World Meteorological Organization (WMO)

Intergovernmental Oceanographic Commission (IOC) of UNESCO

DATA BUOY COOPERATION PANEL (DBCP)

Thirty-Second Session
La Jolla, USA, 17 to 21 October 2016

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

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

SUMMARY AND PURPOSE OF DOCUMENT

The document provides the report by the chairperson of the DBCP Task Team on Data Management

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ACTION PROPOSED

The Meeting is invited to note the information contained in this document when discussing how it organises its work and formulates its recommendations.

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Appendices:
1. Report by the Task Team on Data Management
2. Data format #003 for future SVP and SVPB Drifters
3. Results of drifting buoy analysis of GTS data received at Meteo-France and MEDS, performed on August 6, 2016.
4. Terms of Reference of the DBCP Task Team on Data Management
5. Task Team members
6. CLS report on GTS processing activity for the DBCP Task Team Data Management

DISCUSSION

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

9.1.2 The meeting agreed on the following:

The meeting made the following recommendations:

1. Rec1; The trial JCOMM Global Data Assembly Centres (GDACs) for drifting buoys of Météo-France (former SOC) and ISDM (former RNODC/DB) to continue to work towards the implementation of a routine procedure to compare GTS Bulletin Headers between the two centres,

2. Rec 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.

3. Rec 3; Adopt a new Iridium SBD raw data format #003 for SVP and SVP-B Iridium drifters and make sure all buoy manufacturers adhere to the standard and approved DBCP data formats.

4. Rec 4; Centers must switch to using BUFR template for drifting and moored buoys (templates TM315009 for drifters and TM315008 for moorings) as soon as possible. This concerns JMA for drifting buoys; DWD, Met Office, NOAA/NDBC, Puertos del Estado for moored buoys.

5. Rec 5; Buoy data users to end the migration of their applications to BUFR.

6. Rec 6; 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.

7. Rec 9; The panel and WMO should find a way to provide a tool to give GTS data access to the community in near real time, without going through the National weather services. GDACs don't have this feature available, and third party websites like Sailwx is not a suitable solution to this problem.

9.1.3   The panel thanked Mrs. Pazos and members of the Task Team for their efforts. It was agreed that Mrs. Mayra Pazos would continue as chairperson of the Task Team for the intersessional period. The full report of the Task Team is provided in Appendix 1 of DBCP-32 preparatory document No. 6.1 and will be included in the DBCP annual report for 2016.

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APPENDIX 1

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

A few surveys, conducted by MEDS Canada, and Meteo-France were performed on drifting buoy GTS data since the beginning of 2016. They allowed to identify several problems: bulletins not routed to one of the centres, buoys having a 7-digit WMO number not convertible into a 5-digit one but reporting in FM18 nevertheless and BUFR messages incorrectly coded:

- an inappropriate segmentation of the messages built by CLS was discovered in March. Many observations under header 'IOBX06 KARS' were not distributed onto the GTS due to a wrong use of header extension 'BBB' for the segments. The segmentation was not necessary indeed. The solution consisted in extending the size limit to 500 kB instead of 15 kB, previously;

- in April, it was noticed that CLS America was sending two consecutive messages under the same header (same than above) at a given time: one for platforms wrongly declared as being in subcategory 0 (ships), the other one for platforms declared as being in category 25 (data buoys). According to WMO code manual, a BUFR bulletin should have a single message.

Producing centres were informed of the problems. These latter were then corrected.

By the beginning of August 2016, the situation was stable and almost fine. The survey dated August 6th, showed that:

- JMA remains the only centre that do not produce BUFR data with template TM315009. Six buoys are concerned only. Data are available in BUFR with the right template for 99.6% of the drifting buoys;

- 82.5% of the buoys, including the 6 Japanese are still reporting in FM18;

- CLS and JMA are the remaining two centres to report BUFR data according to the never validated template.

Despite these drawbacks, one may see that now, more buoys are now sending their data in BUFR than in FM18: 1,520 against 1,260 received at Meteo-France; against 1,064 being received at MEDS. FM18 messages generated by Meteo-France are not received at MEDS (191 buoys are concerned).

Operator	Drifting buoys from which the data are received at M-F					Observations from these buoys received at M-F				
	FM18	Old BUFR	TM315009	FM18 only	BUFR only	FM18	Old BUFR	TM315009	FM18 only	BUFR only
Joubeh	93	0	112	1	10	2230	0	2579	24	373
CLS America	956	937	965	0	9	18278	24615	25599	0	7321
SIO	0	0	169	0	169	0	0	4953	0	4953
Pacific Gyre	0	0	8	0	8	0	0	207	0	207
Meteo-France	191	0	243	0	52	4501	0	5739	0	1238
CLS Toulouse	14	22	22	0	8	124	184	184	0	60
JMA	6	6	0	0	0	139	139	0	0	0
HK Observatory	0	0	1	0	1	0	0	3	0	3
	1260	965	1520	1	257	25272	24938	39264	24	14155

Drifting buoy data received at Meteo-France on August 6th, 2016

2. Table Driven coding requirements for data buoy observations

Meteo- France report on Migration to BUFR

Information, news and regular survey are published on:
https://software.ecmwf.int/wiki/display/TCBUF/E-SURFMAR

These pages are mainly maintained by Meteo-France in the frame of E-SURFMAR service.

