









Data handling and stewardship: .nc files etc.

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Working on DAC nc FILES

Nom	Taille	
 [répertoire parent]		
 6901032_BRtraj.nc	5.1 MB	-> Trajectory file (timestamp) with biogeochemical variables
 6901032_Mprof.nc	22.9 MB	-> will disappear soon
 6901032_Rtraj.nc	1.1 MB	-> Trajectory file (timestamp) of the core variables (PRES,TEMP,PSAL)
 6901032_meta.nc	428 kB	-> Metadata file
 6901032_prof.nc	937 kB	-> dealt with on later slide
 6901032_tech.nc	734 kB	-> Technical data
 profiles/		-> profile data

DAC files at the GDAC

In profiles directory :

BD6901032_001.nc

BR6901032_001**D**.nc

BR6901032_002.nc...

D6901032_001.nc

R6901032_001**D**.nc

R6901032_002.nc...

First character :

B -> contains all intermediate parameters

-> contains the CTD profile

Second character

R -> Real Time

D -> Delayed Mode

6901032 -> WMO of the Float

001 -> cycle number

Last Character

D -> Descent profile

-> Ascent profile

WORKING with the metadata file : 6901032_meta.nc (read_coriolis_meta.R)

- Everything about the sensor
 - SENSOR
 - SENSOR_MAKER
 - SENSOR_MODEL
 - SENSOR_SERIAL_NO
- Parameters that are in the profiles
 - PARAMETER
 - PARAMETER_SENSOR
- Calibration equation before the deployment (factory calibration)
 - PREDEPLOYMENT_CALIB_EQUATION
 - PREDEPLOYMENT_CALIB_COMMENT
 - PREDEPLOYMENT_CALIB_COEFFICIENT

On the web site of the Argo data management <http://www.argodatamgt.org/Documentation>
 You will find the file defining the [Argo physical parameters list: Core-Argo and BGC-Argo, January 29th 2018](#)

Parameter_name	Long_name	UNITS
PRES	Sea water pressure, equals 0 at sea-level	decibar
PSAL	Practical salinity	psu
TEMP	Sea temperature in-situ ITS-90 scale	degree_Celsius
DOXY	Dissolved oxygen	micromole/kg
CHLA	Chlorophyll-A	mg/m3
BBP700 (xxx)	Particle backscattering at 700 (xxx) nanometers	m-1
CDOM	Concentration of coloured dissolved organic matter in sea water	ppb
NITRATE	Nitrate concentration	micromole/kg
CP660 (xxx)	Particle beam attenuation at 660 (xxx) nanometers	m-1
PH_IN_SITU_TOTAL	pH	dimensionless
DOWN_IRRADIANCE380 (xxx)	Downwelling irradiance at 380 (xxx) nanometers	W/m^2/nm
DOWNWELLING_PAR	Downwelling photosynthetic available radiation	microMoleQuanta/m^2/sec

WORKING with the profile files

BR6901032_002.nc (PRES and all Biogeochemical Variables),

D6901032_002.nc (PRES, TEMP, PSAL)

- To know the dimensions of the file
- To know how the sensors sample
- To know the status of the quality control for every parameter
- List of the parameter in the profile
- The Calibration of every parameters **after the deployment**

N_PROF, N_PARAM

VERTICAL_SAMPLING_SCHEME

PARAMETER_DATA_MODE

STATION_PARAMETERS

SCIENTIFIC_CALIB_EQUATION

SCIENTIFIC_CALIB_COEFFICIENT

SCIENTIFIC_CALIB_COMMENT

WORKING with the traj files

6901032_BRtraj.nc (PRES and all Biogeochemical Variables),

6901032_Rtraj.nc (PRES, TEMP, PSAL)

- To know the dimensions of the file N_MEASUREMENT, N_PARAM
- To know the status of the quality control for every parameter PARAMETER_DATA_MODE
- List of the parameter in the trajectory STATION_PARAMETERS
- Phase of the float MEASUREMENT_CODE

All data outside of the profiles (drift, surface; ...) or with timing (profile or outside of profile)

