Argo data management report 2021

Coriolis DAC & GDAC

Data Assembly Centre and Global Data Assembly Centre

Annual report November 2021

Version 1.0

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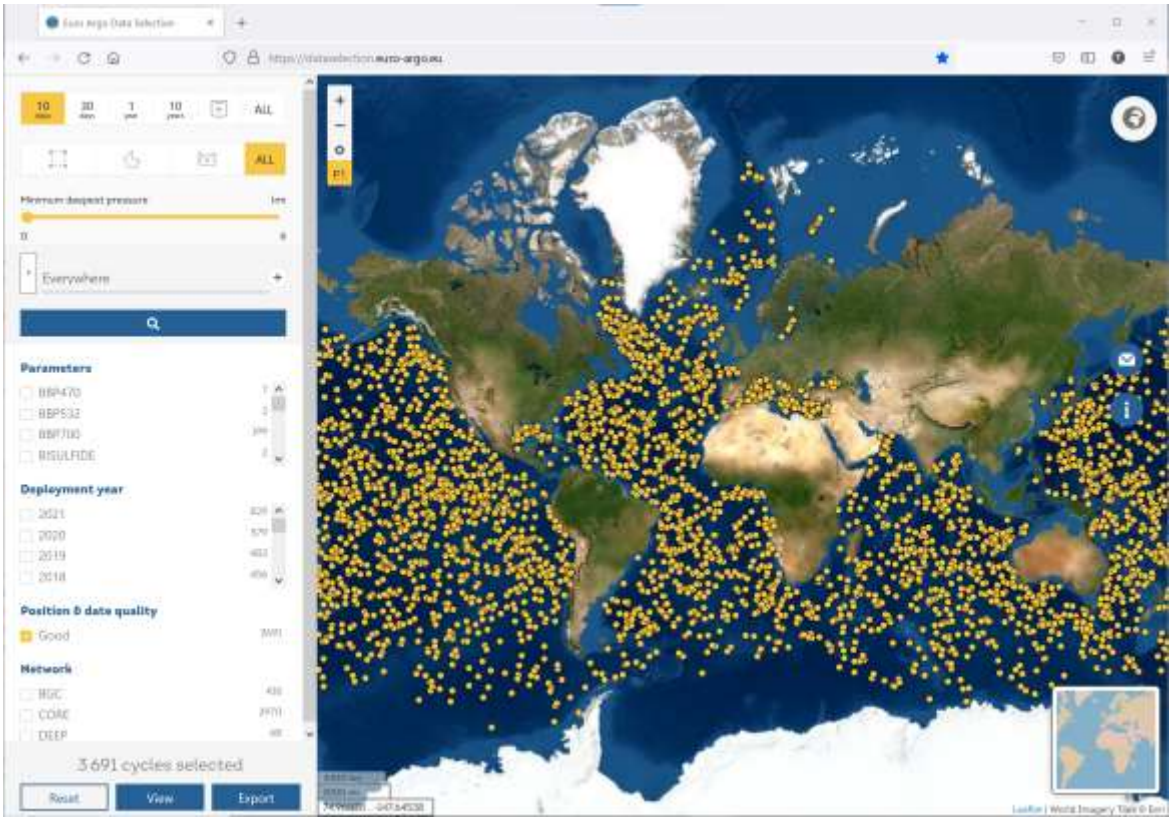
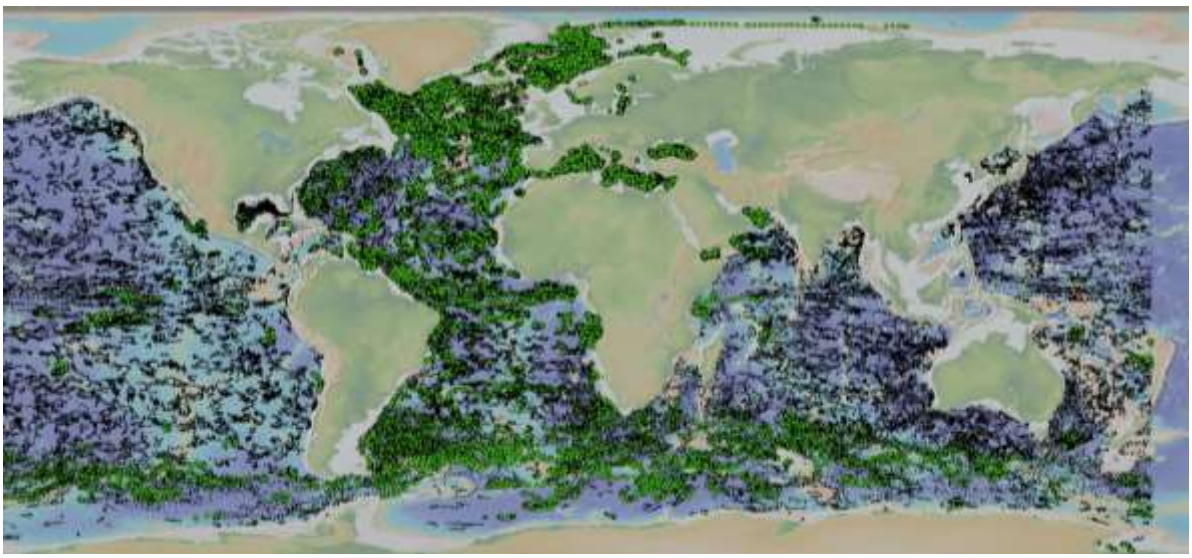




1 DAC status

This report covers the activity of Coriolis DAC (Data Assembly Centre) for the one-year period from September 1st 2020 to October 30th 2021.

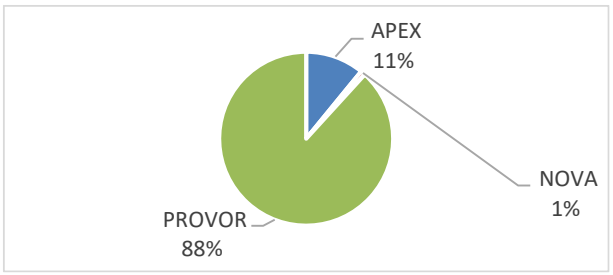
1.1 Data acquired from floats

1.1.1 Active floats for the last 12 months

These last 12 months, **58.535 profiles from 828 active floats** were collected, controlled and distributed.
Compared to 2020, **the number of profiles is fairly increasing (+12%), the number of floats increased by 5%.**
These figures illustrate a good momentum in Coriolis DAC activity.

The 828 floats managed during that period had 52 versions of data formats.

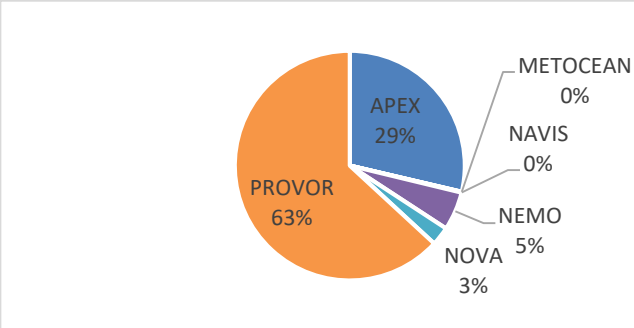
Coriolis DAC, active floats in 2021			
Float family	nb versions	nb floats	nb core p
APEX	19	70	6 385
NOVA	2	12	504
PROVOR	31	746	51 646
Total	**52**	**828**	**58 535**

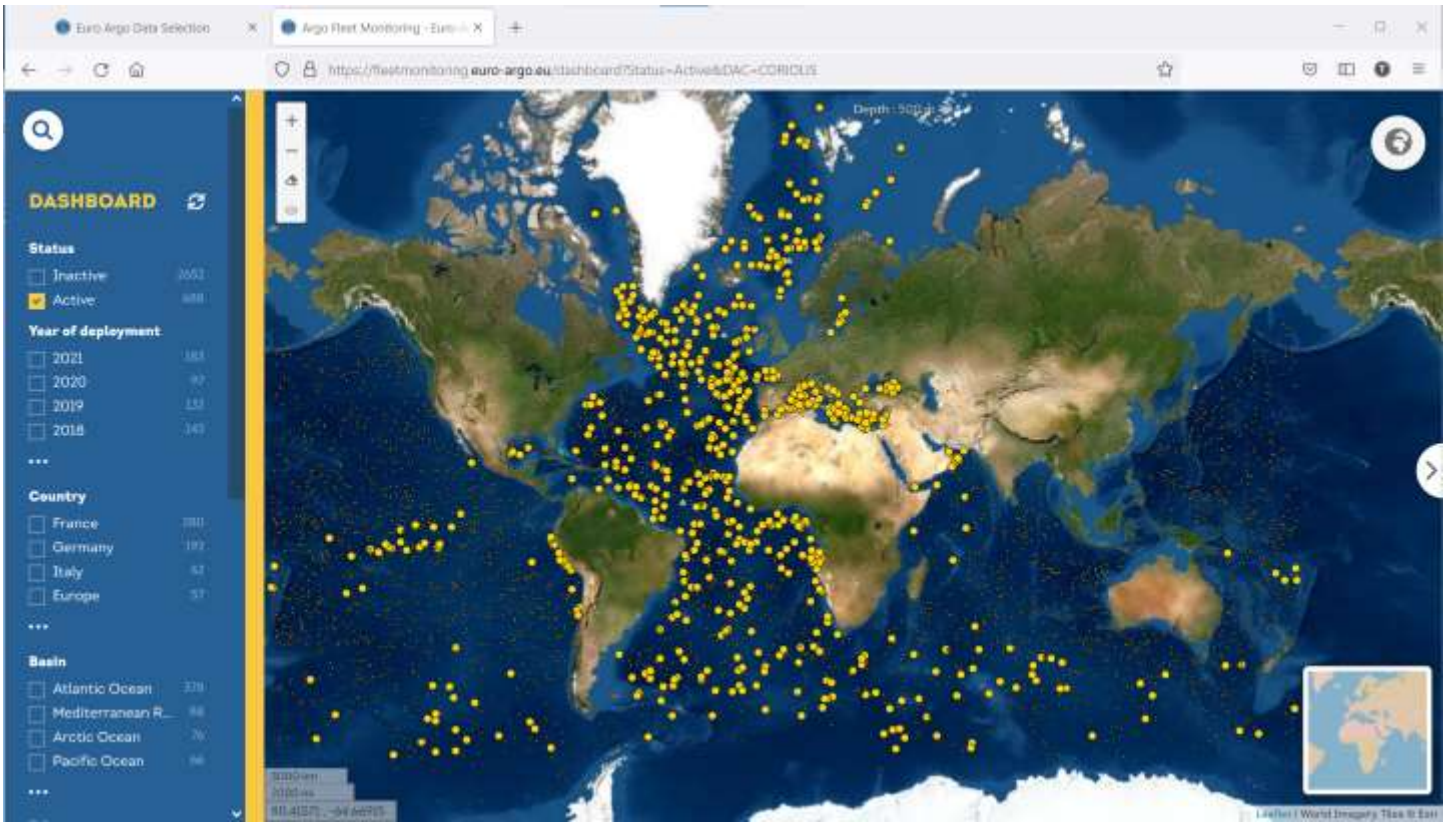


1.1.2 All floats managed by Coriolis DAC

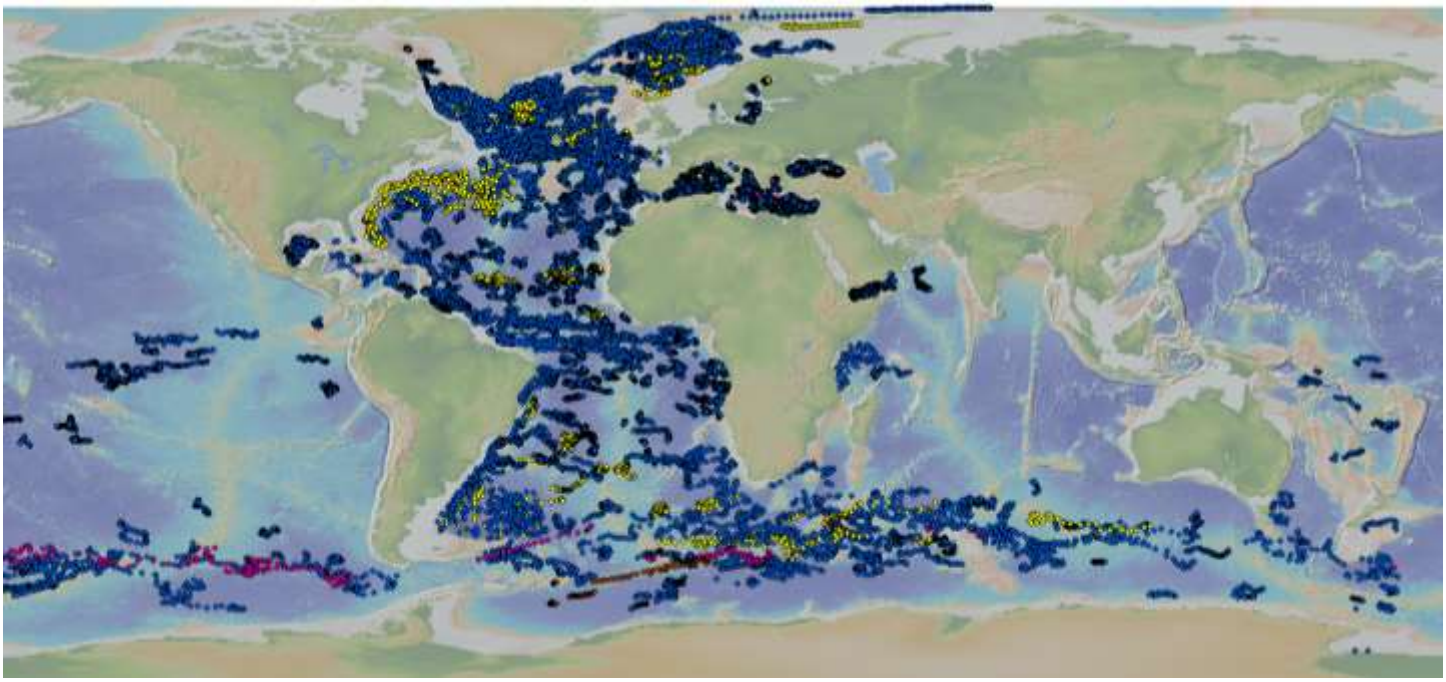
Coriolis DAC manages a total of 3.200 floats with 165 versions, from 6 families.
These floats reported 586.373 core Argo vertical profiles.

