

WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC
COMMISSION (OF UNESCO)

DATA BUOY COOPERATION PANEL

DBCP-28/ Doc. 6.1 rev. 1
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TWENTY-EIGHTH SESSION

ITEM: 6.1

FREMANTLE, AUSTRALIA
2-6 OCTOBER 2012

ENGLISH ONLY

REPORT BY THE TASK TEAM ON DATA MANAGEMENT (TT-DM)

(Submitted by Mayra Pazos, TT-DM Chair, USA)

Summary and purpose of the document

This document contains the report by the chairperson of the DBCP Task Team on Data Management.

ACTION PROPOSED

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

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- Appendices:**
- A. Report by the Task Team on Data Management
 - B. Terms of Reference of the DBCP Task Team on Data Management
 - C. GTS Processing Monitoring graphs from CLS-France

-A- DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT

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

6.1.2 The meeting agreed on the following:

- (i.) The conversion to use 7-digits numbers instead of the 5-digit numbers must continue until all cross-reference lists are changed.
- (ii.) Regarding DBCP-28 action item No. 49 (i.e. to have a methodology to compare non-GTS buoy data with Ocean models, open to anyone via the web, be eliminated from the action list), it has been reported that Meteo-France has internal tools that are working and can provide results of occasional queries sent by e-mail, but for technical reasons it is not planned to make these tools available on the web.
- (iii.) A new column should be added to the GDP/DAC: List and Details of all Buoys in Database on the web (<http://www.aoml.noaa.gov/phod/dac/dirall.html>) to show latitude and longitude of where drifters lost their drogues (**action; GDP; ASAP**);

6.1.3 The Panel thanked Ms Pazos and members of the Task Team for their efforts. It was agreed that Ms Mayra Pazos would continue as chairperson of the Task Team for the intersessional period. The full report of the Task Team is provided in Appendix A of DBCP-28 preparatory document No. 6.1 as well as in the CD-ROM accompanying the DBCP Session final report.

Appendices: 3

APPENDIX A

REPORT BY THE DBCP TASK TEAM ON DATA MANAGEMENT

During the intersessional period, the TT-Data Management Team promoted discussion between members, revised the proposed recommendations from last year to assess actions taken and proposed new recommendations.

1. Receive and Review reports

1.1 With respect to the coordination between SOC and ISDM, it was reported that the Ad Hoc Task Team on Responsible National Ocean Data Centers (RNODCs) and Specialized Oceanography Data Centers (SOCs) met together with the RNODC and SOC for Drifting Buoys (DB) on the occasion of the first Marine Climate Data System Workshop (MCDS1; 28 Nov.-2 Dec. 2011, Hamburg, Germany). The MCDS report recommended that both the "RNODC/DB and SOC/DB become Global Data Assembly Centers for all drifting buoys" (MCDS-1 Final Report section 3.4.2). The Fourth JCOMM session (JCOMM-4/Doc. 7.2.7) further approved the designation of the relevant French (Meteo-France) and Canadian (ISDM) centers as provisional GDAC for Drifting Buoys under JCOMM and IODE (GDAC-DB) to continue in their present roles until the role of the MCDS GDACs is further clarified as a part of the MCDS strategy.

1.2 Following the MCDS-1, Sylvain de Margerie (ISDM) hosted a follow-up teleconference to discuss issues of mutual interest between ISDM, Meteo-France, US-NODC and AOML. Agenda items of this meeting included, an investigation of differences between the AOML SVP data product and the ISDM GTS archive; ideas to improve overall data circulation and archival of GTS data between the DAC's and GDAC's as discussed at MCDS; and the sharing and integration of quality control tools and flags between DAC's and GDAC's.

1.3 Following Action Item 50 from DBCP 26 (D26/6.1 1.5(5), and after the Webex teleconference meeting of May 11, 2012, ISDM and Meteo-France (Bruce Bradshaw and Pierre Blouch) proposed and tested a methodology and exchange format to compare GTS Bulletin Headers received and processed by GDAC-DB-ISDM (RNODC-DB-MEDS) and SOC-Meteo-France (CMM). They exchanged the headers of FM18-BUOY bulletins which are presently received at ISDM and Meteo-France - with the respective numbers of messages received in April. Some work remains to be done this fall to resolve differences resulting from the way some aspects of data processing, duplicates and the reporting messages received in BUFR and/or Buoy Code are handled. Pierre proposed the possibility of developing something similar their platform monitoring application (http://www.meteo2.shom.fr/qctools/rechstat_surfmar.htm). Next step will be to do the same with the BUFR messages. Same exercise will be done with VOS data SHIP, BATHY, TESAC, WAVEOB and their equivalent in BUFR.

