

Argo data management report 2017

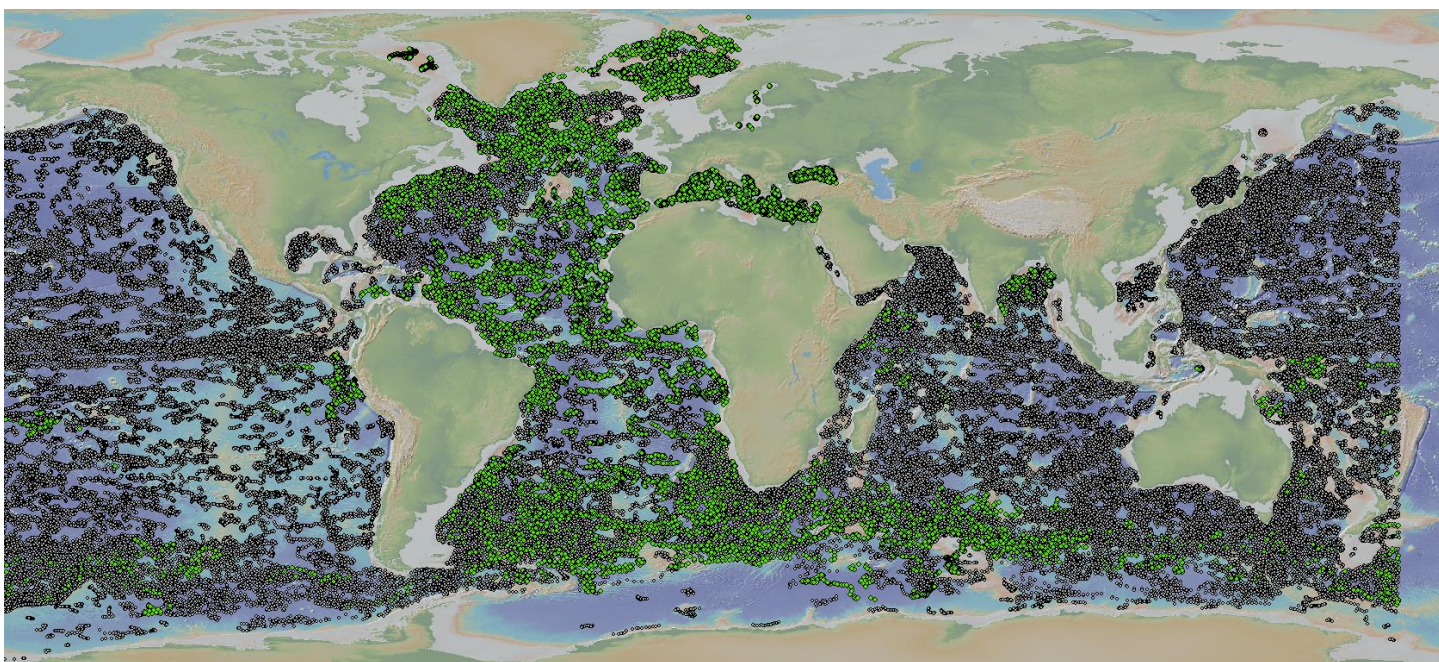
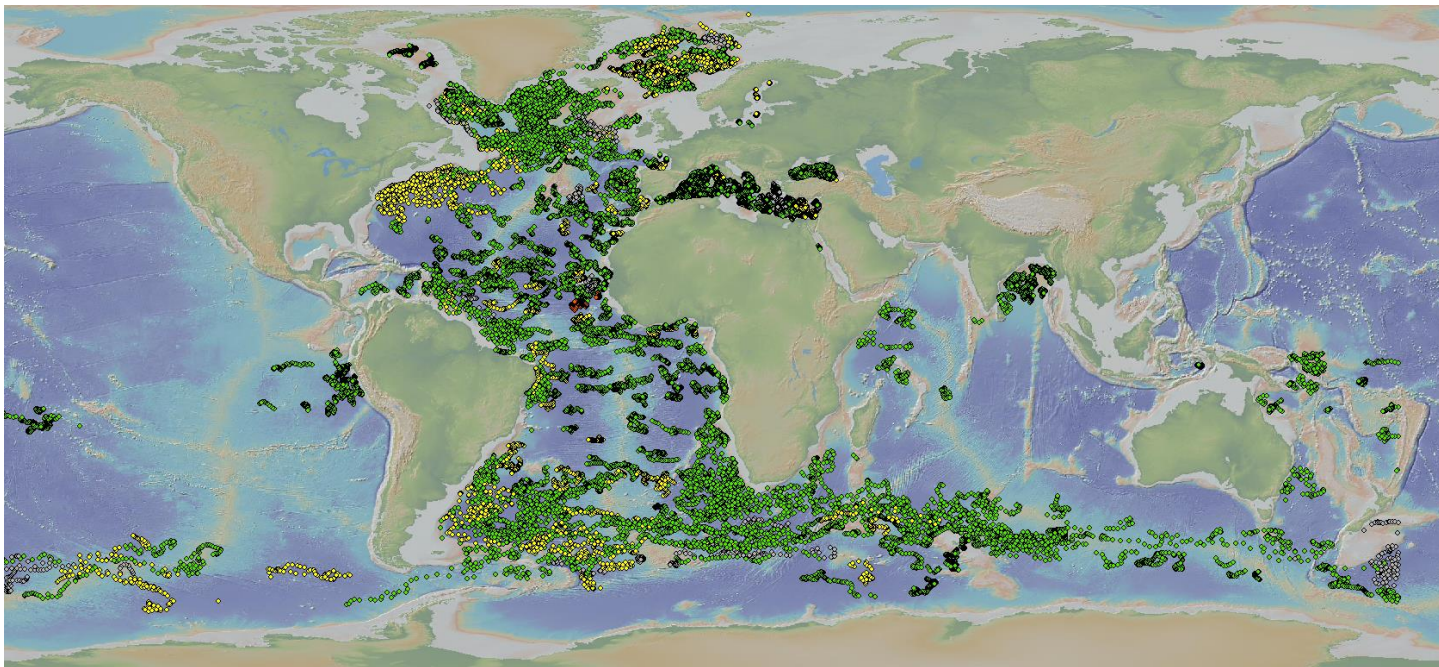
Coriolis DAC & GDAC

Data Assembly Centre and Global Data Assembly Centre

Annual report October 2017

Version 1.0

November 10th, 2017



1 DAC status

This report covers the activity of Coriolis data centre for a one-year period from November 1st 2016 to October 30th 2017.

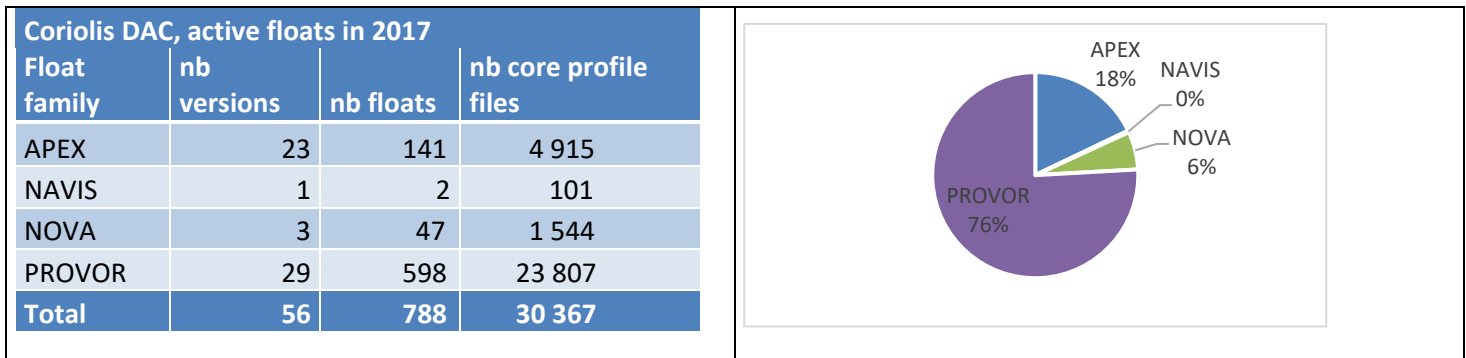
1.1 Data acquired from floats

1.1.1 Active floats for the last 12 months

These last 12 months, **30 367 profiles from 788 active floats** were collected, controlled and distributed.

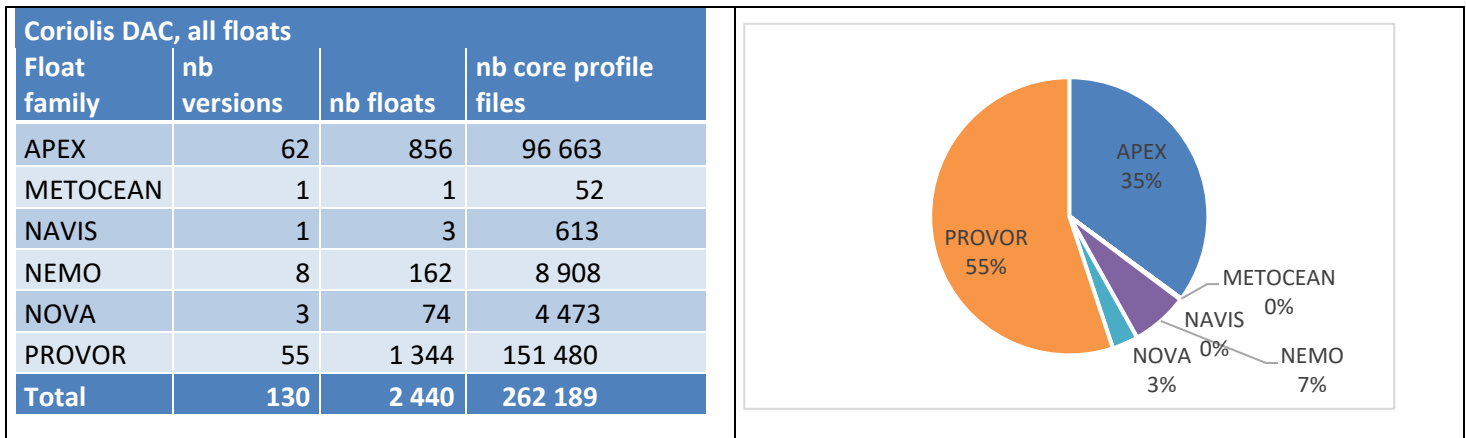
Compared to 2016, **the number of profiles decreased by 1%, the number of floats increased by 2%**. These figures show a fair stability in Coriolis DAC activity.

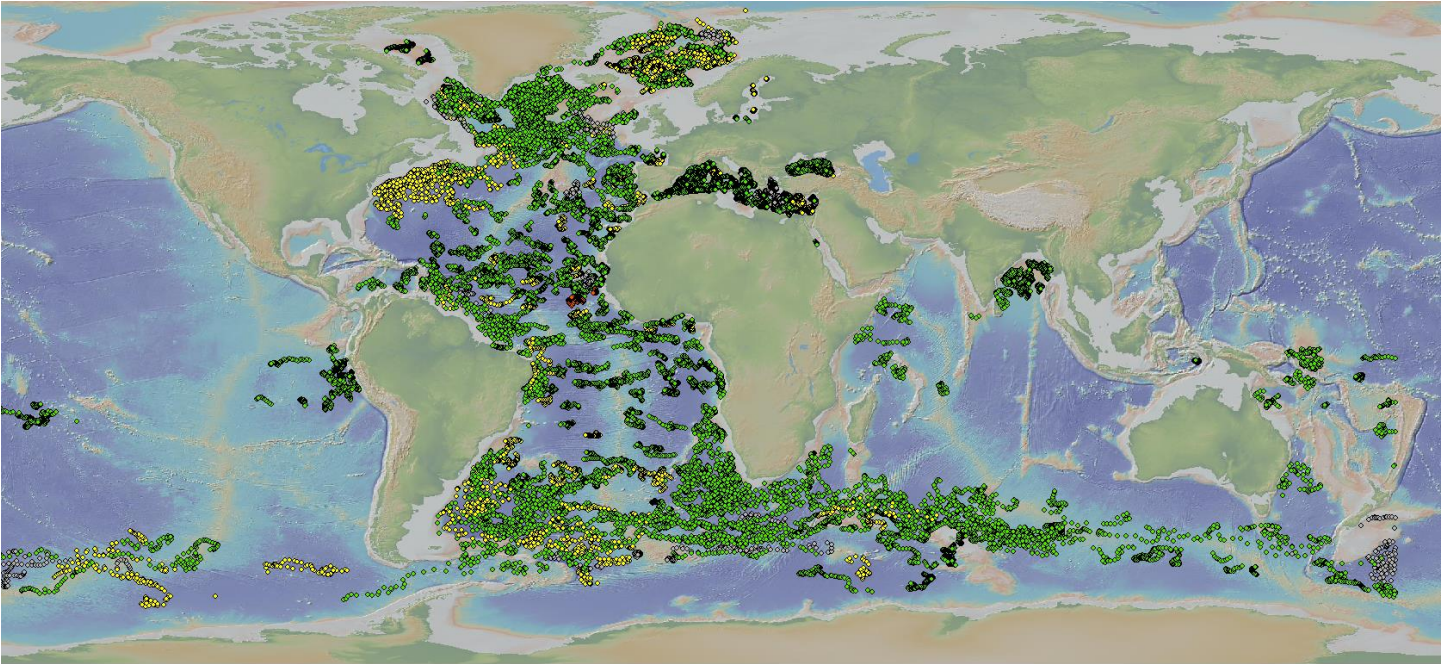
The 788 floats managed during that period had 56 versions of data formats.



