Biogeochemical float data management in the US

Annie Wong, for BGC-Argo Meeting
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Within the US, efforts to transfer biogeochemical float data to the Argo GDACs come from 3 groups:

- MBARI
- UW
- AOML
~ A simplistic data flow chart ~

- UW
- MBARI
- AOML
- UW
- UW
- Argo GDACs
- AOML
Various tasks

MBARI
- Scientific processing of SOCCOM and pre-SOCCOM float data
- Real-time production of BR- files for SOCCOM floats
- ‘A’ and ‘D’ mode adjustments of bgc data
- Synthesis and analysis projects

UW
- Satellite data telemetry
- Real-time production of intermediate msg files for AOML
- Delayed-mode production of D- and BR- files
- UW historical oxygen floats

AOML
- Real-time production of tech, meta, core traj and core R- files
- Other historical oxygen floats (WHOI, remaining UW)
DONE IS BETTER THAN PERFECT
<table>
<thead>
<tr>
<th>Argo netCDF format</th>
<th>SOCCOM</th>
<th>Pre-SOCCOM</th>
<th>Historical oxygen floats</th>
</tr>
</thead>
<tbody>
<tr>
<td>V3.1</td>
<td>100%</td>
<td>90%</td>
<td>65%</td>
</tr>
<tr>
<td>V3.0</td>
<td>10%</td>
<td></td>
<td>35%</td>
</tr>
</tbody>
</table>
Still to be done

• Convert remaining V3.0 profile files to V3.1.
• Correct meta files for bgc floats with multi-channel sensors, e.g. MCOM_FLBBBCD.
• Produce Btraj files to store OptodeAirCal.
MBARI activities for the SOCCOM project
(Southern Ocean Carbon, Climate, Observation & Modeling)

~ Tanya Maurer ~
SOCCOM — to — Argo BR*.nc File Transfers

> 2,000 BR*.nc files (650 MB) pushed to Argo GDAC since Jun2017

- MBARI has taken over SOCCOM BR transfers to GDACs
- New files pushed to AOML 1x/day → show up on GDACs ~8hrs later
- New floats are integrated into the process by the 3rd cycle
- RT QC is being applied → providing science quality <PARAM>_ADJUSTED data to Argo in real time
- Floats are “refreshed” every 5 cycles to pick up any QC updates
- DM QC scheme not finalized → No BD files exist yet on GDACs

First float profile data (QC’d) compared to bottle samples at deployment (Johnson et al., JGR Oceans 2017). Bottle samples are not used to calibrate sensors, they are an independent assessment of accuracy.
Real-time Quality Control of SOCCOM data

1. Quality flag assignments (“R” mode)
2. Data adjustments (“A” mode)
   • Adjustment “rules” (gain, offset, drift) are defined using MBARI-developed MATLAB GUIs for $O_2$ (SAGE-O2), and pH, NO$_3$ (SAGE)
   • Adjustments are then applied to incoming float data in real time (<PARAM>_ADJUSTED variables created)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOXY</td>
<td>Compare to air $pO_2$ (NCEP)</td>
</tr>
<tr>
<td>NITRATE</td>
<td>Compare to 1500 m MLR (Williams et al., 2016)</td>
</tr>
<tr>
<td>pH</td>
<td>Compare to 1500 m MLR (Williams et al., 2016)</td>
</tr>
<tr>
<td>CHLA</td>
<td>CHLA * 0.5 (Roesler et al., 2017)</td>
</tr>
<tr>
<td>CDOM, BBP</td>
<td>NO ADJUSTMENTS</td>
</tr>
</tbody>
</table>

“SAGE-O$_2$”

“SAGE”
Data snapshots with doi

Adopt-A-Float

Argo GDACs

Informal Audit

USER
Science-quality Data!

Data Assembly

Raw data processing
Factory calibrations, Automated QC adjustments

Science-quality Data!

Data Adjustment & Validation in MATLAB (“SAGE” GUIs)

Rules

FTP

Argo GDACs

Informal Audit

USER

MBARI
Monterey Bay Aquarium Research Institute

rsync

Satellite

Float

Ship

Argo GDACs

Argo
Ifremer

FTP

FloatVIZ

Data snapshots with doi

Informal Audit