

# GTSP National Data Management Report

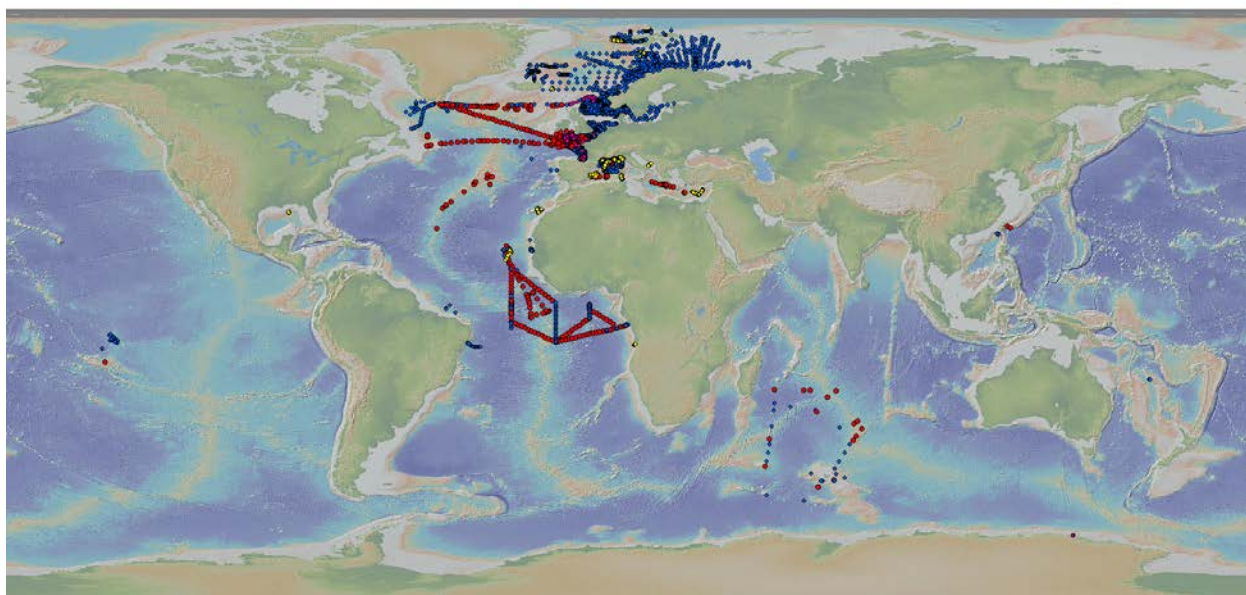
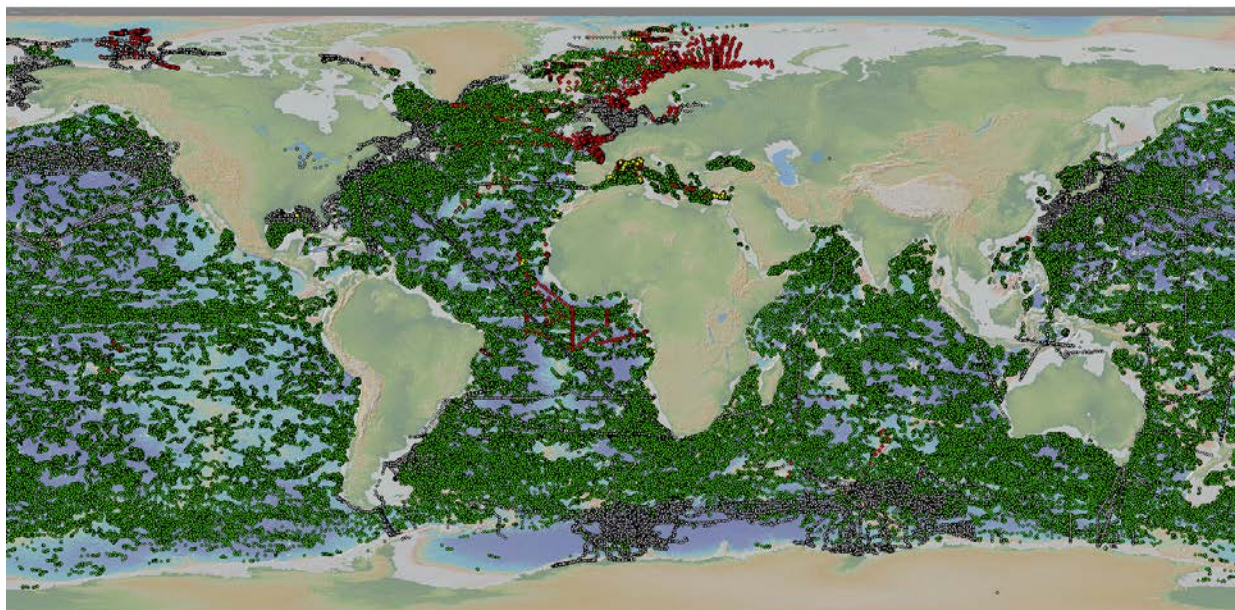
## 2018 Coriolis data centre - Ifremer

Annual report

Version 1.0

June 2019

<https://doi.org/10.13155/61486>



GTSP profiles observed in 2018, provided by Coriolis data centre

# 1 Introduction

This is the Coriolis data center report on GTSPP activities during year 2018. It includes data aggregated in France (SHOM, Ifremer, IRD, CNRS, Institut Polaire Paul Emile Victor). It also includes European data aggregated within Copernicus Marine services.

## Guidelines

Please report the progress made towards completing the following tasks, if your center is currently performing these tasks, and if not yet complete, estimate when you expect them to be complete

- Data acquired from ships, gliders, sea-mammal – numbers, locations, platform types, SOOP line numbers...

List of the platforms that reported temperature and/or salinity profiles:

- SHIPS :
- Gliders :
- Sea-mammals :
- Fishing boats :
- Other type of platforms:
- Data issued to GTS
  - Status of switch to BUFR data delivery to the GTS
- Data issued to US-NODC after real-time QC
- Data issued for delayed QC
- Delayed mode data sent to US-NCEI
- Web pages – availability of data locally?
- Statistics of GTSP data usage (operational models, scientific applications, number of National PIs...)
- Products generated from GTSP data...

