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CMEMS In Situ TAC

Marta de Alfonso <mar@puertos.es>
on behalf of

In Situ TAC Team









Copernicus → In Situ TAC Where are we?



3 components:

- Space
- Insitu
- **Services**

-  **Atmosphere Monitoring**
-  **Climate Change**
-  **Marine Monitoring (CMEMS)**
-  **Land Monitoring**
-  **Security**
-  **Emergency Management**

7 MFCs (models)

- GLO MFC
- ARC MFC
- BAL MFC
- NWS MFC
- IBI MFC
- MED MFC
- BS MFC

8 TACs (Observations)

In Situ TAC

- 6 Space TACs:
OCTAC,
SLTAC, ...
- 1 Multi Ob.

CIS



CMEMS: Evolution in time

CMEMS: Copernicus Marine Environment Monitoring Service
<http://marine.copernicus.eu/>

GMES
MyOcean

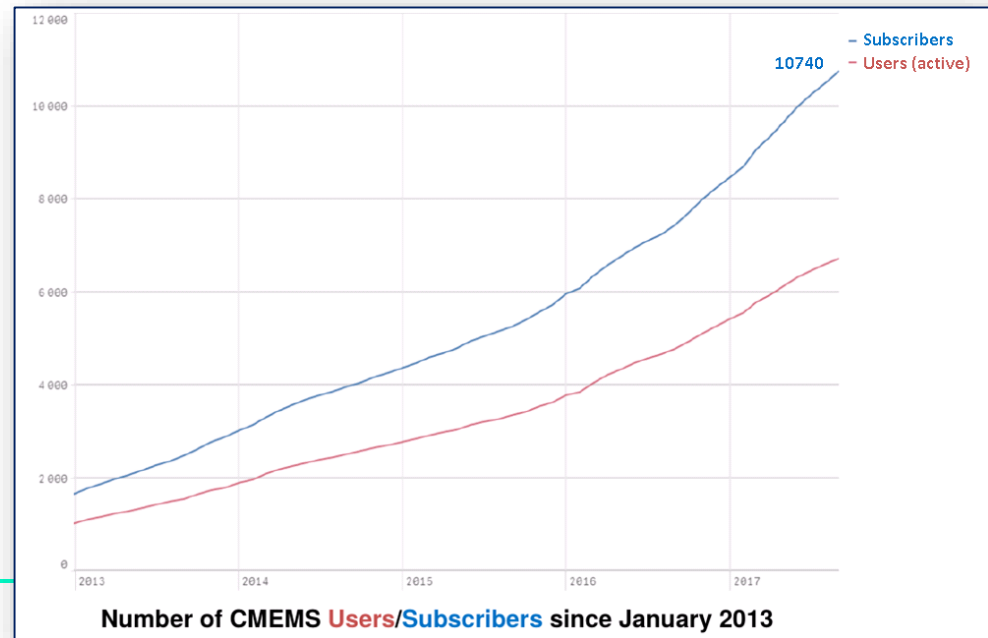
CMEMS Phase 1 (Apr. 2015 – Apr. 2018)

CMEMS Phase 2 (Jan. 2018 – Mar. 2021)



Jan. – Apr. 2018: overlapping period between the two Phases: transition.

**Increasing number of users
(MyOcean- CMEMS)**



In Situ TAC: Organization (2018)

IN SITU TAC ORGANIZATION Leader: Ifremer / France



**Management
& Operations**
7 Regions

Global: Ifremer / France
Arctic: IMR / Norway
Baltic: SMHI / Sweden
NWS: BSH / Germany
IBI: Puertos del Estado / Spain
MED: HCMR / Greece
Black Sea: IOBAS / Bulgaria

**Scientific Expertise
Cross Cutting**

Product Quality: Oceanscope-PdE-IMR
Multi Year: SOCIB-OceanScope-PdE
BGC assim.: IMR

System Evolution

HF Radar: AZTI-CNR-SOCIB
Carbon Data: UIB
BGC assessment: IMR-HCMR-SYKE
Monitoring: SOCIB-PdE-HCMR



In Situ TAC: general description

General characteristics:

- **Fully operational service** since April 2015
- **7 Components:** Global + 6 regions (Arctic, Baltic, NWS, IBI, MED and BlackSea)
- **Same data format** (NetCDF - OceanSites 1.2)
- **Same FTP structure**
- **Same RTQC & quality indexes**
- **NRT** (near real time) and **REP** (reprocessed) products

Functions implemented:

- **Acquisition** from international networks and regional providers
- **Quality control:** agreed procedures following EuroGOOS DATA-MEQ WG recommendations in coherence with international agreements (SeaDataNet,...)
- **Product validation & assessment:** assess the consistency of the data



In Situ TAC: activities during 2017 (1)

Operations

- **April 2017: V3 entry into Service**
- **Wave data in NRT**
- **Improve the homogeneity between the INSTAC DUs & develop a NetCDF checker**
- **Improve automated control procedures to check operations & service**
- **Improve and develop new KPIs to both monitor and provide more easy information**
- **Monitor the dissemination using ICINGA tool**
- **Add new providers and stations (NRT and historical) in particular for wave and BGC.**

Statistics about INSTAC Service:

#Monthly average	#Providers	#Platforms	#Users	#Files distributed	#Bytes downloaded
IBI	+45	+720	~21	+700.000	~148 Gb
Global	+170	+8200	~55	+3.900.000	~1200 Gb



In Situ TAC: activities during 2017 (2)

System evolution

- **Merged CORA4 + EN4 T&S global product**
- **Implementation of Min/Max method for T&S REP products**
- **REP currents product from drifters (1990 – 2016)**
- **Development of BGC REP product:**
 - BGC delayed mode quality control assessment
- **Development of Wave REP product**
 - Historical data & Validation. Include wave spectral information and directional spreading
- **In Situ TAC website: <http://www.marineinsitu.eu/>**
 - Including a dashboard & Key Performance Indicators (about the service)



In Situ TAC Products in 2018

- **T&S** NRT (daily) and REP (yearly update): Global and Regional
Provided since 2015
- **UV** (current) from Drifters REP (yearly update): Global
Provided since 2016
- **Wave** NRT (daily) and REP (yearly update): Global
Provided in NRT since 2017 and **REP 2018**
- **BGC** - O2 and Chla : NRT (daily) and REP (yearly update): Global
Provided in NRT since 2017 and **REP 2018**



