OCEANOPS METADATA MANAGEMENT FOR FIXED STATIONS

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OUTLINE

- Brief Overview of OceanOPS for GOOS
- GLOSS stations at OceanOPS
- OceanOPS metadata structure and contents
- Way forward

FROM JCOMMOPS TO OCEANOPS

Joint WMO-IOC office to support GOOS OCG networks

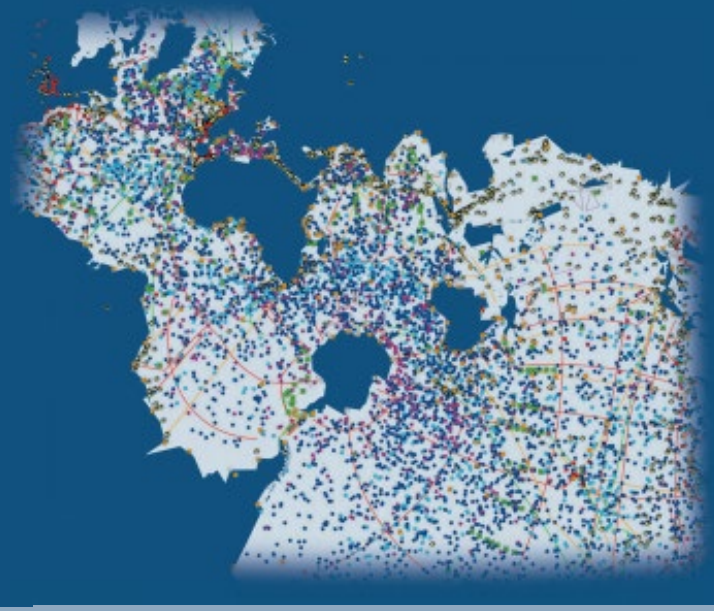
- Infrastructure developed since 2001 up to 8 people team in Brest/France (Ifremer) & Toulouse
  - 1 OceanOPS manager
  - 3 Network experts, focal points
  - 3 IT team (architecture, web, metadata)
  - 1 Communication officer
- 2018: Review through external panel
- 2019: formal WMO field office in France (integrated in the global Earth System approach)
- 2020: 5 year strategic plan (2021-2025): http://www.ocean-ops.org/strategy , developed with a diverse set of supporters and stakeholders.
- Rebrand, annual Report Card (https://www.ocean-ops.org/reportcard/), Issue 2022 in process

5-YEAR STRATEGY

Vision, Mission

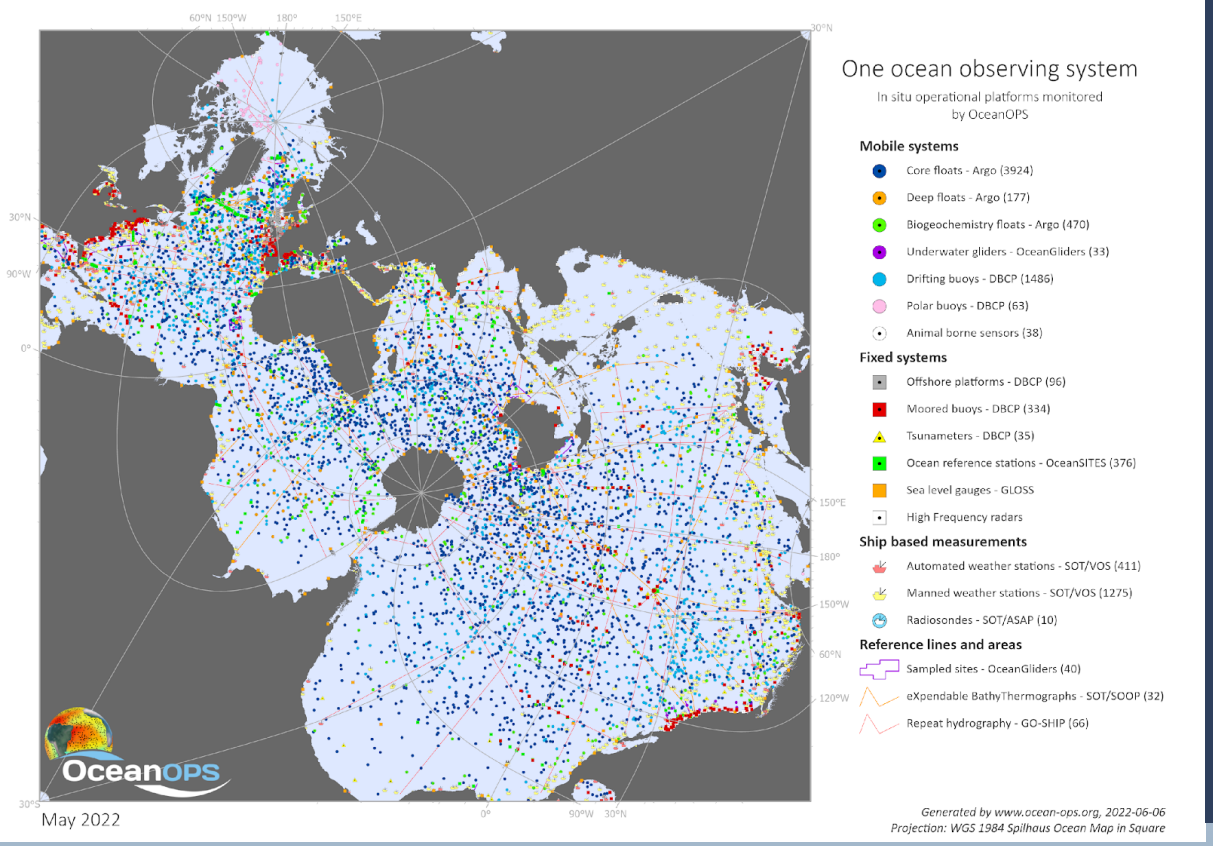
VISION

To be the international hub and center of excellence that provides vital services in monitoring, coordinating, and integrating data and metadata, across an expanding network of global oceanographic and marine meteorological observing communities.



MISSION

To monitor and report on the status of the global ocean observing system and networks, to use its central role to support efficient observing system operations, to ensure the transmission and timely exchange of high quality metadata, and to assist free and unrestricted data delivery to users across, operational services, climate and ocean health.



12 Ocean Observing Networks

80+ contributing countries

~9000 in situ operational platforms

>100,000 daily observations

Argo

DBCP WMO - IOC DATA BUOY COOPERATION PANEL

GLOBAL SEA LEVEL GLOSS OBSERVING SYSTEM

GO-SHIP

OceanSITES
Taking the pulse of the global ocean

SHIP OBSERVATIONS TEAM JCOMM

OceanGliders

ANIBOS

Global HF Radar Network

GOALS

Five high level goals are identified for OceanOPS to achieve its vision over the next 5 years (2021-2025). These goals focus on the core functions of OceanOPS, address the evolving needs of the ocean and marine meteorological observing communities, and identify the internal evolution needed to achieve this vision.

Goal 1

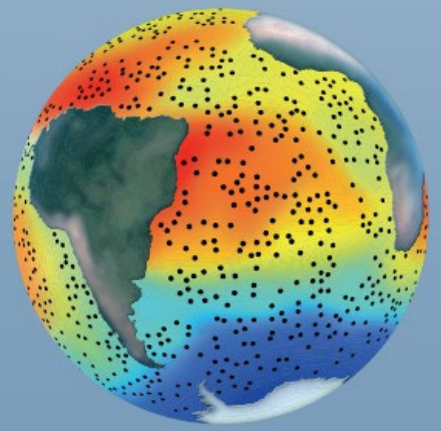
Monitoring for the improvement of global ocean observing system performance

OceanOPS monitors the status of the ocean observing networks, as well as the status of the global ocean observing system as a whole. It achieves this through development of tools and metrics that utilize metadata. By analyzing trends and reporting back to stakeholders, it encourages performance improvement and cost efficiency.

Goal 5

Shape OceanOPS infrastructure for the future

OceanOPS has developed organically for the last 20 years. It is now at a point where strategic restructuring of its resources and operations can address many crosscutting issues identified, and position it to be a highly valued community asset for the next 20+ years.



Goal 4

Enable new data streams & networks

One of the central drivers of OceanOPS is to support the global ocean observing networks in ensuring usable and accessible data, which includes enabling new data to be utilized by users.

Goal 2

Lead metadata standardization and integration across the global ocean observing networks

A core OceanOPS activity is to create harmonized metadata for each observing network, individually and across the ocean observing system collectively, which vastly increases data usability. It also enables OceanOPS to provide global monitoring capacity.

Goal 3

Support and enhance the operations of the global ocean observing system

The *in situ* global ocean observing system has a diverse set of operational needs that OceanOPS is positioned to support and enhance through its monitoring tools and community knowledge.

