#MarineData4Asia

1-Day Workshop - In Situ products overview

Miguel Ximenez

Software engineer at SOCIB: Balearic Islands Coastal Observing and Forecasting system

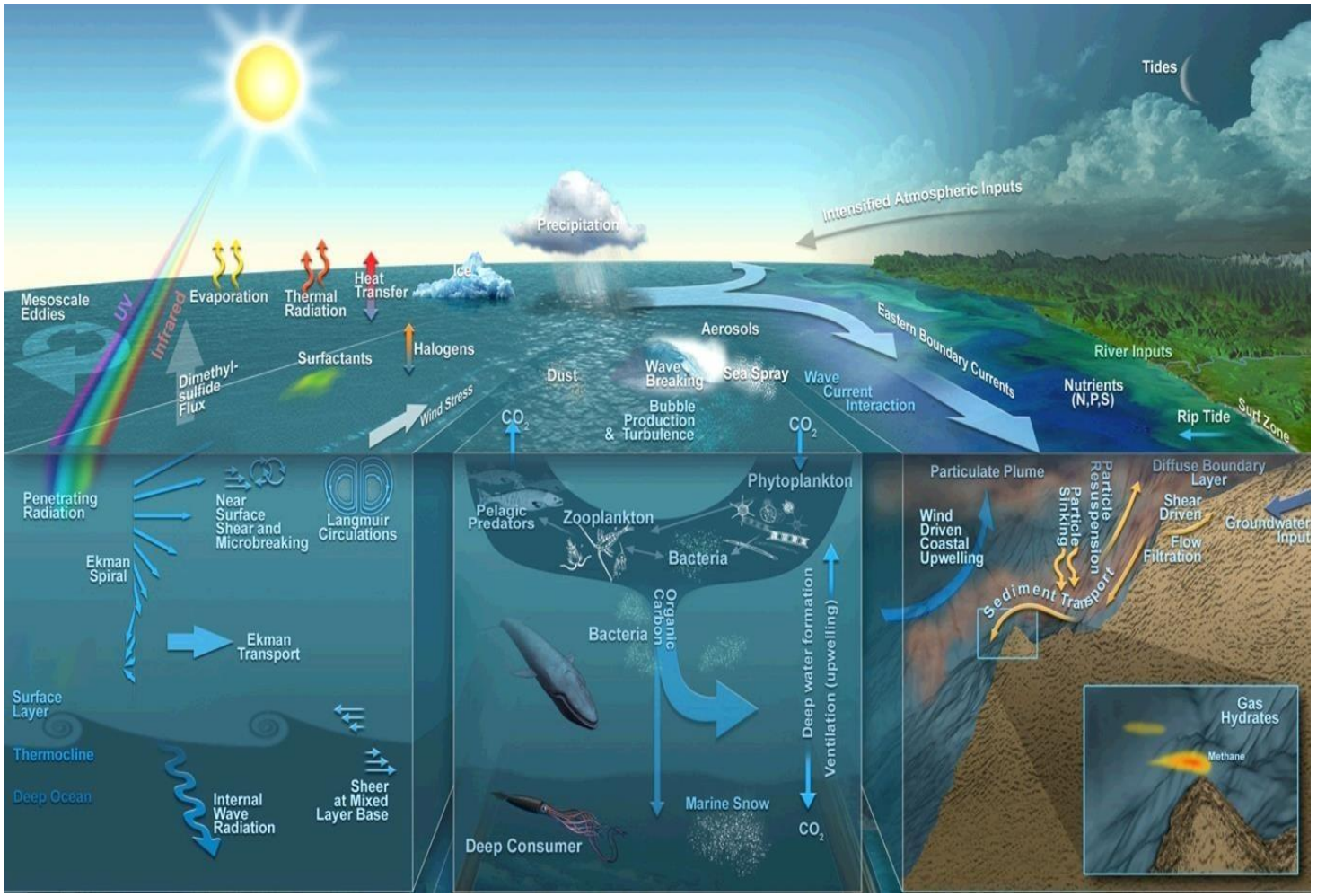
In situ data

> *Without sufficient **observations**, **useful prediction** will likely never be possible. Models will evolve and improve, but, without data, will be untestable, and observations not taken today are lost forever*