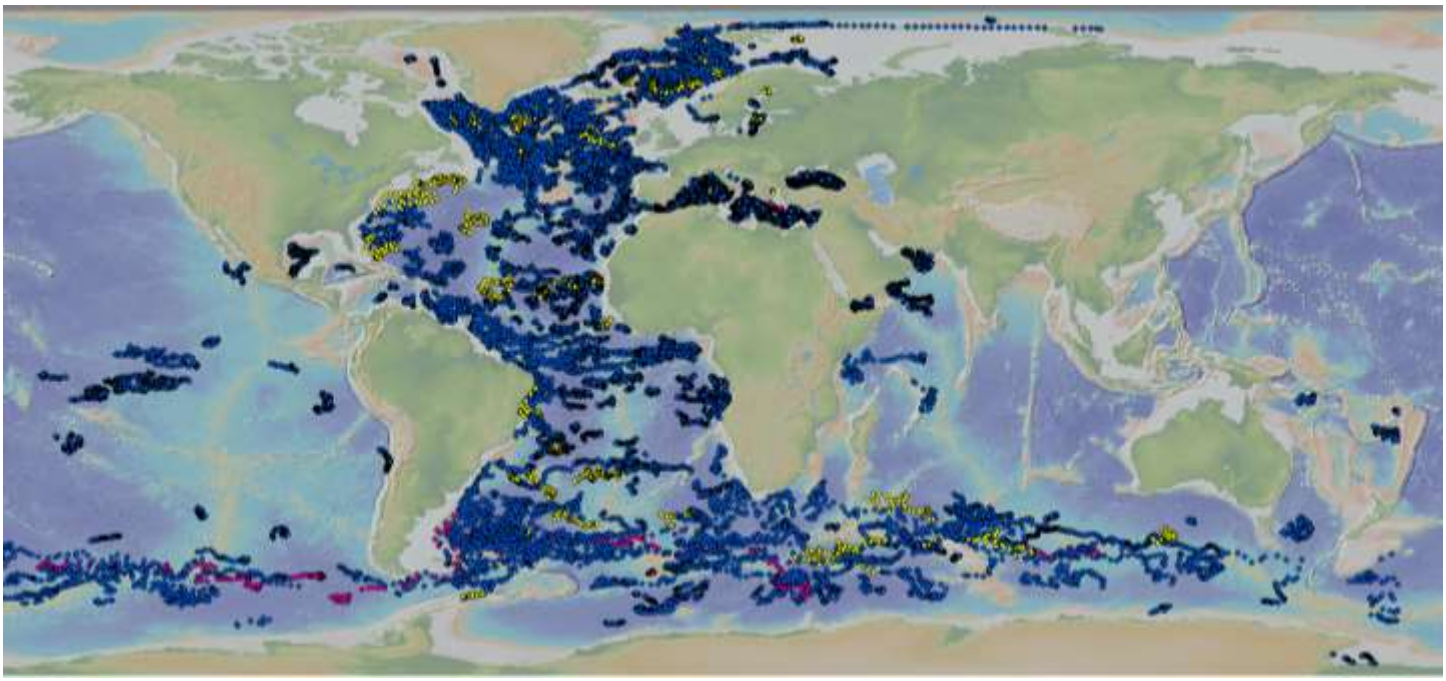
Coriolis DAC, all floats, 2021			
Float family	nb versions	nb floats	nb core p
APEX	78	917	143 320
METOCEAN	1	1	52
NAVIS	1	3	1 932
NEMO	8	174	18 960
NOVA	3	85	9 337
PROVOR	74	2 020	412 772
Total	**165**	**3 200**	**586 373**



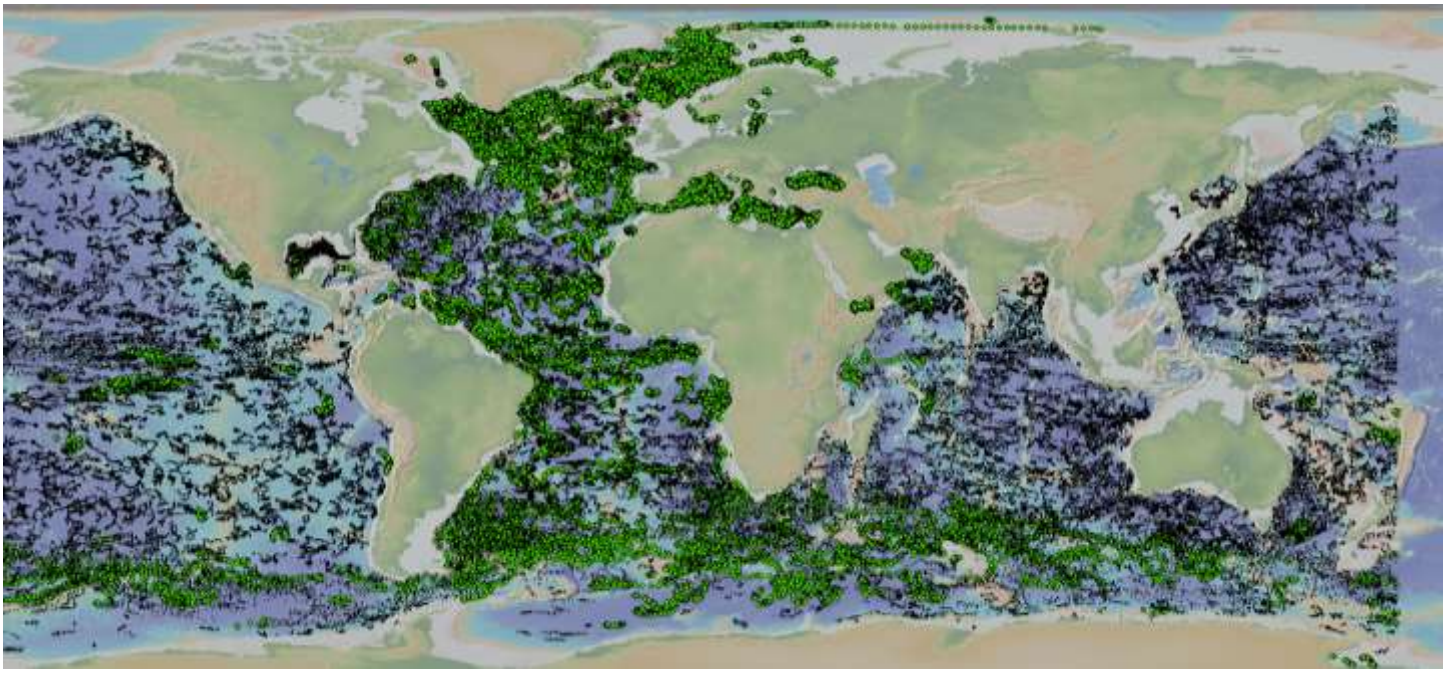


Map of the active floats on December 1st decoded by Coriolis DAC, among others DACs (small dots) as displayed on Euro-Argo floats dashboard https://fleetmonitoring.euro-argo.eu/dashboard

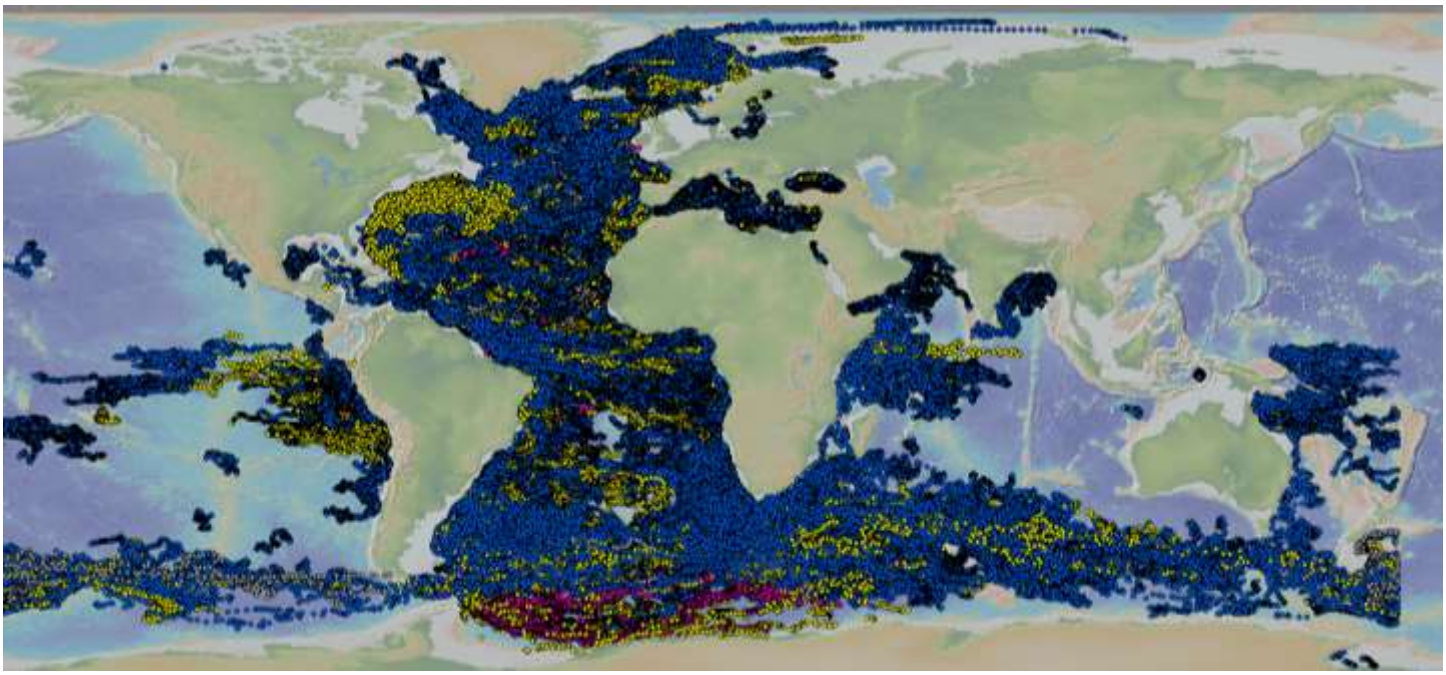




Map of the 58.535 profiles from 828 active floats decoded by Coriolis DAC this current year
Apex Nova Provor



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)



Map of the 586.373 profiles from 3.200 floats managed by Coriolis DAC
Apex **Metocean** **Navis** **Nemo** **Nova** **Provor**

1.1.3 BGC-Argo sensors on Coriolis floats

The data processing chain for data and metadata from Coriolis BGC-Argo floats is continuously improved. These are advanced types of floats performing bio-geo-chemical (BGC) measurements.

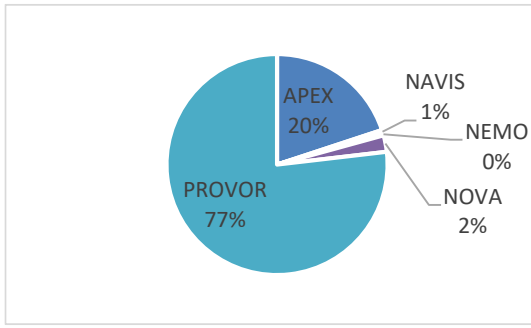
Coriolis DAC manages 622 BGC-Argo floats from 5 families. They performed 79.192 cycles.

