Task Team on Data Management Report

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Receive and Review Reports from the Data Management Centers

Meteo-France and MEDS performed several data surveys since the beginning of 2016 that allowed to identify several problems:

- Bulletins routed to one but not to the other center
- Buoys having 7-digit WMO numbers not convertible into 5-digit WMO number but were reporting using FM18 header
- BUFR messages incorrectly coded
  - ✓ ***Centers that were the source of the problems were informed and they promptly corrected them.***

  Information, news and regular survey results are maintained by Meteo-France in the frame of E-SURFMAR service and are published on:

  https://software.ecmwf.int/wiki/display/TCBUF/E-SURFMAR

Receive and Review Reports from the Data Management Centers

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

- JMA remains the only center that do not produce BUFR data with template TM315009 (only six buoys are concerned). 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 format;
- CLS (by request) and JMA are the remaining two centers to report BUFR data according to the never validated template.

Despite these drawbacks, more buoys are now sending their data in BUFR than in FM18 format.

Table Driven coding requirements for data buoy observations

Migration to BUFR

Due to requests from data users, the stop of the FM18 message transmissions has been postponed several times. The new deadline is **November 1st , 2016**. However, many more buoys report in BUFR format only.

Remainder:

- Maintenance of two data flows, one for FM18 and another one for BUFR, in parallel is a hard job. Producing centers urge data users to **update their applications** to process BUFR data, according to templates:

TM315008 (moored buoys) and **TM315009** (drifting buoys)

Table Driven coding requirements for data buoy observations

WARNING:

Some GTS centres are converting to BUFR the TAC data they receive from the GTS, or vice versa, converting to TAC format the data they receive in BUFR format.

Duplicates are running onto the GTS if the new converted data are sent back with their new coded format. This is a bad practice.

To avoid double use:

- data users must apply filters that take into account the relationship between 5-digit and 7-digit WMO numbers.

Real Time Distribution of Data

- 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 the GTS, for drifters whose GTS is managed by AOML.

- Meteo-France continues to report data on the GTS for E-SURFMAR and Meteo-France partners, as long as their format is one of those recommended by DBCP.
  Available formats are listed in:

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

- Meteo-France QC tools monitors BUFR data as a priority. TAC data are only monitored for drifters not reporting in BUFR.

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 user's 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)
- SIO has migrated to using the new TM315009 BUFR template since June 2016 to report Iridium drifters on the GTS.

Real Time Distribution of Data

- U.K Met Office relies on Meteo-France to issue all Met Office drifter data to the GTS and these are distributed in the approved BUFR format (TM315009). However, the Met Office's plans to utilize BUFR reports received over the GTS have been delayed together with the development of an interim capability to convert the BUFR data back into the FM-18 format.
- 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 old BUFR format TM308009 and distributed on the GTS. The timescale for distributing the moored buoy data to the GTS in the approved BUFR format (TM315008) has been delayed and it is unlikely to be implemented until mid-2017.

