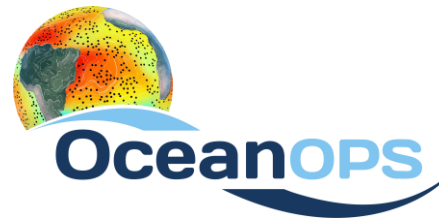




34TH ANNUAL INTERNATIONAL RESEARCH SHIP OPERATORS MEETING

**OceanOPS: Monitoring, Coordination and Implementation Support for
The Global Ocean Observing System**



Martin Kramp

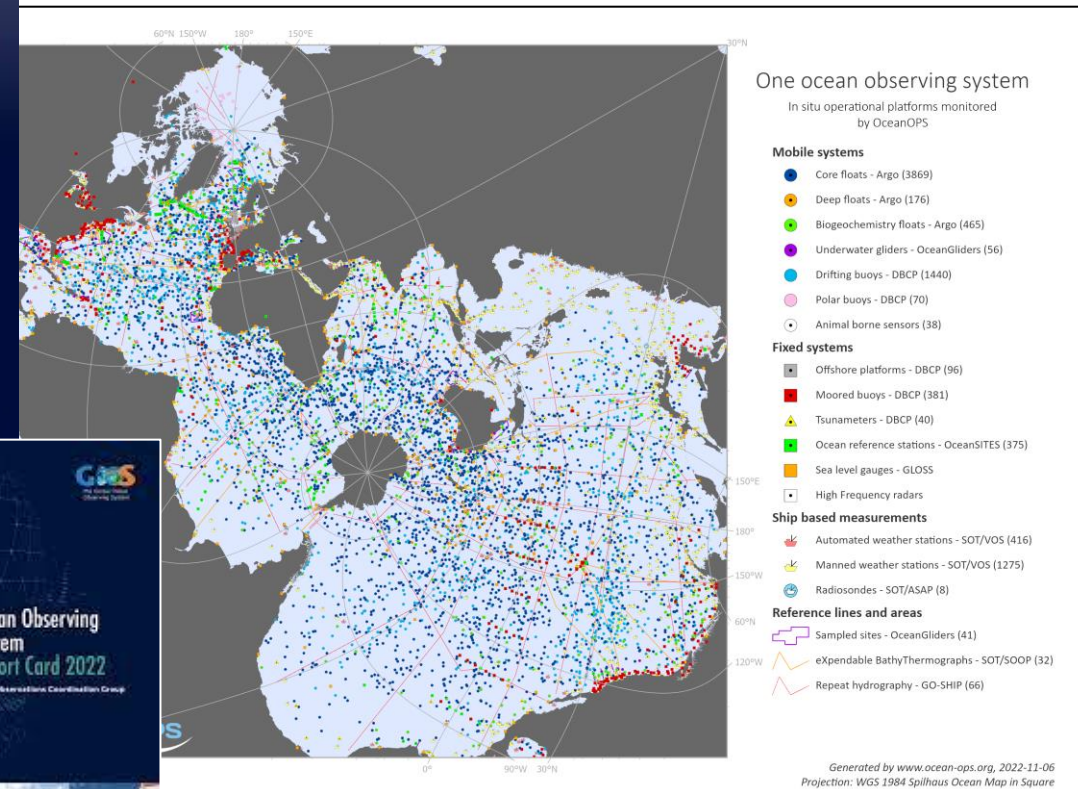
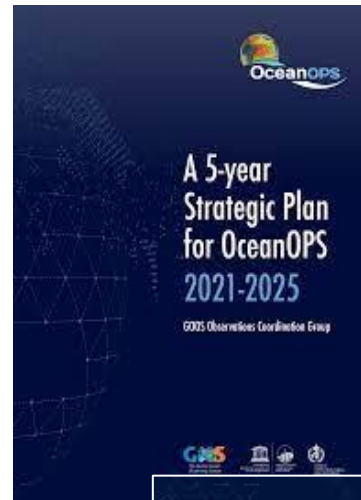
Ship Coordinator