The data processing chain is freely available:

- Coriolis Argo floats data processing chain, http://doi.org/10.17882/45589

BGC-Argo floats processed by Coriolis DAC

Float familly	nb versions	nb floats	nb profile	nb cycles
APEX	33	124	19 336	15 565
NAVIS	1	3	551	551
NEMO	1	2	297	297
NOVA	1	15	1 195	1 170
PROVOR	44	478	172 343	61 609
Total	**80**	**622**	**193 722**	**79 192**



General characteristics

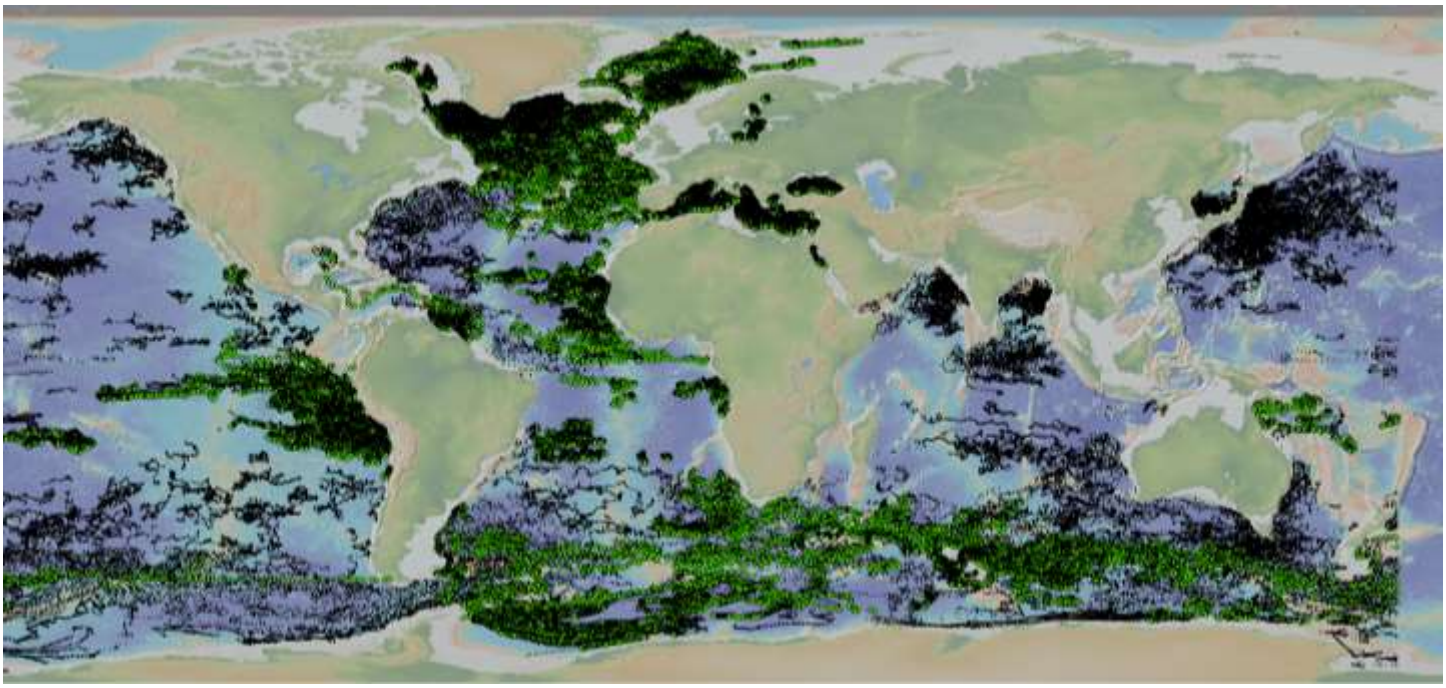
- Iridium sbd or rudics bi-directional communication or Argos
- Fourteen sensors are fitted on the floats
- Eleven BGC parameters reported

Coriolis BGC-Argo floats s	nb floats	nb profiles
AANDERAA_OPTODE_3830	528	72116
C_ROVER	18	4713
ECO_FLBB	240	132510
ECO_FLNTU	10	5366
OPUS_DS	2	732
RAFOS	10	72
RAMSES_ACC	7	610
SATLANTIC_OCR504_ICSW	206	163044
SEAFET	31	3147
SUNA_V2	82	15948
UVP6-LP	6	287

The 11 types of sensors mounted on Coriolis BGC-Argo floats

BGC parameter	nb files
DOXY	238 000
DOWN_IRRADIANCE	131 808
BBP	103 491
CHLA	96 129
NITRATE	50 967
CDOM	44 055
DOWNWELLING_PAR	42 524
PH_IN_SITU_TOTAL	29 039
CP660	4 928
UP_RADIANCE	2 508
TURBIDITY	2 109
BISULFIDE	1 225

The 12 main BGC parameters reported by Coriolis BGC-Argo floats



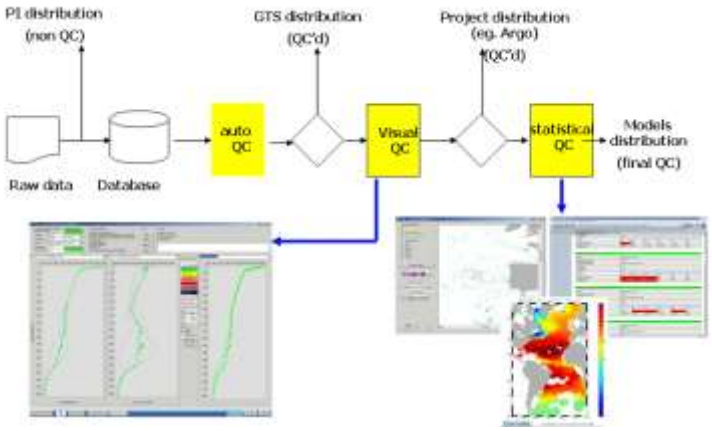
Map of the 622 BGC-Argo floats managed by Coriolis DAC (grey dots: the others DACs bio-Argo floats). They measure parameters such as oxygen, chlorophyll, turbidity, CDOM, back-scattering, UV, nitrate, bisulfide, pH, radiance, irradiance, PAR.

1.2 Data issued to GTS

Vertical profiles processed by Coriolis are distributed on the GTS by way of Meteo-France. This operation is fully automated. After applying the automatic Argo QC procedure, the Argo profiles are inserted on the GTS every hour. The profile files are sent as BUFR messages.

Vertical profiles are distributed on GTS if they are less than 30 days old. Once a day, floats data are checked with ISAS objective analysis that triggers alerts and visual inspection for suspicious observations.
The corrected data are not redistributed on GTS.

In July 2019, Coriolis stopped the TESAC messages distribution; only BUFR messages are now distributed.

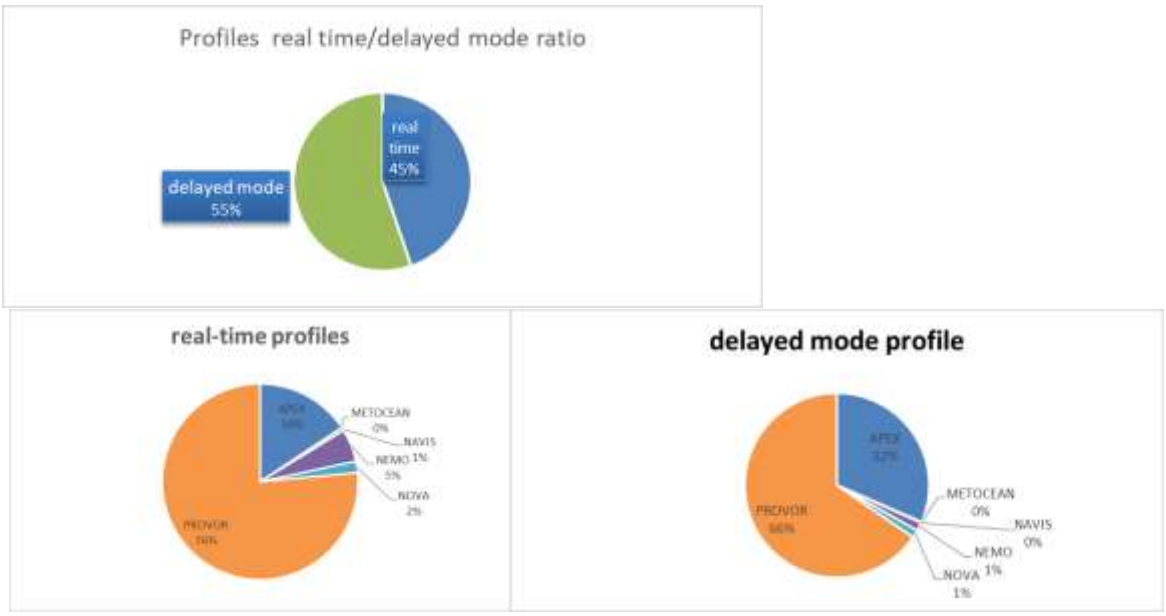


Coriolis DAC Argo data flow

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 profile	DM profiles
APEX	917	143 331	41 261	102 070
METOCEAN	1	52	-	52
NAVIS	3	1 932	1 411	521
NEMO	174	18 960	14 219	4 741
NOVA	85	9 337	4 913	4 424
PROVOR	2021	412 960	200 955	212 005
Total	**3 201**	**586 572**	**262 759**	**323 813**



Distribution of Coriolis DAC real-time and delayed mode profiles

1.4 Data issued for delayed mode QC

Delayed mode profiles

All profile files are sent to PIs for delayed QC.

1.5 Delayed mode data sent to GDACs

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

- A total of **103.891 new or updated delayed mode profiles** was sent to GDACs this year.
- **A total of 323.813 delayed mode profiles** where sent to GDACs since 2005.

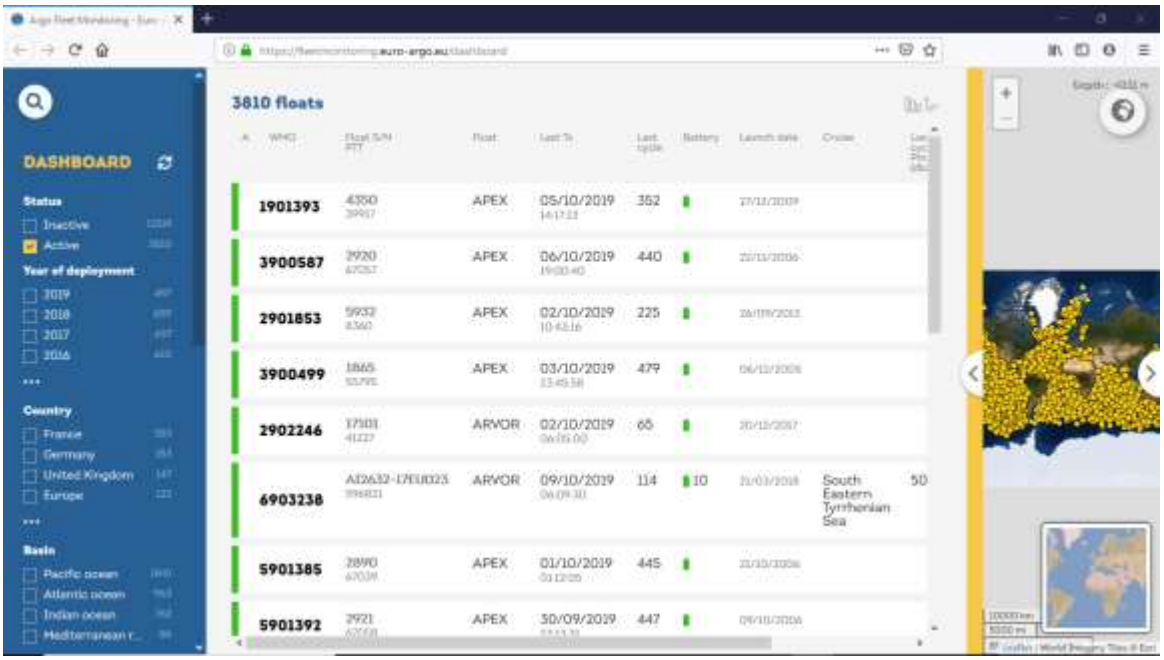
  The number of delayed mode profiles decreased by 45% this year compared to 2020.