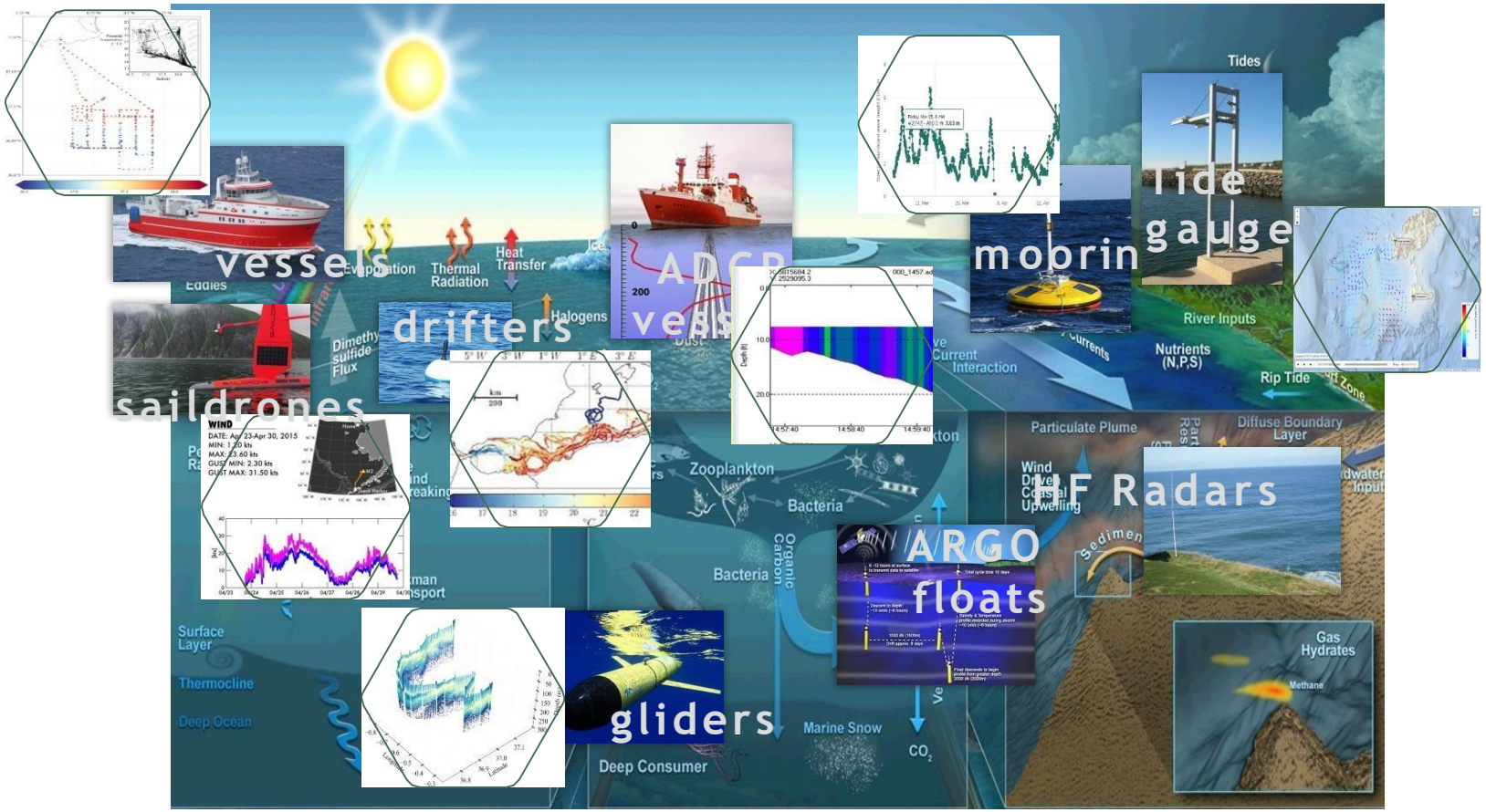
C. Wunsch et al. (2010) PNAS

In situ data: a complex ocean

#MarineData4Asia



In situ data: a multi-platform approach



In situ Component : Main objectives

1. Acquire:

Data from:

- Multiple sources
- Multiple platforms
- Heterogeneous formats

2. Guarantee

Consistency in:

- Quality Control
- data format
- naming conventions
- metadata attributes
- documentation

3. Provide:

< 24 hours

Products updated in Near real time

Twice per year

Re-processed 25-50 year products updated in delayed mode

4. Qualify for:

- Assimilation into numerical ocean models

- Model validation
- Assimilation in ocean reanalysis
- Climate studies

In situ Component : General description

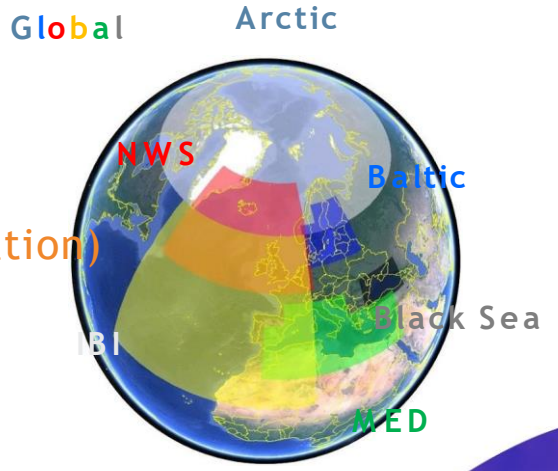
- **7 Components:**
  Global + 6 regions (Arctic, Baltic, NWS, IBI, MED & Black Sea)

- **Strong collaboration** with EuroGOOS, SeaDataNet and EMODnet

- **Open and free** data policy

- **Unique data access point:** Copernicus Marine Service catalogue (registration)
  https://data.marine.copernicus.eu/products