mkramp@ocean-ops.org

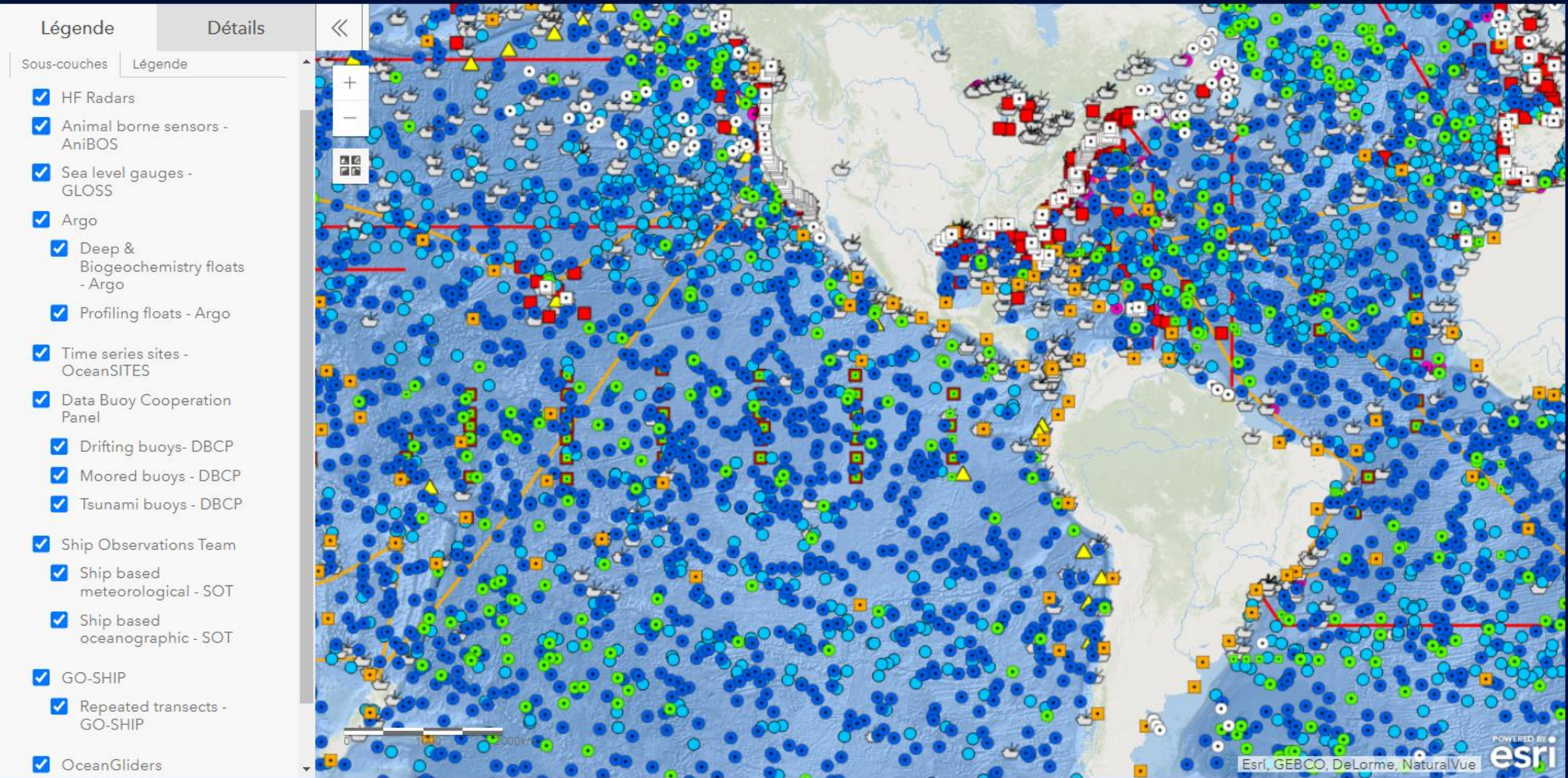
WWW.OCEAN-OPS.ORG











































INTEGRATED INFORMATION, MAPS AND TOOLS TO HELP COORDINATE AND MONITOR GLOBAL OCEAN OBSERVATION EFFORTS.

- Jointly run by WMO & IOC
- ~8000 GOOS platforms
- Coordination & Integration
- Metadata Management
- ID Allocation for GOOS
- Implementation Support
- Monitoring & Notification
- Performance Measurement
- Report Card & Communication

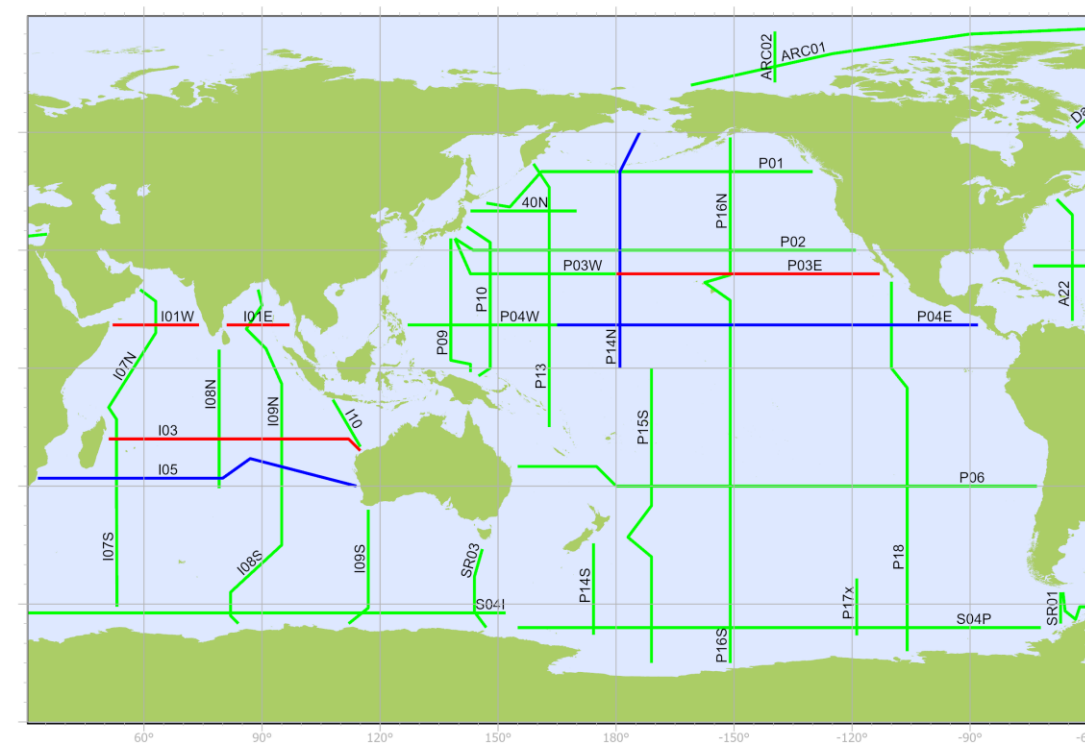


This is an interactive map. Click on Details tab in the map menu to discover all functionalities



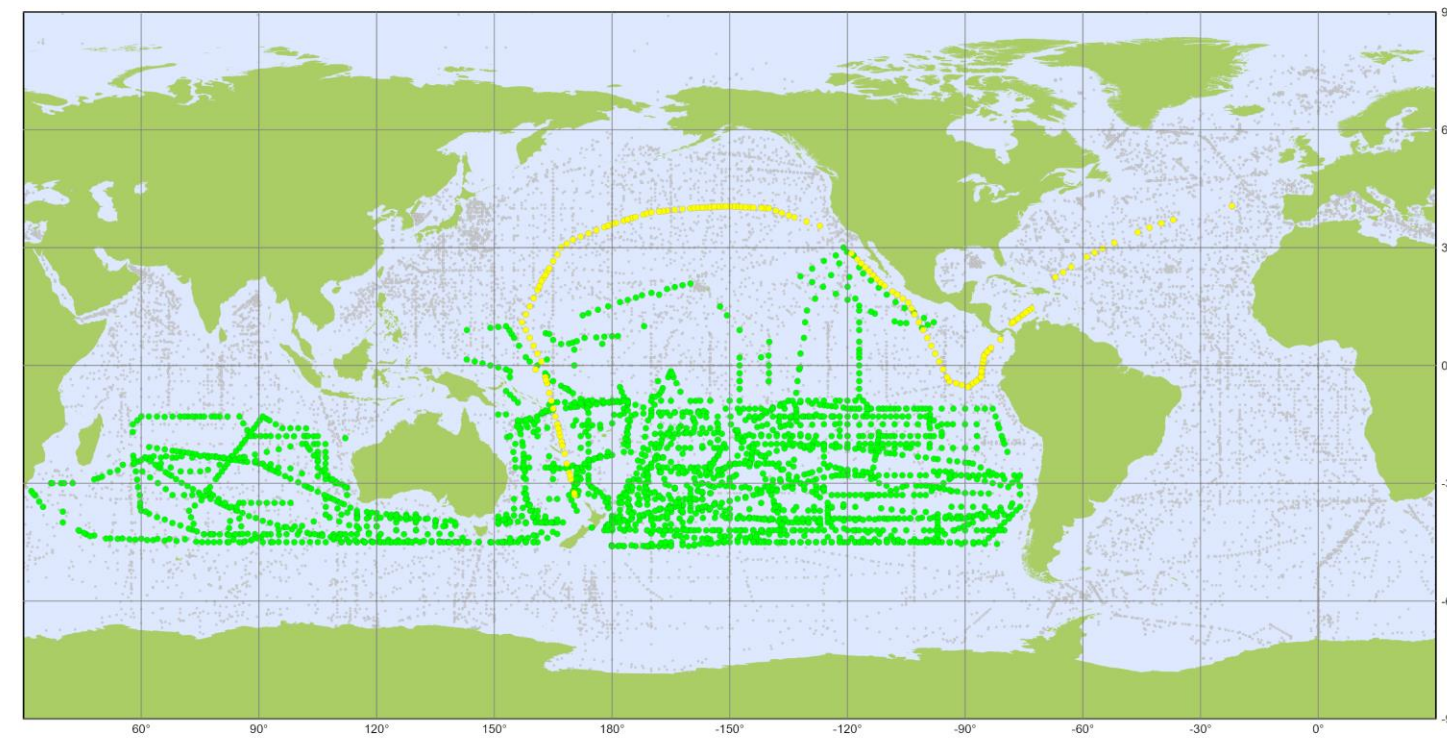
GOOS <i>in situ</i> networks ¹		Implementation	Data & metadata			Best practices ⁶	GOOS delivery areas ⁷		
		Status ²	Real time ³	Archived high quality ⁴	Metadata ⁵	Operational services	Climate	Ocean Health	
	Ship based meteorological – SOT	★★★	★★★	★★★	★★★	★★★			
	Ship based oceanographic – SOT	★★★	★★★	★★★★	★★★	★★★			
	Repeated transects - GO-SHIP	★★★★	Not applicable	★★★★	★★★	★★★★			
	Sea level gauges - GLOSS	★★★★	★★★	★★★★	★★★	★★★			
	Time series sites - OceanSITES	★★★	Not applicable	★★★★	★★★	★★★			
	Moored buoys – DBCP	★★★★	★★★★	★★★★	★★★	★★★★			
	Tsunami buoys - DBCP	★★★	★★★★	★★★★	★★★	★★★★			
	HF radars	★★★ Emerging	★★★	★★★	★★★	★★★★			
	Drifting buoys - DBCP	★★★★	★★★	★★★	★★★	★★★★			
	Profiling floats - Argo	★★★★	★★★★	★★★★	★★★★	★★★			
	Deep & biogeochemistry floats - Argo	★★★ Emerging	★★★	★★★	★★★★	★★★			
	OceanGliders	★★★ Emerging	★★★	★★★	★★★	★★★			
	Animal borne sensors - AniBOS	★★★ Emerging	★★★	★★★	★★★	★★★			