1.6 Web pages

1.6.1 Argo dashboard

The Argo floats dashboard developed in 2019 by Coriolis team is available at:

- https://fleetmonitoring.euro-argo.eu/dashboard

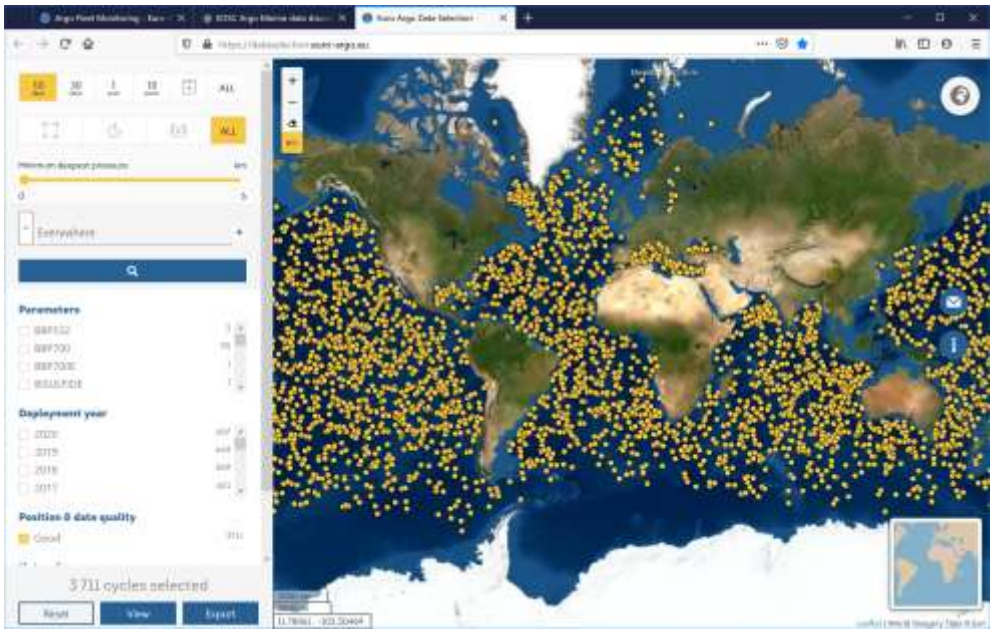


It displays all Argo floats, with facetted interrogations and instantaneous answers. The dashboard is developed on cloud and big-data techniques.

- Cloud techniques: a metadata and a data APIs, opened to internet machine to machine queries
- Big-data techniques: Argo metadata are hourly indexed in an Elasticsearch index, Argo data are hourly indexed in a Cassandra data base. Elasticsearch and Cassandra allows instant answers on dataset having billions of observations.

The Argo data selection was developed in 2020. The initial version is online at https://dataselection.euro-argo.eu/

It proposes data discovery with facetted search on temporal and spatial coverage, parameters, deployment years or quality codes. The selected data are downloadable in NetCDF and CSV formats.



Argo data selection https://dataselection.euro-argo.eu

1.6.2 Argo data on EU BlueCloud

A collaboration is underway with NASA-JPL and the European Blue Cloud to use the CMC (Common Mapping Client) client as the front office of Argo dashboard to provide in situ – satellite – model integration.

- http://bluecloud.odatis-ocean.fr

1.6.3 Interoperability services (ERDDAP API,…)

The APIs used by Argo dashboard and Argo data selection web portals are open and publicly available to interested users at the following endpoints OpenAPI (swagger):

- https://fleetmonitoring.euro-argo.eu/swagger-ui.html
- https://dataselection.euro-argo.eu/swagger-ui.html

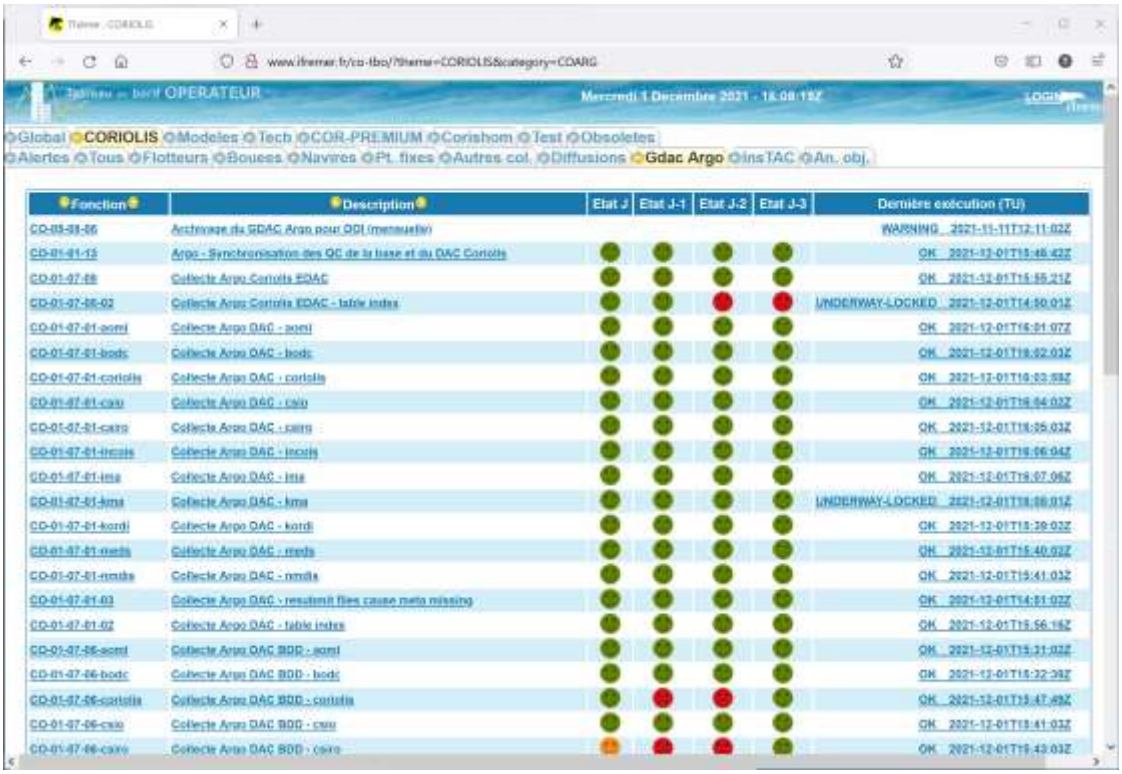
More information available on https://www.euro-argo.eu/Argo-Data-access

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

- http://www.coriolis.eu.org/Data-Products/Data-Delivery/Argo-floats-interoperability-services2
    - Argo data through ERDDAP data server (www.ifremer.fr/erddap)
    - 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 Oceanotron data server
    - Argo profiles data through GCMD-DIF protocol
    - Argo data through RDF and OpenSearch protocols
    - Display Argo profiles and trajectories with GoogleEarth

1.6.4 Data centre activity monitoring

Coriolis operators perform an activity monitoring with an online control board.



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:

- EU Copernicus Marine service models (Mercator, Foam, Topaz, Moon, Noos, Boos)
- French model Soap (navy operational model)

Argo projects: this year, Coriolis data centre performed float data management for **72 Argo scientific projects and 60 PIs (Principal Investigators).**

List of Coriolis scientific PIs and project names

project	nb floats
coriolis	138
argo-bsh	138
argo italy	81
euro-argo	61
mocca	56
mocca-eu	50
naos wp1	33
ovide	33
argo bsh	27
naos	26

Top 10 of Coriolis DAC projects having active floats

pi name	nb active flo
birgit klein	181
pierre-marie poulain	101
christine coatanoan	54
damien desbruyeres	42
virginie thierry	41
kjell arne mork	34
sabrina speich	31
romain cancouet	24
bernard bourles	24
pedro velez	23
laurent coppola	22

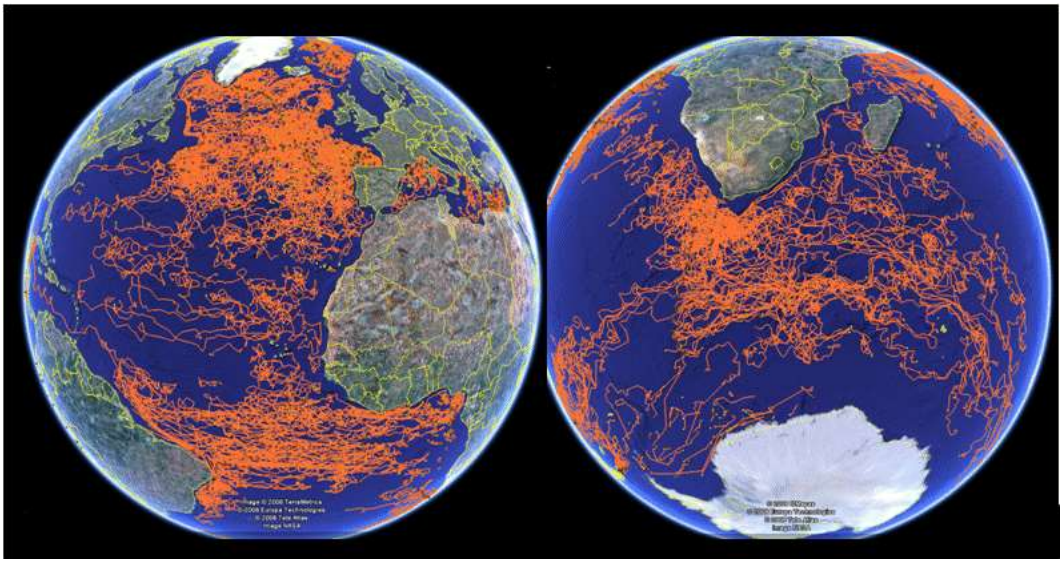
Top 10 of Principal Investigators (PI) in charge of active floats

1.8 Products generated from Argo data

Sub-surface currents ANDRO Atlas

Based on Argo trajectory data, Ifremer and CNRS 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, Brion Emilie, Cabanes Cecile, Piron Anne, Reverdin Gilles, Kolodziejczyk Nicolas (2021). **ANDRO: An Argo-based deep displacement dataset**. SEANOE. https://doi.org/10.17882/47077



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

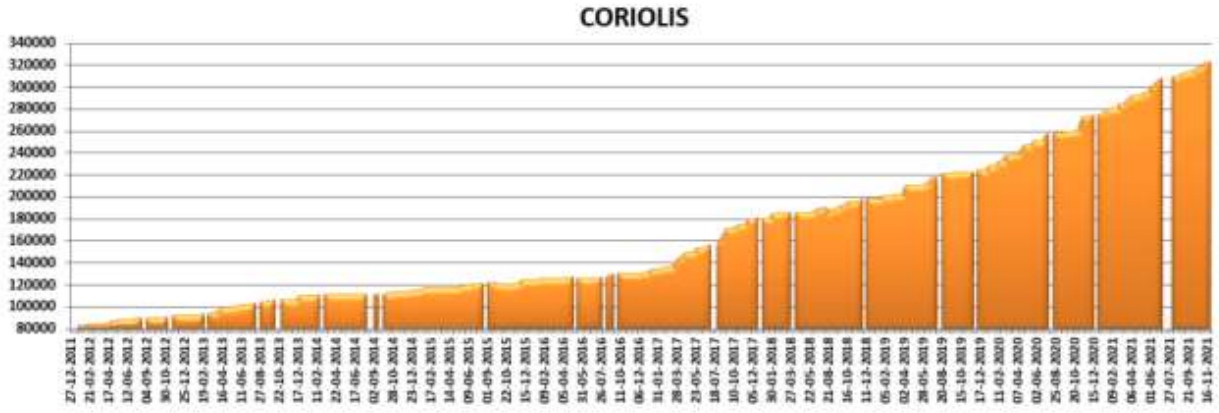
2 Delayed Mode QC

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.

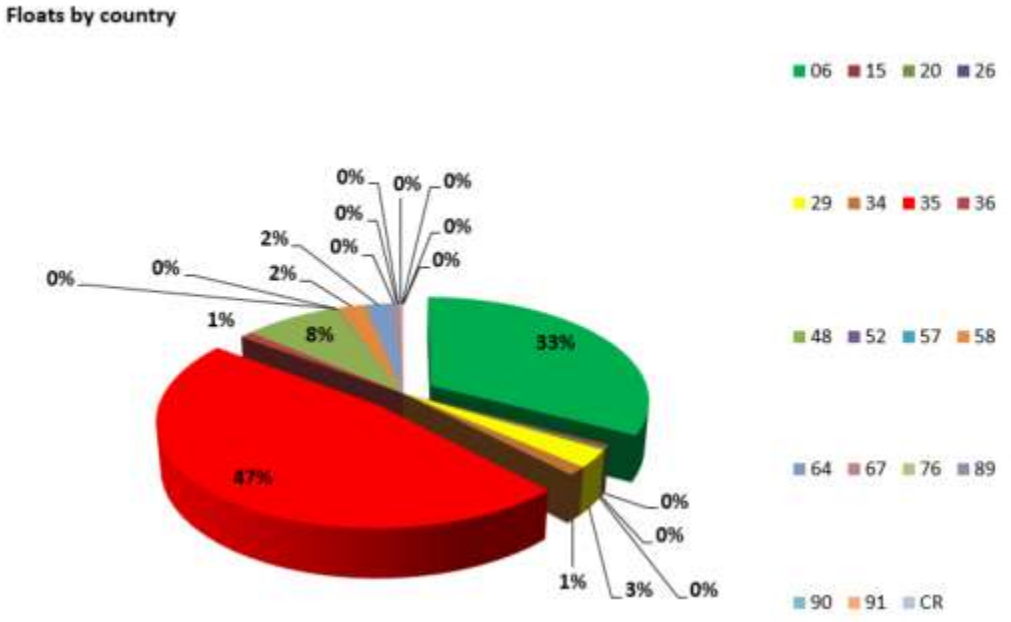
Some floats have been deployed from some projects, meaning a lot of PIs and a lot of time for explaining the DM procedure to all of them. A few PIs are totally able to work on DMQC following the four steps but this is not the case for most of them. Since the unavailability of the PIs leads to work by 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.