## 2 Data acquired from ships, gliders, sea-mammals, etc...

### 2.1 Coriolis-global profiles

Coriolis and Copernicus Marine service aggregate marine in situ profiles from public data sources.

A total of **2 466 178** profiles from 5441 platforms with an observation year of 2018 were managed by Coriolis data center.

The main contributors are **GTS** by way of Meteo-France and MEDS-Canada. The inflated number of profiles is mainly due to US coastal time series data sent on GTS as profile data.

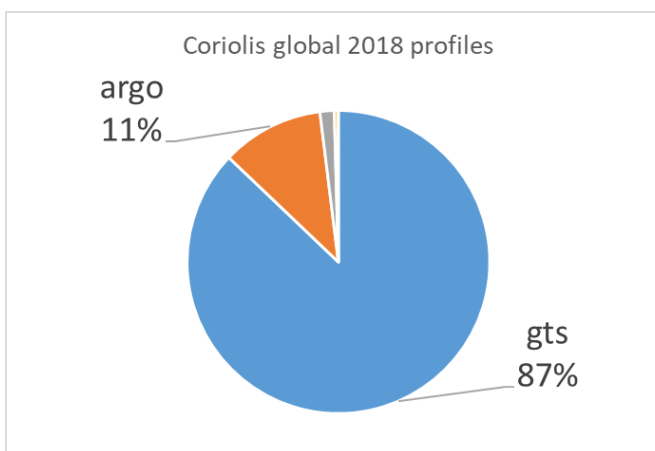
**Argo** (by way of Argo GDAC) remains the main provider of global ocean profiles.

**Coriolis** and EU service “**Copernicus Marine In Situ**” are the data aggregators of European data.

Whenever the World Ocean Database (**WOD**) publishes an update, the new data are ingested in Coriolis database.

Whenever the “International Council for the Exploration of the Sea” (**ICES**) publishes an update, the new data are ingested in Coriolis database.

Data source	nb profiles
gts	2 148 182
argo	269 600
coriolis	37 706
wod	9 676
ices	1 014
<b>Total</b>	<b>2 466 178</b>



### 2.2 Coriolis-only profiles

A total of **37 706** profiles from 75 platforms with an observation year of 2018 were directly collected, controlled and distributed by Coriolis data centre.

When observations are more than 30 days old, they are distributed on GTS as BUFR profiles messages (Argo, gliders, vessels).



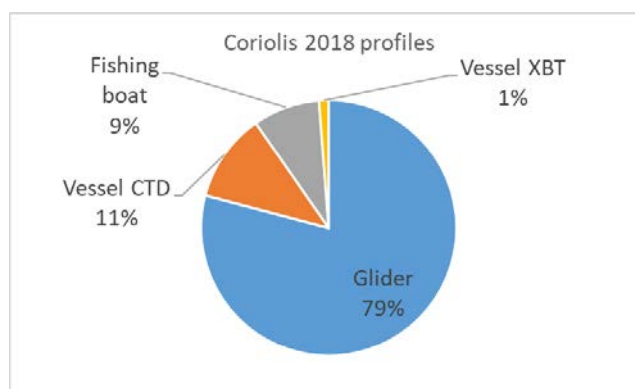
The main contributors are European gliders, research vessels (for CTDs or XBTs), fishing boat vessels (French Recopesca network) and regular vessels (for XBTs).

The European gliders data processing chain is freely available on:  
*EGO gliders data processing chain* <https://doi.org/10.17882/45402>

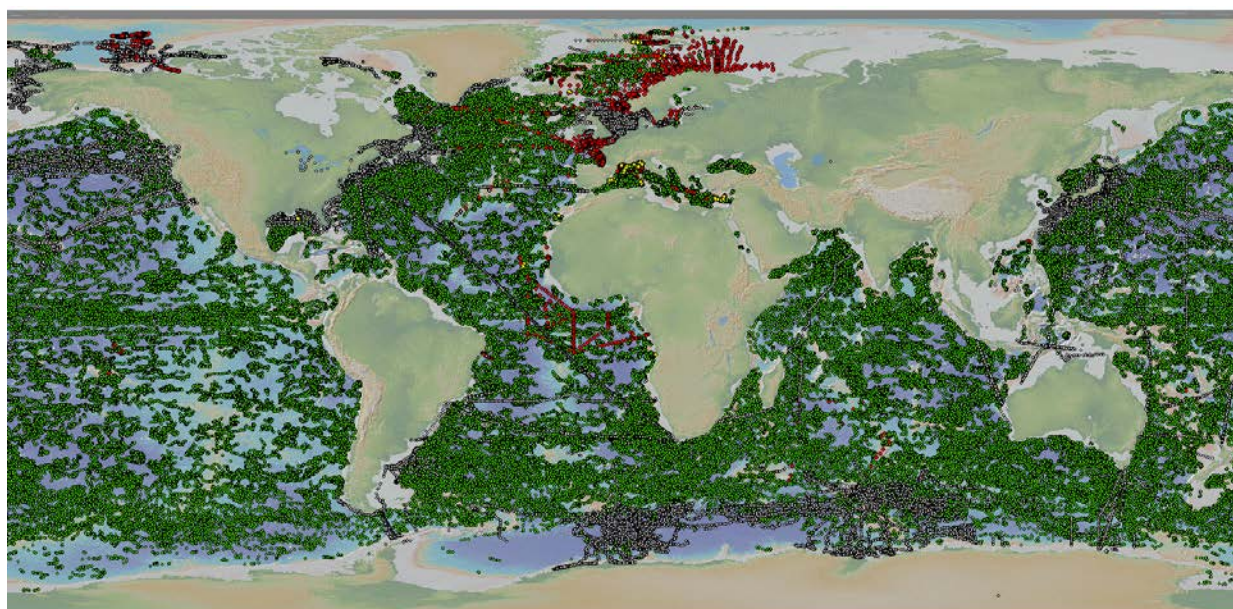
All profiles processed during that period are available in one file on:

- <http://www.ifremer.fr/co/gtspp/2018>

Platform type	nb profile
Glider profiles	29 829
Vessel, CTD profiles	4 226
Fishing boat profiles	3 187
Vessel, XBT profiles	464
<b>Total</b>	<b>37 706</b>

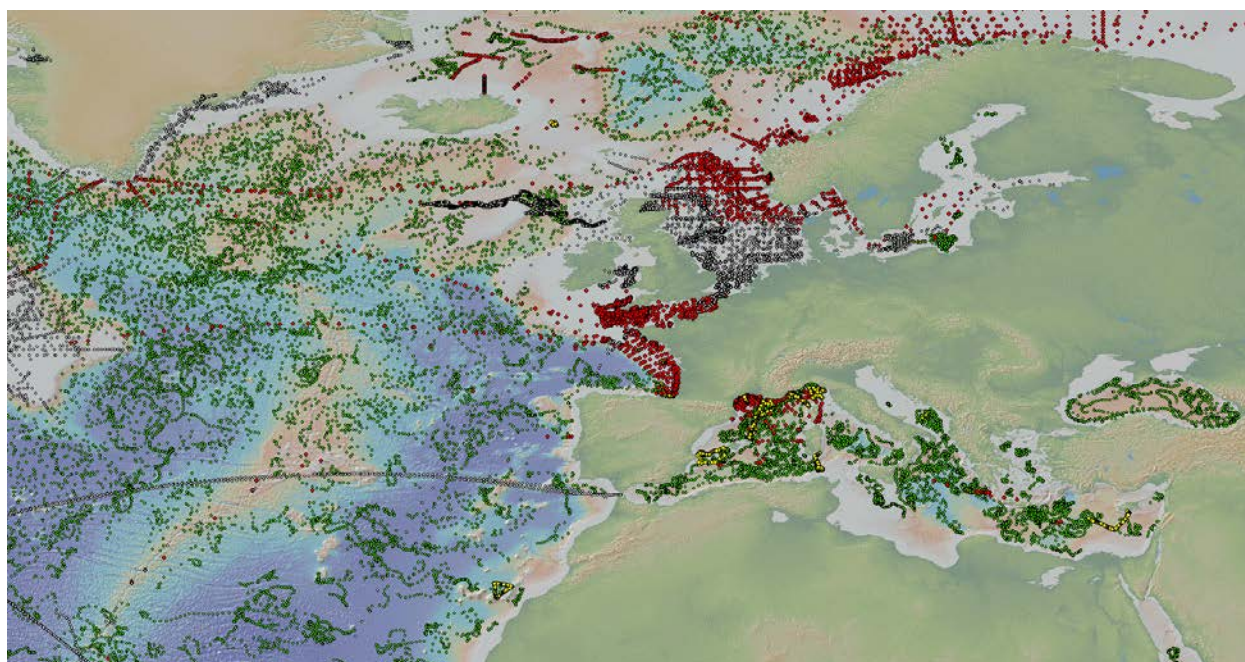


## 2.3 Coriolis-global maps 2018

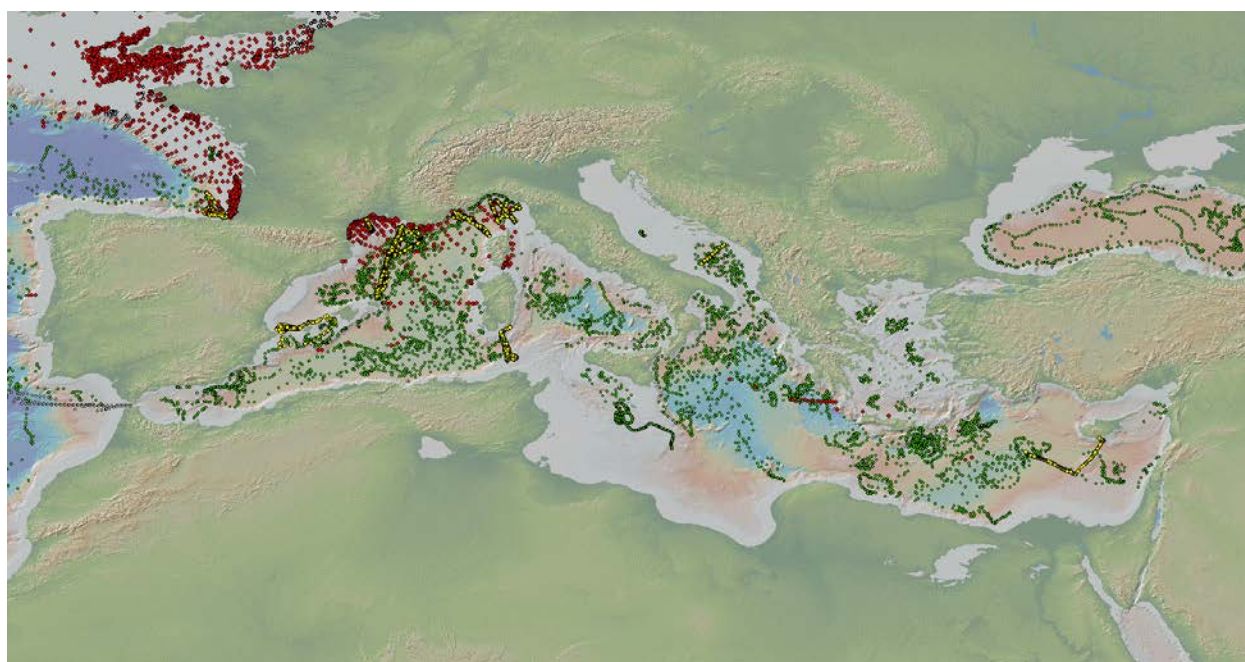


Coriolis-global: 2.4 million profiles with a 2018 observation date (gts argo coriolis)





