Towards the end-users

CMEMS OCEAN MULTI OBSERVATIONS TAC

met-jobs@lists.reading.ac.uk

Raphaëlle Sauzède
Stéphanie Guinehut
Hervé Claustre

19th Argo Data Management Team meeting, 2018, La Jolla, CA
Main objectives of MULTIOBS TAC

Part of the CMEMS (Copernicus Marine Environment Monitoring Service, http://marine.copernicus.eu/): services and products for marine applications

MULTIOBS Thematic Assembly Center (TAC):

➤ Products based on **Observations** (satellite & in-situ) and data **fusion techniques**

➤ Products covering the ocean **physics** and **BGC**

➤ **High level of service to the users**

➤ Provision of **qualified Global** Ocean **Multi Observation** Products

➤ Products for end-users → **modellers** (initialization, validation of models, data assimilation...)

19th Argo Data Management Team meeting, 2018, La Jolla, CA
4D BGC products

- Nutrient vertical profiles from BGC-Argo $O_2$ profiles
- Global 4D $b_{bp}$/POC and Chla product
Nutrient vertical profiles from BGC-Argo O₂ profiles

- Based on a neural-network method trained on high quality nutrient data collected over the last 30 years (GLODAPv2 database)
- CANYON-B (CArbonate system and Nutrients concentration from hYdrological properties and Oxygen using a Neural-network, Bittig et al. 2018, Sauzede et al. 2017)

Profiles of concentration of nitrates (NO₃⁻), phosphates (PO₄³⁻) and silicates (Si(OH)₄)

Global accuracies:
- NO₃⁻: 0.7 µmol kg⁻¹
- PO₄³⁻: 0.05 µmol kg⁻¹
- Si(OH)₄: 2.3 µmol kg⁻¹
4D BGC products

- Nutrient vertical profiles from BGC-Argo $O_2$ profiles
  - Profiles of concentration of nitrates ($NO_3^-$), phosphates ($PO_4^{3-}$) and silicates ($Si(OH)_4$) + associated errors of estimation from calibrated Argo profiles ($P/T/S/O_2$)

$\sim 30,000$ D profiles

Global 4D $b_{bp}$/POC and Chla product

- Based on a neural-network method trained on high quality $b_{bp}$ and fluorescence/Chla data collected from BGC-Argo floats

→ SOCA (Satellite Ocean-Color merged with Argo, Sauzede et al., 2016) : SOCA-BBP, SOCA-CHL + satellite derived product of $b_{bp}$ and Chla + Argo P/T/S + date

To extend surface bio-optical properties to depth from ocean color data

Physical state of the water column (from CTD profiles):

- Influences nutrient and light availability for phytoplankton growth
- Available at high spatio-temporal frequency with Argo data

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→ 3D weekly/monthly $b_{bp}$/POC and Chla

Global error:
- ~20 % on $b_{bp}$
- ~50 % on Chla
4D BGC products

- Global 4D $b_{bp}$/POC and Chla product
- 3D weekly/monthly $b_{bp}$/POC and Chla

Surface ocean color climatologies

+ Argo T/S climatology
  (Roemmich and Gilson, 2009)

4D global climatologies of $b_{bp}$

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4D BGC products

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  - Based on a **neural-network method** trained on high quality \(b_{bp}\) and fluorescence/Chla data collected from BGC-Argo floats
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3D weekly/monthly b_{bp}/POC and Chla

Available soon from the CMEMS website
http://marine.copernicus.eu/

- 3-years monthly global database of b_{bp} transformed in POC from SOCA-BBP
- 3-years monthly global database of Chl from ANNs (SOCA-CHL)