SAMPLE STATIC MAPS



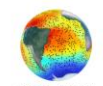
GO-SHIP Status of 2012-2023 Survey (55 Core Lines)

- completed: 47 (86% of all core lines)
 - planned or funded: 4 (7% of all core lines)
 - not planned yet: 4 (7% of all core lines)
- Lines completed or planned: 94% (51 core lines)
 Countries providing ship-time: 10
 Elapsed survey time: 95% (floating 11 years)

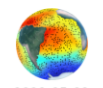


Argo Kaharoa's Deployments September 2023

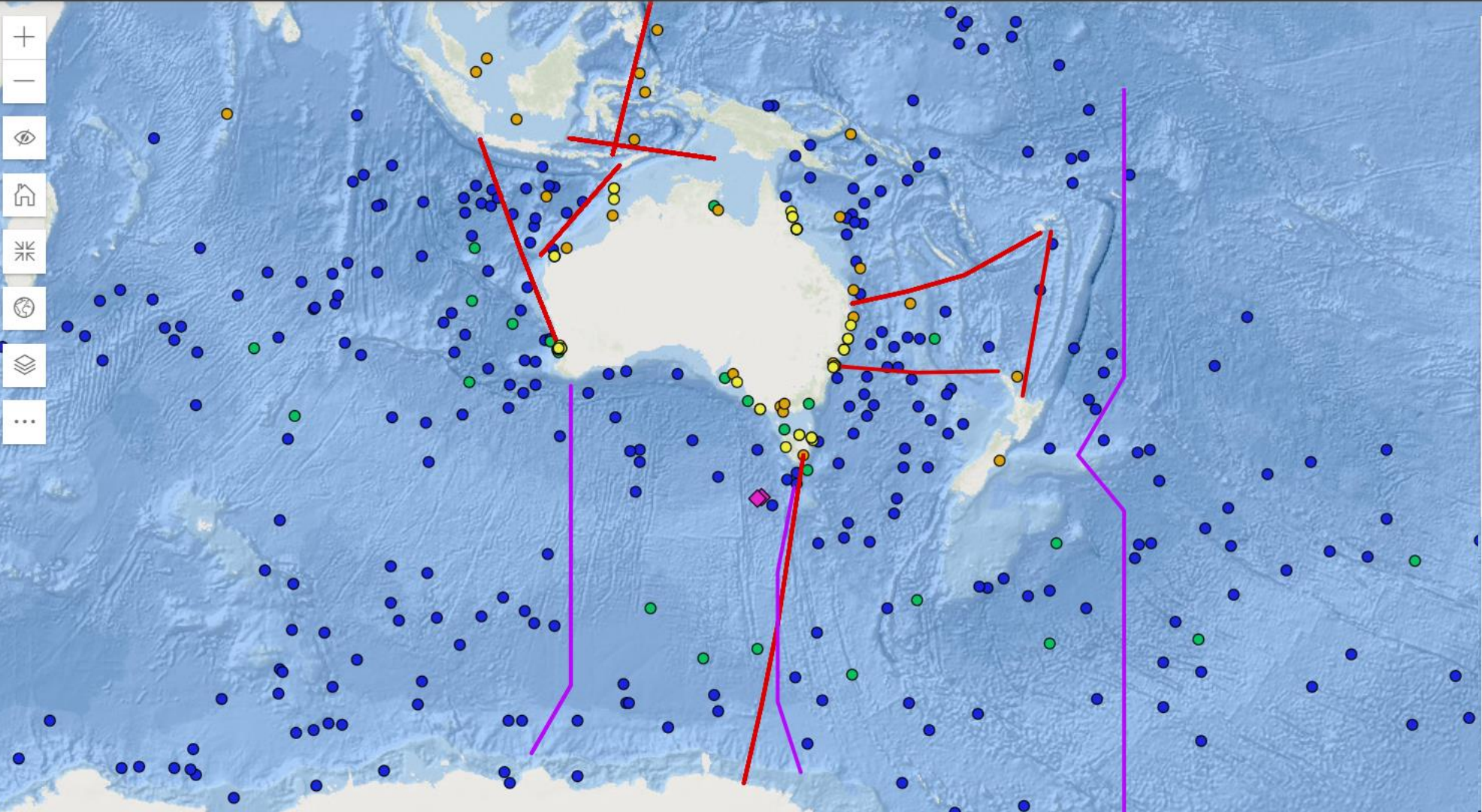
- Planning (152)
- Kaharoa deployments (2171)
- Kaharoa II deployments (0)
- Other deployments (17085)



Generated by ocean-ops.org, 2023-10-01
 Projection: Plate Carree (-150,0000)



Monitoring national Contributions to GOOS with OceanOPS: Showcase Australia









Work layers


- OceanGliders
Australia: 41 Deployments
- OceanSITES
Australia: 2 operat. Sites
- GO-SHIP
Australia: 3 Occupied Lines
- SOOP
Australia: 8 Operational XBT Lines
- VOS Australia:
34 operational Ships
- DBCP Australia:
32 operational Buoys
- Argo Australia:
293 operational Floats