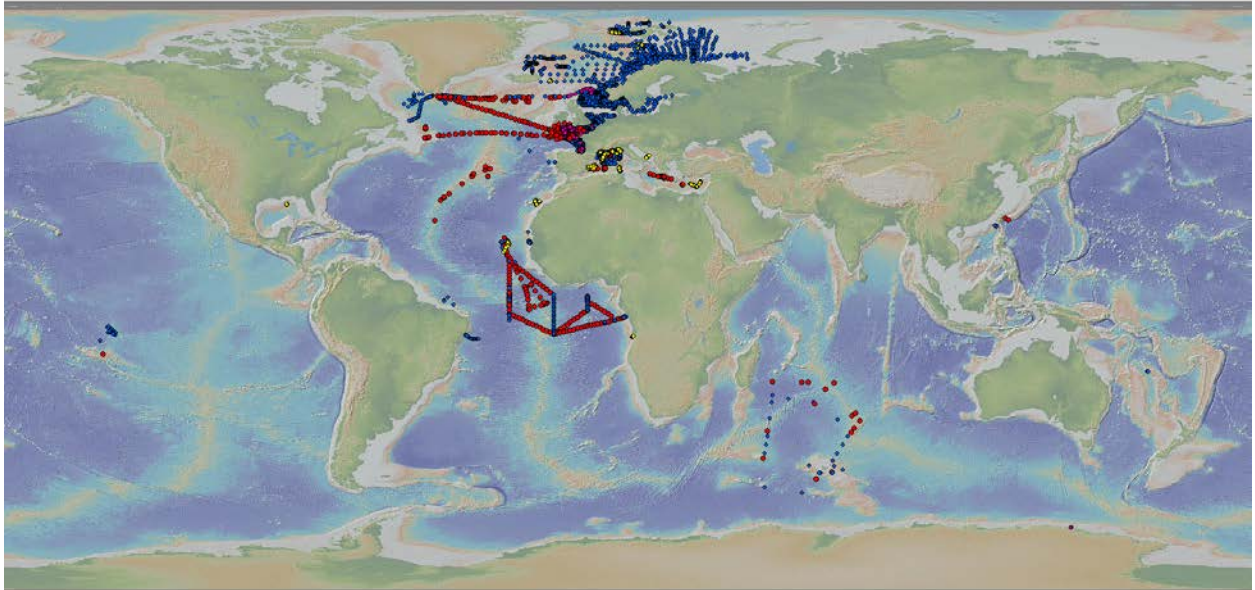
Coriolis-global: a zoom on North Atlantic area (gts **argo** **coriolis**)



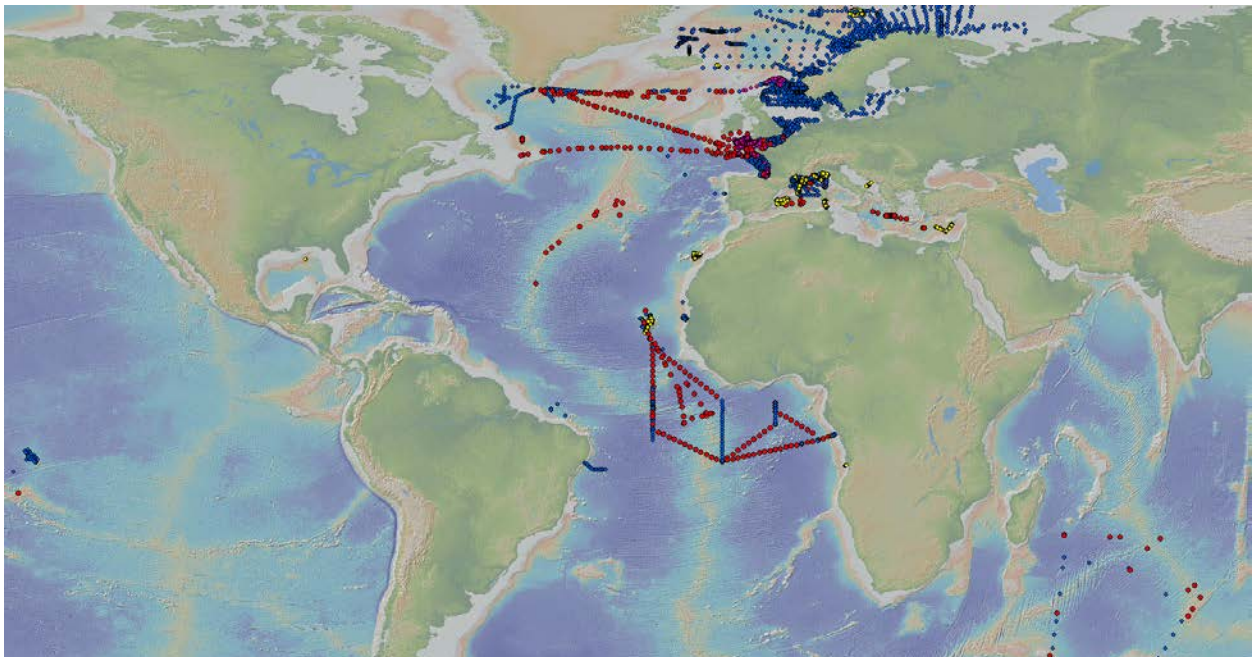
Coriolis-global: a zoom on Mediterranean sea (gts **argo** **coriolis**)



