Meteo-France/CMM provides weekly computed currents derived from buoy's drift. In 2017, a new system was developed based on a methodology and code developed by AOML and University of Miami (Elipot et al 2016), that distinguishes between positioning systems (Argos or GPS). Once the new current product is validated it will become the default.

9.5.1.6 In response to mounting user requests for a complete set of metadata for drifters, regardless of the variable of interest, Meteo-France/CMM has proposed to the community a definition of drifting buoy metadata in the WIGOS metadata standard. This document is now curated by JCOMMOPS and contributions are invited from the community to verify and improve the definition. This document makes the correspondence between existing code tables in WIGOS, -UFR 315009, JCOMMOPS database, AOML/GDP metadata and E-SURFMAR buoy metadata.

9.5.1.7 As per the recommendation at DBCP-32, AOML and Observing System Monitoring Center (OSMC) worked to provide streamlined access to GTS data from drifters. Accordingly, several links and instructions are provided to make graphs or download data in different ways (by time period, by region, or specifying WMO numbers) and in different formats, such as ASCII, NetCDF, Matlab, etc.³

9.5.1.8 It was agreed that Mrs. Mayra Pazos would continue as chairperson of the Task Team for the intersessional period. The full report of the Task Team is provided in Appendix 1 of DBCP-33 preparatory document No. 9.1 and will be included in the DBCP annual report for 2017.

² <http://esurfmar.meteo.fr/doc/soft/MAW/Sbin/>

³ www.aoml.noaa.gov/phod/dac/GTS_OSMC_database.php

Action 9.5.1/1 : GTS Centers that convert, for local use observation data received from a foreign GTS center (e.g. BUFR converted into FM13) must not resend the converted data onto the GTS (**DBCP members; Jan 2018**)

Action 9.5.1/2: Provide input to the JCOMM Data Management strategy document (**TT-DM; Feb 2018**)

Action 9.5.1/3: Collaborate with the GDACS for drifting buoys providing metadata and quality controlled non-interpolated data for the creation of NetCDF files or appropriate web services for archival and distribution (**TT-DM; May 2018**).

Action 9.5.1/4: Identify a potential candidate as a GDAC for moored buoy data (**TT-MB/Secretariat; DBCP-34**)

The meeting made the following recommendations:

Rec 9.5.1/1: *The trial JCOMM Global Data Assembly Centres (GDACs) for drifting buoys of Météo-France (former SOC) and MEDS (former RNO DC/DB) to continue to work towards the implementation of a routine procedure to compare GTS Bulletin Headers between the two centres.*

Rec 9.5.1/2: *Manufacturers are invited to use the existing active templates prior to the creation of their own. In case none of the existing templates is suitable for a given set of buoys, a new one may be designed in coordination with the DBCP - TTDM team. A document describing recommended data formats for Iridium transmission is available⁴.*

Rec 9.5.1/3: *TT-DM reminds all buoy manufacturers to adhere to the guidelines set by the approved satellite message templates which include testing the full range of sensor output availability, as well as compliance with NULL reporting identifiers, through the satellite constellation during development*

9.5.2 Recommendations of the Drifting Buoy Data Management Centres

9.5.2.1 Mr. Mathieu Ouellet from Marine Environmental Data Section (MEDS), Canada reported on the activities of the Global Data Assembly Center (GDAC) for Drifting Buoys managed by the MEDS. He presented the issues related to different data formats, data headers, WMO IDs, BUFR data re-transmission on GTS in TAC format, GTS routing problems and data errors identified and worked on during the intersessional period. Further, he mentioned that a new website layout is available with the links to Coriolis data selection tool, AOML GDP data archive and ICOADS through MEDS GDAC⁵.

9.5.2.2 Mathieu identified the challenges for the MEDS are: BUFR encoding errors at DACs, GTS data structural problems between NMC/WMC and TAC and BUFR data reconciliation. At the same time MEDS acknowledge the opportunities of GTS vs. non-GTS data exchange with Météo-France / Coriolis; GTS data exchange by FTP between countries; and netCDF data format developed by Coriolis which will benefit the data users

9.5.2.3 Mr. Gilbert Emzivalet reported on the activities of the trial Global Data Assembly Center (GDAC) for Drifting Buoys managed by Météo-France under the new Marine Climate Data System (MCDS) scheme. Météo-France is involved in the French Inter Agency Coriolis

⁴ http://esurfmar.meteo.fr/doc/o/db/others/DB_Iridium_formats.pdf

⁵ <http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/drib-bder/index-eng.html>

organisation, proposed Coriolis Data Center to act as a trial GDAC DDB during the implementation phase 2 of MCDS (2015-2017). MEDS and Coriolis GDACs for drifting buoys (DDB GDAC) are collecting data, each of them separately in real time in BUFR format. Coriolis is recovering data before 2005. The two DDB GDAC are working together to establish DDB GDAC organization document and user manual, to formulate exchanges and best practices between the two GDACs. At the same time, draft documents⁶ have been established to define metadata and data format, to assist for data exchanges. The Panel is requested to contribute to the draft documents on Drifting buoys NetCDF format reference manual version 0.13⁷, Drifting buoys Quality Control manual version 0.1⁸, Drifting buoys NetCDF file format checker⁹

Action 9.5.2/1: To review the two GDAC documents (Drifter data management and Proposal for drifting buoy metadata in the WIGOS Metadata Standard) and send comments to the authors (**TT-DM; By 31 December 2017**)

10. ISSUES FOR THE PANEL

10.1 Implementation of the Outreach Strategy to Reduce Damage to Ocean Data Buoys From Vandalism

10.1.1 Mr. Shannon McArthur presented the “Outreach Strategy to Reduce Damage to Ocean Data Buoys from Vandalism”. The Panel was informed regarding all the actions accomplished since DBCP-32 in La Jolla, USA. It was noted that DBCP agreed to four education and outreach goals and expected outcome for the strategy in October 2016. These goals are to: 1) develop regionally and nationally relevant education materials; 2) enhance national, regional, and International coordination and cooperation; 3) Identify key stakeholder groups and enhance education and outreach efforts to those stakeholders; 4) implement education and awareness to build compliance and support enforcement.

10.1.2 DBCP noted that IOC and WMO adopted coordinated resolution on data buoy vandalism in June 2016, which was also approved at the JCOMM-5 session, and that is now up to DBCP partners and stakeholder to make an effort to bring the strategy to action and move forward. The Panel was invited to contribute to the implementation plan of the strategy.

Action 10.1/1: Request JCOMM to establish a cross-cutting Task Team which can bring together experts from WMO-IOC-IMO-FAO- UNDOLAS-IHO - Marine Aids to Navigational and Lighthouse Authorities IALA-with DBCP to discuss the strategy with a likely date for 1st meeting during IOC Tsunami Symposium planned for early 2018 and request WMO/IOC to convene this meeting (**WGV/Secretariat; By January 2018**)

⁶ <http://doi.org/10.17882/45402>

⁷ <http://dx.doi.org/10.13155/52037>

⁸ <http://dx.doi.org/10.13155/52040>

⁹ <http://doi.org/10.17882/45538>

Action 10.1/2: Requests members to provide any existing materials, tools, products, and methods of communication on vandalism awareness for the WGV to review and to be uplinked on the DBCP website through JCOMMOP's TC. WGV will assess these shared materials and create guidelines for the development of new materials by next DBCP session (**DBCP members/WGV; By early January 2018**)

The meeting made the following recommendations:

Rec 10.1/1: DBCP seeks the support of member countries to implement and disseminate the outreach strategy for combating data buoy vandalism (http://www.jcommops.org/dbcp/doc/2017-MISC-OBS-Data-Buoys-Vandalism-Strategy-171246_en.pdf)

Rec 10.1/2: The WGV will design a Future Pilot Project of a stakeholder workshop to build awareness of the vandalism issue to be implemented at two sites (potentially Pacific and Indian Ocean) and may request DBCP Capacity Building for financial support to be held in 2018-2019.

10.2 Satellite data telecommunications

10.2.1 Satcom Forum

10.2.1.1 Mr. Johan Stander reported on behalf of Mr. Michael Prior-Jones, chair Satcom Forum, on the progress, challenges, opportunities and recommendations from Satcom activities during last intersessional period.

10.2.1.2 The key challenge was to determine how to integrate the existing (30-year old) JTA into the Satcom Forum without adverse impact.

10.2.1.3 The Panel noted that recommendation 8-3(2) was approved by (JCOMM-5) where authority was given to the Chairperson of the JTA (currently Eric Locklear) to approve the JTA Argos Global Tariff Agreement on behalf of WMO and IOC, as negotiated on a yearly basis within the JTA framework.

10.2.1.4 The Panel further noted that it was agreed that it was appropriate to delegate this authority to the Chair of JTA as this reflects the existing practice within JTA; no further approval from Chair Satcom Exec or the presidents of JCOMM and CBS is deemed necessary.

10.2.1.5 The Panel was informed that Satcom 2018 (coincident with CIMO TECO at the Meteorological Technology World Expo 2018 [1], 9-11 October 2018, Amsterdam) aims to generate awareness about the satellite communication options available for the environmental monitoring community. It is intended as an information sharing and training event, rather than an academic conference.

10.2.1.6 The preparation of a Satcom handbook is slowly making progress. It is a written guide to the Satcom market, targeting an audience of working scientists who are considering using Satcom. A time line of actions were provided in order to finalize the handbook, and presented as a draft resolution for WMO Congress, which will next meet in May 2019.

10.2.2 Specific satellite systems such as Iridium and ARGOS

10.2.2.1 Mr. Yann Bernard reported on CLS processing activity for the Intersessional period. The number of data messages from drifting buoys processed by CLS on the 2016-2017 period continue to decrease due to less Argos GDP drifters deployed. In addition, the number of BUFR bulletins displayed on the GTS by CLS and CLSA has decreased on 04/05/2017 due to the removal of old BUFR version of encoding.

10.2.2.2 CLS is continuing its efforts to improve the coverage of the real-time antennas in the regions where needed. After improving the South-East Pacific and the Atlantic coverage, CLS is waiting for authorization to upgrade the New Zealand and Antarctic antennas. CLS is working on the Bali ground station to be back in operation in order to secure the Indonesian/East Indian Ocean coverage.

10.2.2.3 The Panel was informed that the daily average delivery time of drifter's bulletins on the GTS is relatively stable during the 2016-2017 period, around 80 minutes and that few BUFR data were corrupted.

10.2.2.4 Mr. Bernard mentioned that new generation of satellite instrument Argos-4 will be launched by the end 2018 by ISRO on OceanSat-3. Argos-4 will reinforce, performance for very low power transmitters, high data rate performance (1200-4800 bps), and increase the system capacity and new "non-environmental frequency band" in order to deploy new applications.

10.2.2.5 He also mentioned that Argos Joint Tariff Agreement (JTA) is a part of the Satcom Forum under the umbrella of WMO/IOC through JCOMM. JTA is working towards a new pricing structure to provide a simple, attractive and budget predictable (all you can transmit) package for customers. The new pricing structure will be discussed and approved at the planned JTA meeting on the 18th November with a planned implementation date of 01 January 2018.

10.2.2.6 A detailed summary report on CLS/Service Argos on the Argos System operations and improvements for the period 2016 -2017 is available at the meeting website¹.

10.3 Environmental stewardship and compliance of buoy operators

10.3.1 Mr. Shannon McArthur gave a presentation on environmental stewardship and compliance of buoy operators. The Panel was invited to provide their ideas.

10.3.2 The Panel noted that Environmental stewardship refers to responsible use and protection of the natural environment through conservation and sustainable practices. The global operational footprint of data buoy practitioners and operators is experiencing rapid growth. The current DBCP terms of reference does not clearly articulate the role of the DBCP in the promotion of best practices and advocacy of safe and environmentally sustainable data buoy operations.

Action 10.3/1: Send email soliciting views on the matter regarding amending the DBCP Terms of Reference concerning safety and environmental stewardship of buoy operators to include for consideration by the DBCP Executive Board (**DBCP EXB; Feb 2018**)

¹ http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20331

10.4 Emerging technologies networks (e.g. unmanned surface vehicles)

10.4.1 Mr. Jon Turton reported on OCG engagement with emerging technologies (e.g. HF radar and gliders) and networks and the relationship of DBCP to these communities. Pilot projects have helped to demonstrate new capability that can be used for sustained operational use (e.g. Iridium drifters).

10.4.2 The OCG is also interested in integration of new technology. Several gaps have been identified and could be addressed by OCG including: 1) use of technology roadmaps to forecast future developments; 2) coordination across networks for assessment of feasibility and testing of new technologies and the process of integrating new technologies into sustained observing status and 3) defining optimal mix of observing platforms to address multiple requirements.

10.4.3 The session was informed that OCG is seeking to establish a Vice-Chair on new technology with the aim of leading this effort.

10.4.4 The session was further informed that the use of gliders (surface and underwater vehicles) for ocean data collection has increased significantly in the recent years and are coordinated separately through the Ocean Gliders Steering Team. Similarly, HF radar which is expanding globally is coordinated by the Group on Earth Observations (GEO) HF Radar community of practice. In both cases there is no need for DBCP involvement. The main interest of DBCP community is to evaluate USVs potential to enhance the ocean observing system.

Action 10.4/1: Provide nominations for the Vice-Chair on New Technology and to the Chair and Secretariat (**DBCP members; March 2018**)

11. STRATEGIC PLANNING DISCUSSION

11.1 Addressing the synergies between DBCP and SOT

11.1.1 Mr. Johan Stander presented an overview of the synergies between DBCP and SOT. The Panel was invited to discuss how to optimize the synergies between the two groups. Several issues were discussed including the benefits of DBCP meeting annually. This gives the Panel the ability to deliver on manageable number of actions on a timely basis.

11.1.2 Key concerns raised by the Panel were that some Member States are not able to send participants to both DBCP and SOT meetings and not to lose the good functionalities of the current set-up.