1.1.2 All floats managed by Coriolis DAC

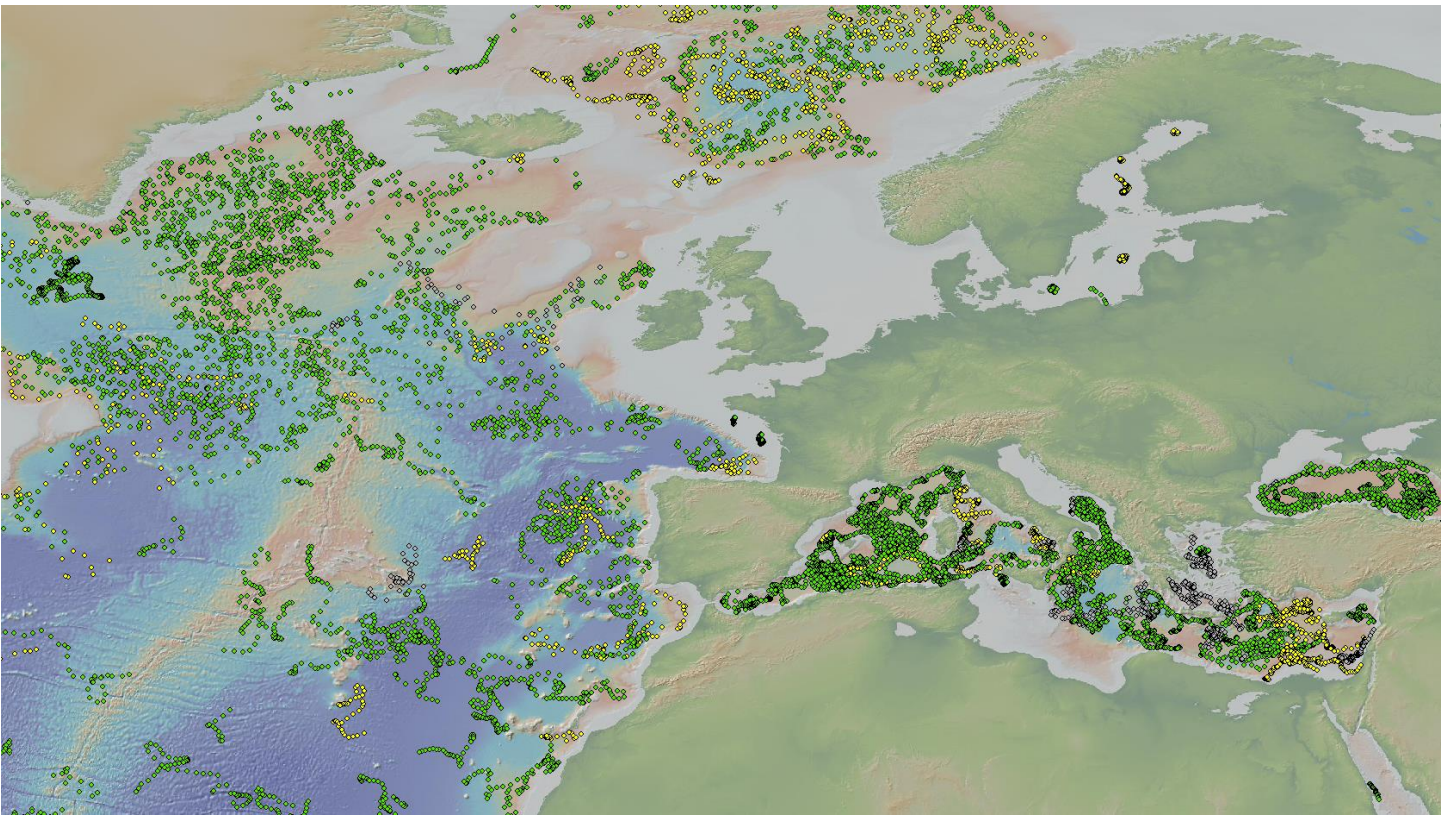
Coriolis DAC manages a total of 2 440 floats with 130 versions, from 6 families. These floats reported 262 198 core Argo vertical profiles.



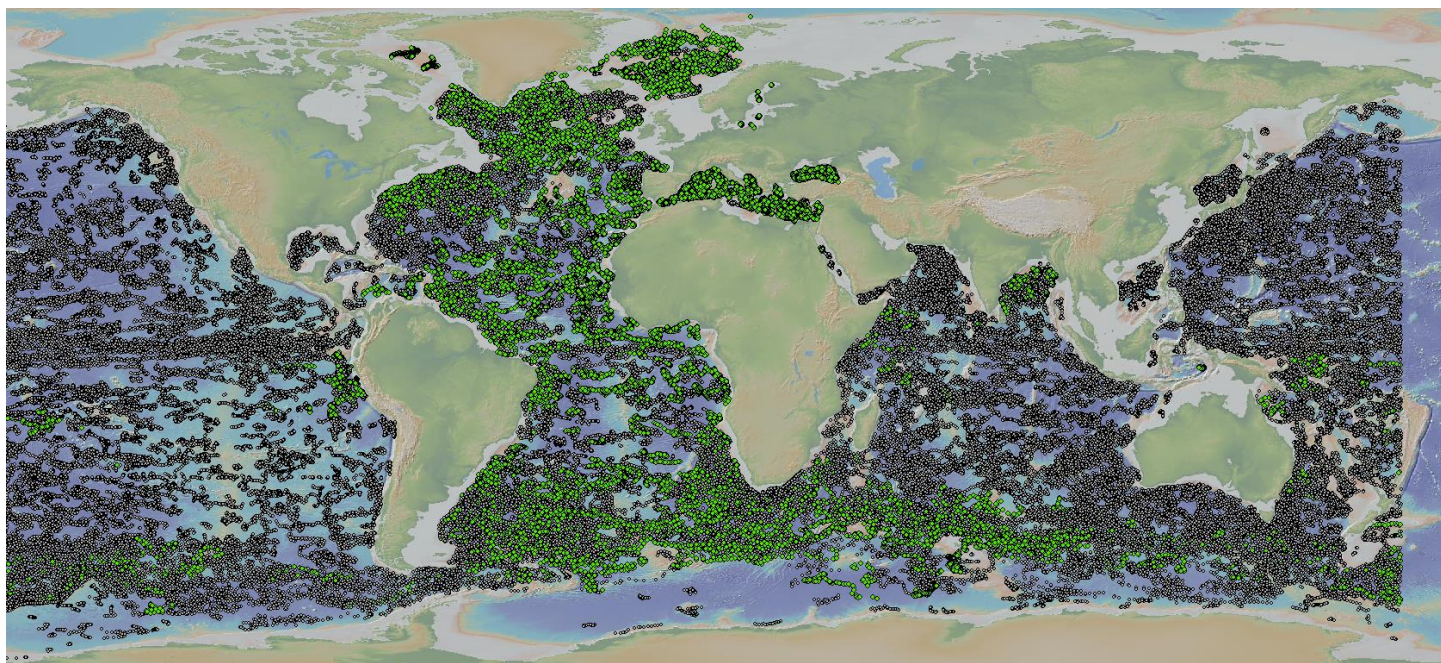


Map of the 30.367 profiles from 788 active floats decoded by Coriolis DAC this current year

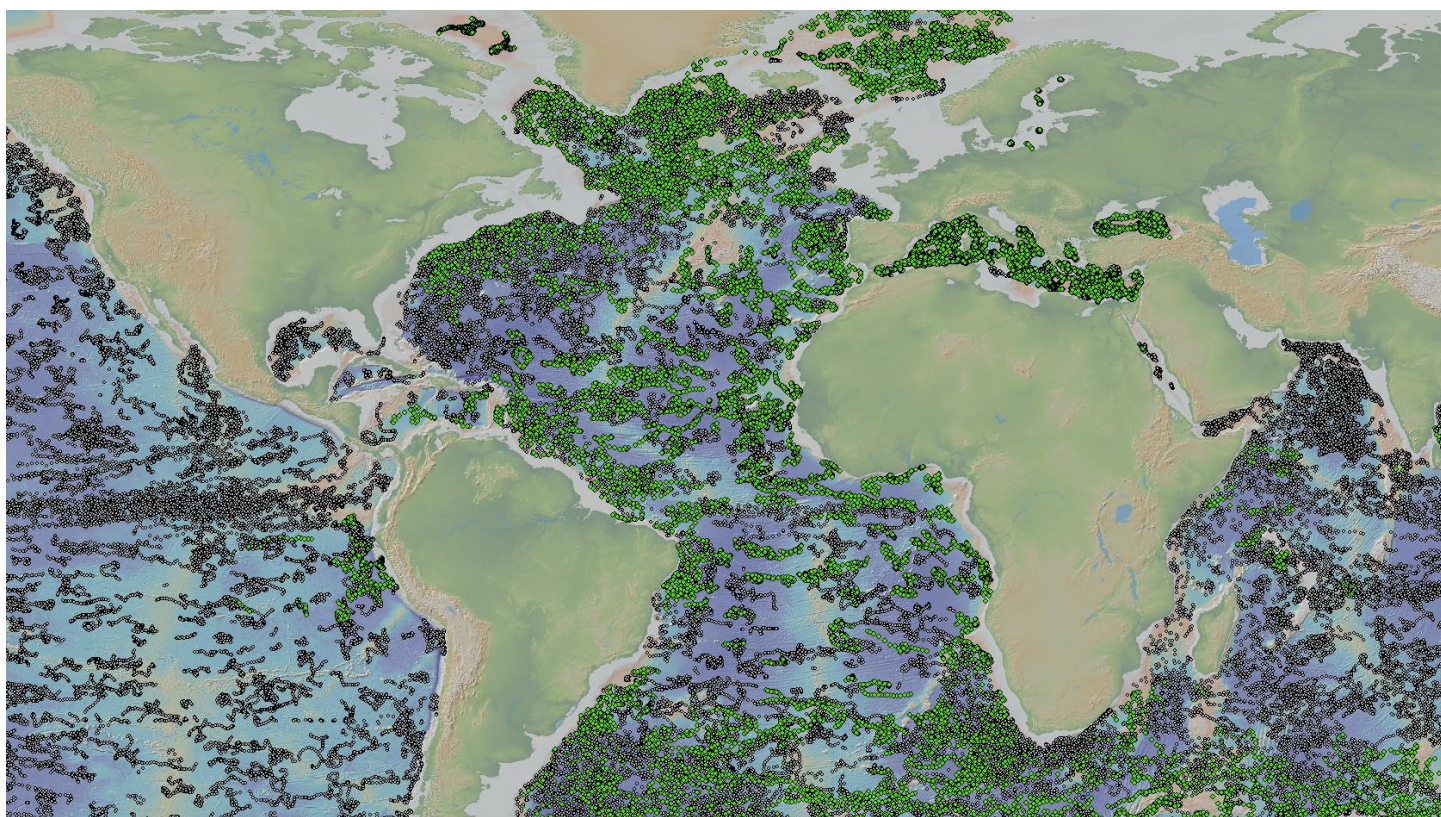
Apex Navis Nemo Nova Provor



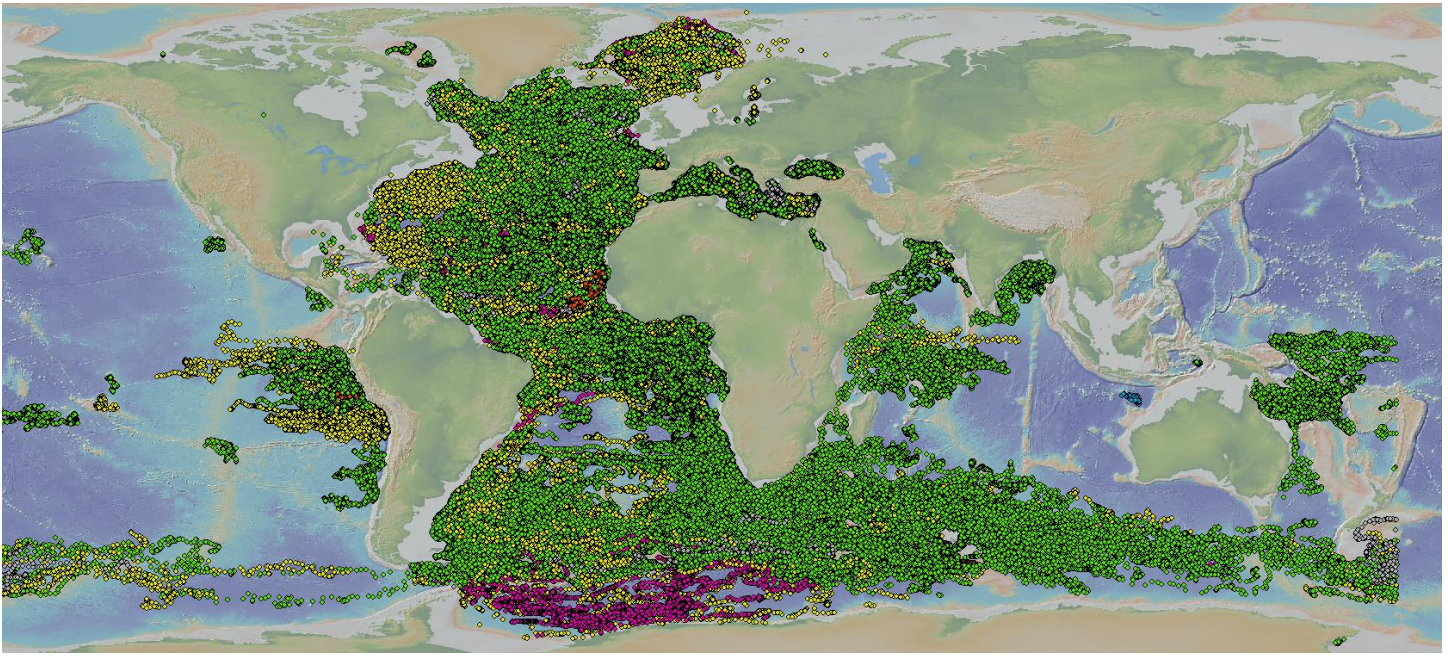
Map of active floats managed by Coriolis this current year, zoom on north Atlantic area



Map of the profiles from active floats decoded by Coriolis DAC this current year, among the other DAC's profiles (Coriolis: green, other DACs: grey)



Atlantic map active floats profiles from Coriolis DAC this current year, among the other DAC's profiles (Coriolis: green, other DACs: grey)



Map of the 262.189 profiles from 2.240 floats managed by Coriolis DAC

Apex Metocean Navis Nemo Nova Provor

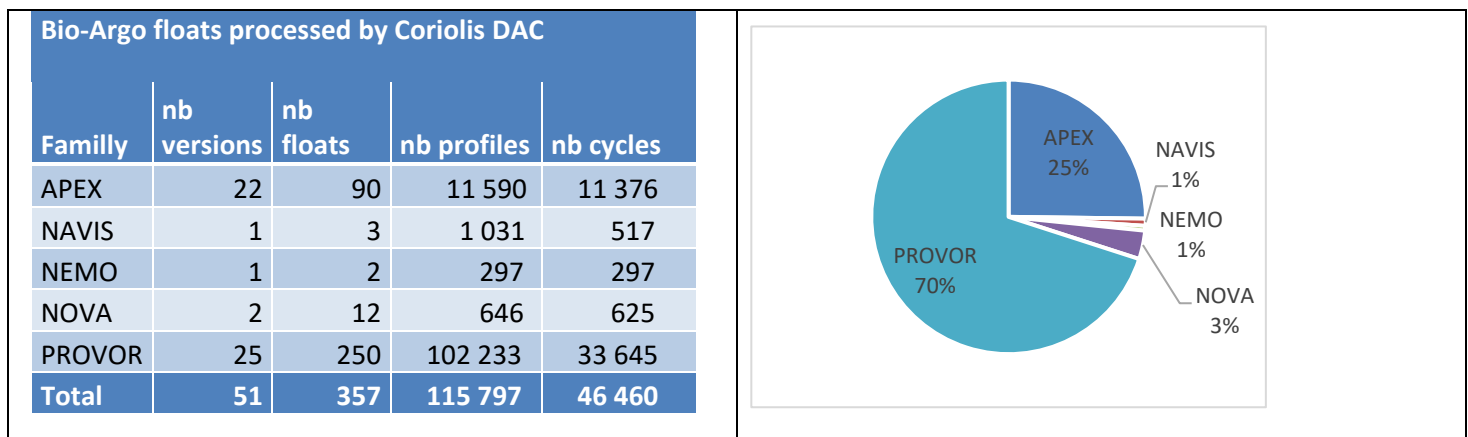
1.1.3 BGC-Argo sensors on Coriolis floats

The data processing chain based on Matlab to manage data and metadata from Coriolis BGC-floats is continuously improved. These are advanced types of floats performing bio-geo-chemical measurements.