## 2.4 Coriolis-only maps 2018

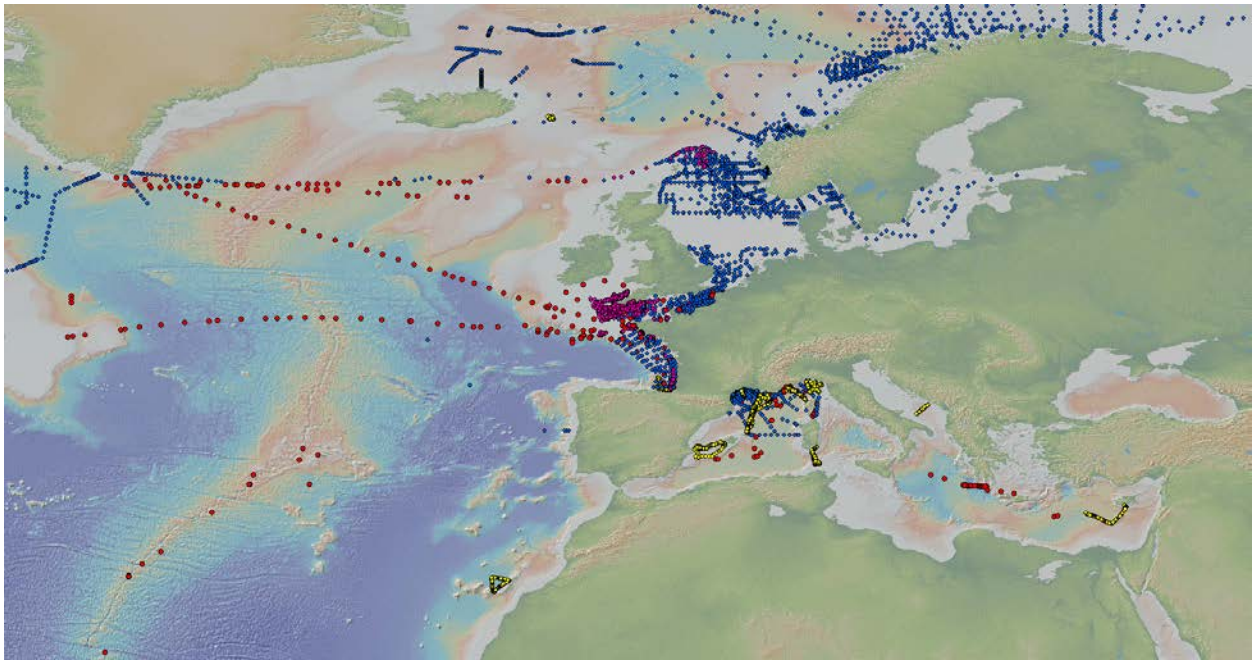


Coriolis only: 37 000 profiles with a 2018 observation date  
blue: CTD, red: XBT, yellow: glider

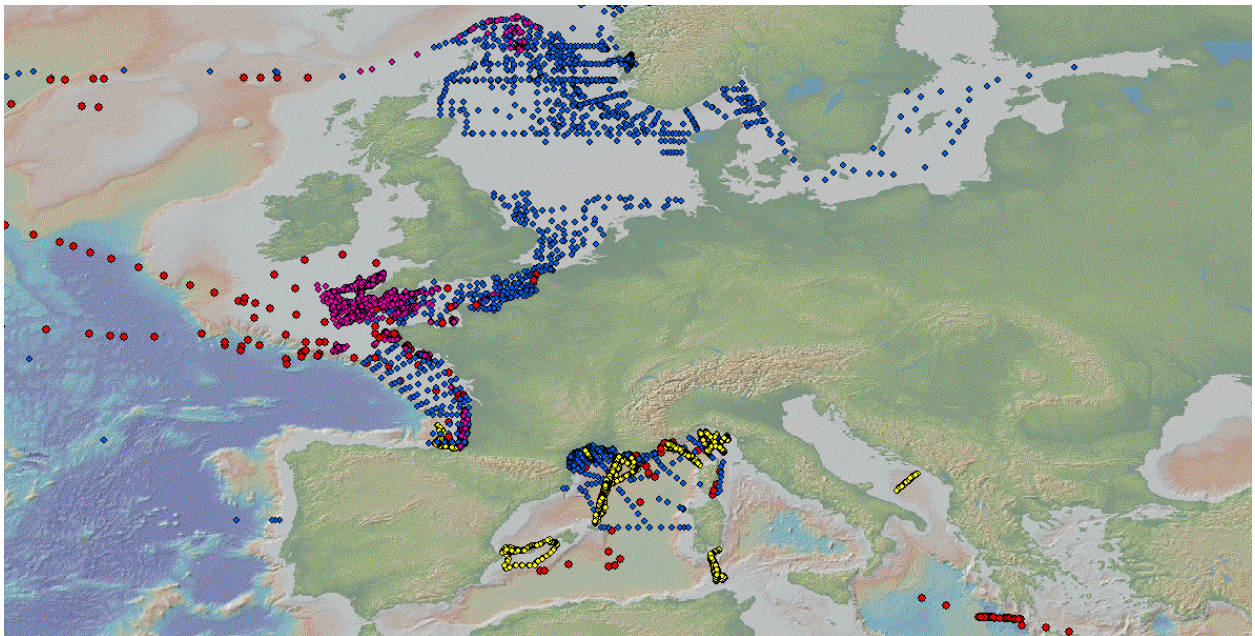


Coriolis only: a zoom on Atlantic area  
blue: CTD, red: XBT, yellow: glider





Coriolis only: a zoom on North Atlantic area  
blue: CTD, red: XBT, yellow: glider



Coriolis only: a zoom on west Europe area  
blue: CTD, red: XBT, yellow: glider

## 2.5 Coriolis-only platforms, 2018 observations

### Vessels: 18 European platforms

code	Name	nb profiles
LGWS	KRISTINE BONNEVIE	1048
LDGJ	JOHAN HJORT	960
FNFP	THALASSA	595
LMEL	G.O. SARS	351
FKJB	L'EUROPE	275
FNCM	L'ATALANTE	187
FHQB	ALIS	145
DBBT	Maria S. Merian	114
FNIN	MARION DUFRESNE	110
FMCY	POURQUOI PAS?	77
DBKV	POSEIDON	55
OXYH2	NUKA ARCTICA	51
DBBH	METEOR	50
FPCS	THALIA	32
FGA3812	NEREIS II	12
FGTO	TETHYS II	8
EFCP	HESPERIDES	4
SQOC	RV OCEANIA	3

### Gliders: 18 European platforms

code	name	nb profiles
6801593	Comet	12881
68453	Theque	4318
6801661	Dora	2261
18956	Bonpland	2113
6801592	Sebastian Glider	1616
6801662	Noa	1428
61866	Potame	1067
68954	Tintin	1048
68967	sdeep01	618
18954	IFM08	456



