GROOM II
GLIDERS FOR RESEARCH, OCEAN OBSERVATION & MANAGEMENT : INFRASTRUCTURE AND INNOVATION

EuroSea

EuroGOOS
European Global Ocean Observing System

European Data Management Workshop

22d of June 2022

Focus on Real Time data management of Chl-a

This project has received funding the European Union's Horizon 2020 research and innovation programme under grant agreement No 951842.

Agenda

- **Introduction – 15 to 20 min**
  - *Meeting objectives*
  - *Live Notes via HackMD*
  - *Introduction (Victor Turpin)*
  - *The example of Argo (Catherine Schmechtig)*
- **Discussion – 1h**
- **Wrap up – 15 min**

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I. Meeting objectives

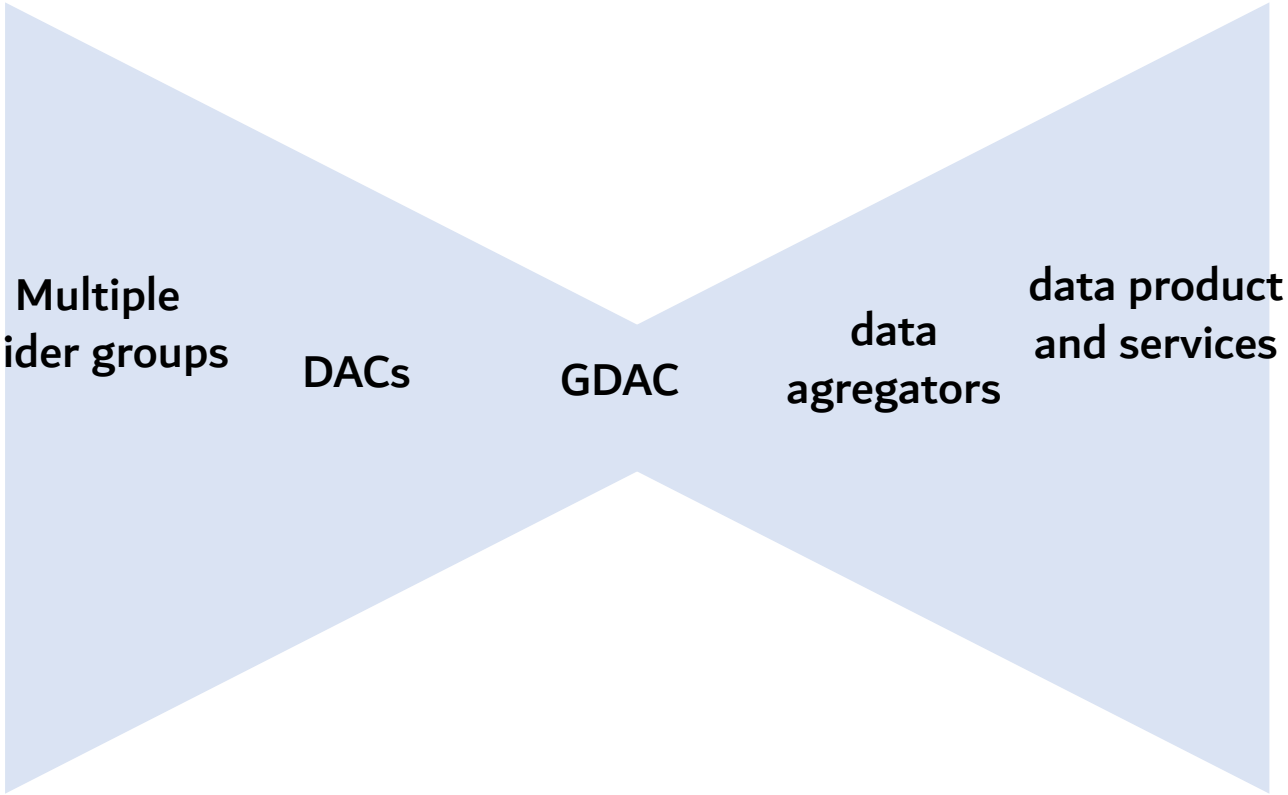
- Raise and share issues related to real time data management of CHLA and BBP.
- Identify needs and requirements from the operating community to facilitate real time data flow of CHLA and BBP.
- Discuss the solutions to get rid of / limit the impact of those issues in operators and Pis
- Provide inputs for GROOM II data management road map