11.1.3 The Secretariat mentioned that there are benefits and challenges in the proposal for joint (DBCP and SOT) meetings that need to be evaluated carefully. From the meeting preparation/organization prospective, it is extremely difficult to manage two such large back to back meetings. The Panel agreed that it was important to examine the DBCP and SOT core functionalities and overlaps if any. A decision can only be made after careful considerations of all issues and factors.

Action 11.1/1: Start a discussion/dialogue; develop a SWOT analysis to assess the advantages, disadvantages, consequences concerning addressing the synergies between

DBCP and SOT to be presented to the SOT 2019 meeting (**DBCP-EXB/J Stander; April 2018**).

11.2 Contributions to Services/ Research to include Global Framework for Climate Services (GFCS)

11.2.1 Dr. Sidney Thurston provided an overview of the linkages between services and research and the contribution from DBCP community activities. The Panel was requested to participate in an open discussion to present their ideas on how the DBCP forward looking plan should be crafted optimizing its contribution to services and research, to include the WMO Global Framework for Climate Services (GFCS), and ensure that ocean and climate observations and other data necessary to meet the needs of end-users are collected, managed and disseminated and are supported by relevant metadata.

11.2.2 The Panel pointed out that DBCP is essentially contributing to all the five components of GFCS in one way or the other.

11.3 WMO Integrated Global Observing System (WIGOS)

11.3.1 Ms Champika Gallage reported on recent developments of WMO Integrated Global Observing System (WIGOS) and the obligations of the members in achieving the WIGOS implementation targets. The WIGOS implementation phase ended in 2015. The years 2016-2019 are identified as the preoperational phase with five key activities. The full implementation of WIGOS in 2020 will strengthen the global observing system s for robust, standardized, integrated, accurate and quality assured relevant observations of the earth system to support WMO priorities and expected results. WIGOS enables the integration of data from a diversity of observing systems. A key principle of successful and sustained observation partnerships is the recognition of mutual benefit, including improved mutual understanding and strengthened collaboration. A draft document on Guidance on WIGOS data partnerships including with non-NMHS was approved at JCOMM-5¹. Following a recent workshop on WIGOS, 26-29, Geneva, Switzerland, it was recognized that there is a need to review operational procedures related to quality monitoring towards data integration. The operational exchange of metadata with OSCAR/Surface is also key issue that requiring some coordinated work.

11.3.2 A WDQMS pilot project with Global NWP centres is being developed where a prototype of a monitoring web tool is being tested for terrestrial stations; Further development of this system is progressing to include marine stations (among others) in the coming months.

11.3.3 Mr. Boris Kelly-Gerreyn from Bureau of Meteorology, Australia, (BOM) presented how the Australian of Bureau of Meteorology (BOM) is working towards achieving WIGOS implementation. Accordingly, he mentioned that documents are under development on National WIGOS implementation and will make them available soon.

Action 11.3/1: Add a section to include non-NMHSs partnerships information in the National report (**Secretariat; DBCP-34**)

¹ [http://meetings.wmo.int/JCOMM-5/_layouts/15/WopiFrame.aspx?sourcedoc=/JCOMM-5/InformationDocuments/JCOMM-5-INF06-1\(2\)-DRAFT%20GUIDANCE%20ON%20WIGOS%20DATA%20PARTNERSHIPS_en.docx&action=default&DefaultItemOpen=1](http://meetings.wmo.int/JCOMM-5/_layouts/15/WopiFrame.aspx?sourcedoc=/JCOMM-5/InformationDocuments/JCOMM-5-INF06-1(2)-DRAFT%20GUIDANCE%20ON%20WIGOS%20DATA%20PARTNERSHIPS_en.docx&action=default&DefaultItemOpen=1)

11.4 DBCP Implementation Strategy

11.4.1 The Panel discussed the outline of DBCP strategy document. Panel agreed the Strategy document will be updated based on the discussions after the meeting and circulated to the members to review and finalize.

11.4.2 Dr. Sidney Thurston provided an overview of the SWOT assessment identifying the strengths, weaknesses opportunities and threats for the DBCP program. Key issues introduced include the WMO reform, WIGOS, IOC-International Decade of Ocean Science for Sustainable Development (2021-2030), JCOMM 10-Year vision.

11.4.3 Some of the key strengths identified include DBCP's long history. It is well established, organized and structured. DBCP is inventive and has forward looking panels (pilots, TTs) etc. Key weaknesses identified include a small percentage of WMO National Met-Hydrological Services engaged in DBCP, limited education and outreach, limited resources, no clear long-term strategy, lack of representation of more countries. Key opportunities identified includes improve data access, management and recovery, DBCP's role in rapidly emerging bio-geo-chemical arena, synergies across JCOMM Observation Group, coastal applications and marine services, strategic changes in WMO and IOC frameworks to establish linkage with the Global Framework for Climate Services among others. Key threats identified include complacency, flat membership and trust fund contributions, continuity, DBCP absorbed within other programmes, to change in global power structure.

11.4.4 The Panel noted the recommendation proposed for the next 1-2 year, 2-4 year and 4-5 year time frames. In addition, Dr. Thurston proposed the need to identify five new functional directors to the EB by 2018 as well as key performance indicators (metrics).

Action 11.4/1: Update the DBCP Implementation Strategy reflecting the discussions at the DBCP-33 and send to the DBCP Panel for review (***BBCP EXB, March 2018***)

Action 11.4/2: Circulate SWOT analysis and recommendations, invite comments. SWOT analysis to be reviewed and appropriate recommendations to be adopted intersessionally by the EXB (***Sidney Thurston/Members/EXB; End of April 2018***).

12. ORGANIZATIONAL ISSUES

12.1 DBCP Terms of Reference

12.1.1 The Panel examined the DBCP Terms of Reference (ToR), based on the Chairpersons discussion during the session. The Panel was invited to send comments in order to update the ToR (Annex IV)

Action 12.1/1: Send comments on the DBCP ToR to the Secretariat (***DBCP Panel; 31 January 2018***)

12.2 JCOMMOPS Management

12.2.1 Ms. Champika Gallage reported on JCOMMOPS Management focusing on information on the changes made to the JCOMMOPS management practices during this intersessional period.

12.2.2 It was highlighted that IOC/UNESCO and WMO has been jointly managing the human and financial resources of JCOMMOPS while OCG and panel/network Chairs provided work and programme management.

12.2.3 The Panel noted the decision of the JCOMM Management Committee and approval of IOC regarding the transfer of most JCOMMOPS Management functions from the IOC of UNESCO Secretariat to the WMO Secretariat and the invitation to WMO Secretariat to establish an integrated management of JCOMMOPS within the Secretariat in order to facilitate negotiations with JCOMMOPS.

12.2.4 The Panel further noted that in consultation with the WMO Weather and Disaster Risk Reduction Service Department (WDS) and the WMO Observing and Information Systems Department (OBS) has decided that the Management of JCOMMOPS by the WMO Secretariat shall be under the full responsibility of the OBS Department which came into effect from February 2017.

12.2.5 The Panel was informed that the JCOMMOPS lead position is being established (JCOMM-5 decision in this regard pending at the time of writing this report) with identified rules and responsibilities in order to assure appropriate coordination of JCOMMOPS activities locally, in particular with regard to the synergistic aspects of JCOMMOPS, and liaison with the local hosts. The key role of the JCOMMOPS lead is to provide guidance on JCOMMOPS synergies, assist the secretariat to liaise with host country, and officially represent JCOMMOPS at various occasions. He underlined that the JCOMMOPS lead is nominated from the JCOMMOPS staff by the JCOMM Co-Presidents according to recommendation of the OCG Chair, and in consultation with the Panel/Network Chairs and the Secretariats.

12.2.6 The Panel was reminded that the JCOMMOPS leadership has de facto been provided informally in the last years by Mr. Mathieu Belbéoch in the most effective way and to the satisfaction of the Observations Coordination Group (OCG) and JCOMMOPS contributing Panels/Networks.

12.2.7 A decision has been forwarded to JCOMM-5 to clarify JCOMMOPS management, including new Terms of Reference of the centre reflecting latest developments and requirements for support with new networks (e.g. ocean gliders), and to formalize and establish the JCOMMOPS lead position.

12.2.8 The Panel noted/welcomed the OCG proposal for an external review of JCOMMOPS to be undertaken to assess: 1) the future role of JCOMMOPS; 2) organizational relationship with sponsors and stakeholders and; 3) future sponsorship and management. This decision was presented to JCOMM-5 for approval.

Action 12.2/1: Develop framework describing how DBCP solicit member contributions towards making the funding of DBCP/JCOMMOPS more stable and sustainable (**Secretariat/Shannon; April 2018**)

The meeting made the following recommendation:

REC 12.2/1: *To provide their input as required to the JCOMMOPS review committee to complete the planned external review of JCOMMOPS*

12.3 JCOMM activities and management and decisions from JCOMM-5

12.3.1 Summary of the JCOMM-5 is included under Agenda item 12.4 on “Report on decisions of WMO and IOC governing bodies” and reported by Ms. Champika Gallage.

12.4 Report on decisions of WMO and IOC governing bodies

WMO Secretariat

12.4.1 Ms. Champika Gallage from the WMO Secretariat reported on the decisions of the WMO Governing Bodies on the results of the Sixth session of Inter-Commission Coordination Group on The WMO Integrated Global Observing System (ICG-WIGOS-6, Geneva, Switzerland, 12-14 January 2017), Thirteenth session of the JCOMM Management Committee meeting (JCOMM-13, Geneva Switzerland, 18-21 January, 2017), Sixty-ninth Session of the WMO Executive Council (EC-69, Geneva, Switzerland, 10-17 May 2017).

12.4.2 The Panel noted that the ICG-WIGOS-6 reviewed the progress towards the implementation of WIGOS achieved by the Technical Commissions (TCs) and the Regional Associations (RAs), the contributions of the JCOMM and JCOMMOPS activities in support of WIGOS. It is further noted that there is still only limited appreciation and understanding of WIGOS in the oceanographic community.

12.4.3 A key aspect will be to establish partnerships and interfaces between WIGOS and the (non JCOMM-owned) partner observing networks (e.g. Argo and OceanSITES), where JCOMMOPS and the Task Team for Integrated Marine Meteorological and Oceanographic Services within WIS (TT-MOWIS) will have key roles.

12.4.4 The Panel was informed that compliance with WIGOS metadata is an issue for JCOMM and the situation will improve significantly when a machine-to-machine interface is available for uploading metadata from JCOMMOPS to Observing Systems Capability Analysis and Review (OSCAR), but this will not resolve the issue that many metadata elements that are considered mandatory for WIGOS are not reported to JCOMMOPS.

12.4.5 The Panel noted that the research community tends to rely on different file formats from those stipulated in WMO regulatory and guidance material, e.g. NetCDF instead of BUFR. Since WMO is not in a position to enforce compliance with its file formats toward external partners, conversion tools are needed.

12.4.6 The Panel noted that DBCP contribution to the Year of Polar Prediction (YOPP) was discussed and the DBCP chairperson is identified as the contact point for JCOMM's involvement in Special Observing Period.

12.4.7 The Co-Presidents also requested OCG to consider parallel meetings of DBCP and SOT, with joint sessions on common issues, i.e. data management.

12.4.8 The Tropical Pacific Observing System 2020 project (TPOS 2020), is recognized as a WIGOS Pre Operational Regional Pilot, and that its implementation and transition back into the global sustained observing system is coordinated by the TPOS 2020/JCOMM Transition and Implementation Task Team. Decision 28 at EC-69 requests the Intercommission Coordination Group on WIGOS (ICG-WIGOS) and JCOMM to facilitate implementation of this Decision. EC-69 further requested Members to actively engage, collaborate and contribute

resources towards implementing the recommendations of the first report on the Tropical Pacific Observing System 2020 project¹.

12.4.9 The Panel was informed that a draft Outreach Strategy to Reduce Damage to Ocean Data Buoys from Vandalism or Interference was developed by the DBCP ad-hoc working group on buoy vandalism as per Decision 49 (EC-68). This document was reviewed by the IOC of UNESCO Working Group on Tsunami and Other Hazards Related to Sea-level Warning and Mitigation Systems, the Food and Agriculture Organization of the United Nations (FAO), and other relevant organizations with the goal to be finalized and endorsed the document at the JCOMM-5 in 2017.

12.4.10 At EC-69 Decision 29 was made requesting: (1) JCOMM, through the DBCP, to continue to seek input from relevant international organizations and work to finalize the strategy by October 2017 for submission to EC-70 for final approval; (2) Members to actively engage, support and collaborate in the efforts of the DBCP and its Working Group on Data Buoy Vandalism to collect existing education and outreach materials related to national or regional mitigation of data buoy vandalism efforts.

12.4.11 Further, EC urges Members to take action to prevent and mitigate the effects of vandalism for other types of observing platforms such as AWS.

Action 12.4/1: Provide a presentation template for TT reports **(Secretariat/DBCP EXB; June 2018)**

Action 12.4/2: Continue to submit metadata particularly all the mandatory information identified in WIGOS to the JCOMMOPS **(DBCP members; ongoing)**

Action 12.4/3: Actively engage, collaborate and contribute resources towards implementing the recommendations of the first report on the Tropical Pacific Observing System 2020 project **(DBCP members; ongoing)**

Action 12.4/4: Actively engage, support and collaborate to collect existing education and outreach materials related to national or regional mitigation of data buoy vandalism efforts **(DBCP members; ongoing)**

Action 12.4/5: Contribute towards the implementation of the Outreach Strategy to Reduce Damage to Ocean Data Buoys from Vandalism or Interference **(DBCP members; ongoing)**

IOC Secretariat

12.4.12 Mr. Denis Chang Seng from the IOC Secretariat reported on the decisions of the IOC of UNESCO Governing Bodies on the results of the Twenty-ninth session of the Intergovernmental Oceanographic Commission Assembly (IOC-29, Paris, France, 21-29 June 2017).

12.4.13 He pointed out that the Assembly agreed on a Resolution XXIX-1 on a proposal for an International (UN) Decade of Ocean Science, to be established for the period 2021-2030 for Sustainable Development.