Due to requests from data users, the FM18 message transmission stop was postponed several times. The new deadline is November 1st, 2016. However, more and more buoys report in BUFR only:
- some centres (e.g. Hong Kong Observatory, Pacific Gyre, PMEL, SIO) never developed the producing of FM18 messages;
- observations from buoys having 7-digit WMO numbers that cannot be converted into 5-digit ones, cannot be transmitted in FM18.
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One must remind that the maintenance of two dataflows – one for FM18, the other one for BUFR -, in parallel, is a hard job. The stop was primarily fixed to the 1st of November 2014 but has been postponed several times, the last date is not proposed to be on November 1, 2016. Producing centres urge data users to update their applications to process BUFR data, most especially since the data are sent according to templates TM315008 (moored buoys) and TM315009 (drifting buoys).

Drifting buoys

Since the beginning of June 2015, Meteo-France (LFPW) and CLS (LFVW and KARS) have been transmitting drifting buoy data according to template TM315009. However, WMO IDs had been wrong at CLS until mid-October 2015. The conversion of 5-digit IDs into 7-digit ones was incorrect. It must be noted that CLS continues to report buoy data according to the old template, in parallel.

Pacific Gyre (IOBX06 KWBC) started to produce BUFR data with template TM315009 in August 2015. After several attempts, Joubeh (CWAO) succeeded in transmitting BUFR data (TM315009) in March 2016. In April, SIO (IOBX02 KWBC) started the transmission of drifting buoy data in BUFR (template TM315009).

Moored buoys

The situation is more complex for moored buoys than drifting buoys due to the fact that several data formats (TAC and BUFR) are used: FM13, FM18 and BUFR with old buoy template as well as templates TM309008 (ship data) and TM315008 (moored buoy data). This latter is the only official data format for moored buoys.

It must be noted that some GTS centres are converting in BUFR the TAC data they receive from the GTS (or vice versa: in TAC the data received in BUFR). Duplicates are then running onto the GTS if the new data are sent back with their new format. To avoid double use, data users must apply filters that take into account the relationship between 5-digit and 7-digit WMO numbers.

One may see that:

- In August 2015, NDBC (KWNB) started transmission of BUFR data for a few moored buoys, according to template TM315008;

- In September, PMEL (KPML) started the transmission of BUFR data for T-Flex moored buoys and OceanSITES in Pacific, according to template TM315008. The number of buoys of these categories is growing;

- In October, Meteo-France (LFPW) and Met Eireann (EIDB) started the transmission of BUFR data (template TM315008) for French wave riders and Irish moored buoys, respectively;

- CLS Toulouse and America started also the correct producing of BUFR data with template TM315008 in autumn 2015.

CCCC	Operator	FM13	FM18	TM308009	Old template	TM315008	TM315009	Total buoys	Remark
CWAO	Joubeh		5				4	5	One buoy in "FM18 only"
CWEG	Env. Canada	2						2	FM13 only
CWHX	Env. Canada	6						6	FM13 only
CWTO	Env. Canada	14						14	FM13 only
CWUL	Env. Canada	1						1	FM13 only
CWVR	Env. Canada	20						20	FM13 only
DEMS	IMD, India		18					18	FM18 only
EDZW	DWD	3		4				0	Waiting a template for **fixed platforms**
EGRR	Met Office	202		199				15	Including about **187 fixed platforms**
EIDB	Met Eireann			1		4		4	**Kinsale gas platform** in BUFR ship
KARS	CLS America		36		39	41		43	Include old Atlas buoys
KPML	NOAA/PMEL					9		9	T-Flex buoys
KWBC	NOAA/NWS	210						0	Unwanted doubles
KWNB	NOAA/NDBC	250	51	250		51		301	The 51 are refreshed Atlas buoys
LEMM	AEMET				16			16	Old buoy templete only
LFPW	Meteo-France		16			21		21	5 buoys in "BUFR only"
LFVW	CLS Toulouse		14		13	15		16	Include Triton buoys
RKSL	KMA, Korea		17					17	FM18 only
Total		**498**	**157**	**454**	**68**	**141**	**4**	**508**	

Counting of observations received at Meteo-France for stations having a WMO ID made of digits only, and reported either in FM13 SHIP, FM18 BUOY and FM94 BUFR (templates 308009, 315008, 315009 or the never validated one for data buoys). Fixed platforms are excluded in column "Total buoys".

By the beginning of August 2016 (see table here above), one may note that only 141 moored buoys (28%) out of a total of 508 report onto the GTS with the right template (TM 315008):

- Observations processed by Joubeh for moored buoys are transmitted with the template devoted to drifting buoys (TM315009)… unless a mistake occurred in the allocation of the concerned WMO IDs;

- Observations from moored buoys operated by Environment Canada are transmitted in FM13 only, whilst those operated by IMD (India) and KMA (Korea) are transmitted in FM18 only;

- Observations from moored buoys operated by DWD, Met Office, and NOAA (partly) are still transmitting in FM13. These latter are then converted in BUFR (ship template 308009);

- NOAA/NWS reports the data of about 210 fixed marine stations, including moored buoys in FM13 SHIP. Many fixed platforms in North Sea, for which the data are sent onto the GTS by Met Office, are part of these. These data should not be re-sent onto the GTS with a different header;

- Observations from Spanish moored buoys are still transmitted in BUFR according to the never validated template

3. Real Time Distribution of Data

As of December 16, 2015, all moored buoys processed at CLS for GTS distribution are set up to report with the new BUFR template: 315008. As per users request, CLS is reporting all moored buoy data in 3 different formats until November 1, 2016 when the transition to the new BUFR template will be effective.:
- TAC bulletin (previous header)
- BUFR bulletin old template (previous header)
- BUFR bulletin new template 315008 (new header)
A table showing all old and new moored and drifting buoys bulletin headers can be found in appendix 3.