I. Live Note

https://hackmd.io/csEWBKBaRV2sa80Bfg3myQ?both

Need support to take note
Can/should be a collective effort

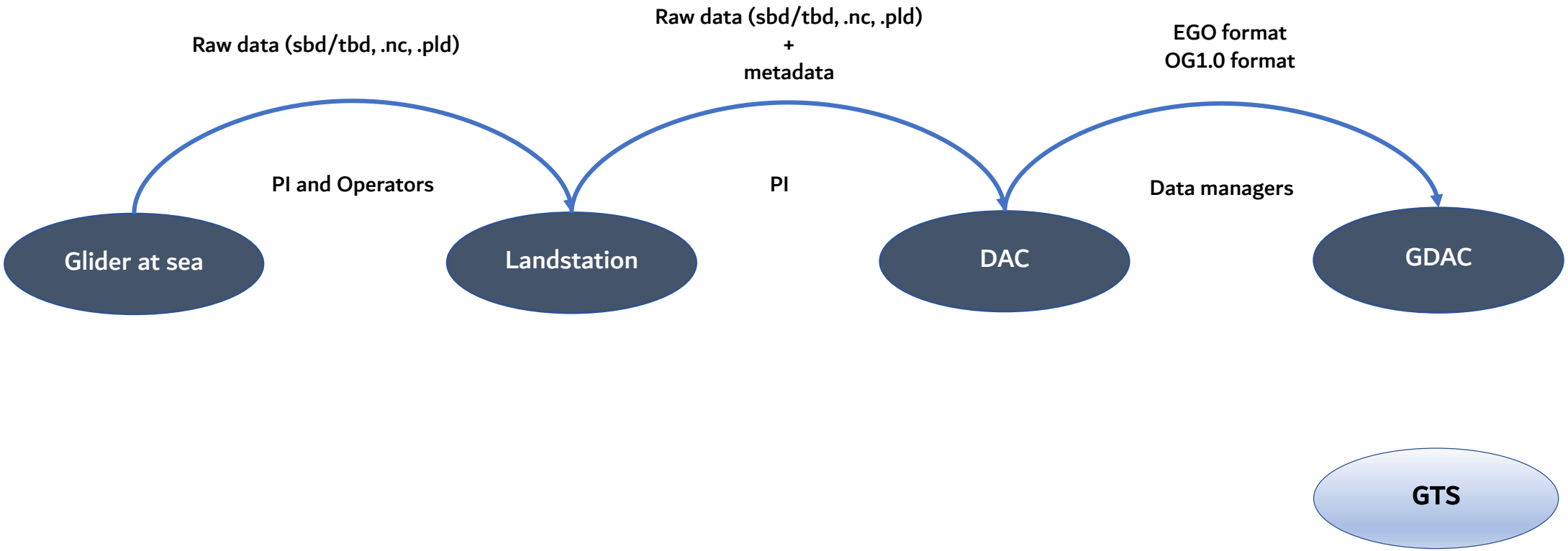
Volonteers ?