WORKING with the tech files

6901032_tech.nc (all technical parameters)

Tables

- Argo physical parameters list: Core-Argo and BGC-Argo, January 29th 2018
*Climate and Forecast Norm, Sea Data Net reference, units...
with Justin Buck (BODC)*
- Configuration parameter names, BGC-Argo, April 4th 2018
*ADMT14, Action 23 :Check the new Bio Argo configuration parameter table, to ensure that all their float types are covered.
alongside with Esmee Van Wijk (CSIRO) on the core configuration parameters*
- Technical parameters names, version 1.0, March 6th 2018
interact with Birgit Klein (BSH)

Profiles: PARAMETER fields

For every parameters, 5 variables are available (eventually not filled)

CHLA	(Float)
CHLA_QC	(Character)
CHLA_ADJUSTED	(Float)
CHLA_ADJUSTED_QC	(Character)
CHLA_ADJUSTED_ERROR	(float)



Meaning of the QC:

- 1 Good data
- 2 Probably good data
- 3 Probably bad data
- 4 Bad data
- 5 Values changed (quenching)
- 8 Interpolated data

SCIENTIFIC_CALIB xxx: post deployment calibration and adjustment information

SCIENTIFIC_CALIB_EQUATION	(Characters)
SCIENTIFIC_CALIB_COEFFICIENT	(Characters)
SCIENTIFIC_CALIB_COMMENT	(Characters)

These variables explain how the ADJUSTED PARAMETER was filled

REAL-TIME (R-mode)

- Data has been decoded and converted to meaningful values
- Real-time quality control tests applied
- Data is received at the GDACs within 24 h of float surfacing
- Data is assumed acceptable for operational use
- Processing is automatic and does not require human intervention
- Data is not acceptable for direct usage in scientific applications

REAL-TIME ADJUSTED (A-mode)

- Data has been decoded and converted to meaningful values
- Real-time quality control tests applied
- Data is received at the GDACs within 24 h of float surfacing
- Data is assumed acceptable for operational use
- Processing is automatic and does not require human intervention
- Data adjustments (gain, offset, and/or drift) are applied in real-time

DELAYED-MODE (D-mode)

- Data has been visually inspected by the delayed mode operator
- Data has been compared against relevant reference datasets and necessary adjustments have been applied
- QC flag assignments have been thoroughly checked
- Data suitable for direct usage in scientific applications

From Bittig et al., 2019, A BGC-Argo guide: Planning, deployment, data handling and usage, Front. Mar. Sci. <https://doi.org/10.3389/fmars.2019.00502>