¹ <http://tpos2020.org/first-report/>

12.4.14 During the UN Member States consultations held in March, April and May 2017 in relation to the “Call for Action” Outcome document to be adopted by the UN Ocean Conference in June 2017, several Member States expressed their support to have the Decade proposal reference in the “Call for Action” document.

12.4.15 In May 2017, the IOC Executive Secretary wrote to the heads of UN Agencies, international organizations, scientific unions that have an interest in ocean science with a view to engage them in the development of the Decade proposal.

12.4.16 He stressed that the Resolution on a proposal for an International (UN) Decade of Ocean Science is of importance to the DBCP community.

12.4.17 He informed the Panel that the Twenty-ninth session of the Intergovernmental Oceanographic Commission Assembly also passed a Decision IOC-XXIX/6.12 concerning WMO-ICSU-IOC-UNEP Global Climate Observing System (GCOS) new implementation plan, The Global Observing System for Climate: Implementation Needs (GCOS-200, GCOS-214)

12.4.18 The Global Observing System for Climate: Implementation Needs (GCOS-200, GOOS-214) was approved by the GCOS Steering Committee at its 24th Session in Ecuador.

12.4.19 The Parties at the 22nd session of the UNFCCC Conference of the Parties welcomed the new implementation plan submitted by the GCOS secretariat and prepared under the guidance of the GCOS Steering Committee; encouraged Parties to the Convention to work towards the full implementation of the plan and to consider what actions they can take to contribute towards its implementation and; invited United Nations agencies and international organizations to support the full implementation of it, as appropriate. This provides a strong statement of global consensus on scientific requirements for sustained observations to support the goals of the Parties of the UNFCCC.

12.4.20 DBCP agreed to support the IOC Resolution on a proposal for an International (UN) Decade of Ocean Science for Sustainable Development to be established for the period 2021-2030

Action 12.4/6: Support the IOC Resolution on a proposal for an International (UN) Decade of Ocean Science for Sustainable Development to be established for the period 2021-2030 **(DBCP members; ongoing)**

12.5 Financial reports

12.5.1 Mr. Eric Locklear, the DBCP Financial Advisor presented a review of the financial activity over the last 12 months and a proposed budget for 2018. He stressed that over the intersessional period significant progress has been achieved in simplifying the budget through concentrated efforts by many colleagues. Three significant steps include: 1) All accounting reports are now in U.S. dollars instead of a combination of U.S. dollars and Swiss Francs; 2) outstanding IOC financial obligations have been resolved; 3) expenditures are being tracked based on the projects (i.e. JTA, DBCP, SOT & WMO) for improved clarity and transparency.

12.5.2 He recalled that DBCP operates on Member States contributions, and these contributions are spent in accordance with member instructions. The contributions are

deposited into the DBCP Trust Fund and the JCOMM Trust Fund, and both are with WMO. The five-year financial summary shows that the total cost for DBCP activities has continually decreased. The contributions for 2018 are assumed to be consistent with 2018.

12.5.3 The DBCP Executive Board, after reviewing the financial situation, recommended that the DBCP Panel adopted the basic budget itemized in table 1 below for DBCP expenses only for 2018.

<i>DBCP Technical Coordinator (JCOMM TF)</i>	<i>\$75,000</i>
<i>Provision for termination/transition of DBCP TC</i>	<i>\$0</i>
<i>JCOMMOPS logistical support for DBCP</i>	<i>\$13,000</i>
<i>Other JCOMMOPS Expenses</i>	<i>\$2,000</i>
<i>Travel of DBCP Chairperson</i>	<i>\$10,000</i>
<i>Travel of DBCP Technical Coordinator</i>	<i>\$15,000</i>
<i>DBCP Capacity Building</i>	<i>\$10,000</i>
<i>Other DBCP Expenses</i>	<i>\$15,000</i>
<i>WMO Indirect and Bank Charges</i>	<i>\$18,000</i>
<i>Total</i>	<i>\$158,000</i>

Table 1: DBCP panel budget and maximal expenditures for 2018

12.5.4 Table 2 below was discussed, and agreed upon at the DBCP Executive Board meeting and includes expenses for the entire DBCP Trust Fund. Recall that the JTA, DBCP, SOT, JCOMMOPS, and WMO utilize the DBCP Trust Fund to implement these respective activities.

#	Item description	2018 Budget
	JCOMMOPS	
1.	Contract (salary) for DBCP & SOT Technical Coordinators at \$75,000 and \$45,000 respectively. (JCOMM-TF)	\$120,000
2.	Provision for termination / transition of the Technical Coordinators	\$0
3.	JCOMMOPS Logistical Support - DBCP	\$13,000
	JCOMMOPS Logistical Support - SOT	\$13,000
4.	DBCP-TC Travel	\$15,000
5.	SOT-TC Travel	\$8,000
6.	Other JCOMMOPS expenses	\$2,000
7.	Bank Charges and support cost	\$18,000

JTA		
8.	JTA , including Chairperson’s contract, Executive Board	\$45,000
DBCP		
9.	DBCP chair and other travel	\$10,000
10.	DBCP Capacity Building	\$10,000
11.	Other DBCP expenses	\$15,000
	Reconciled prior CLS Expenses	\$60,000
	Reconciled prior IOC Expenses	\$25,000
SOT		
12.	SOT chair and other travel	\$5,000
13.	Other SOT expenses	\$2,000
WMO		
14.	WMO activities ²	\$10,000
	Total	\$371,000

Ref.: 05892/2018-11 085-WIGOS/OSD
Approved by Fernando Belda Esplugaes, Thu Mar 01 11:33:12 UTC 2018

12.5.5 It was noted that an account reconciliation has been completed between the WMO and IOC. The conclusion is a payment of \$60,000 to CLS and a payment of \$25,000 to the IOC is necessary to complete this reconciliation.

12.5.6 In order to simplify the monitoring of indirect and bank charges to the DBCP Trust Fund, the nations contributions and WMO expenses for indirect costs and bank charges will be maintained in the JCOMMOPS sub-program of the trust fund.

DBCP Principles

12.5.7 The Panel recalled that DBCP operates on member nation contributions, and these contributions are spent in accordance with member instructions, or in the case of no instruction, contributions will be made to the general operation of JTA, DBCP, SOT, JCOMMOPS, and WMO as follows: JTA 0%, DBCP 31%, SOT 8%, and JCOMMOPS 61%, and WMO 0%.

12.5.8 The contributions for the DBCP are deposited into two accounts, the DBCP Trust Fund and the JCOMM Trust Fund. Both trust funds are with the WMO. The JCOMM TF is only for the DBCP Technical Coordinator salary. All other DBCP TC costs are in the DBCP TF. Expenditures from the DBCP Trust Fund for the JTA, DBCP, SOT, JCOMMOPS, and WMO activities are now

² Using funds made available by contributors (e.g. JTA) for WMO Secretariat

approved by each separate chair instead of being subject to the sole approval of the DBCP chair.

12.5.9 A five-year summary below (table 2), shows the total costs for all program activities have continually decreased. These are “actual” costs lifted from the original WMO financial statements and include costs and contributions for all programs utilizing the trust fund, not just the DBCP panel itself. The balance closing in the table may not represent encumbrances and expenses that are not resolved by these reports. Note that the JCOMM TF covers most of the cost of the DBCP TC, \$75,000.

DBCP Trust Fund								
	A	B	C	D	E	F	G	H
		DBCP-31	DBCP-32	DBCP-33				
	(\$ - U.S. Currency)	2014	2015	2016	2017	2017	2017	2018
		Actual	Actual	Actual	Jan - Jun	Jul - Dec	Estimate	Estimate
1	Balance Brought Forward	249,329	153,908	74,544	143,798	-	143,798	167,287
2	Contributions	126,275	94,348	141,553	86,764	35,000	121,764	169,538
3	Adjustments	64,195	-		7,725	-	7,725	-
4	Funds Available	439,799	248,256	216,097	238,287	35,000	273,287	336,825
5								
6	Direct Costs	256,911	156,223	59,876	41,875	46,125	88,000	236,000
7	Indirect Costs	28,979	17,489	12,423	1,442	16,558	18,000	18,000
8	Total Costs	285,890	173,712	72,299	43,317	62,683	106,000	254,000
9								
10	Balance Closing	153,909	74,544	143,798	194,970	(27,683)	167,287	82,825
The DBCP Technical Coordinator's Salary is charged to the JCOMM Trust Fund. All other DBCP TC costs are charged to the DBCP TF.								
Table 2								

Table 2: DBCP account summary

12.5.10 Mr. Locklear thanked the Member States for their ongoing contributions to the DBCP. Some contributions may have been received since the last reporting period back in June. Lastly, contributions for 2018 are assumed to be consistent with 2017 unless told otherwise. Below in Table 3 is a summary of Nation contributions to the DBCP Trust Fund since 2014

Nation Contributions					
(\$ - U.S. Currency)	2014	2015	2016	2017	2018
Currency Rates as of 19-10-17	Actual	Actual	Actual	Actual	Estimate
E-SURFMAR	54,720	44,893	54,115	51,227	56,632
CLS	28,342	25,578	29,457	21,058	25,364
Environment Canada			20,590	2,240	21,495
Bureau of Meteorology, Australia	15,918	13,765	12,690	12,239	12,502
National Institute of Ocean Technology, India*	10,068		10,098		4,600
South African Weather Service (SAWS)*	5,502	4,406	8,870		4,274
BSH, Germany*	9,472	3,809	3,822		3,847

Meteorological Services of New Zealand*	2,253	1,897	1,911		1,923
United States (Contribution to JCOMM TF for DBCP)	75,000	75,000	75,000	75,000	75,000
Total	201,275	169,348	216,553	161,764	205,637

*Nation contributions not posted as of the June reporting period.

Table 3: DBCP Nation Contributions

12.5.11 In light of the reduced yearly closing balance and uncertainty in carrying forward obligations, the DBCP Financial Advisor cautioned against expenditures other than the most necessary, i.e. support for the DBCP/OceanSITES Technical Coordinator.

12.5.12 The panel expressed its appreciation for the skill and engagement Mr Locklear has demonstrated through his presentation.

12.5.13 The panel discussed the role of specific allocations and in-kind contributions in the financial statements. Mr Locklear emphasized that nations must take a realistic view toward how their in-kind contributions will support activities, because support costs are a necessary part of any DBCP activity. A rational balance between cash and in-kind contributions must be made. The WMO appreciates that in-kind contributions are a part of any engagement in WMO activities by nations and requests statements of such as an annex to the annual report.

12.5.14 The Panel was reminded that DBCP TF receives contributions for the activities of the JTA, DBCP, SOT, JCOMMOPS and the WMO. The Panel agreed that contributors to the TF should be invited to identify how their contributions should be distributed through the JTA, DBCP, SOT, JCOMMOPS and WMO projects.

12.5.15 WMO Secretariat has made improvement to the DBCP TF tracking by introducing different projects (i.e. JCOMM OPS, DBCP, SOT, JTA, WMO) to track the expenses. The Panel agreed that starting in 2018, the 2018 Contributions and expenses should be allocated to the appropriate Project and the remaining balance at the end of the fiscal year should be carried forward within specific projects.

Action 12.5/1: To reduce the overhead costs which may incur due to currency difference (non CHF), WMO Secretariat to request TF contributing countries if the contributions can be made in CHF **(Secretariat; Dec 2017)**

13. EXECUTIVE DECISIONS

13.1 DBCP Operating Principles

13.1.1 The Panel was notified on the changes to the DBCP operating principles. Based on the discussion during the session, the Panel was asked to provide their feedback on the Operating Principles. The DBCP Operating Principle are given in Annex IV.

Action 13.1/1: Panel members are requested to provide input to the Implementation Strategy and Implementation Plan before 31st January 2018. Send the two document to the DBCP Panel. **(TC; 10 Dec 2017)**

13.2 Review of action items from the previous DBCP Session

13.2.1 Mr. Long Jiang presented a review of [action items](#) form DBCP-32. The Panel closed completed actions. Open action items list is available on the ftp site¹.

13.3 Work plans and priorities for the Panel and the Technical Coordinator

13.3.1 In addition to the Regular duties identified in the ToR of the DBCP TC, the TC's work plan and priorities for the next intersessional period is captured in the new DBCP action items (See Annex III)

14. ELECTION OF CHAIRPERSON AND VICE-CHAIRPERSONS

14.1 The Panel was invited to elect its Chairperson and Vice-chairpersons for the next intersessional period.

14.2 Mr Jon Turton is eligible to work one more year and the Panel unanimously re-elected him as the Chair of the DBCP for next intersessional period.

14.3 Previous vice chair for the Asia Region, Ms. Yu Tin was re-elected unanimously to continue in her duties as the vice chair for the Asia Region during next Intersessional period.

14.4 Dr. Rick Lumpkin for AOML/USA was proposed as the vice chair for the North American Region by Ms Laura Medioris and seconded by Ms Jennifer Lewis. There were no other nominations proposed and Dr. Rick Lumpkin was appointed as the vice chair for the North American Region. The Panel thanked the outgoing vice chair Mr. Shannon McArthur for the North American Region.

14.5 Mr. Boris Kelly-Gerreyn, was proposed as the vice chair of the Southern Hemisphere by Mr. Johan Stander and seconded by Mr. Shawn Dolk. It was the only nomination for the vice chair of the Southern Hemisphere and he was elected to the position. The Panel thanked the outgoing vice chair Mr. Johan Stander for his dedicated contribution to the Panel as the vice chair.

14.6 It was decided by the Panel that for practical reasons the term for the members of the Executive Board should be for two years. Executive Board members shall be eligible for re-election in their respective capacities, but would serve in principle for no more than two consecutive terms.

15. REVIEW OF ACTIONS/RECOMMENDATIONS

15.1 The Secretariat presented a list of new actions and recommendations to the Panel. The Panel reviewed the actions (See Annex III) to be included in the forthcoming intersessional workplan as appropriate, taking into account of updates from TTs and AGs, and discussions during DBCP-33.

