JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

JERICO-NEXT project

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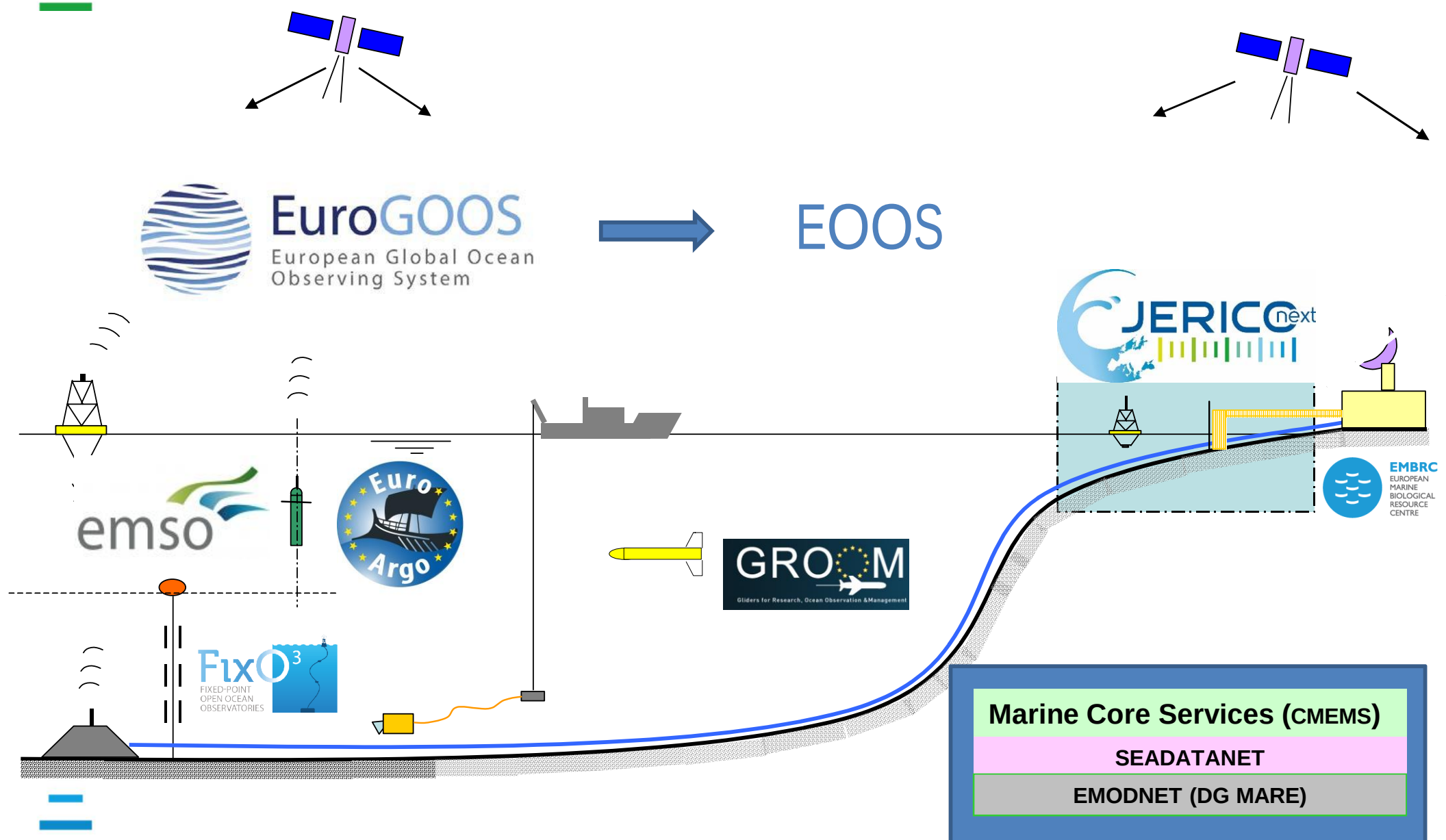
Toward a sustained Pan European JERICO-RI

Some components of the European Context



JERICO-NEXT: Quicklook

... Objectives and needs...