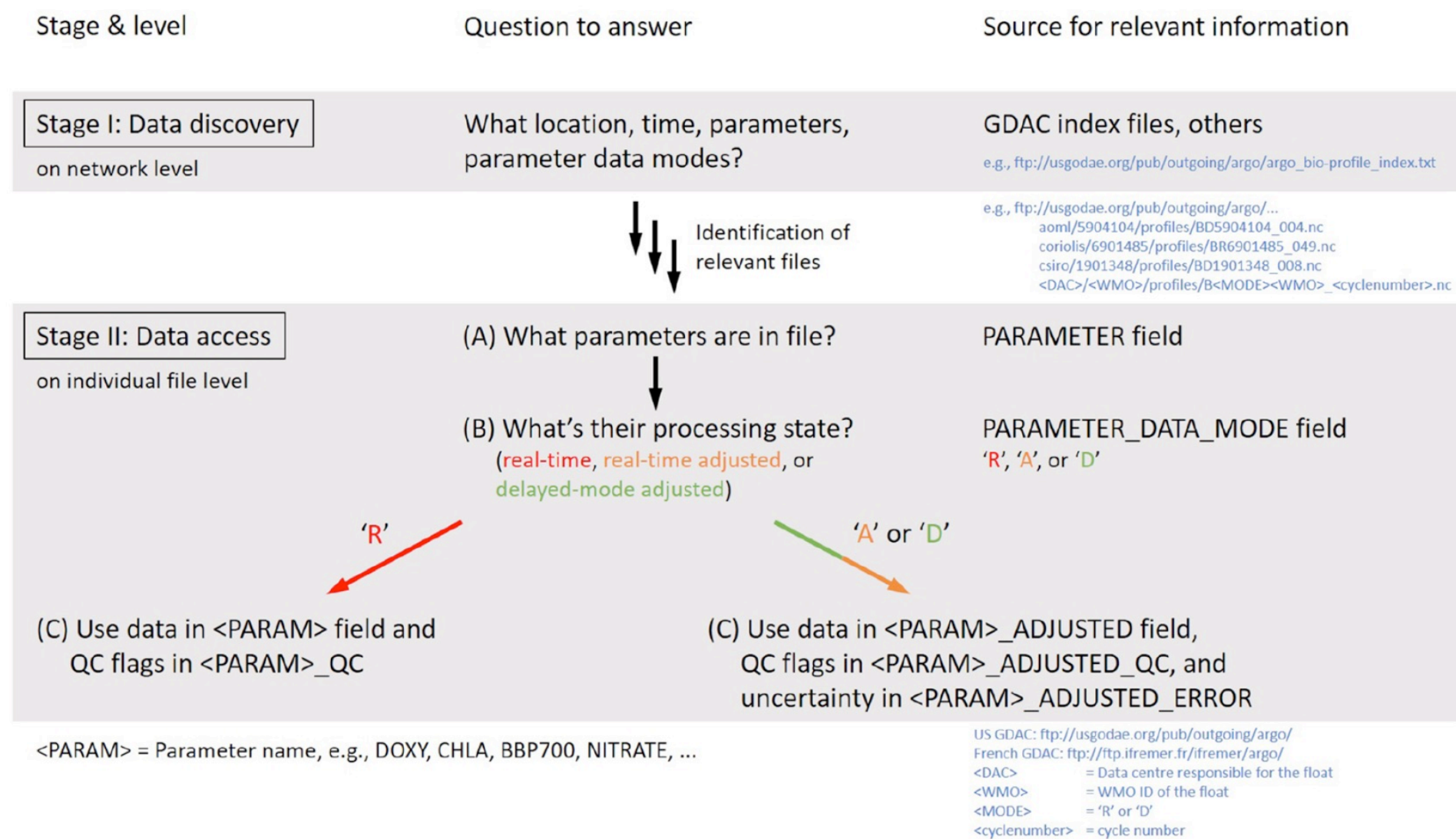