¹ <ftp://ftp.jcommops.org/DBCP/meetings/2017/Actions%20and%20Recommendations%20per%20DBCP-33.docx>

Action 15.0/1: Review and update the Recommendations and meeting report (provided in Google doc) (***DBCP Panel; 31st Jan 2018***)

16. DATES AND PLACE FOR THE NEXT SESSION

16.1 Mr. Johan Stander offered to host DBCP-34 in Cape Town in October 2018 by the South African Weather Service. Johan will confirm the dates of the meeting based on the venue availability in October.

16.2 The Panel agreed and thanked Mr. Johan Stander for the offer to hold the DBCP-34 in Cape Town, South Africa during October 2018.

17. CLOSURE OF THE SESSION

17.1 In closing the session, Mr Jon Turton thanked the Secretariat, the Chairs of the Action Groups, Task Teams and Pilot Project groups, the Technical Coordinator, national representatives, and all participants for their participation and contributions to the meeting and to the work of the Panel.

17.2 The Secretariat expressed appreciation to JCOMMOPS staff and Ifremer for organizing and hosting the meeting in Brest, France.

17.3 The DBCP-33 session was closed at 13:30 on Friday 17 November 2017.

ANNEX I
AGENDA DBCP-33 2016

- 1 Opening and Welcome to the DBCP Session**
- 2 Scientific and Technical Workshop**
- 3 National Reports**
 - 3.1 Country reports
 - 3.2 National risk analysis information format
- 4 Opening of the DBCP Business Session**
 - 4.1 Adoption of the agenda
 - 4.2 Working arrangements
- 5 Report by the Executive Board**
- 6 JCOMMOPS Report by the DBCP-TC**
- 7 Pilot Projects**
 - 7.1 Pilot Project on High Resolution Sea Surface Temperature (PP-HRSST)
 - 7.2 Pilot Project-WET
- 8 Recommendations by the Action Groups**
 - 8.1 Global Drifter Programme (GDP)
 - 8.2 International Arctic Buoy Programme (IABP)
 - 8.3 International Buoy Programme for the Indian Ocean (IBPIO)
 - 8.4 International Programme for Antarctic Buoys (IPAB)
 - 8.5 International South Atlantic Buoy Programme (ISABP)
 - 8.6 DBCP-PICES North Pacific Data Buoy Advisory Panel (NPDBAP)
 - 8.7 Surface Marine programme of the Network of European Meteorological Services, EUMETNET (E-SURFMAR)
 - 8.8 Tropical Moored Buoys Implementation Panel (TIP)
 - 8.9 International Tsunameter Partnership (ITP)
 - 8.10 Other regional activities
- 9 Recommendations by the Task Teams**
 - 9.1 Task Team on Instrument Best Practices and Drifter Technology Development (TT-IBPD)
 - 9.2 Task Team on Moored Buoys (TT-MB)
 - 9.3 Task Team on Wave Measurements (TT-WM)
 - 9.4 Task Team on Capacity-Building (TT-CB)
 - 9.5 Task Team on Data Management (TT-DM)
 - 9.5.1 Recommendations of the Task Team
 - 9.5.2 Recommendations of the Buoy data management centres
- 10 Issues for the Panel**
 - 10.1 Implementation of the Outreach Strategy to Reduce Damage to Ocean Data Buoys From Vandalism
 - 10.2 Satellite data telecommunications
 - 10.2.1 Satcom Forum
 - 10.2.2 Specific satellite systems such as Iridium and ARGOS
 - 10.3 Environmental stewardship and compliance of buoy operators
 - 10.4 Emerging technologies networks (e.g. unmanned surface vehicles)
- 11 Strategic Planning Discussion**
 - 11.1 Addressing the synergies between DBCP and SOT
 - 11.2 Contributions to Services/Research to include Global Framework for Climate Services (GFCS)
 - 11.3 WMO Integrated Global Observing System (WIGOS)
 - 11.4 DBCP Implementation Strategy

12 Organizational Issues

- 12.1 DBCP Terms of Reference
- 12.2 JCOMMOPS Management
- 12.3 JCOMM activities and management and decisions from JCOMM-V
- 12.4 Report on decisions of WMO and IOC governing bodies
- 12.5 Financial reports

13 Executive Decisions

- 13.1 DBCP Operating Principles
- 13.2 Review of action items from the previous DBCP Session
- 13.3 Work plans and priorities for the Panel and the Technical Coordinator

14 Election of chairperson and vice-chairpersons

15 Review of Actions/Recommendations

16 Dates and Place for the Next Session

17 Closure of the Session

ANNEX II

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**ANNEX III
ACTION LIST/WORKPLAN
DBCP-33 New Actions**

No	Ref. Item DBCP-33	Action Item	by	Deadline
1	3.1/1	Provide a template for national report presentations (5-6 slides with network information; challenges and opportunities)	DBCP EXB	June 2018
2	3.2/1	Discussion on the need to develop a quantified risk analysis and management system of the observing networks at national level and EXB decide/develop a mechanism to collect this information	DBCP-EXB/TC	DBCP-34
3	6.0/1	Investigate the underlying causes of the decline in the number of drifting buoys with air pressure observations and work with the community to address the decline	TC	March 2018
4	6.0/2	Develop moored buoy metadata in line with WIGOS Metadata Standards and ensure timely ingestion to JCOMMOPS database	TC/TT-MB(J Turton)	March 2018
5	6.0/3	Further refine KPIs and targets for the Polar regions	IABP & IPAB/ TC	DBCP-34
6	7.1/1	Provide a list of PP-HRSST members. DBCP Chair will coordinate with David Meldrum and send letters out to the EUMETSAT and ESA.	David Meldrum/Chair	Feb 2018
7	7.1/2	Approve PP-HRSST budget request for travel support	DBCP-EXB	March 2018
8	7.1/3	Integrate the metadata database from HRSST to the JCOMMOPS database	JCOMMOPS/TC	DBCP-34
9	8.2/1	WMO/IOC Secretariats send a letter, co-signed by the JCOMM Co-Presidents to the Russian Federation to remind them of the signed resolution in support of the IPY regarding the need to fill the noteworthy and sizable observation gap in the Eurasian Arctic as part of the International Arctic Buoy Programme (IABP)	WMO/IOC, Co-Presidents of JCOMM	March 2018
10	8.3/1	Add the IBPIO Trello webpage https://trello.com/b/QRNleOqD to the JCOMM and JCOMMOPS website	Secretariat/ TC	March 2018
11	8.6/1	Participate in 'adopt a drifter program', or other community outreach/education activities, and make materials available at the DBCP/ JCOMM website (NPDBAP, WMO/IOC/JCOMM)	DBCP members/TC	DBCP-34

12	8.8/1	Work with TIP to identify the partnerships in Tropical moored buoy array and reflect such collaboration on the JCOMMOPS database appropriately	JCOMMOPS/TC	DBCP-34
13	9.1/1	Define and adopt a universal format for drifter specification sheets, that can be easily imported into commercially available searchable database software, during the next inter-sessional period	TT-IBPD	February 28th 2018
14	9.1/2	Define a BUFR sequence for directional wave spectral observations from drifters	DBCP chair/TT-DM/Secretariat	June 30th 2018
15	9.1/3	Further revise the METADATA structure and content with regards to drifters in cooperation with JCOMMOPS and WIGOS Task Team for Metadata (Currently Joe Swaykos - joe.swaykos@noaa.gov)	TT-IBPD/TC/JCOMMOPS	DBCP-34
16	9.2/1	Send a reminder letter to the PRs identifying the issue with BUFR transition for moored buoys, and request the relevant organizations to make it a priority	WMO Secretariat	May 2018
17	9.2/2	Capture knowledge and lessons learned on use of MetOcean sensors in a DBCP Technical Document. A template capturing knowledge and lessons learned on use will be developed, distributed and submitted to DBCP Panel for final review. (Chapters 1-4 have been completed)	R. Venkatesan	DBCP-34
18	9.2/3	DBCP guidelines for oceanographic instruments-draft (http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=20768) was presented and urged members to review and finalize before DBCP 34	DBCP Panel	DBCP-34
19	9.2/4	Differentiate the sail drone platforms from DB in the JCOMMOPS database and identify their WMO numbers	TC	DBCP-34
20	9.2/5	Publish the Saildrone WMO IDS and bulletin headers through the GTS and WMO newsletter	TC	Jan 2018
21	9.2/6	Collect and compile the MB time stamping practices from MB operators	TC	Feb 2018
22	9.2/7	Develop a document on how the time stamp should be reported on the GTS message	TT-MB with TC	DBCP-34
23	9.2/8	The DBCP Members are requested to continue reporting on vandalism incidents. JCOMMOPS to maintain a contact list and develop mechanisms within to assist with adrift moored buoys recovery. This can be the same as the JCOMM point of contacts (IOC/WMO)	TC/ Secretariats	DBCP-34
24	9.2/9	Develop template for "lessons learned use of Metocean Sensors" (modified from Vandalism) submit to TT-MB and TC (from Rec 22, DBCP-32),	R. Jensen	DBCP-34

25	9.2/10	Populate historical metadata for any MetOcean (Coastal Buoy network) for entire period of record.	DBCP Members/TC	DBCP 34
26	9.2/11	Review the moored buoy metadata template and make necessary adjustment to comply with WIGOS metadata standard	TC/J. Turton on behalf of TT-MB	DBCP 34
27	9.2/12	Coordinate with TC on additions/modifications of the existing metadata template to include wave sensor, payload-analysis packages, and version control. Expand the metadata entries to capture all historical information.	TC/TT-MB	DBCP-34
28	9.4/1	Request DBCP-Executive Board commences Succession planning for Chair TT-CB. Dr. Sidney Thurston (USA), who has been privileged to serve in this capacity for one decade, will step down after DBCP-33, or until a successor can be identified during 2018. Solicit nominations for new Chair of TT-CD	DBCP EXB	2018
29	9.4/2	Coordinate and report on DBCP TT-CD activities with the two new JCOMM- CD coordinators	TT-CD	Jan 2018
30	9.4/3	DBCP TT-CD representative to be involved in the regular JCOMM CD meetings	TT-CD	Jan 2018
31	9.5.1/1	GTS Centers those convert observation data, for local use, received from a foreign GTS center (e.g. BUFR converted into FM13) must not resend the converted data onto the GTS.	DBCP members	ASAP
32	9.5.1/2	Provide input to the JCOMM Data Management strategy document (http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=19895)	TT-DM	Feb 2018
33	9.5.1/3	Collaborate with the GDACS for drifting buoys providing metadata and quality controlled non-interpolated data for the creation of NetCDF files or appropriate web services for archival and distribution.	TT-DM	May 2018
34	9.5.1/4	Identify a potential candidate as a GDAC for moored buoy data	TT-MB/Secretariat	DBCP-34
35	9.5.2/1	Review the two GDAC documents (Drifter data management http://dx.doi.org/10.13155/52037 and Proposal for drifting buoy metadata in the WIGOS Metadata Standard http://dx.doi.org/10.13155/52040) and send comments to the authors	TT-DM	By 31 December 2017

36	10.1/1	Request JCOMM to establish a cross-cutting Task Team which can bring together experts from WMO-IOC-IMO-FAO- UNDOLAS-IHO - Marine Aids to Navigational and Lighthouse Authorities IALA-with DBCP to discuss the strategy with a likely date for 1 st meeting during IOC Tsunami Symposium planned for early 2018 and request WMO/IOC to convene this meeting.	WGV/Secretariat	By January 2018
37	10.1/2	Requests members to provide any existing materials, tools, products, and methods of communication on vandalism awareness for the Working Group on Vandalism(WGV) to review and to be uplinked on the DBCP website through DBCP TC. WGV will assess these shared materials and create guidelines for the development of new materials by next DBCP session.	DBCP members/WGV	By early January 2018.
38	10.3/1	Send email soliciting views on the matter regarding amending the DBCP Terms of Reference concerning safety and environmental stewardship of buoy operators to include for consideration by the DBCP Executive Board	DBCP EXB	Feb 2018
39	10.4/1	Provide nominations for the OCG Vice-Chair on New Technology to the DBCP Chair and/or Secretariat	DBCP members	March 2018
40	11.1/1	Start a discussion/dialogue and develop a SWOT analysis to assess the advantages, disadvantages, consequences concerning addressing the synergies between DBCP and SOT to be presented to the SOT 2019 meeting	DBCP-EXB/J Stander	April 2018
41	11.3/1	Add a section to include non-NMHSs partnerships information in the National report	Secretariat	DBCP-34
42	11.4/1	Update the DBCP Implementation Strategy reflecting the discussions at the DBCP-33 and send to the DBCP Panel for review	DBCP EXB	March 2018
43	11.4/2	Circulate SWOT analysis and recommendations, invite comments. SWOT analysis to be reviewed and appropriate recommendations to be adopted intersessionally by the EXB	Sidney Thurston/Members/EXB	End of April 2018
44	12.1/1	Send comments on the DBCP ToR to the Secretariat (http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=20302)	DBCP Panel	January 2018
45	12.2/1	Develop framework describing how DBCP solicit member contributions towards making the funding of DBCP/JCOMMOPS more stable and sustainable	Secretariat	April 2018
46	12.4/1	Provide a presentation template for TT reports	Secretariat/DBCP EXB	June 2018
47	12.5/1	To reduce the overhead costs which may incur due to currency difference (non	Secretariat	Dec 2017