2. Table Driven coding requirements for data buoy observations

2.1 Regarding BUFR templates, some work was done by the DMPA Task Team on Table Driven Code (<http://tinyurl.com/d4l6brc>), on common BUFR sequences for data buoys, VOS ships and other JCOMM platforms. Bill Burnett was chairing this team. Kelly has been appointed to ensure Bill's interim before his replacement as chair of the team. A comprehensive document exists. Pierre Blouch has a copy and can provide a copy if requested. It is not certain whether Jon and Chris recommendations were taken into account.

2.2 ISDM continues to decode and archive GTS BUFR data and have developed tools to compare and report on the content of both BUFR and BUOY Code data streams. At this time our quality control and product generation are still done on the Buoy Code GTS data stream.

3. Real Time Distribution of Data

3.1 The **DAC** continues to distribute and monitor all data from AOML's drifters on the GTS. During this intersessional period the DAC insured that ~1000 drifters with an average of one position fix every 1.2 hours were placed on the GTS. The DAC takes immediate action after recommendations from the QC centres are received regarding suspicious data on the GTS.

3.2 **NDBC** reported that during this period, they provided 24x7x365 data analysis and quality control support for 115 NDBC moored buoy platforms, 51 coastal marine stations, 242 water level stations met stations, 39 deep-ocean tsunameters, 55 Tropical Ocean Atmospheric moored buoys in the equatorial Pacific, 48 oil and gas platforms in the Gulf of Mexico and 270 Integrated Ocean Observing Systems (IOOS) partner platforms (moored buoys and coastal stations). Through this effort, NDBC provided more than 11.5 million quality-controlled observations to the Global Telecommunications System (GTS) in real-time.

3.3 **NDBC** continues to implement new techniques to support the archive of climate observations. NDBC continues to use Open Geospatial Consortium Inc. standards and Sensor Observation Services to provide all their archived weather buoy and Tropical Atmosphere and Ocean (TAO) observations in the National Oceanographic Data Centers (NODC) approved netCDF format.

3.4 The **DAC** is very happy to see the WMO/ID cross reference list on the web continued to be updated regularly.

Salinity measurements

3.5 This year, there were 76 moored buoys and 30 drifting buoys reporting Sea surface Salinity onto the GTS.

3.6 **Meteo-France** reports that four salinity drifters fitted with a digital temperature probe - instead of the usual analog -, were deployed during the intersessional period. They are considered as HRSST-2 buoys in the frame of the ad hoc Pilot Project. Comparisons with temperatures measured by the SeaBird conductivity sensor were performed. They showed the accuracy of digital probes for SVP drifters may reach 0.02 K (standard deviation of the measurement differences at night) provided that the probes are correctly calibrated: a systematic bias of 0.11 K was observed on one buoy at night, whilst it was lower than 0.02 K on the three other buoys. The first (six) HRSST-2 SVP-B drifters will be deployed in July 2012. About 20 others have been ordered.

Surface current measurements

3.7 For many years, Meteo-France has been providing the Coriolis centre on a weekly basis with drifter observation data (SST and SSS), current deduced from the move of the buoys and co-located winds and wind stress. This is done for all SVP drifters reporting their data onto the GTS. Till now a single automatic test was performed on the drogue indicator (submergence or strain gauge) to assess the presence or the absence of the drogue. This test is based on the average and the standard deviation of the drogue indicator, yielding a flag for the drogue presence probability. A new test has been implemented this year, based on a correlation analysis between the co-located wind stress and the calculated buoy current for the most recent data. More specifically, another flag of presence is derived from the result of the analysis of the cross-spectrum estimation of the two parameters, and the regression of the current on the wind. As before, the data of buoys supposed having lost their drogues are not distributed. Near real time current data are required by ocean modellers such as those of Mercator. For the moment, the data are used for the validation of the models but they could be assimilated in them in a near future.

