TT-MB report to DBCP-XXVI

1. Technical developments

2. Moored Buoy Metadata

3. Suggested revised (improved?) BUFR templates for buoy (drifter & moored) data

Moored buoy technology developments

- Report contains updates from/on
  - Environment Canada
  - US National Data Buoy Center
  - US Pacific Marine Environmental Laboratory
  - Indian (NIOT) moored buoy programme
  - UK Met Office

Highlights

- Environment Canada
  - 3 new seasonal buoys in Gulf of St Lawrence (2 WatchKeeper,1 Triaxys)
  - Retrofitting SUTRON SatLink2 GOES transmitters to network
  - Contributions to PP-WET
  - Integration of Iridium SBD into Watchman 100 payload

Highlights

- US NDBC
  - TAO refresh
  - Comparisons with wave gliders
  - Collaboration with Mexico (red-tide HAB) and Chile (Tsunami)
  - Reviewing US National Wave Plan – identify sentinel locations

Highlights

- PMEL
  - Incorporation of China's Bai-Long RAMA data into main Tropical Moored Buoy web pages
  - Deployment of prototype TFlex moorings (aim to replace legacy Atlas moorings)
  - Collaboration with JAMSTEC and EC on Kuroshio Extension Observatory and Station Papa (OceanSITES)

Highlights

- India
  - Sub-surface Ocean Moored buoy Network for India (OMNI) buoys
  - Best practices manual
  - Anti-vandalism measures
  - Next generation Met–Ocean buoy design
  - Introduction of Automated Data Reception Software (for Met-Ocean, OMNI and Tsunami buoys)

Highlights

- UKMO
  - Modification of joint Met Office/NOCS buoy at PAP (OceanSITES)
  - Operation of Weymouth Bay buoy for Olympics
  - Next generation buoys being built for K7 and E1 (jointly with PML)

Moored buoy metadata

- During the year the metadata content required for moored buoys was agreed and published on the DBCP web-site (http://www.jcommops.org/dbcp/data/metadata.html)
- Categories include
  - Metadata details (e.g. validity period)
  - Station details
  - Sensor details (anemometry, air temp, SST, SSS, air pressure, RH, precipitation, downwelling shortwave, downwelling longwave, waves, surface currents, sub-surface currents, sub-surface temperature, sub-surface salinity)

Moored buoy metadata

- Agreed at DBCP-27 that the metadata would be uploaded to JCOMMOPS in NetCDF for consistency with OceanSITES and tsunami buoys
- NDBC have offered to develop the SIF (standard input format) for the moored buoy metadata NetCDF
- Once SIF is agreed then operators can start to compile their metadata in a format to submit to JCOMMOPS
- Probably will need translator(s) to convert the metadata from text/csv/xml into the NetCDF
- We shouldn’t underestimate the work involved in compiling the historical metadata

Other metadata actions

- In liaison with Johan Stander (South Africa) and the TT-IBP, to address the issue of developing a proper certification process, and procedures for the calibration, and investigate what calibration information should be collected internationally and recorded
- DBCP-27 also agreed that TT-MB should lead on the definition and collection of metadata from rigs and platforms (coordinated with SOT TTs)

- Neither have been progressed – as we need to complete the process for moored buoy metadata first

BUFR

- Presently have a BUFR template (still under validation) for buoy data, both moored buoys and drifters, hence when used it contains a lot of redundant elements (missing data filled with 1s)
- DBCP-27 recommended to develop specific templates for specific platform types (e.g. having different templates for drifting buoys, wave buoys, and moored buoys)
- Proposed (simpler) templates for drifters and moored buoys circulated to TT-MB & TT-DM in Aug 2012

BUFR - Drifters

- For drifters based on existing template but removed all elements that pertain only to moored buoys and those that indicate the buoy is a drifter (as will know a-priori)
  - Gets rid of half the content by avoiding redundancy
- Other suggested changes are relatively straightforward
  - For temperature (SST and sub-surface) should we include standard and high accuracy ?
  - Use delayed replication factors (0 or 1) to make sub-surface temperature and salinity chain measurement data optional
  - Also to make an optional sequence for wind measurements
  - Will need to include an optional sequence for wave measurements from drifters (not currently in draft template)

BUFR – Moored Buoys

- For moored buoys suggest a new design template that breaks the message down into a series of sequences, that may (or may not) be used by preceding them with a delayed replication count (1 or 0 in the data section)

Suggested sequences

- For identification (WMO#, site, time, position)
- For standard met parameters (P, T, U, wind, SST)
- For ancillary met parameters (precip, vis, long- and short-wave radiation)
- For basic wave measurements (Hs, Hmax, tave, tpeak, mean wave dirn, dirn spread)
- For detailed spectral wave measurements
- For sub-surface temperature and salinity
- For sub-surface currents

Could easily add metadata sequences

- For standard met measurements
- For ancillary met measurements
- For wave measurements
- Etc.

- Agreed during discussion yesterday that if we deliver metadata via NetCDF there is little benefit from including it in the BUFR, also if make the basic met section optional then can use with waverider buoys

3 01 aaa	Sequence for representation of moored buoy identification (7 figure WMO number) type, time and location of the observation report
3 02 bbb	Sequence for representation of standard surface marine meteorological measurements
1 01 000 0 31 000 3 02 ccc	Replicate next sequence Delayed replication factor Sequence for representation of ancillary meteorological measurements (optional)
1 01 000 0 31 000 3 02 ddd	Replicate next sequence Delayed replication factor Sequence for representation of basic wave measurements (optional)
1 01 000 0 31 000 3 02 eee	Replicate next sequence Delayed replication factor Sequence for representation of detailed spectral wave measurements (optional)
1 01 000 0 31 000 3 06 004	Replicate next sequence Delayed replication factor Sequence for representation of sub-surface temperature and salinity measurements (optional)
1 01 000 0 31 000 3 06 005	Replicate next sequence Delayed replication factor Sequence for representation of sub-surface current measurements (optional)
1 01 000 0 31 000 3 02 fff	Replicate next sequence Delayed replication factor Sequence for metadata associated with standard surface marine meteorological measurements (optional)
1 01 000 0 31 000 3 02 ggg	Replicate next sequence Delayed replication factor Sequence for representation of metadata associated with ancillary meteorological measurements (optional)
1 01 000 0 31 000 3 02 hhh	Replicate next sequence Delayed replication factor Sequence for metadata associated with wave measurements

Next steps ?

- TT-MB and TT-DM to review and comment
- Revise templates
- Propose modified templates to JCOMM TT-TDC for independent review
- Modify as required then TT-TDC submit to CBS for approval to publish on WMO web-site for use/validation

WIGOS

- With changes to BUFR formats and implementation of metadata collection will probably need to review technical regulations and document best practices