Coriolis DAC manages 357 BGC-Argo floats from 5 families and 51 instrument versions. They performed 46.460 cycles.

The data processing chain is freely available:

- Coriolis Argo floats data processing chain, version 20170328_010a. SEANOE. <http://doi.org/10.17882/45589>



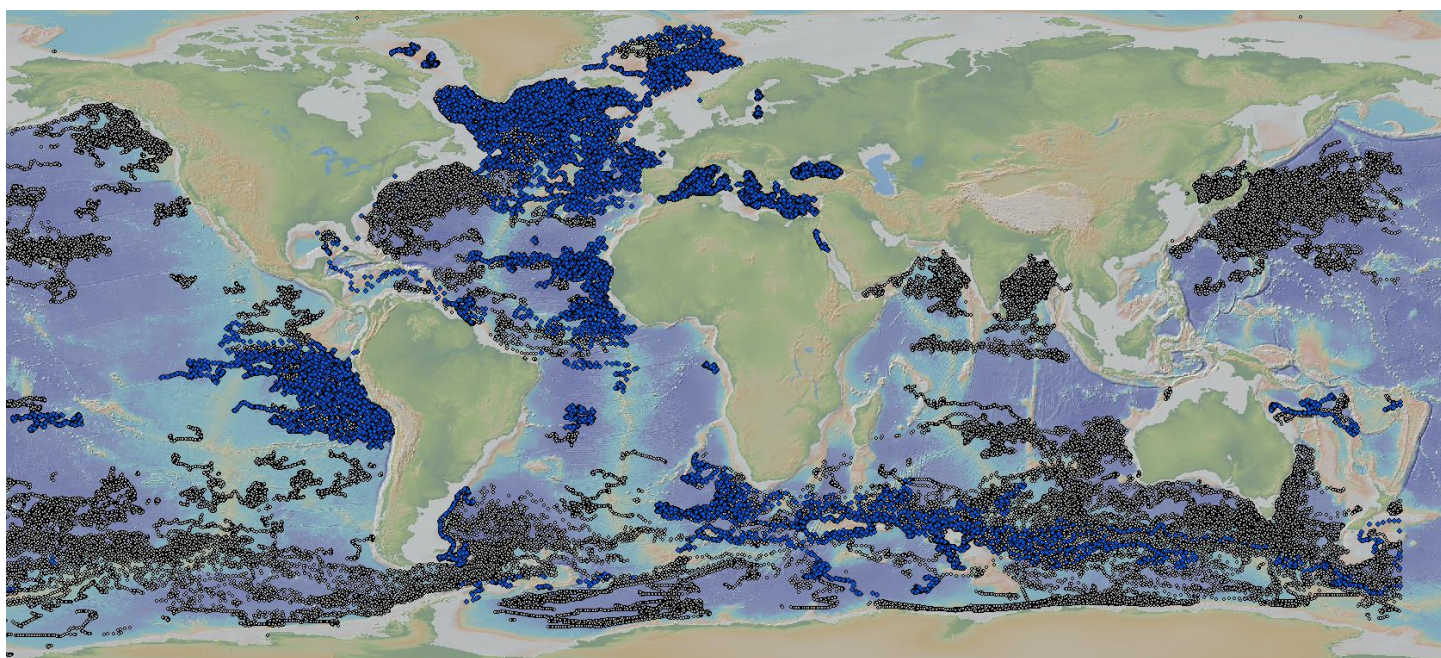
General characteristics

- Iridium rudics bi-directional communication or Argos
- Six sensors are fitted on the floats

- AANDERAA_OPTODE_4330 Aandera oxygen sensor
- C_ROVER Wetlabs transmissiometer
- ECO_PUCK Wetlabs fluorometer turbidity, scattering
- SATLANTIC_OCR504 Satlantic Irradiance sensor
- SBE41CP Seabird CTD sensor
- SUNA_V2 Satlantic nitrate sensor
- 41 parameters managed: core-argo, b-argo, i-argo parameters
bbp532, bbp700, beta_backscattering532, beta_backscattering700, bisulfide, bphase_doxy, c1phase_doxy, c2phase_doxy, cdom, chla, cp660, down_irradiance380, down_irradiance412, down_irradiance490, downwelling_par, doxy, doxy2, fit_error_nitrate, fluorescence_cdom, fluorescence_chla, frequency_doxy, humidity_nitrate, molar_doxy, mtime, nitrate, phase_delay_doxy, phase_delay_doxy2, ppox_doxy, raw_downwelling_irradiance380, raw_downwelling_irradiance412, raw_downwelling_irradiance490, raw_downwelling_par, rphase_doxy, temp_cpu_chla, temp_doxy, temp_doxy2, temp_nitrate, temp_spectrophotometer_nitrate, tphase_doxy, uv_intensity_dark_nitrate, uv_intensity_nitrate

These parameter include chlorophyll, turbidity, CDOM, back-scattering, UV, nitrate, bisulfide, pH, radiance, irradiance, PAR.

Main parameters	nb profiles
DOXY (oxygen)	32716
BBP700	23397
BETA_BACKSCATTERING700	23397
CHLA (chrolophyll)	23397
DOWN_IRRADIANCE380	20941
DOWNWELLING_PAR	20941
CDOM	20627
NITRATE	6411
PPOX_DOXY (oxygen in air)	520
BISULFIDE	184



Map of the 357 bio-Argo floats managed by Coriolis DAC (grey dots: the others DACs bio-Argo floats). They measure parameters such as chlorophyll, turbidity, CDOM, back-scattering, UV, nitrate, bisulfide, pH, radiance, irradiance, PAR.



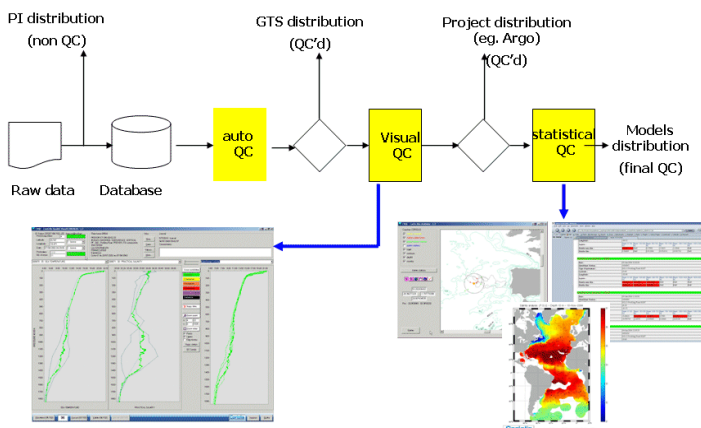
© Antoine Poteau, Observatoire Océanologique de Villefranche (CNRS/UPMC)
Deployments of a bio-argo Provod in Ligurian sea

1.2 Data issued to GTS

All profiles processed by Coriolis are distributed on the GTS by way of Meteo-France. This operation is automatically performed. After applying the automatic Argo QC procedure, the Argo profiles are inserted on the GTS every 2 hours. Argo profiles are inserted on the GTS 365 days per year, 24 hours a day.

The profile files are sent as TESAC and BUFR messages by way of Meteo-France. Meteo-France accept Coriolis as valid BUFR messages and circulate them on neighbouring nodes.

Once a day, floats data that are less than 21 days old are checked in an objective analysis (ISAS) that triggers alert and visual inspection for suspicious observations.

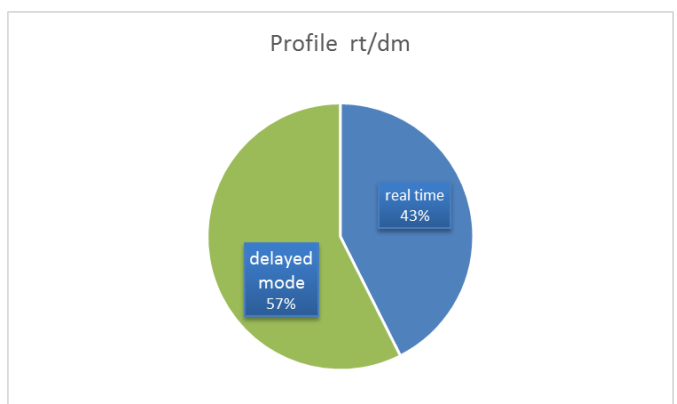


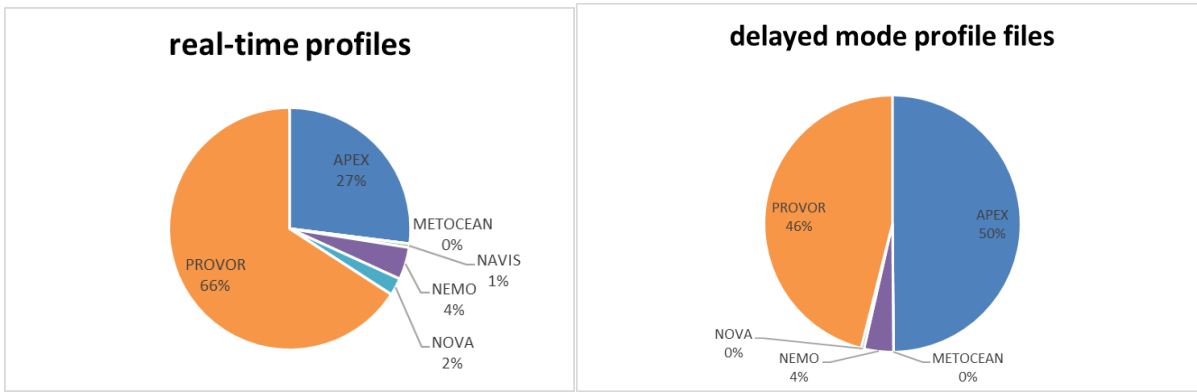
COROLIS DAC: Argo data flow

1.3 Data issued to GDACs after real-time QC

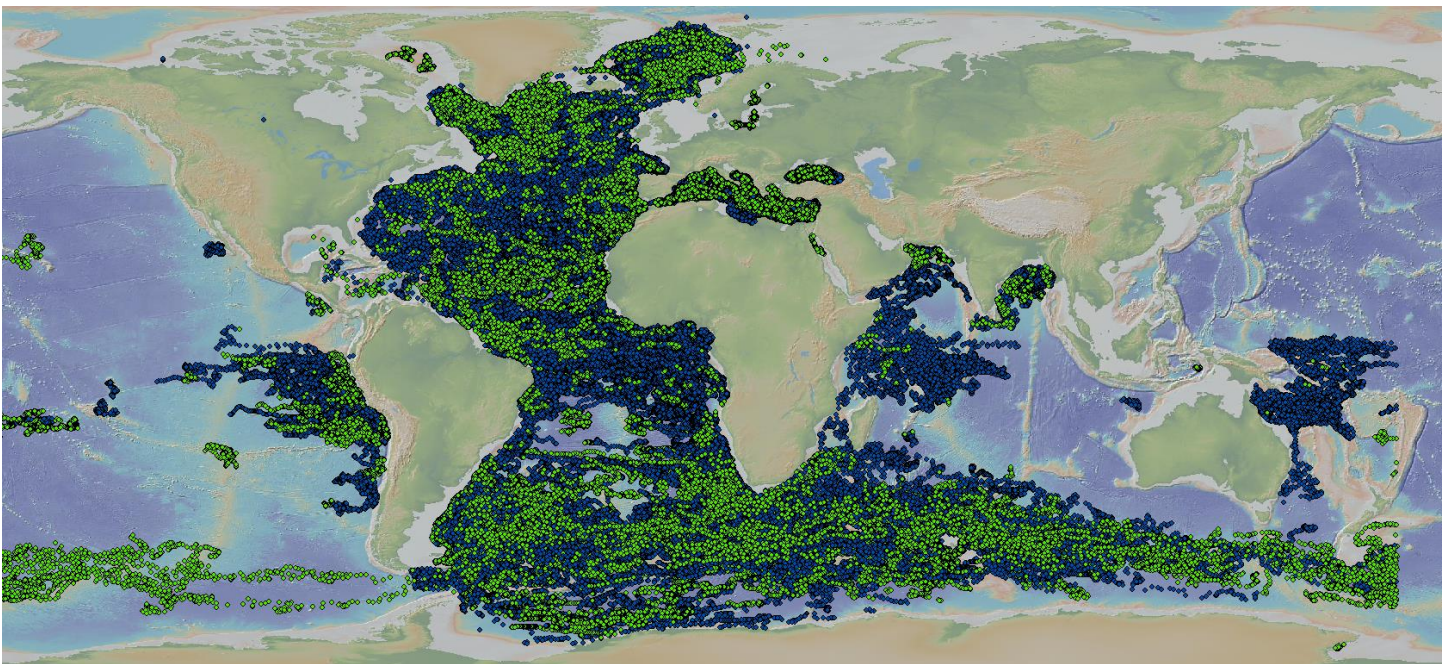
All meta-data, profiles, trajectory and technical data files are sent to Coriolis and US-GODAE GDACs. This distribution is automated.

All Coriolis floats, number of profile files on GDAC				
Family	nb floats	nb profile	RT profil	DM profiles
APEX	829	90 533	25 918	64 615
METOCEAN	1	52	-	52
NAVIS	3	488	488	
NEMO	163	8 911	4 141	4 770
NOVA	52	2 727	2 233	494
PROVOR	1 162	122 974	63 264	59 710
Total	2 210	225 685	96 044	129 641





Distribution of Coriolis DAC real-time and delayed mode profiles (96 044 profiles – 225 685 profiles)



Map of real-time profiles and delayed mode profiles
Real time: green dots, delayed mode: blue dots

1.4 Data issued for delayed mode QC

Delayed mode profiles

All profile files are sent to PIs for delayed QC. Most of the Atlantic data handled by Coriolis are checked by the European project Euro-Argo.