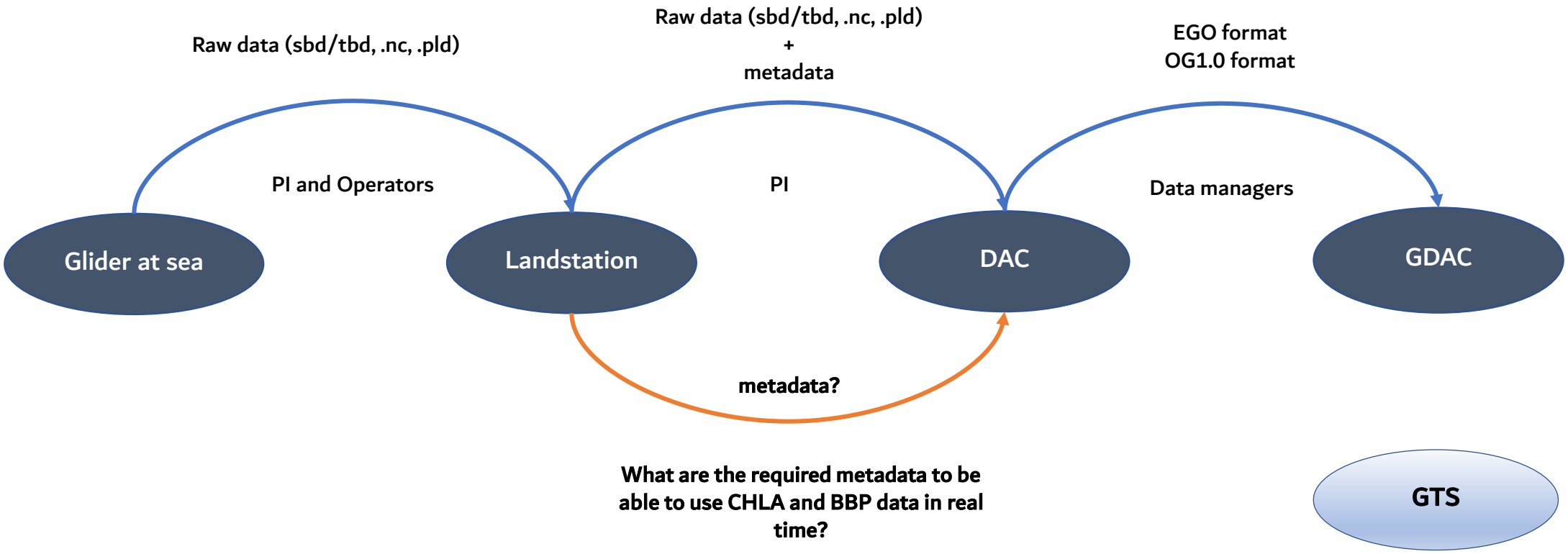
The GROOM I Real Time Data Management butterfly