Monitoring piggy-back Operations with OceanOPS: Float/Drifter Deployments


← → ↻ ocean-ops.org/board#

 Search    

 Inspect ship INVESTIGATOR (ICES Code: 096U)

 Info

Name	INVESTIGATOR	Ref. (ICES Code)	096U
Type	Research Vessels	IMO	9616888
Call Sign	VLMJ	MMSI	-
Country	Australia		

 Activity

SIO-DB
Argo eq. JAMSTEC
Argo UW-SOCCOM
SIO-DB

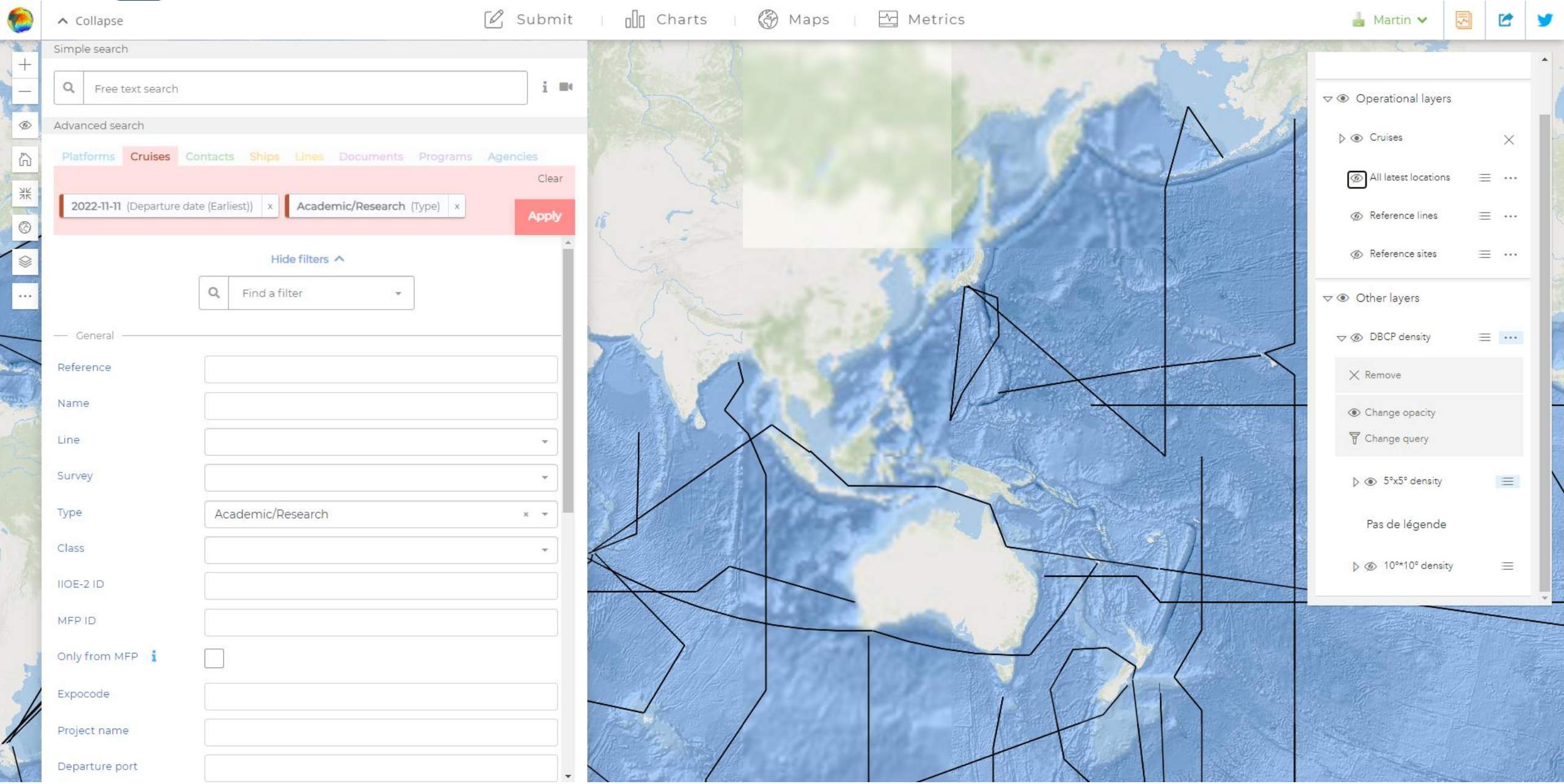
Other platforms (287)

5501531_100	5501531
5905834	5905834
5904672	5904672
5501530_100	5501530

INVESTIGATOR
Research Vessels
VLMJ
Australia

SIO-DB
Argo eq. JAMSTEC
Argo UW-SOCCOM
SIO-DB

Collecting and Updating of Cruise Plans manually: No efficient Solution



The screenshot displays the OceanOPS web application interface. At the top, there are navigation tabs for 'Submit', 'Charts', 'Maps', and 'Metrics'. The user's name 'Martin' is visible in the top right corner. The main interface is divided into a left sidebar and a central map area.

Search and Filter Section:

- Simple search:** A search bar with the placeholder text 'Free text search'.
- Advanced search:** A section with tabs for 'Platforms', 'Cruises', 'Contacts', 'Ships', 'Lines', 'Documents', 'Programs', and 'Agencies'. The 'Cruises' tab is selected.
- Filters:** Two active filters are shown: '2022-11-11 (Departure date (Earliest))' and 'Academic/Research (Type)'. An 'Apply' button is located to the right of these filters.
- Hide filters:** A dropdown menu with the text 'Find a filter'.
- General section:** A list of input fields for various attributes: Reference, Name, Line, Survey, Type (set to 'Academic/Research'), Class, IIOE-2 ID, MFP ID, Only from MFP (checkbox), Expocode, Project name, and Departure port.

Map and Layers Panel:

- The central map shows a satellite-style view of the Pacific Ocean region, with black lines overlaid representing cruise tracks.
- Operational layers:**
 - Cruises (with a close button 'X')
 - All latest locations (checked)
 - Reference lines
 - Reference sites
- Other layers:**
 - DBCP density
 - Remove button
 - Change opacity
 - Change query
 - 5°x5° density
 - Pas de légende
 - 10°*10° density