Likewise, GTS data from drifting buoys processed at CLS are transmitting in 3 different formats until the end of the transition period:
- FM18-BUOY TAC
- FM-94 BUFR (never validated BUFR template
- BUFR new template TM315009

SIO has migrated to using the new TM315009 BUFR template since June 2016 to report iridium drifters on the GTS.

The UK Met Office relies on Meteo-France to issue all Met Office drifter data to GTS, and these are distributed in the approved BUFR format (TM 315009). However, the Met Office's plans to utilise BUFR reports received over GTS have been delayed, together with the development of an interim capability to convert the BUFR data back into the FM-18 format. Therefore the Met Office had to ask for an extension of parallel distribution of these data in both BUFR and FM-18 until 1st November to avoid a significant detrimental impact on their NWP products.

Regarding moored buoys, the U.K Met Office still generates legacy FM-13 messages for the data from its moored buoy (and light vessel) network. These are converted to the deprecated BUFR format (TM 308009) and distributed on the GTS. Some of the moored buoys have a spectral wave sensor for which those data are distributed on GTS in a self-describing (i.e. non template) BUFR format. The timescale for distributing the moored buoy data to GTS in the approved BUFR format (TM 315008), which will include the spectral wave data, has been delayed and this capability is unlikely to be implemented until mid-2017. Presently we are still utilizing moored buoy data received in FM-13 and FM-18 formats and have no facility yet to handle data in BUFR TM 315008, again this is not expected to be in place until 2017.

MEDS reports that it was discovered that NDBC and JouBeh were sending several BUFR bulletins with the same bulletin header, this was pointed out on May 11th 2016. NDBC upgraded their software and JouBeh were in the progress of doing so as of August 2016.

The element reserved for sea-surface temperature in TM315009 is encoded as an element for water temperature at specified depth. This was noted by IPET-DRMM a couple years ago, but only after the template was validated. MEDS decided not to ask IPET-DRMM to change the template since many DACs are still busy implementing or fixing their BUFR production and this could jeopardize the transition further.
Some DACs encode the surface temperature data from drifters with thermistor chains twice: once in the surface temperature element, and again at depth 0 in the profile group. This is due to the fact that the SBD payload used by the manufacturer duplicates the surface value. The meeting should consider whether recommendations should be made to manufacturers regarding this practice.

For tropical moored buoys, the long-term tradition has been to duplicate the nearest measured temperature value in the sea surface temperature group. However, with the advent of BUFR, the intent of TM315008 was "that the sea surface temperature descriptor would be used for a sensor attached to the buoy hull and that the optional profile sequence would only be used when there are sensors on the mooring line or suspended

below the buoy hull at a known depth (>0m)." An email was sent (July 14th 2016) by Jon Turton to members of TT-TDC and TT-MB to seek whether to encourage DACs to drop this practice or not.

After notification, CLS dropped their additional practice of replicating their 1.5 m depth profile temperature value as a 0 m depth profile temperature in their TM315008 tropical moored buoy messages on July 18th 2016.

There are variable encoding practices currently in use to account for missing parameters (null values vs. replicators set to 0), sometimes in the same data subset, which may be addressed once all other issues have been solved.

As of August 2016, MEDS are suspecting that NDBC are using the moored buoy template to send data from a drifting buoy (52522).

Several drifting buoys whose data are encoded by JouBeh have been attributed WMO IDs reserved for moored buoys (64477, 64756, 71244, 71247, 71102, 71245), or Arctic/Antarctic WMO IDs when they were deployed in the Antarctic/Arctic region respectively (71235, 64478). This was pointed out by Meteo-France on Jan 22nd 2016 but cannot be fixed retroactively and will need to be taken into account for products generation and long-term data curation.

In May, Canada allocated 7-digit WMO IDs to some of its buoys while the FM-18 transmission period was not yet over. On May 18th 2016, Météo-France reported that some data from these 7 digit WMO IDs, transmitted by JouBeh, were actually converted into 5 digit WMO IDs identical to IDs already allocated (to EUMetNET) and transmitting: 44601, 44602, 44603, 44604 and 44605. JouBeh shortly stopped transmission of messages under these erroneous WMO IDs.

As of August 2016, MEDS are suspecting that CLS buoy 55061 is actually a drifting buoy.

Since June 2015, Canada no longer receives FM-18 data encoded by Météo-France, who are no longer routed through international circuits. MEDS will replace these data with those received in TM315009 BUFR bulletins. Carried over from last inter-sessional period, MEDS is still attempting to remediate the February and April 2015 GTS "outages" of CLS FM 18 bulletin data, by replacing the missing data with data from BUFR bulletins. These two efforts have been combined in one data mining project to complete the 2015 FM 18 dataset assembled at MEDS with best BUFR sources.

FM-18 bulletin shortages were observed in 2016, in Canada, for buoys that have no BUFR backup, such as sent by RJTD (Japan). GTS authorities in Canada do not seem to be able to resolve this problem. MEDS will need to request a copy of FM 18 messages to its mirror GDAC and update its archives accordingly.

Members of the TTDM team worked hard to identify a problem reported by Navoceano, where on Jun 15, 2016 it was noted that when extracting drifting buoy data for an area in the Western Pacific from their GTS surface buoy database there were 9 drifters in the area six of which had 7 digit WMO ids and all had the same date-time for the most recent data which was 6 June 2016 0600. A global dump for 6 June and 7June was done from the same database and a significant drop off in the number of surface drifters was noticed, the largest number of drifters missing were those that had 7 digit WMO numbers. After a few e-mails among several task team members, the problem was identified to be due to the switch from the old to the new BUFR template adopted by SIO on June 6, 2016, NAVOCEANO was not decoding the new header IOBX02 KWBC (formerly posted as IOBX01 KWBC).