A lot of work is always done from BSH (Birgit Klein) taking into account also floats from other German institutes and OGS (Antonella Gallo/Giulio Notarstefano) for the MedSea as well as Alberto Gonzalez Santana for IEO.

In the last 4 years, an important effort has been dedicated to improve the delayed mode quality control status.

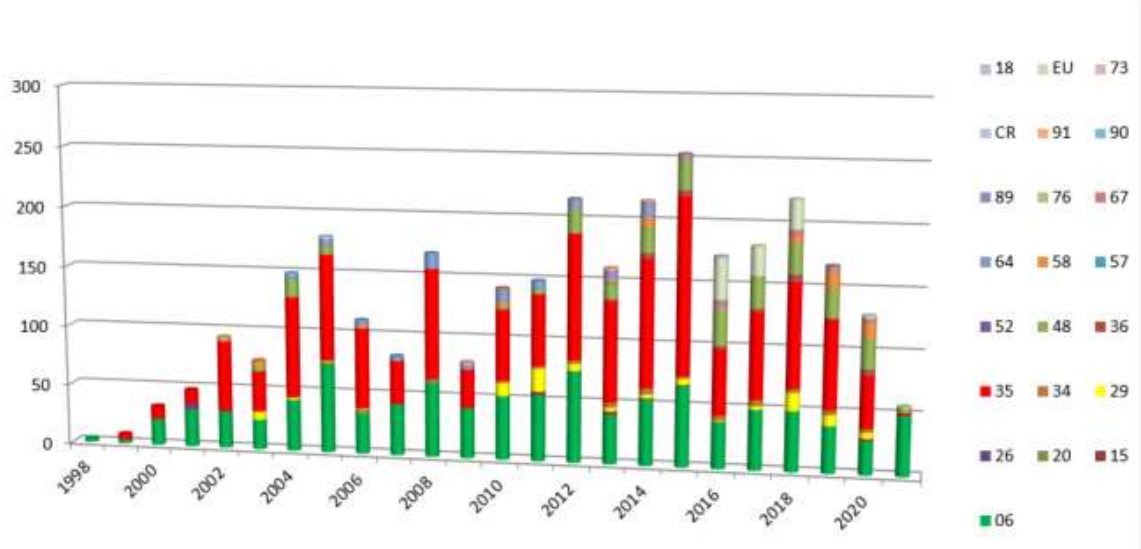


Evolution of the DM profiles' submission versus dates in last 10 years



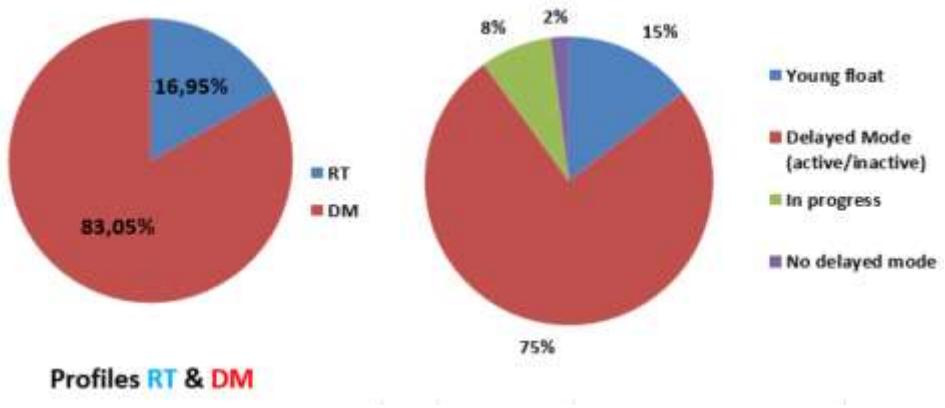
Percentage of floats by country in the Coriolis DAC.

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



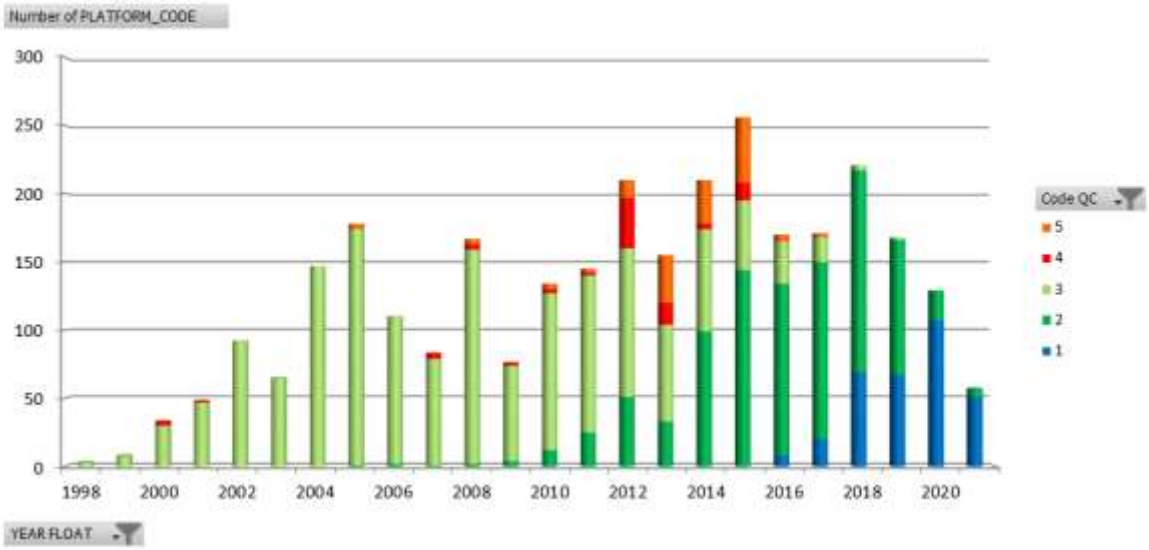
Number of floats by country and by launch's year in the Coriolis DAC

During the last year (from November 2020 to November 2021), 49671 new delayed mode profiles where produced and validated by PIs. A total of 323450 delayed mode profiles where 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 three last years (2019-2021), 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.

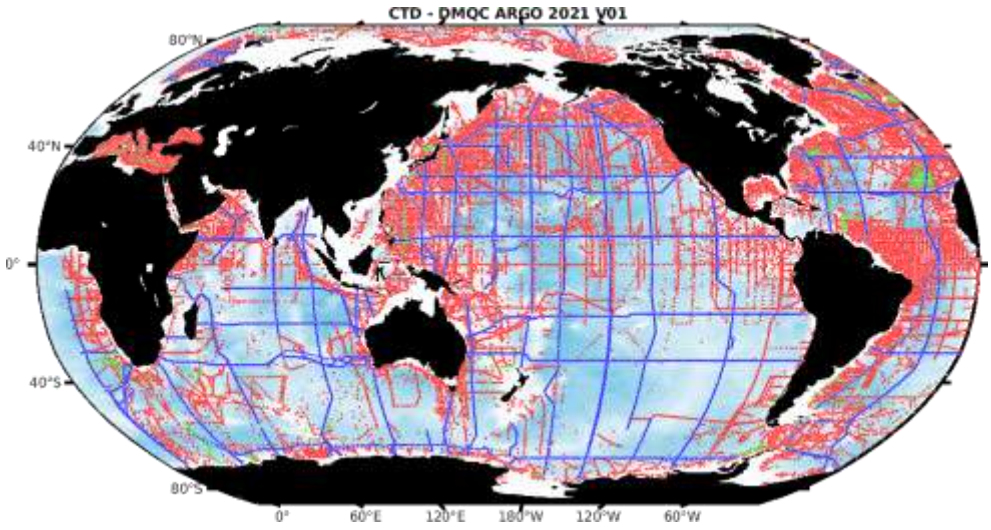


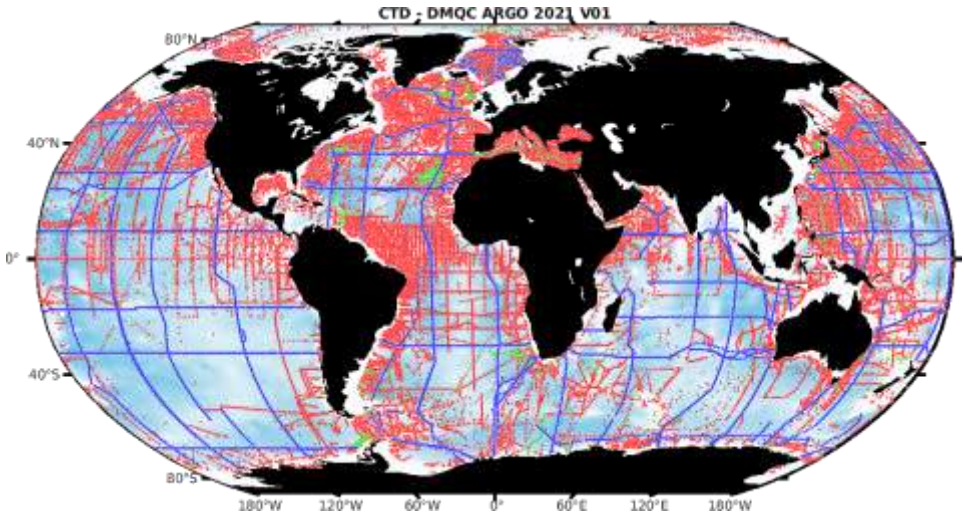
Status of the quality control done on profiles sorted by launch's year, code 1: young float, code 2: active float, DM done, code 3 : dead float, DM done; code 4 : DM in progress, code 5 : waiting for DM, code 6 : problems with float.

Reference database

In March 2021, an updated version 2021V01 was provided including the GO-SHIP EASY ocean data product (16231 stations) for the DEEP reference database. Where the GO-SHIP profile from CCHDO existed in the previous version, it has been replaced by the easy product version (higher QC'd version). In the reference database, these data can be identified with the QCLevel GSD (for GO-SHIP Deep Argo).

In this version, Ingrid Angel Benavides (BSH) worked on cleaning the CTD reference database in the Atlantic Ocean, Arctic and Nordic seas, removing out of range or incomplete samples, and duplicate checks as well as adding new data for the European and Asian Arctic region.





Version 2021V01: GSD Easy-Ocean, GSH GO-SHIP and Others

A next version, 2021V02, is in preparation and will include some new CTDs (deployment CTDs, scientists' CTDs) as well as some corrections from the US-Audit DM feedback.

Like the others, the last version is available on the Ifremer ftp site (ask login/password at codac@ifremer.fr) and is divided in smaller tar balls, one by wmo box area (1-3-5-7): for instance, CTD_for_DMQC_2021V01_1.tar.gz for all boxes starting with wmo 1, then we will have 4 tar files.