In Situ TAC: changes and plans for Phase 2

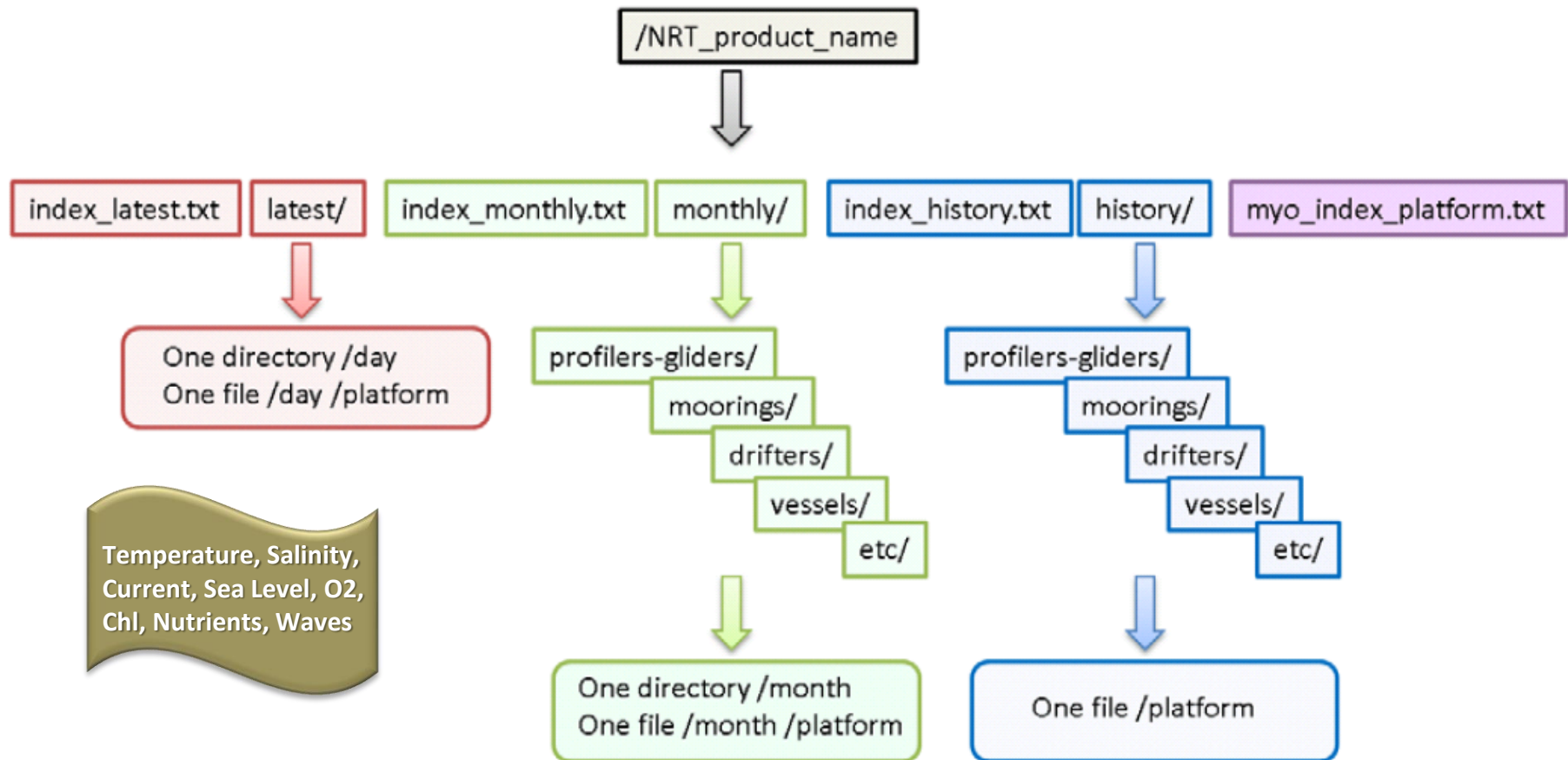
- One common Distribution Unit: DIAS (Data Information and Access Service) cloud system → **Unique FTP access** for all the CMEMS products
- **HF Radar integration** following INCREASE Service Evolution project coordinated by AZTI
Planned NRT for 2019 and REP 2020
- **Carbon data integration** in link with ICOS-Ocean operated by University of Bergen
Planned NRT & REP for 2019
- Prepare Ocean Monitoring Indicators (OMIs)
Planned for 2018, 2019 & 2020
- Integration of CLS activities related to INSTAC product customisation for Mercator

In Situ TAC: FTP structure (NRT)

Access with Copernicus user & passwd (free registration)

NRT product: data received in real time

history directory: aggregated NRT data



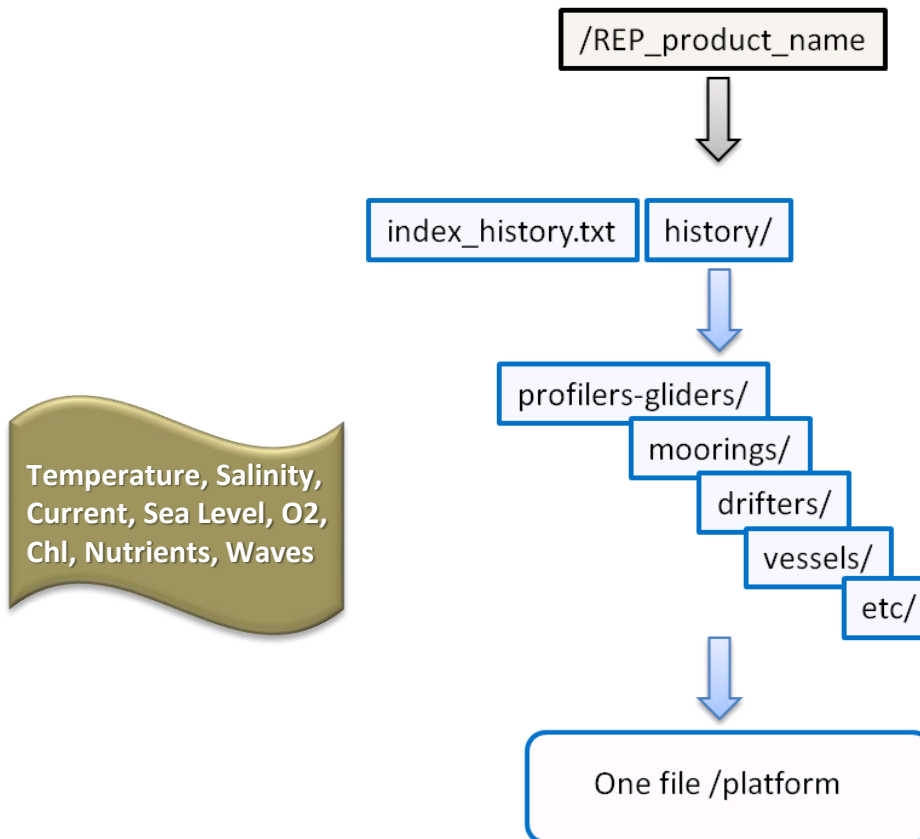


In Situ TAC: FTP structure (REP)