II. Introduction

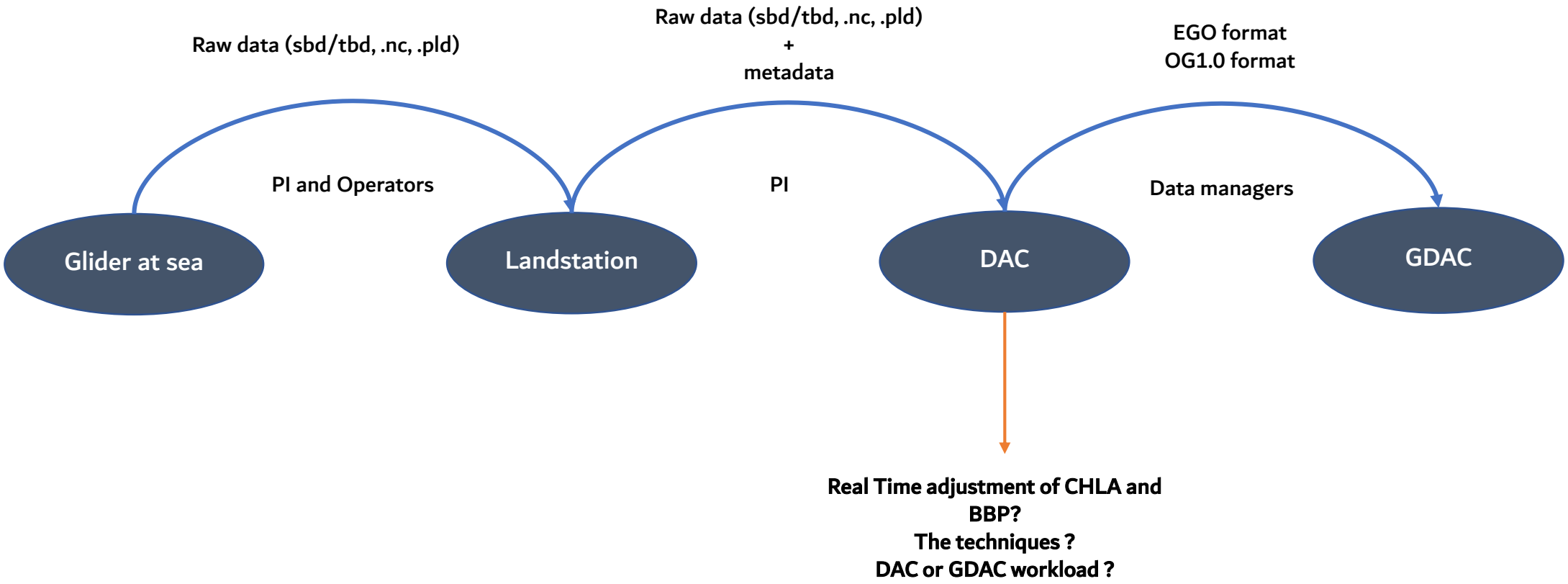
Real Time Data flow



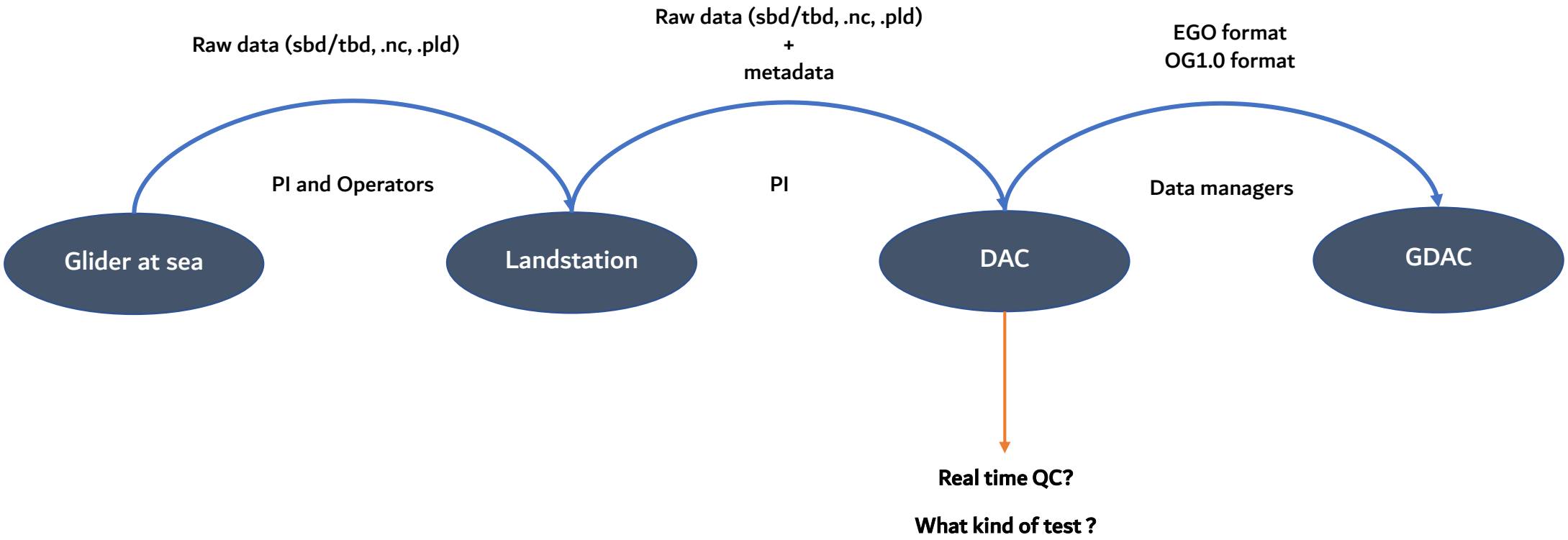
Real Time Data flow



Real Time Data flow



Real Time Data flow



III. The Argo exemple

<u>Why is it relevant to look at Argo's approach ?</u>

No OceanGliders community SOP on CHLA and BBP yet

With Argo we are sharing the same sensors with similar integration

Is CHLA and BBP real time data management of Argo a reference for our community ?

Can we get inspired by the Argo approach?

Real Time QC http://dx.doi.org/10.13155/35385