- **NetCDF4** data files
- **Index files** to ease navigation and search



In situ Products

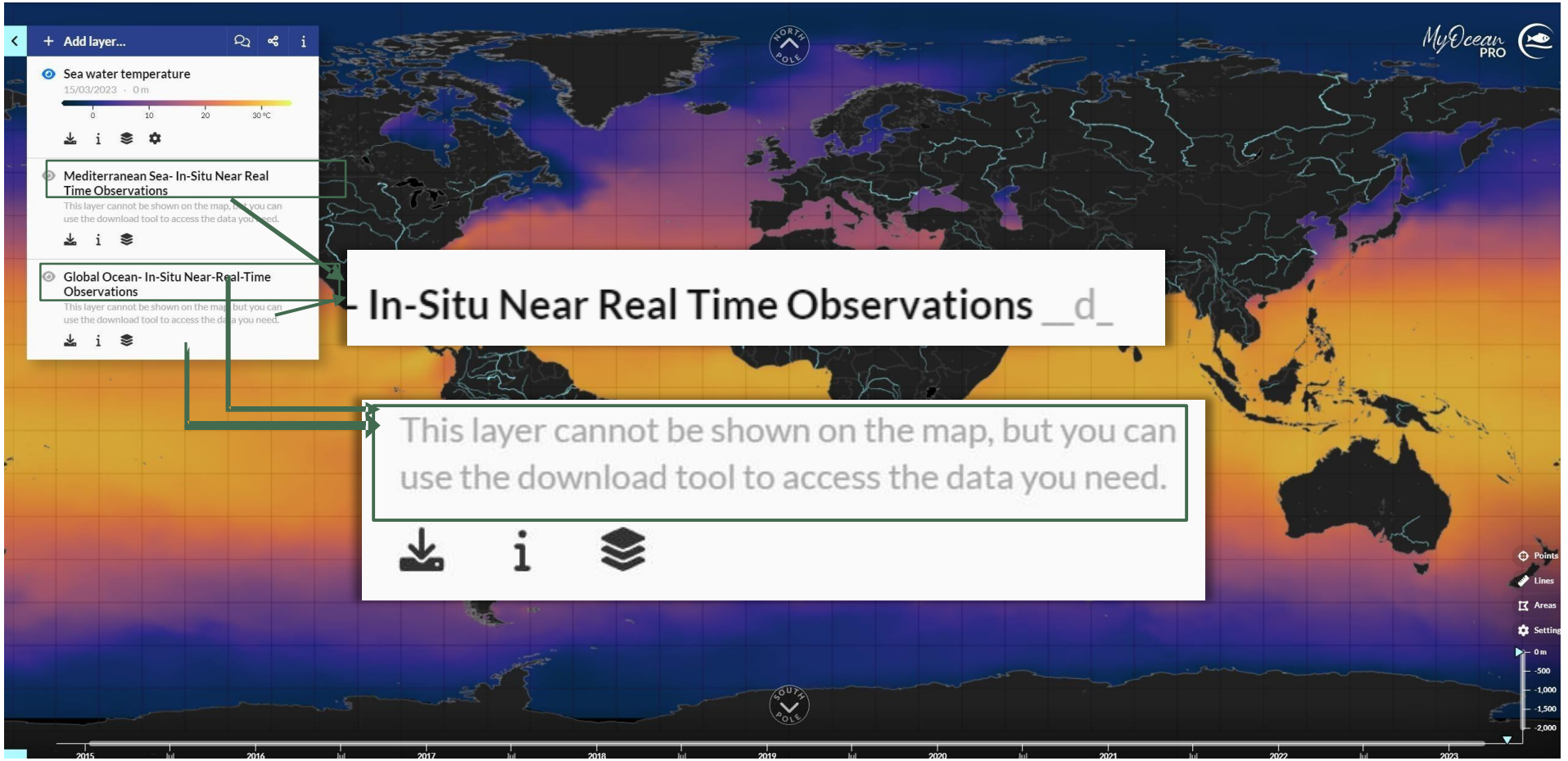
Product family	MY	MY-NRT
Update	Every 6 months	Every hour
Scope	Global	Global and regional
Quality Mode	Delayed mode	Delayed mode + Real Time (when delayed mode is not available)
Target	One topic (WAVE/ BGC/ TS/ UV/ Carbon/ SSH)	One or more topics
Products	INSITU_GLO_BGC_CARBON_DISCRETE_MY_013_050 INSITU_GLO_BGC_DISCRETE_MY_013_046 INSITU_GLO_PHY_SSH_DISCRETE_MY_013_053 INSITU_GLO_PHY_TS_DISCRETE_MY_013_001 INSITU_GLO_PHY_TS_OA_MY_013_052 INSITU_GLO_PHY_UV_DISCRETE_MY_013_044 INSITU_GLO_WAV_DISCRETE_MY_013_045	INSITU_ARC_PHYBGCWAV_DISCRETE_MYNRT_013_031 INSITU_BAL_PHYBGCWAV_DISCRETE_MYNRT_013_032 INSITU_BLK_PHYBGCWAV_DISCRETE_MYNRT_013_034 **INSITU_IBI_PHYBGCWAV_DISCRETE_MYNRT_013_033** **INSITU_MED_PHYBGCWAV_DISCRETE_MYNRT_013_035** INSITU_NWS_PHYBGCWAV_DISCRETE_MYNRT_013_036 **INSITU_GLO_PHYBGCWAV_DISCRETE_MYNRT_013_030** INSITU_GLO_PHY_TS_OA_NRT_013_002 INSITU_GLO_PHY_UV_DISCRETE_NRT_013_048 INSITU_GLO_UV_NRT_OBSERVATIONS_013_048

Documents associated with each product:

- **PUM** Product User Manual

Other documents (In Situ TAC): Format Manual, Parameters List, Useful Code…

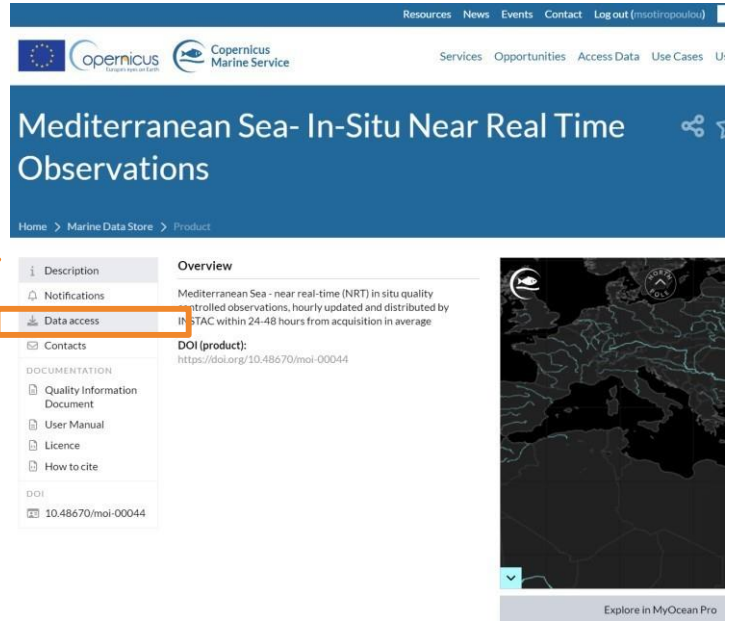
MyOcean Pro data visualization tool and In Situ observations

