SOCIB Balearic Islands Coastal Observing and Forecasting System

EMODnet European Marine Observation and Data Network

SOCIB

Multi-Platform Data Distribution Challenges: from Observing Systems to Data Distribution

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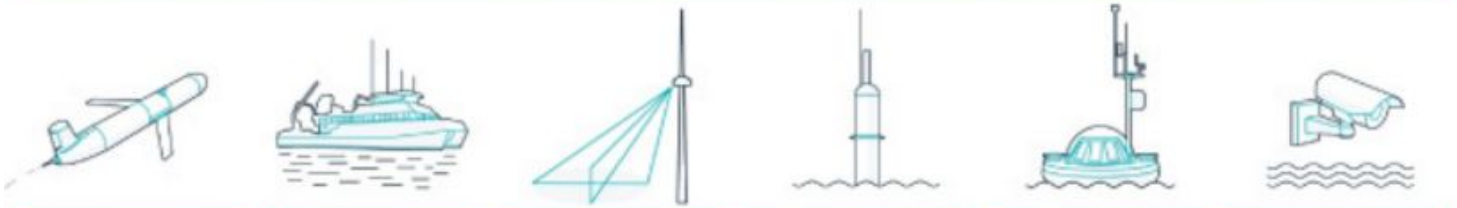
OUTLINE

1. Coastal Ocean Observing & Forecasting System of the Balearic Islands (SOCIB)
2. SOCIB Data Center Facility
3. SOCIB Data Distribution
4. EMODnet Physics
5. HF Radar: challenges for the standardization
6. HF Radar standardization strategy and road map
7. HF Radar: SOCIB contributions
8. Glider: current framework
9. Glider: current challenges
10. Glider network development plans

Multi-platform observing system - SOCIB

Observing Facilities



GLIDER FACILITY
74 glider missions total
1.668 glider days at sea total
68.821 CTD profiles total

R/V SOCIB
484 ship days of operation from 2013-2017
353 ship days external access from 2013-2017

HF RADAR
95% time in operation (1.779 days)
75% area coverage

LAGRANGIAN PLATFORMS
ARGO PROFILERS
2.022 Vertical profiles
9.843 total days of Argo profilers observations

SURFACE DRIFTERS
132 total platforms
15.129 days of data

ANIMAL BORNE TRACK
22 sea turtles track, 9 (of the 22) instrumented with TTDR
11.140 temperature profiles

FIXED STATIONS
21 stations transmitting data in realtime
6 sea level stations
2 oceanographic buoys
2 coastal stations
6 Weather stations
5 AIS antennas

BEACH MONITORING
3 beach monitoring stations
2.500 operative days
6 beach monitoring surveys/year/beach
16 Technical & Research collaborations

Forecasting Facilities

3 operational forecasting systems

CURRENTS
1 high-resolution prediction system (WMOF)

WAVES
1 high-resolution prediction system (SAPO-IB)

RISSAGUES
1 atmosphere-ocean prediction system for meteo-tsunamis (BRIFS)