- Initial QC

CHLA_QC=3

- Global Range QC
- SPIKE QC (not already removed in the official documentation)

Spike test → Median filter for Dark estimation and Quenching correction

Remove the Flagging of the vertical levels with QC=4

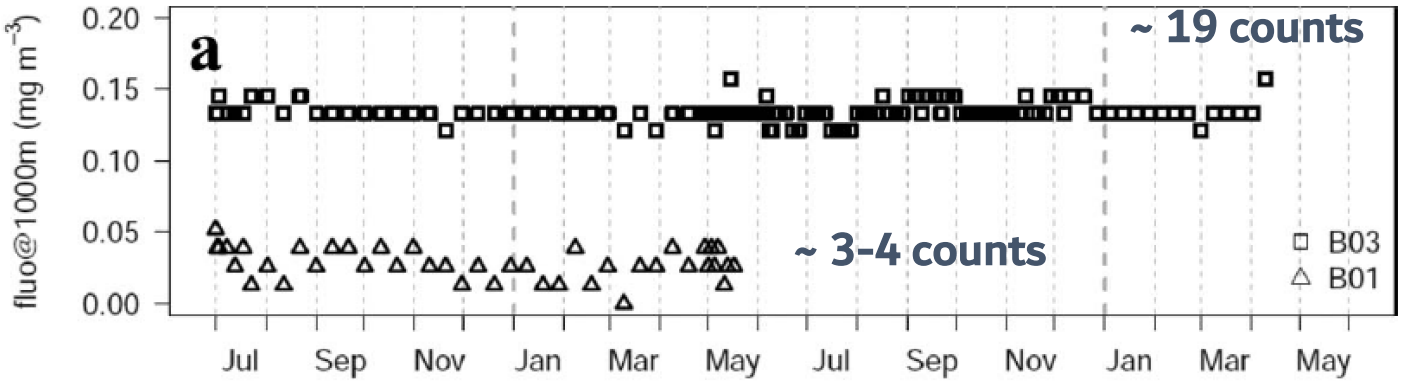
IV. CHLA RT QC and RT adjustment in Argo

Adjustment background (1/3) http://dx.doi.org/10.13155/35385

- FChla Data correction needs to consider of

1. Dark correction

   (Due to the change of dark currents of sensor on float)



(Xing, ADMT19, 2018)