5-YEAR STRATEGY

HTTP://WWW.OCEAN-OPS.ORG/STRATEGY

5-YEAR STRATEGY

Goal 2

Lead metadata standardization and integration across the global ocean observing networks

Objective 2.1
Set and disseminate the standards and best practices for metadata harmonization across the OCG networks.

Objective 2.2
Develop the web services required for machine-to-machine metadata exchange and access.

Objective 2.3
Provide a harmonized and high-quality standard of metadata across all OCG networks.

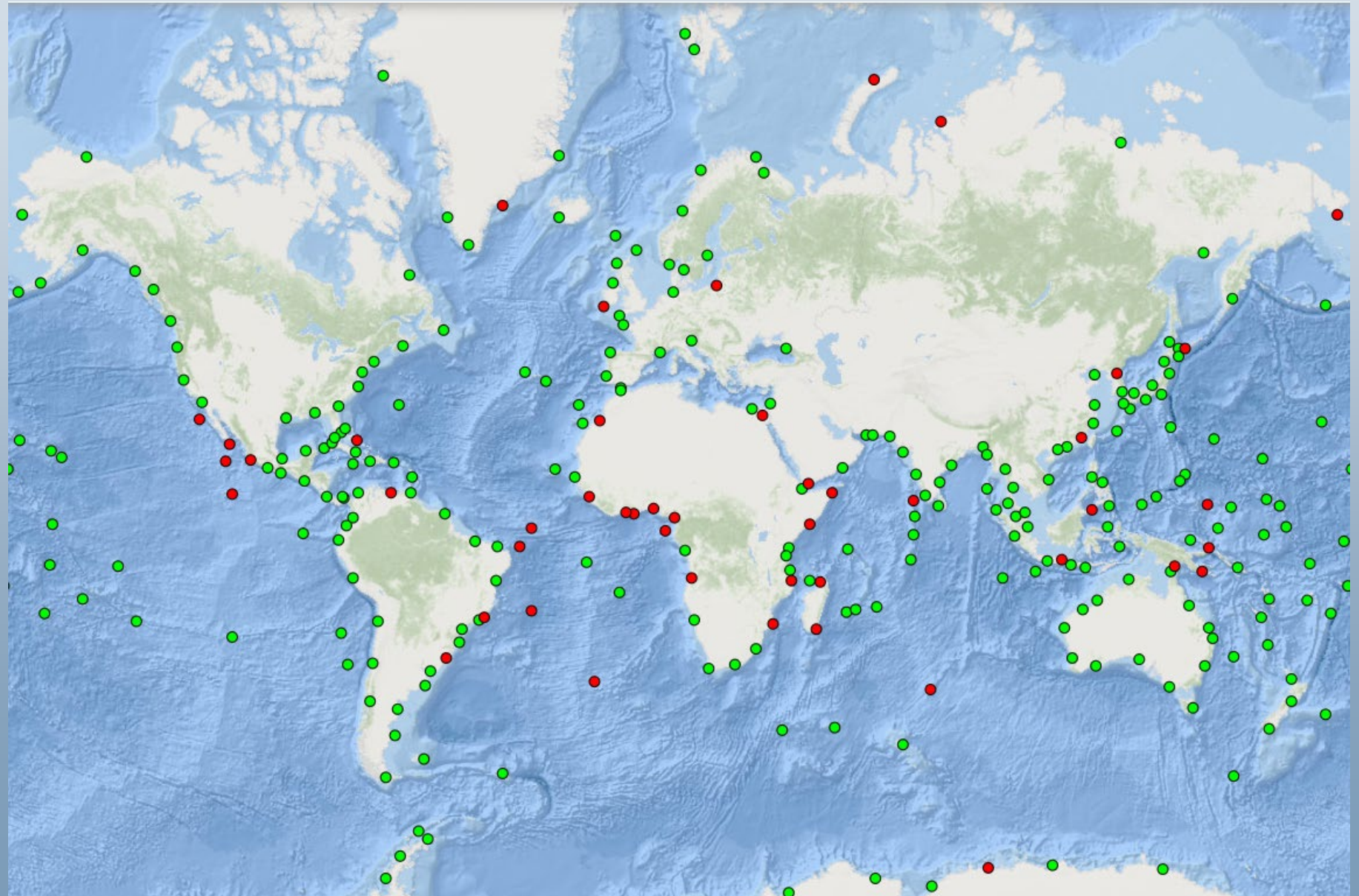
Objective 2.4
Assist users on data access and available data services.

Objective 2.5
Connect OceanOPS services with IOC and WMO international data systems.

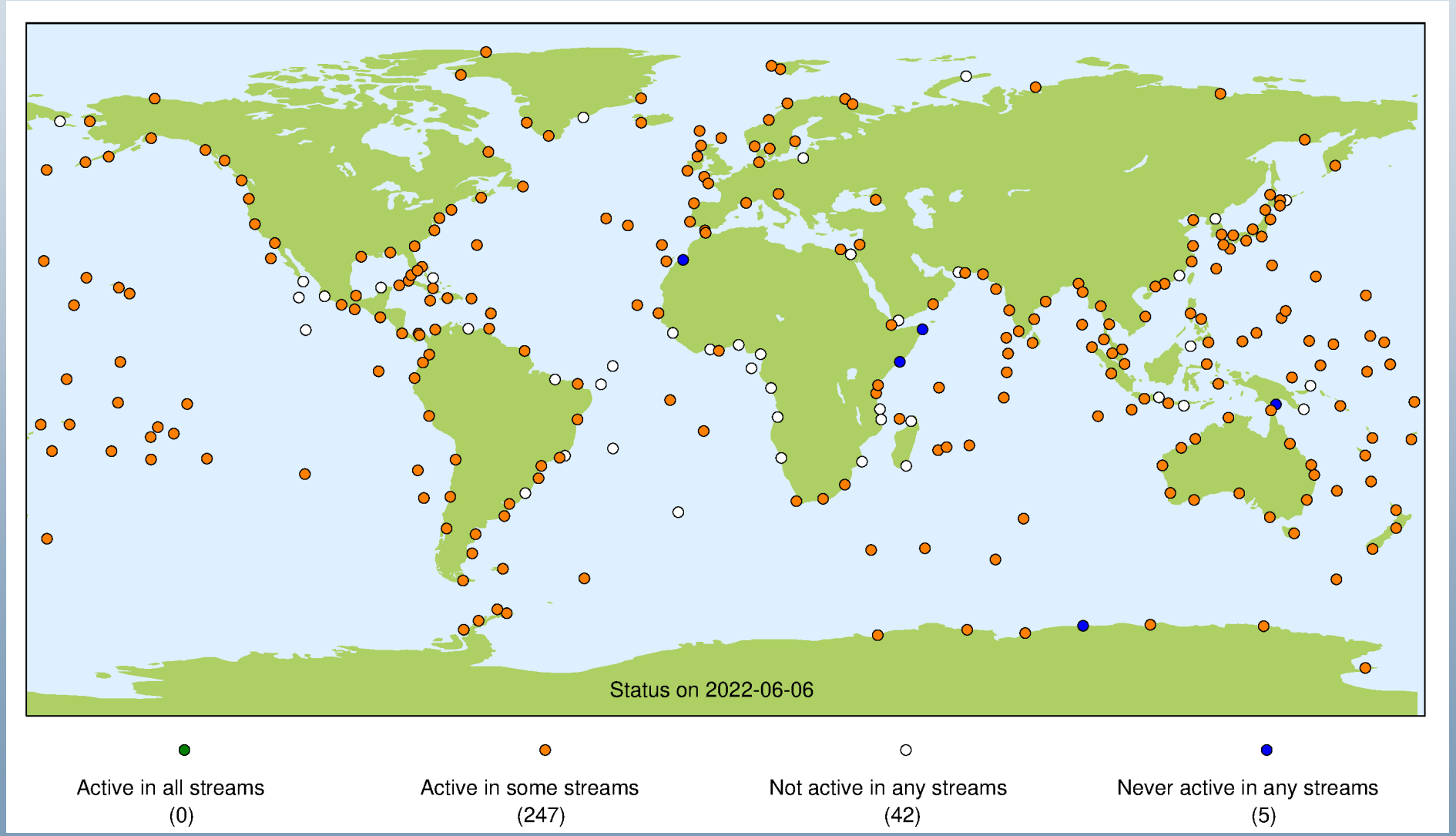
- Large set of RT monitoring tools, stats, authoritative maps, website interactive features, performance indicators, analysis tools.
- Tuning required for Tide Gauges but the existing base is powerful.
- Critical up to date information for the Steering Team, GOOS OCG, national/regional programmes, etc.