Preparation of Argo delayed mode trajectories

The delayed mode trajectories derived from Andro trajectory product were produced in version 3.0. Their conversion to V3.1 trajectory format will be performed in 2016.

The 1442 delayed mode trajectories files are available from:

- <ftp://ftp.ifremer.fr/ifremer/argo/etc/coriolis-custom/argo-andro-data/data/dac/coriolis/>

The Andro trajectory TRAJ3 files are available for most of the DACs. Each DAC may decide to use these files to provide delayed mode trajectory on GDAC.

Coriolis DAC will use these files as its delayed mode trajectories for old floats versions.

1.5 Delayed mode data sent to GDACs

An Argo delayed mode profile contains a calibrated salinity profile (psal_adjusted parameter).

- A total of **57 013 new or updated delayed mode profiles** was sent to GDACs this year.
- A total of **179 361 delayed mode profiles** were sent to GDACs since 2005.
The number of delayed mode profiles increased by 27% this year.

1.6 Web pages

The web site of the French DAC is available at:

- <http://www.coriolis.eu.org/Observing-the-Ocean/ARGO>

This web page describes all Argo floats:

- <http://www.ifremer.fr/co-argoFloats/>
 - Individual float description and status (meta-data, geographic map, graphics : section, overlaid, waterfall, t/s charts)
 - Individual float data (profiles, trajectories)
 - FTP access
 - Data selection tool
 - Global geographic maps, GoogleEarth maps
 - Weekly North Atlantic analyses (combines Argo data and other measurements from xbt, ctd, moorings, buoys)

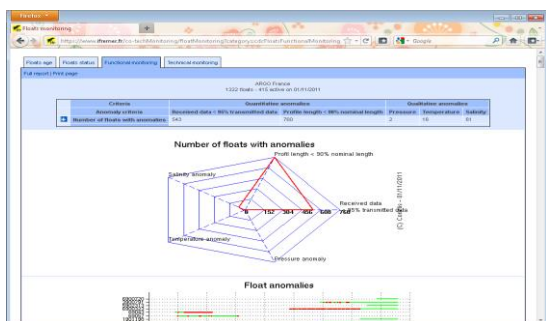
This web page describes all Argo floats interoperability services from Coriolis:

- <http://www.coriolis.eu.org/Data-Products/Data-Delivery/Argo-floats-interoperability-services>

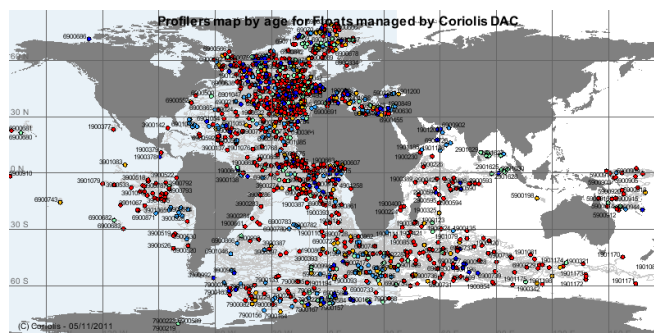
- Display an individual float's data and metadata in HTML or XML format
- Display all Argo floats, display a group of floats
- Argo profiles and trajectories data selection (HTML or XML)
- All individual float's metadata, profile data, trajectory data and technical data
- Argo profiles data on OpenDAP, OGC-WCS and http
- Argo data through RDDAP data server (www.ifremer.fr/erddap)
- Argo data through Oceanotron data server
- Argo profiles data through GCMD-DIF protocol
- Argo data through RDF and OpenSearch protocols
- Display Argo profiles and trajectories with GoogleEarth

Some pages of Coriolis web site are dedicated to technical monitoring:

- <http://www.coriolis.eu.org/Data-Products/At-sea-monitoring>



Example 1: technical monitoring of Argo-France floats



Example 2: age map of floats managed by Coriolis DAC.

Within Euro-Argo ERIC (European Research Infrastructure Consortium), a dashboard with alerts on anomalies was developed: <http://www.ifremer.fr/argoMonitoring/floatMonitoring/385>

The screenshot shows a web interface titled 'Monitoring At Sea' with a 'Dashboard' tab selected. It displays a table titled 'NB FLOATS (%)' and 'NB CYCLES (%)' with columns for 'Group Code', 'NB FLOATS (%)', and 'NB CYCLES (%)'. The table lists various float anomalies and their corresponding counts and percentages.

Group Code	NB FLOATS (%)	NB CYCLES (%)
INFO	406 (38.05%)	20692 (13.74%)
FLAG_MissingCycle_LOGICAL	218 (20.43%)	19471 (12.93%)
FLAG_MissingVerticalProfile_LOGICAL	17 (1.59%)	17 (0.01%)
FLAG_VoltageDrop_LOGICAL	215 (20.15%)	1210 (0.80%)
DATA TRANSMISSION	949 (88.94%)	39250 (26.07%)
FLAG_CtdDataTransmissionIncomplete_LOGICAL	495 (46.39%)	5138 (2.73%)
FLAG_ParameterDataTransmissionIncomplete_LOGICAL	12 (1.12%)	22 (0.01%)
FLAG_TechnicalDataTransmissionIncomplete_LOGICAL	191 (17.90%)	268 (0.18%)
FLAG_HydraulicDataTransmissionIncomplete_LOGICAL	0 (0%)	0 (0%)
FLAG_SatelliteCoverageProblem_LOGICAL	0 (0%)	0 (0%)
FLAG_PercentageMessagesGoodCRC_LOGICAL	685 (64.20%)	24679 (16.39%)
FLAG_UnusualTransmissionTime_LOGICAL	577 (54.08%)	16828 (11.18%)
CONDITIONING	0 (0%)	0 (0%)

Within ENVRIPLUS EU project, an Argo big data demonstration: <http://co-discovery-demo.ifremer.fr/euro-argo/>
 All Argo data is indexed and available through an Elasticsearch API.
 More on https://www.youtube.com/watch?v=PKU_JcmSskw

Data centre activity monitoring: Coriolis operators perform an activity monitoring with an online control board.

Fonction	Description	Etat J	Etat J-1	Etat J-2	Etat J-3	Dernière exécution (TU)
CO-05-08-08	Archive GDAC Argo					UNDERWAY-LOCKED 2017-11-25T02:07:01Z
CO-03-07-01	Argo files controller					OK 2017-10-13T08:00:46Z
CO-05-08-11	Argo grey list diffuser		😊	😊	😊	OK 2017-11-24T11:05:02Z
CO-03-07-01-02	Argo stat controller				😊	OK 2017-11-22T01:02:21Z
CO-01-07-08	Collecte Argo Coriolis EDAC	😊	😊	😊	😊	OK 2017-11-25T09:45:04Z
CO-01-07-03	Collecte Argo DAC - FTP	😊	😊	😊	😊	OK 2017-11-25T10:09:04Z
CO-01-07-01-02	Collecte Argo DAC - Table argo index profiles	😊	😊	😊	😊	OK 2017-11-25T09:58:50Z
CO-01-07-01-aoml	Collecte Argo DAC - aoml	😊	😊	😊	😊	OK 2017-11-25T10:00:04Z
CO-01-07-01-bodc	Collecte Argo DAC - bodc	😊	😊	😊	😊	OK 2017-11-25T10:01:02Z
CO-01-07-01-coriolis	Collecte Argo DAC - coriolis	😊	😊	😊	😊	OK 2017-11-25T10:02:21Z
CO-01-07-01-csio	Collecte Argo DAC - csio	😊	😊	😊	😊	OK 2017-11-25T10:03:02Z
CO-01-07-01-csiro	Collecte Argo DAC - csiro	😊	😊	😊	😊	OK 2017-11-25T10:04:03Z
CO-01-07-01-incois	Collecte Argo DAC - incois	😊	😊	😊	😊	OK 2017-11-25T10:05:02Z
CO-01-07-01-jma	Collecte Argo DAC - jma	😊	😊	😊	😊	OK 2017-11-25T10:06:05Z
CO-01-07-01-kma	Collecte Argo DAC - kma	😊	😊	😊	😊	OK 2017-11-25T10:07:03Z
CO-01-07-01-kordj	Collecte Argo DAC - kordj	😊	😊	😊	😊	OK 2017-11-25T10:08:02Z
CO-01-07-01-meds	Collecte Argo DAC - meds	😊	😊	😊	😊	OK 2017-11-25T10:09:03Z
CO-01-07-01-nmdis	Collecte Argo DAC - nmdis	😊	😊	😊	😊	OK 2017-11-25T10:10:02Z
CO-01-07-06-aoml	Collecte Argo DAC BDD - aoml	😊	😊	😞	😞	OK 2017-11-25T09:42:07Z
CO-01-07-06-bodc	Collecte Argo DAC BDD - bodc	😊	😊	😊	😊	OK 2017-11-25T09:42:03Z

Argo GDAC operations monitoring: every working day, an operator performs diagnostics and take actions on anomalies (red or orange smileys)

1.7 Statistics of Argo data usage (operational models, scientific applications, number of National Pis...)

Operational oceanography models; all floats data are distributed to:

- French model Mercator (global operational model)
- French model MARC (regional operational model)
- French model Soap (navy operational model)
- EU Copernicus models (Foam, Topaz, Moon, Noos)
- EuroGoos projects

Argo projects: this year, Coriolis data centre performed float data management for 55 Argo scientific projects and 55 PIs (Principal Investigators).

List of Coriolis scientific PIs and project names

Project name	nb floats
euro-argo	584
coriolis	397

bsh	83
argo-bsh	79
argo italy	76
naos	69
remocean	62
mocca	60
goodhope	47
mocca-eu	43
pirata	27
gmmc	21
argomed	16
rrex asfar	15
sagar	12
dap	11
rrex	10
argo norway	10
argo greece	10

List of projects with more than 10 active floats

List of project with less than 10 active floats: argo_fin, geovide, amop, soclim, bwr, argo_spain, ovide, outpace, ticmoc, mocca-germany, naos-canada, gmcc_cnes, brazilian navy argo program, naos-france, mocca-italy, cienperu, argo italy , morsea, argo-poland, moose, vsf, eaims, narval, mocca-poland, mafia, mocca-ger, argo bulgary, sri_lanka, aspex, argo spain, e-aims, argo brazil, cnes, proteusmed, asfar, argo-finland, mocca-eu, dekosim (metu), bioargo-italy, opportunity (sail), upsen, ge moose, naos,pirata, perseus, socib, mocca-ned, argo-italy, dekosim, lefe, bioargo italy, argo bsh, bide, mocca-netherlands, euroargo, peacetime, congas

PI name	nb floats
birgit klein	142
pierre-marie poulain	95
christine coatanoan	92
sabrina speich	64
virginie thierry	63
bernard bourles	28
christophe maes	24
herve claustre	23
holger giese	22
fabrizio d'ortenzio	17
romain cancouët	16
fabien durand	15
andreas sterl	13
jose lluis pelegri	12
marcel babin	12
dimitris kassis	11
waldemar walczowski	11
kjell arne mork	10

laurent coppola	10
pedro velez belchi	10
jean-baptiste sallee	9
peter brandt	8
tero purokoski	8

List of Principal Investigators (PI) in charge of more than 8 active floats

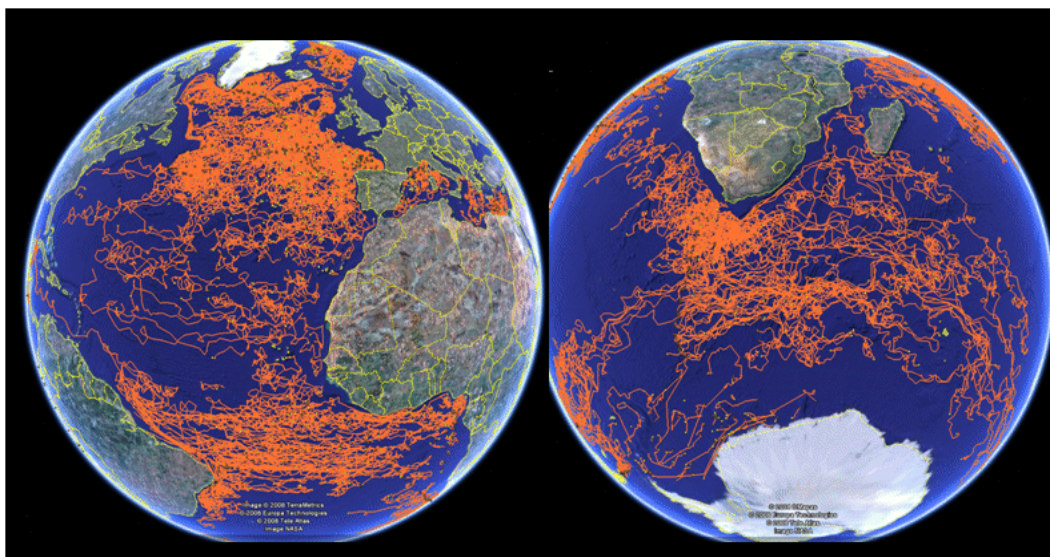
List of Principal Investigators (PI) in charge of less than 8 active floats: sophie cravatte, franck dumas, luis felipe silva santos, vincent echevin, guillaume maze, alban lazar, camille daubord, cecile cabanes, violeta slabakova, bert rudels, louis marié, stephane blain, thierry moutin, xavier andre, arne kortzinger, elodie martinez, katrin latarius, serge le reste, stephanie louazel, sven petersen, tobias ramalho dos santos ferreira, agus atmadipoera, alain serpette, anja schneehorst, bettina fach, jordi font, julia uitz, nathanaele lebreton, pascal conan, s. petersen, sorin balan

1.8 Products generated from Argo data ...

Sub-surface currents ANDRO Atlas

Based on Argo trajectory data, Michel Ollitrault and the Ifremer team are regularly improving the “Andro” atlas of deep ocean currents. The ANDRO project provides a world sub-surface displacement data set based on Argo floats data. The description of each processing step applied on float data can be found in:

- Ollitrault Michel, Rannou Philippe (2013). *ANDRO: An Argo-based deep displacement dataset*. SEANOE. <http://doi.org/10.17882/47077>
- See also : <http://wwz.ifremer.fr/lpo/Produits/ANDRO>



Argo trajectories from Coriolis DAC are carefully scrutinized to produce the “Andro” atlas of deep ocean currents.