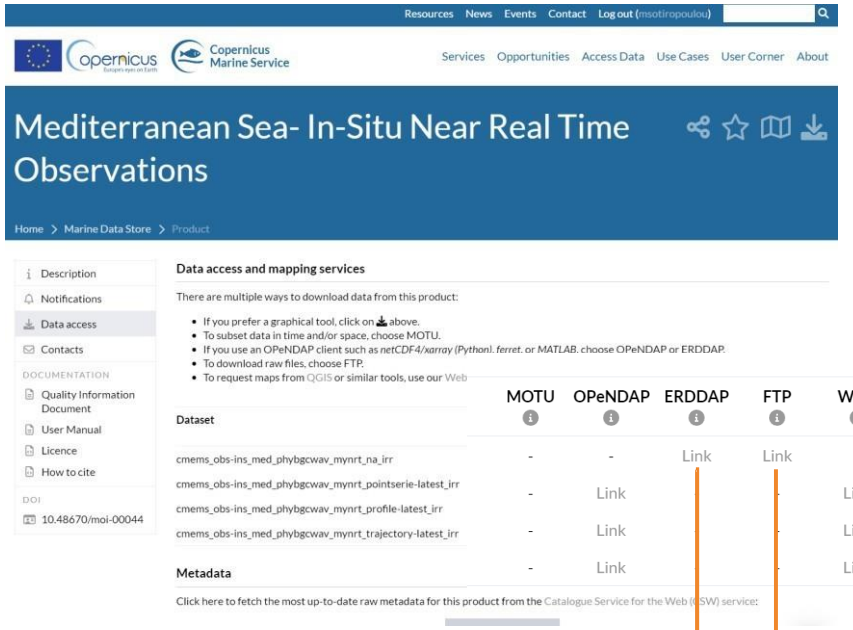


WORK in progress

Currently working on the integration of In Situ TAC products

In situ products: Data Access I - https://marine.copernicus.eu/

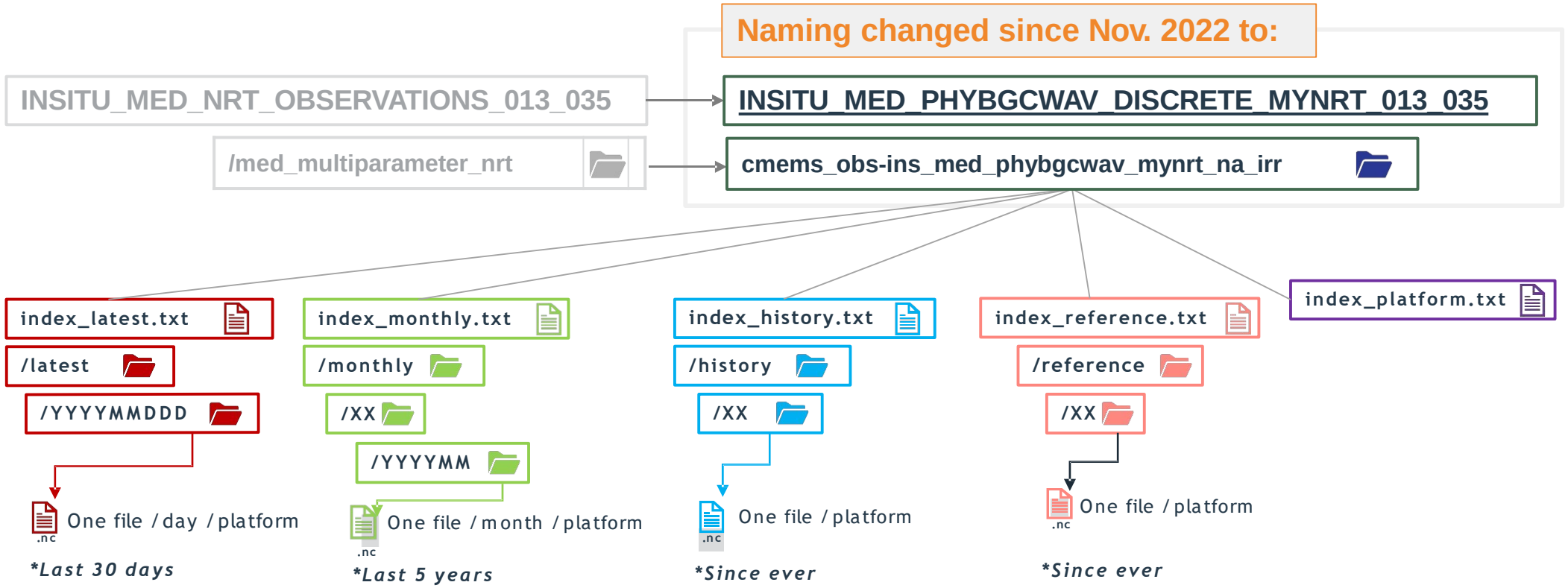




** ERDDAP:* ***only latest*** *files (latest 30 days)*

ftp://nrt.cmems-du.eu
/Core/INSITU_MED_PHYBGCWAV_DISCRETE_MYNRT_013_033/cmems_obs-ins_med_phybgcwav_mynrt_na_irr/

In situ products: FTP folders structure



XX = /BO /CT /DB /DC /FB /GL /HF /ML /MO /PF /RF /SD /SM /TG /TS /TX /VA /XB /XX

In situ products: File naming

Latest directory: RR_XX_YY_CODE_YYYYMMDD.nc
Monthly directory: RR_XX_YY_CODE_YYYYMM.nc
History directory: RR_XX_YY_CODE_ZZZ.nc

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

File types
- TS Time series
- PR Profile
- TV Total velocities (HF Radars)
- RV Radial velocities (HF Radars)
- WS Wave spectral data