GLOSS STATIONS AT OCEANOPS

HTTPS://WWW.OCEAN-OPS.ORG/BOARD?T=GLOSS



GLOSS Stations at PSMSL



Inspect Platform GLOSS_245

About | Event log

Main information

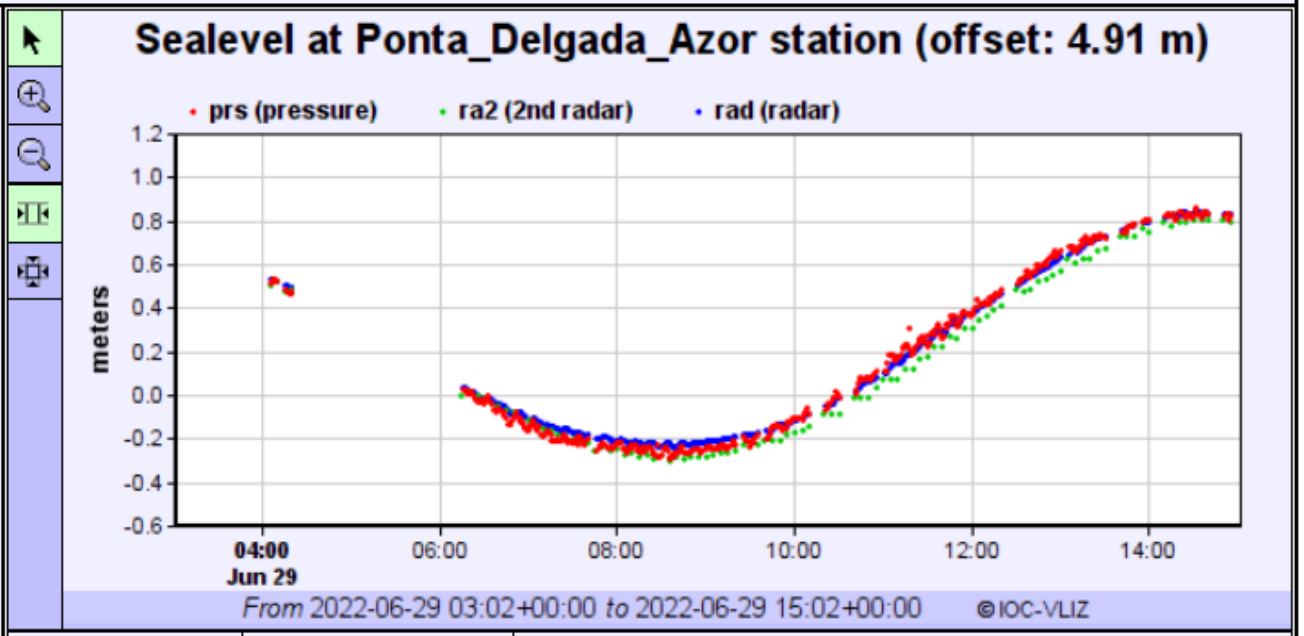
Ponta Delgada (Azores)

Name	GLOSS Ponta Delgado, Azores
Reference	GLOSS_245
Status	OPERATIONAL
Country	PORTUGAL (GLOSS PT)
Model	Tide Gauge (Tide Gauge)

Tracking lifecycle

	Deployed
Latitude	37.442
Longitude	-25.403
Date	-

Station metadata	
Code	pdas
Country	Portugal
Location	Ponta_Delgada_Azor
Status	Operational
Local Contact	Instituto Hidrográfico (Portugal)
Other Contact	University of Hawaii Sea Level Center (USA)
GLOSS ID	245 [goto handbook]
Long-term MSL data	UHSLC 211 (1978-2018) PSMSL 1885 (1978-2012) PSMSL 258 (1924-2018)
Latitude	37.73
Longitude	-25.68
Connection	GTS message
GTS message type	SEPO40
Sensor 1	
Type of sensor	prs (pressure)
Sampling rate (min)	1
Sensor 2	
Type of sensor	rad (radar)
Sampling rate (min)	1
Sensor 3	
Type of sensor	ra2 (2nd radar)
Sampling rate (min)	5
Sensor 4	
Type of sensor	sw1 (1st switch)
Sampling rate (min)	60
Sensor 5	
Type of sensor	sw2 (2nd switch)
Sampling rate (min)	60
Sensor 6	
Type of sensor	bat (battery)
Sampling rate (min)	5



Period	Signals	Data
12h / day / 7 days / 30 days	prs, rad, ra2, Remove outliers, Remove spikes	Relative levels= signal - average over selected period; Absolute levels= as received; Offset signals= relative signals + offset; Show switch data; Show battery voltage

Tip:use left icons to zoom & scroll

STRONGER REQUIREMENTS FOR DATA AND METADATA FROM USERS

- **WMO** new Data Policy for Earth System
- **IOC/IODE**: Strategy for Ocean Data and information Stewardship (SODIS) for the UN
- Data strategy of **GOOS Observations Coordination Group**, data and metadata mapping
- **UN Ocean Decade** (Co-design, ObservingTogether—sea level, CoastPredict, …)

OCG data and metadata: Vision

- Provide frictionless data flow to uniform ‘end points’ for inclusion into a federated OCG data network
  - Support both real time and delayed mode
- Liaise and collaborate with the international data community to ensure the OCG federated network data boundary is seamless to global stakeholders
- Continue evolving towards greater efficiency in data flow across the OCG networks

OCG data and metadata: Goals

- FAIR compliance of metadata, data and data services across all OCG networks
  - Federated end point of distributed services for OCG data
- Quality data are available in near real time from the GTS and/or other data access services
- Data/Metadata are discoverable and harvestable
- Data/Metadata are available through identified global repositories
- Data are fully documented and required metadata is available through OceanOPS
    - OceanOPS services will connect to external catalogs (WMO, IODE, GOOS, UN Decade)
- Data/Metadata are properly archived and citable

OCG data and metadata: Data Mapping

Mapping the Network Data flows

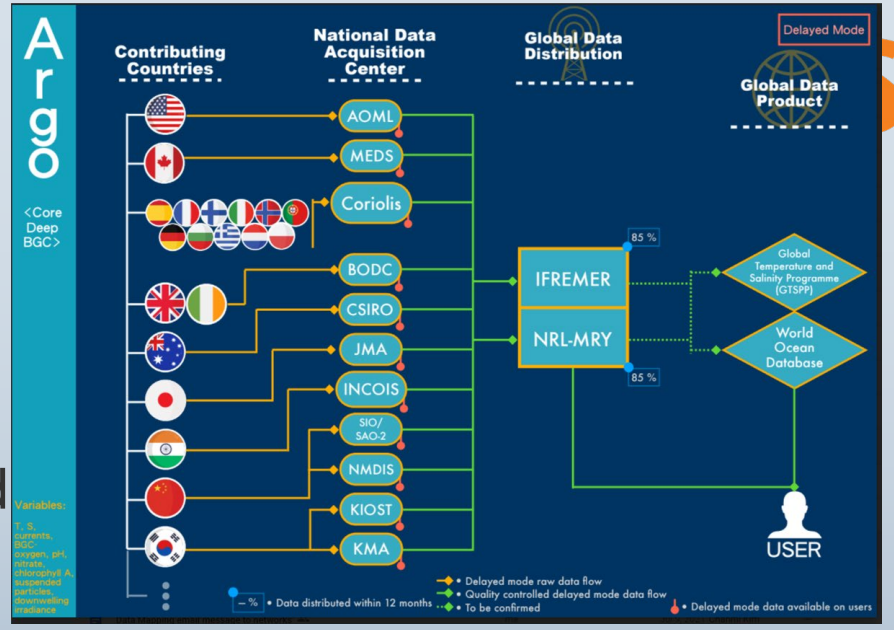
- Mapped near-real time, delayed mode and metadata flows for the global in situ networks