2 Delayed Mode QC

(Please report on the progress made towards providing delayed mode Argo data, how it's organized and the difficulties encountered and estimate when you expect to be pre-operational.)

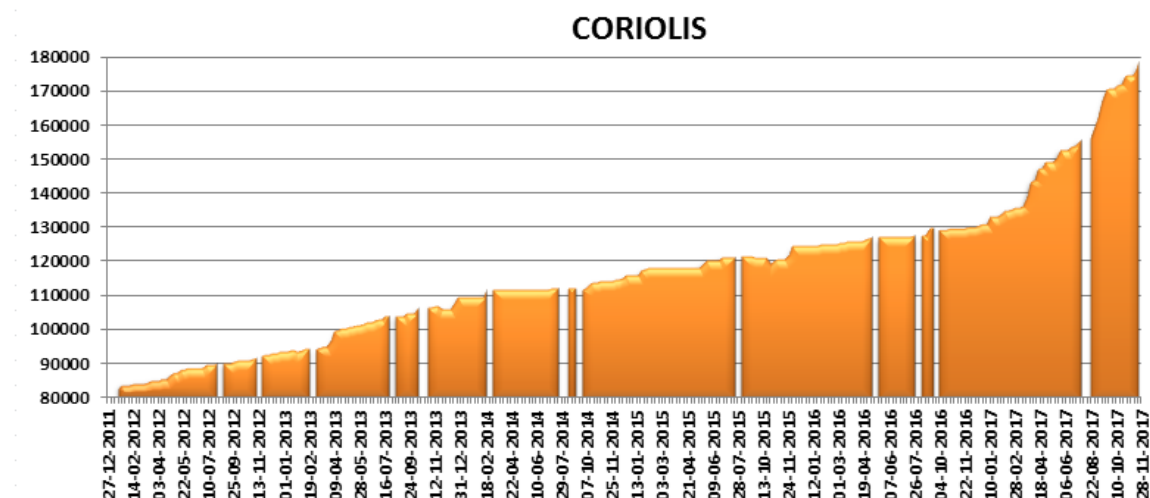
At the Coriolis data centre, we process the delayed mode quality control following four steps. Before running the OW method, we check carefully the metadata files, the pressure offset, the quality control done in real time and we compare with neighbor profiles to check if a drift or offset could be easily detected. As each year, we have worked on this way with PIs to strengthen the delayed mode quality control.

Some floats have been deployed from some projects, meaning a lot of PIs and a lot of time for explaining the DM procedure to all of them. A few PIs are totally able to work on DMQC following the four steps but this is not the case for most of them. Since the unavailability of the PIs leads to work by intermittence and then extend the period of work on the floats, we did the work with a private organism (Glazeo) to improve the realization of the DMQC, exchanging only with the PIs to validate results and discuss about physical oceanography in studied area. Working in this way, we largely improve the amount of delayed mode profiles.

For a few projects, there are still no identified operators to do DMQC, for instance the first run has been done by students which have now left institutes or are not available to carry on with this work. We have made a lot of progress with BSH (Birgit Klein) taking into account also floats from other German institutes and OGS (Giulio Notarstefano) for the MedSea.

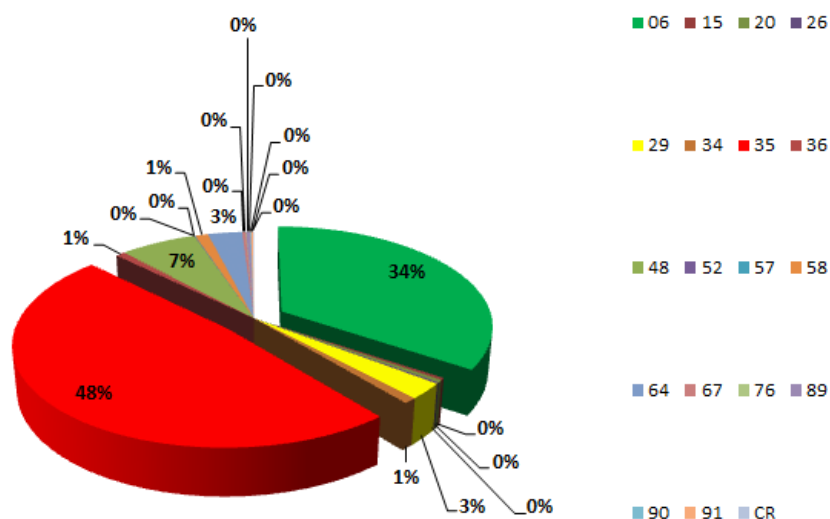
Some DM files have been updated to format version 3.1 taking into account a new decoder (matlab) developed at Coriolis. This work has been done for some Provor and Apex, few files need to be manually updated.

Regular DM files submission is performed each year but an effort has been done during the year 2017 to increase the DM files number.



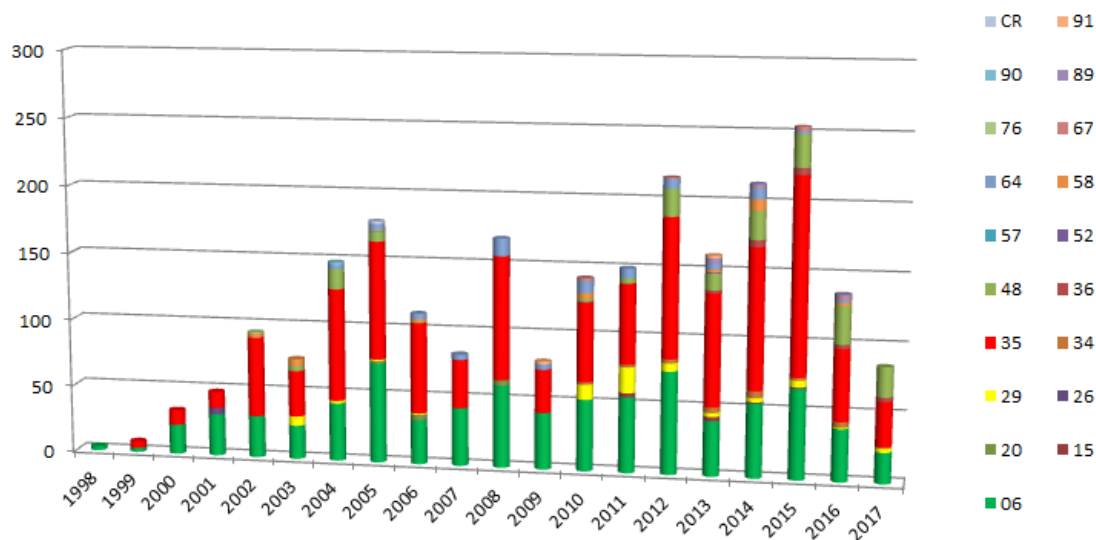
Evolution of the DM profiles' submission versus dates

Floats by country



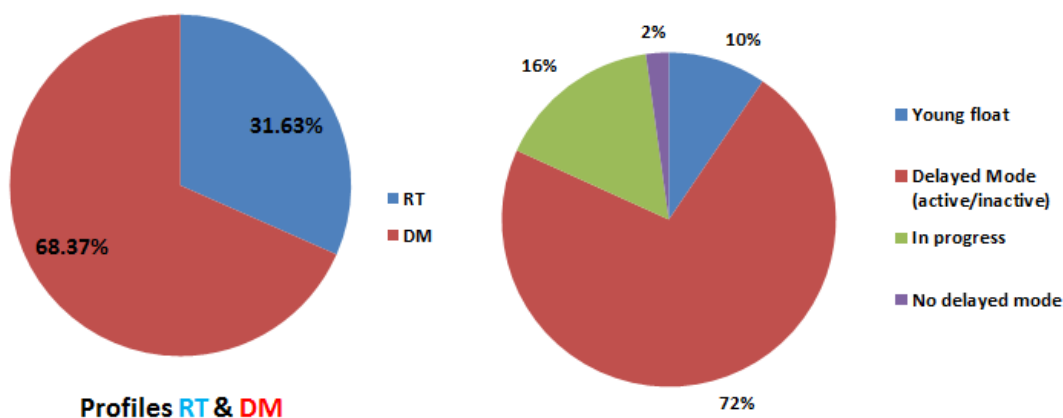
Percentage of floats by country in the Coriolis DAC.

Codes for the countries: 06 : Germany - 15 : Bulgaria - 20 : Chili - 26 : Denmark - 29 : Spain - 34 : Finland - 35 : France - 36 : Greece - 48 : Italy - 52 : Lebanon - 57 : Mexico - 58 : Norway - 64 : Netherlands - 67 : Poland - 76 : China - 89 : Turkey - 90 : Russia - 91 : - South Africa - CR : Costa Rica



Number of floats by country and by launch's year in the Coriolis DAC

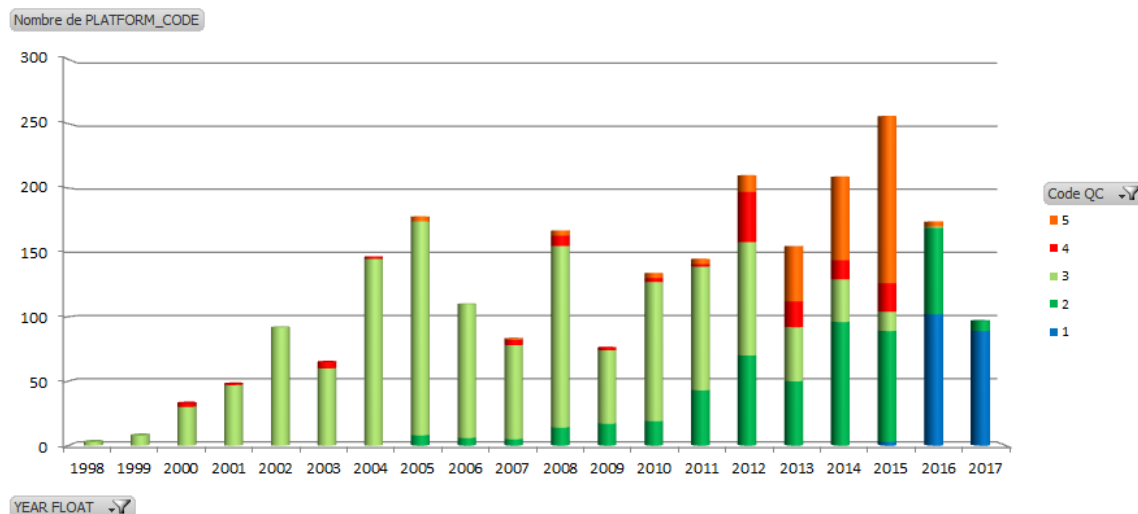
During the last year (from October 2016 to November 2017), 49125 new delayed mode profiles were produced and validated by PIs. A total of 178763 delayed mode profiles were produced and validated since 2005.



Status of the floats processed by Coriolis DAC.

Left: in terms of profile percent and right: in terms of float percent (DM : delayed mode – RT : real time).

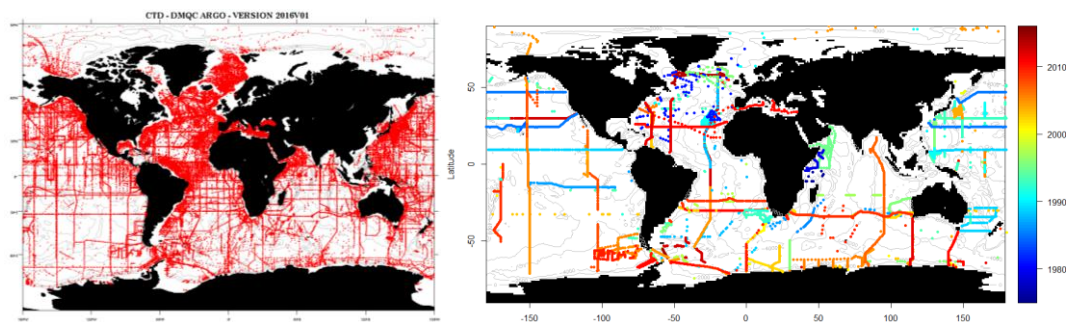
The status of the quality control done on the Coriolis floats is presented in the following plot. For the two last years (2016-2017), most of the floats are still too young (code 1) to be performed in delayed mode. For the years 2012-2013-2014, we are still working on the DMQC of some floats. The codes 2 and 3 show the delayed mode profiles for respectively active and dead floats.



Status of the quality control done on profiles sorted by launch's year, code 1: young float, code 2: active float, DM done, code 3 : dead float, DM done; code 4 : DM in progress, code 5 : waiting for DM, code 6 : problems with float.

2.1 Reference database

In September 2016, the version CTD_for_DMQC_2016V01 has been provided with a large improvement of the dataset since this version took into account new CTD provided by the CCHDO API (following figure), CTD from scientists as well as feedbacks from users on quality of some profiles.

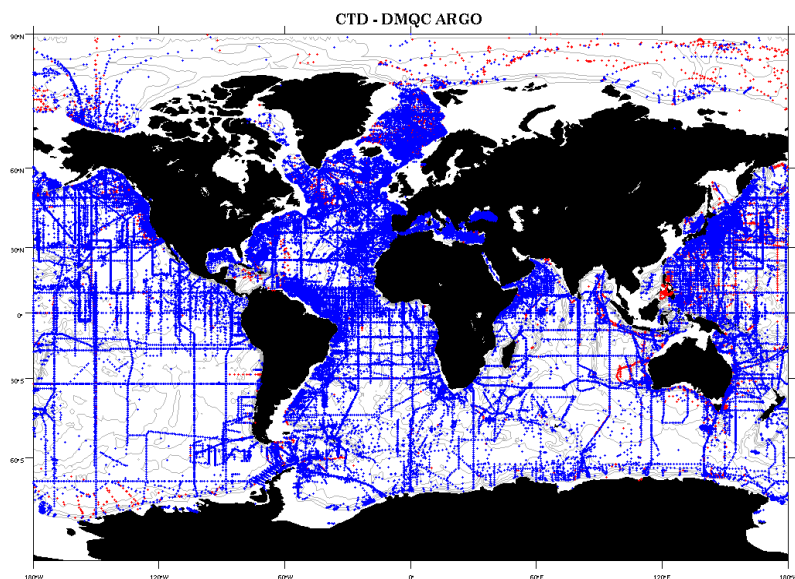


Version 2016 V01 & New CTD datasets downloaded from the CCHDO API

A new version 2017V01 has been provided at the beginning of this year with some updates on a few boxes, following the feedback sent by some scientists.

This last version is available on the ftp site in smaller tar balls, one by wmo box area (1-3-5-7): for instance, CTD_for_DMQC_2017V01_1.tar.gz for all boxes starting with wmo 1, then we will have 4 tar files.