6801634	IFM13	430
18952	IFM09	408
68455	Conti	296
6800957	Leonardo	281
6801664	Freya	277
68450	Pheidippides	152
6801631	p202	150
61863	IFM02	29

### Recopesca fishing gear sensor: 18 platforms

code	Name	nb profiles
EXRE0231	Recopesca sensor 5334	424
EXRE0070	Recopesca sensor 15069	121
EXRE0233	Recopesca sensor 15057	71
EXRE0224	Recopesca sensor 15128	121
EXRE0195	Recopesca sensor 5224	23
EXRE0223	Recopesca sensor 5225	38
EXRE0054	Recopesca sensor 5092	35
EXRE0232	Recopesca sensor 5013	847
EXRE0234	Recopesca sensor 5232	317
EXRE0066	Recopesca sensor 15094	39
EXRE0218	Recopesca sensor 15065	25
EXRE0235	Recopesca sensor 5191	30
EXRE0212	Recopesca sensor 5122	29
EXRE0014	Recopesca sensor 5046	167
EXRE0202	Recopesca sensor 15052	2
EXRE0060	Recopesca sensor 15107	32
EXRE0207	Recopesca sensor 5054	827
EXRE0173	Recopesca sensor 5213	39

### Repeat hydrography on fixed sites: 68 sites

code	Name	nb profiles
IF000650	Point 1 Boulogne	44
IF000657	Point 1 Dunkerque	42
IF000655	At so	33
EXMY1065	Eggum Buoy	31
EXMY1067	Skrova Buoy	30
IF000652	Point 3 SRN Boulogne	26
IF000651	Point 2 SRN Boulogne	25

EXMY1751	B1 Fixed Station	24
IF000656	SRN Somme mer 2	24
IF000654	Mimmer	22
IF000659	Point 4 SRN Dunkerque	22
IF000658	Point 3 SRN Dunkerque	22
IF000653	Bif	21
EXMY1233	Ingoy	19
EXMY1752	BY31 Fixed Station	18
EXMY1066	Lista Buoy	12
EXMY1722	ANHOLTE Fixed Station	10
EXMY1726	BY15 Fixed Station	9
EXMY1231	Sognesjoen	9
EXMY1717	A13 Fixed Station	8
EXMY1740	REFM1V1 Fixed Station	8
EXMY1736	HANOBUKTEN Fixed Station	7
EXMY1732	BY38 Fixed Station	7
EXMY1737	N14 Fixed Station	7
EXMY1741	SLAGGO Fixed Station	7
EXMY1735	FLADEN Fixed Station	7
EXMY1912	BY29 Fixed Station	6
EXMY1731	BY32 Fixed Station	6
EXMY1721	A17 Fixed Station	6
EXMY1723	BCSIII10 Fixed Station	6
EXMY1719	A15 Fixed Station	6
EXMY1739	P2 Fixed Station	6
EXMY1742	WLANDSKRONA Fixed Station	6
EXMY1733	BY4 Fixed Station	6
EXMY1729	BY2 Fixed Station	5
EXMY1718	A14 Fixed Station	5
EXMY1725	BY1 Fixed Station	5
EXMY1734	BY5 Fixed Station	5
EXMY1724	BY10 Fixed Station	5
EXMY1720	A16 Fixed Station	4
EXMY1730	BY29 Fixed Station	4
EXMY1745	LL12 Fixed Station	3
EXMY1995	OOCs-BBAY	3
EXMY1755	BY31 Fixed Station	3
EXMY1339	OOCs	3
EXMY1748	BY23 Fixed Station	3
EXMY1727	BY20 Fixed Station	2



EXMY1855	KULLEN Fixed Station	1
EXMY1881	BY13 Fixed Station	1
EXMY1887	STOLPETROSKEK Fixed Station	1
EXMY2239	SWVINGAGF4 Fixed Station	1
EXMY1883	BY9 Fixed Station	1
EXMY1749	BY28 Fixed Station	1
EXMY1854	GF9 Fixed Station	1
EXMY1891	BY39 Fixed Station	1
EXMY1882	BY11 Fixed Station	1
EXMY1728	BY21 Fixed Station	1
EXMY1890	BY36 Fixed Station	1
EXMY1862	LASORANNA Fixed Station	1
EXMY1879	BY19 Fixed Station	1
EXMY1880	BY27 Fixed Station	1
EXMY1884	BY7 Fixed Station	1
EXMY1892	BY30 Fixed Station	1
EXMY1863	STMIDDELGRUND Fixed Station	1
EXMY1852	GF6 Fixed Station	1
EXMY1889	BY3 Fixed Station	1
EXMY1861	LAMIDDELGRUND Fixed Station	1
EXMY1853	GF8 Fixed Station	1

### 3 Historical and delayed mode data

#### 3.1 Provide historical profiles that are not yet in GTSP – OCL

A comparison between OCL profiles and Coriolis profiles performed once a year. The profiles from Coriolis that do not exist in OCL can be provided to GTSP.

#### 3.2 Delayed mode data from MEOP sea-mammals program

In June 2018, the MEOP program published its 2018 release.

*Roquet Fabien, Guinet Christophe, Charrassin Jean-Benoit, Costa Daniel P., Kovacs Kit M, Lydersen Christian, Bornemann Horst, Bester Marthan N., Muelbert Monica C., Hindell Mark A., McMahon Clive R., Harcourt Rob, Boehme Lars, Fedak Mike A. (2018). **MEOP-CTD in-situ data collection: a Southern ocean Marine-mammals calibrated sea water temperatures and salinities observations.** SEANOE. <https://doi.org/10.17882/45461>*

The Coriolis data team performed the ingestion of MEOP 2018 release. All sea-mammal profiles from GTS or previous MEOP profiles were removed and replaced by MEOP 2018 profiles.

All former IF\* platform codes were eliminated and replaced by their proper WMO code.

An action is underway with JCOMMOPS to assign WIGOS platform codes to historical sea-mammal platforms that never received a WMO platform code.