BUFR messages

3.8 Joubeh started the transmission of BUFR data onto the GTS.

Iridium buoys

3.9 Meteo-France continues to process buoy data received through Iridium SBD in real-time, for GTS. All data are transmitted in both BUOY and BUFR formats. During the intersessional period, about 100 buoys have been processed in average each month. These include 60 SVP-B for E-SURFMAR, 15 SVP-B in IBPIO, 5 salinity drifters (SVP-BS) operated by France and 15 SVP-B drifters for Meteo-France partners. In addition to the data of SVP-B and SVP-BS currently processed, Meteo-France will manage the GTS transmission for many SVP-BTC drifters, built by Marlin, during next months. These drifters are fitted with a thermistor chain allowing to get sea temperature down to 80 metres on 16 levels.

3.10 Meteo-France reports that since 2008, more than 500 Iridium drifting buoys have been deployed.

3.11 Meteo-France maintains a list and description of iridium drifters recommended data formats, available at: http://esurfmar.meteo.fr/doc/o/db/others/DB_Iridium_formats_v010.pdf

2010-2011 GTS processing enhancements at CLS

3.12 According to the last DBCP meeting (XXVII) decisions on GTS bulletins, CLS and CLS America as operational GTS data processing centers:

- (i) Display bulletins for 7-digit WMO buoy numbers in FM-94 BUFR format only. For 5-digits WMO numbers, FM-18 BUOY and FM-94 BUFR reports are displayed on the GTS. For 7-digits WMO numbers, only FM-94 BUFR reports are displayed on the GTS.
- (ii) Setup for all buoy observations BUFR reports a subcategory value equal to 25 under category 1. This new subcategory value replaces the previous one (255 "missing value") since the September 11, 2012 at 12:00 UTC for all surface buoy observation BUFR reports displayed by CLS and CLS America GTS processing centers.

3.13 According to WMO recommendations:

- (i) The Master Table 0 Version has been upgrade to 15 on February 28, 2012.
- (ii) The GTS BUFR version will be upgraded to V4 on September 18, 2012.

3.14 Acceptance tests for these upgrades have been made successfully by Météo-France and the National Weather Service.

3.15 CLS/CLS America transmit all drifter data on GTS in both, BUOY and BUFR formats

4. Delayed mode distribution and archiving of data

4.1 Regarding delayed mode distribution of data to the RNODC archiving center for drifting buoy (ISDM, Canada), the **Drifter Data Assembly Center (DAC)** at AOML, submitted in May 2012, an updated version of the SVP data set for all drifters alive during the year 2011, for archival and distribution. ISDM is currently processing this new dataset but delays are expected this year as new procedures are being developed and implemented to handle a change from 6 to 8 digit identifiers for Argos and iridium. The update should be available from ISDM in the usual products, (data grouped by year and by ocean basin), later this year.

4.2 Quality-controlled interpolated drifter data by subsets or entire dataset can be downloaded from the DAC web page, through March 2012, or a more recent update is available only if downloading the entire dataset at: (www.aoml.noaa.gov/phod/dac/dacdata.php).

4.3 The GDP/Data Assembly Center (**DAC**) is conducting a reevaluation of drogue presence in drifters from 1992 to the present. Recent findings have shown that a significant number of drifters lost their drogues sooner than originally diagnosed. A new methodology based on anomalous downwind ageostrophic motion has been applied to the data to reanalyze drogue presence that, together with information from submergence or tether strain and transmission frequency variations, will lead to a more accurate determination of when drifters lost their drogues. More information on the drogue reanalysis can be found in a paper submitted to the *Journal of Atmospheric and Oceanic Technology* by Lumpkin et al (manuscript available at: http://www.aoml.noaa.gov/phod/dac/drogue_reassess.pdf). A complete report will be presented during the DBCP-28 Technical Workshop and submitted as a separate document.

4.4 Since 2005 the DAC has monitored drifter's performance by deploying clusters of drifters from different manufacturers at the same time and at the same location, (ADB study). During the 2012 intersessional period the GDP did not deploy any new clusters of drifters for inter-comparison and evaluation due to delays in acquisition and recalls of drifters from two manufacturers. Instead the GDP/DAC has been focusing on lifetimes of drifters across the entire global array since 2005, by manufacturer and buoy type (SVP vs SVPB).

4.5 AOML continues to acquire Iridium drifter data from Joubert's website for AOML purchased, upgraded to barometers by Meteo-France, New Zealand, Australia and Environment Canada, funded by DBCP to be part of the Iridium-PP. They have been quality controlled, interpolated and added to the DAC database. AOML continues to receive data, once a week, from Meteo-France from Iridium drifters they process. Those data will be added to the AOML database as soon as a system is in place. Data received from Proceano, Brazil, Iridium drifters will also be quality controlled and added to the AOML database.