Access with MyOcean – Copernicus user & passwd

REP product: validated and assessed data

history directory: validated and assessed data from providers or NRT product





Metadata Index Files

index_latest.txt

```
# Title : in-situ observations catalog
# Description : catalog of available IBI in-situ observations per platform.
# Project : MyOcean (generated by Puertos del Estado-SPAIN).
# Format version : 1.1.
# Date of update : 20151120072253
# product_id,file_name,geospatial_lat_min,geospatial_lat_max,geospatial_lon_min,geospatial_lon_max,time_coverage_start,time_coverage_end,
provider,date_update,data_mode,parameters
MYO_IBIROOS_01,ftp://arcas.puertos.es/Core/INSITU_IBI_NRT_OBSERVATIONS_013_033/latest/20151109/GL_LATEST_PR_GL_58970_20151109.nc,43.3013,43.38,7.91735,8.03727,2015-11-09T01:19:34Z,2015-11-09T22:43:07Z,INSU Institut National des Sciences de l'Univers,2015-11-17T08:12:15Z,R,DC_REFERENCE PRES CNDC TEMP_DOXY CDOM TEMP PSAL
MYO_IBIROOS_01,ftp://arcas.puertos.es/Core/INSITU_IBI_NRT_OBSERVATIONS_013_033/latest/20151110/GL_LATEST_PR_GL_58970_20151110.nc,43.2865,43.3531,7.91254,8.0125,2015-11-10T01:02:48Z,2015-11-10T23:49:14Z,INSU Institut National des Sciences de l'Univers,2015-11-17T08:13:24Z,R,DC_REFERENCE PRES CNDC TEMP_DOXY CDOM TEMP PSAL
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MYO_IBIROOS_01,ftp://arcas.puertos.es/Core/INSITU_IBI_NRT_OBSERVATIONS_013_033/latest/20151023/IR_LATEST_TS_MO_13130_20151023.nc,28.18848,28.19824,-15.80078,-15.79102,2015-10-23T00:00:00Z,2015-10-23T23:00:00Z,Puertos del Estado (Spain),2015-10-25T18:10:02Z,R,DEPH VTDH VTZA VDIR ATMS DRYT WSPD WDIR HCSP HCDT TEMP PSAL
```

myo_index_platform.txt

```
# Title : in-situ platforms catalog
# Description : catalog of available IBI in-situ platforms.
# Project : MyOcean (generated by Puertos del Estado-SPAIN).
# Format version : 1.0.
# Date of update : 20151120074057
# platform_code,creation_date,update_date,wmo_platform_code,data_source,institution,institution_edmo_code,parameter,last_latitude_observation,
last_longitude_observation,last_date_observation
1900602,2010-01-01T00:00:00Z,2014-12-13T20:56:01Z,1900602,GL_LATEST_TS_PF_1900602 GL_XXXXXX_TS_PF_1900602,IFREMER,1054,DC_REFERENCE POSITIONING_SYSTEM PRES TEMP PSAL,9.96921E36,9.96921E36,2013-04-23T21:36:58Z
1900616,2010-01-01T00:00:00Z,2013-04-06T11:39:35Z,1900616,GL_LATEST_TS_PF_1900616 GL_XXXXXX_TS_PF_1900616,SHOM,540,DC_REFERENCE POSITIONING_SYSTEM PRES PRES_ADJUSTED TEMP PSAL,48.857,-10.431,2010-09-07T12:35:27Z
62024,2010-01-01T00:00:00Z,2015-11-20T06:10:03Z,62024,IR_LATEST_TS_MO_62024 IR_XXXXXX_TS_MO_62024,Puertos del Estado (Spain),2751,DEPH VTDH VTZA VDIR ATMS DRYT WSPD WDIR HCSP HCDT TEMP PSAL,43.645,-3.04443,2015-11-20T05:00:00Z
62092,2010-01-01T00:00:00Z,2015-11-20T06:10:03Z,62092,IR_LATEST_TS_MO_62092 IR_XXXXXX_TS_MO_62092,Marine Institute (Ireland),396,DEPH VTDH VTZA WSPD WDIR,51.2162,-10.5506,2015-11-20T04:00:00Z
```



File Naming

File naming convention in the latest directory:

RR_LATEST_XX_YY_CODE_YYYYMMDD.nc

Example: GL_LATEST_PR_GL_58970_20151112.nc

File naming convention in the monthly directory:

RR_YYYYMM_XX_YY_CODE.nc

Example: IR_201510_TS_MO_62024.nc

File naming convention in the history directory:

RR_XX_YY_CODE.nc

Example: IR_TS_MO_MotrilTG.nc

- **RR**: region bigram
- **LATEST**: fixed name
- **YYYYMMDD**: year month day of observations
- **XX**: TS (timeserie) or PR (profile)
- **YY**: data type
- **CODE**: platform code
- **.nc**: NetCDF file extension

Data types

- **BA** Data from Bathy messages on GTS
- **CT** CTD profiles
- **DB** Drifting buoys
- **FB** Ferrybox
- **GL** Gliders
- **MO** Fixed buoys or mooring time series
- **PF** Profiling floats vertical profiles
- **RE** Recopesca
- **RF** River flows
- **TE** Data from TESAC messages on GTS
- **TS** Thermosalinographs
- **XB** XBT or XCTD profiles

Region bigram

- **GL** Global
- **AR** Arctic
- **BO** Baltic
- **NO** North West Shelf
- **IR** IBI (Iberia-Biscay-Ireland)
- **MO** Mediterranean
- **BS** Black Sea



Regional IBI In Situ TAC organization (2018)

IBI INSTAC Operations. Roles & responsibilities:

- **Puertos del Estado:** Coordination. NRT production and validation (assigned providers). Waves REP validation and assessment.
- **Ifremer:** Contribution to the NRT production and validation for French providers & Lagrangian and underway platforms.
- **Oceanscope:** T&S REP product validation and assessment
- **BSH:** PU for IBI region. NRT production and validation for assigned providers in the overlapping area IBI-NWS.



IBI In Situ TAC Work breakdown structure

Institute	Coordination Production Monitoring Product transition	Production Unit PU	Prod Quality NRT Assessment	Product Quality multi-year assessment (REP)
Puertos del Estado	IBI	IBI, MED, NWS, GLO	IBI (MED, NWS)	IBI Wave
Ifremer	GLO	IBI, ARC, BAL, NWS, MED, BS	GLO IBI	GLO T & S & Wave
BSH	NWS	NWS, IBI, GLO	NWS (IBI)	NWS T & S & Wave
OceanScope	-		-	GLO (T&S) IBI (T & S)



IBI In Situ TAC providers

Fixed stations (Moorings)

- **Buoys**
- **Tide Gauges,**
- **Platforms,**
- **Lightships,**
- **River flow stations**

Providers

- **Spain:**
 - Puertos del Estado, IEO, Euskalmet, Xunta Galicia, SOCIB
- **Portugal:**
 - Instituto Hidrografico, University of Azores, DGT
- **France:**
 - SHOM, MétéoFrance, Ifremer, CETMEF, CEREMA
- **Ireland:**
 - Marine Institute (buoys & tide gauges)
- **UK:**
 - UKMO, EA (UK tide gauges), CEFAS

New coastal stations & historical wave data

Lagrangian and underway stations:

- **Profilers-gliders:**
 - ARGO, CTD, Gliders, XBT and other profiles
- **Drifters**
- **Vessels**

Providers

- **EuroARGO** (BSH, IEO, Ifremer, RNMI, UKMO, MI, SHOM, LOV,...)
- Data from **GTS** (Global Telecommunication System)
- **SeaDataNet** (Historical)
- Non European: NOAA, WOODS HOLE O.I., Univ. Washington, US Navy, Inst. Ocean Sciences Victoria,...
- PLOCAN, Univ. College, SOCIB, IRD Brest, IRISH SHIPPING LTD, SBR, INSU,...



