Monday 3, November

Introduction (Hervé Claustre)

The terms of reference of the Bio-Argo Task Team were presented emphasising on need for a close interaction between Bio-Argo teams (and especially their present and future data managers) and ADMT. The steady progression in the number Bio-Argo floats is mentioned as well as the arrival of future projects that will contribute to the network improvement, in particular the SOCCOM project in USA. Actions related to Bio-Argo activity including the Ocean Science meeting, SCOR WG 142 and the Summer School of Biogeochemical sensors) were reviewed.

New file organization (Thierry Carval)

Argo Format version 3.1 was presented. This format evolution is significant because it describes how the Core-Argo and Bio-Argo parameters are to be stored in the Core-Argo in the C-file, all Bio-Argo parameters in the b-file, and Core-Argo plus Ocean state variables within Bio-Argo parameters in the merged file. The merged file is to be created at the GDAC from DAC supplied core and b-files. Full details are described in:
http://www.argodatamgt.org/content/download/23591/162719/file/argo-dm-user-manual-v3.1.pdf (Reference table 3: parameter code table)

Variable Naming (Justin Buck)

Bio-Argo parameter names

The present of Argo parameter name list including biogeochemical variables is available at:
http://www.argodatamgt.org/content/download/22516/155295/file/argo-parameters-list-core-and-b.xlsx

Argo terms have been mapped to both Climate Forecast (CF, http://cfconventions.org/standard-names.html) and SeaDataNet (SDN, http://www.seadatanet.org/Standards-Software/Common-Vocabularies) terms. This enables data interoperability with US and EU data integrators and systems such as EMODnet and GEOSS. The Bio-Argo group and BODC are keen to help if other new parameters and mappings are required.

Configuration parameters and metadata (Catherine Schmechtig)

Configuration parameters have been defined and refined jointly by Jean Philippe Rannou, Catherine Schmechtig, and Esmee Van Wijk. Tables 25 and 27 of the Argo user manual have been updated to take include Bio-Argo sensors and sensor models. Configuration parameters were split in two documents; core-Argo configuration parameters and Bio-Argo configuration parameters. Version 0.0 of the configuration parameters for Bio Floats is available on the Argo data management web pages:
http://www.argodatamgt.org/content/download/23250/160210/file/Bio_Argo_Configuration_Parameter_Names_for_Metafile_17Oct2014.xlsx

Report on RT and DM QC on O2 (Virginie Thierry)

Virginie Thierry presented the status of both real time and delayed mode Argo-O2 data management. Oxygen data are to be stored in Argo b-files. The existing processing manual has been reformatted to provide a clear and well documented procedure to compute, for each possible sensor/case, DOXY from the transmitted raw data. This document should be finalized by the end of 2014. Questions about the consistency of unit spelling between the

metadata file (and the User's manual) and the tech file were raised. It was been decided to ensure consistency so the unit should be spelled in all Argo nc file following tech units table (v1.6, see Argo Data Management Documentation web page).
It was mentioned that, when data from the CTD (PSAL for instance) need to be used to compute the final parameter (DOXY) from the raw data (TPHASE_DOXY for instance) and the CTD data are not available at the same pressure level than the oxygen related parameters (TPHASE_DOXY) then CTD data need to be interpolated on to oxygen pressure levels.
Real-time QC tests were defined in 2012 and are implemented in most DACs. The status of implementation by DAC is shown in Table 1.

Table 1 : status of implementation of Real Time QC tests on O2 data.

AOML	BODC	CORIOLIS	CSIO	CSIRO	INCOIS	JMA	KMA	KORDI	MEDS	NMDIS
done	done	done	?	done	done	no	End of 2014	no floats	No (no more active floats)	No floats

In delayed mode quality control, existing methods are based on adjustments from climatology, from reference calibrated in situ data and from "in air" measurements. The first method is useful when in situ or "in air" measurements are not available. Using reference in situ data provides much better results, especially in areas where the climatology is not well defined or subject to large inter-annual variability (North-Atlantic Ocean). The adjustment using "in air" measurements has been done by few groups and the method provides very good results that are in agreement with Winkler titration values to within 2 umol/kg near the ocean surface. This method is very promising and it is suggested that all Argo floats with O2 sensor should acquire "in air" measurements.
Finally, some optodes are probably subjected to drift and this should be investigated in the future. The "in air" measurements should help to detect and correct those drifts.