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)

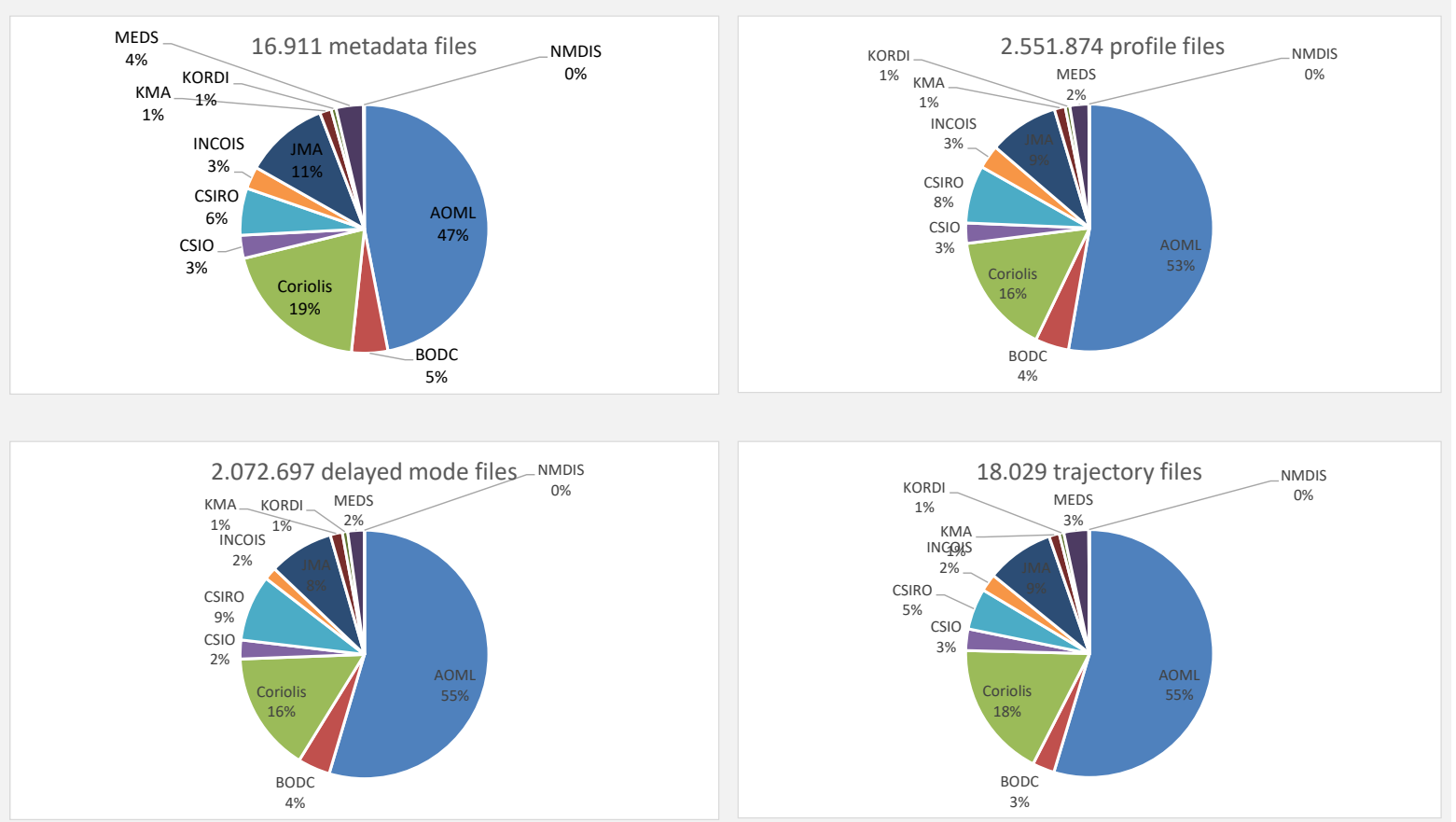
- National centres reporting to you
- Operations of the ftp server
- Operations of the www server
- Data synchronization
- Statistics of Argo data usage : Ftp and WWW access, characterization of users (countries, field of interest : operational models, scientific applications) …

3.1 National centres reporting to you

Currently, 11 national DACs submit regularly data to Coriolis GDAC. On November 2021, the following files were available from the GDAC FTP site.

3.1.1 GDAC files distribution

DAC	metadata files 2021	increase	profile files	increase2	delayed mode profile files	increase3	trajectory files	increase4
AOML	7 941	4%	1 345 968	7%	1 131 308	9%	9 854	4%
BODC	798	6%	112 039	11%	87 276	16%	519	1%
Coriolis	3 298	7%	404 850	11%	323 813	19%	3 219	8%
CSIO	509	13%	67 509	13%	50 954	19%	507	14%
CSIRO	1 035	8%	192 827	8%	178 313	9%	967	9%
INCOIS	491	0%	78 729	4%	33 950	1%	412	0%
JMA	1 854	4%	232 674	6%	175 111	9%	1 596	2%
KMA	253	2%	36 325	3%	32 590	41%	244	3%
KORDI	110	1%	15 350	0%	14 505	0%	107	0%
MEDS	603	4%	63 143	7%	44 832	14%	585	4%
NMDIS	19	0%	2 460	0%	45	-	19	0%
Total	**16 911**	**11%**	**2 551 874**	**17%**	**2 072 697**	**32%**	**18 029**	**10%**



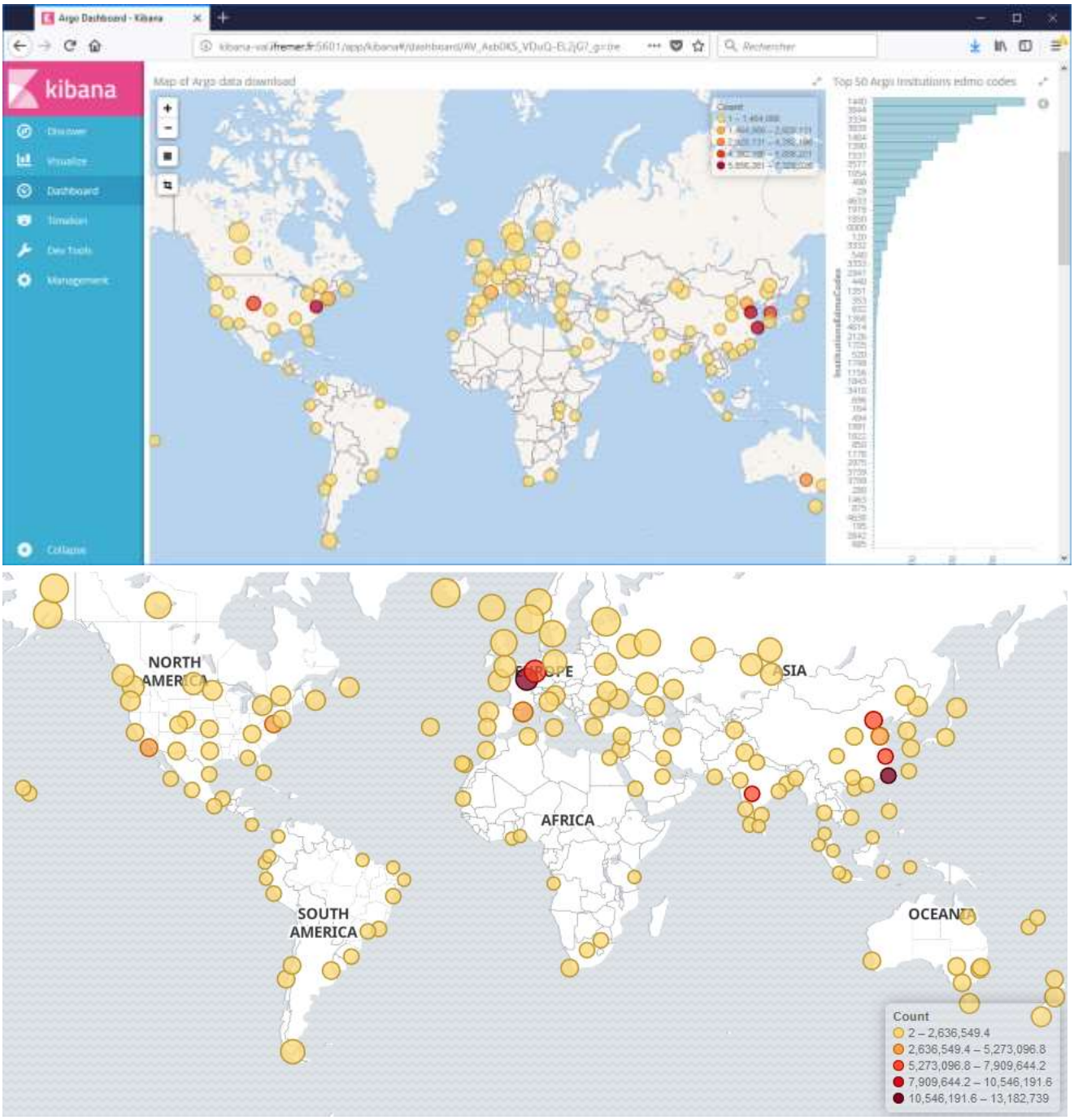
Number of files available on GDAC, November 2021

3.1.2 Argo Semaphore dashboard: give credit to data providers

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

FTP downloads log files are ingested in an Elsaticsearch 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 2018 - 2019

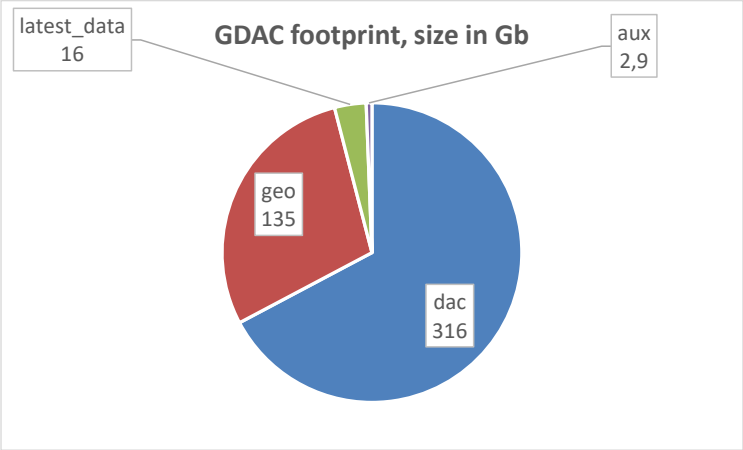
The majority of users (red dots) are located in USA, China, Australia and of course Europe. The right side histogram sorts the floats institution code (1440: PMEL, 3844: WHOI, 3334: INCOIS, 3839: UWA, 1484: CSIRO, …).

3.1.3 GDAC files size

- The total number of NetCDF files on the GDAC/dac directory was 3.124.121 (+9% in one year)
- The size of GDAC/dac directory was 316Gb (+11%)
- *The size of the GDAC directory was 572Gb (- 4%)*

More on: http://www.argodatamgt.org/Data-Mgt-Team/News/BGC-Argo-M-prof-files-no-more-distributed-on-GDAC

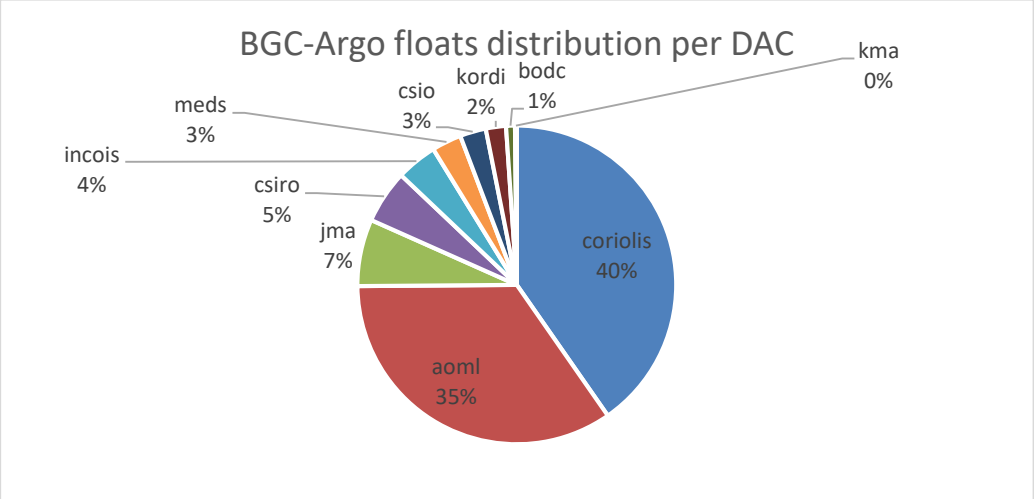
branch	GDAC size in Go	yearly increase	N-1
dac	316	11%	284
geo	135	13%	119
latest_data	16	7%	15
aux	2,9	38%	2
gdac total	661	16%	572