Real Time Distribution of Data

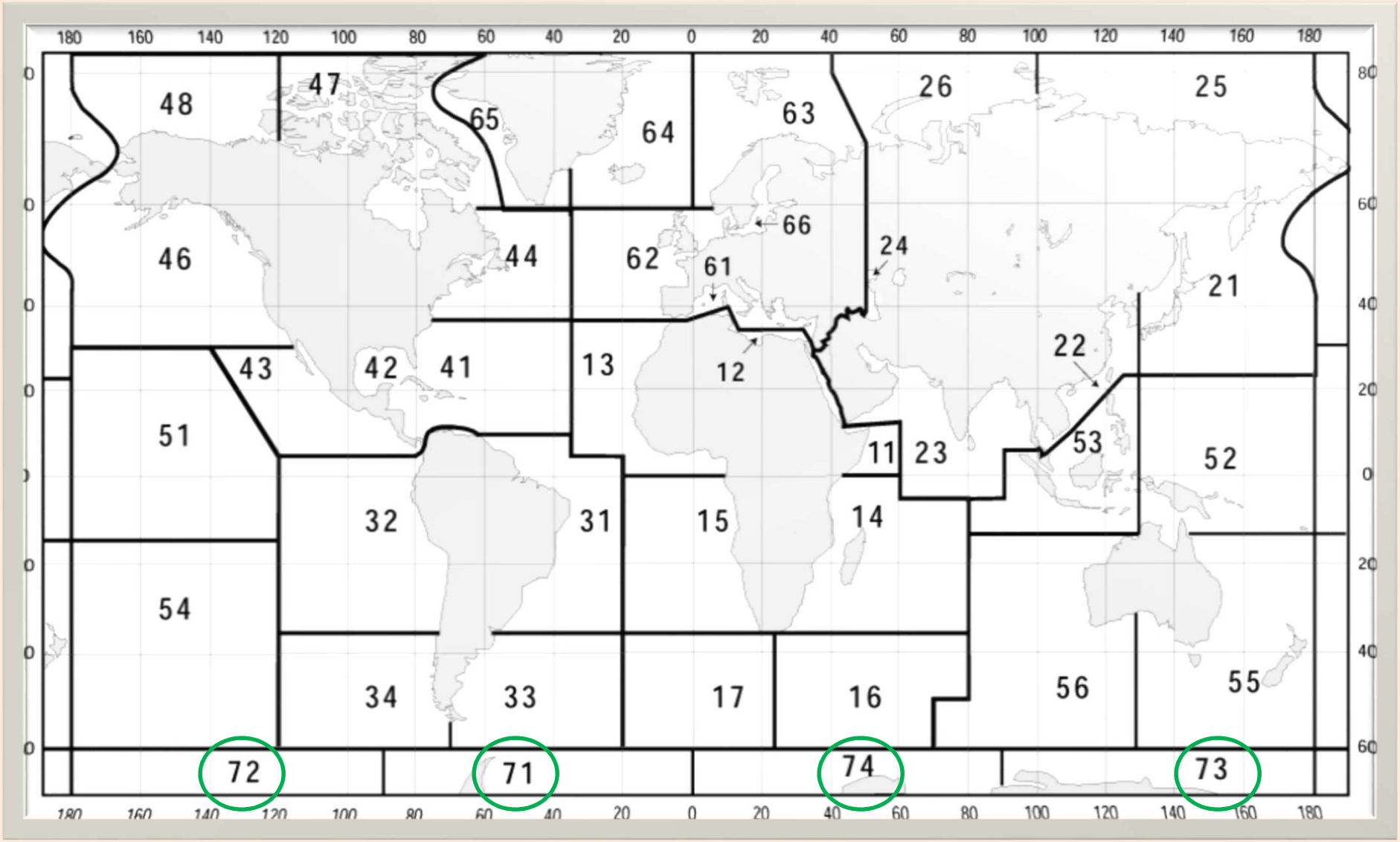
- MEDS reported it was discovered that NDBC and JouBeh were sending several BUFR bulletins with the same bulletin header, this was pointed out on May 11th 2016. NDBC upgraded their software and JouBeh was in the progress of doing so as of August 2016.
- Since June 2015, Canada no longer receives FM-18 data encoded by Meteo-France who are no longer routed through international circuits. MEDS will replace these data with those received in TM315009 BUFR bulletins.
- FM-18 bulletins shortages were observed in 2016 in Canada, for buoys that have no BUFR backup, such as those 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.

Real Time Distribution of Data

- Members of the TTDM team worked hard to identify a problem reported by Navoceano, where on Jun 15, 2016 they noted a significant drop of the number of surface drifters received from the GTS, most of them were 7-digit WMO numbers, and some from the Antarctic area. 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).
- WMO numbers for the Antarctic area are now back to start with "7" and not "0" in the first digit of the WMO number as it was changed during the intersessional period.

Ex: WMO that started with **01, 02, 03, 04** start now with:
71, 72, 73 and 74

Allocation of WMO numbers based on deployment area



Real Time Distribution of Data

- AOML/DAC continues to monitor data on the GTS and acting on requests received from the meteorological centres, to take sensor data, and/or positions off GTS for drifters managed by AOML.
- 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 on near real time should be found without going through the NWS. QC-tools, 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.

Delayed Mode Distribution and Archiving of Data

- AOML/DAC continues to assemble, quality control and distribute data from Argos and Iridium drifters received at the centre. On an average DAC quality controls about 1300 drifters per month.

- Raw drifter data are received at AOML from the following sources:
  - Argos – CLS America
  - Iridium – CLS America, Meteo-France, SIO, Joubeh and Department of Defense (DoD).

- AOML/DAC just released the most recent quality control/ interpolated dataset updated through June 2016, available from the AOML web page:

  www.aoml.noaa.gov/phod/dac/dacdata.php

- Raw and edited non-interpolated data are also available from AOML/DAC upon request by e-mail to:

  Mayra.Pazos@noaa.gov or **Erik.Valdes@noaa.gov**

Delayed Mode Distribution and Archiving of Data

- AOML/DAC sends MEDS updated drifting buoy data to populate their archives once or twice a year.
  - The latest dataset archived at MEDS covers the period through December 2011. Decoding errors were found in the drifter ID and WMO numbers due to manipulations performed at MEDS at the time of populating their archives.
  - AOML/DAC sent MEDS during the intersessional period, data from all three different stages of processing: raw, edited and interpolated, since 1979 through March 2016 to ensure MEDS has the latest and most up to date dataset in their archives.
  - MEDS is working on repopulating their database and will make it available on line.