AOML/DAC continues to monitor data on the GTS and acting on requests received from the meteorological centers, to take sensor data, and/or positions off GTS, for drifters whose GTS is managed by AOML.

SIO reported they had migrated to new server racks (Iridium processing chain and GTS) as it was discussed at DBCP-31. Standard OS and Kernel upgrades were done at the same time.

SIO also reported they have implemented real-time off-site redundant backups (Iridium processing chain), and it is now operational. This was part of the GDP Iridium transition plan.

It was brought to the attention of the TTDM by several scientists desiring access to near real time data, that a way to provide GTS data access to the community should be found, without going through the NWS. GDACS don't have this feature available. QCtools provided by Meteo-France is a great tool that allows to check data going out on the GTS through graphics but it does not provide data downloads.

WMO numbers for the Antarctic area are now back to be "7" and not "0" in the first digit as it was changed again during this intersessional period. Ex: WMO numbers that used to start with 01, 02, 03, 04 are now 72xxxxx, 71xxxxx,74xxxxx 73xxxxx

4. Delayed mode distribution and archiving of data

Meteo-France reports that, although not officially agreed and despite DBCP is responsible for such metadata, platforms metadata are collected in E-SURFMAR VOS metadata database meanwhile a more suitable repository is available
(http://esurfmar.meteo.fr/doc/vosmetadata_v6/).

Metadata for Iridium drifting buoys of which the data are managed by Meteo-France, are available at
ftp://esurfmar.meteo.fr/pub/pb/ghrsst/ghrsst_buoys.xls .

AOML/DAC maintains metadata for all drifters processed by this center, updated quarterly and biweekly at:

www.aoml.noaa.gov/phod/dac/dirall.html (quarterly) and
www.aoml.noaa.gov/phod/dac/deployed.html (biweekly)

JCOMMOPS maintains a metadata file which is available as a spreadsheet on their ftp server: ftp://ftp.jcommops.org/JCOMMOPS/GTS/wmo/wmo_list.txt which is widely used to cross reference WMO numbers with IDS, for several years now, it had several problems, one was not having up to date information. Recently, just a few weeks prior to DBCP Champika reported it is now being updated everyday, and puling information from the ARGOS GTS database, from the AOML deployment log and E-SURFMAR deployment log, it has been tested and we are very happy to see this information now being current and accurate. Thank you Champika!

AOML sent to MEDS all drifting buoy data from the AOML database in all three forms: raw decoded data, edited (position and sensor) and 6-hour interpolated data from February 1979 through March 31, 2016. MEDS will be loading these data and will replace their existing AOML inventory with these up to date data.

The most recent QC interpolated drifter dataset updated through June 30, 2016 can be downloaded from the AOML web page at: **www.aoml.noaa.gov/phod/dac/dacdata.php**

Edited and raw data are also available from NOAA/AOML upon requests by e-mail sent to: Mayra.pazos@noaa.gov or Erik.valdes@noaa.gov

5. Format Issues

After Iridium SBD showed its efficiency to report drifting buoy observations ashore (Iridium-PP work), Meteo-France became the repository for the related data formats. A document describing these data formats is regularly updated at:
http://esurfmar.meteo.fr/doc/o/db/others/DB_Iridium_formats.pdf

A link to these data formats is also provided from the GDP web site:
http://www.aoml.noaa.gov/phod/dac/gdp_doc.php

The use of standard data formats simplifies the work of data processing centres.

During the intersessional period, the TTDM team worked to propose a new Iridium SBD template #003 (see table in appendix) to report internal physical measurements (pressure, temperature and humidity) in addition to the existing ones. After its adoption by DBCP-32, this template would become the standard for SVP-SVPB drifters. The team also worked on:
- creation of a new template (#022) for SVP-BS drifters (salinity). The purpose was to report the conductivity instead of the salinity;
- creation of a provisional template (#080) for SVP and SVP-B drifters built by SIO. This action integrate a template designed by this manufacturer, afterward. It will disappear after data format #003 is adopted;
- the draft of a new template (#090) for future experimental HRSST-2 drifters;
- The removing of obsolete templates.

   Two features – which were misunderstood by some manufacturers -, must be reminded: When a parameter is missing (not measured or faulty), it must be reported with all bits forced to '1'. This is the case for SVP drifters: Air pressure and Pressure tendency are so forced in data format #000. It should be the same for technical parameters which are not measured (e.g. in new data format #003).

- If the GPS worked less than 4094 minutes ago, the most recent valid position must be reported even if it was not acquired at the time of the other parameters (e.g. air pressure). The age of the location (difference with the observation time) is then reported as "GPS fix time delay" (in minutes). This should perhaps be renamed as "GPS fix age" in order to avoid any confusion, most especially with the Time To First Fix (TTFF). All GPS technical parameters are those of the most recent valid location. In case no location could be get during the last 4095 minutes, all GPS parameters must be forced with all bits to '1'. Data centres could then use the Iridium position (e.g. with a maximum CP Radius of 7 km): not accurate enough for Lagrangian current measurements but acceptable for air pressure at least.
- We must note that analysis of existing data showed that the Time to First GPS Fix (TTFF) is an excellent criteria to detect the presence or absence of the drogue in wave conditions[1]. It could replace the strain gauge or submergence indicators, with advantage, as it was presented at DBCP-31 S & T workshop by the AOML Drifter Data Assembly Center, Mayra Pazos and Erik Valdes.