New In Situ TAC web site: <http://www.marineinsitu.eu/>

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ACCESS DATA



SUBMIT DATA



DASHBOARD



MONITORING



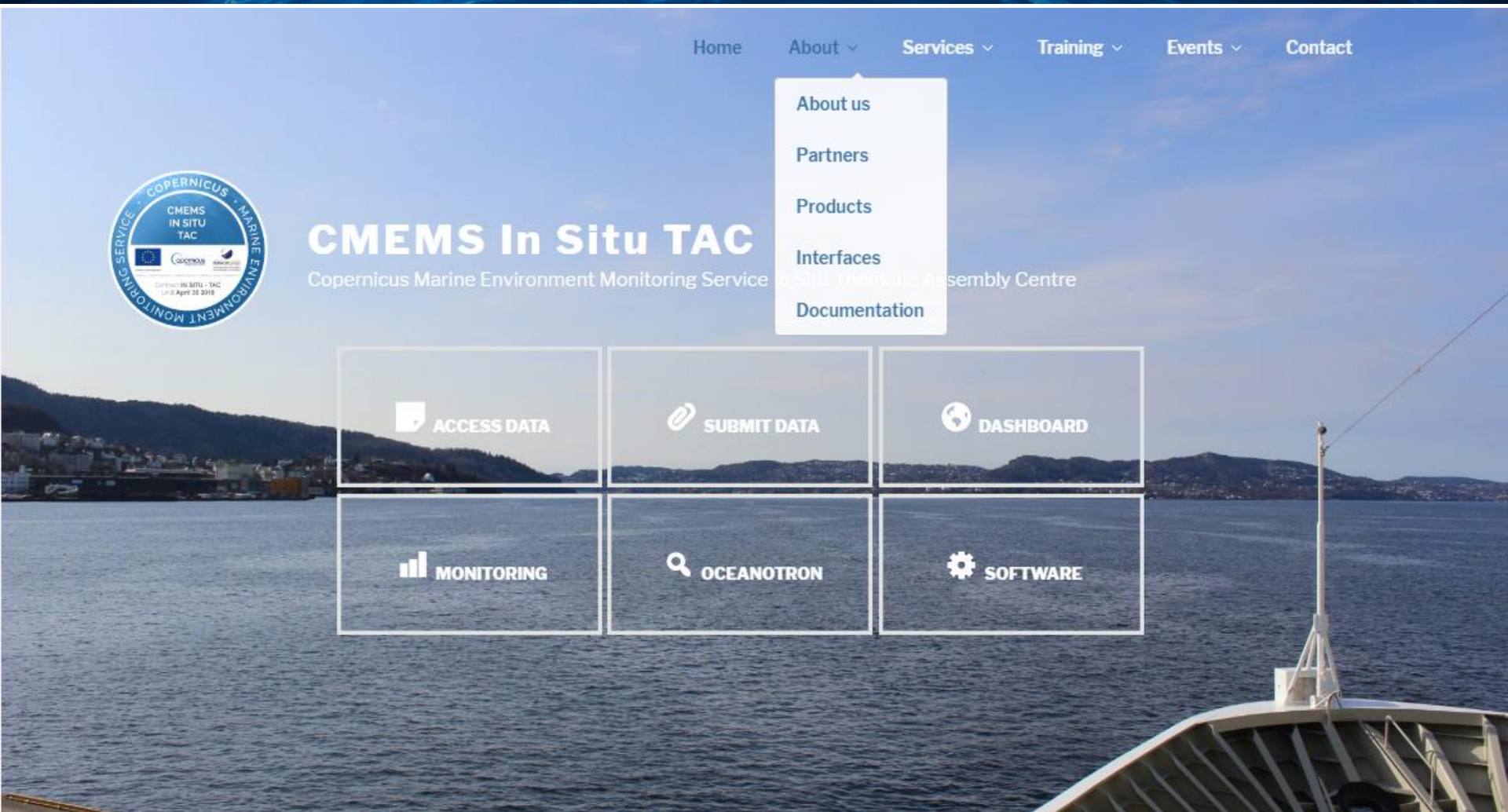
OCEANOTRON



SOFTWARE



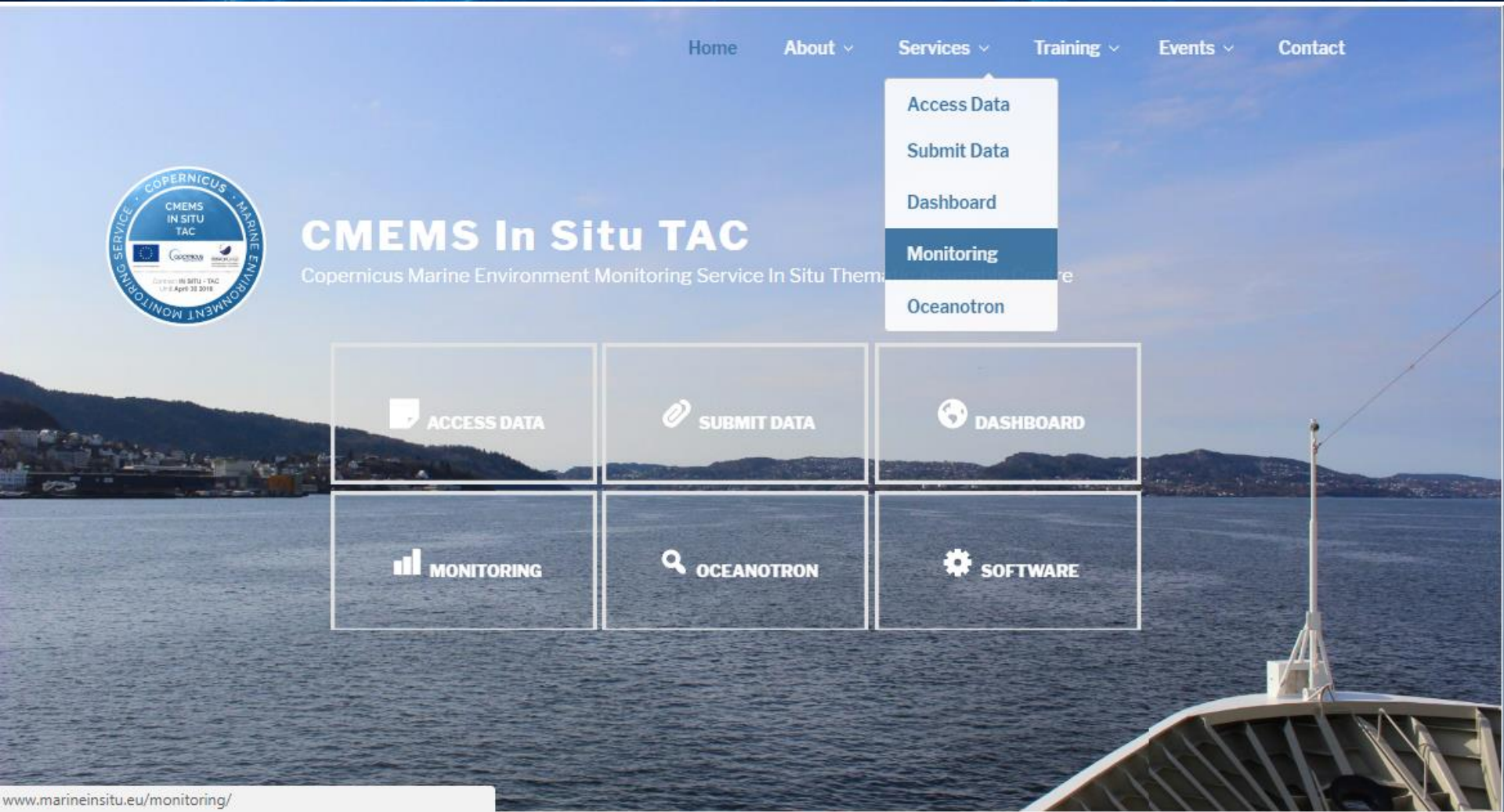
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Monitoring

