

# TT-MB report to DBCP-29



1. BUFR formats for moored buoy data
2. Moored buoy metadata
3. Technical developments

# BUFR



- WMO timescale for the cessation of TAC being transmitted on the GTS is November 2014
- Presently have a single BUFR template (still technically under validation) for buoy data from both drifting and moored buoys
  - when used it contains a lot of redundant elements (missing data filled with 1s)
- Hence the proposal at DBCP-27 to specify separate templates for moored buoy and drifter data

# BUFR



- At DBCP-28 Panel reaffirmed that separate BUFR templates for drifting and moored buoys should be defined and for TT-MB and TT-DM to finalize the proposals and submit them to CBS through the JCOMM TT-TDC
- Both templates were reviewed by TT-MB & TT-DM in Dec 2012 and a few amendments made
- In May 2013 templates were passed to TT-TDC for review, with a few further amendments made

# BUFR



- Templates then passed to the WMO Inter Programme Expert Team of Data Reporting Maintenance and Monitoring (IPET-DRMM) for approval at their July meeting
- A few minor amendments were made and the templates have been accepted for validation as the first step towards becoming operational
- ‘Agreed’ templates have now been published on DBCP-29 meeting site (document 11.2)



# BUFR validation

- For each template a test dataset is generated and encoded into BUFR using the proposed template
- The test dataset encoded in BUFR is then decoded by another centre using a different BUFR encoder/decoder and results compared to the original dataset
- Hence need at least 2 centres to participate in the validation process
- The results of this process are submitted to the IPET-DRMM for their approval after which the templates can be declared as operational

# BUFR validation



- So far we have the following ‘volunteers’
  - Moored buoy BUFR: UK Met Office, Env Canada, (NDBC)
  - Drifter BUFR: Pacific Gyre, Meteo-France, CLS
- (Optimistic) timetable is to present validation results to IPET-DRMM by end of the year  
December
  - aim for operational acceptance by 1 April 2014
  - will need to inform NMSs about the new templates via the WWW Operational Newsletter

# BUFR developments



- Moored buoy BUFR is modular with optional sections for different classes of data (e.g. basic wave data, spectral wave data, sub-surface T&S etc.)
- One of our buoys (E1) now carries sensors for bio-geochemical variables (e.g.  $O_2$ , chl<sub>a</sub>, nutrients) which in the longer term we will want to exchange on GTS
- We have BUFR Master Table MT0 for meteorology and MT10 for oceanography: MT0 only allows  $O_2$  at present, while MT10 lacks any platform details
- Not clear yet whether to add b-gc descriptors to MT0 or to use MT10 – awaiting guidance from WMO (issue also for Bio-Argo floats)

# Moored buoy metadata



- Over the last few years the details of the metadata needing to be collected have been agreed and published on the DBCP web-site
  - could have over 200 elements
- At DBCP-27 agreed that the metadata should be submitted to JCOMMOPS in NetCDF for consistency with OceanSITES and tsunami buoys and NDBC would lead on developing the SIF (standard input format)
  - no progress on this due to staff changes at NDBC



# Alternatives to NetCDF



- At DBCP-28 agreed that other formats would probably have to be used as many operators (e.g. NMS) do not use NetCDF
- As content is highly variable due to buoy capability, then advantageous if the format used is self-describing
- TT-MB have discussed and recommend the use of tagged pairs and XML to submit the metadata to JCOMMOPS

# Tagged pairs format



Tagged pairs approach has been used by the SAMOS (shipboard automated meteorological and oceanographic system) community, has the advantage that each element is described such that the order of the data string is unimportant and the length depends on the data content

```
$MB_metadata,create:20130920,update:20130920,msd:20130611,  
med:valid,ID:51,WMO#62050,stn:E1,ts:MB,stat:operational,....
```

XML similarly is self describing through the use of tags (e.g. for WMO# `<WMO#>62050</WMO#>`)

# Moored buoy metadata



- UKMO and EC have compiled much of the metadata for their moored buoys
- Action to translate this to tagged pairs format and submit metadata to JCOMMOPS before the end of the year
- Will then need TC to develop a system for making the metadata available via JCOMMOPS web-site
- Need to ensure JCOMM ETMC are fully aware of progress and plans

# Moored buoy technology developments



- Report contains updates from/on
  - Environment Canada
  - US Pacific Marine Environmental Laboratory
  - UK Met Office
- Workshop presentations on Axys Wind Sentinel buoy, Brazilian PIRATA buoy and PMEL mooring profiler
- Further information on capabilities likely to be provided in the national reports later in the meeting