		CHF), WMO Secretariat to request TF contributing countries if the contributions can be made in CHF		
48	13.1/1	Panel members are requested to provide input to the Implementation Strategy and Implementation Plan before 31 st January 2018. Send the two document to the DBCP Panel.	TC	15 th Dec 2017
49	15/1	Review and update the Recommendations and meeting report (https://drive.google.com/drive/folders/1GhtuPMnWo3VvfSwXdLlhhqCho3QkQVC-)	DBCP Panel	31 Jan 2018
50	12.4/2	Continue to submit metadata particularly all the mandatory information identified in WIGOS metadata standard to the JCOMMOPS	DBCP members	Ongoing
51	12.4/3	Actively engage, collaborate and contribute resources towards implementing the recommendations of the first report on the Tropical Pacific Observing System 2020 project	DBCP members	Ongoing
52	12.4/4	Actively engage, support and collaborate to collect existing education and outreach materials related to national or regional mitigation of data buoy vandalism efforts	DBCP members	Ongoing
53	12.4/5	Contribute towards the implementation of the Outreach Strategy to Reduce Damage to Ocean Data Buoys from Vandalism or Interference	DBCP members	Ongoing
54	12.4/6	Support the IOC Resolution on a proposal for an International (UN) Decade of Ocean Science for Sustainable Development to be established for the period 2021-2030	DBCP members	Ongoing

DBC3-33

Recommendations

No.	Ref.Item DBC3-33	Recommendations
1	2.0/1	Provide an introduction/overview of DBC3 in future DBC3 sessions
2	2.0/2	Include more S&T contributions/presentations with a focus on what needs to be done in S&T workshop
3	2.0/3	DBC3 noted the requirements of GOOS EOY ocean sensor development and needs to be addressed in future
4	8.1/1	Recognizing that the Global Drifter Program provides a unique opportunity to involve countries with fewer resources for marine observations and the potential for improving the GDP coverage recommended that special attention be given for the GDP engagement in capacity building efforts and workshops hosted in areas with drifter gaps, such as the Pacific Islands.
5	8.3/1	Need for continued support from JCOMMOPS (DBC3 TC and Ship Coordinator TC) to encourage participation from DBC3 members for instrument deployment/ship recruitment
6	8.6/1	The DBC3 recognizes the efforts of the buoy community to increase participation with school children to promote the use of buoy data. Whether through the Adopt a Drifter Program, or other community outreach activities, members are encouraged to provide insight and expertise.
7	8.7/1	Socioeconomic benefit study of moored buoys, need to go beyond the NMHS. Thus recommended to include wider community in this effort - recommend first step is identification of stakeholders in the UN community working with the WMO and IOC Outreach Departments. Future actions may include DBC3 representatives participating in broader ocean events particularly related to SDGs.
8	8.7/2	DBC3 guidelines for oceanographic instruments (draft) was presented and urged members to review and finalize before DBC3 34
9	8.8/1	Establish a core TPOS 2020 Tropical Mooring Array (TMA). This should define and document the "Core TMA" similar to the "Core Argos" document. A baseline configuration should begin with mooring configuration, quality control (QC), and accuracy; Incorporate developments for TAO, PIRATA and RAMA; further refinements should be made with current understanding of future requirements. Overlapping deployments should be implemented when prototyping emerging methodologies or technologies.
10	8.8/2	Request TPOS 2020 to develop Technical Specifications/Guidance for TPOS TMA
11	8.8/3	Consider adopting RAMA-2.0 once review is complete.
12	8.9/1	Vandalism to tsunameters poses a major risk to public safety. DBC3 is requested to continue its efforts to address this issue at the highest levels in the local, national, regional, and global bodies to protect vulnerable communities..
13	8.9/2	The panel noted that the Joint Task Force (JTF) for SMART Subsea Cables, sponsored by the International Telecommunication Union (ITU), together with WMO and IOC, is exploring the use of undersea cables for ocean observations supporting tsunami as well as climate-quality data from the oceans has progressed well. ITP to continue to interact with JTF and report

		on developments to DBCP Panel.
14	9.1/1	The TT-IBPD task-team recommends that drifter manufacturers pay particular attention to the material, quality, and thickness of the tether, to its connection to the drogue wheel and to the surface buoy, and that they use drogue wheels of sufficient quality and strength to maximize the lifetime of the drogue.
15	9.1/2	Panel members should request life span statistics from manufacturers based on their requirements when considering ordering drifters based on different buoy types and for different ocean areas
16	9.3/1	DBCP recommended to promote complementary wave measurements from existing and new satellites through JCOMM satellite communication channels.
17	9.3/2	Encourage the three Programme Areas of JCOMM (JCOMM OPA, DMPA, SFSPA) to engage in the activities of the cross-cutting TTWM, addressing the priorities noted in the vision presented at the JCOMM-5 TECO for wave measurement, data and metadata management and user requirements for services, as noted in Appendix 3 of DBCP-33-Doc 9.3, during the next intersessional period of JCOMM
18	9.4/1	On bringing awareness on end-use of drifter data India agreed to involve in their ongoing ocean technology student- camp program for school children DBCP supports such unique CB exercise
19	9.4/2	Representative from Saudi Arabia mentioned the importance and lack of Capacity building in the middle eastern region. Thus suggested to engage more of the middle eastern countries in the JCOMM Capacity building activities working with the DRA Program of WMO seek future opportunities for DBCP representatives to share the work of DBCP.
20	9.4/3	Recommended to present or make aware of the NPOMS activities at the ESCAP/WMO Typhoon Committee meeting planned in Feb 2018 in Vietnam (http://www.typhooncommittee.org/)
21	9.5.1/1	The trial JCOMM Global Data Assembly Centres (GDACs) for drifting buoys of Météo-France (former SOC) and MEDS (former RNODC/DB) to continue to work towards the implementation of a routine procedure to compare GTS Bulletin Headers between the two centres.
22	9.5.1/2	Manufacturers are invited to use the existing active templates prior to the creation of their own. In case none of the existing templates is suitable for a given set of buoys, a new one may be designed in coordination with the DBCP - TT-DM team. A document describing recommended data formats for Iridium transmission is available at http://esurfmar.meteo.fr/doc/o/db/others/DB_Iridium_formats.pdf
23	9.5.1/3	TT-DM reminds all buoy manufacturers to adhere to the guidelines set by the approved satellite message templates which include testing the full range of sensor output availability, as well as compliance with NULL reporting identifiers, through the satellite constellation during development
24	10.1/1	Member countries to implement and disseminate the outreach strategy for combating data buoy vandalism (http://www.jcommops.org/dbcp/doc/2017-MISC-OBS-Data-Buoys-Vandalism-Strategy-171246_en.pdf)
25	10.1/2	The Working Group on Vandalism will design a Future Pilot Project of a stakeholder workshop to build awareness of the vandalism issue to be implemented at two sites (potentially Pacific and Indian Ocean) and may request DBCP Capacity Building for financial support to be held in 2018-2019
26	12.2/1	Provide input as required to the JCOMMOPS review committee to complete the planned external review of JCOMMOPS

ANNEX IV

LINKS TO THE DOCUMENTS

DBCP Operating Principles;

http://www.jcommops.org/dbcp/doc/DBCP_Operating-Principles.pdf

DBCP Implementation Strategy;

http://www.jcommops.org/dbcp/doc/DBCP_Impl_Strategy.pdf

ANNEX V

ACTION GROUP SUMMARIES

- 1 Global Drifter Programme ([GDP](#))
- 2 International Arctic Buoy Programme ([IABP](#))
- 3 International Buoy Programme for the Indian Ocean ([IBPIO](#))
- 4 International Programme for Antarctic Buoys ([IPAB](#))
- 5 International South Atlantic Buoy Programme ([ISABP](#))
- 6 DBCP-PICES North Pacific Data Buoy Advisory Panel ([NPDBAP](#))
- 7 Surface Marine programme of the Network of European Meteorological Services,
EUMETNET ([E-SURFMAR](#))
- 8 Tropical Moored Buoys Implementation Panel ([TIP](#))
- 9 International Tsunameter Partnership ([ITP](#))

GLOBAL DRIFTER PROGRAM (GDP)

Name of Action Group	Global Drifter Program
Date of report	25 September 2017
Overview and main requirements addressed	Global Drifter Program (GDP). Goals: 1. Maintain a global 5x5° array of ~1300 satellite-tracked surface drifting buoys to meet the need for an accurate and globally dense set of in-situ observations of mixed layer currents, sea surface temperature, atmospheric pressure, winds and salinity; and 2. Provide a data processing system for scientific use of these data. These data support short-term (seasonal to interannual) climate predictions as well as climate research and monitoring.
Area of interest	Global ocean
Type of platform and variables measured	Lagrangian drifters measuring surface velocity, SST; some drifters also measure sea level pressure, wind, salinity, and/or sub-surface temperature profiles
Targeted horizontal resolution	5 degree x 5 degree (~1300 units)
Chairperson/Managers	Dr Rick Lumpkin, NOAA/AOML, USA Dr Luca Centurioni, SIO/CIMEC, USA
Coordinator	Operations Manager: Mr Shaun Dolk, NOAA/AOML, USA
Participants	Numerous national and international institutions
Data centre(s)	GDP Data Assembly Center (DAC) - Manager: Ms Mayra Pazos, NOAA/AOML, USA
Website	http://www.aoml.noaa.gov/phod/dac/
Meetings <i>(meetings held in 2016/2017; and planned in 2017/2018)</i>	None
Current status summary	Annual size of array was 1419 drifters. Current size as of 25 September 2017 is 1469 drifters.
Summary of plans for 2017-2018	Maintain array at ~1300 drifters

International Arctic Buoy Programme (IABP)

Name of Action Group	International Arctic Buoy Programme (IABP)
Date of report	30 Sept. 2017
Overview and main requirements addressed	Participants of the IABP continue to work together to maintain a network of drifting buoys on the ice of the Arctic Basin to provide meteorological and oceanographic data for real-time operational requirements and research purposes including support to the World Climate Research Programme (WCRP) and

	the World Weather Watch (WWW) Programme.
Area of interest	Arctic Ocean and its marginal seas, excepting Exclusive Economic Zones, where agreements of the Coastal States have not been obtained.
Type of platform and variables measured	Buoys on ice and/or in water measuring basic meteorological variables such as atmospheric air pressure and surface temperature. Other variables such as: atmospheric pressure tendency, air chemistry (e.g. ozone), snow and sea-ice properties, as well as sub-surface oceanographic characteristics (e.g. temperature and salinity)
Targeted horizontal resolution	250 km x 250 km
Chairperson/Managers	Chairperson: Christine Best, Meteorological Service Canada Vice Chairperson: Dr Christian Haas, York University, Toronto, Canada; and: Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany
Coordinator	Dr. Ignatius Rigor, Polar Science Center, University of Washington, Seattle, WA, USA
Participants	Participants range from Science Institutions to Universities to Government Agencies. http://iabp.apl.washington.edu/overview_participants.html Participant contributions are shown on this site http://iabp.apl.washington.edu/overview_contributions.html
Data centre(s)	http://iabp.apl.washington.edu/
Website	http://iabp.apl.washington.edu/
Meetings <i>(meetings held in 2016/2017; and planned in 2017/2018)</i>	Participants held their annual meeting in Toronto, Canada, on June 9, 2017 hosted by the University of Toronto and York University. The next meeting marks the 40 th anniversary of the Arctic Buoy Programme (1979-2018). We plan to have a technical session focusing on emerging technology to observe the changing Arctic Ocean. The meeting location is still open, but Seattle, Washington D.C., and Helsinki were mentioned as possible locations.
Current status summary <i>(mid-2017)</i>	As of June 2017, 108 buoys were reporting compared to 142, and 162 on June 2016 and 2015 respectively.
Challenges/Opportunities/Risks <i>(intersessional period)</i>	The primary challenge for the IABP is maintain the network in the Eurasian Basin of the Arctic Ocean (Fig. 1). Collaboration with the Arctic and Antarctic Research Institute and other Russian Agencies is critical. US sanctions have been lifted, but new hurdles appear such as difficulty in obtaining permits for research cruises.

Summary of plans for 2018	<p>Summer is the primary deployment season in the Arctic.</p> <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>A broad overview map of our deployments plans is shown in Fig. 3. Details may be viewed at http://iabp.apl.washington.edu/overview_deploymentplans.html.</p> <p>Plans for future years will be similar.</p>
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International Buoy Programme for the Indian Ocean (IBPIO)

Name of Action Group	International Buoy Programme for the Indian Ocean (IBPIO)
Date of report	31 September 2017
Overview and main requirements addressed	<p>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...).</p>
Area of interest	Indian Ocean North of 55°S and between 25°E and 120°E (130°E in the North of Australia)
Type of platform and variables measured	<p>Drifting buoys: Air pressure, SST, (wind)</p> <p>Moorings: air pressure, wind, air temperature, SST, waves, relative humidity, radiation, rainfall, SSS, subsurface temperature and salinity, current...</p>
Targeted horizontal resolution	500 km x 500 km
Chairperson/Managers	<p>Mr Shaun Dolk, NOAA/AOML, USA - Chair</p> <p>Mr Johan Stander, SAWS, South Africa - Vice Chair</p>
Coordinator	Mr Gilbert Emzivat, Météo-France
Participants	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).)
Data centre(s)	CORIOLIS as French trial GDAC for drifting buoys DFO/OS as Canadian trial GDAC for drifting buoys NOAA/AOML for DBCP/GDP
Website	http://esurfmar.meteo.fr/ibpio/ (new URL)
Meetings	Annual meetings in conjunction with DBCP meetings. IBPIO 20 in Brest (France) in November 2017 The same next year.
Current status (mid-2017)	260 drifters (183 with Air Pressure) 29 moored buoys (14 from RAMA array)
Challenges/Opportunities/Risks (<i>intersessional period</i>)	IIOE-2 meeting (February 2017) participation from ABOM to coordinate an action plan for deployments, cooperation
Summary of plans for 2018	Maintain a network of 150 drifters at least. Adopt new RAMA design (RAMA-2.0) Maintain or expand the moored buoy arrays.