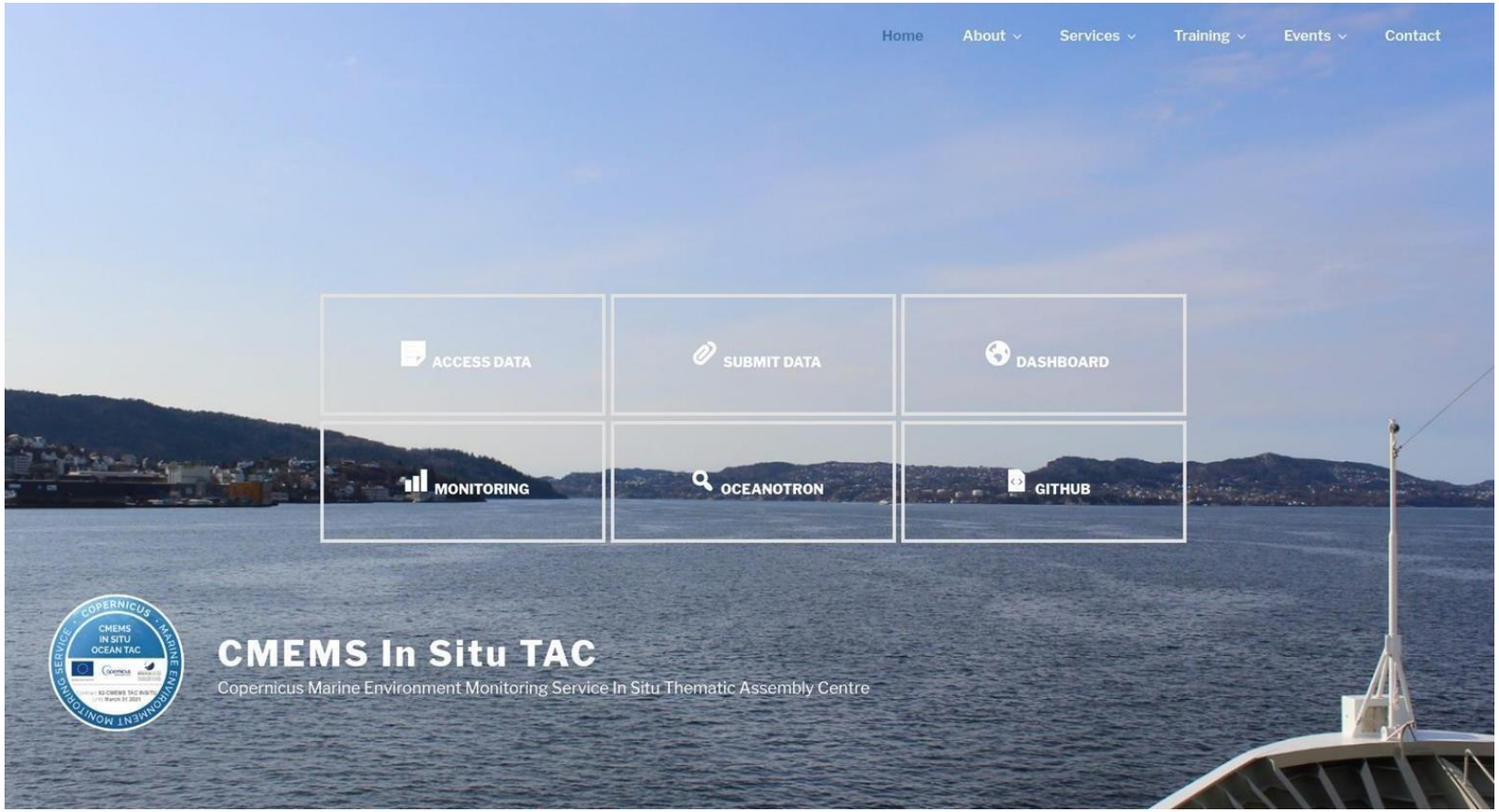
Data types
- PF profiling floats
- GL gliders
- MO fixed buoys, mooring time series
- RF River flow
- HF HF radar
- DB drifting buoys
- DC drifting buoy reporting current
- CT oceanographic CTD profiles
- BO bottle data
- FB ferrybox
- SF towed CTD data (ex: scanfish)
- TG Tide gauge station
- TS thermosalinograph data
- XB XBT or XCTD profiles
- ML mini logger for fishery observing system
- SM Sea mammals data
- XX Not yet identified data type