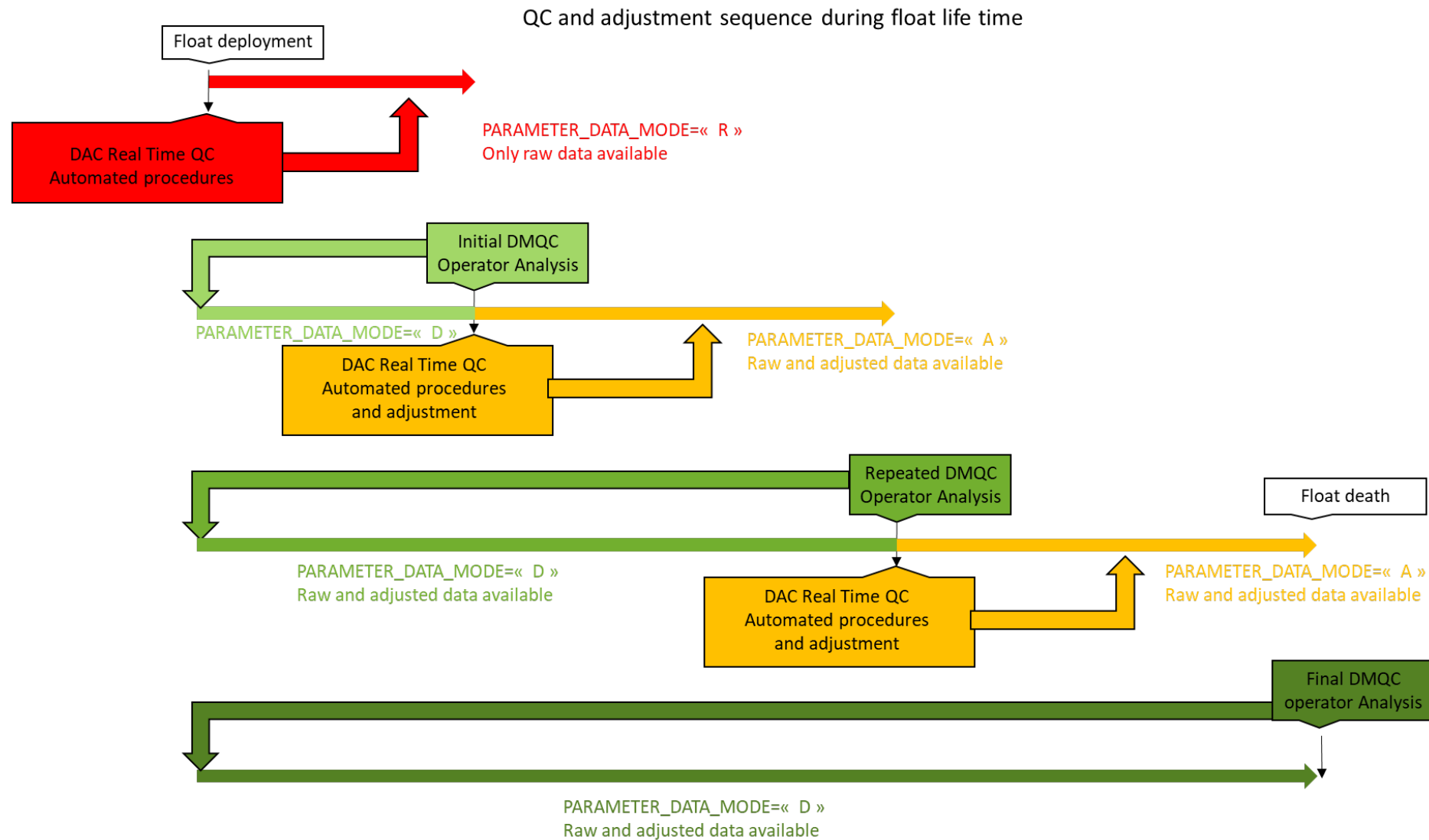


