BGC-Argo data management in China

Xiaogang Xing (CSIO), Zenghong Liu (CSIO)
6th BGC-ADMT Meeting
Hamburg, 27 Nov. 2017
Outlines

- CSIO Data Receiving and Processing System Upgraded
- “New” BGC-Argo Data from China Uploaded
- Future BGC-Argo Plan of China
- Some Questions
CSIO System Upgraded

- CSIO Data Receiving and Processing System has integrated the DAC level of Optode and ECO data processing program.
- Going to integrate the DAC level and RTQC of OCR, SUNA and SeaFET.
- Going to integrate the DMQC of Optode (In-Air Measurement).

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- Green: Done
- Orange: To be done in the next ADMT
- Red: To be done in the end of 2019
“New” BGC-Argo Data Uploaded

- APEX Equipped with Aanderaa 4330 (stalked but no in-air measurement)
- Project: *Response of the Meridional Overturning Circulation in the Antarctic Circumpolar Current to global warming and its effect on climate change* (ReMOCA)
- PI: Yu ZHANG (OUC)
- Ship: Xue-Long
- Area: Southern Ocean
“New” BGC-Argo Data Uploaded

■ Trajectories:

■ Basic Info:

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Sufficient energy supply is important and highly recommended!
“New” BGC-Argo Data Uploaded

- The PI just agrees to share the data to Argo & BGC-Argo project (Oct 2017)
- CSIO takes over the data processing and uploads data to GDAC
- We will change the float names as “oucbio018” to “oucbio023”, following the NKE float naming format.
## Future BGC-Argo Plan in China

### Deployment Plan in 2018
(At least 25 floats will be contributed to Argo project)

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OUC: Ocean University of China (Qingdao)
XMU: Xiamen University (Xiamen)
ZJU: Zhejiang University (Hangzhou & Zhoushan)
SHOU: Shanghai Ocean University (Shanghai)

48 floats in total for Argo project
Future BGC-Argo Plan in China

Argo BioGeoChemical

National contributions - 286

Latest location of operational floats (data distributed within the last 30 days)

September 2017

- AUSTRALIA (15)
- FINLAND (2)
- GREECE (1)
- JAPAN (2)
- UK (11)
- CANADA (8)
- FRANCE (63)
- INDIA (30)
- KOREA, REPUBLIC OF (2)
- USA (131)
- EUROPE (2)
- GERMANY (3)
- ITALY (8)
- NORWAY (8)
Future BGC-Argo Plan in China

- Purchase Plan in the next 2 years
  (~20 floats will be contributed to Argo project)

<table>
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<th>Institution</th>
<th>Num</th>
<th>Model</th>
<th>ECO</th>
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</table>

FIO: First Institute of Oceanography, SOA (Qingdao)
HTOU: Hainan Tropical Oceanography University (Sanya)
SCSIO: South China Sea Institute of Oceanography, CAS (Guangzhou)
Some Questions

1. Naming format issue
   - CLS names APEX and Navis floats using 4 digits, like “5146”
   - CLS names NKE floats using institution + lov + 3 digits + “a-e”, like “lovbio006b”
   - We hope to have uniform naming format in the China BGC-Argo Data Center
   - We suggest CLS to name APEX and NAVIS as same as NKE floats, at least for Chinese floats
Some Questions

2. Some unclear/questionable places in Oxygen DAC file:
   A. Page 14 (Method 1 for 4330)

From the partial pressure of \( O_2 \), the air saturation is then calculated as:

\[
\text{AirSaturation(\%)} = \frac{\Delta p \times 100}{[(\text{NomAirPress} - p_{\text{vapour}}(T)) \times \text{NomAirMix}]}.
\]

Where \( \text{NomAirPress} \) is the nominal air pressure (usually 1013.25 hPa), and \( \text{NomAirMix} \) is the nominal \( O_2 \) content in air (by default 0.20946).

Where \( p_{\text{vapour}}(T) \) is the vapour pressure calculated from temperature by the following equation:

\[
p_{\text{vapour}}(T) = e^{[52.57 - \frac{6690.9}{T+273.15} - 4.681 \times \ln(T+273.15)]}
\]

The oxygen concentration (in umol/L) compensated for the salinity effect at a prescribed salinity \( S_0 \) but not compensated for the pressure effect is finally calculated as:

\[
MOLAR\_DOXY = C^* \times 44.614 \times \frac{\text{AirSaturation}}{100}
\]

Where \( C^* \) is the oxygen solubility (in cm\(^3\)/dm\(^3\)) calculated from the Garcia and Gordon equation of 1992 ([RD1]):

44.6596 is used in the PPOX calculation of the same file and WG142 file.
Some Questions

- 2. Some unclear/questionable places in Oxygen DAC file:
  - B. Scorr in DAC file and WG142 file

\[ S_{\text{corr}} = A(\text{TEMP}, \text{PSAL}, S_{\text{preset}}) \times e^{(PSAL) \times (B_0 + B_1 T_s + B_2 T_s^2 + B_3 T_s^3) + C_0 \times (PSAL^2)}} \]

\[ S_{\text{Corr}} = \exp( (S - S_{\text{preset}}) \cdot (B_0 + B_1 \cdot T_s + B_2 \cdot T_s^2 + B_3 \cdot T_s^3) + C_0 \cdot (S - S_{\text{preset}}^2) ) \]

Is it better to make the parameter naming uniform?
Some Questions

2. Some unclear/questionable places in Oxygen DAC file:
   - C. Page 105 (CASE_202_205_305)

   - TEMP_DOXY for calibration?
   - TEMP for S & P correction?

   If TEMP_DOXY QC=3, but TEMP QC=1?
   If TEMP_DOXY QC=1, but TEMP QC=3?