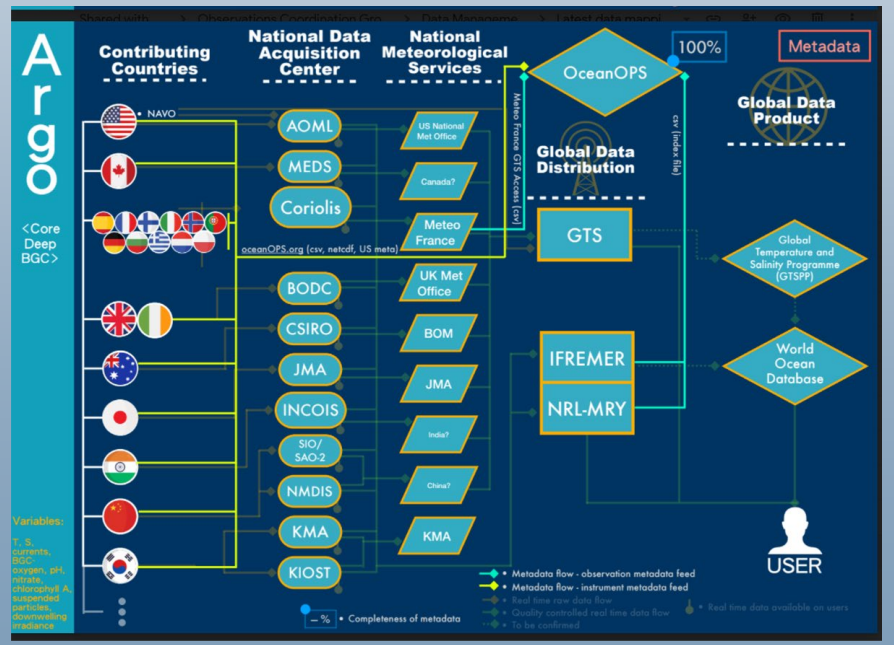
Goal: Identify gaps and opportunities to move OCG data and metadata services towards FAIR compliance

First iteration of OCG Data Mappings **complete***

Next steps:

- Validate with data teams from each network
- Work with IODE, WMO to extend data mappings
- Use Data Mappings to develop OCG data recommendations and implementation strategy