FIGURE 7 | Workflow how to discover (stage I) and access BGC-Argo data (stage II).

From Bittig et al., 2019, *A BGC-Argo guide: Planning, deployment, data handling and usage*, *Front. Mar. Sci.* <https://doi.org/10.3389/fmars.2019.00502>



From Bittig et al., 2019, *A BGC-Argo guide: Planning, deployment, data handling and usage*, *Front. Mar. Sci.* <https://doi.org/10.3389/fmars.2019.00502>

Name

📁 profiles
📄 6901866_BRtraj.nc
📄 6901866_meta.nc
📄 6901866_Mprof.nc
📄 6901866_prof.nc
📄 6901866_Rtraj.nc
📄 6901866_Sprof.nc
📄 6901866_tech.nc

-> Synthetic profiles containing core and B parameters

Working on GDAC nc FILES

In profiles directory :

SD6901866_001.nc

SR6901866_001D.nc

SR6901866_002.nc...

First character :

S -> synthetic profile: all c and b

Second character

R -> Real Time

D -> Delayed Mode

6901866 WMO of the Float

001 -> cycle number

Last Character

D -> Descent profile

-> Ascent profile

“Synthetic” Profiles

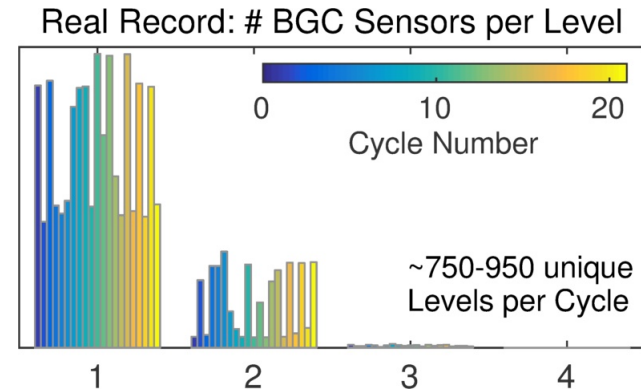
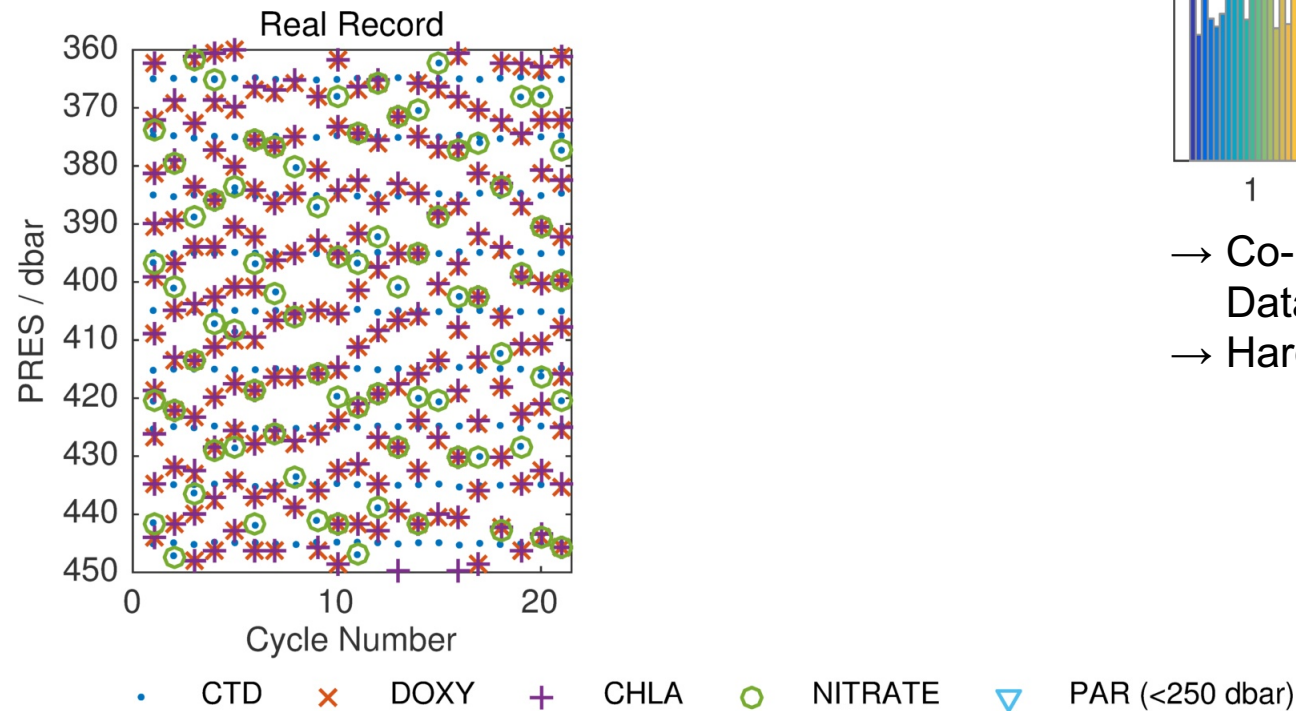
- Many Sensors on BGC Floats – Rarely (←’never’) sampled together
- Made transparent by newer float types; reflected in c- and b-profiles