YYYYMMDD: year month day of observations
YYYYMM : year month of observations

.nc: NetCDF file name suffix

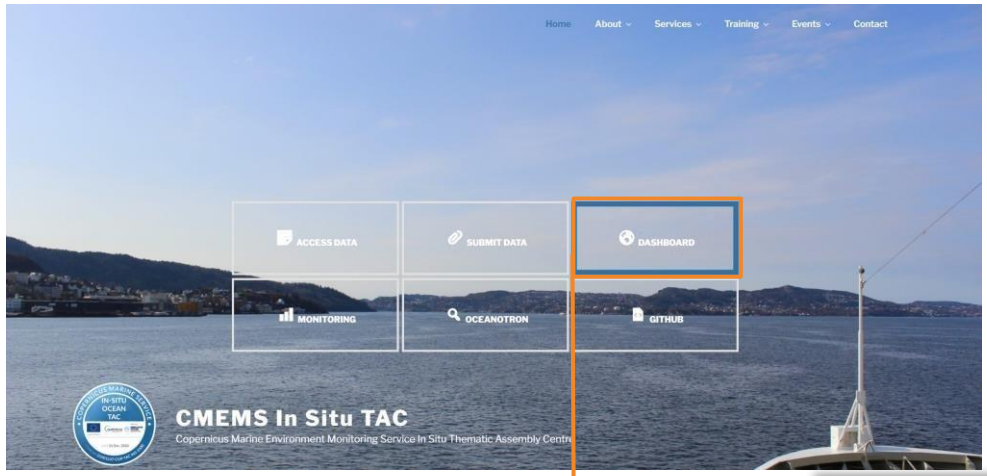
In situ products: Data Access II

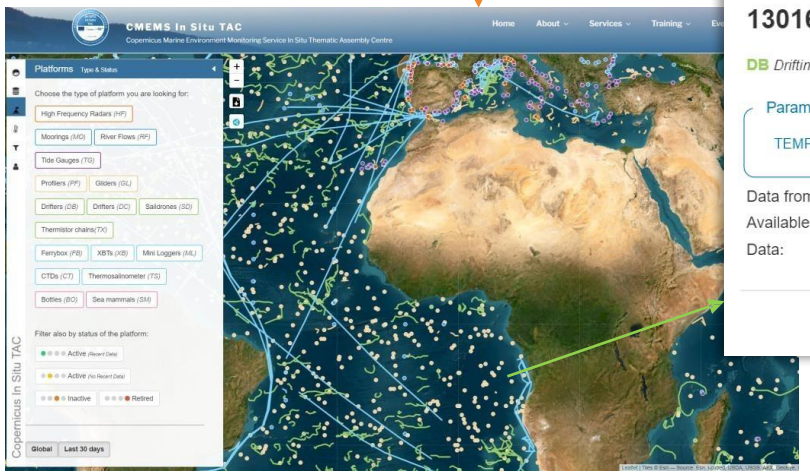
http://www.marineinsitu.eu/

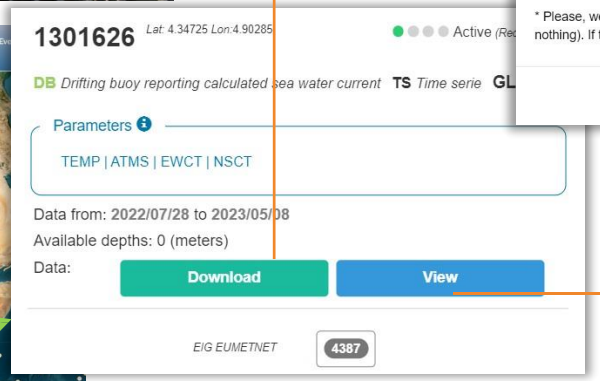


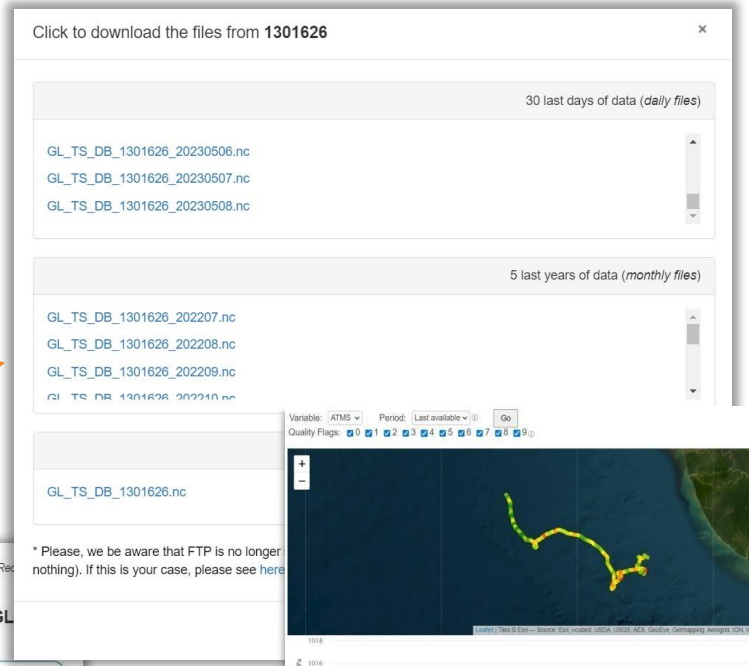
In situ products: Data Access II

http://www.marineinsitu.eu/dashboard/









http://www.marineinsitu.eu/submit-data/

SUBMIT DATA

Submit data to the Copernicus Marine Service In Situ TAC

Ocean data from observations can be provided to the Copernicus Marine Service In Situ TAC in exchange of data management added value services:

- More visibility: Data discovery and data access services
- Real time quality control
- Data formatting: NetCDF OceanSITES
- Data disseminatrion to individual users, operational oceanography community such as GTS or Copernicus

Submit data to the Copernicus Marine Service In Situ TAC is easy, only **Regional Copernicus Marine Service In Situ TAC Service Desk** has to be contacted:

- Ifremer (France) for the Global Ocean **Copernicus Marine Service-Global** cmems-service@ifremer.fr
- Puertos del Estado (Spain) for the Iberia-Biscay-Ireland region **Copernicus Marine Service-IBI** cmems-service@puertos.es
- HCMR (Greece) for the Mediterranean Sea **Copernicus Marine Service-MOON** cmems-service@hcmr.gr
- IOBAS (Bulgaria) for the Black Sea **Copernicus Marine Service-BlackSea** cmems-service@io-bas.bg
- IMR (Norway) for the Arctic **Copernicus Marine Service-Arctic** cmems-service@imr.no
- SMHI (Sweden) for the Baltic Sea **Copernicus Marine Service-BOOS** cmems-service@smhi.se
- BSH (Germany) for the North West Shelves region **Copernicus Marine Service-Noos** cmems-service@bsh.de

https://www.marineinsitu.eu/documentation/ #MarineData4Asia

Main documentation

- SRD – System Requirement Document
- PUM – Products User Manual
- PUM – Global ocean delayed mode currents from drifting buoys, Product User Manual
- Copernicus Marine Service In Situ TAC NetCDF format reference manual
- OceanSITES NetCDF format reference manual
- Regions definition
- Parameter List
- Data sources codes

Quality control procedures

- Recommendations for in-situ data Near Real Time Quality Control
- Copernicus In Situ TAC, Real Time Quality Control for WAVES
- BGC:
    - Quality Control of Biogeochemical Measurements within Copernicus in situ TAC
    - Real time quality control of biogeochemical measurements within Copernicus Marine in situ TAC
    - Copernicus in situ TAC, BGC data, Recommendations for Production Centers and Data Providers

Useful code:

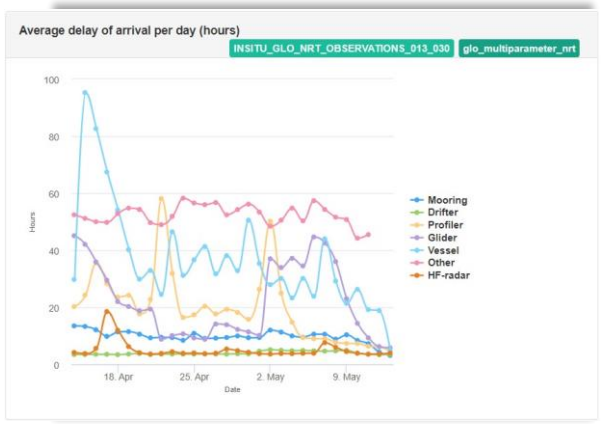
- In situ TAC file format checker
- Copernicus NetCDF file format checker
- Python code snippets to discover, subset, download and visualize Copernicus Marine Service insitu data files: repo | live