<http://www.marineinsitu.eu/>



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Monitoring

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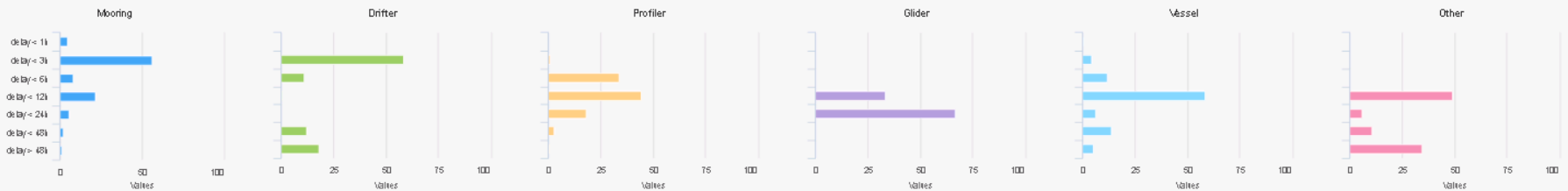


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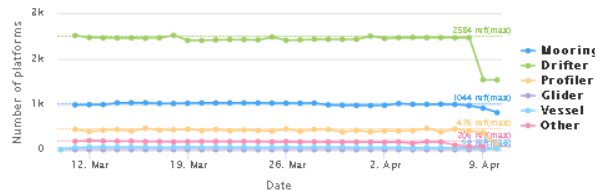
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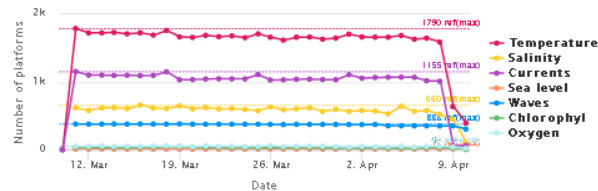
kpi1a : Delay of arrival during last week (%)



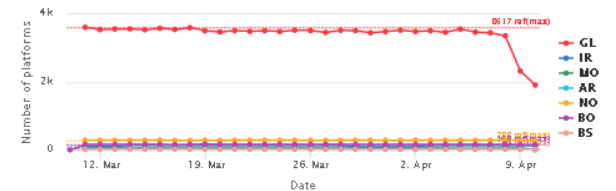
kpi2a : Number of platforms in the DU within a day per type



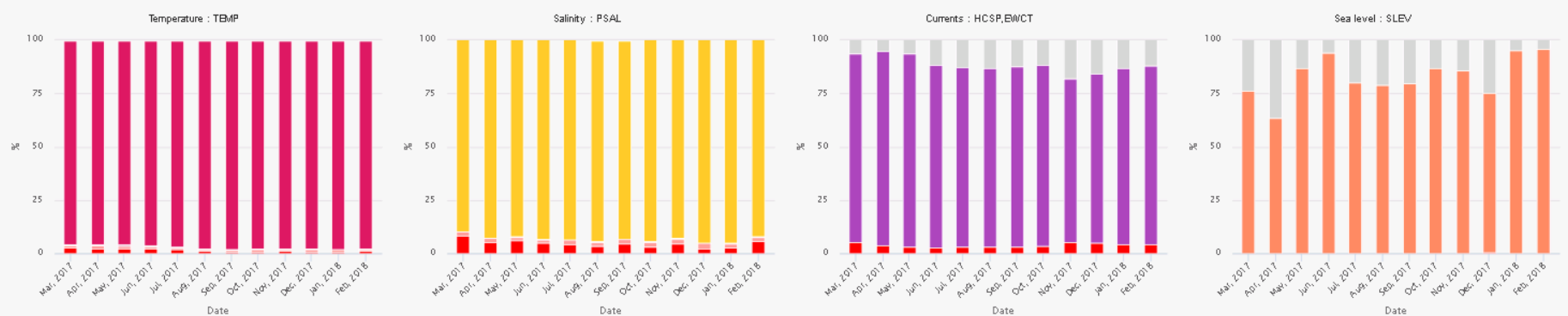
kpi2b : Number of platforms in the DU within a day per parameter