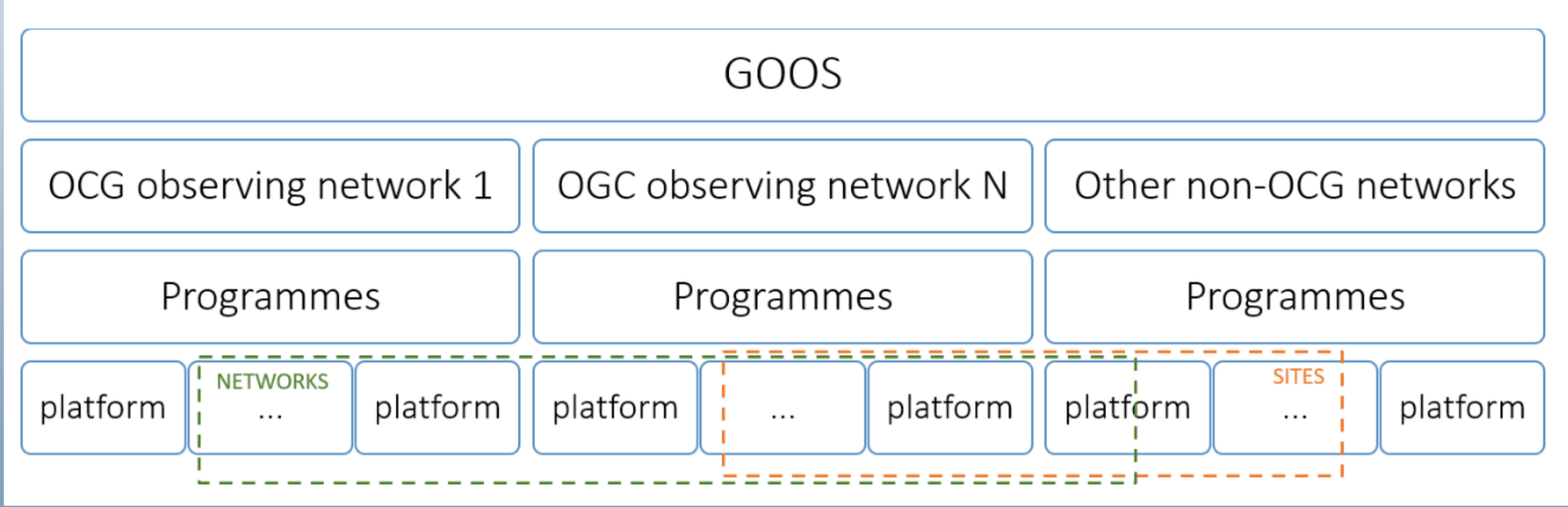


* will be available from new OCG pages on GOOS site soon

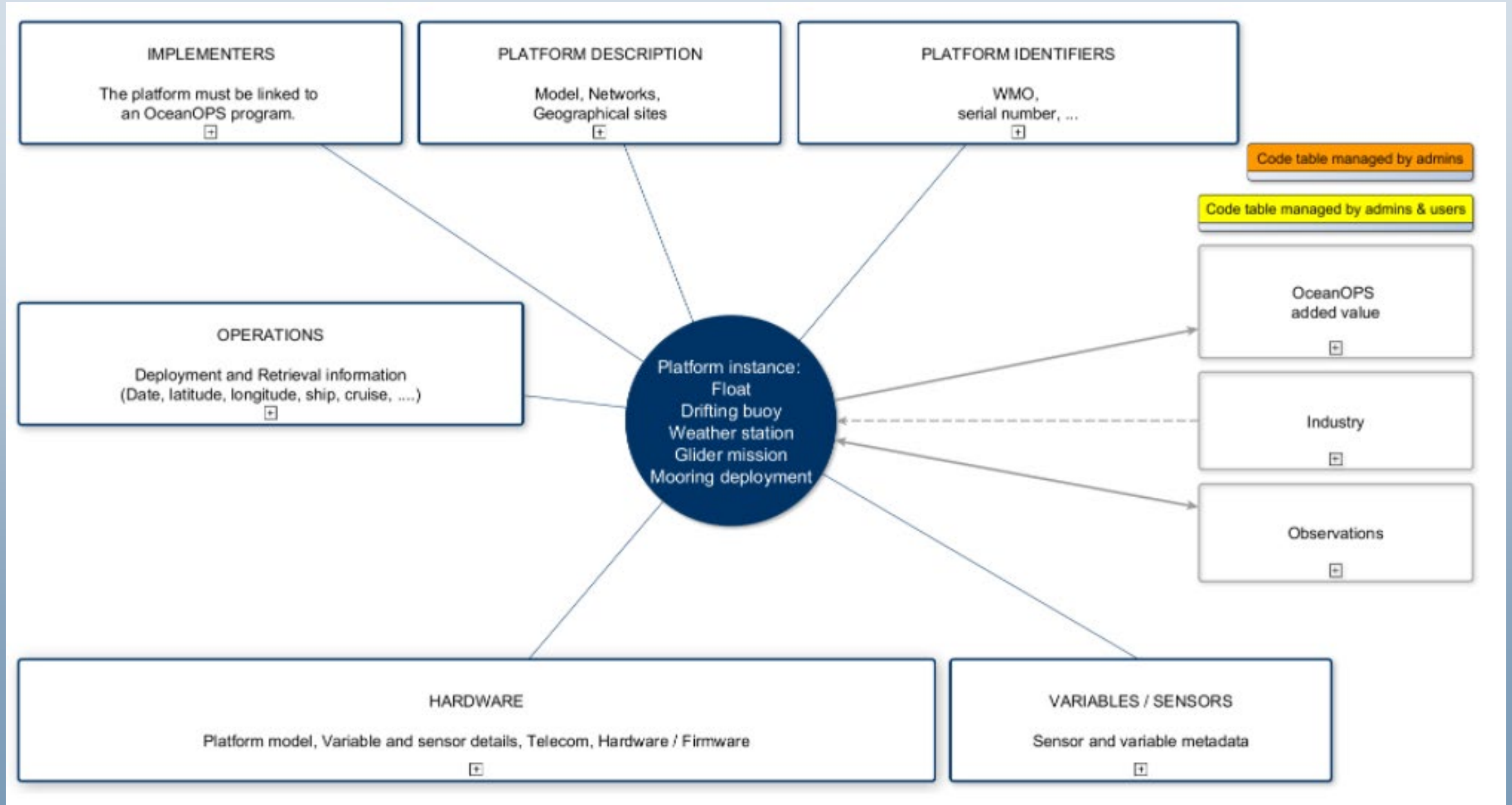
OCEANOPS METADATA SYSTEM

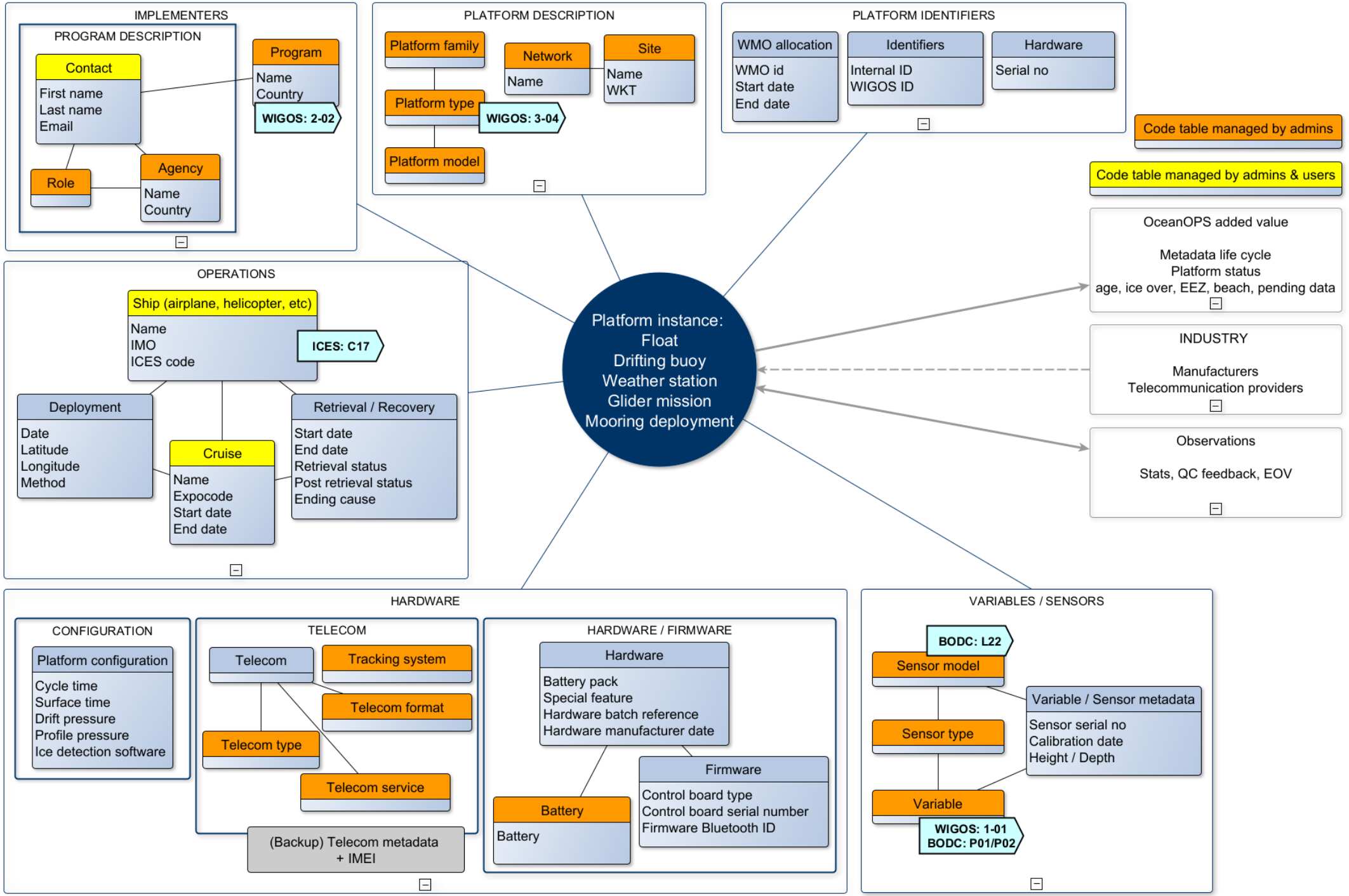
- Mandated by former JCOMM, currently coordinated by Observations Coordination Group
  - WMO/WIGOS IDs (Decision 29), reaffirmed by WMO INFCOM-I (WMO No.1165)
  - WMO Observing Systems Capability Analysis and Review system (OSCAR) integration (Decision 30)

OCEANOPS METADATA STRUCTURE



METADATA STRUCTURE




IMPLEMENTERS
PROGRAM DESCRIPTION
Contact
First name
Last name
Email
Program
Name
Country
WIGOS: 2-02
Role
Agency
Name
Country
PLATFORM DESCRIPTION
Platform family
Network
Name
Site
Name
WKT
Platform type
WIGOS: 3-04
Platform model
PLATFORM IDENTIFIERS
WMO allocation
WMO id
Start date
End date
Identifiers
Internal ID
WIGOS ID
Hardware
Serial no
Code table managed by admins
Code table managed by admins & users
OceanOPS added value
Metadata life cycle
Platform status
age, ice over, EEZ, beach, pending data
INDUSTRY
Manufacturers
Telecommunication providers
Observations
Stats, QC feedback, EOV
OPERATIONS
Ship (airplane, helicopter, etc)
Name
IMO
ICES code
ICES: C17
Deployment
Date
Latitude
Longitude
Method
Cruise
Name
Expocode
Start date
End date
Retrieval / Recovery
Start date
End date
Retrieval status
Post retrieval status
Ending cause
Platform instance:
Float
Drifting buoy
Weather station
Glider mission
Mooring deployment
HARDWARE
CONFIGURATION
Platform configuration
Cycle time
Surface time
Drift pressure
Profile pressure
Ice detection software
TELECOM
Telecom
Tracking system
Telecom format
Telecom type
Telecom service
(Backup) Telecom metadata
+ IMEI
HARDWARE / FIRMWARE
Hardware
Battery pack
Special feature
Hardware batch reference
Hardware manufacturer date
Firmware
Control board type
Control board serial number
Firmware Bluetooth ID
Battery
Battery
VARIABLES / SENSORS
BODC: L22
Sensor model
Variable / Sensor metadata
Sensor serial no
Calibration date
Height / Depth
Sensor type
Variable
WIGOS: 1-01
BODC: P01/P02

EXAMPLES OF FIXED STATIONS

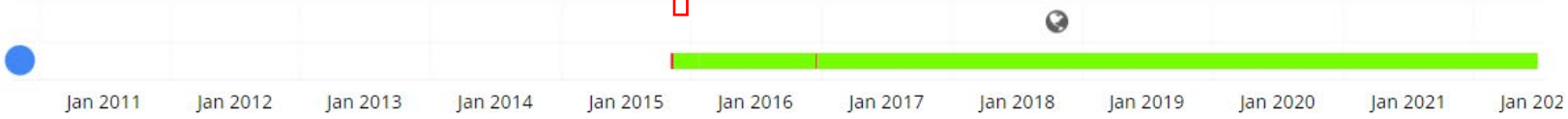
About | Event log | Data | QC | Operator | Media | Adopt

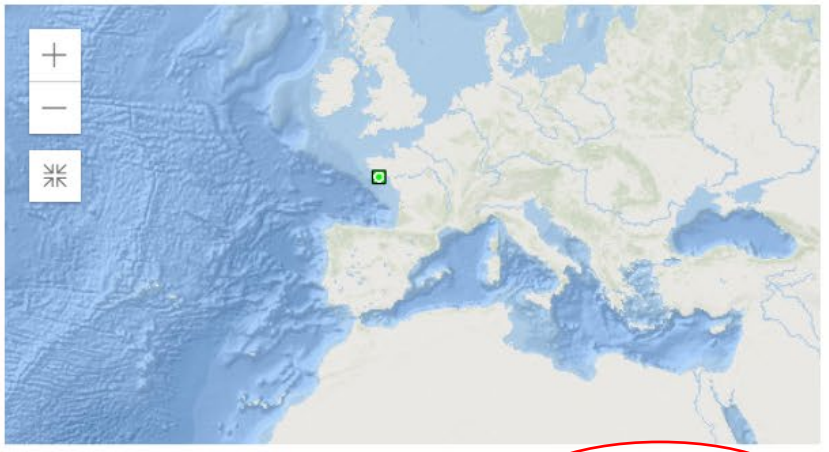
Main information

Name	Belle-Ile	WMO ID	6200074
Reference	6200074	Telecom	HF RADIO
Status	OPERATIONAL	Networks	Coastal/National Moored Buoys
Country	FRANCE (CANDHIS)		AtlantOS
Model	Datawell (Wave Moored Buoy)		E-SURFMAR
			DBCP
		Ship	-

Tracking lifecycle

	Deployed	Latest observation
Latitude	47.285	47.285
Longitude	-3.285	-3.285
Date	2010-10-18T00:00:00	2022-06-28T23:40:00





Technical details

HTTPS://WWW.OCEAN-OPS.ORG/BOARD/WA/PLATFORM?REF=5100022_035

Platform Report

www.ocean-ops.org - 2022-06-30

Name	2S155W
Site	T2S155W
Reference	5100022_035
Status	OPERATIONAL
WMO	5100022
Program	NDBC-MB
Network	OceanSITES, Global Tropical Moored Buoy Array, Tropical Pacific Observing System, DBCP, TAO