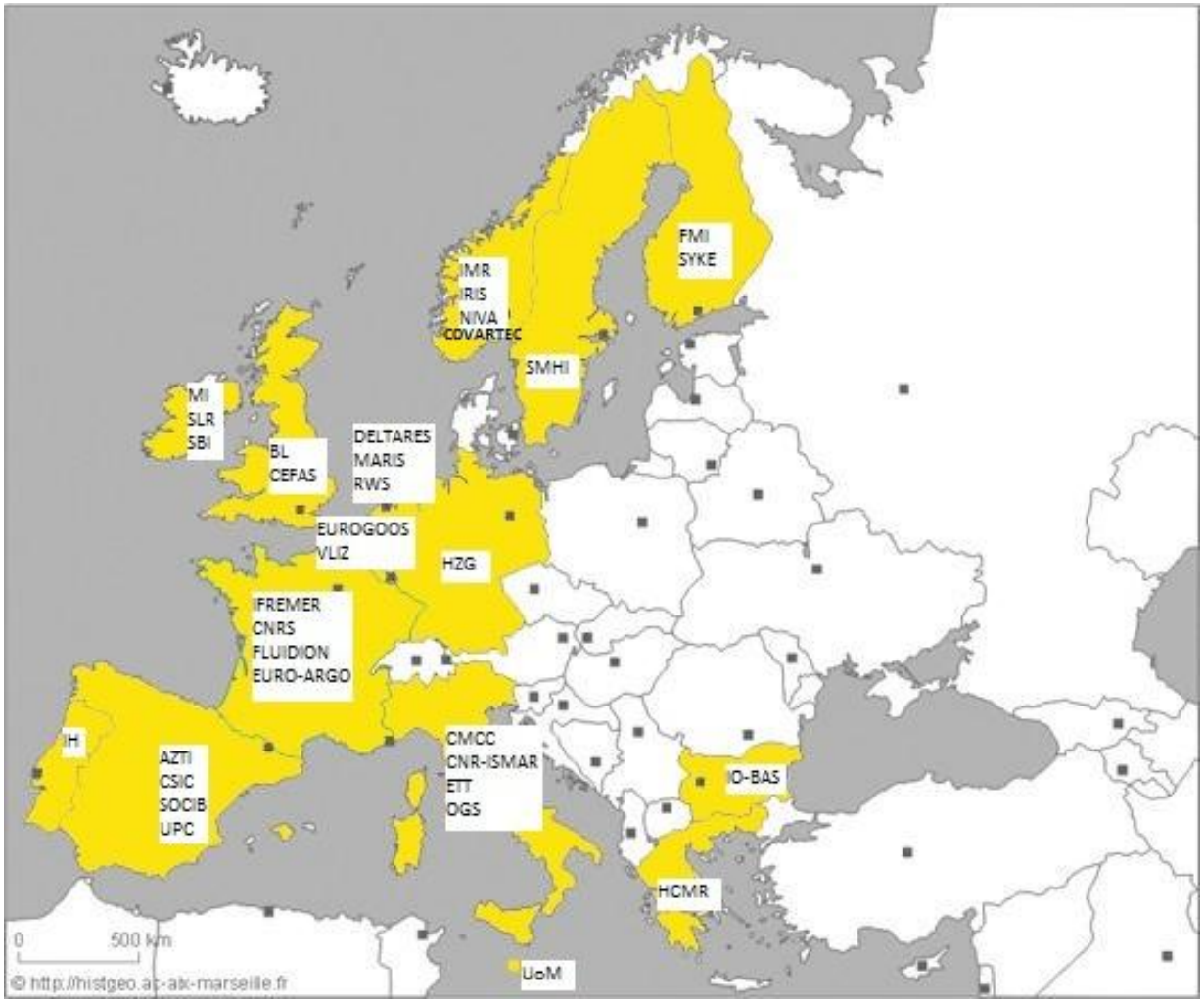
Delivery of an harmonized research infrastructure for coastal observations, compliant with EMODNET and Copernicus

- To ensure the sustainable provision of high-quality coastal multidisciplinary observations that can support:
  - Progress and breakthrough in marine science
  - European policies and national duties
  - The development of business activities (e.g. marine services)

To produce a long-term strategy for further development, integration, sustainability and relevance of coastal observatories in Europe