During this year, the OCL updates have been downloaded and some works on quality control have been made before adding them in the reference database. A new version is in preparation and should be delivered at the beginning of 2018. Some new CTDs can be observed in the following plot (blue: last version and red: new CTDs).



3 GDAC Functions

(If your centre operates a GDAC, report the progress made on the following tasks and if not yet complete, estimate when you expect them to be complete)

- National centres reporting to you
- Operations of the ftp server
- Operations of the www server
- Data synchronization
- Statistics of Argo data usage : Ftp and WWW access, characterization of users (countries, field of interest : operational models, scientific applications) ...

3.1 National centres reporting to you

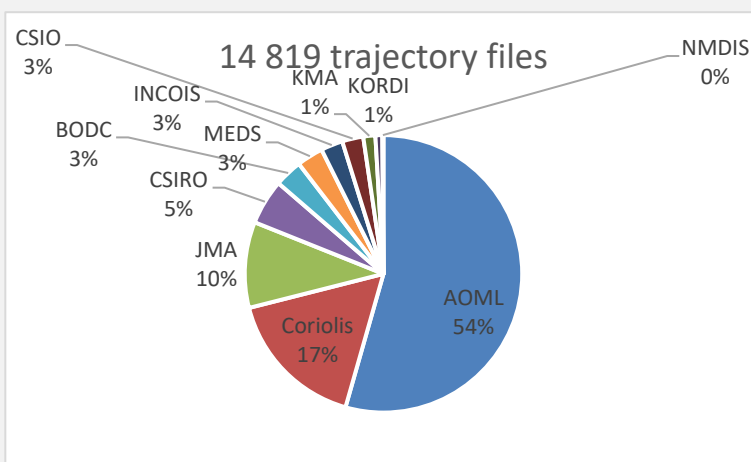
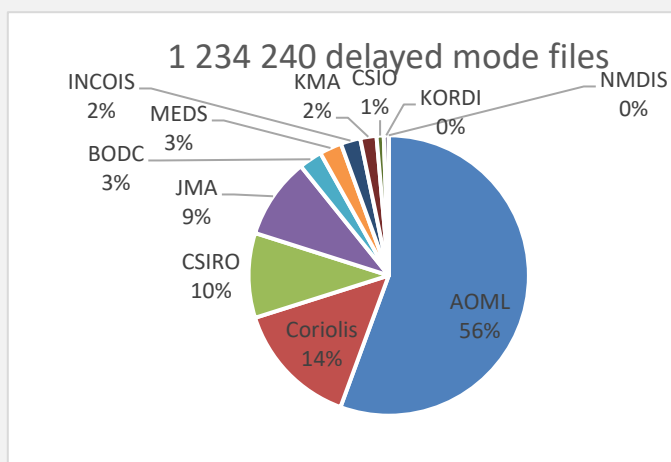
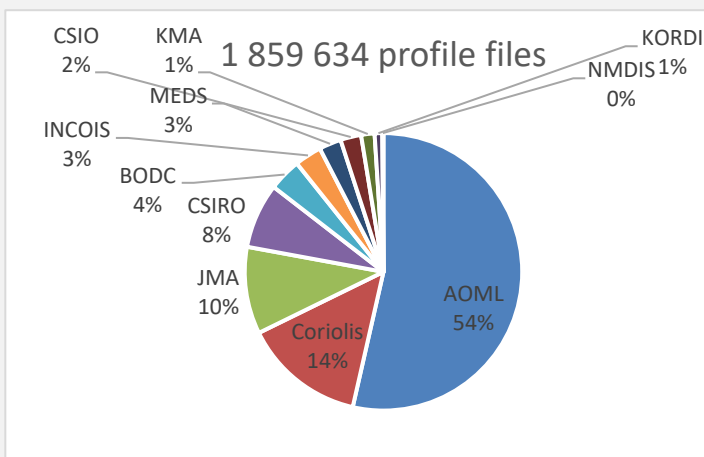
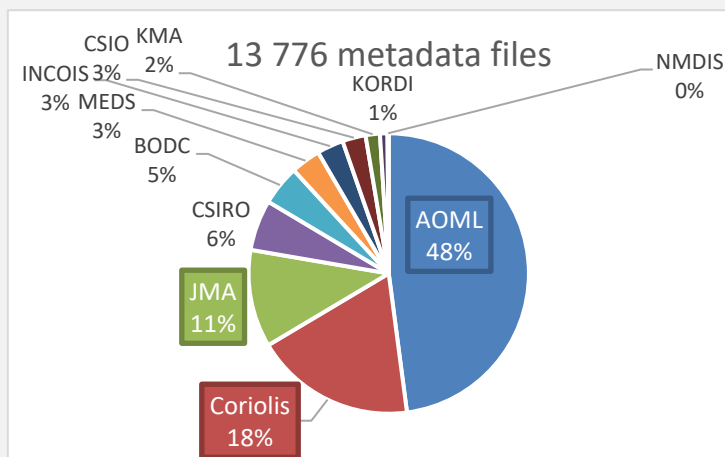
Currently, 11 national DACs submit regularly data to Coriolis GDAC.

The additional GTS DAC contains all the vertical profiles from floats that are not managed by a national DAC. These data come from GTS and GTSP projects. The GTS profiles are quality controlled by the French DAC (Coriolis).

On November 25th 2017, the following files were available from the GDAC FTP site.

3.1.1 GDAC files distribution

DAC	metadata files 2017	increase from 2016	profile files 2017	increase from 2016	delayed mode profile files 2017	increase from 2016	trajectory files 2017	increase from 2016
AOML	6 601	10%	996 019	13%	686 144	20%	8 064	12%
BODC	636	18%	70 637	23%	33 015	5%	479	14%
Coriolis	2 554	11%	263 894	17%	179 361	38%	2 465	11%
CSIO	370	8%	44 934	15%	10 221	0%	365	7%
CSIRO	806	8%	140 870	14%	120 680	24%	781	10%
INCOIS	422	7%	58 538	14%	28 008	1%	379	2%
JMA	1 550	7%	188 716	11%	115 044	20%	1 484	4%
KMA	227	5%	29 005	11%	23 094	11%	208	0%
KORDI	119	0%	16 578	2%	6 986		119	0%
MEDS	472	9%	47 983	8%	31 687	23%	456	8%
NMDIS	19	0%	2 460	0%	0		19	0%
Total	13 776	9,35%	1 859 634	13,75%	1 234 240	22,02%	14 819	9,93%



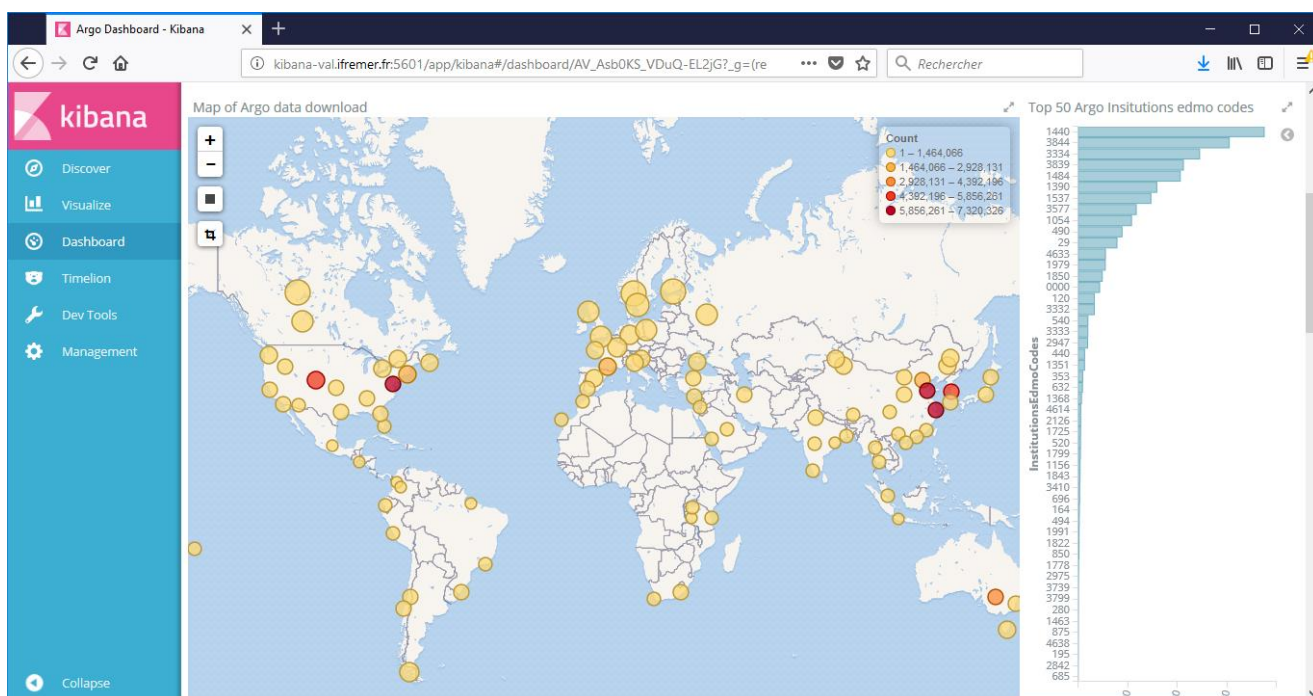
Number of files available on GDAC, November 2017

3.1.2 FTP dashboard: give credit to data providers

Within EU AtlantOS project, Ifremer is setting up a dashboard to monitor data distribution and give credit to data providers such as Argo floats.

FTP downloads log files are ingested in an Elasticsearch index. A link between downloaded files, download originators, floats included in the downloaded files and institution owners of the floats is performed. These links are displayed in a Kibana dashboard.

This dashboard will offer the possibility to give credit to Floats owner institutions such as how many data from one particular institution was downloaded, by whose data users.



Geographical distribution of GDAC ftp downloads in 2017

The majority of users (red dots) are located in USA, China, Australia and of course Europe. The right side histogram sorts the floats institution code (1440: PMEL, 3844: WHOI, 3334: INCOIS, 3839: UWA, 1484: CSIRO, ...).

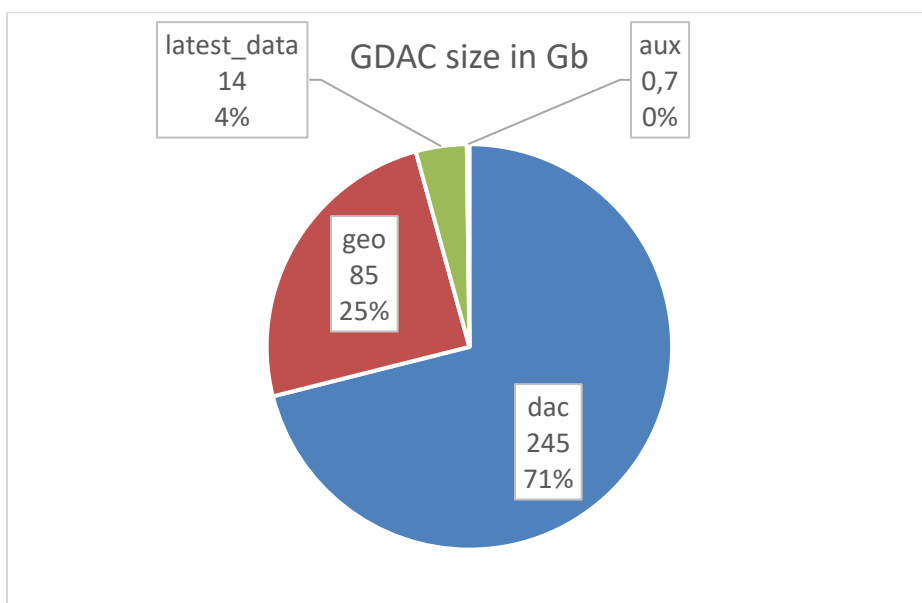


The top 50 of floats institutions downloads and the top 50 of data user's

3.1.3 GDAC files size

- The total number of NetCDF files on the GDAC/dac directory was 2 178 811
- The size of GDAC/dac directory was 245 G (+95%)
- *The size of the GDAC directory was 462Go*

GDAC branch	GDAC size in Gb	since 2016
dac	245	46%
geo	85	25%
latest_data	14	-7%
aux	0,7	-

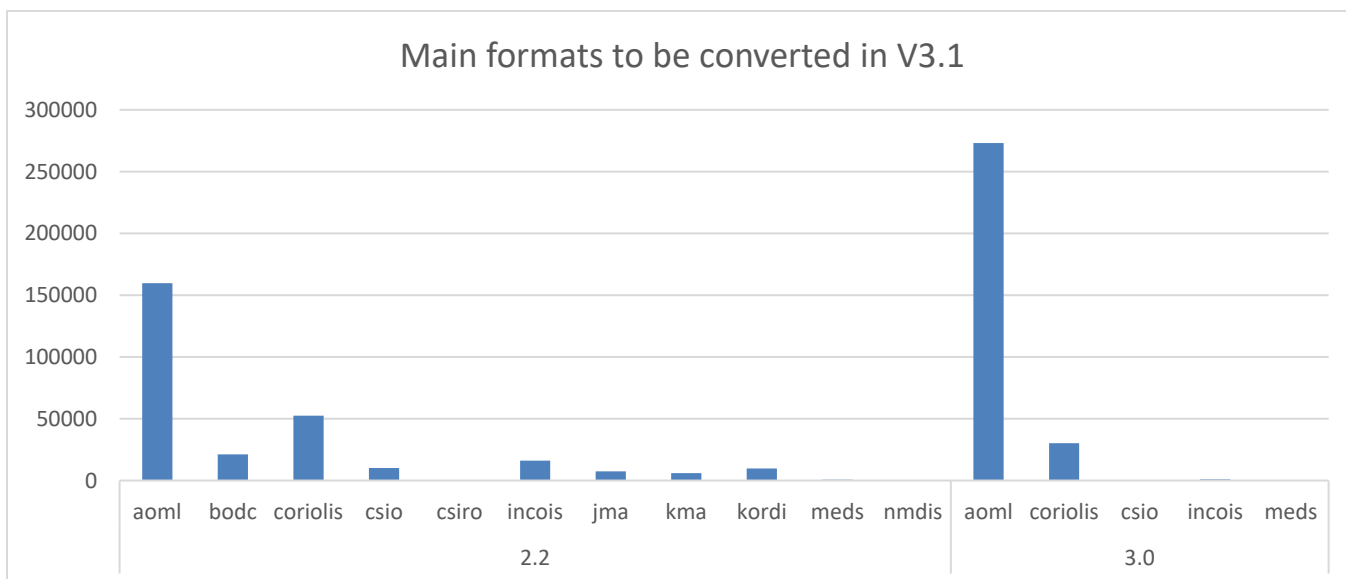
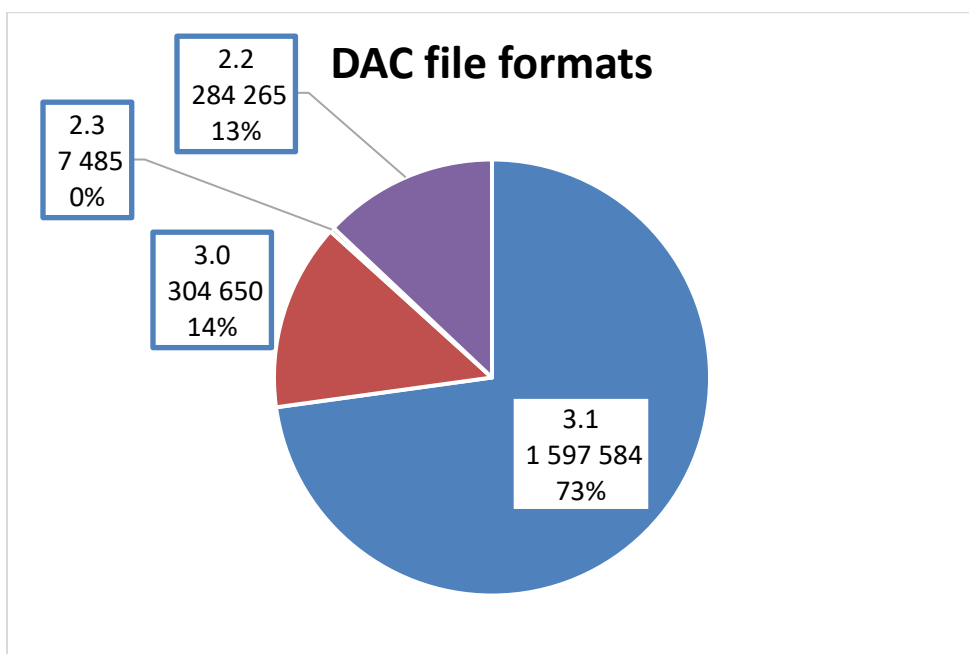