WCRP/SCAR International Programme for Antarctic Buoys (IPAB)

Name of Action Group	WCRP/SCAR International Programme for Antarctic Buoys (IPAB)
Date of report	11 Oct 2017
Overview and main requirements addressed	The Participants of the WCRP/SCAR International Programme for Antarctic Buoys (IPAB) work together to maintain a network of drifting buoys in the Southern Ocean, in particular over sea ice, to provide meteorological and oceanographic data for real-time operational requirements and research purposes. The IPAB was established in 1994 and became an Action Group of the Panel in October 1994.
Area of interest	South of 55°S and that region of the Southern Ocean and Antarctic marginal seas within the maximum seasonal sea-ice extent.
Type of platform and variables measured	Ice buoys measuring the following: <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
Targeted horizontal resolution	500 km x 500 km
Chairperson/Managers	Dr Petra Heil, AAD and ACE CRC, Hobart, Australia
Coordinator	Dr Christian Haas, York University, Toronto, Canada; and: Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany Dr. Ignatius Rigor, University of Washington, Seattle, USA
Participants	- Alfred Wegener Institute, Germany

	<ul style="list-style-type: none"> - Australian Antarctic Division, Australia - Bureau of Meteorology, Australia - British Antarctic Survey, UK - Finnish Institute for Marine Research, Finland - GI, University of Alaska Fairbanks, USA - IARC, University of Alaska Fairbanks, USA - National Ice Center, USA - National Snow and Ice Data Center NSIDC, USA - ISDM/MEDS, Dept. of Fisheries and Ocean, Canada - Meteorological Service NZ LTD, New Zealand - Norwegian Polar Institute, Norway - Polar Science Center, Univ. of Washington, USA - National Institute of Polar Research, Japan - JAMSTEC, Japan - Programma Nazionale di Ricerche in Antartide, Italy - DAMTP, UK - SAMS, UK - York University, Toronto, Canada - CLS/Service Argos, France - South African Weather Service, South Africa- Meteorological Office, UK - CRREL, USA
Data centre(s)	<p>Alfred Wegener Institute for Polar and Marine Research, Germany: http://www.pangaea.de/search?q=ipab http://data.meereisportal.de/gallery/index_new.php?lang=en_US&active-tab1=method&active-tab2=buoy National Snow and Ice Data Center NSIDC, USA: http://nsidc.org/data/docs/daac/nsidc0084_ipab_antarctic_buoys.gd.html</p>
Website	http://www.ipab.aq/
Meetings <i>(meetings held in 2016/2017; and planned in 2017/2018)</i>	<p>IPAB participants reported during the annual meeting of the International Arctic Buoy Programme IABP in Toronto, Canada, on June 9, 2017.</p> <p>It is considered to hold the next IPAB participants meeting during the POLAR 2018 SCAR & IASC Conference in Davos, Switzerland, 15-26 June 2018</p>
Current status summary <i>(mid-2017)</i>	<p>2 snow depth buoys, 2 IMBs, and 3 SVPs contributed by AWI were deployed on sea ice floes during a AWI Polarstern cruise in the Eastern Weddell Sea in January 2017, south of 70°S. Due to poor ice condition in the region, all deployed buoys died after a few day to several weeks.</p> <p>15 SVP (?) buoys were deployed in the Ross Sea in February by USIPAB using tourist cruise ships traveling between NZ and McMurdo. None survived more than a few months. In addition, a few SVPs are routinely deployed by USCGC Gould during her transits from Punta Arenas to the Antarctic Peninsula.</p> <p>The South African National Drifting Weather Buoy Programme deployed 14 NOAA weather buoys during the 2016/17 period, north of the ice edge. 5 more were handed over to representatives from South Georgia.</p> <p>The Meteorological Services Australia and New Zealand continue to operationally deploy numerous SVP's in the Southern Ocean, primarily north of the sea ice edge.</p>
Challenges/Opportunities/ Risks (2017/18)	<p>GTS transmission of data remains a challenge; need to raise awareness of buoy operators.</p> <p>Small number of buoys and short survival times remain important challenges. Need a boost for YOPP.</p>
Summary of plans for	USIPAB will deploy several SVPs in the Ross & Amundsen Sea.

2017/18	AWI will carry out a massive deployment campaign in the Southern Weddell Sea in February 2018 during Polarstern cruise PS111, including 6 snow buoys, 8 IMBs, and 8 SVPs. South African Weather service plans to deploy 10 X drifters for 2017/18, pending provision by NOAA.
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International South Atlantic Buoy Programme

Name of Action Group	
Date of report	27 Sept. 2017
Overview and main requirements addressed	The main objective of ISABP continues to 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 with Argos and Iridium transmitters, measuring sea level pressure, SST, salinity and sea-surface velocity
Targeted horizontal resolution	5 degrees x 5 degrees and continuously filling areas where gaps exist
Chairperson/Managers	Mayra Pazos, GDP, AOML, Miami, USA
Coordinator	Erik Valdes, GDP, AOML, Miami, 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 MEDS ,Canada, (GDAC for drifters) for archival and further distribution. Real time data is also archived at MEDS. GTS quality control is handled by AOML GDP for both Argos and Iridium and disseminated to the GTS by SIO GDP for Iridium drifters and by CLS-America for Argos drifters
Website	http://www.jcommops.org/dbcp/isabp/index.html http://www.oceanlan.org/isabp/en/ Data also available through: www.aoml.noaa.gov/phod/dac , and osmc.noaa.gov/Monitor/OSMC/OSMC.html
Meetings <i>(meetings held in 2016/2017; and</i>	ISABP meetings are held during DBCP. Last Meeting took place on October 2016 during DBCP-

<i>planned in 2017/2018)</i>	32 in San Diego, California, USA. A similar meeting is planned this year during DBCP-33 in Brest, France.
Current status summary (<i>mid-2017</i>)	As of September 25, 2017, there were a total of 229 drifters in the S.A. Region, 7 more than last year at this same time, of which 103 are SVP (68 Iridium), 126 SVPB (83 Iridium). Of the total, 66% are Iridium, compared to 22% Iridium last year. (Figure 3)
Challenges/Opportunities/Risks (<i>intersessional period</i>)	Populate hard to reach areas and maintain coverage
Summary of plans for 2018	Continue to address observational gap areas, increase the number of SVPB drifters in the region and transition from all Argos to Iridium drifters. Continue partnerships with SAWS, Tristan da Cunha Fisheries, Brazilian Navy and GDP for deployment opportunities and participation in the barometer upgrade program

PICES North Pacific Data Buoy Advisory Panel (NPDBAP)

Name of Action Group	DBCP-PICES North Pacific Data Buoy Advisory Panel (NPDBAP)
Date of report	28 September 2017
Overview and main requirements addressed	The goals of the NPDBAP are to deploy 60 SVPB drifters a year, and maintain 75 active buoys in the region.
Area of interest	North Pacific Ocean and marginal seas generally north of 30°N
Type of platform and variables measured	Lagrangian drifters measuring sea level pressure, SST, and sea-surface velocity
Targeted horizontal resolution	5° x 5°
Chairperson/Managers	Co-Chairperson for the NE Pacific: Dr. Rick Lumpkin, NOAA, United States Co-Chairperson for the NW Pacific: Dr. BG Lee, Jeju National University, South Korea
Coordinator	Mr Shaun Dolk, NOAA / AOML
Participants	Rick Lumpkin, BG Lee, Shaun Dolk, Ignatius Rigor, Champika Gallage, Mayra Pazos, Erik Valdes, Jooyoung Lee, Mathieu Ouellet, Serge Hagan-Deschamps, Myungwon Park, Sang Kill Park
Data centre(s)	Drifter Data Assembly Centre (DAC) Integrated Science Data Management (ISDM), Canada
Website	http://dbcp.jcommops.org/npdbap/
Meetings	Yearly meetings usually held in conjunction with DBCP

	meetings. Next meeting planned 15 November 2017 in Brest, France.
Current status summary	From 01 September 2016 to 31 August 2017, 85 drifters were deployed in the North Pacific Ocean. Of the 85 drifter deployments, 48 units were equipped with barometer sensors and the remaining 37 drifters were standard SVP type drifters.
Summary of plans for 2017	The goal for 2018 is to deploy 75 drifters, of which, 50 drifters will be equipped with barometer sensors.

**Operational Service of the Network of European Meteorological Services,
EUMETNET (E-SURFMAR)**

Name of Action Group	Operational Service of the Network of European Meteorological Services, EUMETNET (E-SURFMAR)
Date of report	30 September 2017
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 North of the South Atlantic (from 20S to 10N) in the framework of AtlantOS project (April 2015- March 2019).
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	E-SURFMAR: >100 drifting buoys, 4 moored buoys for satellite calibration/validation. AtlantOS: a network of 13 drifting buoys.
Chairperson/Managers	E-SURFMAR Operational Service Manager: Dr Paul Poli, Météo-France Expert Team-Data Buoy (ET-DB), Chairperson: Mrs María Isabel Ruiz Gil de la Serna, Puertos del Estado
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)	CORIOLIS as French trial GDAC for drifting buoys DFO/OS as Canadian trial GDAC for drifting buoys NOAA/AOML for DBCP/GDP
Website	http://www.eumetnet.eu/
Meetings	ET-DB meets once a year. ET-DB14 in Lisbon, 16-19 May 2017 Planned : ET-DB15 in a location to be determined later, May 2018
Current status (mid-2017)	141 E-SURFMAR drifting buoys in operation (all Iridium including 21 AtlantOS, and 32 SVP-B upgrades) + 5 others, all reporting AP. 4 E-SURFMAR supported moored buoys in operation, plus a further 30 others operated by members.
Challenges/Opportunities/Risks (<i>intersessional period</i>)	
Summary of plans for 2018	Maintain : <ul style="list-style-type: none"> - a network of 100 drifting buoys in North Atlantic, - a network of 13 drifting buoys in South Tropical Atlantic, - and the 4 reference moored buoys in operation. Trial experiments with drifting buoys measuring AP: <ul style="list-style-type: none"> - in the Mediterranean Sea, and - in the Arctic in support of the Year Of Polar Prediction (YOPP) and within IABP.

Tropical Moored Buoy Implementation Panel (TIP)

Name of Action Group	Tropical Moored Buoy Implementation Panel (TIP)
Date of report	30 Sept. 2017
Overview and main requirements addressed	The Tropical Moored Buoy Implementation Panel (TIP) oversees the design and implementation of the following components: <ul style="list-style-type: none"> • The Tropical Atmosphere Ocean / Triangle Trans-Ocean Buoy Network (TAO / TRITON), a central component of the ENSO Observing System, deployed specifically for research and forecasting of El Niño and La Niña; • The Prediction and Research Moored Array in the Tropical Atlantic (PIRATA) • The Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (RAMA)
Area of interest	The tropical ocean regions as part of an integrated approach to observing the climate system to address the research needs of CLIVAR and the operational strategies of GOOS and GCOS. Pacific Ocean: 8°N to 8°S; Atlantic Ocean: 21°N to 19°S; Indian Ocean: 15°N to 12°S.
Type of platform and variables measured	Tropical moorings with surface meteorological and sub-surface oceanographic sensors measuring surface wind, air temperature, relative humidity, SST and SSS on all surface moorings. Air pressure, precipitation, short wave radiation, long wave

	<p>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. Biogeochemical measurements, including CO₂ and O₂, are included 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: 68 moorings; Tropical Atlantic Ocean: 19 moorings ; Tropical Indian Ocean: 33 moorings
Chairperson/Managers	Dr. Mike McPhaden, PMEL, USA, Chairman Dr. Kentaro Ando, JAMSTEC, Japan, Vice-Chairman
Coordinator	Mr. Kenneth Connell, PMEL, USA
Participants	<p>TAO/TRITON: NOAA National Data Buoy Center (NDBC), Japan Agency for Marine-Earth Science and Technology (JAMSTEC)</p> <p>PIRATA: NOAA Pacific Marine Environmental Laboratory (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 Ocean Technology (NIOT), Indian National Institute of 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), Bay of Bengal Large Marine Ecosystem (BOBLME) program, and University of Tasmania.</p>
Data centre(s)	PMEL, NDBC, JAMSTEC, NCEI
Website	http://www.pmel.noaa.gov/gtmba http://tao.ndbc.noaa.gov/
Meetings <i>(meetings held in 2016/2017; and planned in 2017/2018)</i>	<ul style="list-style-type: none"> • CLIVAR Pacific Ocean Panel 11th session, Qingdao, China, 17-18 September 2016 • CLIVAR Open Science Conference, Qingdao, China, 19-23 September 2016 • TPOS 2020, 3rd meeting, Steering Committee in Lima, Peru, 25-28 October 2016 • PREFACE-PIRATA-CLIVAR Tropical Atlantic Conference, Paris, France, 28 Nov-2 Dec 2016 • Fall AGU Meeting, San Francisco, CA 12-16 December 2016

	<ul style="list-style-type: none"> • AMS 97th Annual Meeting, Seattle, WA, 23-26 January 2017 • CLIVAR GOOS Indian Ocean Panel 13th session and 7th session of the IndOOS Resource Forum (IRF-7), Perth, Australia, 30 Jan-3 Feb 2017 • GCOS-COOS-WCRP Ocean Observations Panel for Climate, 20th Session, Woods Hole, MA, 14-17 March 2017 • EGU General Assembly, Vienna, Austria, 23-28 April 2017 • Second Meeting of the TPOS 2020 Resource Forum (TRF-2), Honolulu, Hawaii, 16-17 May 2017 • Oceans 2017, Anchorage, AK, 18-21 Sept 2017 • NOAA Ocean Observing & Monitoring Division PI Community Workshop, Silver Spring, MD, 9-11 May 2017 • TPOS 2020 Western Pacific Workshop, Qingdao, China, 4-6 September 2017 • Indian Ocean community workshop, La Jolla, CA, 11-13 September 2017 • TPOS 2020, 4th meeting, Steering Committee in Seattle, USA, 16-19 October 2017 • Fall AGU Meeting, New Orleans, LA 11-15 December 2017 • AGU/ASLO/TOS Ocean Sciences Meeting, Portland, OR 11-16 February 2018
<p>Current status summary (<i>Sep 2017</i>)</p>	<p>TAO/TRITON: 53 of 55 TAO, 1 of 2 TRITON surface moorings reporting data. PIRATA: 10 of 18 surface moorings reporting data. RAMA: 20 of 23 surface moorings reporting data.</p>
<p>Challenges/Opportunities/Risks (<i>intersessional period</i>)</p>	<p>TPOS 2020 moving forward to redesign and refine the TPOS to observe ENSO and advance science, to advance efficient and effective observational solutions, and to advance understanding of tropical Pacific physical and biogeochemical/ecosystem variability and predictability.</p> <p>Challenges due to vandalism and ship time limitations endure and continue to constrain array sustainability. RAMA-2.0 has been proposed and is intended to make the array more robust, cost-effective and less dependent on ship time, which is the most limiting resource for sustaining the array. Sites with frequently recurring vandalism have also been eliminated in order to promote sustainable maintenance of the array.</p> <p>Limitations in ship availability due to unanticipated ship mechanical problems have delayed the Brazilian cruise to service the western Atlantic PIRATA moorings, which have all gone offline due to extended deployment time. This has resulted in decreased data return for PIRATA in 2017.</p>
<p>Summary of plans for 2018</p>	<p>TAO/TRITON: Maintain 57 mooring array. (11 of 13</p>

	original TRITON/ADCP moorings retired.) PIRATA: Maintain 19 mooring array RAMA: Maintain 30 mooring array, including 3 new sites.
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International Tsunami Partnership (ITP)