Latest Location

Lat	-2
Lon	-155
Date	2022-06-28

Latest Observation

Lat	-2
Lon	-155
Date	2022-06-28

Instrumentation

Model	TAO_REFRESH
Type	Tropical Moored Buoy

Sensors

SEABIRD_SBE39_IM (Serial N°: 6405)
TEMP

SEABIRD_SBE39_IM (Serial N°: 6401)
TEMP

SEABIRD_SBE37_SM (Serial N°: 6445)
CNDC, TEMP

SEABIRD_SBE37_SM (Serial N°: 6455)
CNDC, TEMP

SEABIRD_SBE37_SM (Serial N°: 6440)
CNDC, TEMP

SEABIRD_SBE37_SM (Serial N°: 6442)
CNDC, TEMP

SEABIRD_SBE37_SM (Serial N°: 6076)
CNDC, TEMP

SEABIRD_SBE37_SM (Serial N°: 9146)
CNDC, TEMP

SEABIRD_SBE37_SM (Serial N°: 5990)
CNDC, TEMP

SEABIRD_SBE37_SM (Serial N°: 5992)
CNDC, TEMP

SEABIRD_SBE37_SM (Serial N°: 5806)
CNDC, TEMP

ROTRONIC_MP101A (Serial N°: 20370758)
THERMOMETER_ELECTRIC, HYGROMETER_ELECTRONIC

RM YOUNG_05103 (Serial N°: 182245)
ANEMOMETER_PROPELLER_VANE_WD, ANEMOMETER_PROPELLER_VANE_WS

Status Timeline

REGISTERED	2021-10-05
OPERATIONAL	2021-10-05

Deployment

Date	2021-09-24
Lat	-2
Lon	-155

Deployment Ship

Name	BLUE FIN
Ref. (ICES Code)	3311
Type	Support vessels
IMO	8036586
Call Sign	WDC7379
Country	US

Inspect Site T2S155W

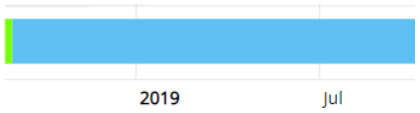
Main details

Name	T2S155W
Category	TAO_REFRESH, ATLAS_NEXT, ATL
Networks	OceanSITES
Family	
Sustainablity	
Unique GTS-IDs	1

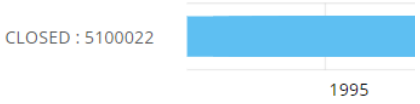
Description

TAO 2s155w Standard

Activity timeline



Activity timeline by GTS-ID



Inspect Site T2S155W

Reference	Deployment date	Retrieval date
5100022_035	2021-09-24	
5100022_034	2018-08-31	2020-03-29
5100022_033	2017-09-23	2018-08-31
5100022_032	2016-10-03	2017-09-23
5100022_031	2015-12-12	2016-10-03
5100022_030	2014-11-17	2015-12-11
5100022_029	2013-10-01	2014-11-16
5100022_028	2011-10-11	2013-09-30
5100022_027	2010-09-11	2011-10-10
5100022_026	2009-05-14	2010-09-10
5100022_025	2008-02-10	2009-05-13
5100022_024	2007-07-20	2008-02-09
5100022_023	2006-10-15	2007-07-20
5100022_022	2005-10-28	2006-10-14
5100022_021	2004-11-04	2005-10-27
5100022_020	2004-06-26	2004-11-03
5100022_019	2003-10-25	2004-06-26
5100022_018	2003-06-18	2003-10-24
5100022_017	2002-10-12	2003-06-18
5100022_016	2002-06-08	2002-10-12
5100022_015	2001-10-06	2002-06-07
5100022_014	2001-06-08	2001-10-05
5100022_013	2000-10-22	2001-06-07
5100022_012	2000-06-24	2000-10-22
5100022_011	1999-07-10	2000-06-23
5100022_010	1998-06-15	1999-07-09

Platform Report

www.ocean-ops.org - 2022-06-30

Name	2S155W
Site	T2S155W
Reference	5100022_020
Status	CLOSED
WMO	5100022
Program	NDBC-MB
Network	OceanSITES, Global Tropical Moored Buoy Array, Tropical Pacific Observing System, DBCP, TAO