www.socib.es

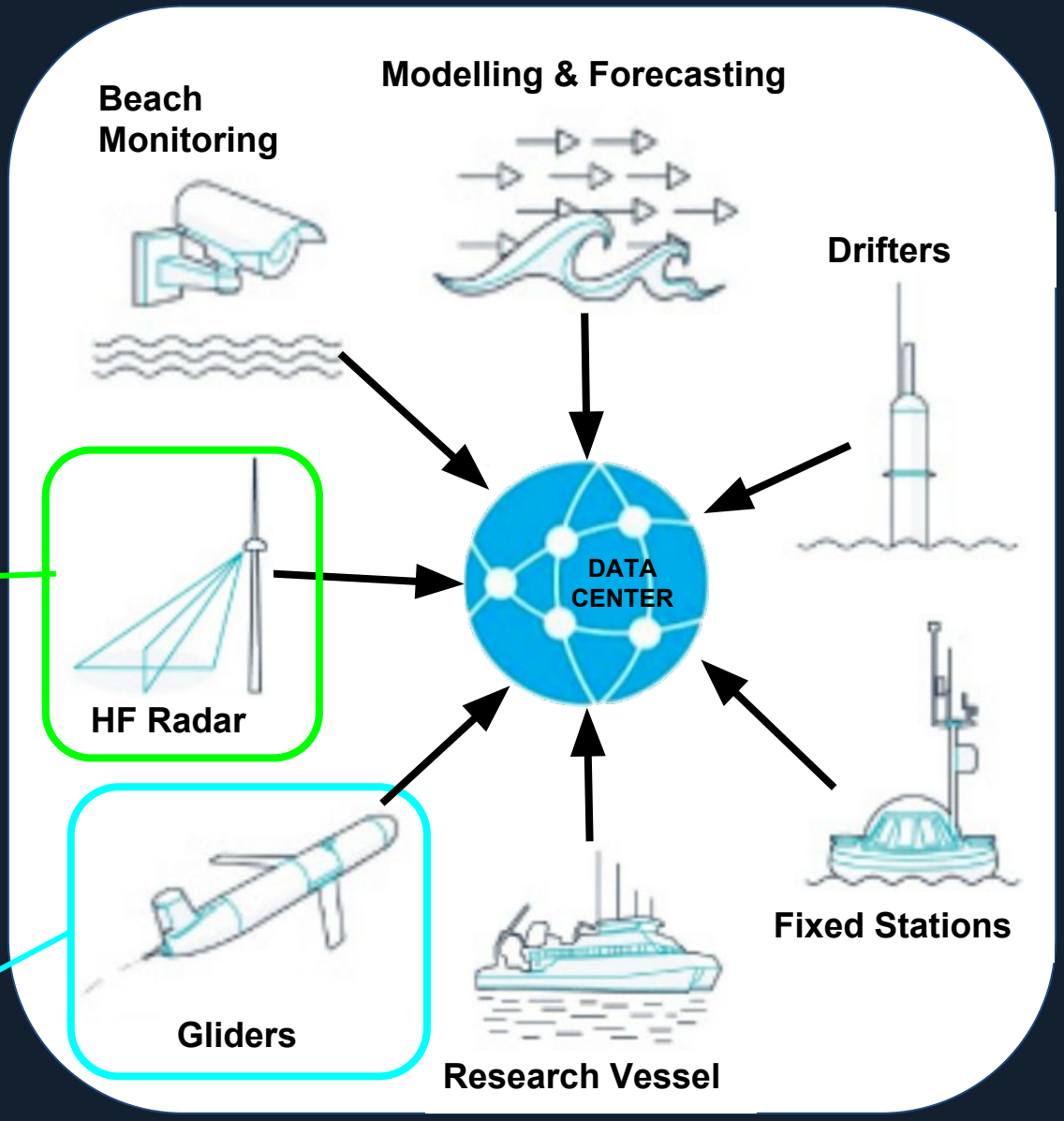
Fully open data
Three key drivers:
- science priorities
- tech. Development
- society needs

SOCIB Data Center Facility

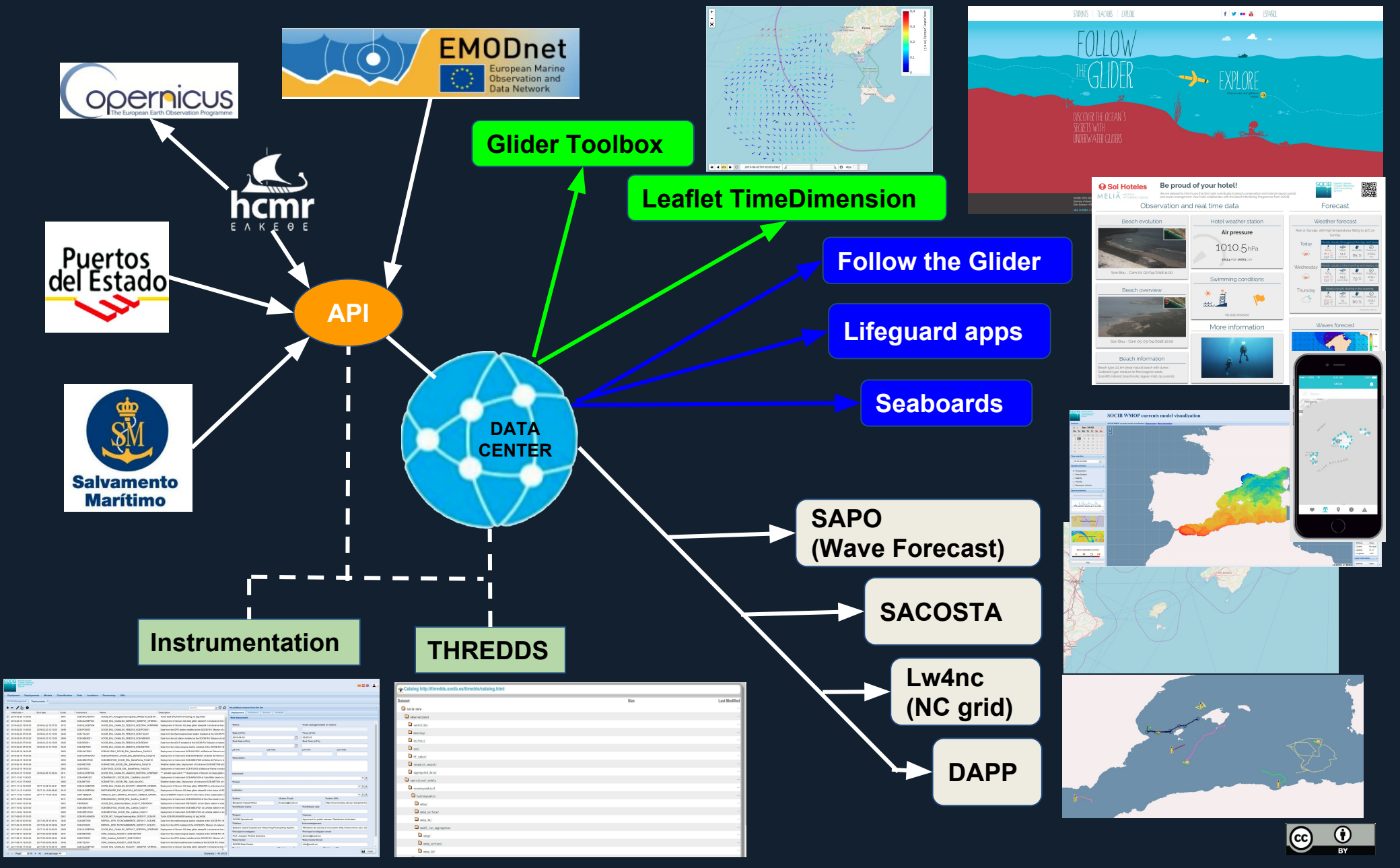
- Platform management and communication
- QC assurance
- Metadata aggregation and standardization
- Data archive
- Data search and discovery
- Data policy and distribution
- Data viewing