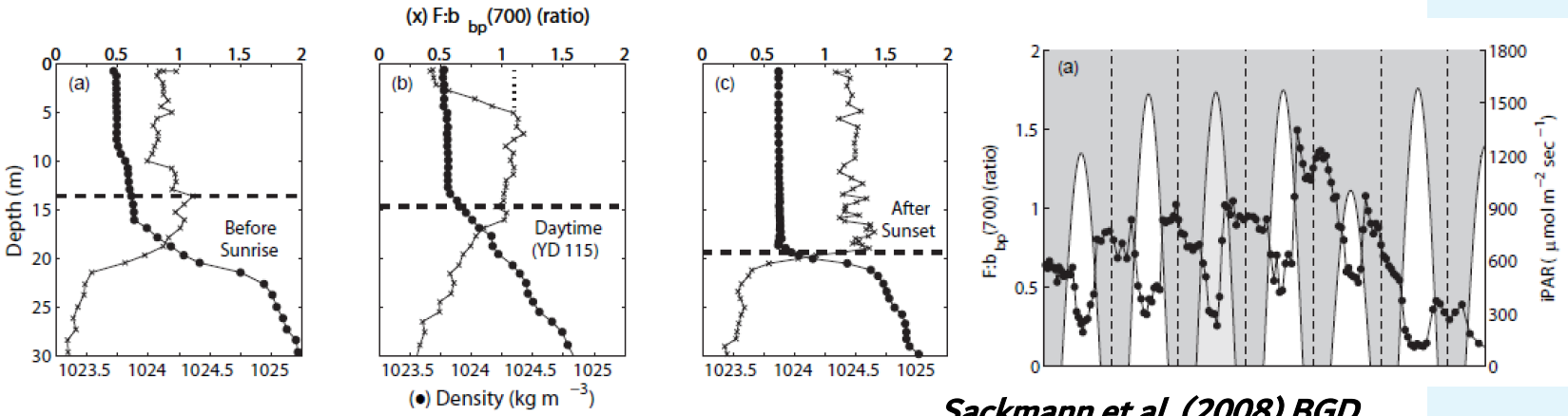
IV. CHLA RT QC and RT adjustment in Argo

Adjustment background (2/3)

- FChla Data correction needs to consider of
  2. NPQ correction

     (If profiling at daytime, Due to the fluorescence dynamics of in vivo chlorophyll-a)

IV. CHLA RT QC and RT adjustment in Argo



Sackmann et al. (2008) BGD

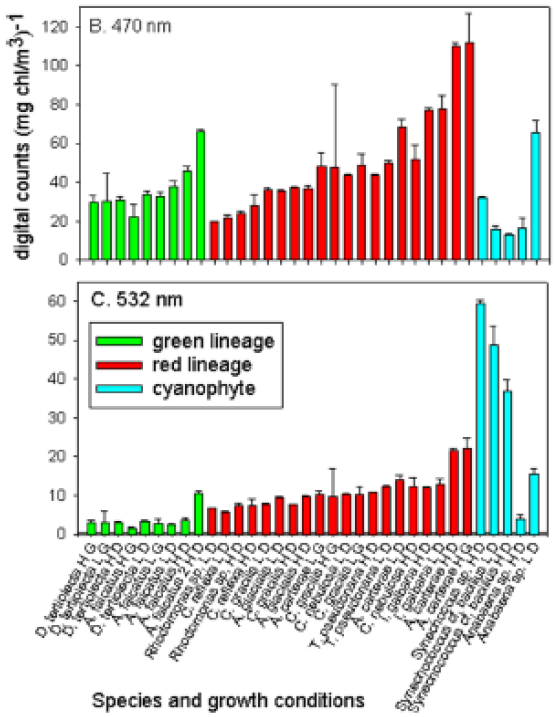
(Xing, ADMT19, 2018)

Adjustment background (3/3)

- FChla Data correction needs to consider of

  3. Slope correction

     (Due to the factory-calibration issue and fluorescence variability)