JERICO-NEXT: Quicklook

34 partners

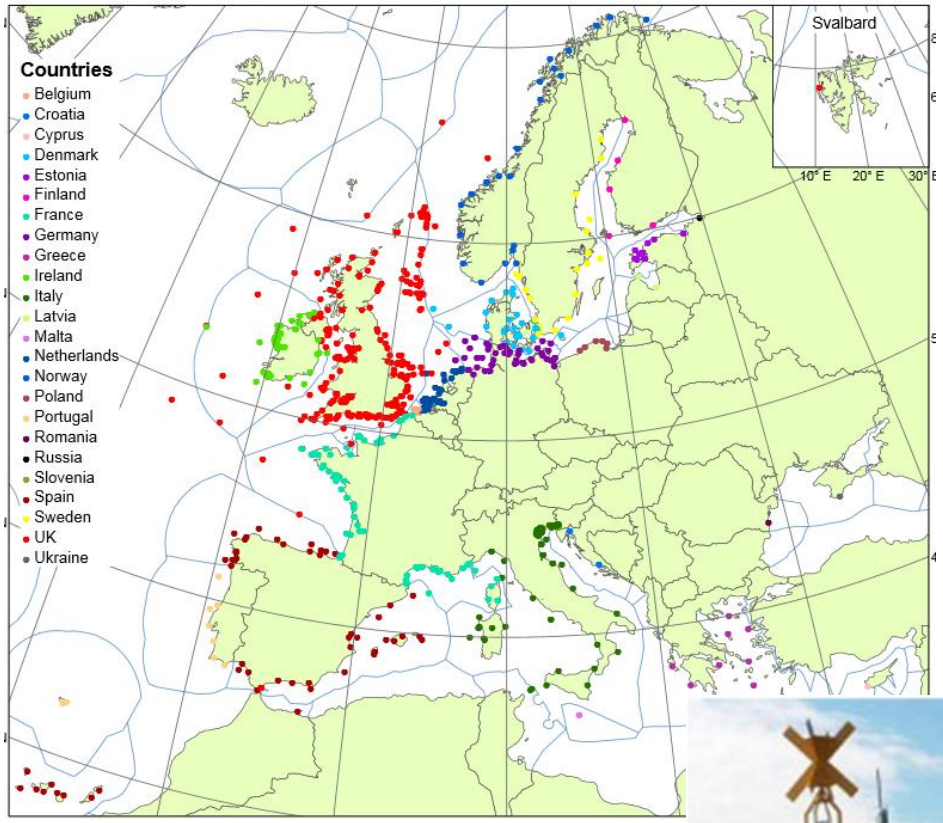


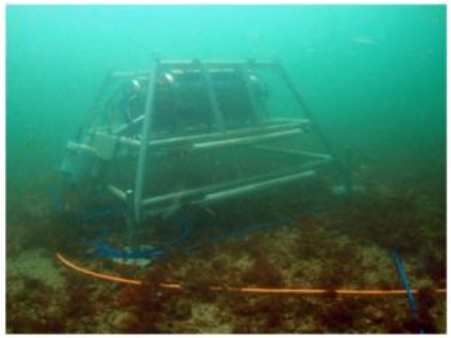
JERICO-NEXT: Quicklook

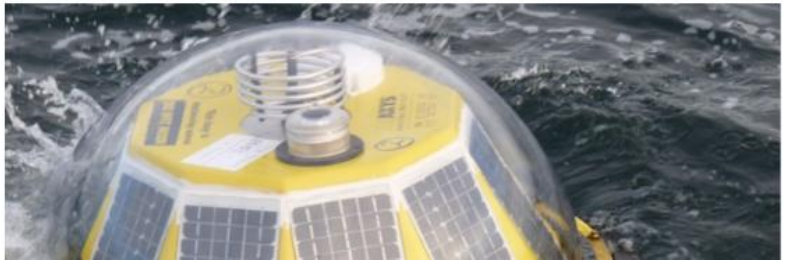
Important figures

- Duration: Sept. 2015- Aug. 2019, 4 years
- EU funding: 10M€
- Consortium: 34 partners, 910 manmonths
- Organisation: 9 WPs + STAC + User panel
- Coordination: Ifremer: jerico@ifremer.fr