- Since June 2012, 1779 days (95% of operating time, 75% area coverage)
- 2 Direction Finding HFR stations
- QA/QC implementation
- Data validation with in-situ data
- CF1.6 + OceanSites + INSPIRE metadata compliance
- Future integration in CMEMS Apr. 2019 (NRT) & Apr. 2020 (Reproc.)
- Integration in EDS - SASEMAR

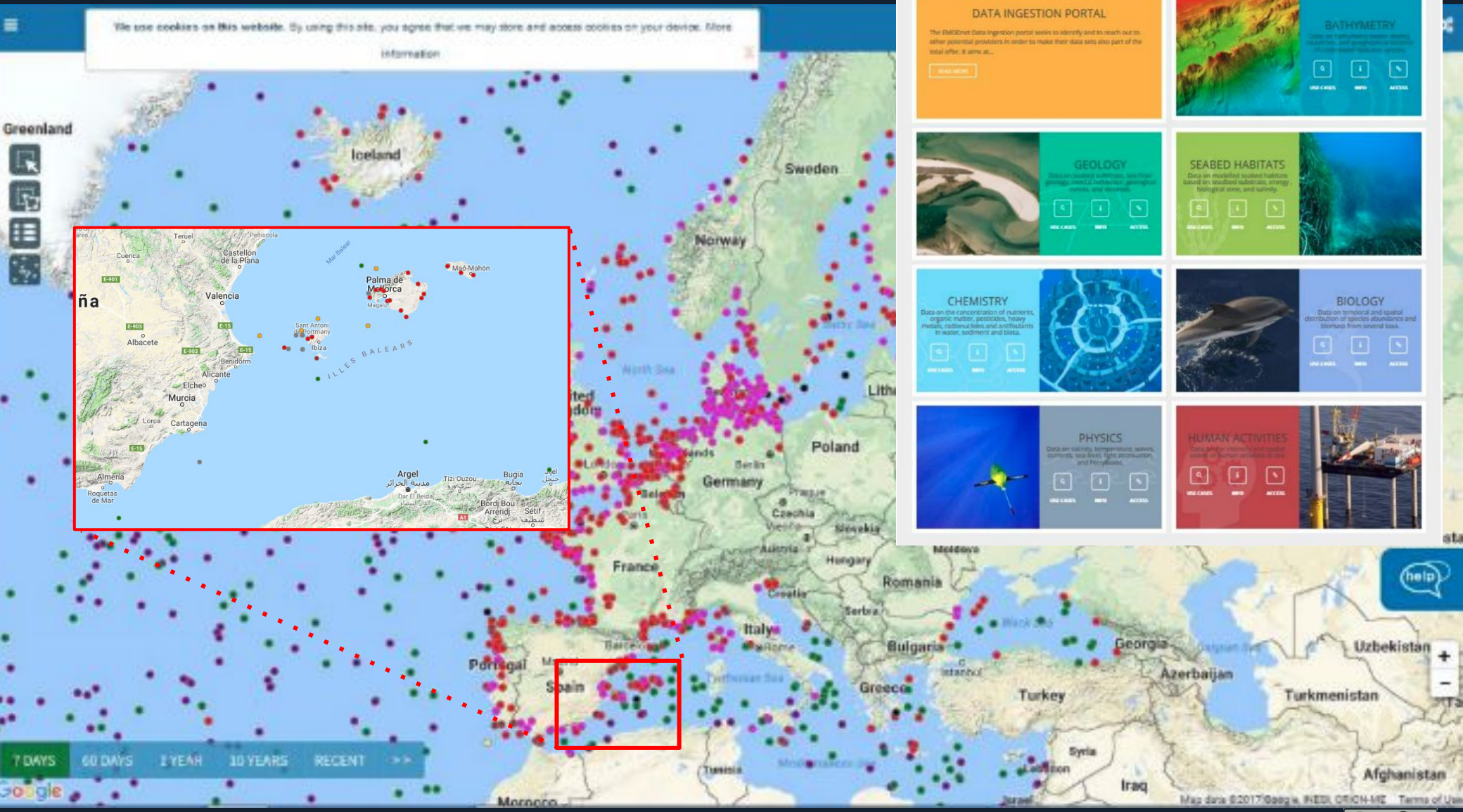
- Since 2011, Glider 'endurance' lines (Quasi-continuous)
- 74 missions
- 3 G1 & 4 G2 Slocum gliders, 2 Seaglider
- QA/QC implementation almost operational
- Biogeochemical calibration
- CF1.6 + EGO metadata compliance
- Integration in Coriolis + EMODnet