Proctor and Roesler (2010) LOmet

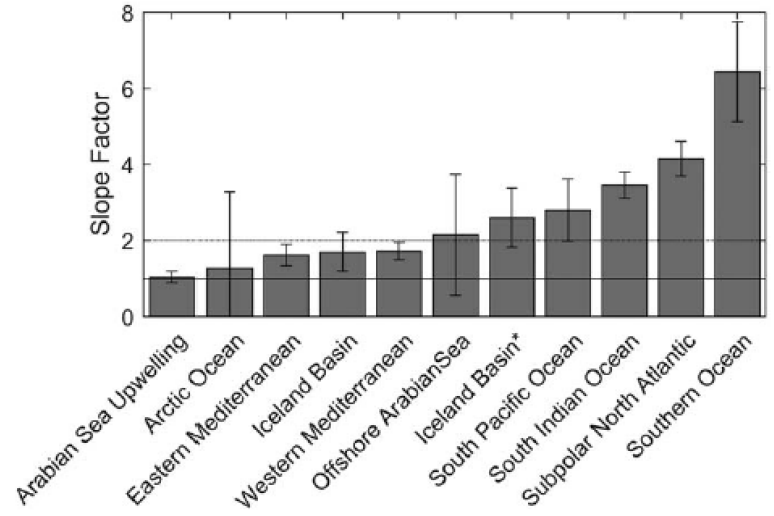


Fig. 2. Mean slope factors derived from observations of paired HPLC and in situ Chl fluorescence from major oceanographic regions (Table 1). Error bars indicate 95% confidence limits on slope from linear regression of all observations within each region. Lines indicate slope factors of 1 (solid) and 2 (dotted).

Roesler et al. (2017) LOmet

(Xing, ADMT19, 2018)

IV. CHLA RT QC and RT adjustment in Argo

Storing the information (for Float 6902736)

In 6902736_meta.nc

INITIAL CALIBRATION

PREDEPLOYMENT_CALIB_EQUATION =« CHLA=(FLUORESCENCE_CHLA-DARK_CHLA)*SCALE_CHLA »
PREDEPLOYMENT_CALIB_COEFFICIENT=« SCALE_CHLA=0.0072, DARK_CHLA=45 »
PREDEPLOYMENT_CALIB_COMMENT =« »

In profile file BD6902736_020.nc (PARAMETER_DATA_MODE=« A » for CHLA)

CALIBRATION for adjustment in RT

SCIENTIFIC_CALIB_xxx: post deployment calibration and adjustment information

SCIENTIFIC_CALIB_EQUATION= « CHLA_ADJUSTED=((FLUORESCENCE_CHLA-DARK_CHLA)*SCALE_CHLA)/2 »
SCIENTIFIC_CALIB_COEFFICIENT= « DARK_CHLA=53, SCALE_CHLA=0.0072 »
SCIENTIFIC_CALIB_COMMENT=« CHLA real time adjustment (specified in http://dx.doi.org/10.13155/35385 and computed with MLD_LIMIT=0.03, DELTA_DEPTH=200, DELTA_DEPTH_DARK=50) and following recommentdations of Roesler et al., 2017 (https://doi.org/10.1002/lom3.10185) »

BBP : having reliable metadata is crucial

https://biogeochemical-argo.org/cloud/document/meetings/admt/19/admt19-workshop-7-bgc-argo-d1_16-reprocessing_poteau-bbp.pdf

ADMT 16 Bermuda / Nov. 2015

Cookbooks Ver_0
Processing Bio-Argo particle backscattering (BBP) at the DAC level

BBP700 =2*π* | [(BETA_BACKSCATTERING700 – DARK_BACKSCATTERING700)* SCALE_BACKSCATTERING700 - BETASW700]

| (khi) is the conversion factor

DARK_BACKSCATTERING700 are the dark counts
SCALE_BACKSCATTERING700 is the scaling factor

BETA_BACKSCATTERING700 are the raw counts output

BETASW700 is the contribution of the pure seawater

Do we have a good χ (khi) ?