### 3.3 Delayed mode data from French research vessels ADCPs

As part of Coriolis observing system, the hull ADCP from French research vessels are continuously measuring current velocity profiles.

These data are public and reusable.

In 2020, they will be distributed in Copernicus Marine current product, in the homogeneous Copernicus NetCDF format.

If requested, they may contribute to GTSP project.

## 4 Delayed Mode QC

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

### 4.1 CORA delayed mode data

CORA, the Coriolis delayed mode reanalysis on temperature and salinity is released once a year.

*Szekely Tanguy, Gourrion Jerome, Pouliquen Sylvie, Reverdin Gilles (2019). **CORA, Coriolis Ocean Dataset for Reanalysis.** SEANOE. <http://doi.org/10.17882/46219>*

CORA data set contains scientifically assessed temperature and salinity data from Coriolis data centre:

- In situ profiles, time series and trajectories



- Standardized vertical profiles (along pressure or depth)
- Gridded ISAS6 temperature and salinity fields

## 4.2 ISAS objective analysis

All vertical profiles from 1950 to now are analyzed with ISAS V6 objective analysis. Alerts on profiles generated by ISAS and by the MIN-MAX comparison are visually checked in Coriolis database.

The visual inspection is performed by a scientist who may decide to flag suspicious data as bad.

The version 7 of ISAS objective analysis is under implementation.

<http://www.umar-ops.fr/en/SNO-Argo/Products/ISAS-T-S-fields>

## 4.3 MIN-MAX quality control method

The MIN-MAX quality control is routinely used and tuned to detect anomalies on real-time data.

The MIN-MAX QC method is developed within Copernicus-Marine by Jérôme Gourrion and Tanguy Szekely.

# 5 Research operations

- (Please report any research activities, such as XBT fall rate tests or system tests undertaken during the year, if any)

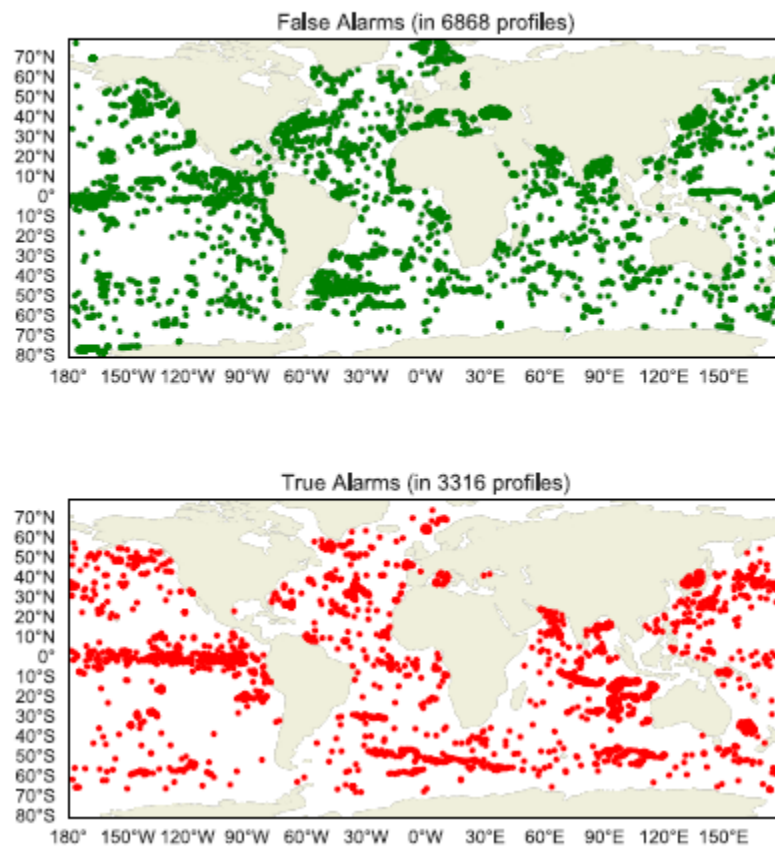
## 5.1 Deep learning to improve quality control

Deep learning quality control methods are developed and implemented to detect anomalies in large ocean in situ datasets, such as ISAS or CORA. These techniques significantly decrease the number of profiles to be visually checked by experts.

Large datasets are classified with multiple criteria (P, T, S, position, QC flags history). These promising techniques are developed by Guillaume Maze and implemented by Sean Tokunaga and Robin Le Guen.