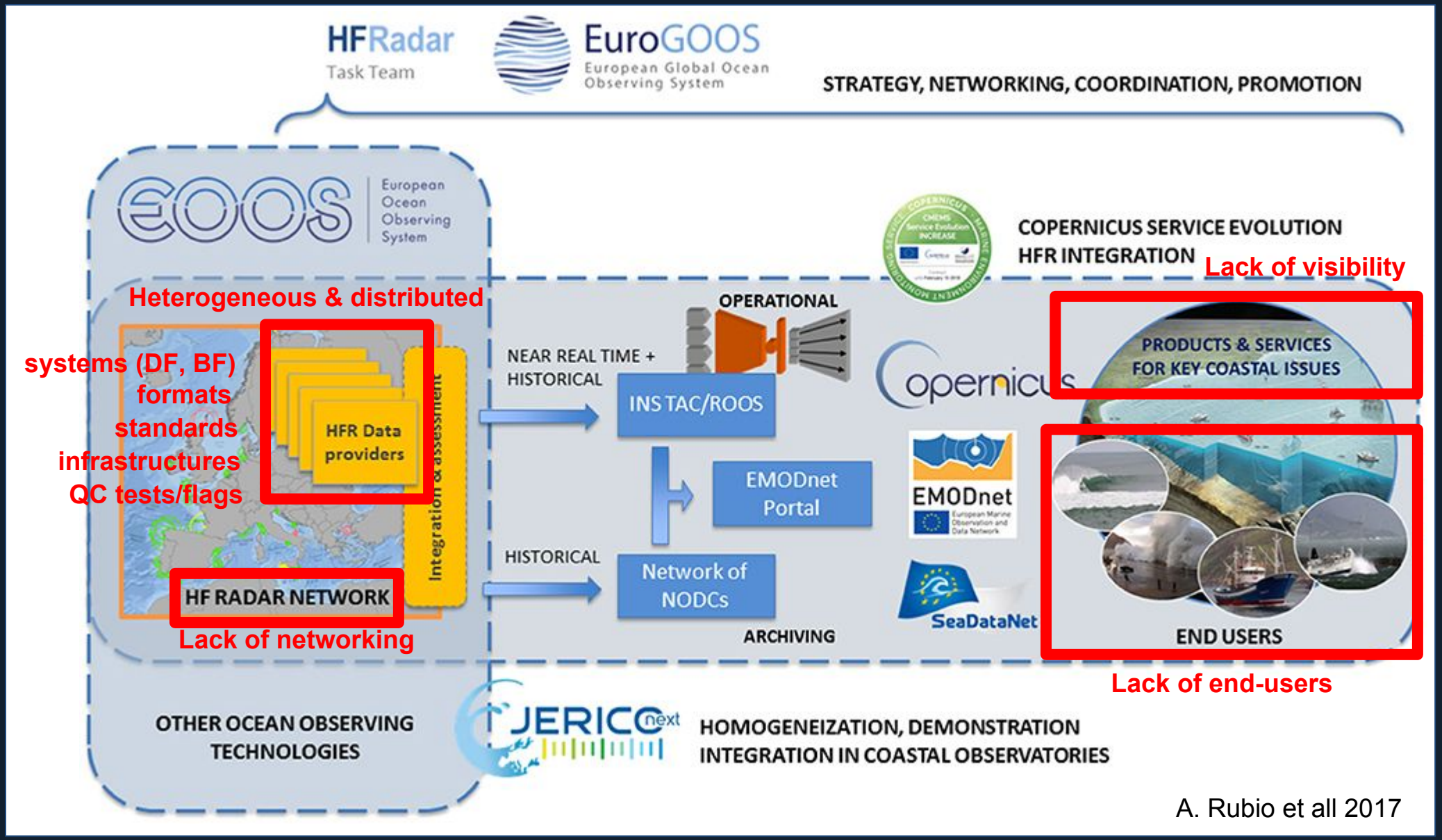
SOCIB Data Distribution - API as Key Component