Name of Action Group	International Tsunami Partnership (ITP)
Date of report	24OCTOBER 2017
Overview and main requirements addressed	Activity since last report (DBCP-32): status of Tsunameters; (appendix A); issues/enhancements to data sharing, technological developments, challenges, other
Area of interest	Discussion Topic 1: Key International Partnerships in 2017 Discussion Topic 2: Potential Opportunities for 2018.
Type of platform and variables measured	Surface expressions (buoys and autonomous vehicles) and deep ocean water level recording devices
Targeted horizontal resolution	IOC Tsunami Programme: http://www.ioc-tsunami.org/index.php?option=com_content&view=featured&Itemid=93&lang=en Promotes a coordinated but regionalized approach to awareness, risk assessment, observation networks and early warning systems
Chairperson/Managers	Dr. Venkatesan; Mr. Stephen G. Cucullu
Coordinator	Mr. Long Jiang
Participants	DBCP Representatives
Data Centre(s)	Various
Website	http://ioc-unesco.org/index.php?option=com_oe&task=viewEventRecord&eventID=1638
Meetings (meetings held in 2015/2016; and planned in 2016/2017)	32nd session of the DBCP, La Jolla 2016 23 and 24 February 2017, 10th session of Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG) , Paris cedex 07, France. Annexure -3 http://www.ioc-unesco.org/index.php?option=com_oe&task=viewEventRecord&eventID=1894
Current status summary (mid-2017)	Refer to section 2.1.

Summary of plans for 2018	Refer to Section 2.2.
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ANNEX VI

RECOMMENDATION BY TASK TEAMS

- 1 Task Team on Instrument Best Practices and Drifter Technology Development ([TT-IBPD](#))
http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20480
- 2 Task Team on Moored Buoys ([TT-MB](#))
http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20465
- 3 Task Team on Wave Measurements ([TT-WM](#))
http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20425
- 4 Task Team on Capacity-Building ([TT-CB](#))
http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20467
- 5 Recommendations of the Task Team ([TT-DM](#))
http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20276
- 6 Recommendations of the Buoy data management centres ([TT-DMC](#))
http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20524

ANNEX VII
REPORT FROM FINANCIAL ADVISOR



**WORLD METEOROLOGICAL
ORGANIZATION**



**INTERGOVERNMENTAL
OCEANOGRAPHIC COMMISSION (OF
UNESCO)**

DATA BUOY CO-OPERATION PANEL

THIRTY-THIRD SESSION

FRANCE

13-17 November 2017

REPORT

EXECUTIVE DECISIONS

132.5 Report and Recommendations from the Executive Session and Panel

12.5.1 The DBCP Executive Board, after reviewing the financial situation, recommended and the DBCP panel adopted the basic budget itemized in table 1 below for DBCP expenses only for 2018.

<i>DBCP Technical Coordinator (JCOMM TF)</i>	<i>\$75,000</i>
<i>Provision for termination/transition of DBCP TC</i>	<i>\$0</i>
<i>JCOMMOPS logistical support for DBCP</i>	<i>\$13,000</i>
<i>Other JCOMMOPS Expenses</i>	<i>\$2,000</i>
<i>Travel of DBCP Chairperson</i>	<i>\$10,000</i>
<i>Travel of DBCP Technical Coordinator</i>	<i>\$15,000</i>
<i>DBCP Capacity Building</i>	<i>\$10,000</i>
<i>Other DBCP Expenses</i>	<i>\$15,000</i>
<i>WMO Indirect and Bank Charges</i>	<i>\$18,000</i>
<i>Total</i>	<i>\$158,000</i>

Table 1: DBCP panel budget and maximal expenditures for 2018

12.5.2 Eric Locklear (USA) DBCP Financial Advisor presented a review of the financial activity over the last 12 months and proposed 2018 budget for the panel's concurrence.

Improving Financial Accountability

Over the past year, significant progress in simplifying the budget was accomplished through concentrated efforts by many colleagues from the DBCP panel, WMO, and IOC. Three significant accomplishments include:

- All accounting reports are now in U.S. dollars instead of a combination of U.S. dollars and Swiss Francs.
- Outstanding IOC financial obligations have been resolved.
- Expenditures are being tracked and reported based on the project (i.e. JTA, DBCP, SOT, JCOMMOPS & WMO) for improved clarity and transparency.

12.5.3 Table 2 below was discussed, and agreed upon at the DBCP Executive Board meeting and includes expenses for the entire DBCP Trust Fund. Recall that the JTA, DBCP, SOT, JCOMMOPS, and WMO utilize the DBCP Trust Fund to implement these respective activities.

#	Item description	2018 Budget
	JCOMMOPS	
1.	Contract (salary) for DBCP & SOT Technical Coordinators at \$75,000 and \$45,000 respectively. (JCOMM-TF)	\$120,000

2.	Provision for termination / transition of the Technical Coordinators	\$0
3.	JCOMMOPS Logistical Support - DBCP	\$13,000
	JCOMMOPS Logistical Support - SOT	\$13,000
4.	DBCP-TC Travel	\$15,000
5.	SOT-TC Travel	\$8,000
6.	Other JCOMMOPS expenses	\$2,000
7.	Bank Charges and support cost	\$18,000
	JTA	
8.	JTA , including Chairperson’s contract, Executive Board	\$45,000
	DBCP	
9.	DBCP chair and other travel	\$10,000
10.	DBCP Capacity Building	\$10,000
11.	Other DBCP expenses	\$15,000
	Reconciled prior CLS Expenses	\$60,000
	Reconciled prior IOC Expenses	\$25,000
	SOT	
12.	SOT chair and other travel	\$5,000
13.	Other SOT expenses	\$2,000
	WMO	
14.	WMO activities ¹	\$10,000
	Total	\$371,000

Table 2

It was noted that an account reconciliation has been completed between the WMO and IOC. The conclusion is a payment of \$60,000 to CLS and a payment of \$25,000 to IOC is necessary to complete this reconciliation.

In order to simplify the monitoring of indirect and bank charges to the DBCP Trust Fund, the nation contributions and WMO expenses for indirect costs and bank charges will be maintained in the JCOMMOPS sub-program of the trust fund.

12.5.4 DBCP Principles

Recall that DBCP operates on member nation contributions, and these contributions are spent in accordance with member instructions, or in the case of no instruction, contributions will be made to the general operation of JTA, DBCP, SOT, JCOMMOPS, and WMO equally as follows: JTA 0%, DBCP 31%, SOT 8%, and JCOMMOPS 61%, and WMO 0%.

¹ Using funds made available by contributors (e.g. JTA) for WMO Secretariat

The contributions for the DBCP are deposited into 2 accounts, the DBCP Trust Fund or and the JCOMM Trust Fund. Both trust funds are with the WMO. The JCOMM TF is only for the DBCP Technical Coordinator salary and portion of JCOMMOPS center infrastructure costs. All other DBCP TC costs are in the DBCP TF. Expenditures from the DBCP trust fund for the JTA, DBCP, SOT, JCOMMOPS, and WMO activities are now approved by each separate chair instead of being subject to the sole approval of the DBCP chair.

A five-year summary below (table 2), shows the total costs for DBCP all program activities have continually decreased. These are “actual” costs lifted from the original WMO financial statements and include costs and contributions for all programs utilizing the trust fund, not just the DBCP panel itself. The balance closing in the table may not represent encumbrances and expenses that are not resolved by these reports. Note that the JCOMM TF covers most of the cost of the DBCP TC, \$75,000.

DBCP Trust Fund								
	A	B	C	D	E	F	G	H
		DBCP-31	DBCP-32	DBCP-33				
	(\$ - U.S. Currency)	2014	2015	2016	2017	2017	2017	2018
		Actual	Actual	Actual	Jan - Jun	Jul - Dec	Estimate	Estimate
1	Balance Brought Forward	249,329	153,908	74,544	143,798	-	143,798	167,287
2	Contributions	126,275	94,348	141,553	86,764	35,000	121,764	169,538
3	Adjustments	64,195	-		7,725	-	7,725	-
4	Funds Available	439,799	248,256	216,097	238,287	35,000	273,287	336,825
5								
6	Direct Costs	256,911	156,223	59,876	41,875	46,125	88,000	233,000
7	Indirect Costs	28,979	17,489	12,423	1,442	16,558	18,000	18,000
8	Total Costs	285,890	173,712	72,299	43,317	62,683	106,000	251,000
9								
10	Balance Closing	153,909	74,544	143,798	194,970	(27,683)	167,287	85,825
The DBCP Technical Coordinator's Salary is charged to the JCOMM Trust Fund. All other DBCP TC costs are charged to the DBCP TF.								

Table 3: DBCP account summary

12.5.5 Mr. Locklear thanked the member Nations for their ongoing contributions to the DBCP. Some contributions may have been received since the last reporting period back in June. Lastly, contributions for 2018 are assumed to be consistent with 2017 unless told otherwise. Below in Table 3 is a summary of Nation contributions to the DBCP Trust Fund since 2014.

Nation Contributions

(\$ - U.S. Currency)	2014	2015	2016	2017	2018
Currency Rates as of 19-10-17	Actual	Actual	Actual	Actual	Estimate
E-SURFMAR	54,720	44,893	54,115	51,227	56,632
CLS (For JTA Expenses)	28,342	25,578	29,457	21,058	25,364
Environment Canada			20,590	2,240	21,495
Bureau of Meteorology, Australia	15,918	13,765	12,690	12,239	12,502
National Institute of Ocean Technology, India*	10,068		10,098		4,600
South African Weather Service (SAWS)*	5,502	4,406	8,870		4,274
BSH, Germany*	9,472	3,809	3,822		3,847
Meteorological Services of New Zealand*	2,253	1,897	1,911		1,923

United States (Contribution to JCOMM TF for DBCP)	75,000	75,000	75,000	75,000	75,000
Total	201,275	169,348	216,553	161,764	205,637

*Nation contributions not posted as of the June reporting period.

Table 3: DBCP Nation Contributions

12.5.6 In light of the reduced yearly closing balance and uncertainty in carried forward obligations, the DBCP Financial Advisor cautioned against expenditures other than the most necessary, ie support for the DBCP / OceanSITES Technical Coordinator.

12.5.7 The panel expressed its appreciation for the skill and engagement Mr Locklear has demonstrated through his presentation.

12.5.8 The panel discussed the role of specific allocations and in-kind contributions in the financial statements. Mr Locklear emphasized that nations must take a realistic view toward how their in kind-contributions will support activities, because support costs are a necessary part of any DBCP activity. A rational balance between cash and in-kind contributions must be made. The WMO appreciates that in-kind contributions are a part of any engagement in WMO activities by nations and requests statements of such as an annex to the annual report.

12.5.9 Panel was reminded that DBCP TF receives contributions for the activities of the JTA, DBCP, SOT, JCOMMOPS and the WMO. The Panel agreed that contributors to the trust fund should identify how the contribution should be distributed through the JTA, DBCP, SOT, JCOMMOPS and WMO projects. If no instruction is made, contributions will be made to the general operation of JTA, DBCP, SOT, JCOMMOPS, and WMO as follows: JTA 0%, DBCP 31%, SOT 8%, and JCOMMOPS 61%, and WMO 0%.

12.5.10 WMO Secretariat has made improvement to the DBCP TF tracking by introducing different projects (i.e. JCOMM OPS, DBCP, SOT, JTA, WMO) to track the expenses. The Panel agreed that starting in 2018, the 2018 Contributions and expenses should be allocated to appropriate Project and the remaining balance at the end of the fiscal year should be carried forward within specific projects. Any remaining 2017 balance brought forward into 2018 will be allocated as follows:

JTA 0%, DBCP 31%, SOT 8%, and JCOMMOPS 61%, and WMO 0%.

**DBCP ANNUAL REPORT FOR 2016 AND INTERIM REPORT FOR 2017
FINANCIAL STATEMENTS AND INFORMATION**

1) STATEMENTS OF ACCOUNT

Note: IOC DBCP Trust Fund is not reported as it has been inactive since 2012 and has negligible balance.