Real Record – 1 Profile

MTIME	PRES	TEMP	PSAL	DOXY	CHLA	BBP700	NITRATE
13:37:25	445.2	14.181	35.919				
13:37:44	443.7			143.53			
13:37:46	443.4	↑ 10 dbar					
13:37:48	443.9	14.188	35.917	↑ 10 dbar	-0.004	7.4456E-05	14.84
13:39:04	434.9	14.192	35.913	↓ 10 dbar	↓ 10 dbar	↓ 10 dbar	
13:39:24	432.6			137.84			
13:39:26	432.4				0.019	8.1720E-05	↑ 25 dbar
13:40:42	424.8	14.333	35.928				↓ 25 dbar
13:41:04	421.5			137.51			
13:41:06	421.2				-0.011	8.1720E-05	
13:41:59	416.2	14.648	35.980				14.48
13:42:20	415.0	14.650	35.981				
13:42:44	410.6			141.53			
13:42:46	410.4				-0.005	8.1720E-05	
13:43:59	405.1	14.895	36.023				
13:44:25	400.4			144.49			
13:44:26	400.2				-0.004	7.9904E-05	
13:45:37	395.1	15.231	36.077				
13:46:05	390.5			146.40			
13:46:06	390.4				-0.013	7.9904E-05	
13:46:08	390.7	15.336	36.097				12.60
13:47:15	385.1	15.400	36.109				
13:47:45	381.1			147.98			
13:47:46	380.9				-0.008	7.9904E-05	
13:48:53	375.0	15.607	36.145				
13:49:25	372.2			149.79			
13:49:26	372.0				0.015	8.5352E-05	
13:50:18	367.8	15.803	36.179				11.40
13:50:32	364.8	15.943	36.210				
13:51:04	363.3			153.93			
13:51:06	363.1				-0.004	7.4456E-05	

“Synthetic” Profiles

Real Record – First 20 Profiles



- Co-Location of multi-Sensor Data only by Chance !
- Hard for multi-BGC Analyses...

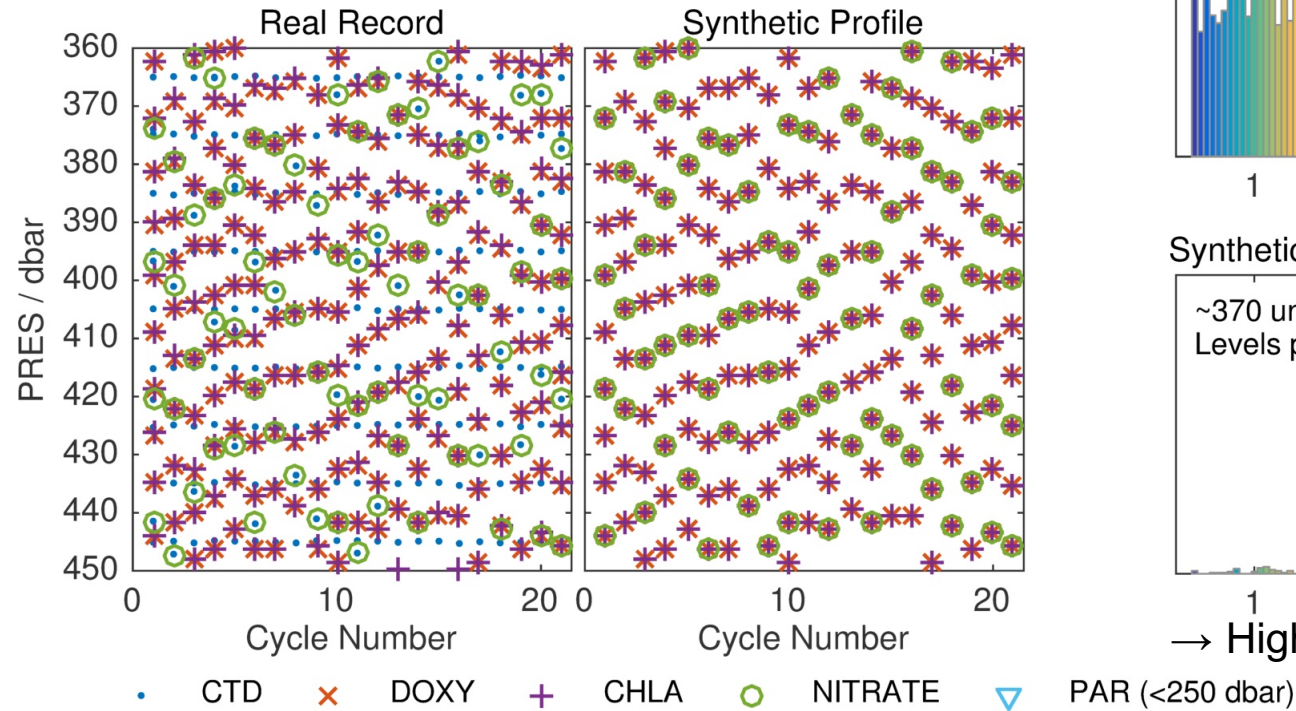
Produce ‘Synthetic’ Profiles by GDACs that