EMODnet Physics



HF Radar - European integration challenges



A. Rubio et all 2017

HF radar - INCREASE & HF Radar TT

ACTIVE INITIATIVES
EuroGOOS HFR Task Team
EMODnet Physics
CMEMS (INCREASE)

PROJECTS
EU project Jerico-Next
EU project SeaDataCloud
CMEMS INSTAC Phase 2

COLLABORATION
IOOS
IMOS-ACORN
ROWG

Launched by EuroGOOS HFR TT to provide:

- General overview of EU HFR system
- Main HFR operation & maintenance issues
- Standardization
- Data sharing protocols
- Main areas of applications
- Main identified users
- Main related research lines

Survey → **Boost Network** → **Integration** → **Standardization** → **Engagement** → **Agreements** → **Tools**

Join proposals, Essential role of EuroGOOS HFR TT

Foster HFR network integration in EU marine portals (e.g. EMODnetPhys, CMEMS)

Provide and promote tools exchange, assessment metrics and methodologies (e.g. JRadar software by AZTI, OMA know-how..)

Improve administrative procedures (e.g. agreements to avoid interferences France-Spain-Italy)

Engage end-users (e.g. Integration of HFR data in EDS-SASEMAR)

Ensure data availability in standard formats (e.g. definition of guidelines and software for converting formats into standards)

HF radar - SOCIB Contributions

Helped implementing common data format and metadata structure for NRT HFR derived current data
(see poster: The European common data and metadata model for real-time High Frequency Radar surface current data, L. Corgnati)

data format	metadata structure	QC flagging scheme	QC tests
• **netCDF-4** data, and **netCDF-3.6.1**. • CMEMS IN-SITU TAC archiving strategy and folder structure, • CMEMS IN-SITU TAC naming convention. **Data var names:** • SeaDataNet P09*	***Mandatory Attr.*** • to comply with CF-1.6 and OceanSITES conventions. ***Recommended Attr.*** • to comply with INSPIRE and Unidata Dataset Discovery conventions. ***Suggested Attr.*** • relevant in describing the data, whether it is part of the standard or not.	CMEMS IN-SITU TAC –OceanSITES: **0.** unknown, no QC **1.** good, all QC passed **2.** probably good, **3.** Probably correctable, data used without scientific correction/calibration **4.** Bad data, one or more QC failed **7.** Nominal value, data not observed but reported **8.** interpolated value **9.** Missing value	• chosen among the ones listed in the **QARTOD** manual. • **are manufacturer-independent**, i.e. they do not rely on particular variables or information provided only by a specific device. • defined **for both radial and total velocity data** • **required for labelling** the data as Level 2B (for radial velocity) and Level 3B (for total velocity) data.

Helped homogenizing QA/QC procedure

For Radial Data
- Syntax
- Over water
- Variance threshold
- Velocity threshold
- Median filter
- Average radial bearing

For Total Data
- Data density threshold
- Balanced contributing radials
- GDOP threshold
- Velocity threshold

Boosting network by coordinating and participating in joint proposals
http://crusoe-hfradar-training.eu

Promote data use (integration in EDS-SASEMAR)

Sign collaboration agreements

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Glider - What about the glider network?