TABLE 1: WMO Final Statement of Account for the DBCP Trust Fund for the period 1 January 2016 to 31 December 2016

TABLE 2: WMO Interim Statement of Account for the DBCP Trust Fund for the period 1 January 2017 to 30 June 2017

TABLE 3: WMO Final Statement of Account for the JCOMM Trust Fund for the period 1 January 2016 to 31 December 2016

TABLE 4: WMO Interim Statement of Account for the JCOMM Trust Fund for the period 1 January 2017 to 30 June 2017

TABLE 1: WMO Final Statement of Account for the DBCP Trust Fund for the period 1 January 2015 to December 2016

Ref.: 05892/2018-1.1 OBS-WIGOS/OSD
Approved by Fernando Belda Esplugaes, Thu Mar 01 11:33:12 UTC 2018

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU



WMO OMM

World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
世界气象组织

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DATA BUOY CO-OPERATION PANEL
Trust Fund 421309
Final Statement of income and expenditure
For the period 1 January to 31 December 2016
Amounts in United States dollars

1. Balance brought forward , 1 January 2016			74,544
2. Income: Contributions a/			141,553
3. Total available funds during reporting period			<u>216,097</u>
4. Expenditure			
4.1 Direct project costs			
4.1.1 Travel	38,876		
4.1.2 DBCP Support to JCOMMOPS IT Hosting	<u>21,000</u>		
4.1.3 Total direct costs		59,876	
4.2 Indirect project costs			
4.2.1 Unrealized loss on currency exchange	6,711		
4.2.2 Realized loss on currency exchange	3,573		
4.2.3 Support costs at 3%	1,796		
4.2.4 Bank charges	<u>343</u>		
4.2.5 Total indirect costs		<u>12,423</u>	
4.3 Total project expenditure			72,299
5. Balance of fund at 31 December 2016			<u>143,798</u>
	a/	Contributions	
	E-SURFMAR (EUR 48,000)		54,115
	CLS/Service Argos, France (for JTA)		29,457
	Environment Canada (CAD 27,000)		20,590
	Bureau of Meteorology, Australia (EUR 11,700)		12,690
	National Institute of Ocean Technology, India (CHF 5,026)		10,098
	South African Weather Service (SAWS) (EUR 8,000)		8,870
	BSH, M22/SOOP, Germany (EUR 3,600)		3,822
	Meteorological Services of New Zealand (EUR 1,800)		1,911
	Total contributions		<u>141,553</u>

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
2 March 2017

TABLE 2: WMO Interim Statement of Account for the DBCP Trust Fund for the period 1 January 2017 to 30 June 2017



DATA BUOY CO-OPERATION PANEL
Trust Fund 421309
Interim Statement of income and expenditure
For the period 1 January to 30 June 2017
Amounts in United States dollars

1. Balance brought forward , 1 January 2017		143,798
2. Income		
2.1 Contributions a/	86,764	
2.2 Unrealized gain on currency exchange	7,725	
2.3 Total income	<u>94,489</u>	
3. Total available funds during reporting period		238,287
4. Expenditure		
4.1 Direct project costs		
4.1.1 JCOMM - JCOMM Ops Project	26,000	
4.1.2 SOT		
4.1.2.1 Travel	4,108	
4.1.2.2 Consultants	<u>2,000</u>	
4.1.2.3 SOT Total	6,108	
4.1.3 DBCP - Travel	5,556	
4.1.4 JTA - JTA Executive Meeting, Toulouse, France, 17-21 July 2017	2,995	
4.1.5 WMO - Travel	<u>1,216</u>	
4.1.6 Total direct costs	41,875	
4.2 Indirect project costs		
4.2.1 Support costs at 3%	1,256	
4.2.2 Realized loss on currency exchange	168	
4.2.3 Bank charges	<u>18</u>	
4.2.4 Total indirect costs	1,442	
4.3 Total project expenditure		<u>43,317</u>
5. Balance of fund at 30 June 2017		<u>194,970</u>
a/		
	Contributions	
Météo France (EUR 48,000)	51,227	
CLS/Service Argos, France (for JTA)	21,058	
Bureau of Meteorology, Australia (EUR 11,700)	12,239	
Environment Canada (CAD 3,000)	<u>2,240</u>	
Total contributions	<u>86,764</u>	

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


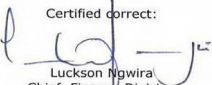
Certified correct:


 Luckson Ngwira
 Chief, Finance Division
 13 July 2017

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. Additional outstanding obligations should include those owed to the IOC accounts for salary support of the DBCP Technical Coordinator. (\$127,265 + 5/12 127,265 = \$180,292) (see IOC Financial Statement).


TABLE 3: WMO Final Statement of Account for the JCOMM Trust Fund for the period 1 January 2016 to 31 December 2016

Ref.: 05892/2018-1.1 OBS-WIGOS/OSD
Approved by Fernando Belda Esplugaes, Thu Mar 01 11:33:12 UTC 2018

<p style="font-size: small;">WEATHER CLIMATE WATER TEMPS CLIMAT EAU</p> 	<p>WMO OMM</p> <p>World Meteorological Organization Organisation météorologique mondiale Organización Meteorológica Mundial Всемирная метеорологическая организация المنظمة العالمية للأرصاد الجوية 世界气象组织</p>	<p>Secrétariat 7 bis, avenue de la Paix – Case postale 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</p>						
<p>Trust Fund for JCOMM support - Sub award no. A101189 Trust Fund 421306 Final Statement of income and expenditure For the period 1 January to 31 December 2016 <i>(amounts in US Dollars)</i></p>								
<p>1. Balance of fund at 1 January 2016</p> <p>1.1 Voluntary contribution (listed below)</p> <p>1.2 Gain in currency exchange</p> <p>1.3 Interest</p> <p>1.4 Total Income</p> <p>2. Expenditure</p> <p>2.1 Direct project costs</p> <p>2.1.1 Technical Coordinator, OOPC - Ms Hill</p> <p>2.1.2 Technical Coordinator: Argo Information Centre, Mr M. Belbeoch</p> <p>2.1.3 JCOMMOPS IT Hosting in 2016</p> <p>2.1.4 JCOMMOPS IT Hosting in 2015</p> <p>2.1.5 Technical Coordinator: DBCP-SOT, Ms Gallage Dona</p> <p>2.1.6 JCOMMOPS Development in 2015</p> <p>2.1.7 Total Direct project costs</p> <p>2.2 Indirect project costs</p> <p>2.2.1 WMO overhead (7%)</p> <p>2.2.2 Bank charges</p> <p>2.2.3 Total indirect costs</p> <p>2.3 Total expenditure</p> <p>3. Balance of fund at 31 December 2016</p>	<p>164,000.00</p> <p>158,104.52</p> <p>60,000.00</p> <p>60,000.00</p> <p>53,175.58</p> <p>38,000.00</p> <p>533,280.10</p> <p>37,329.61</p> <p>18.46</p> <p>37,348.07</p> <p>570,628.16</p> <p>169,807.36</p>	<p>208,055.71</p> <p>529,000.00</p> <p>3,177.39</p> <p>202.42</p> <p>740,435.52</p>						
<p>Voluntary contribution from Woods Hole Oceanographic Institute</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Date</th> <th style="text-align: right; border-bottom: 1px solid black;">in US Dollars</th> </tr> </thead> <tbody> <tr> <td>21 March 2016</td> <td style="text-align: right;">529,000.00</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black;">529,000.00</td> </tr> </tbody> </table>			Date	in US Dollars	21 March 2016	529,000.00		529,000.00
Date	in US Dollars							
21 March 2016	529,000.00							
	529,000.00							
<p>Certified correct:</p>  <p>Luckson Ngwira Chief, Finance Division 2 March 2017</p>								

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 2015 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 2016.

TABLE 4: WMO Interim Statement of Account for the Trust Fund for JCOMM support for the period 1 January 2017 to 30 June 2017

 <p style="font-size: small; margin: 0;">WEATHER CLIMATE WATER TEMP. CLIMATE EAU</p>	<p>WMO OMM</p> <p>World Meteorological Organization Organisation météorologique mondiale Organización Meteorológica Mundial Всемирная метеорологическая организация المنظمة العالمية للأرصاد الجوية 世界气象组织</p>	<p>Secrétariat 7 bis, avenue de la Paix – Case postale CH 1211 Genève 2 – Suisse Tél: +41 (0) 22 730 81 11 Fax: +41 (0) 22 730 81 81 wmo@wmo.int – public.wmo.int</p>								
<p>Trust Fund for JCOMM support - Sub award no. A101189 Trust Fund 421306 Interim Statement of income and expenditure For the period 1 January to 30 June 2017 <i>(amounts in US Dollars)</i></p>										
<p>1. Balance of fund at 1 January 2017</p> <p>1.1 Voluntary contribution (listed below)</p> <p>1.2 Interest</p> <p>1.3 Total Income</p> <p>2. Expenditure</p> <p>2.1 Direct project costs</p> <p>2.1.1 Technical Coordinator, OOPC - Ms Hill</p> <p>2.1.2 Technical Coordinator: Argo Information Centre, Mr M. Belbeoch</p> <p>2.1.3 JCOMMOPS IT Hosting in 2016</p> <p>2.1.4 Technical Coordinator: DBCP-SOT, Mr Martin Kramp</p> <p>2.1.5 Total Direct project costs</p> <p>2.2 Indirect project costs</p> <p>2.2.1 WMO overhead (7%)</p> <p>2.2.2 Loss in currency exchange</p> <p>2.2.3 Total indirect costs</p> <p>2.3 Total expenditure</p> <p>3. Balance of fund at 30 June 2017</p>	<p>169,807.36</p> <p>957,000.00</p> <p>12.33</p> <p>1,126,819.69</p> <p>164,000.00</p> <p>69,052.84</p> <p>34,000.00</p> <p>15,032.94</p> <p>282,085.78</p> <p>19,746.00</p> <p>22,552.12</p> <p>42,298.13</p> <p>324,383.91</p> <p>802,435.78</p>									
<p>Voluntary contribution from Woods Hole Oceanographic Institute</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black; padding: 2px;">Date</th> <th style="text-align: right; border-bottom: 1px solid black; padding: 2px;">in US Dollars</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">17 January 2017</td> <td style="text-align: right; padding: 2px;">11,000.00</td> </tr> <tr> <td style="padding: 2px;">21 February 2017</td> <td style="text-align: right; padding: 2px;">946,000.00</td> </tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black; border-bottom: 3px double black; padding: 2px;">957,000.00</td> </tr> </tbody> </table>			Date	in US Dollars	17 January 2017	11,000.00	21 February 2017	946,000.00		957,000.00
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Certified correct:


 Luckson Ngwira
 Chief, Finance Division
 13 July 2017

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 2016 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.

ANNEX VIII

LIST OF ACROYNM

AAD	Australian Antarctic Division, Australia
ADCP	Acoustic Doppler Current Profiler
AG	DBCP Action Groups
AOML	NOAA Atlantic Oceanographic and Meteorological Laboratory (USA)
Argo	Argo Profiling Float Pilot Project
ASV	Autonomous Surface Vehicle
ATLAS	Autonomous Temperature Line Acquisition System
AWS	Automatic Weather Station
BOM	Bureau of Meteorology (Australia)
BSH	Bundesamt für Seeschifffahrt und Hydrographie (Germany Federal Maritime and Hydrographic Agency)
BUFR	FM 94 BUFR GTS format: Binary Universal Form for Representation of meteorological data
BUOY	FM 18 BUOY GTS format: Report of a buoy observation
CAS	WMO Commission for Atmospheric Sciences
CAGM	Commission for Agricultural Meteorology (WMO)
CalCofi	California Cooperative Oceanic Fisheries Investigations
CB	Capacity-Building
CBS	Commission for Basic Systems (WMO)
CCI	WMO Commission for Climatology
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)
CMOC	WMO-IOC Centre for Marine Meteorological and Oceanographic Climate Data
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
CWB	NDBC Coastal Weather Buoy network
DAC	Data Assembly Centre
DART	Deep-ocean Assessment and Reporting of Tsunami (Tsunameter)
DBCP	Data Buoy Co-operation Panel (WMO-IOC)
DCP	Data Collection Platform
DISA	<i>Defense Information Systems Agency (USA)</i>
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
EC-PORS	WMO EC Panel of Experts on Polar Observations, Research and Services
ECV	Essential Climate Variable
EOV	Essential Ocean Variable
EEZ	Exclusive Economic Zone
ESA	European Space Agency
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
FAO	Food and Agriculture Organization (UN)
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
GCW	Global Cryosphere Watch
GDAC	Global Data Assembly / Acquisition Centre
GDP	Global Drifter Programme
GEOSS	Global Earth Observation System of Systems
GFCs	Global Framework for Climate Services
GHG	Greenhouse Gas
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)
HD-GDMSC	High Quality Global Data Management System for Climate
HRSST	High Resolution SST
HMEI	Association of Hydro-Meteorological Equipment Industry
IABP	International Arctic Buoy Programme
IAEA	<i>International Atomic Energy Agency</i>
IBCS	<i>Intergovernmental Board on Climate Services (WMO)</i>
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)
KPI	Key Performance Indicator
LDC	Least Developed Countries
LDL	Lagrangian Drifter Laboratory
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
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)
NOMAD	Navy Oceanographic Meteorological Automatic Device buoy
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
PP-WMD	DBCP Pilot Project on Wave Measurements from Drifters
PTT	Platform Transmitter Terminal (Argos)
QARTOD	
QC	Quality Control
RA	Regional Association (WMO)
RAMA	Indian Ocean Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction
RFMO	Regional Fisheries Management Organizations (FAO)
RMIC	WMO-IOC Regional Marine Instrument Centre
RNODC	Responsible Oceanographic Data Centre (IODE-JCOMM)
RNODC/DB	RNODC for Drifting Buoys

RWC	Regional WIGOS Centres
SAMS	Scottish Association for Marine Science
SAWS	South African Weather Service
SC	Steering Committee
SCG	Services Coordination Group (JCOMM)
SCOOP	Self-Contained Ocean Observing System
SCOR	Scientific Committee on Oceanic Research (SCOR)
SFSPA	JCOMM Services and Forecasting Systems Programme Area
SIDS	Small Island Developing States
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)
SoG	Statement of Guidance
SOOP	Ship-Of-Opportunity Programme
SOT	Ship Observations Team (JCOMM)
SSS	Sea Surface Salinity
SST	Sea-Surface Temperature
S&T	Science and Technology Workshop
SVP	Surface Velocity Programme (of TOGA and WOCE, replaced by GDP) drifter
SVPB	SVP barometer drifter
SWOT	Strengths, Weaknesses, Opportunities and Threats
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
TT-WM	Task Team on Wave Measurement
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
USACE	US Army Corps of Engineers
USD	United States Dollar
USV	Unmanned Surface Vehicles
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 USA
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
YOPP	Year of Polar Prediction