Delayed Mode Distribution and Archiving of Data

- **Metadata:**
  - AOML/DAC maintains metadata for all drifters processed by this center/ These files are updated quarterly and biweekly and are made available on the web:
    www.aoml.noaa.gov/phod/dac/dirall.html (quarterly) and
    www.aoml.noaa.gov/phod/dac/deployed.html (biweekly),
    Available also as csv file:
    www.aoml.noaa.gov/phod/dac/gdp_doc.php
  - Meteo-France reports that although not officially agreed and despite DBCP is responsible for such metadata, platform's metadata are collected in E-SURFMAR VOS metadata database while a more suitable repository is available
    http://esurfmar.meteo.fr/doc/vosmetadata_v6/

Delayed Mode Distribution and Archiving of Data

- **Metadata:**
  - Metadata for Iridium drifters managed by Meteo-France are available at:
    ftp://esurfmar.meteo.fr/pub/pb/ghrsst/ghrsst_buoys.xls
  - JCOMMOPS maintains a metadata file which is available as a spreadsheet on their ftp server. This file is widely used to cross reference WMO numbers with IDS:

ftp://ftp.jcommops.org/JCOMMOPS/GTS/wmo/wmo_list.txt

Format Issues

- During the intersessional period the TTDM team worked to propose a new Iridium SBD template #003 to report internal physical measurements (pressure, temperature and humidity) in addition to the existing ones. After its adoption by DBCP-32, this template will become the standard for SVP-SVPB drifters. (A description of the template can be found in the full TTDM report). After the TTDM side meeting yesterday, it was recommended to modified this format to add extra digits to the latitude and longitude to add more precision

Format Issues

- The Task Team on Data Management continues to recommend all buoy manufacturers to adhere to the standard message formats approved by DBCP, and to work with the TTDM in case a new data format is needed.
- ***The use of standard data formats simplifies the work of data processing centers.!***

- Meteo-France maintains the list and description of Iridium recommended formats that are suitable for conversion in BUFR. This list can be found 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:

www.aoml.noaa.gov/phod/dac/gdp_doc.php

Action Items completed

- ✓ SIO 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 implemented real-time off-site redundant backups (Iridium processing chain) and it is now operational. This was part of the GDP Iridium transition plan.
- ✓ JCOMMOPS metadata file posted on the web as a spreadsheet, which is widely used to cross-reference WMO numbers with IDS, is now updating regularly and pulling information from the ARGOS GTS database, AOML and E-SURFMAR deployment logs to provide real time up to date and accurate information. Thank you Champika!

ftp://ftp.fcommops.org/JCOMMOPS/GTS/wmo/wmo_list.txt

Action Items completed

- ✓ After yesterday's TTDM side meeting it was recommended to look at recommended real time SLP QC procedures prior to its release to GTS using the DBCP technical document #37 as a governing reference document.

- "Meteorological Centres assimilating SLP data in NWP models detect any buoys reporting erroneous or biased data onto the GTS , by making statistical comparisons with the model analysis and/or first guess background field should report and propose changes via online or email-based system to cooperating agencies in charge of data distribution"-

That is the procedure AOML uses to advise SIO or Argos to stop GTS distribution

Recommendations

- 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.
- 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.
- Centres must switch to using BUFR template for drifting and moored buoys (templates TM315009 for drifters and TM315008 for moorings) as soon as possible.
- Buoy data users should end the migration of their applications to BUFR
- Centres that convert, for local use, observation data received from a foreign GTS centre (e.g. BUFR converted into FM13) must not resend the converted data onto the GTS.

Recommendations

- JCOMM Global Data Assembly Centers (GDACs) for drifting buoys, Meteo-France and ISDM, should continue to work together comparing GTS bulletin headers received by the two centers to resolve problems.
- 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 is not a suitable solution to this problem.

  There exists a web site that could be used to obtain data from all platforms on real time and in delayed mode, (although at the moment a small problem decoding some 7-digit WMO numbers is being addressed). AOML will place a link to:

http://osmc.noaa.gov/erddap/tabledap/OSMC_30day.html

Thanks to all who contributed to this report and to those who dedicated their time to solve problems encountered during the intersessional period ☺