4.6 Following last year's report item 4.6, ISDM has made significant progress developing an online mapping, reporting, discovery and data download capability using ArcGIS and a web-warehouse database but cannot commit to a beta release at this time. Requests for data and reports continue to be handled through the ISDM online request system.

4.7 ISDM has installed an OPeNDAP and THREDDS server system in order to provide web access to NetCDF format ocean data products. Initial experimentation serving Canadian Tidal data automatically from ISDM archive databases has been encouraging. ISDM would welcome assistance with developing procedures to leverage existing NetCDF code and data formats for drifting and moored buoy data that may be in use by the community. Additionally ISDM is considering an expanding our use of Matlab with netCDF in future data processing, quality control, the generation of data products.

5. Format Issues

5.1 The DAC reported that there were several instances where the specification sheets received from drifter manufacturers had the wrong calibration coefficients to convert sensor data, what it looked like a result from cut and paste from similar drifters but not exactly the same calibrations. These errors caused problems at the time data was processed in real time (GTS) and in delayed mode. Manufacturers are urged to check the accuracy of the information included in the specification sheets prior to submissions.

5.2 Barometric pressure tendency from all SVP-B drifters manufactured by Pacific Gyre does not conform to the standard DBCP-M2 format for this parameter, this caused the transmissions on

the GTS from this parameter to be wrong, due to the fact that the template has the calibration for standard DBCP-M2 formats. When the root of the problem was found, CLS-America created a new template for Pacific Gyre SVP-B drifters that applies a correction to the AP from these drifters. The correction has been applied to all SVP-B Pacific Gyre drifters currently on the GTS, and the AP values are now correct.

5.3 Meteo-France maintains a list and description of Iridium drifters recommended data formats, available at: http://esurfmar.meteo.fr/doc/o/db/others/DB_Iridium_formats_v010.pdf

6. Comparison to Models for non-GTS data

6.1 With respect to DBCP-25 agenda item 8.8.2 to make NWP/Ocean model outputs available to buoy operators i) to check data quality before sending to the GTS upon deployment and ii) to check data that had been removed from the GTS to assess if it had improved over time and can be released to the GTS again, **Meteo-France** has reported there are internal tools that are working to provide these checks, but for technical reasons, it is not planned to make these tools available on the Web. However, Meteo-France may send the result of a query further to occasional requests sent by email. For this reason, this action should be removed from the action item list.

7. Review all relevant JCOMM Publications

7.1 TTDM task team circulated and is reviewing the document “An Oceanographer’s and Marine Meteorologist’s Cookbook for Submitting Data in Real Time and In Delayed Mode.” Some feedback has been received and forwarded to the TC for editing and merging into the document. Some more comments are expected to arrive in the coming weeks.

8. Action Items Completed during the intersessional period

8.1 The GDP/DAC has changed from five-digits to 7-digits WMO numbers all listings in the web pages (**action; GDP & JCOMMOPS; DBCP-28**).
<http://www.aoml.noaa.gov/phod/dac/dirall.html> and
<http://www.aoml.noaa.gov/phod/dac/deployed.html>

8.2 The cross reference list of WMO IDS vs. Transmitter ID provided by JCOMMOPS on the web (ftp://ftp.JCOMMOPS.org/JCOMMOPS/GTS/wmo/wmo_list.txt) is now being updated regularly by the TC. (**action; TC DBCP; ASAP**).

8.3 The GDP/DOC/DAC have prepared three new information pages on the web regarding Drifter Metadata as it was requested at the last DBCP-27, all of these pages are in beginning stages, more information will be populated as it becomes available:
Drifter Specifications, Drogue Specifications, Barometer Metadata.
http://www.aoml.noaa.gov/phod/dac/gdp_doc.php

The Chair of the Task Team on Data Management would like to thank members for their hard work during the intersessional period, and for providing the input for this report

APPENDIX B

TERM OF REFERENCE OF THE TASK TEAM ON DATA MANAGEMENT

(as adopted at DBCP-XXIV)

The DBCP Task Team on Data Management shall:

1. Receive and review reports from the Data Management Centres specializing in buoy data, i.e., (i) the Météo-France SOC / DB, and (ii) the ISDM, Canada RNODC / DB; reconcile any overlaps with emphasis on differences;
2. Liaise with the DBCP Task Team on Quality Management for compiling table driven coding requirements for data buoy observations, for all relevant applications, and submit them in a consolidated way to the DMPA Task Team on Table Driven Codes;
3. Address issues to do with real-time distribution of data, including GTS issues, timeliness and methods to improve data / flows;
4. Address issues relating to delayed-mode distribution and archiving of the data;
5. Seek input from data users on which instrumental metadata is most important and how it is best managed and coordinate these activities with the JCOMM Meta-T Project;
6. Review all relevant JCOMM Publications, to make sure they are kept up-to-date and comply with Quality Management terminology;
7. Follow-up with regard to the development of the WIGOS Pilot Project for JCOMM and make sure that the developments proposed by the Task Team are consistent with the WIGOS and WIS requirements;
8. Make recommendations to the DBCP Executive Board or the DBCP for addressing the issues above; and
9. Report to the DBCP Executive Board and the DBCP at its biennial Sessions.

Membership:

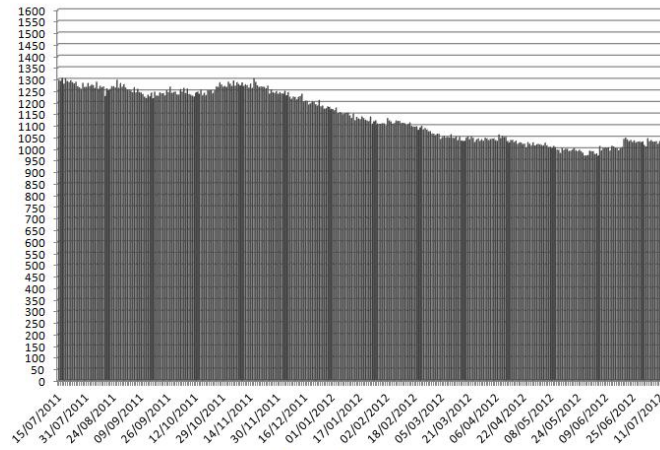
The membership is open to all Panel members. The Chairperson, appointed by the Panel, has selected the following team members:

Ms Mayra Pazos (TT Chairperson and GDP representative)	TT Co-Chairperson [to be appointed]
Mr Yann Bernard (CLS data manager)	Mr. Pierre Blouch (France)
Mr Bruce Bradshaw (RNODC representative)	Mr. Richard Crout (NDBC)
Mr Tony Chedrawy (MetOcean)	Mr Jean Rolland (SOC representative)
Mr. Jon Torton	DBCP Technical Co-ordinator (<i>ex officio</i>)
Mr Johan Stander (SAWS)	
B. K. Jena	

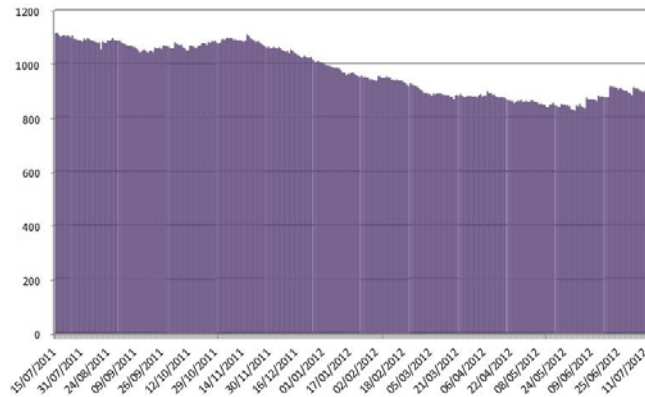
APPENDIX C

GTS PROCESSING MONITORING GRAPHS FROM CLS-FRANCE

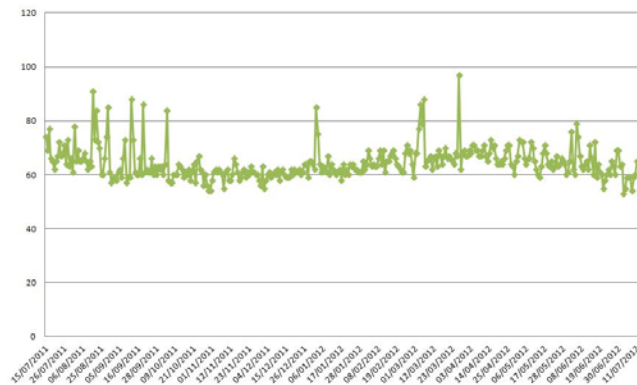
Number of WMO platforms processed per day



Number of drifters GTS processed per day



Daily average delivery time (in min) of text bulletins on GTS



Number of BUFR reports sent on GTS per day