- align BGC without upsampling, displacing too far, or distorting profile shape
- add HR T/S profile back in after BGC alignment to allow combined physical/BGC analyses

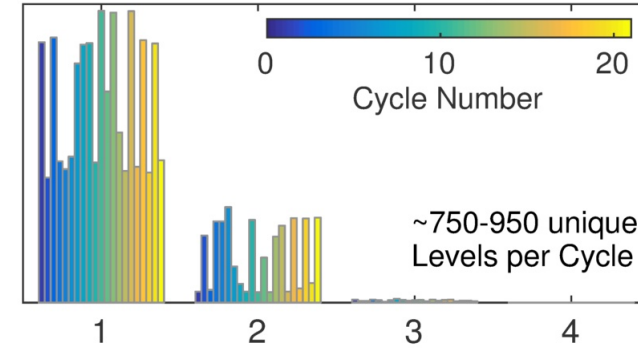
“Synthetic” Profiles

Real Record – First 20 Profiles

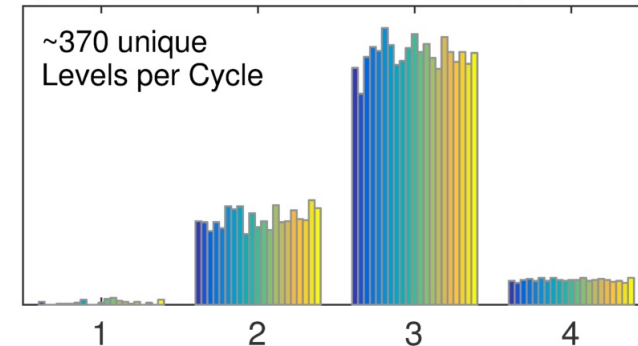
Synthetic Profile – First 20 Profiles



Real Record: # BGC Sensors per Level



Synthetic Profile: # BGC Sensors per Level



→ Highest justifiable Co-Location

Produce ‘Synthetic’ Profiles by GDACs that

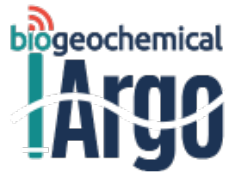
- align BGC without upsampling, displacing too far, or distorting profile shape
- add HR T/S profile back in after BGC alignment to allow combined physical/BGC analyses



ARGO DATA MANAGEMENT

<http://www.argodatamgt.org/>

Argo user's manual, QC documents, technical and configuration parameters



BGC-Argo

<http://www.biogeochemical-argo.org/>

Meeting presentations, interactive BGC-Argo Map



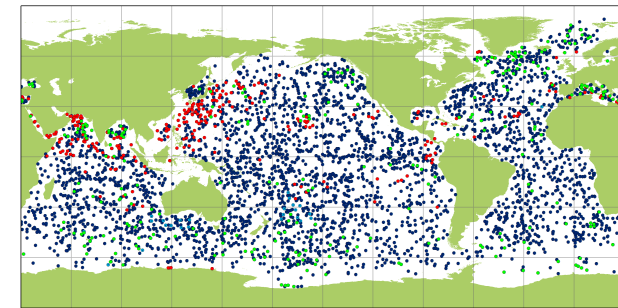
AIC - JCOMMOPS

<http://www.jcommops.org/>

Maps, Metadata

Diffusion list :

argo-bio@jcommops.org



Argo Networks December 2016

• BioGeoChemical (282) • Deep (26) • Equivalent (372) • Argo (3933)



Generated by www.jcommops.org_04/01/2017