2015

ADMT 17 Tianjin / Sep. 2016

khi values and sensors models updated

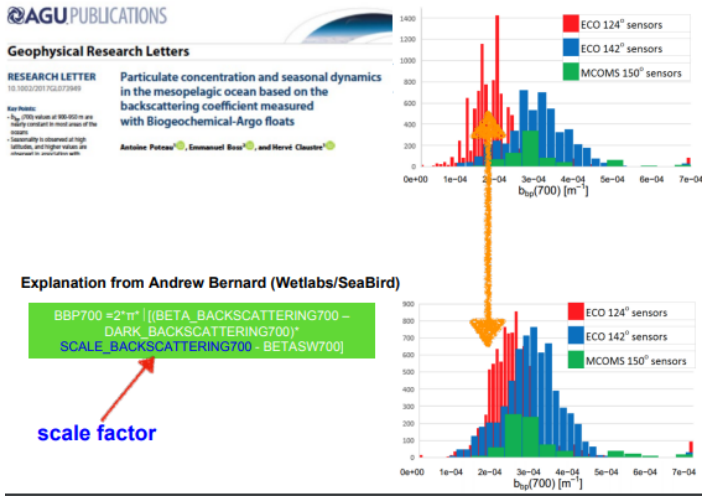
Wetlabs Sensor	Measurements angle	Full Width at Half Maximum (FWHM)	Bandwidth	χ
MCOMS and SeaOWL UV-A	149°	20°	20nm	1.142*
Single Channel Sensors	124°	20°	20nm	1.076**
Dual Channel Sensors (FLbb, FLNTU)	142°	30°	20nm	1.097*
Three Channel Sensors	124°	20°	20nm	1.076**
Combined Three Channel Sensors	124°	20°	20nm	1.076**

WET Labs backscatter Models	Examples	Centroid angle (°)	χ(θ)
ECO Single Channel	BB, NTU	124	1.076
ECO Dual Channel	FLBB, FLNTU, FLBBAP2, FLBB2K	142	1.097
ECO Three Channel	BB3, BBFL2, BB2FL, Triplet-w	124	1.076
ECO Combined Three Channel	FLBBCD, FLBBBB, FLBBCDREM, FLBBBBREM, FLBBCDAP2, FLBBBBAP2	124	1.076
MCOMS Combined Three Channel	MCOMS-FLBBCD	150	1.142

3 SENSOR_MODEL at 124° 142° and 150° measurements angle

2016

ADMT 18 Hamburg / Nov. 2017



2017

BBP : ha

https://b
reprocess

Processing Bi

BBP70
DARK_BACKSC

| (khi) is the conv

DARK_BACKSCATTERIN(
SCALE_BACKSCATTERIN

BETA_BACKSCATTERING

BETASW700 is the contribut

GROOM RI EuroSea EuroGOOS

SEANOE Sea scientific open data edition SEANOE

Correction of scale factors for backscattering channel on ECO sensors mounted on BGC-Argo floats

2018 !!!!

Date	2021-02-18
Author(s)	Barnard Andrew[1]
Affiliation(s)	1 : Sea-Bird Scientific, Research and development department
DOI	10.17882/54520
Publisher	SEANOE
Abstract	WET Labs investigated the bias found in Poteau et al. 2017: http://dx.doi.org/10.1002/2017gl073949 and provides a matrix of affected sensors with scale factors for the backscattering channels using a correct weighted phase function constant values for ECO sensors mounted on BGC-Argo floats.
Licence	CC BY-NC

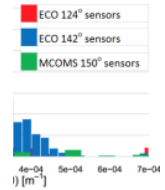
Data

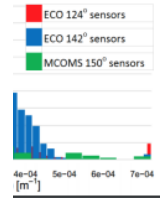
File	Size	Format	Processing	Access
55891.csv	31 KB	CSV	Quality controlled data	Open access

Top of the page

Click to download the data

DATA





Download metadata
TXT, RIS, XLS, RTF, BIBTEX

BBP

RT QC developed by Giorgio Dall'Olmo (PML) in the framework of the EuroArgo-Rise project
Endorsed by ADMT22 (2021) soon in the Argo data system

https://www.euro-argo.eu/content/download/157288/file/D4.3_v1.0.pdf

V. Discussions and feedback from community

Suggestions of topics :

Can we apply similar real time data management rule for gliders and Argo floats ?

What are the required metadata to be able to use CHLA and BBP data in real time?

How to store them ?

Real Time adjustment of CHLA and BBP? Can we transfer the technique from Argo to Gliders ? Shall it be a DAC or GDAC workload ?

Real time QC on CHLA and BBP ? What sort of test ?

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