6. Review all relevant JCOMM Publications

7. Action Items completed during the intersessional period:

- The file: (ftp://ftp.jcommops.org/JCOMMOPS/GTS/wmo/wmo_list.txt) produced by JCOMMOPS and which is widely used as a cross reference of platform IDS and WMO numbers is now being updated regularly with all relevant and correct information.
- A new Iridium SBD raw data format (#003) was designed and circulated within the TTDM members, to report new internal physical measurements in addition to the

existing ones, for SVP and SVPB.

8. Acknowledgements

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 inputs to this report.

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APPENDIX 2

**DATA FORMAT #003 FOR FUTURE SVP AND SVPB DRIFTERS
(DRAFT FOR ADOPTION BY DBCP-32)**

Parameter	Bits	Pos	Offset	Max	Formula
Format identifier	8	0	0	254	Forced to 3 in present version
Year	7	8	2000	2126	Year = n + 2000
Month	4	15	0	12	Month = n
Day	6	19	0	31	Day = n
Hour	5	25	0	23	Hour = n
Minute	6	30	0	59	Minute = n
Air pressure	12	36	800.0	1209.4	AP (hPa) = n*0.1 + 800
SST	14	48	-80.00	83.82	SST (°C) = n*0.01 – 80
Strain gauge count	6	62	0	100	SGC (%) = n * 1.6129
Battery voltage	6	68	5	17.4	Vbat (V) = n*0.2 + 5
Iridium transm. duration	6	74	0	310	SBDT (s) = n*5
Iridium retries	3	80	0	6	SBDR = n
GPS time delay (since last fix)	12	83	0	4094	Delay (min) = n
GPS Latitude (deg. N)	21	95	-90	90	Lat (deg) = n*0.0001 - 90
GPS Longitude (deg. E)	22	116	-180	180	Lon (deg) = n*0.0001 - 180
GPS Horiz. Dilution of Precision	7	138	0	12.6	HDOP = n*0.1
GPS #sat	5	145	0	30	Nsat = n
GPS Time To First Fix (TTFF)	9	150	0	510	TTFF (s) = n
Hull Humidity	8	159	0	100	Hum (%) = n*0.5
Hull Pressure	8	167	900	1408	Press (hPa) = n*2 + 900
Hull Temperature	9	175	-80.0	175	Temp (°C) = n*0.5 – 80

APPENDIX 3

**RESULTS OF DRIFTING BUOY ANALYSIS OF GTS DATA RECEIVED AT
METEO-FRANCE AND MEDS, PERFORMED ON AUGUST 6, 2016**

MF		Drifting buoys from which the data are received at M-F					Observations from these buoys received at M-F					
CCCC	Operator	FM18	Old BUFR	TM315009	FM18 only	BUFR only	FM18	Old BUFR	TM315009	FM18 only	BUFR only	
CWAO	Joubeh	93	0	112	0	9	2230	0	2579	0	349	
KARS	CLS America	956	937	965	0	9	18278	24615	25599	0	7321	
KWBC	SIO	0	0	169	0	169	0	0	4953	0	4953	
KWBC	Pacific Gyre	0	0	8	0	8	0	0	207	0	207	
LFPW	Meteo-France	191	0	243	0	52	4501	0	5739	0	1238	
LFVW	CLS Toulouse	14	22	22	0	8	124	184	184	0	60	
RJTD	JMA	6	6	0	0	0	139	139	0	0	0	
	HK Observatory	0	0	1	0	1	0	0	3	0	3	
Total		1260	965	1520	0	256	25272	24938	39264	0	14131	

MEDS		Drifting buoys from which the data are received at MEDS					Observations from these buoys			# Drifting buoys with uneven # of obs		
CCCC	Operator	FM18	Old BUFR	TM315009	FM18 only	BUFR only	FM18	Old BUFR	TM315009	More FM18	More TM315009	
CWAO	Joubeh	88	0	84	4	0	2099	0	1949	21	4	incl. 8 "moored" buoys (55086, 55087, 64476, 64478, 71235, 7124...
KARS	CLS America	1023	1022	1024	0	1	23141	25824	26126	197	601	62728 BUFR only
KWBC	SIO	0	103	41	0	103	0	2419	324	0	41	
KWBC	Pacific Gyre	0	0	8	0	8	0	0	210	0	8	
LFPW	Meteo-France	0	0	248	0	263	0	0	5936	0	244	FM18 probably on national headers, not routed internationally
LFVW	CLS Toulouse	13	28	28	0	18	334	729	729	0	27	in the old bufr, there's a header (IOBX03) with moored buoys o...
RJTD	JMA	2	4	0	0	2	20	36	0	2	0	
Total		1126	1157	1433	0	395	25594	29008	35274	220	925	

TABLE SHOWING NEW AND OLD BUFR BULLETIN HEADERS

NEW BUFR BULLETINS HEADERS	OLD BUFR BULLETIN HEADERS	DESCRIPTION
IOBX05	IOBX13	GDP DRIFTERS PROCESSED BY CLS FRANCE
IOBX06	IOBX02	GDP DRIFTERS PROCESSED BY CLS AMERICA
IOBX15	IOBX07	ARCTIC AND ANTARCTIC DRIFTERS PROCESSED BY CLS FRANCE
IOBX16	IOBX12	ARCTIC AND ANTARCTIC DRIFTERS PROCESSED BY CLS AMERICA
IOBX17	IOBX01	OTHER DRIFTING BUOYS PROCESSED BY CLS FRANCE
IOBX18	IOBX03	OTHER DRIFTING BUOYS PROCESSED BY CLS AMERICA
IOBX09	IOBX11	TRITON BUOYS
IOBX10	IOBX08	TAO, PIRATA, RAMA BUOYS
IOBX19		OTHER MOORED BUOYS PROCESSED BY CLS FRANCE
IOBX04		OTHER MOORED BUOYS PROCESSED BY CLS AMERICA