Free text search

Advanced search

Platforms Cruises Contacts Ships Lines Documents Programs Agencies

Clear · Load · Save

Argo Deep (Networks) x OPERATIONAL (Status) x **Apply**

January 1990 - January 2025 Operational only

Country

Sea region

Hide filters ^

Find a filter

General

Observing networks

Name

Reference Exact match

Status

Country

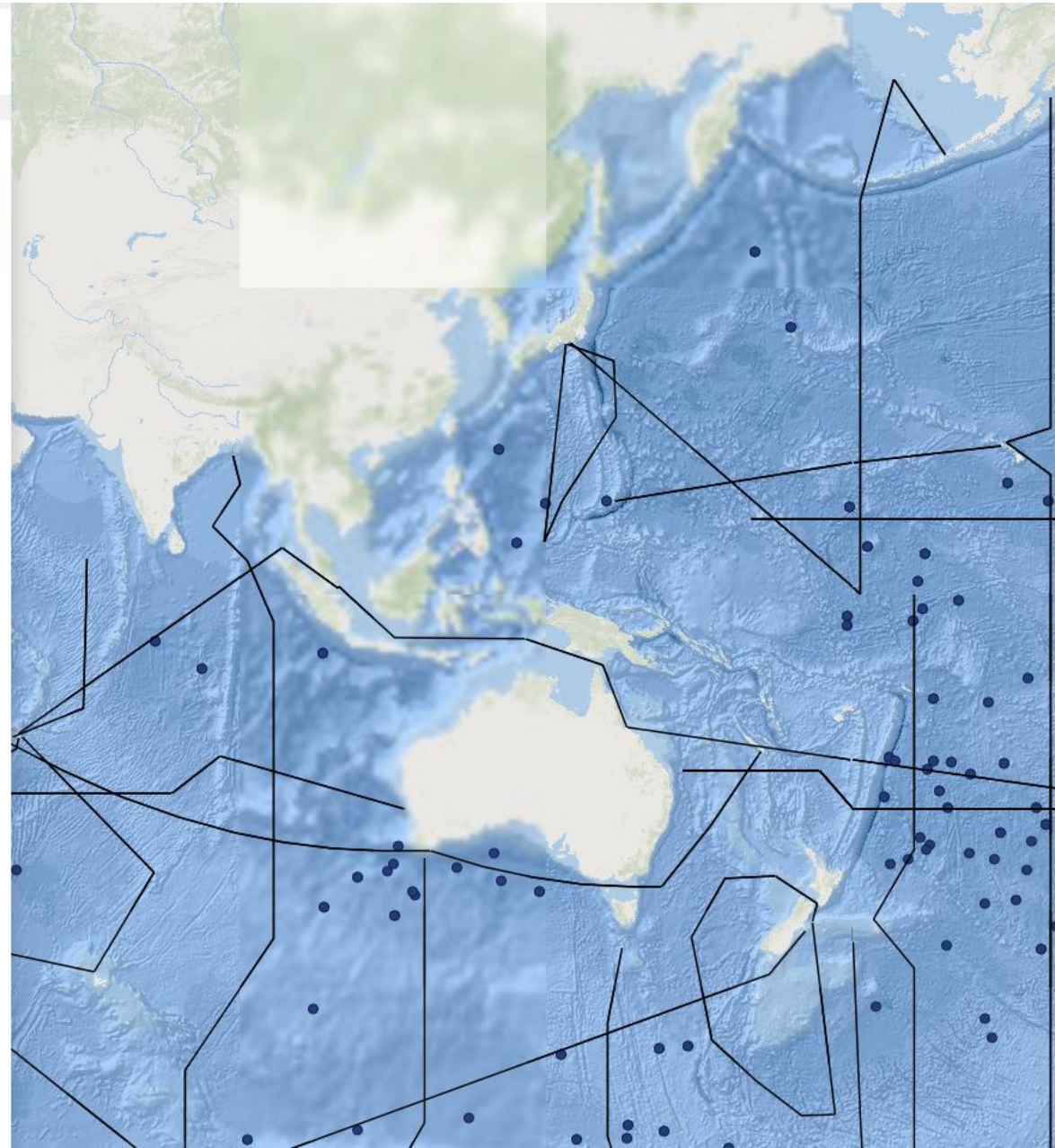
Program

Agencies POGO members

Contacts Roles

Networks

Station



Operational layers

- Cruises X
- All latest locations ...
- Reference lines ...
- Reference sites ...

Other layers

- DBCP density ...
- Remove
- Change opacity
- Change query
- 5°x5° density ...
- Pas de légende
- 10°x10° density ...