European Glider Data Management Meeting, March 2018, Milan

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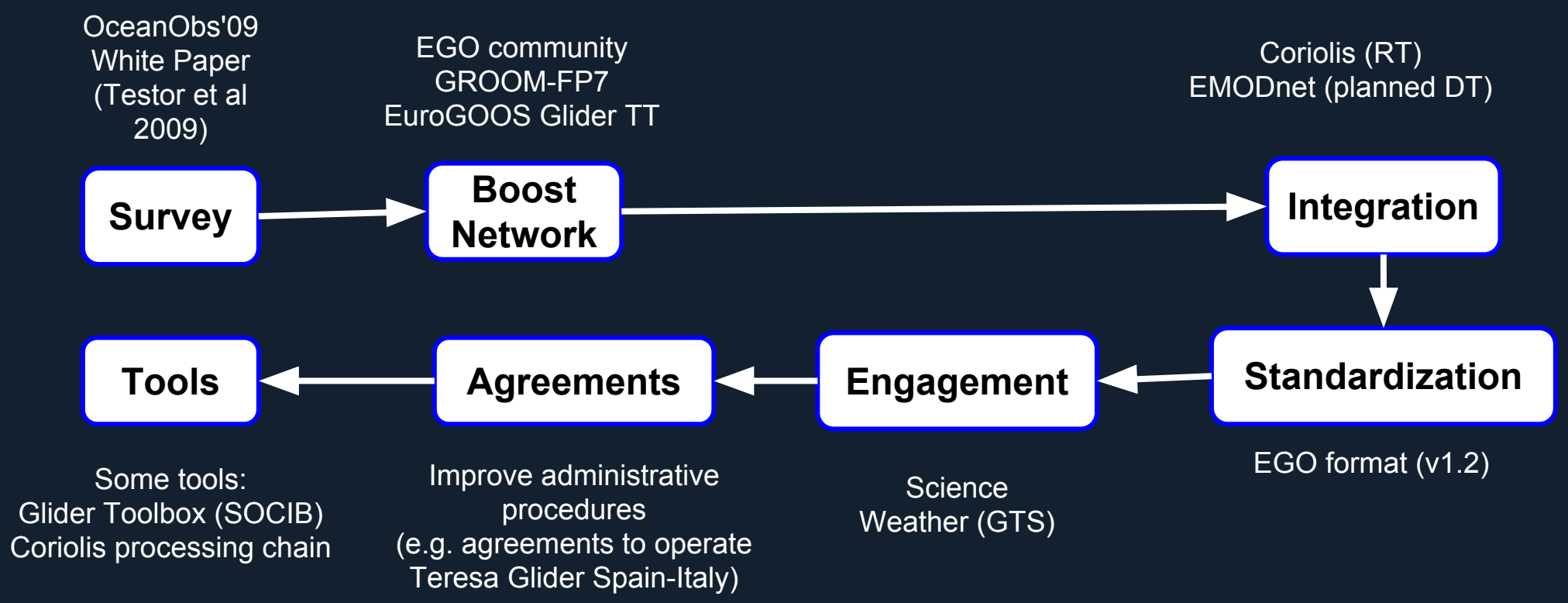
Glider - Should we follow the same path?



Glider - Should we follow the same path?

Need update

OceanObs'09 White Paper (Testor et al 2009)

Improve communication (e.g. forum or mailing list)

EGO community
GROOM-FP7
EuroGOOS Glider TT

Complicated, need to remove redundancy in registration
=> Improve efficiency to take on data flow increase

Coriolis (RT)
EMODnet (pianned DT)

Require definition of delayed mode and QC standards/tests

Survey → **Boost Network** → **Integration** → **Standardization** → **Engagement** → **Agreements** → **Tools**

EGO format (v1.2)

- Need DAC compliance and format stability for coherent evolution of data flow
- Align format checker
- Evolution of format anticipated in the next 2 years
- Full and light format required
- Glider variable name mapping

Science
Weather (GTS)

Need to enlarge community (e.g. environmentalists)

Improve administrative procedures
(e.g. agreements to operate Teresa Glider Spain-Italy)

Some tools:
Glider Toolbox (SOCIB)
Coriolis processing chain

Need of join efforts to provide tools to users specially for QC

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Glider - What is next?

European Glider Data
Management Meeting
March 2018, Milan

EUROGOOS Glider TT
Data management meeting
September 2018 (coming soon)

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Thanks for listening!

Questions?

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EMODnet
European Marine Observation and Data Network