APPENDIX 4

TERMS OF REFERENCE OF THE DBCP TASK TEAM ON DATA MANAGEMENT (TT-DM)
(as adopted at DBCP-29)

The DBCP Task Team on Data Management shall:

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

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

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

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

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

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

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

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

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

APPENDIX 5

TT-DM Membership:

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

1. Mayra Pazos (NOAA/AOML/ GDP) ,Chair   mayra.pazos@noaa.gov

2. Pierre Blouch (E-SURFMAR Service Manager). Co-chair   pierre.blouch@meteo.fr

3. Christophe Billon (Meteo-France)   Chritsophe.billon@meteo.fr

4. Yann Bernard (CLS Technical Manager)   ybernard@cls.fr

5. Mathieu Ouellet (RNODC representative)   Mathieu.Ouellet@dfo-mpo.gc.ca

6. Jeff Wingenroth (Data Buoy Instrumentation)   jlwing55@gmail.com

7. Champika Gallage (DBCP Technical Coordinator) cgallage@jcommops.org

8. Gilbert Emzivat (SOC representative)   gilbert.emzivat@meteo.fr

9. Emily McPherson (Metocean)   Emily@metocean.com

10. Jon Turton (UK Met Office)   jon.turton@metoffice.gov.uk

11. Basanta Kumar Jena (Scientist, NIOT, India)   bkjena@niot.res.in

12. Johan Stander (SA Weather Service)   johan.stander@weathersa.co.za

13. Tshikana Rasehlomi   tshikana.rasehlomi@weathersa.co.za

14. Karen Grissom   karen.grissom@noaa.gov,

15. Erik Valdes (GDP)   erik.valdes@noaa.gov

16. Lance Braasch   lbraasch@ucsd.edu

17. Paul Poli   paul.poli@meteo.fr

18. Richard Crout   richard.crout@noaa.gov

19. Tammy   tammy@oceanafrica.com

20. B. Robert   brobert@cls.fr

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

APPENDIX 6

CLS report on GTS processing activity for the DBCP Task Team Data Management

Reference: CLS-DCL-NT-2016-158
Nomenclature: -
Issue: 1. 0
Date: Sep. 26, 2016
Proprietary information: no part of this document may be reproduced divulged or used in any form without prior permission from CLS.
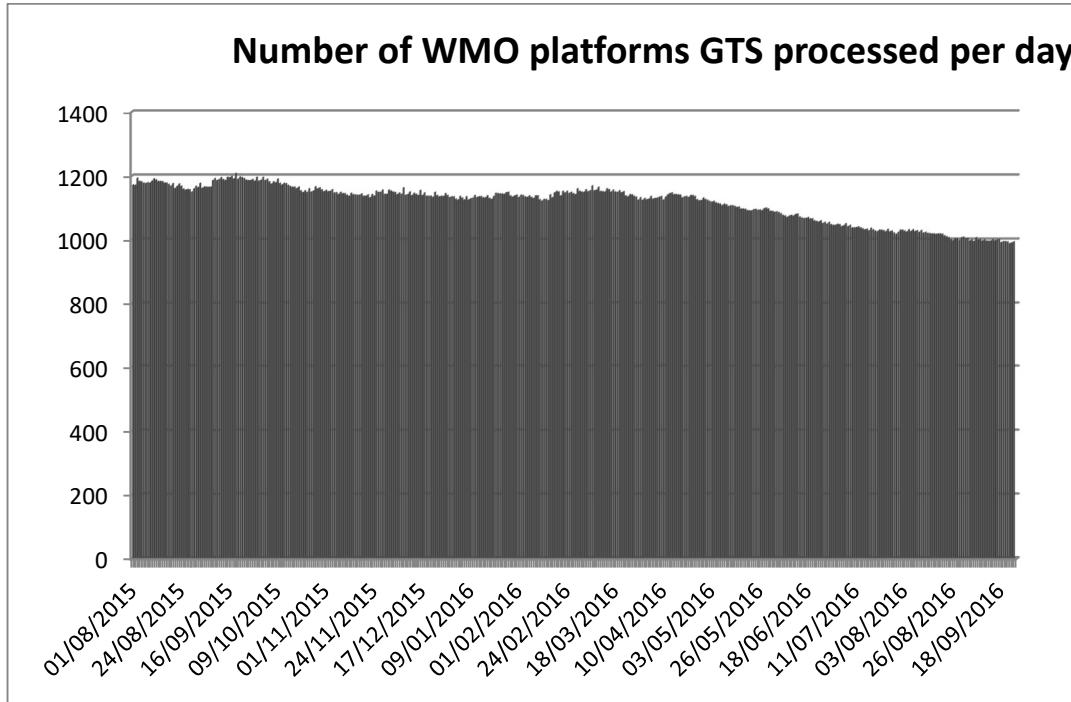
Chronology Issues:			
Issue:	Date:	Reason for change:	Author
1.0	19/08/2016	Creation	Yann Bernard

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1. 2015-2016 GTS processing statistics

Number of WMO platforms GTS processed per day

The number of WMO numbers processed by CLS on the 2015-2016 period is decreasing on the 2nd semester of 2016 due to less Argos drifters deployed as shown on the graph below.