^ Collapse

Submit

Charts

Maps

Metrics

Martin



Simple search

Free text search

Advanced search

Platforms Cruises Contacts Ships Lines Documents Programs Agencies

Clear · Load · Save

Argo Deep (Networks) x OPERATIONAL (Status) x

Apply

January 1990 - January 2025

Operational only

Country

Sea region

Hide filters ^

Find a filter

General

Observing networks

Name

Reference Exact match

Status

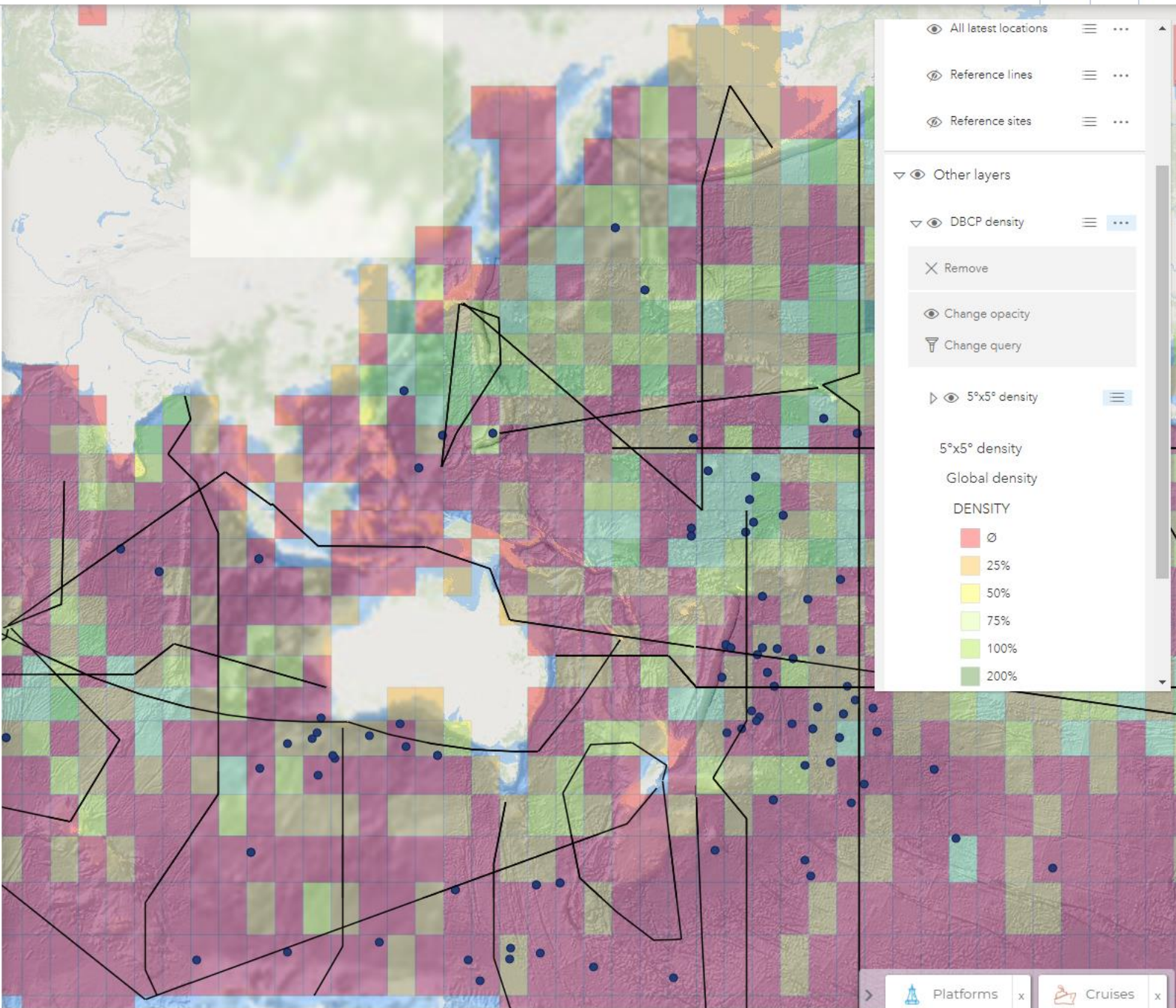
Country

Program

Agencies POGO members

Contacts Roles

Networks



All latest locations

Reference lines

Reference sites

Other layers

DBCP density

Remove

Change opacity

Change query

5°x5° density

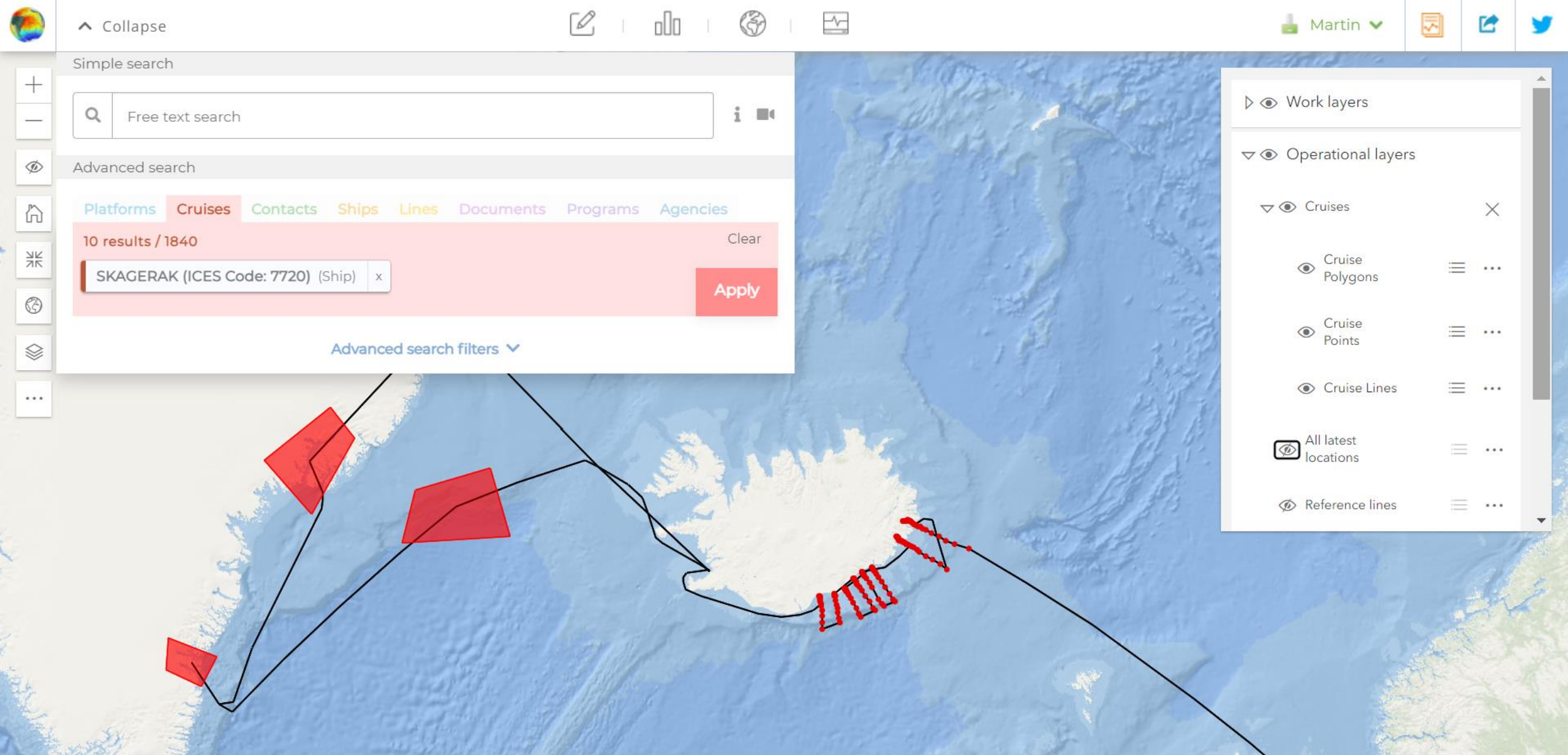
5°x5° density

Global density

DENSITY

- 0
- 25%
- 50%
- 75%
- 100%
- 200%

Platforms x Cruises x



The screenshot displays the OceanOPS web interface. At the top left, there is a 'Collapse' button and a navigation menu with icons for home, search, and other functions. The main search area is divided into 'Simple search' and 'Advanced search'. The 'Simple search' section has a search bar with the text 'Free text search'. The 'Advanced search' section has tabs for 'Platforms', 'Cruises', 'Contacts', 'Ships', 'Lines', 'Documents', 'Programs', and 'Agencies'. The 'Cruises' tab is selected, showing '10 results / 1840' and a search filter 'SKAGERAK (ICES Code: 7720) (Ship)'. An 'Apply' button is visible. On the right side, there is a user profile for 'Martin' and social media icons. The main map area shows a bathymetric map of the Skagerrak region with red polygons and a black line representing a cruise track. A legend on the right side of the map lists 'Work layers' and 'Operational layers'. The 'Operational layers' section includes 'Cruises', 'Cruise Polygons', 'Cruise Points', 'Cruise Lines', 'All latest locations', and 'Reference lines'.