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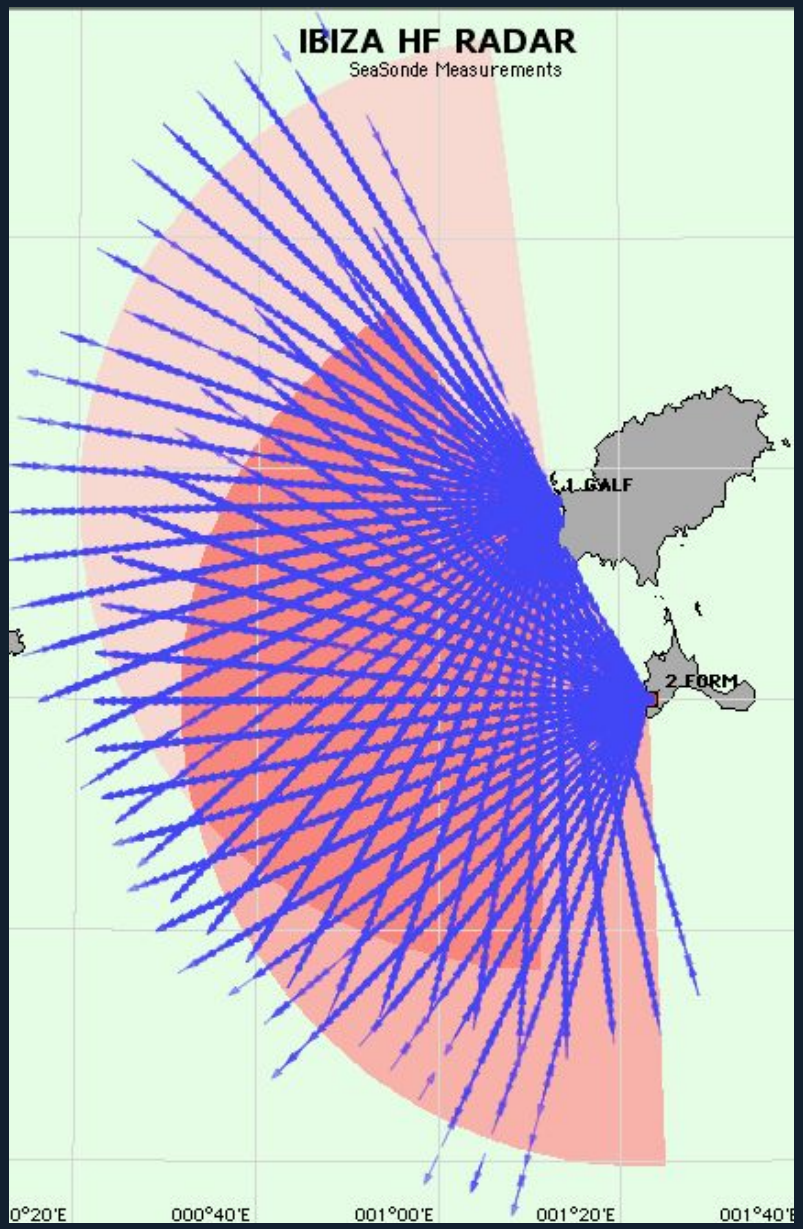
HF Radar - SOCIB experience



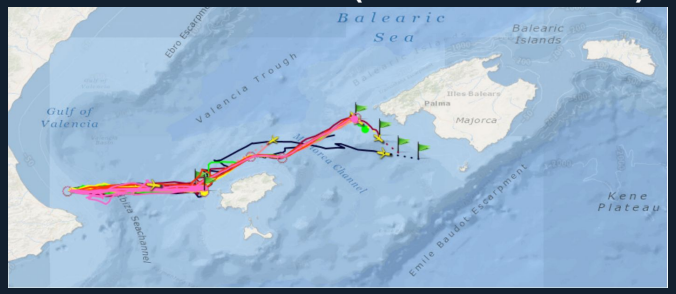
MAIN ACHIEVEMENTS

- Real-time data acquisition and dissemination
- Validation of the HFR data: NRT[1] & DM
- QA/QC procedures and monthly reports[1]
- New products: data-gap filled[1]
- HFR data assimilation & model assessment[1]
- Contributions to international conferences
- Outreach activities – HFR leaflets[1]
- Participation in EC funded projects
- International / national collaborations
- Integration of SOCIB data sources into SASEMAR-EDS[1]

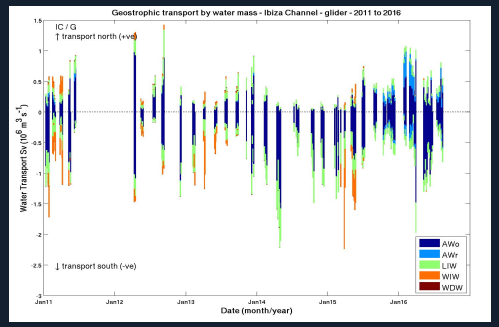
[1] Specifically in 2016-2017

Glider - SOCIB experience

SUSTAINED OBSERVATIONS & PROCESS TYPE STUDIES (OPEN ACCESS)