O2: Kanako Sato
Jamstec deployed 45 floats with DO sensor from 2010 to 2013. About a half of them are NEMO floats with Optode 3830 and were not calibrated in the lab before deployment. The Optode data before adjustment are lower than in situ RINKO data by up to 30 micromole/kg. Jamstec adjusted Optode data on floats to in situ RINKO data. These Rinko data were adjusted to Winkler O2 data within plus/minus 4 days and 150 km from float deployment according to the calibration equations proposed by Uchida et al. (2008). Then, the adjusted data of Optode 3830 were significantly improved. The standard deviation of the difference between them was 3,3 micromole/kg.

Tuesday 4, November

Chlorophyll A RT-QC, DM-QC (Catherine Schmechtig, Hervé Claustre)
Catherine Schmechtig presented the RTQC procedure for the CHLA: adjustment at depth, range test, negative spikes test, Non Photochemical Quenching correction. The adjustment at depth within oxygen depleted areas should be refined (regional test?). The RTQC for CHLA will be implemented at Coriolis and tested.
Hervé Claustre presented the tool seasiderendezvous (http://seasiderendezvous.fr)

The “possible” bias in the relationship between satellite Chla and Chla-adjusted should be further investigated by further work on the quenching correction, and linearity of the relation Chla versus fluorescence over the whole range of Chla concentration.

BBP RT-QC (Catherine Schmechtig)

The new version of “processing the BBP at the DAC level” was presented. It includes now the dependence in temperature and salinity of the Betasw (contribution of the pure sea-water to the signal). This version is already implemented at Coriolis.

Additionally, Range test and Negative spikes test for the RTQC procedure for the BBP were presented. The RTQC will be implemented at Coriolis. There is also a need to complete the documentation on the processing of scattering sensors including FLNTU. This will be done by LOV with the help of INCOIS, JAMSTEC.

Hardware: Good practices for good data (Antoine Poteau)

“Good practices” were presented to handle Bio-argo floats and to facilitate data management:

- Training of the persons who deploy floats
- Testing sensors at sea
- Testing sensors mounted on floats in a pool
- Calibration procedures (“in-air” measurements for optodes, black tape on sensor for ECO sensors)
- Communications with floats (positions, missions…)

The advantage of adding a pre-mission phase is to allow sensor data acquisition on the deck before the standard mission is transmitted by the float.

Trajectory for Bio-Argo (Antoine Poteau)

Antoine Poteau showed an example of Bio-Argo data stored in the Btrajectory file. All Bio-Argo floats deployed by LOV acquire data at an (low) interval of 10 min at drift. Those data will be used for science and to study sensor drift. A. Poteau reminded that a quality control should be performed on Bio-Argo trajectory data.

SOCCOM, NO3, pH, RT-QC, DM-QC (Ken Johnson)

The SOCCOM (Southern Ocean Carbon and Climate Observations and Modeling) program was initiated in Sept., 2014. SOCCOM will be the major US contribution to Biogeochemical Argo observations over the next six years with deployment of some 200 profiling floats equipped with oxygen, nitrate, pH and bio-optical sensors in the Southern Ocean. SOCCOM will support a full time biogeochemical data manager at UW, and a data coordinator at Princeton University.

Biogeochemical data still requires adjustments to be more scientifically useful. Significant progress in this area is being made. Air oxygen measurements can be used to largely remove the errors in oxygen sensor calibrations, producing data that are consistent to within about 1% with Winkler titrations made at deployment. Real time, adjusted data are being generated at MBARI for oxygen, nitrate and pH. The lessons learned can be used to create a QC and Adjustment manual for Bio-Argo.