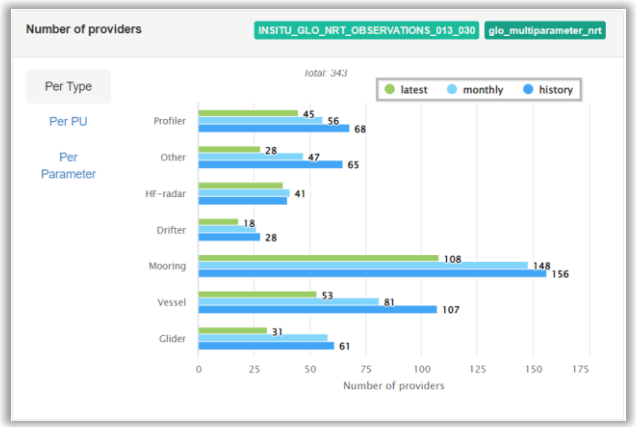
In Situ Monitoring

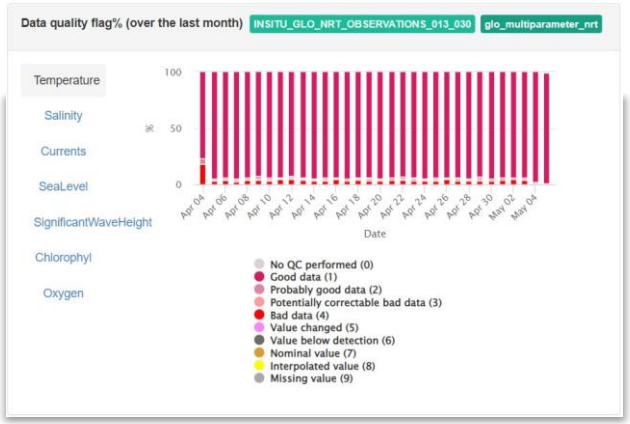
http://www.marineinsitu.eu/monitoring/

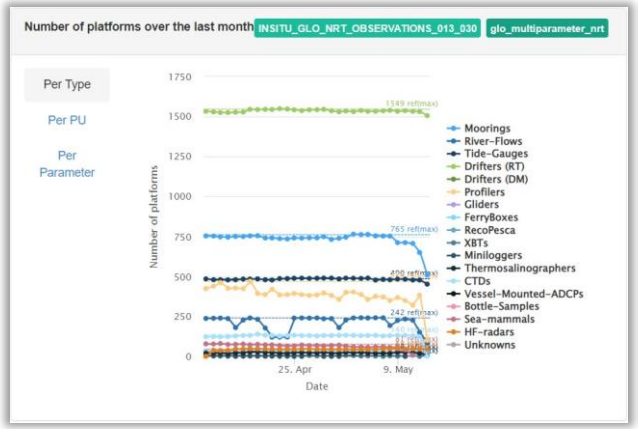
Key Performance Indicators (KPIs)

- Delay of Arrival
- Number of platforms
- Data Quality
- Data Providers
- Data Files