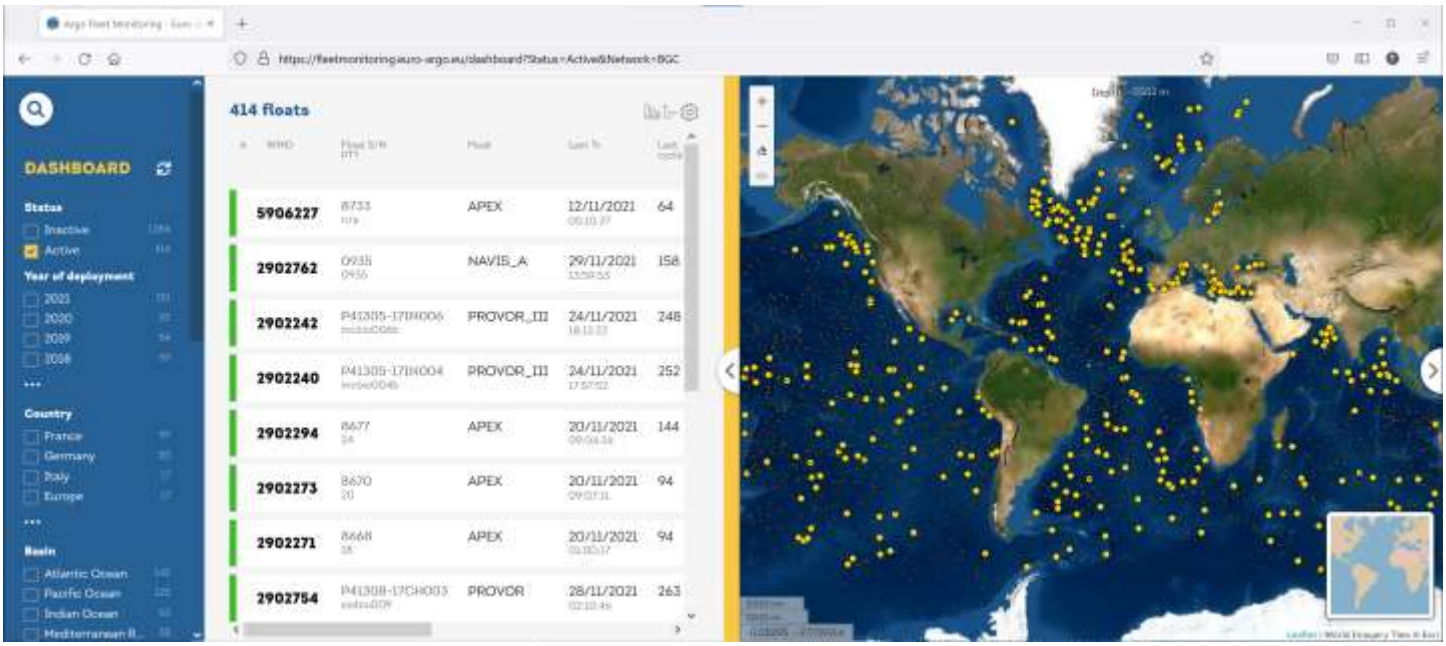


3.1.4 BGC-Argo floats

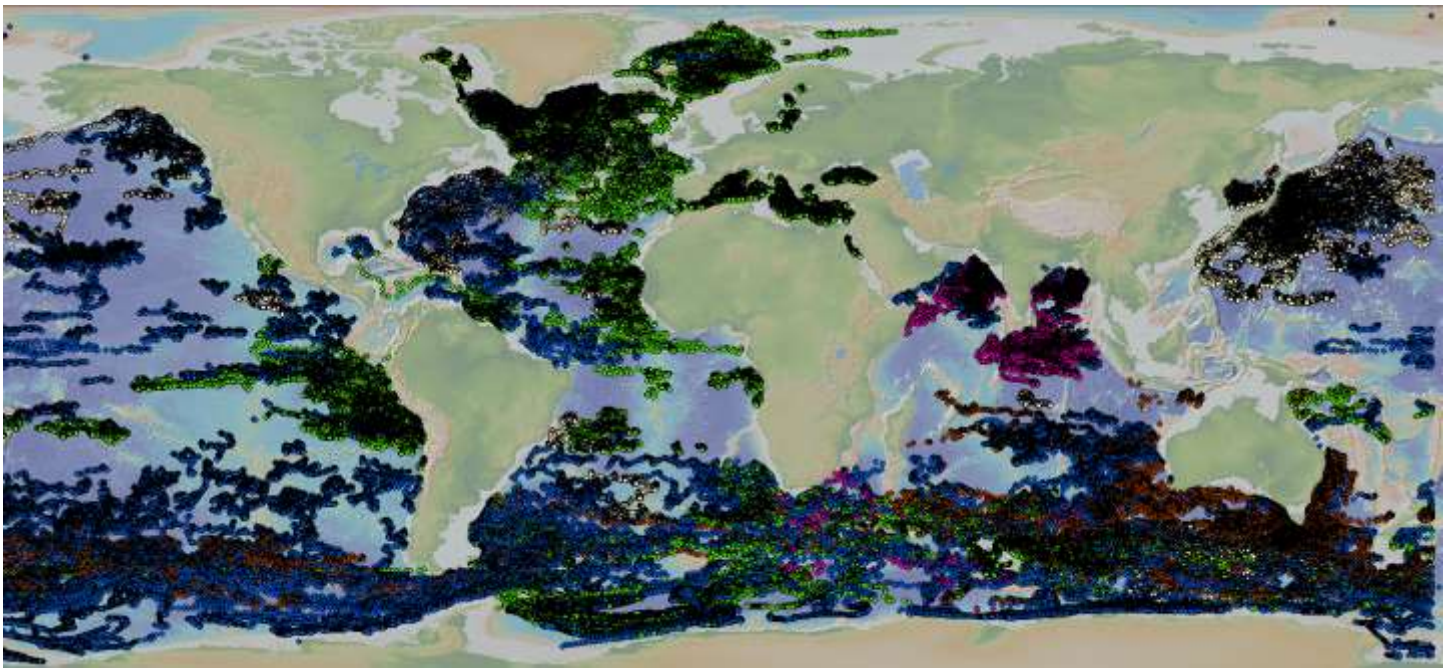
In November 2020, 225.135 BGC-Argo profiles from 1664 floats were available on Argo GDAC. This is a strong increase compared to 2019: +19% more floats and +19% more profiles.

DAC	nb bgc float	nb bgc file
coriolis	671	90 817
aoml	575	86 014
jma	113	18 027
csiro	90	22 203
incois	69	11 352
meds	50	4 910
csio	44	9 170
kordi	34	3 416
bodc	15	4 723
kma	3	106
Total	**1664**	**250 738**



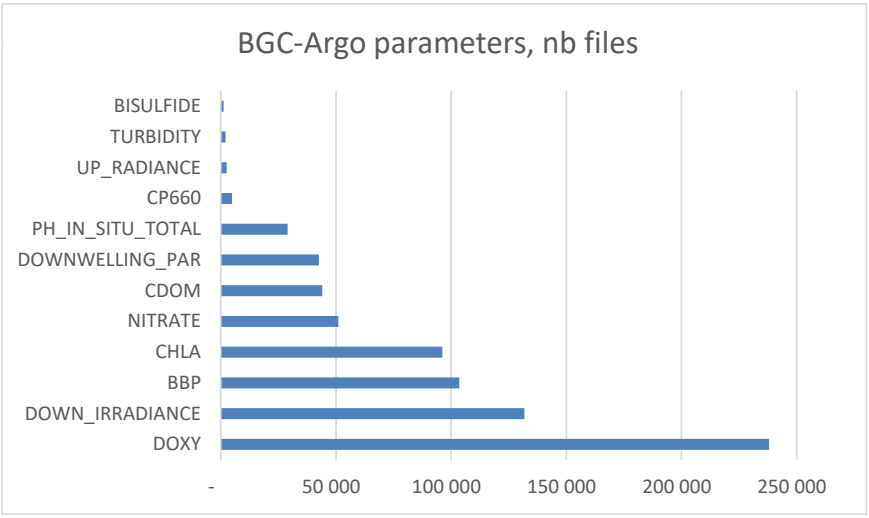


Map of 414 BGC-Argo floats (active: yellow, other: grey) from https://fleetmonitoring.euro-argo.eu/dashboard



BGC-Argo profiles, colored by DACs

BGC parameter	nb files
DOXY	238 000
DOWN_IRRADIANCE	131 808
BBP	103 491
CHLA	96 129
NITRATE	50 967
CDOM	44 055
DOWNWELLING_PAR	42 524
PH_IN_SITU_TOTAL	29 039
CP660	4 928
UP_RADIANCE	2 508
TURBIDITY	2 109
BISULFIDE	1 225



Main BGC-Argo physical parameters, number of profiles

3.2 Operations of the ftp and web server

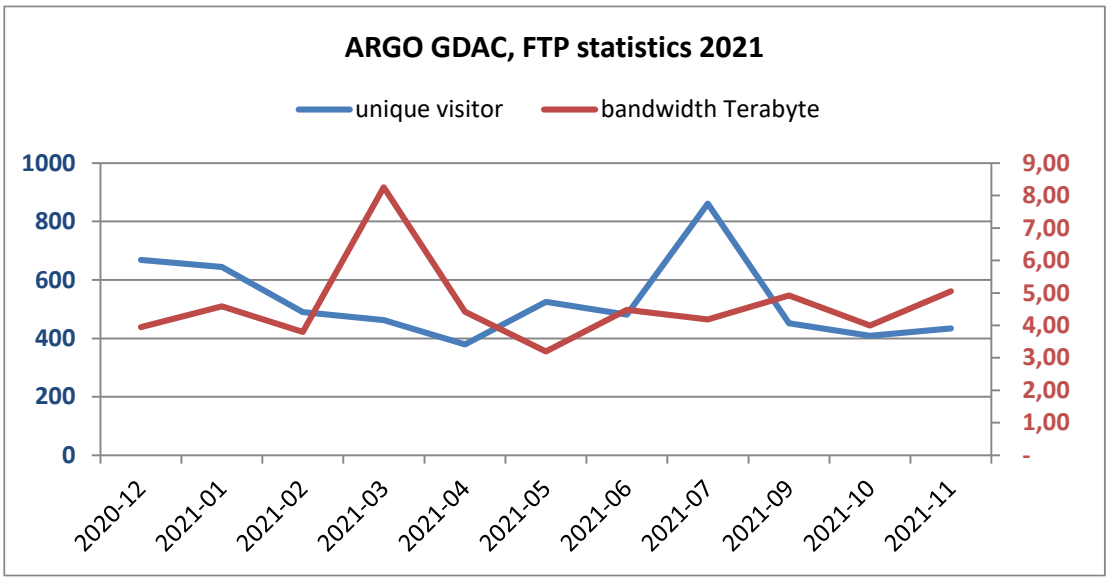
For each individual DAC, every 30 minutes, meta-data, profile, trajectory and technical data files are automatically collected from the national DACs. The 11 DACs are processed in parallel (one process launched every 3 minutes).

Index files of metadata, profiles, trajectories, technical and auxiliary data are hourly updated.

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

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

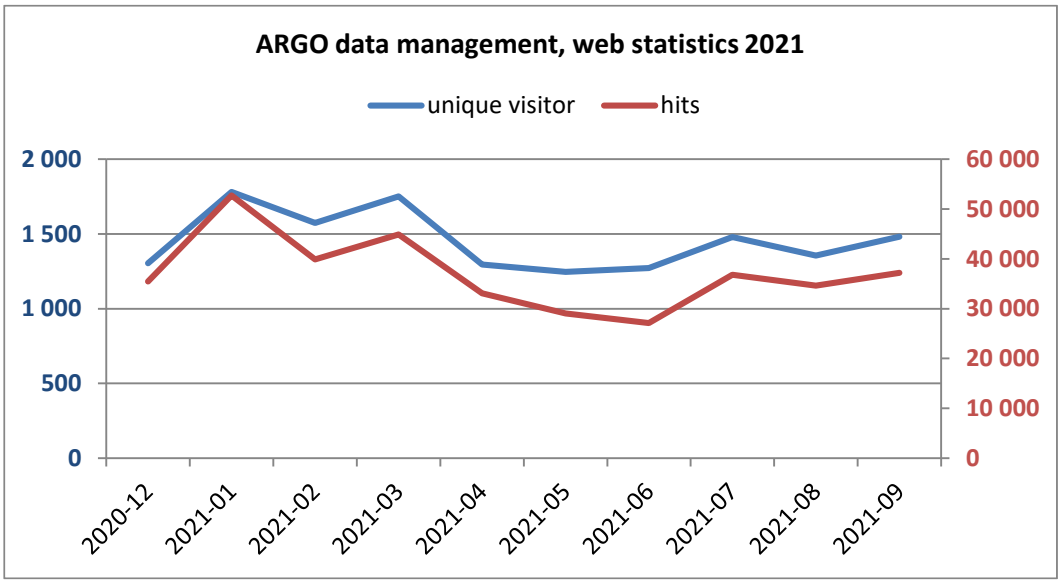
There is a monthly average of 633 unique visitors, performing 5218 sessions and downloading 4.53 terabytes of data files.



ARGO GDAC FTP statistics				
month	unique visitor	number o	hits	bandwidth terabyte
2020-12	669	5 952	9 589 480	3,95
2021-01	644	6 097	11 225 139	4,59
2021-02	490	4 775	2 995 564	3,80
2021-03	462	4 383	7 557 743	8,25
2021-04	379	4 340	15 033 602	4,42
2021-05	525	4 806	5 042 736	3,20
2021-06	481	5 427	5 110 916	4,48
2021-07	861	5 310	5 319 054	4,18
2021-08	1787	6 184	7 375 238	3,50
2021-09	451	4 770	8 787 532	4,92
2021-10	409	4 957	7 093 178	3,99
2021-11	434	5 610	7 145 900	5,05
Average	**633**	**5 218**	**7 689 674**	**4,53**

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

There is a monthly average of 1400 unique visitors, performing 2200 visits and 37000 hits. The graphics shows a slightly stable number of unique visitors.



ARGO GDAC web statistics					
month	unique vi	visits	pages	hits	bandwidth Go
2020-12	1 684	2 534	5 044	36 842	1,1
2021-01	1 371	2 174	3 997	34 018	1,1
2021-02	1 305	2 046	4 255	35 483	1,3
2021-03	1 781	3 118	6 752	52 755	2,7
2021-04	1 574	2 443	4 873	39 921	1,6
2021-05	1 751	2 845	6 593	44 917	1,1
2021-06	1 296	2 086	4 735	33 105	1,2
2021-07	1 246	2 088	4 431	29 054	0,9
2021-08	1 272	1 772	3 684	27 099	1,1
2021-09	1 479	2 078	4 506	36 819	1,1
2021-10	1 355	2 008	4 485	34 600	0,7
2021-11	1 481	2 083	4 259	37 191	1,1
Average	**1 454**	**2 257**	**4 857**	**37 094**	**1,3**

3.3 GDAC files synchronization

The synchronization with US-GODAE server is performed once a day at 03:55Z

Synchronization dashboard in November 2021: the daily sync. time takes on average 1 hour, with a failure on October 19th.