Simple search

Free text search

Advanced search

Platforms Cruises Contacts Ships Lines Documents Programs Agencies

10 results / 1840 Clear

SKAGERAK (ICES Code: 7720) (Ship) x Apply

Advanced search filters

Work layers

Operational layers

- Cruises
- Cruise Polygons
- Cruise Points
- Cruise Lines
- All latest locations
- Reference lines



^ Collapse



Martin ✓



Simple search

Free text search

Advanced search

Platforms Cruises Contacts Ships Lines Documents Programs Agencies

10 results / 1840

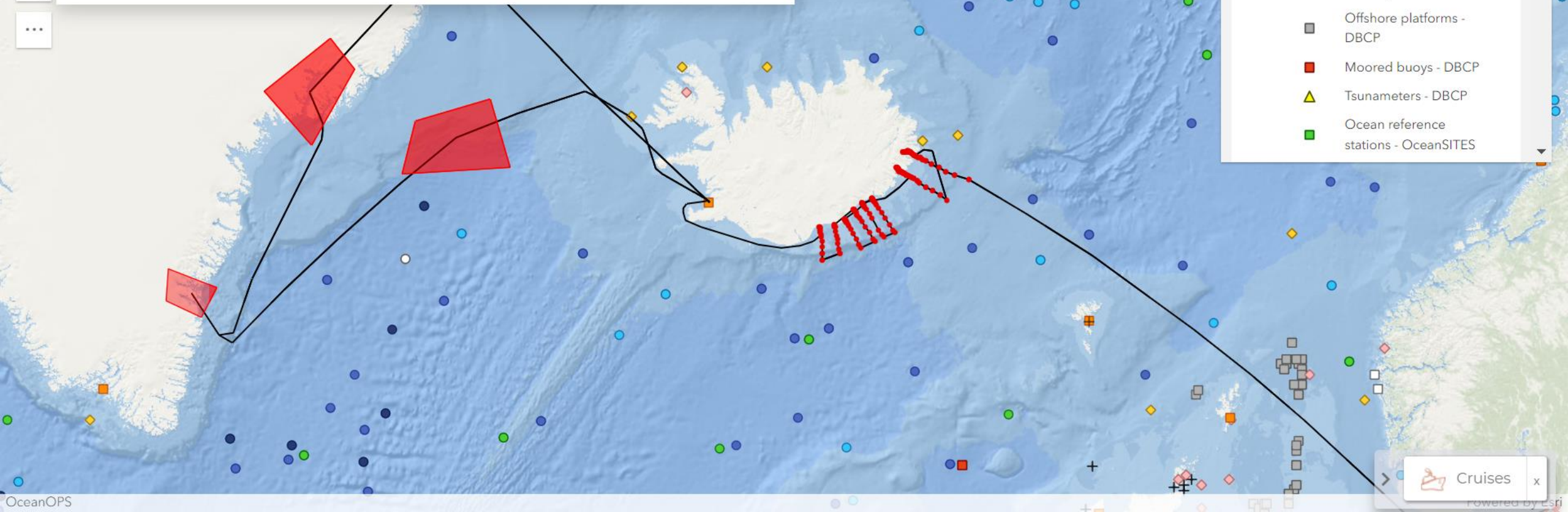
Clear

SKAGERAK (ICES Code: 7720) (Ship) x

Apply

Advanced search filters

- Core floats - Argo
- Deep floats - Argo
- Biogeochemistry floats - Argo
- Underwater gliders - OceanGliders
- Drifting buoys - DBCP
- Polar buoys
- Animal borne sensors
- Sail drones
- Fixed systems
- Offshore platforms - DBCP
- Moored buoys - DBCP
- ▲ Tsunameters - DBCP
- Ocean reference stations - OceanSITES



GO-SHIP

Real Time/
Delayed Mode

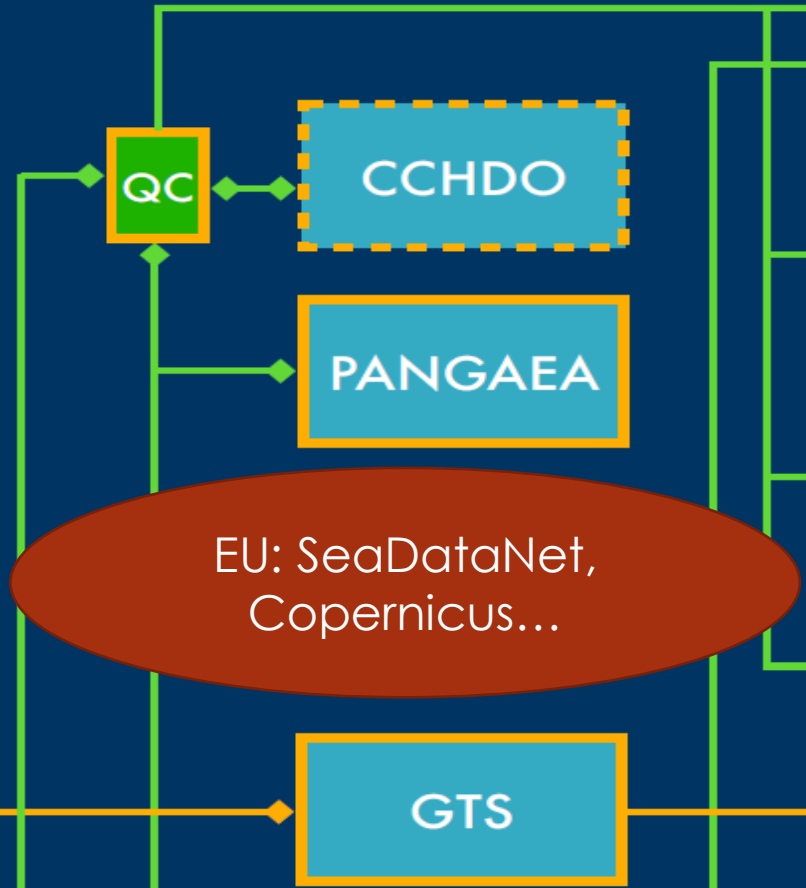
Contributing Members



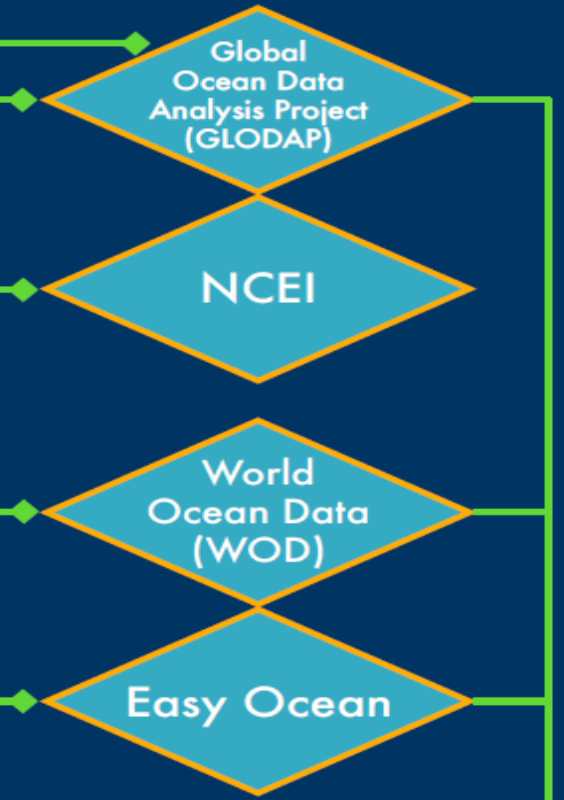
National Data Acquisition Center



Global Data Distribution



Global Data Product



- Central data server
- Real time raw data flow
- Quality controlled real time data flow
- Quality controlled delayed mode data flow

<Bottle/
CTD>

Variables:

T, P, S,
Oxygen
DIC, pH
Alkalinity
Nutrients
(NO3/NO2,
PO4,
SiO3), CFCs,
SF6, 14C,
& 13C of DIC,
CCl4,
Dissolved
Inorganic
Carbon,
phosphate,
silicate, DOC,
DON

TRACKING A CRUISE AND EMERGING DATA / METADATA OVER THE FULL LIFECYCLE

- Suggested: Idea to apply for shiptime at later stage
- Planned: Application process is underway
- Confirmed: Application was successful
- At sea: Cruise is underway
- Completed: Cruise finished
- Submitted: Data flow to DAC and GDAC successfully
- Uptake: Data being used in products/publications

A FULL LIFETIME UNIQUE CRUISE ID

- Allocated by OceanOPS, based on approved Argo/Drifter/SOT system
- 10 characters not including any further semantik
- Reminder: Expocode not available before departure; DOI overkill given that many cruises are only suggested but never confirmed
- PIs could continue with internal codes – Data managers match incoming data with the different IDs
- CSR and other IDs could be based on the OceanOPS ID
- Concept approved by key data producers (GO-SHIP) and users (GLODAP)

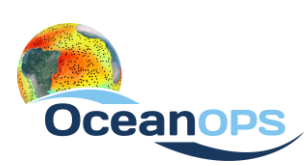
ALLOCATION OF THE CRUISE ID

- Use the OceanOPS dashboard / GUI for online edits
- Use a csv file and upload cruise metadata
- Use the OceanOPS API
- Use the MFP synchronization protocol

It can start with a very simple metadata set many years in advance;

« GO-SHIP A 25 France 2027 »

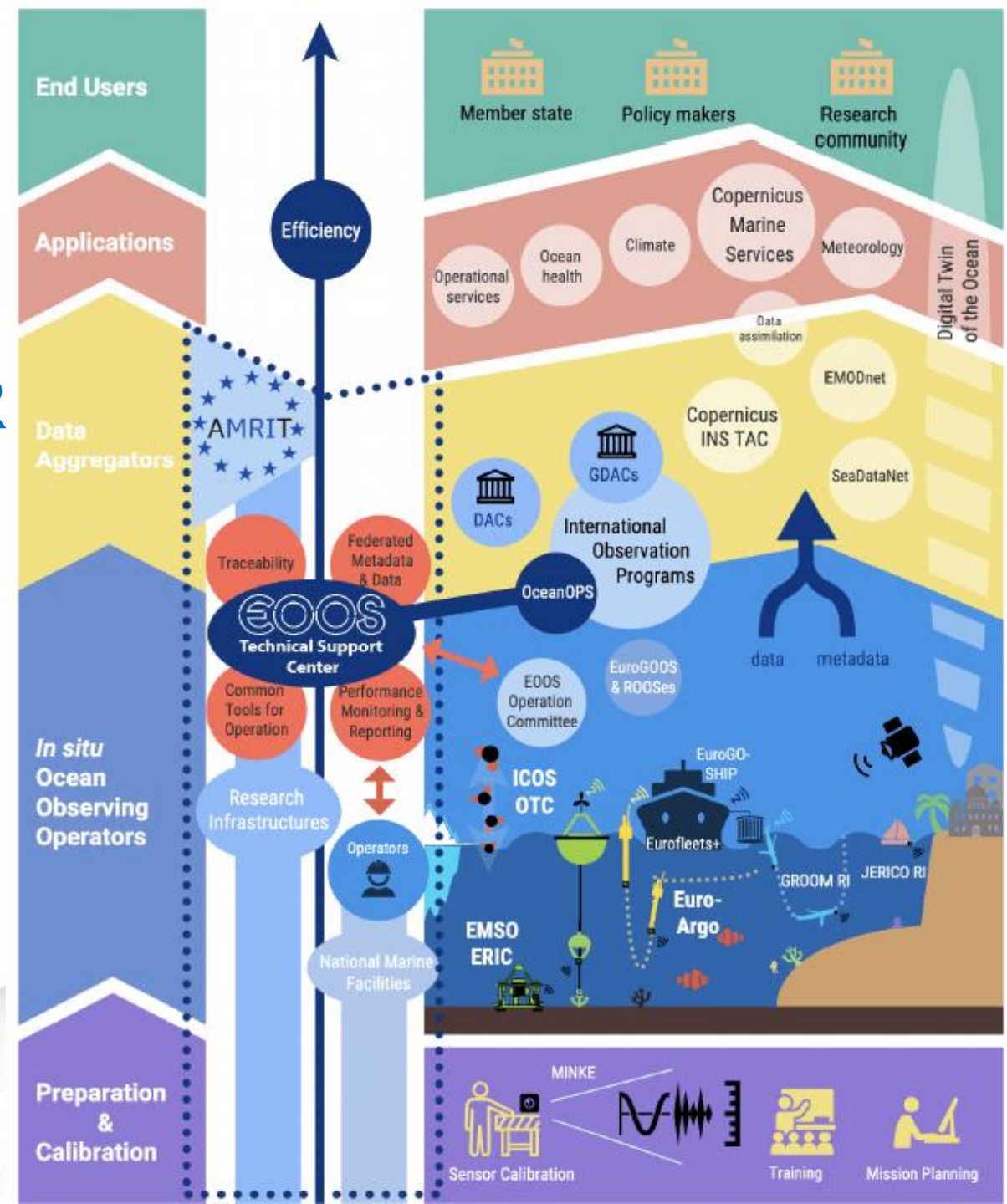
Metadata then become richer as time goes by: Ship, CS, variables...



EU HORIZON PROJECT AMRIT: ADVANCE MARINE RESEARCH INFRASTRUCTURES TOGETHER

26 Partners, including ERICs (Euro-Argo, ICOS, EMSO) and MRIs like JERICO, Eurofleets+, GROOM, and later EUMR2, MINKE and EuroGO-SHIP; WMO/OceanOPS

1. better support research with an improved flux of ocean data;
2. function as truly integrated components of EOOS and, ultimately, GOOS;
3. better support the Copernicus Marine Service.



AMRIT TASK 8.3: CONNECT R/V NATIONAL FLEET SCHEDULES, AND MANAGEMENT METADATA TO THE CENTRAL SYSTEM

Lead: WMO; Partners: CNR, CSIC, Ifremer, KDM, MI, NIOZ, NOC

“The national R/V information nodes will develop and implement APIs, following the overarching API design recommendations, to connect to the federated metadata system or adapt their current management system (e.g., Marine Facility Planning, MFP) as needed. Particular attention will be given to the geographical information of the planned cruise tracks through Open Geospatial Consortium (OGC) standards and introduction of PIDs for cruises.”

DISCUSSION

- Pros and Cons Cruise ID
- Visibility of RVs in GOOS/OCG, with IRSO as « network »?
- Sharing Cruise Plans with OceanOPS; role of IRSO ?

Goal beyond « FAIR » Data:

Show full scope/performance of a cruise (incl. piggybacks), exploit maximum of synergies, share costs (incl. environmental footprint)

THANKS!
MKRAMP@OCEAN-OPS.ORG