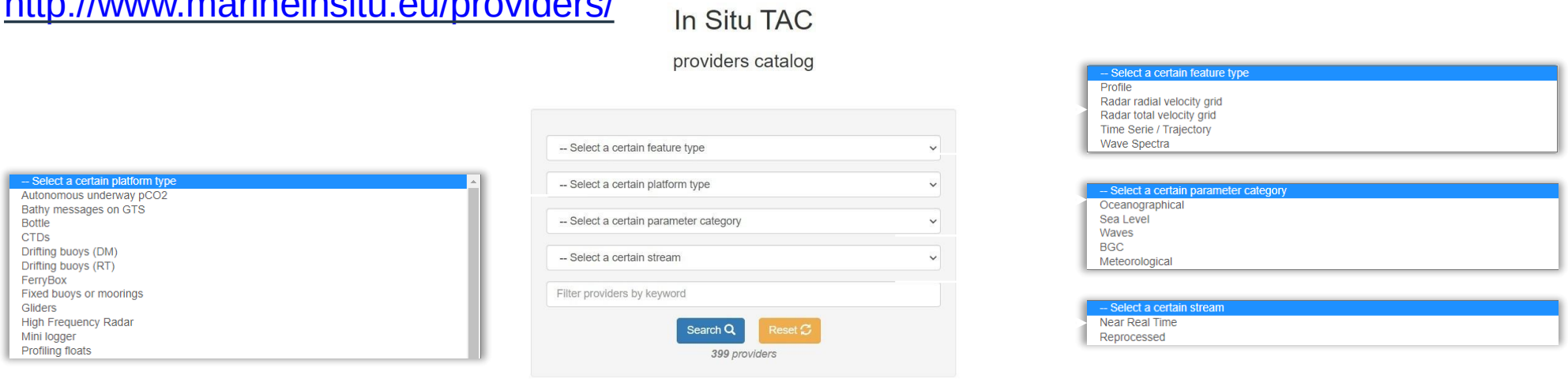




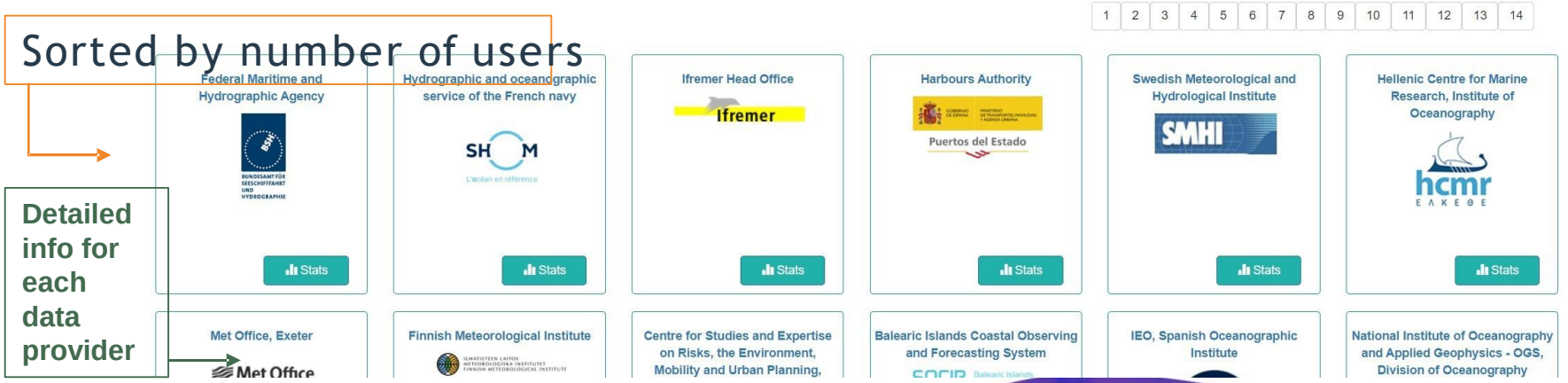


In Situ Providers Catalog

http://www.marineinsitu.eu/providers/



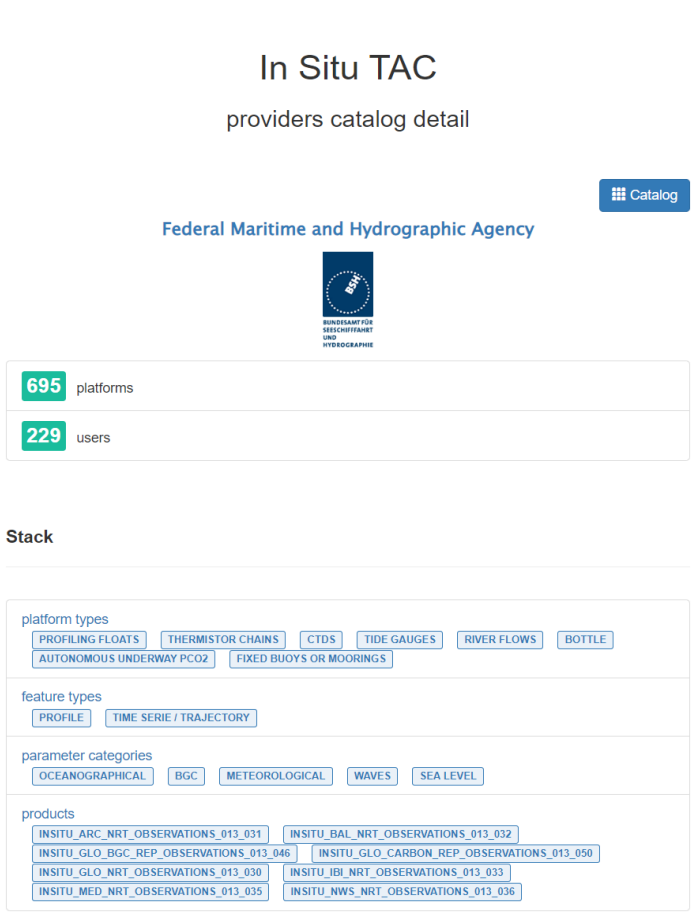
Sorted by number of users

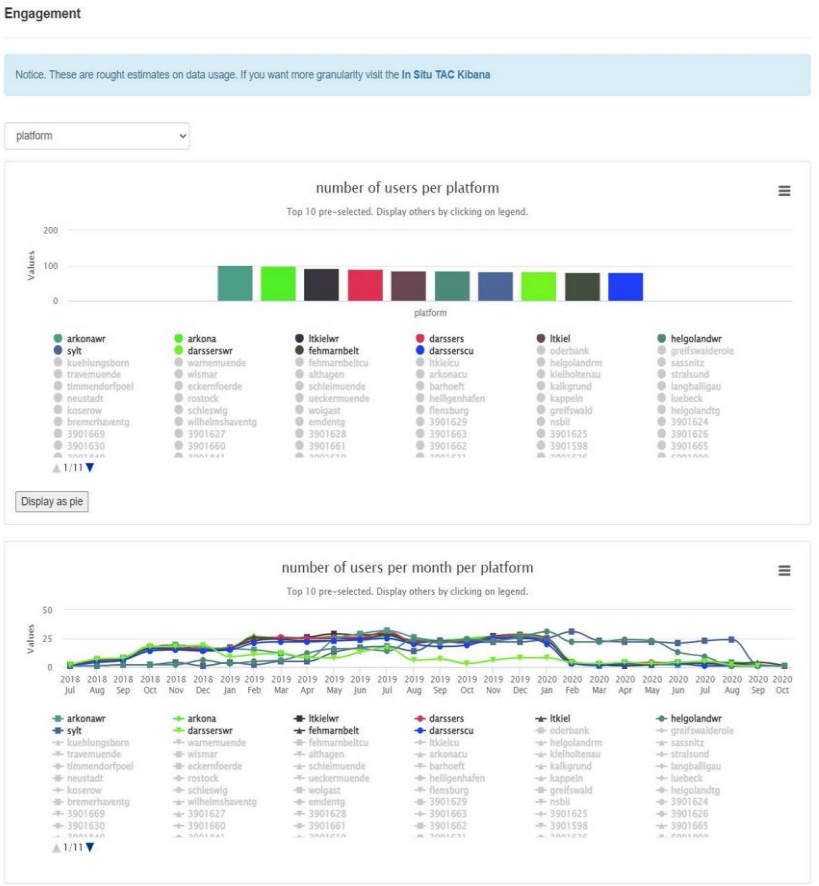


Detailed info for each data provider

In Situ Providers Catalog Details

http://www.marineinsitu.eu/providers/





For questions contact us at:

servicedesk.cmems@mercator-ocean.eu

Thank you