kpi2c : Number of platforms in the DU within a day per PU



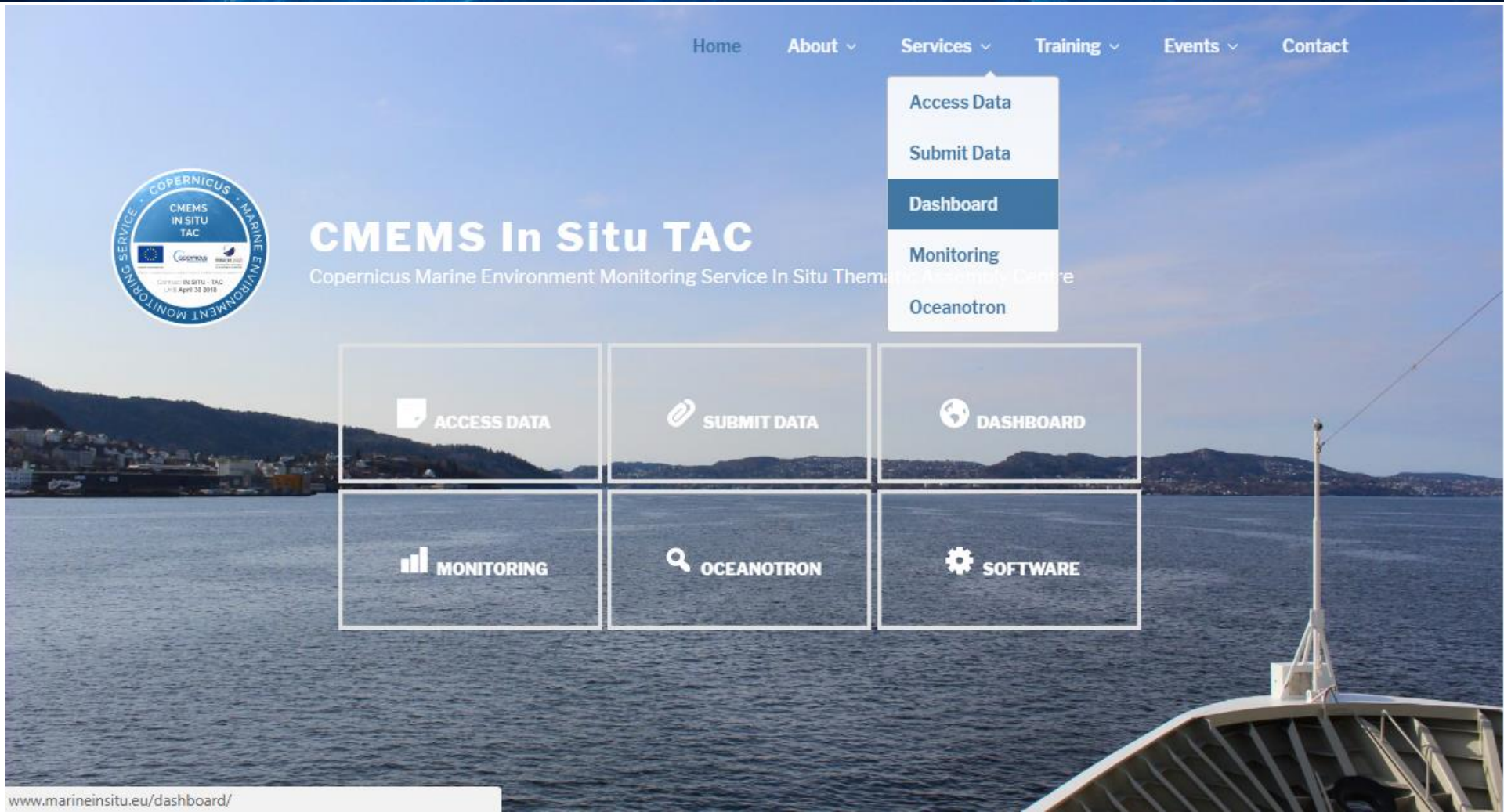
kpi3b : Data quality flag percentages per parameter during specified period in months





Dashboard

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Total number of platforms

37624

Since ever

Volume of data

2536 MB

From last 30 days

Data providers

315

From last 30 days

Number of users

161

From last 30 days

Number active platforms

7028

From last 30 days

Services availability

~ **99.9%**

From last 30 days



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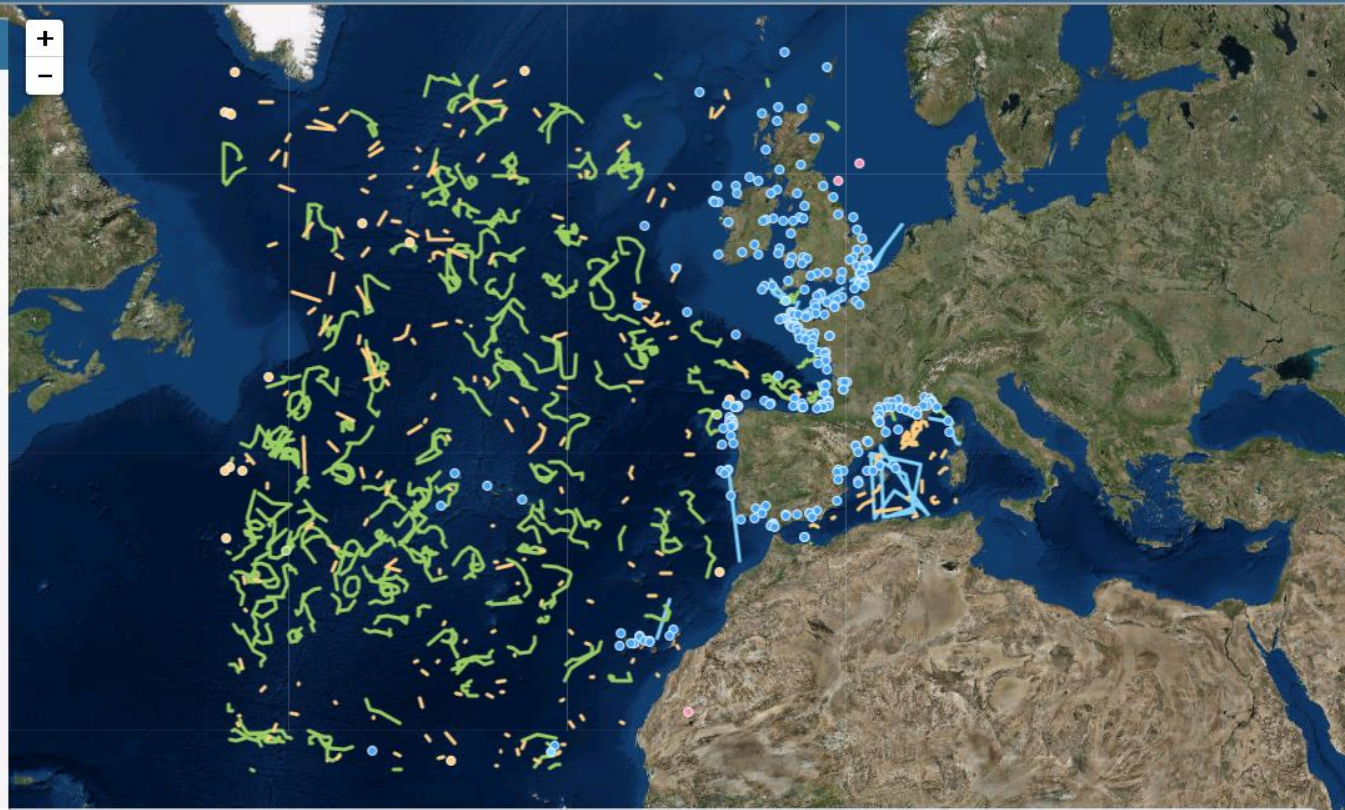
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Regions

INSTAC comprehends 7 regions of data collection. More info at: [Copernicus in situ TAC - CMEMS regions definition](#).