Number of drifters GTS processed per day

Number of BUFR bulletins sent on GTS per day
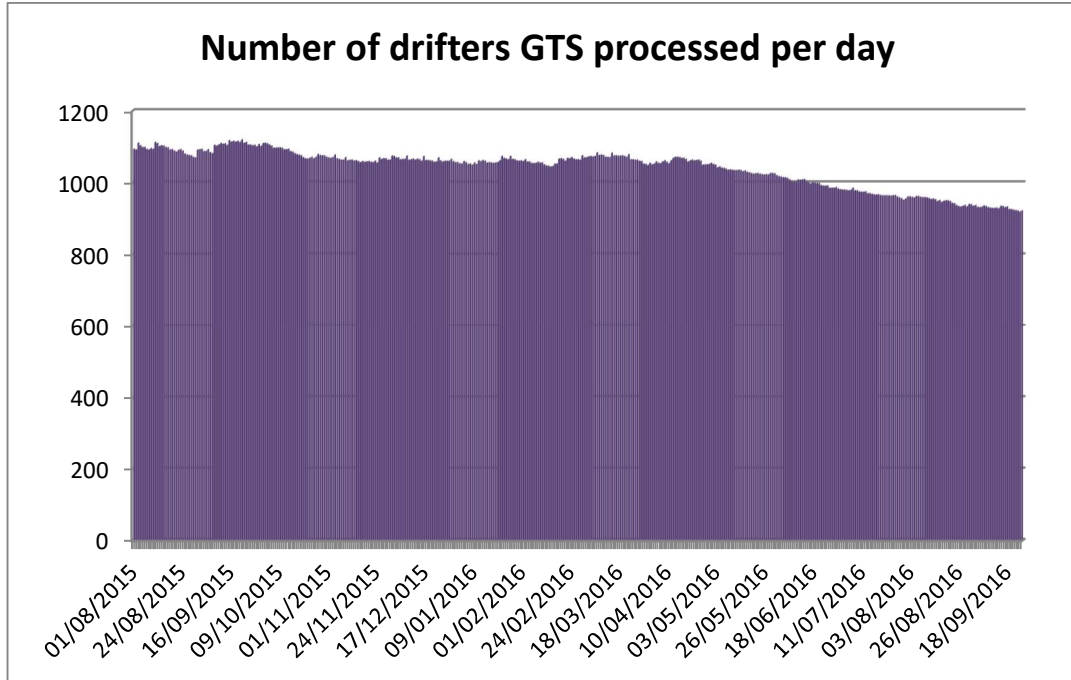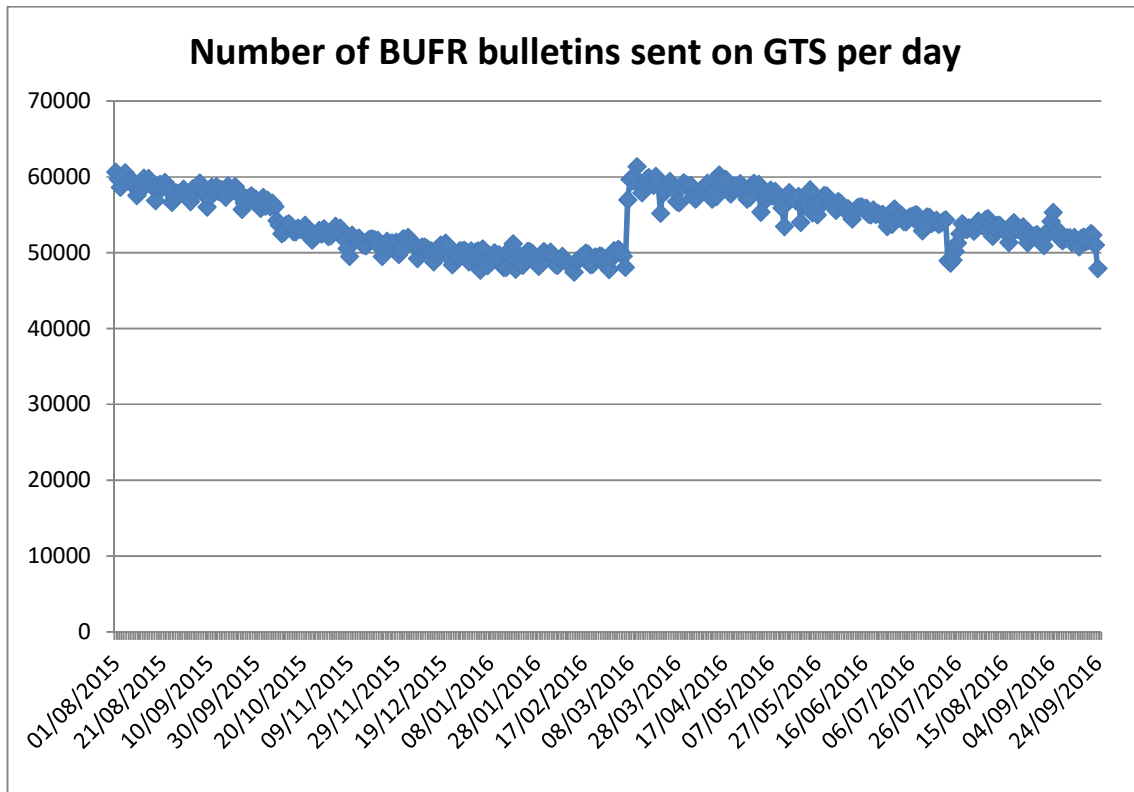
The number of BUFR bulletins displayed on the GTS by CLS and CLSA has increased in March 2016 due to the upgrade of 469 drifting buoys that haven't had yet the new BUFR sequence (TM 315009) in our database.