Latest Location
No Data

Latest Observation
No Data

Instrumentation

Model	ATLAS_NEXT
Type	Tropical Moored Buoy

Sensors

SEABIRD_SBE37
CNDC, TEMP

SEABIRD_SBE16
CNDC, TEMP

PAINE
PRES

PAROSCIENTIFIC_MET1_2
BAROMETER_GENERIC

ROTRONIC_MP100
THERMOMETER_ELECTRIC, HYGROMETER_ELECTRONIC

YSI_THERMISTOR_46006
SST_GENERIC

RDI Sentinel
ADCP

RM YOUNG_05103
ANEMOMETER_PROPELLER_VANE_WD, ANEMOMETER_PROPELLER_VANE_WS

RMYoung 50203-34
RAIN_GAUGE

Status Timeline

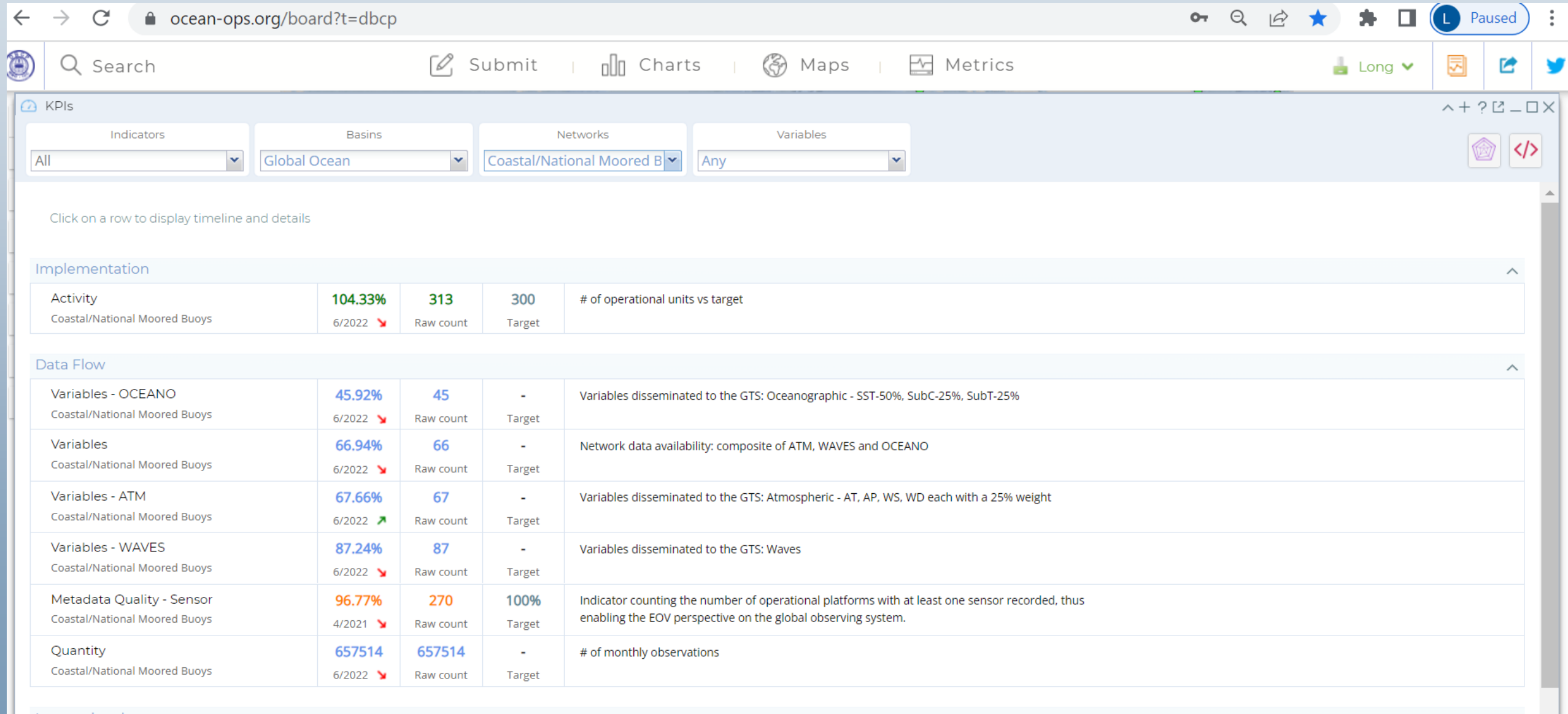
CLOSED	2004-11-03

Deployment

Date	2004-06-26
Lat	-2
Lon	-155

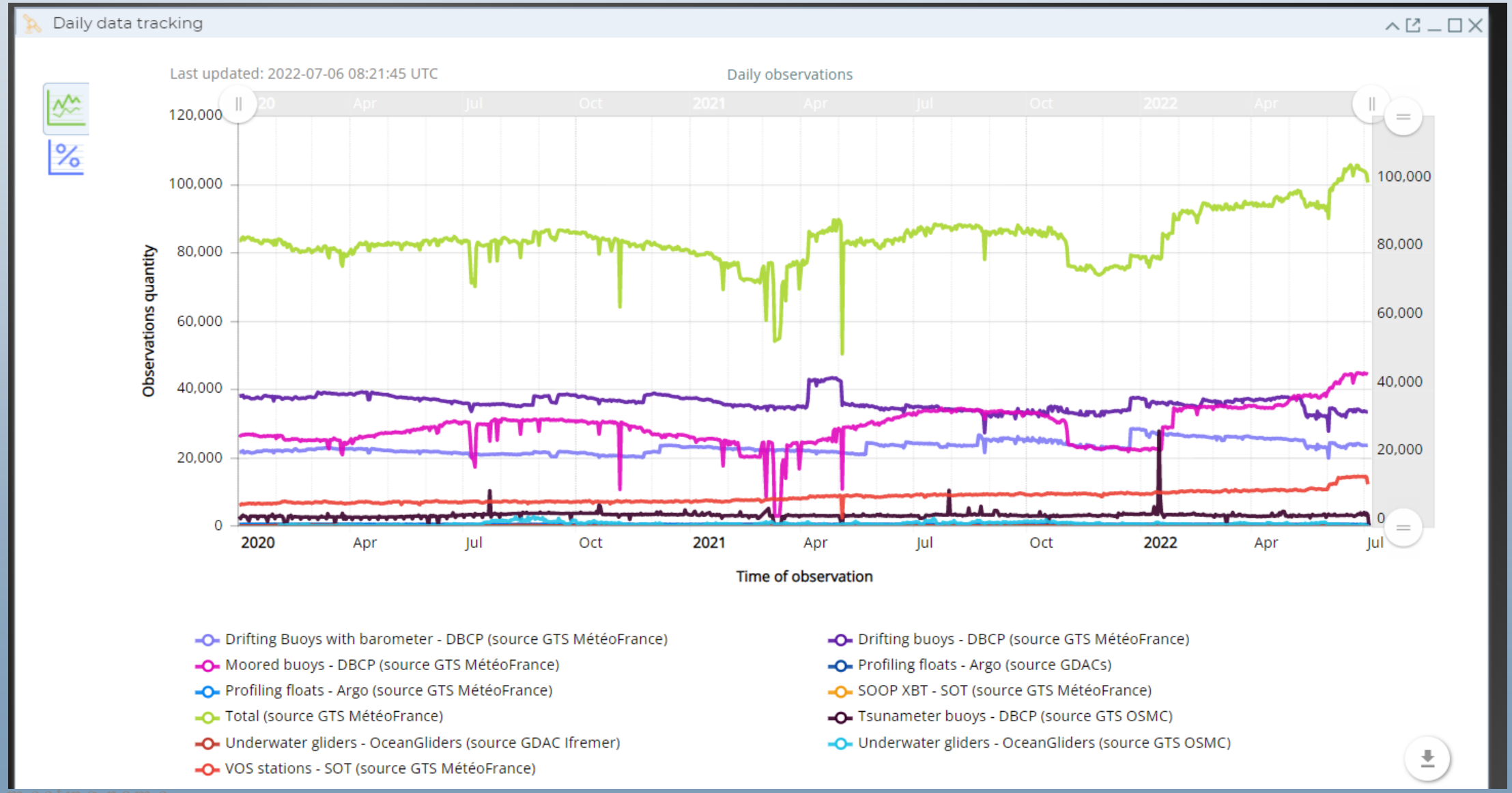
Deployment Ship
No ship information registered for this platform yet or information is masked