- Global
- Mediterranean
- Iberia-Biscay-Ireland
- North West Shelf
- Baltic
- Artic
- Black Sea



☑ Latest ☑ Iberia-Biscay-Ireland

2536

Data providers 315 From last 30 days	Number of users 161 From last 30 days	Number active platforms 7028 From last 30 days	Services availability ~ 99.9% From last 30 days
----------------------------------------------------------	-----------------------------------------------------------	--------------------------------------------------------------------	---------------------------------------------------------------------

Leaflet | Tiles © Esri — Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, AeroGRID, IGN, IGP, UPR-EGP, and the GIS User Community



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Platforms

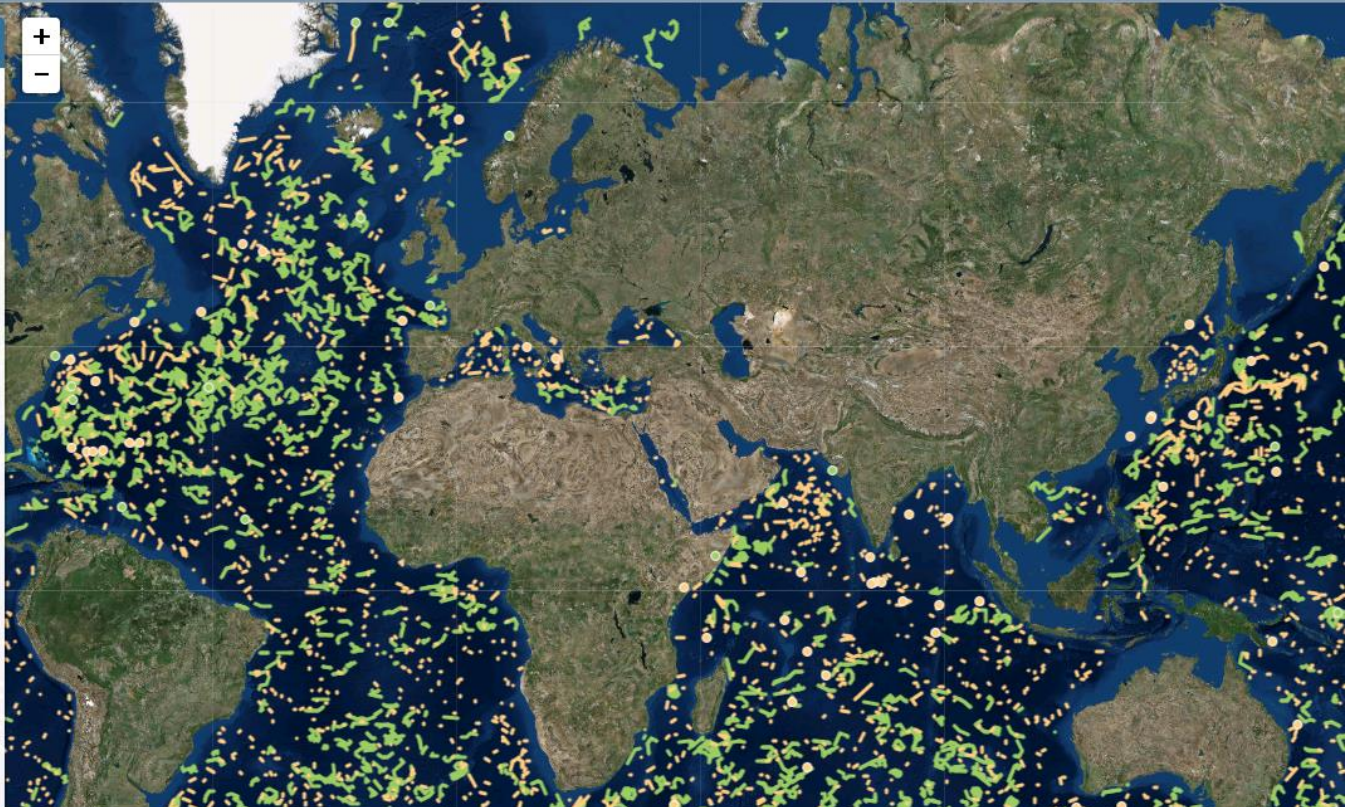
INSTAC groups datasets according to the platform on board of which those were collected differentiating 5 major groups: fixed stations (moorings, river flows, tide gauges...), drifters (reporting sea water currents or not), profilers & gliders, vessels (ferriboxes, XBTs, Miniloggers...) and others (Sea-Mammals, Bottles...).

Select the category you want to isolate from all displayed. More info at: [Product User Manual \(Platform category\)](#).

- Fixed stations
- Vessels
- Drifters
- Profilers&gliders
- Others

INSTAC distinguish in turn several subcategories (data origin) from within the previous categories. More info at [Product User Manual \(Data types\)](#).

- Moorings
- River flows
- Drifters (DC)
- Drifters (DB)
- Profilers
- Gliders
- Ferribox
- Recopesca
- XBTs
- Mini loggers
- TESAC
- CTDs
- Bottles
- ScanFish
- Sea mammals
- Thermosalinometer
- BATHY