Average daily delivery time (in min) of BUFR bulletins on GTS
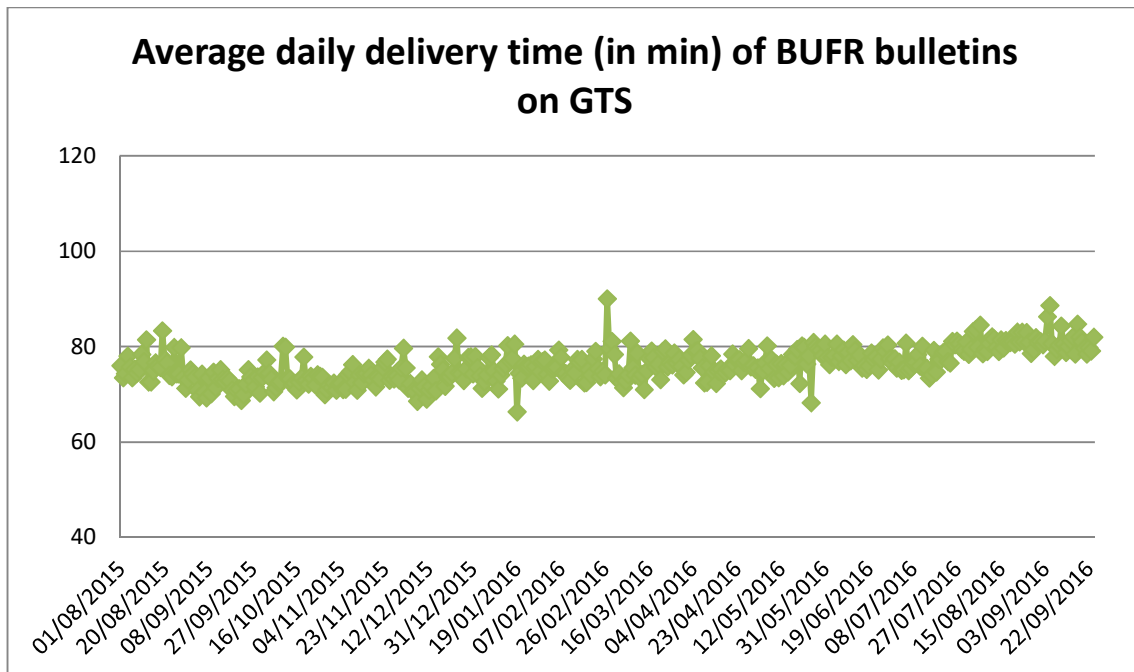
The daily average delivery time of drifter bulletins on the GTS is relatively stable on the 2015-2016 period around 80 minutes.

2. 2015-2016 GTS processing enhancements & operations at CLS

Lat 0; Lon 0 positions: Bug highlighted in September 2015, due to a processing issue that allocated some drifting observations without location despite the presence of correct Argos or GPS locations. A new quality control ("Location Mandatory") has been set up in September 2015 on both CLS and CLSA processing centers which checks that a correct location is encoded in each GTS bulletin.

New BUFR sequences with wrong WMO numbers: due to a different coding of the WMO number than in the previous BUFR template sequence for buoys, CLS has corrected in October 2015 its BUFR coding to display correctly WMO numbers in the 2 BUFR sequences.

Air Pressure BUFR descriptor harmonization: Settings of all SVP-B drifting buoys GTS processed at CLS and CLSA have been harmonized with the same descriptor in December 2015 on Meteo France request with only Pressure reduced to sea level = BUFR element 0 10 051.

BUFR bulletins limitation size: In agreement with NWS and Météo-France, and according to the WMO regulations, CLS and CLSA have extended the limitation size of our BUFR bulletins to 500 Kb instead of 15 Kb on April 13th, 2016.

Antarctic buoys WMO numbers: On Meteo-France and WMO request CLS and CLSA have stopped to change the 7 by 0 on the first digit of the Antarctic buoys WMO number on April 13th, 2016.

Technical issue on June 28th, 2016: The CLS and CLSA GTS processing chains have encountered technical issues in sending Bulletins on Tuesday 28th June from 08:53 to 14:24 UTC. The bulletins processed were corrupted and not available in a correct format. All BUFR and Alphanumeric (BUOY) files were impacted. We have implemented corrective and preventive solutions for the future. All missing bulletins have been reprocessed and displayed on the GTS in delayed mode.

BUFR templates: The 2 new BUFR sequences for drifting buoys (TM 315009) and moored buoys (TM 315008) have been developed and qualified at CLS. These 2 new BUFR sequences have been validated by Meteo-France, the NWS, ISDM and the UK Met Office. They have been applied on all active buoys processed by CLS and all processing templates. Today, as requested by Météo-France and EUMETNET, for a transition period each buoy observation is sent 3 times together on the GTS by CLS:
- one alphanumeric bulletin (BUOY) with previous GTS header
- one BUFR bulletin with the old sequence and previous GTS header
- one BUFR bulletin with the new sequence and new GTS header
Here below the corresponding table between previous and new GTS headers used by CLS:

New BUFR bulletins headers	Old BUFR bulletins headers	Description
IOBX05	IOBX13	GDP drifters processed by CLS France
IOBX06	IOBX02	GDP drifters processed by CLS America
IOBX15	IOBX07	Arctic and Antarctic drifters processed by CLS France
IOBX16	IOBX12	Arctic and Antarctic drifters processed by CLS America
IOBX17	IOBX01	Other drifting buoys processed by CLS France
IOBX18	IOBX03	Other drifting buoys processed by CLS America
IOBX09	IOBX11	TRITON buoys
IOBX10	IOBX08	TAO, PIRATA, RAMA buoys
IOBX19		Other moored buoys processed by CLS France
IOBX04		Other moored buoys processed by CLS America

The transition period has been extended on Canada and then UK request to the 1st of November 2016. After this date only one BUFR bulletin with the new sequence and new GTS header will be transmitted onto the GTS for drifting and moored buoys observations.