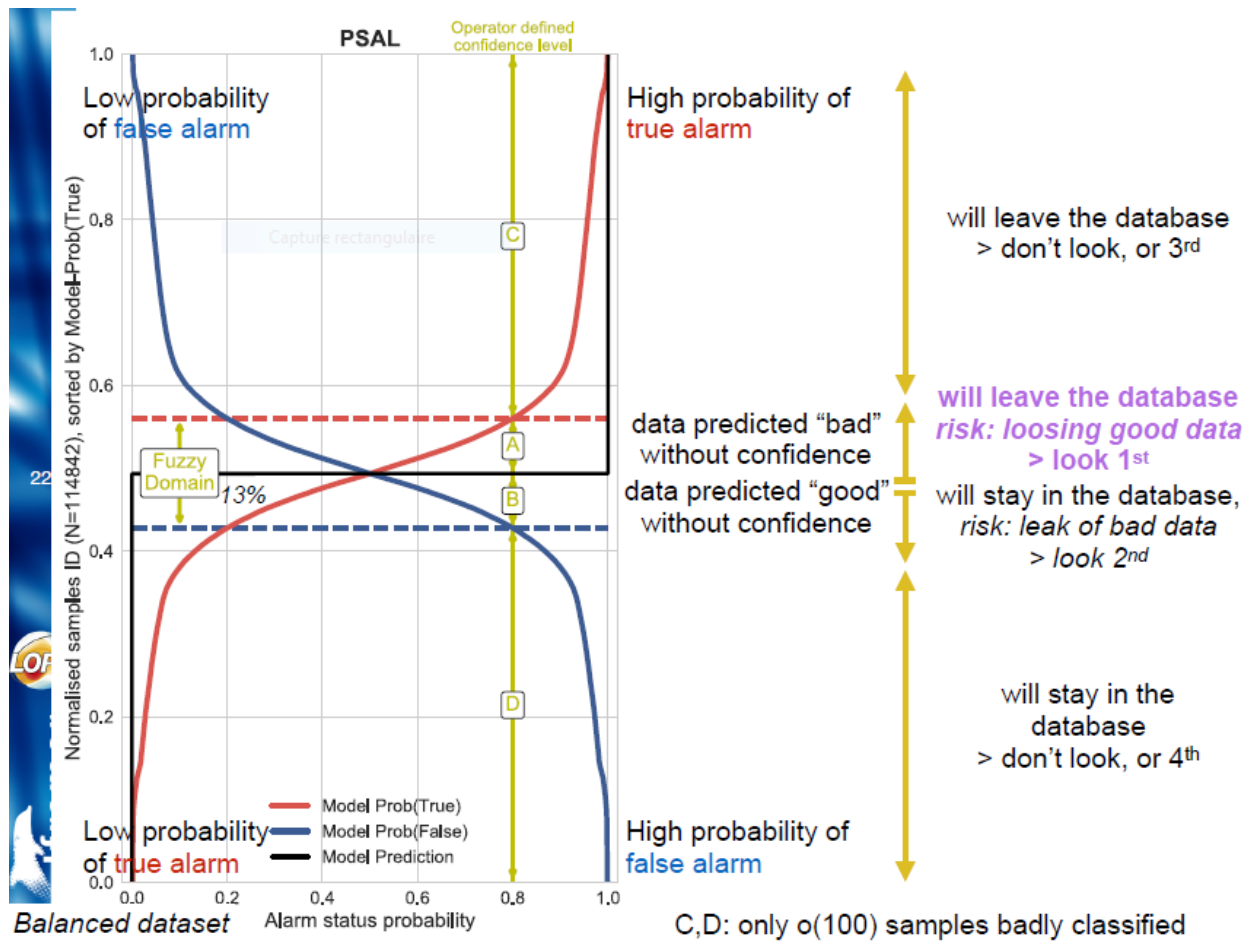
Maze Guillaume, Mercier Herle, Cabanes Cecile (2017). **Profile Classification Models**. *Mercator Ocean Journal*, (55), 48-56. Open Access version : <https://archimer.ifremer.fr/doc/00387/49816/>

## Alarms on PSAL



Deep learning alarms detection on ISAS dataset





Deep learning alarm triggers settings

## 6 Difficulties encountered

- (Please report on any difficulties or issues you have faced since these might be more widespread than expected)

### 6.1 Coriolis specific codes

The Ifremer Medsascii files contains some additional codes that are unknown to GTSP. These new codes probably disturb the ingestion of Coriolis data in GTSP.

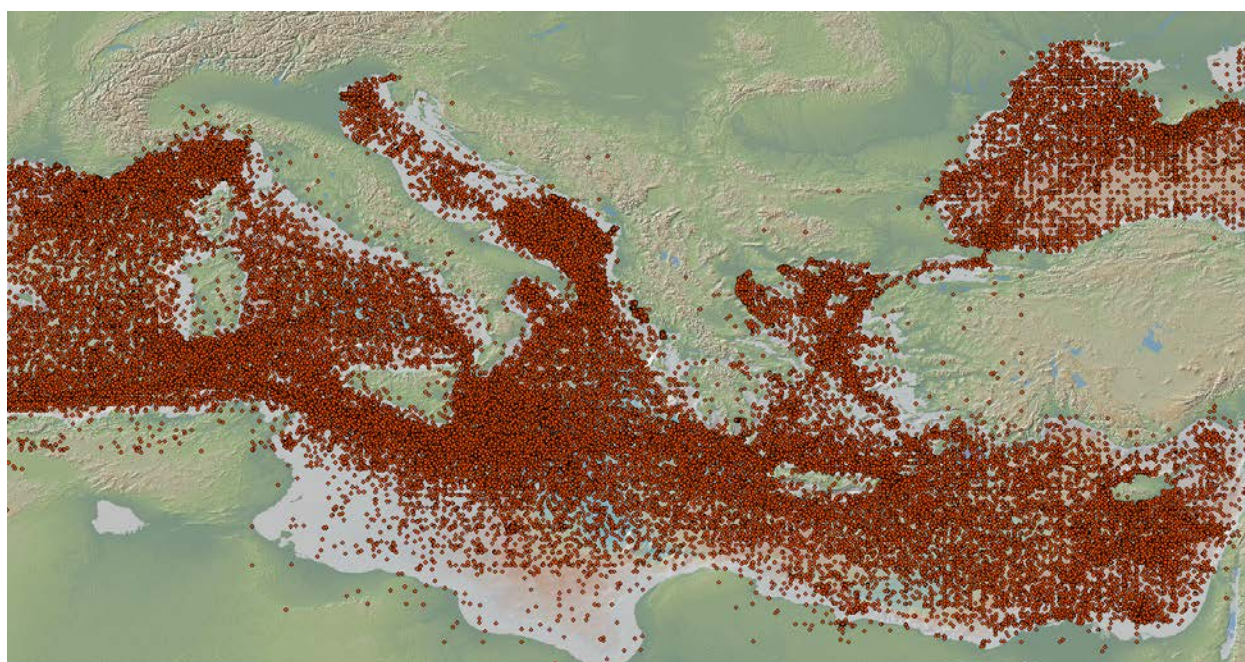
### 6.2 Positions incorrectly flagged

A series of profiles with a position incorrectly flagged as good were detected in WOD data ingested by Coriolis in 2016. Some of these profiles may come from GTSP.

A position on land QC will soon be applied on these data. However, this is certainly not enough, as profiles incorrectly positioned and flagged in the ocean will remain undetected.



Profiles ingested in 2016 with incorrectly flagged position (Africa, Arabia...)



Profiles ingested in 2016 with incorrectly flagged position (North Africa, Italy, Turkey,...)