3.1.4 Argo NetCDF transition to format V3.1

The transition from Argo format 2.* and 3.0 toward format 3.1 is underway.

On 2017, the number of files in format version 3.1 reached and passed the 70% threshold.

format version	nb files	percentage
3.1	1 597 584	73%
3.0	304 650	14%
2.3	7 485	0%
2.2	284 265	13%
2.1	12	0%
Total	2 193 996	100%



Detailed list of format versions per DAC

File format	number of files
2.1	12
aoml	2
csio	8
kma	1
meds	1
2.2	284265
aoml	159647

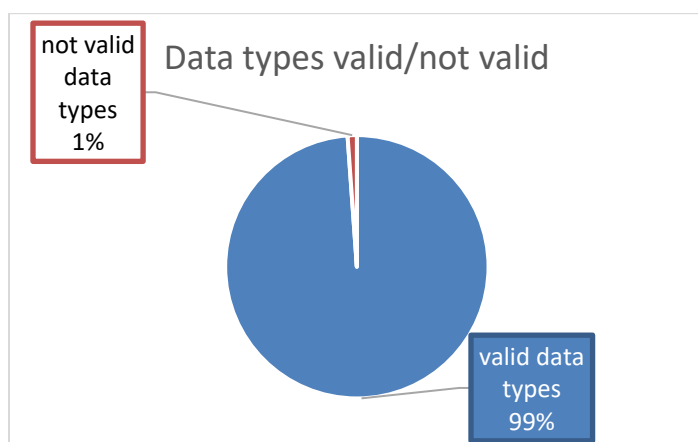
bodc	21137
coriolis	52487
csio	10097
csiro	314
incois	16122
jma	7447
kma	6064
kordi	9789
meds	713
nmdis	448
2.3	7485
aoml	80
bodc	556
coriolis	6623
csio	2
incois	16
jma	1
kma	148
kordi	55
nmdis	4
3.0	304650
aoml	273128
coriolis	30253
csio	352
incois	908
meds	9
3.1	1577138
aoml	663282
bodc	57140
coriolis	265158
csio	48531
csiro	183719
incois	53261
jma	216367
kma	23736
kordi	7200
meds	56660
nmdis	2084
Total général	2173550

The files in format version V3.1 are much more homogeneous than their previous versions. The controls applied by the format checker on V3.1 is much more exhaustive. The controlled vocabulary listed in the 27 reference tables is used for V3.1 format checks. A non-valid content is automatically rejected. Only valid V3.1 content appears on GDAC.

Example of valid content checked by the format checker on V3.1 files

There are 8 valid DATA_FORMAT variables listed in reference table 1 (there are 26 more tables...). A survey on GDAC files shows that 24 779 files (1% of the total) do not have a valid DATA_FORMAT. The V3.1 files are not affected by this kind of problem.

data_type	nb files	valid type
Argo meta-data	13748	yes
ARGO profile	22326	no
Argo profile	1867361	yes
Argo profile merged	131347	yes
Argo technical	556	no
ARGO technical data	174	no
Argo technical data	12686	yes
ARGO trajectory	1237	no
Argo Trajectory	110	no
Argo trajectory	13434	yes
B-Argo profile	130641	yes
B-Argo trajectory	376	no



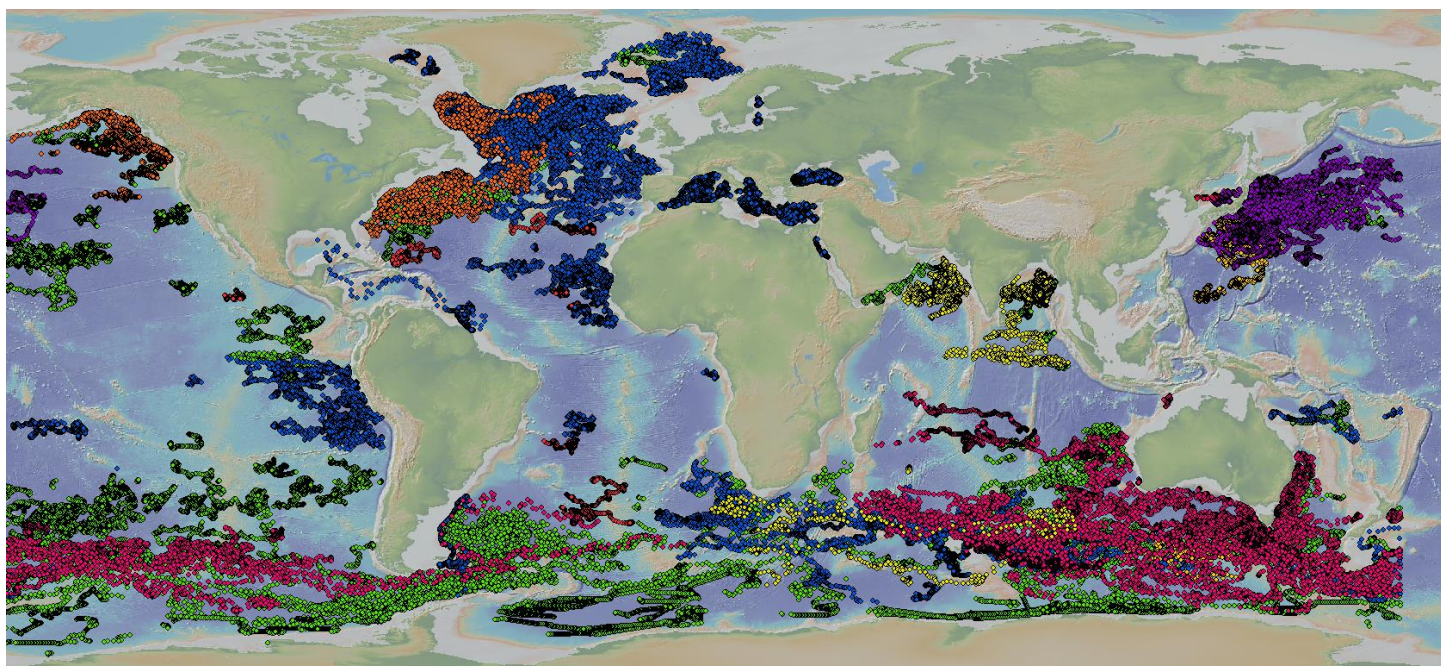
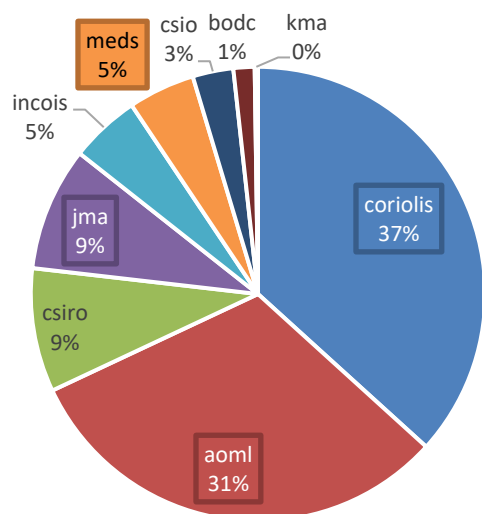
3.1.5 BGC-Argo floats

In November 2017, 131 308 BGC Argo profiles from 863 floats were available on Argo GDAC. This is a strong increase compared to 2016 : +65% more profiles and +54% more floats.

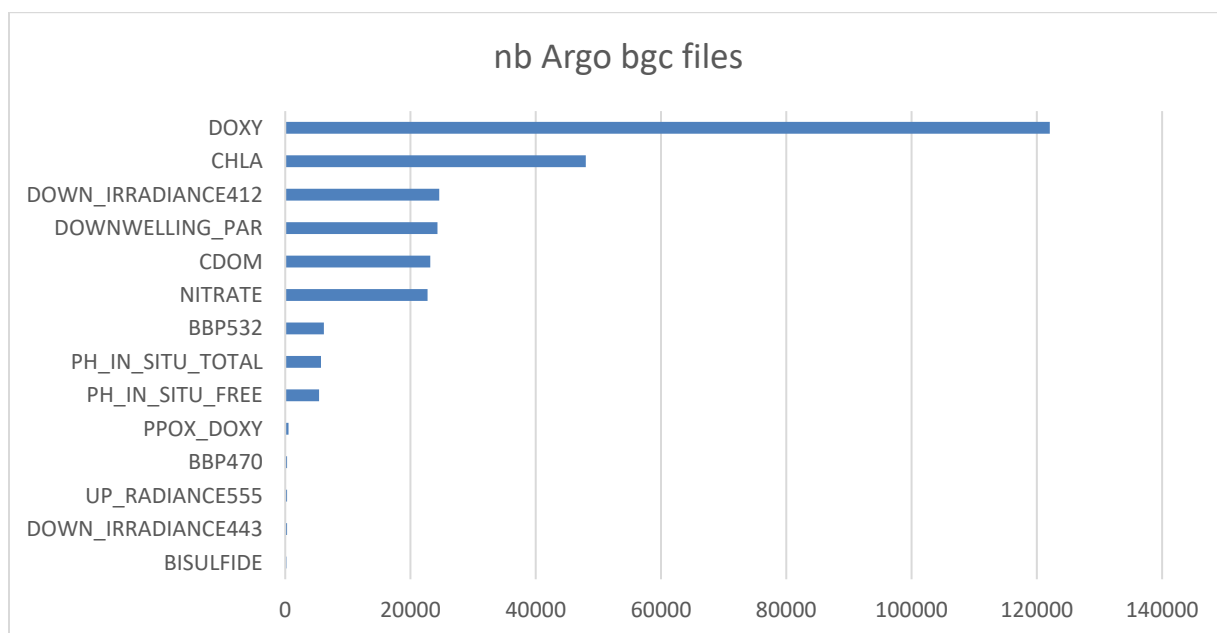
DAC	nb bio floats	nb bio files
coriolis	317	41 147
aoml	270	36 917
csiro	76	20 149
jma	76	14 602
incois	43	5 201
meds	41	3 821

csio	25	6 344
bodc	13	3 041
kma	2	86
Total	863	131 308

DAC distribution of Argo-bgc floats



BGC-Argo profiles, colored by DACs



Main BGC-Argo physical parameters, number of profiles

3.2 Operations of the ftp server

Meta-data, profile, trajectory and technical data files are automatically collected from the national DACs ;

Index files of meta-data, profile and trajectory are daily updated ;

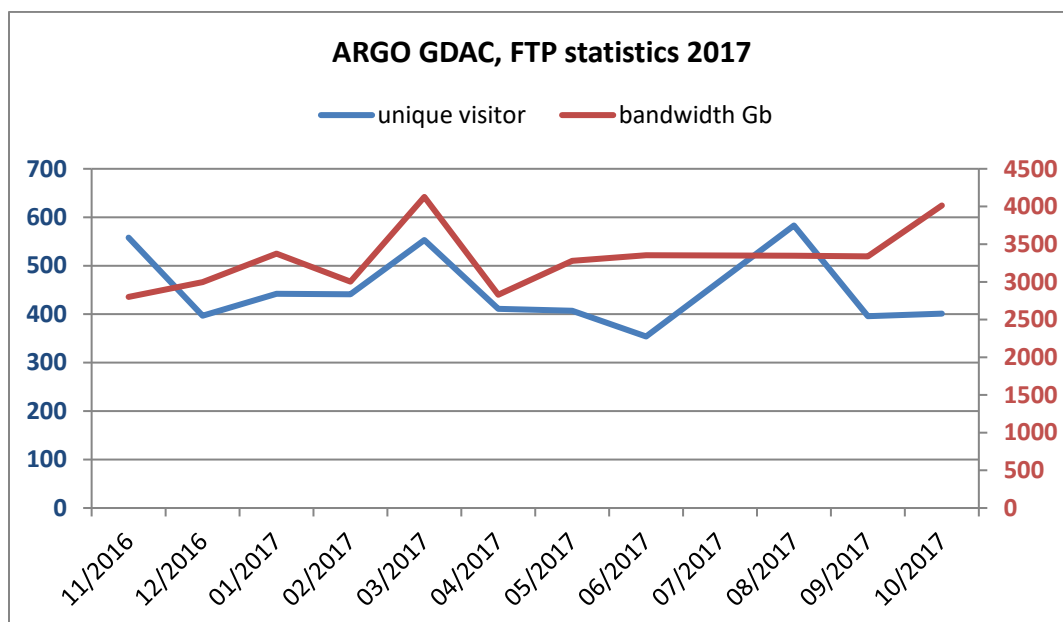
GDAC ftp address: <ftp://ftp.ifremer.fr/ifremer/argo>

Statistics on the Argo GDAC FTP server: <ftp://ftp.ifremer.fr/ifremer/argo>

There is a monthly average of 449 unique visitors, performing 4552 sessions and downloading 3.3 terabytes of data files.