WATER MASS FLOW TOOLS



GLIDER LAB

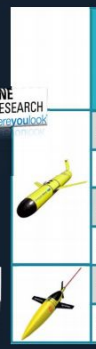
CTD & BIOGOCHEM CALIBRATION

GARICAST

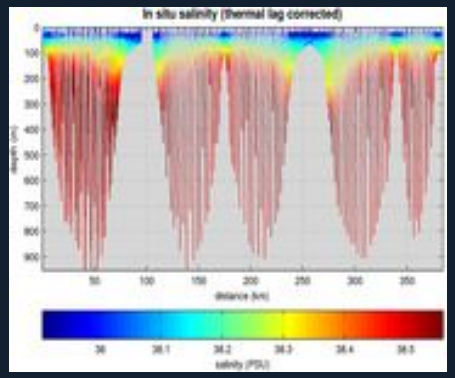
GLIDER FLEET

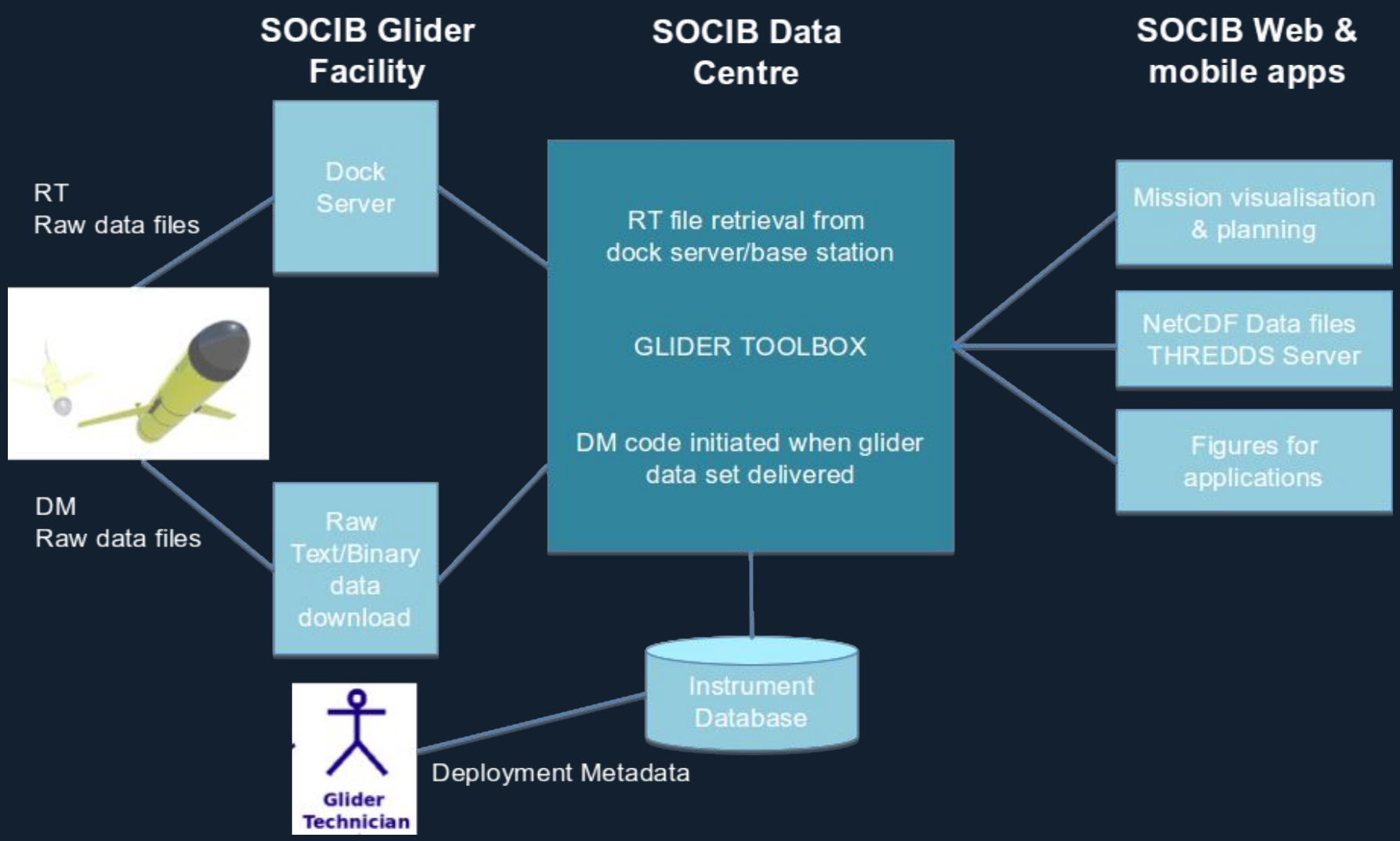
GLIDER FLEET

Name	Model	(m)Depth Range	Science Sensors	(days)Max. Autonomy	Property Of	ByManaged	YearPurchase
sdeep00	Slocum G2	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2011
sdeep01	Slocum G2	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2011
sdeep04	Slocum G2	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2015
sdeep05	Slocum G2	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2015
sdeep02	Sea Glider	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2012
sdeep03	Sea Glider	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2012



GLIDER TOOLBOX



GLIDER DATA DISTRIBUTION

Glider - SOCIB Glider Toolbox