☑ Latest ☑ Drifters ☑ Profilers&gliders ☑ Global

<p>Data providers</p> <p>315</p> <p>From last 30 days</p>	<p>Number of users</p> <p>161</p> <p>From last 30 days</p>	<p>Number active platforms</p> <p>7028</p> <p>From last 30 days</p>	<p>Services availability</p> <p>~ 99.9%</p> <p>From last 30 days</p>
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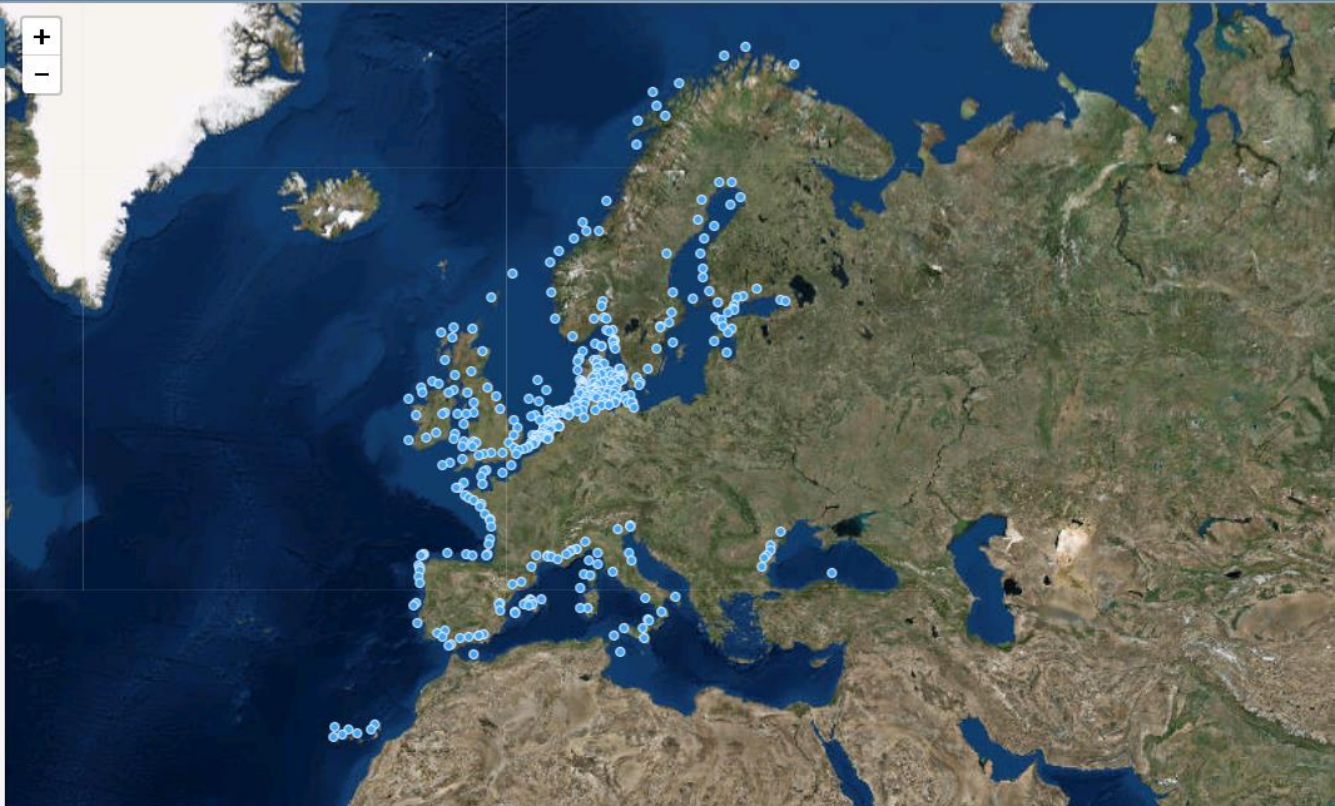
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Parameters

Abstraction of INSTAC list of parameters ie: PSAL and CNDC as 'Salinity'. More info at: [Copernicus in situ TAC - CMEMS System Requirements Document](#).

- Salinity
- Temperature
- Currents
- Sea Level
- Waves
- Chlorophyl
- Oxygen



Copernicus In Situ TAC

- Latest
- Sea Level
- Global

<p>Data providers</p> <p>315</p> <p>From last 30 days</p>	<p>Number of users</p> <p>161</p> <p>From last 30 days</p>	<p>Number active platforms</p> <p>7028</p> <p>From last 30 days</p>	<p>Services availability</p> <p>~ 99.9%</p> <p>From last 30 days</p>
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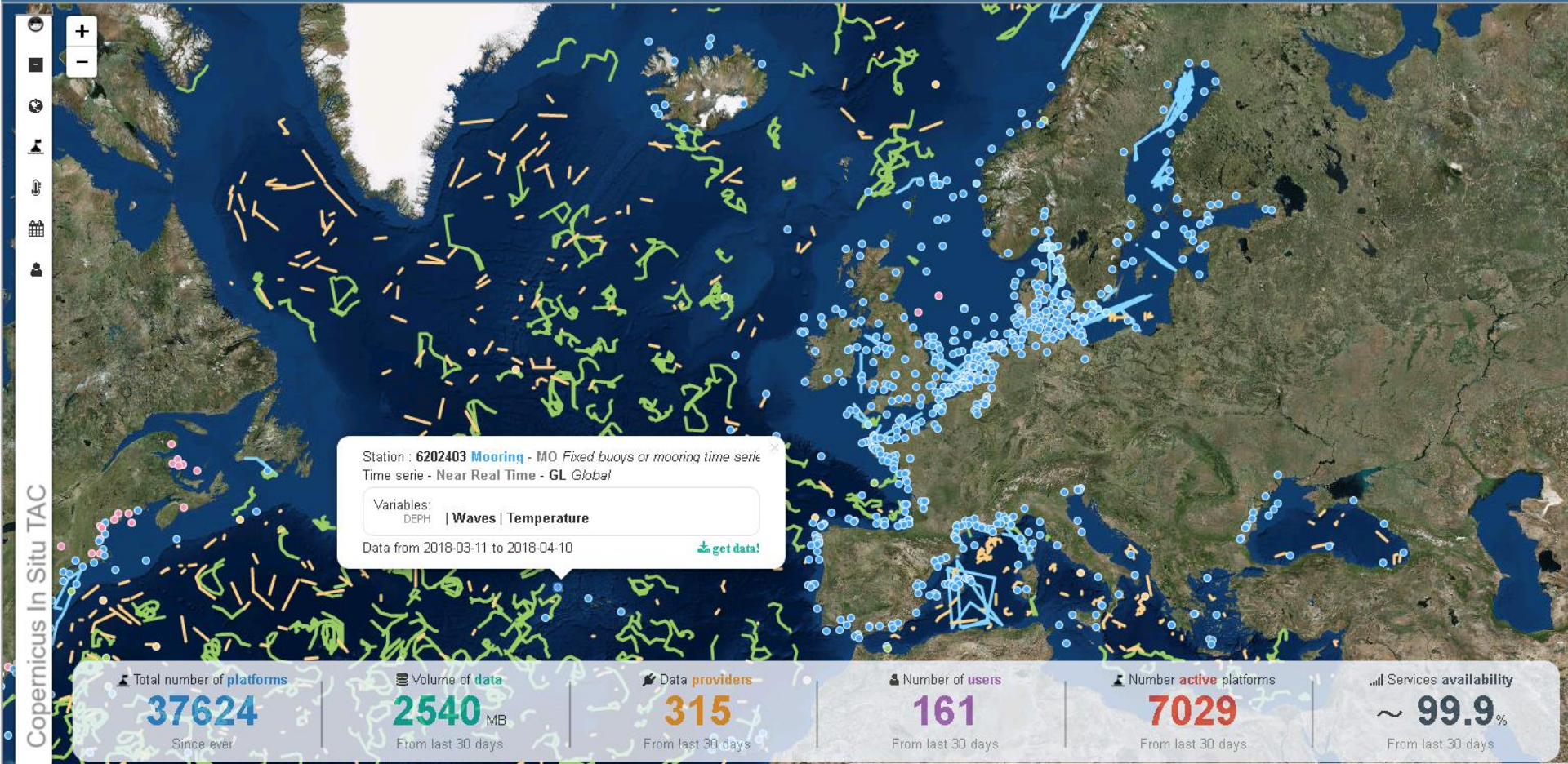
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New web site:
<http://www.marineinsitu.eu/>

In Situ TAC web site is not finished yet:

Missing providers acknowledgement!

- **Managed by EDMO (SDN European Directory of Marine Organizations) code**
- **Waiting for some regions to implement it.**
- **It should appear the name of provider, logo & URL.**

➔ Very soon!!



THANKS FOR YOUR ATTENTION!

OUR TEAM
Can we help you?