The table below shows a huge spike of visitors in July 2017 on GDAC FTP. This may be an attack of the server, the July unique visitors number is ignored in statistics.

ARGO GDAC FTP statistics				
month	unique visitor	number of visits	hits	bandwidth Gb
11/2016	558	5 045	3 969 591	2800,42
12/2016	397	3 839	4 072 286	2997,55
01/2017	442	4 778	7 213 071	3375,6
02/2017	441	4 215	4 913 490	3003
03/2017	553	4 619	10 495 933	4127
04/2017	411	4 113	3 583 758	2829
05/2017	407	4 563	4 006 245	3280
06/2017	354	4 011	3 718 402	3354
07/2017	29386	47153	3 810 288	3334
08/2017	583	6 183	7 235 786	3347
09/2017	396	4 345	4 923 991	3339
10/2017	401	4 360	8 097 647	4013
Average	449	4 552	5 503 374	3 317



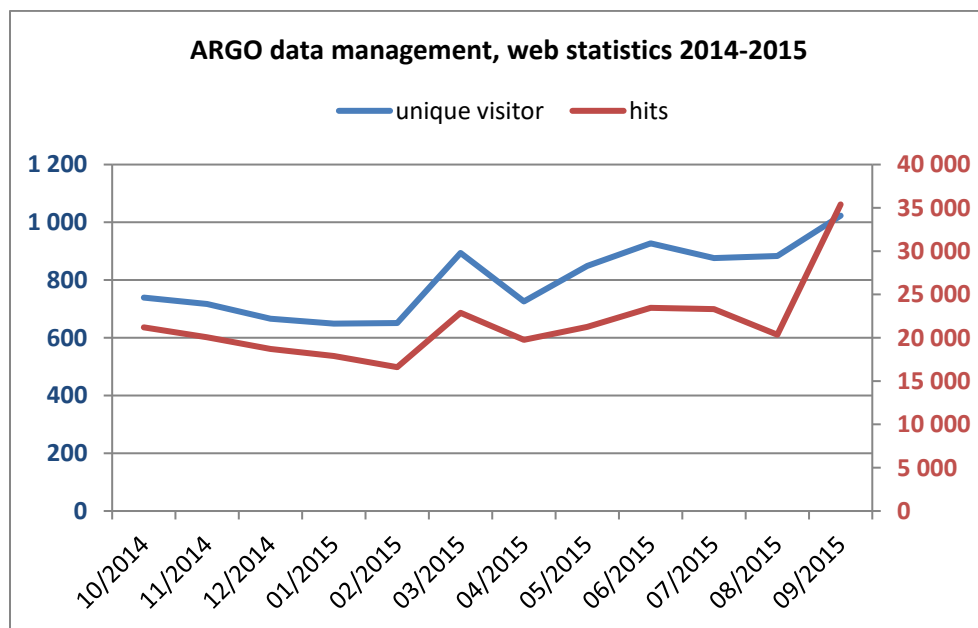
Statistics on the Argo data management web site: <http://www.argodatamgt.org>

Note : the 2017 figures are not available. This chapter will soon be updated.

There is a monthly average of 800 unique visitors, performing 1363 visits and 21 743 hits.

The graphics shows a slightly increasing number of unique visitors.

ARGO GDAC web statistics					
month	unique visitor	visits	pages	hits	bandwidth Go
10/2014	739	1 297	2 904	21 205	2
11/2014	717	1 224	2 486	20 050	1
12/2014	666	1 127	2 395	18 716	2
01/2015	649	1 138	2 290	17 901	1
02/2015	651	1 066	2 535	16 605	1
03/2015	894	1 531	3 643	22 890	2
04/2015	726	1 270	3 028	19 761	1
05/2015	849	1 403	2 940	21 263	1
06/2015	927	1 584	3 317	23 461	1
07/2015	876	1 478	3 185	23 313	1
08/2015	883	1 417	3 131	20 349	1
09/2015	1 023	1 826	4 355	35 396	1
Average	800	1 363	3 017	21 743	1



3.3 Data synchronization

The synchronization with US-Godae server is performed once a day at 01:55Z.



The synchronization dashboard in November 2017: the daily synchronization time takes on average 2 hours.

You may notice on the dashboard that the synchronization process reported 5 errors in November (red bars):

- “Can’t create the ftp connection to usgodae.org”
There was an ftp connection problem between Coriolis and US GDACs

3.4 FTP server monitoring

Note: this chapter is not yet available for 2017.

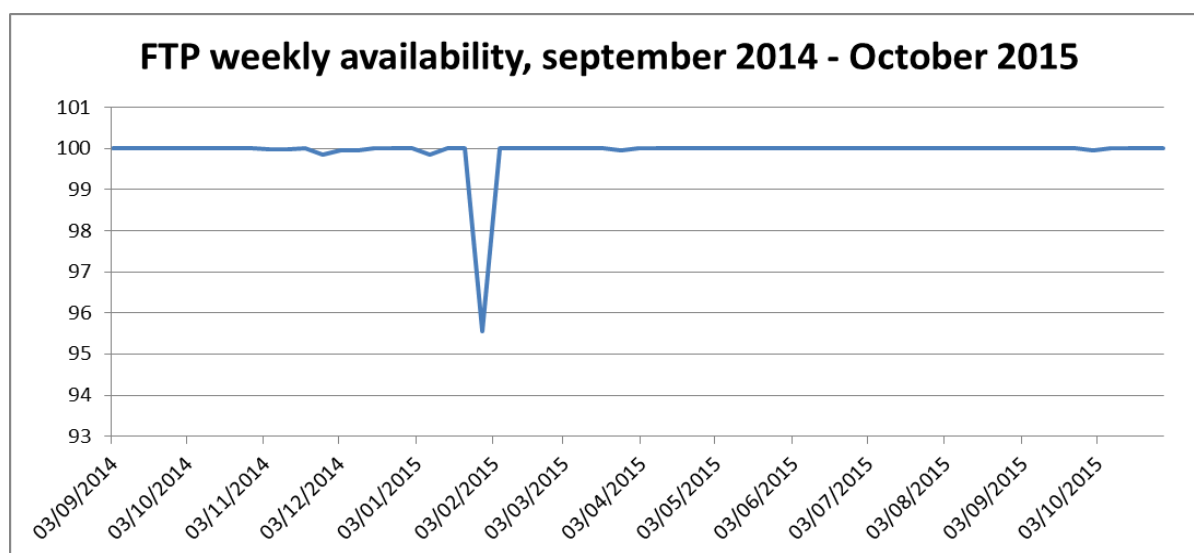
The Argo GDAC ftp server is actively monitored by a Nagios agent (<http://en.wikipedia.org/wiki/Nagios>).

Every 5 minutes, an ftp download test and an Internet Google query are performed. The success/failure of the test and the response time are recorded. The FTP server is a virtual server on a linux cluster.

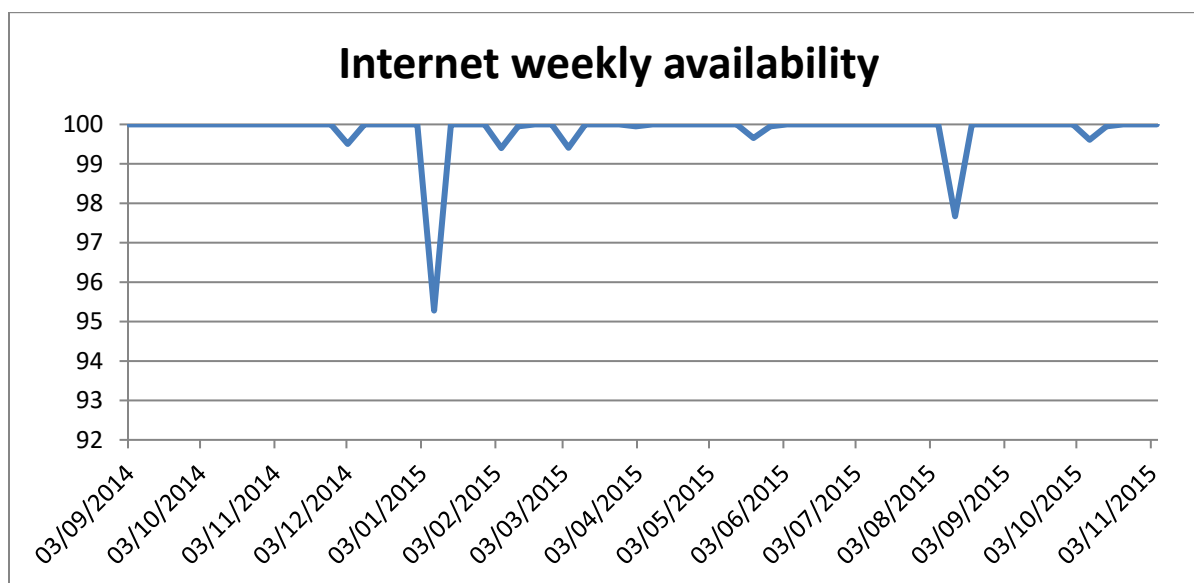
On the last 12 months, the weekly average performance was 99.84%. The 0.16% of poor performances represents 15 minutes for a week. For the last 12 months, the cumulative poor performances period is of 24 hours.

We faced 3 significant events these last 12 months.

- First week of January: 8 hours of Internet poor performances
- Last week of January 2015: disk storage instability: 7 hours and 35 minutes of poor performances of ftp.
- Mid-August 2015 : 4 hours of poor Internet performances



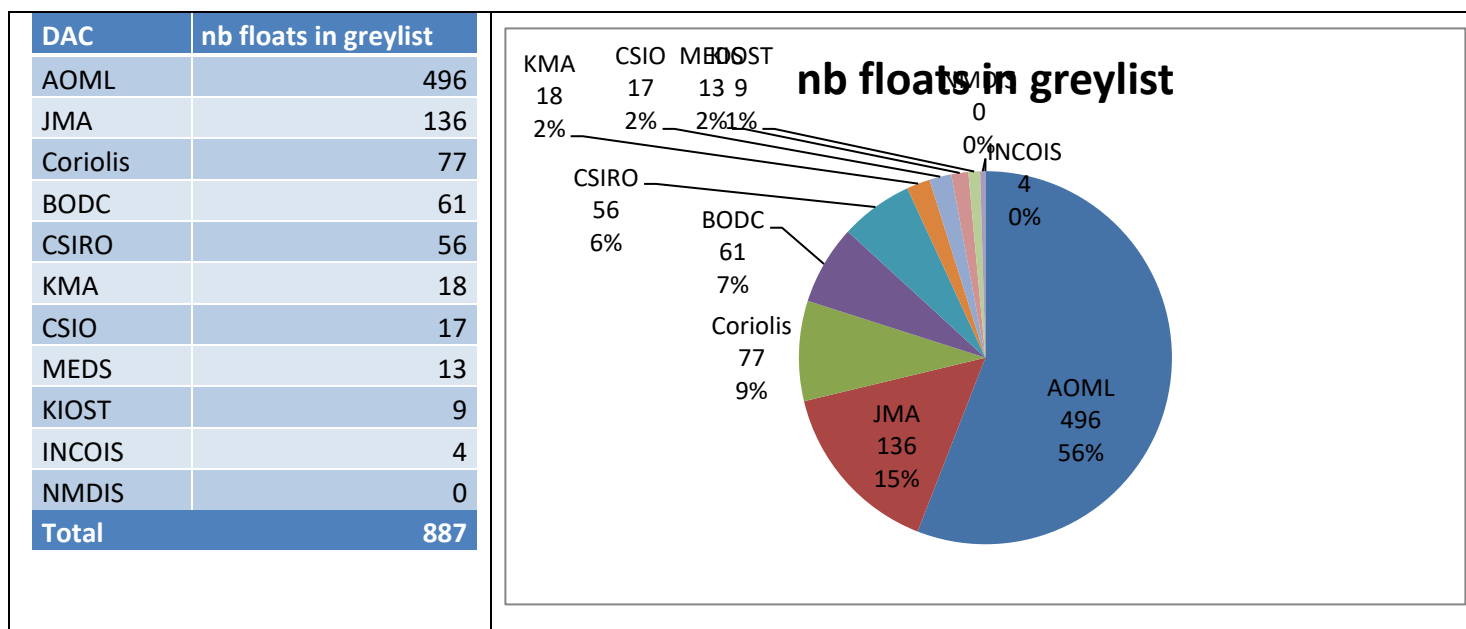
Nagios ftp monitoring: between September 2014 and October 2015



Nagios Internet monitoring: between September 2014 and October 2015

3.5 Grey list

According to the project requirements Coriolis GDAC hosts a grey list of the floats which are automatically flagged before any automatic or visual quality control. **The greylis has 887 entries** (November 25th 2017), compared to 1000 entries one year ago.



Distribution of greylist entries per DAC and per parameter

AOML reports a high percentage of pressure and temperature in the greylist, compared to other DACs.

Dac - parameter	Nb floats
AO	496
PRES	145
PSAL	226
TEMP	125
BO	61
PRES	15
PSAL	29
TEMP	17
CS	56
PRES	10
PSAL	32
PSAL	1
TEMP	13
HZ	17
PRES	2
PSAL	13
TEMP	2
IF	77
DOXY	2
PRES	5
PSAL	58
TEMP	12
IN	4
PRES	1
PSAL	2
TEMP	1
JA	136
DOXY	1
PRES	22
PSAL	83
TEMP	30
KM	18
PRES	6
PSAL	6
TEMP	6
KO	9
PRES	3
PSAL	3
TEMP	3
ME	13
PRES	2
PSAL	8
TEMP	3
Total général	887

3.6 Statistics on GDAC content

The following graphics display the distribution of data available from GDAC, per float or DACs. These statistics are daily updated on: <http://www.argodatamgt.org/Monitoring-at-GDAC>

Argo documents DOIs

- Argo User's manual: <http://dx.doi.org/10.13155/29825>

Argo GDAC DOI

- Argo floats data and metadata from Global Data Assembly Centre (Argo GDAC) <http://doi.org/10.17882/42182>

Argo GDAC monthly snapshots DOIs

- Snapshot of 2017 October 8th <http://doi.org/10.17882/42182#52113>
- Snapshot of 2014 October 8th <http://doi.org/10.17882/42182#42280>
- Snapshot of 2012 December 1st <http://doi.org/10.17882/42182#42250>