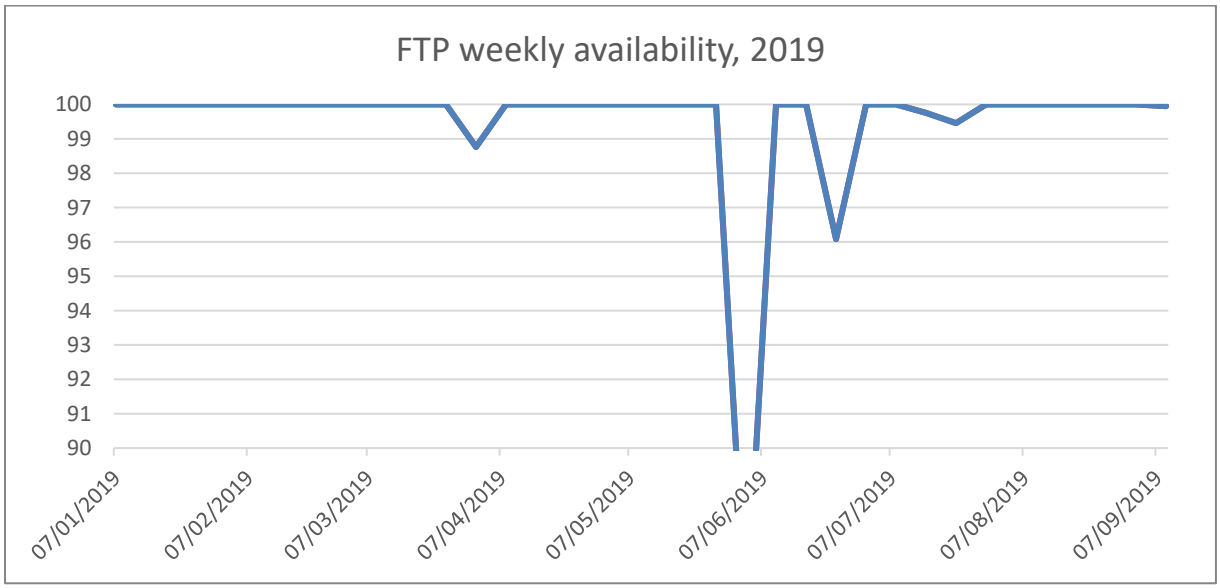
3.4 FTP server monitoring

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

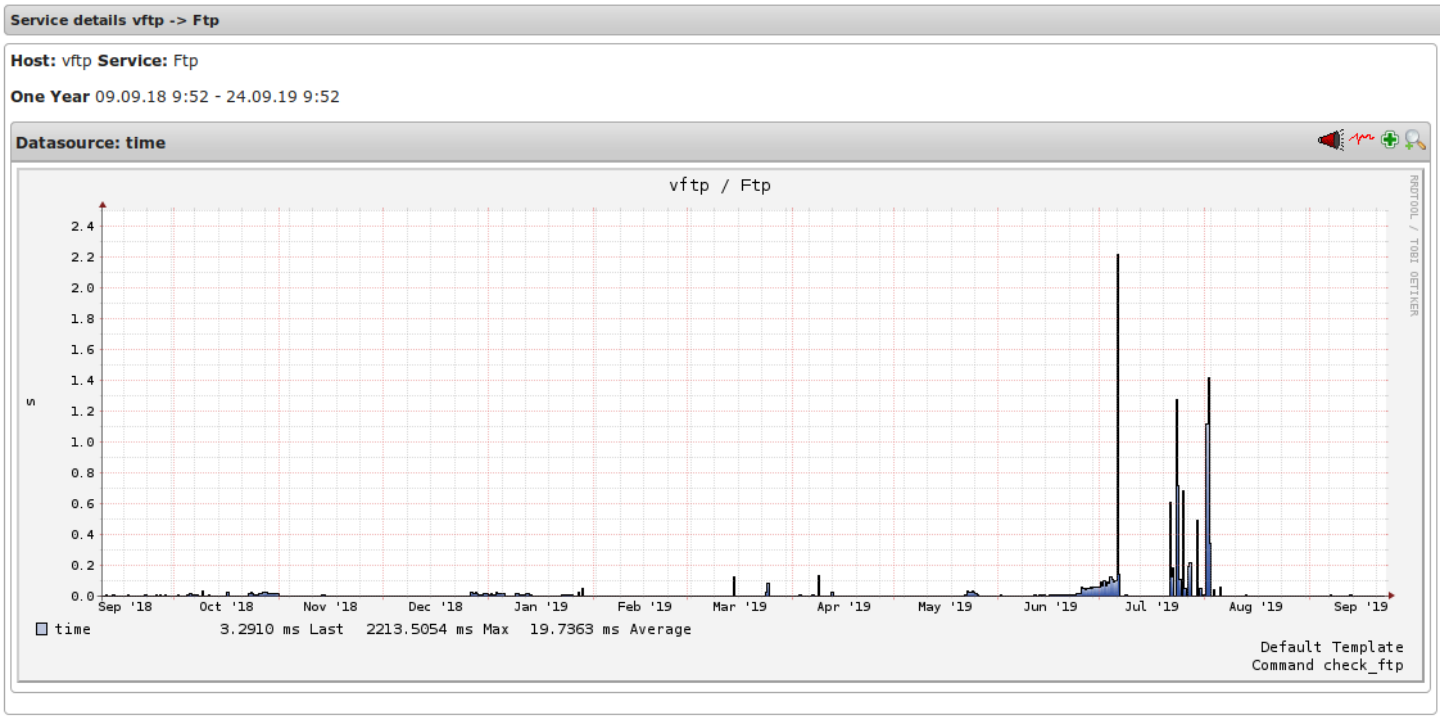
Every 5 minutes, an ftp download test and an Internet Google query are performed. The success/failure of the test and the response time are recorded. The FTP server is a virtual server on a linux cluster.

On the last 9 months, the FTP server was operational on 99.540% of time, non-operational during 1 day and 2 hours (0.421%). This is a very poor performance compared to last year (only 14 minutes non-operational in 2018). The main explanation is electricity maintenance work, which will hopefully improve the future FTP availability. The graphics below shows that the major FTP outages occurred on June 7th and then in July 6th 2019.

FTP server monitoring 01/01/2019 - 24/09/2019			
Status	percentage	duration	comment
OK	99,540%	256d 3h 7m 20s	operational
Warning	0,039%	0d 2h 10m 10s	poor performance
Unknown	0,000%	0d 0h 0m 0s	
Critical	0,421%	1d 2h 56m 22s	non operational

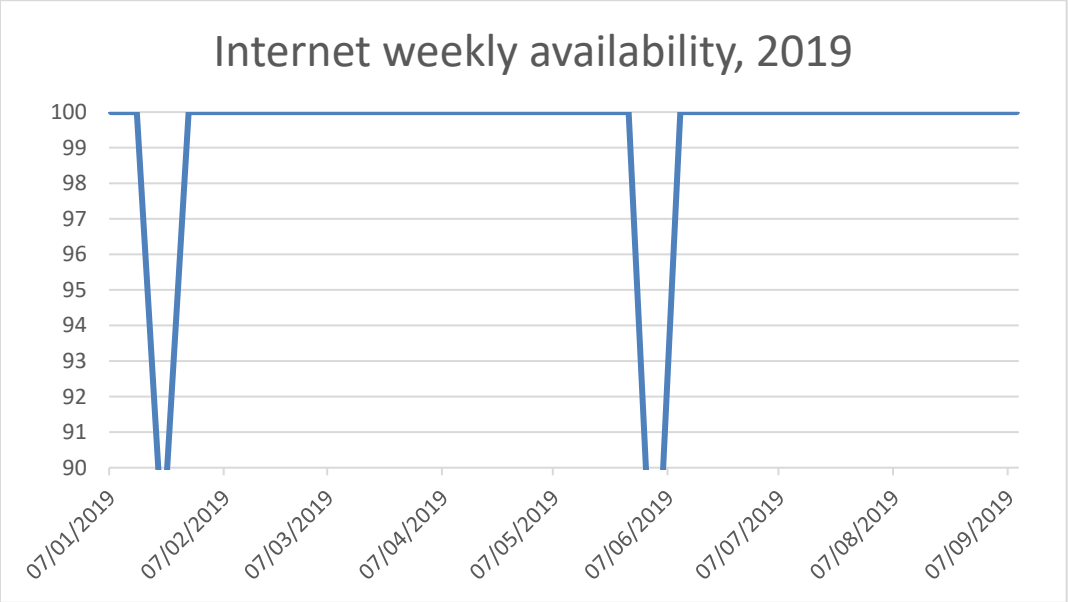


Nagios ftp monitoring: between January and September 2019



FTP server response time monitoring, poor performances end of June and in July

Internet access monitoring 01/01/2019 - 16/09/2019			
Status	***percentage***	***duration***	***comment***
OK	*99,816%*	*265d 20h 33s*	*operational*
Warning	*0,000%*	*0d 0h 0m 0s*	*poor performance*
Unknown	*0,000%*	*0d 0h 0m 0s*	
Critical	*0,184%*	*0d 11h 46m 12s*	*non operational*



Nagios Internet monitoring: between January and September 2019, poor performances in January and June.

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 greylist has 2100 entries** (November 2021), compared to 2210 entries one year ago.

DAC	nb floats
aoml	991
coriolis	454
bodc	214
csiro	175
jma	140
kma	38
meds	32
incois	24
csio	23
kordi	9
Total	**2100**

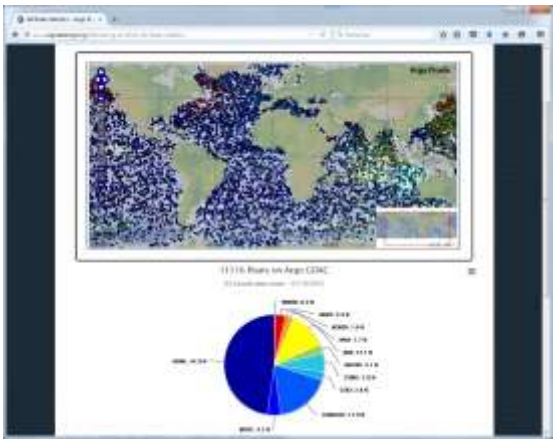
Distribution of greylist entries per DAC and per parameter

Coriolis reports many BGC greylist entries.

Parameter	nb entries
PSAL	1427
TEMP	192
PRES	154
BBP700	83
DOXY	83
CDOM	62
CHLA	51
BBP532	18
CP660	6
DOWN_IRRADIANCE380	4
DOWN_IRRADIANCE412	4
DOWN_IRRADIANCE490	4
DOWNWELLING_PAR	4
NITRATE	4
PH_IN_SITU_TOTAL	3
PH_IN_SITU_FREE	1

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



3.7 Mirroring data from GDAC: rsync service

In July 2014, we installed a dedicated rsync server called vdmzrs.ifremer.fr described on:

- http://www.argodatamgt.org/Access-to-data/Argo-GDAC-synchronization-service

This server provides a synchronization service between the "dac" directory of the GDAC with a user mirror. From the user side, the rysnc service:

- Downloads the new files

- Downloads the updated files
- Removes the files that have been removed from the GDAC
- Compresses/uncompresses the files during the transfer
- Preserves the files creation/update dates
- Lists all the files that have been transferred (easy to use for a user side post-processing)

Examples

Synchronization of a particular float

- rsync -avzh --delete vdmzrs.ifremer.fr::argo/coriolis/69001 /home/mydirectory/...

Synchronization of the whole dac directory of Argo GDAC

- rsync -avzh --delete vdmzrs.ifremer.fr::argo/ /home/mydirectory/...

3.8 Argo DOI, Digital Object Identifier on monthly snapshots

A digital object identifier (DOI) is a unique identifier for an electronic document or a dataset. Argo data-management assigns DOIs to its documents and datasets for two main objectives:

- Citation: in a publication the DOI is efficiently tracked by bibliographic surveys
- Traceability: the DOI is a direct and permanent link to the document or data set used in a publication
- More on: http://www.argodatamgt.org/Access-to-data/Argo-DOI-Digital-Object-Identifier

Since July 2019, the DOI monthly snapshot of Argo data is a compressed archive (.gz) that contains distinct core-Argo tar files and BGC-Argo tar files. A core-Argo user can now ignore the voluminous BGC-Argo files.

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 2018 November 8th http://doi.org/10.17882/42182#59903
- Snapshot of 2014 October 8th http://doi.org/10.17882/42182#42280
- Snapshot of 2012 December 1st http://doi.org/10.17882/42182#42250