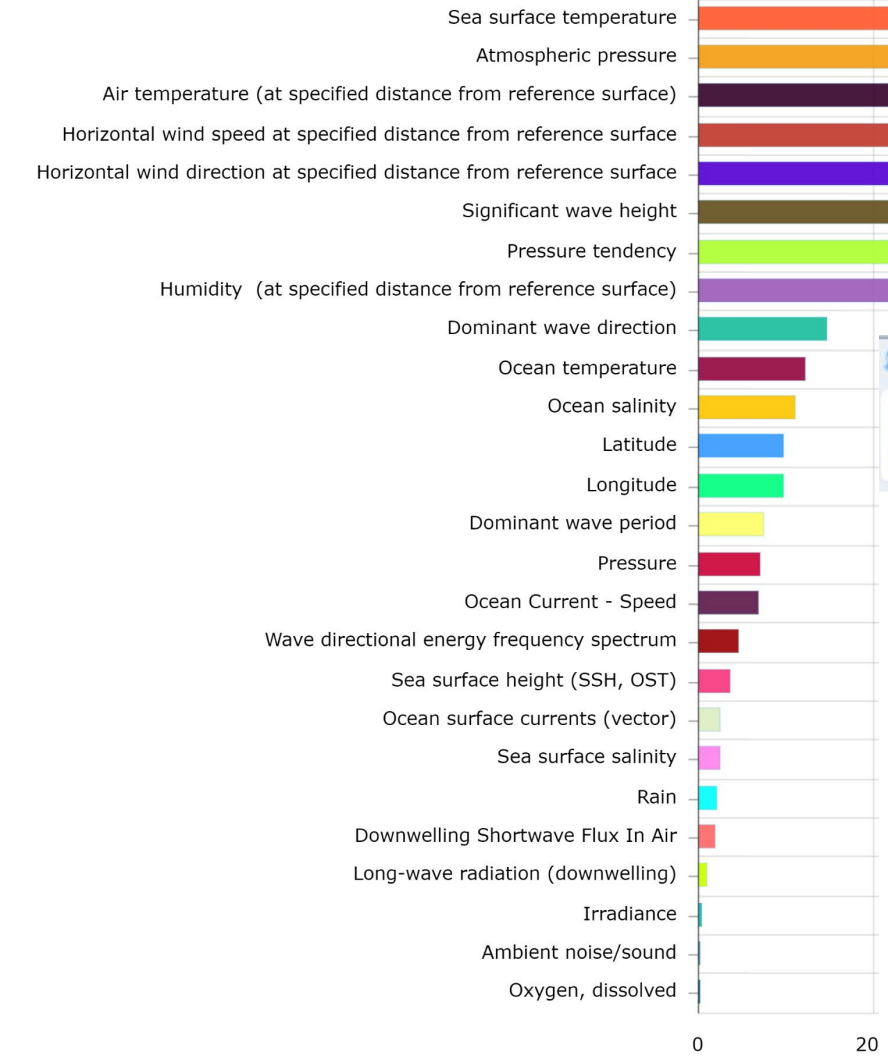
MONITORING AND METRICS/KPIS

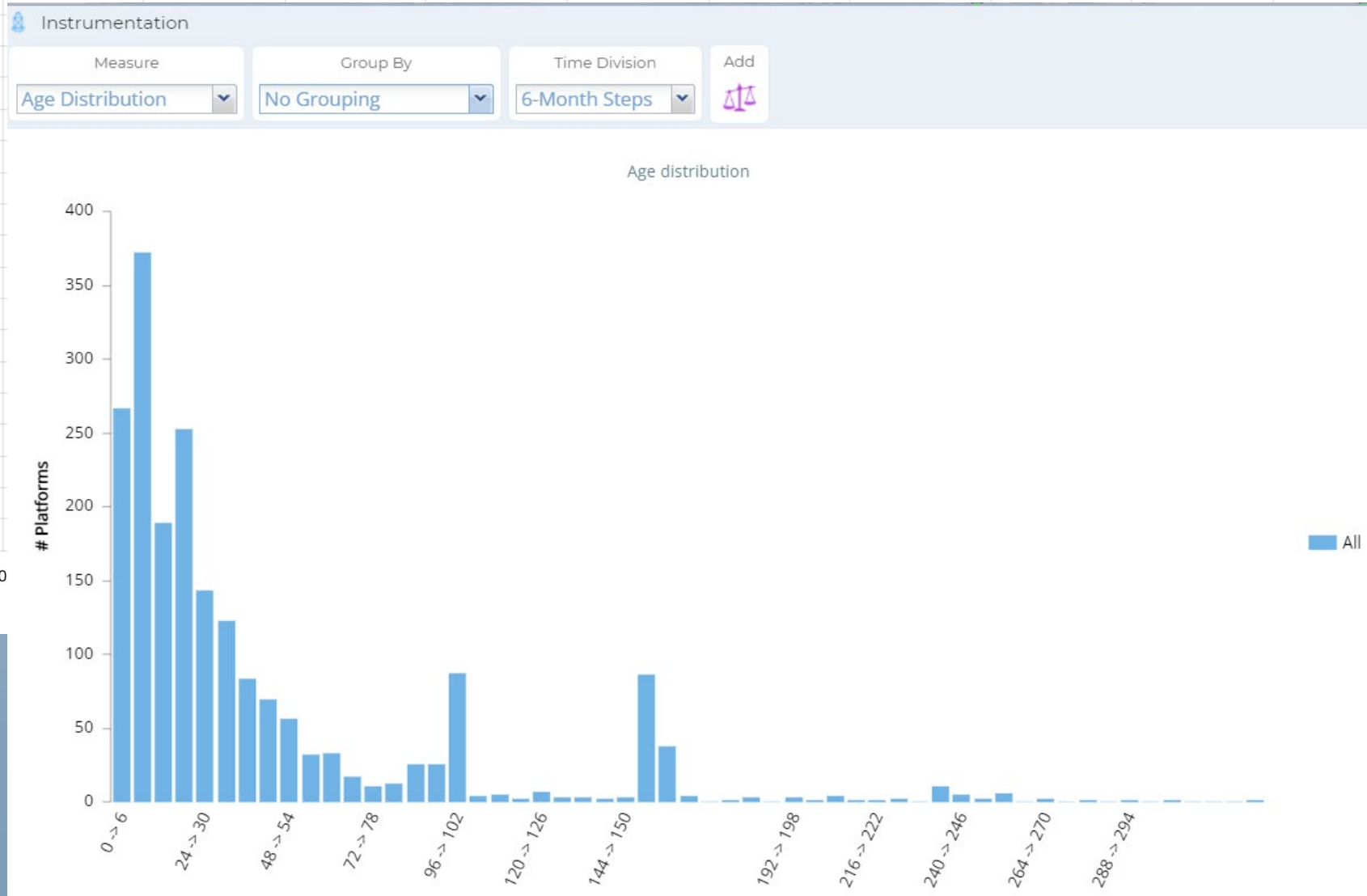


DATA FLOW

HTTPS://WWW.OCEAN-OPS.ORG/BOARD/WA/DATATRACKINGMODULE




Sea surface temperature
Atmospheric pressure
Air temperature (at specified distance from reference surface)
Horizontal wind speed at specified distance from reference surface
Horizontal wind direction at specified distance from reference surface
Significant wave height
Pressure tendency
Humidity (at specified distance from reference surface)
Dominant wave direction
Ocean temperature
Ocean salinity
Latitude
Longitude
Dominant wave period
Pressure
Ocean Current - Speed
Wave directional energy frequency spectrum
Sea surface height (SSH, OST)
Ocean surface currents (vector)
Sea surface salinity
Rain
Downwelling Shortwave Flux In Air
Long-wave radiation (downwelling)
Irradiance
Ambient noise/sound
Oxygen, dissolved
0
20


Instrumentation
Measure
Age Distribution
Group By
No Grouping
Time Division
6-Month Steps
Add
Age distribution
Platforms
400
350
300
250
200
150
100
50
0
All
0 -> 6
24 -> 30
48 -> 54
72 -> 78
96 -> 102
120 -> 126
144 -> 150
192 -> 198
216 -> 222
240 -> 246
264 -> 270
288 -> 294

FIXED STATIONS

- Moored buoys/Moorings
- Oil rigs (some under SOT~100, some under DBCP~100)
- Tidal gauges, incl. GLOSS
- HF Radars
- Ferry boxes

GLOSS AND OCEANOPS

- Metadata Source: manually added with basic info from IOC GLOSS page

http://www.ioc-sealevelmonitoring.org/list.php

  - https://gloss-sealevel.org/data
  - https://www.bodc.ac.uk/resources/inventories/gloss_handbook/stations/
  - http://uhslc.soest.hawaii.edu/data/?rq
  - https://www.sonel.org/-GPS-.html
  - http://www.ioc-sealevelmonitoring.org/map.php

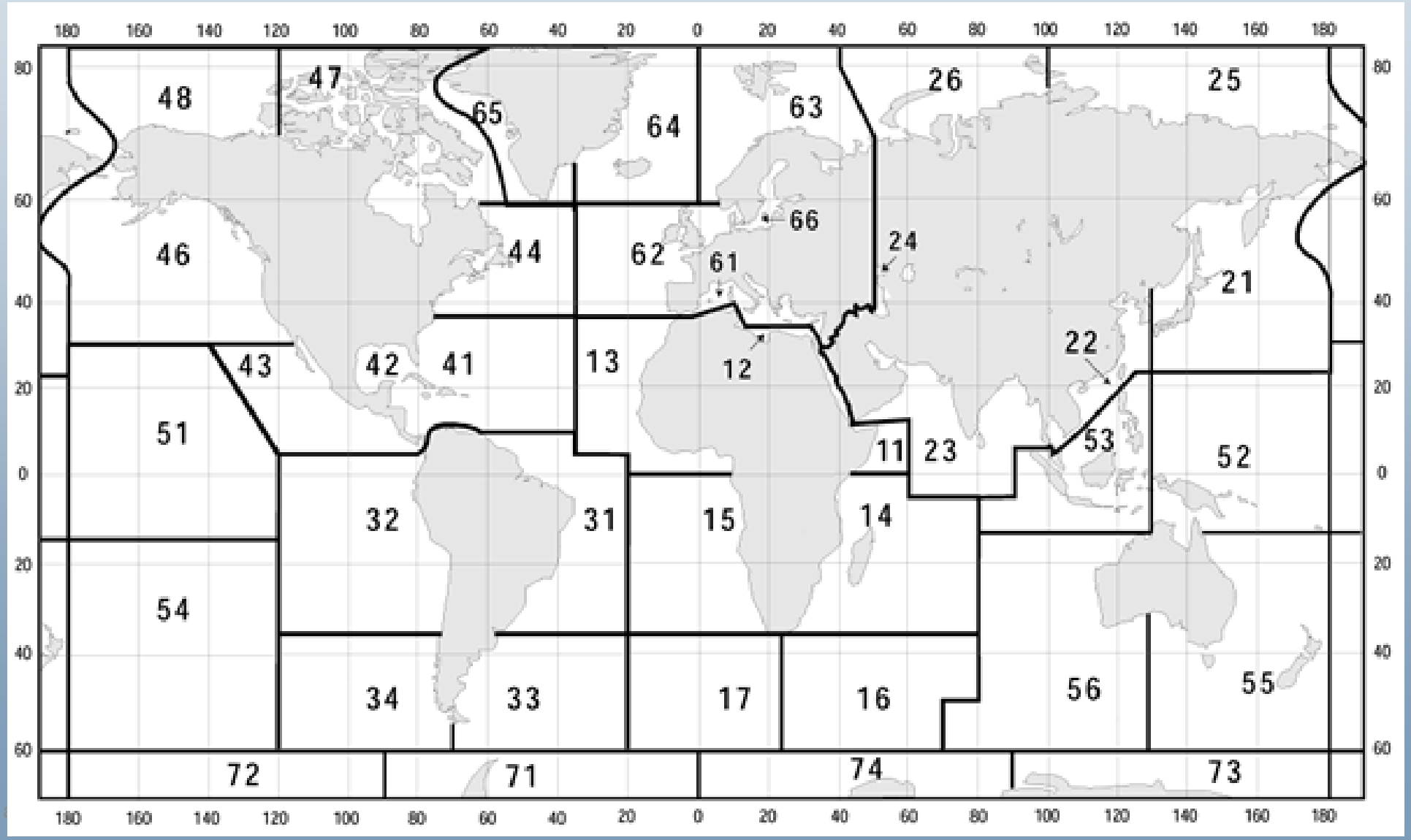
- Preliminary constructive dialogues with EuroSea and IOC/TSU

WAY FORWARD

- **Agreement** and engagement from national centres and GLOSS leadership
- Need to consider **complexity** of each station specifications in data and metadata status
- **Pilot** from some members: such as *Chile*, *India*, *Mexico*, etc?
- WIGOS **IDs** allocation may refer to moored buoys/OceanSITES, TBC with the community https://community.wmo.int/rules-allocating-wmo-numbers
  - Unique IDs to be allocated by OceanOPS for fixed systems to apply to Tide Gauges ?
  - Future: WIGOS_ID= 0-22000-<p>-<ABnnnnn>
  - Key for interoperability !
- **OceanOPS focal point**: Long Jiang, ljiang@ocean-ops.org

WMO AREAS AND WMO IDS

HTTPS://COMMUNITY.WMO.INT/RULES-ALLOCATING-WMO-NUMBERS



Спасибо

Thank you

Gracias

Merci

谢谢

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