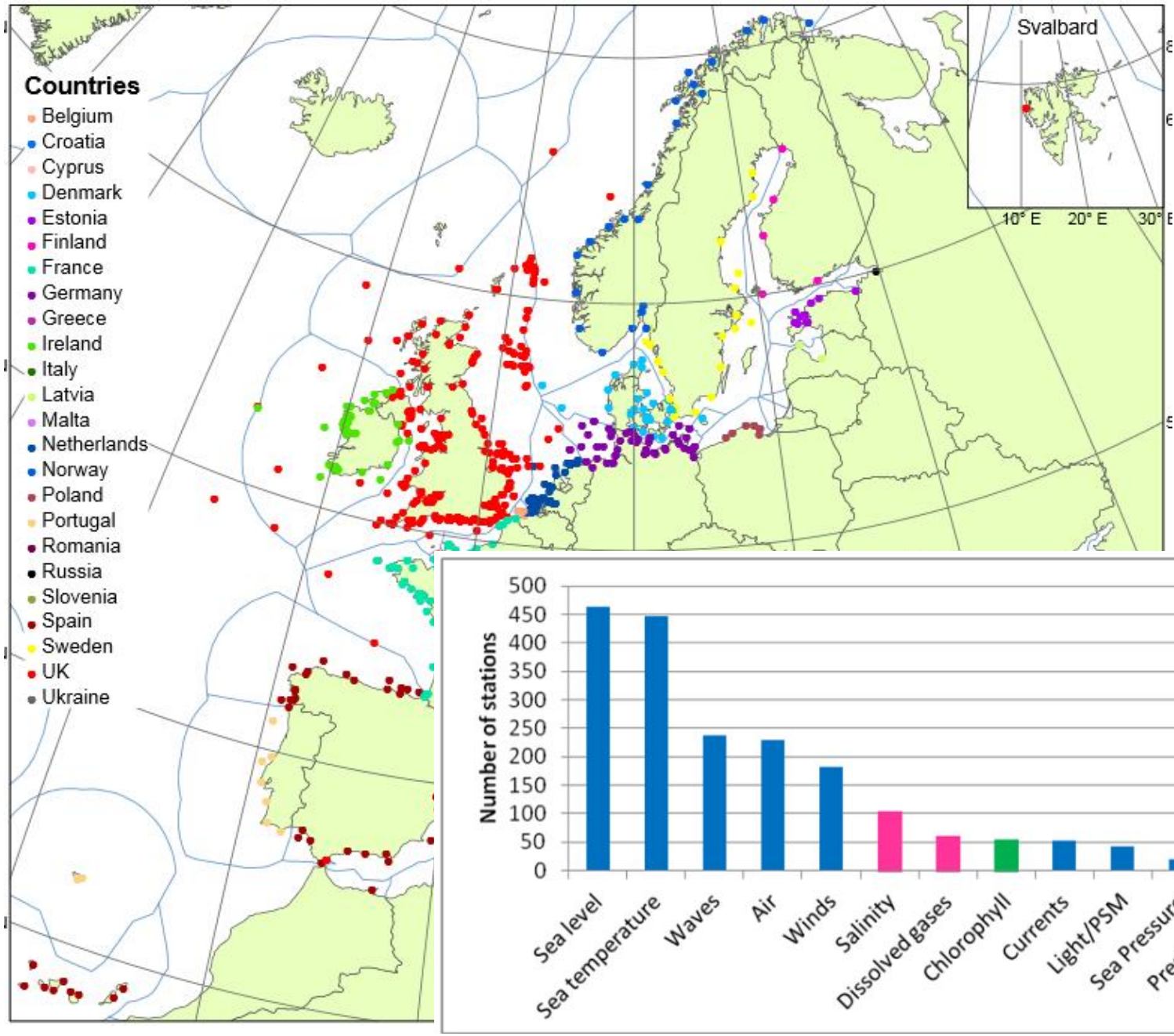
STATUS AND CHALLENGES OF PRESENT EUROPEAN COASTAL OBSERVATORIES





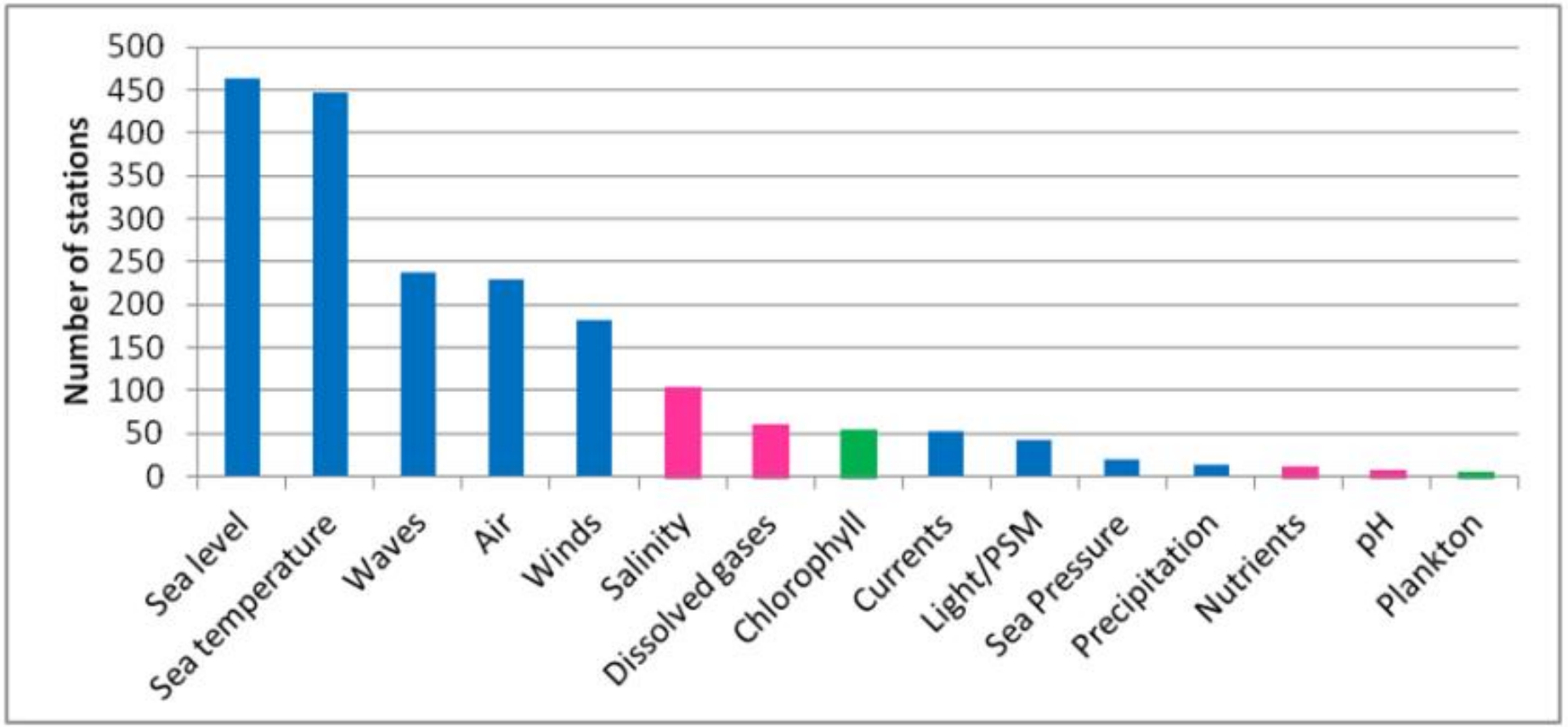


STATUS AND CHALLENGES OF PRESENT EUROPEAN COASTAL OBSERVATORIES



STATUS AND CHALLENGES OF PRESENT EUROPEAN COASTAL OBSERVATORIES

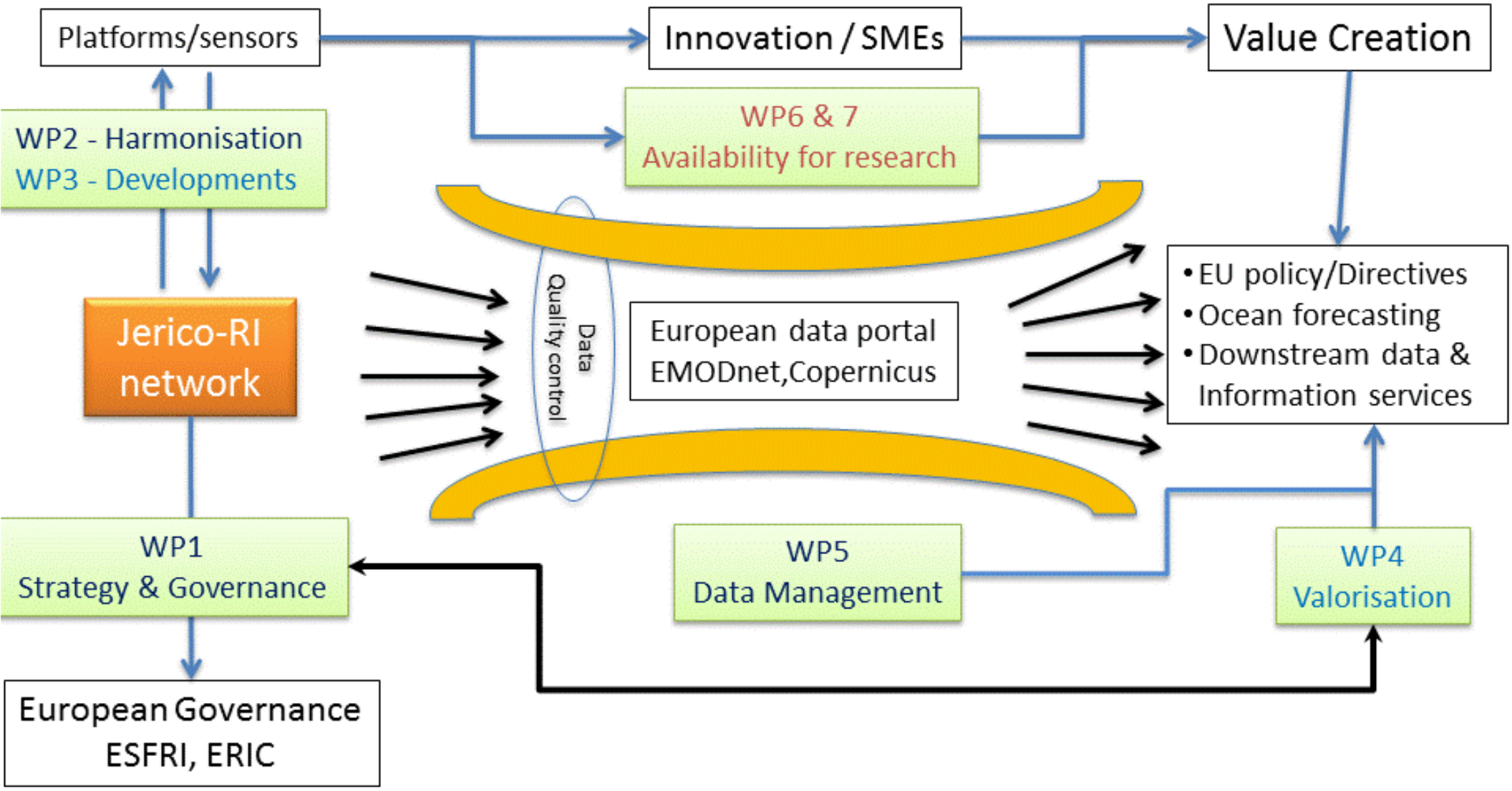
- Challenge 1: provide sufficient information on chemical and biological variables



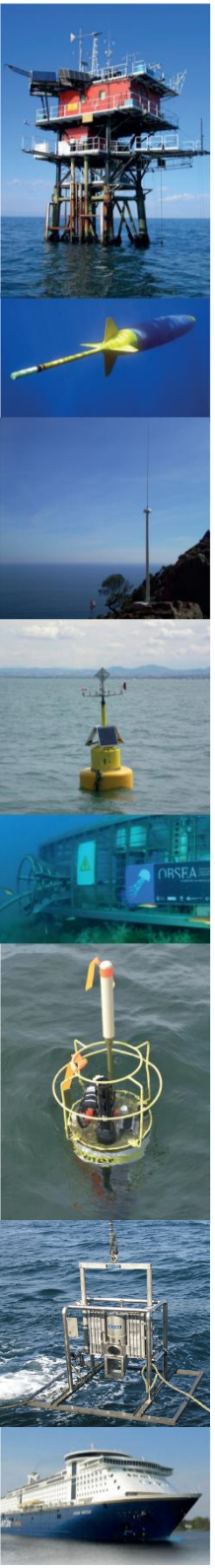
STATUS AND CHALLENGES OF PRESENT EUROPEAN COASTAL OBSERVATORIES

- Challenge 1: provide sufficient information on chemical and biological variables
  - Requires further development and harmonization of observation methods
- Challenge 2: make sensors and observed data accessible for use by European research and policy (e.g. MSFD)
  - Requires protocols to connect to existing European data structures
- Challenge 3: Show added value of multi-disciplinary data by elaborating use cases.

JERICO-NEXT: Quicklook



Networking Activities Transnational Activities Joint Research Activities



JERICO next

State-of-the-art Coastal observation infrastructure and networks

JERICO

Physical data

SEVENTH FRAMEWORK PROGRAMME

New high quality infrastructures & services

HF radar

Sensors

Biological data

New competences to better understanding interraction between physical & biological data

New additional partners

Better characterization of ecosystem health and pressures on marine biodiversity

JERICO-NEXT

Continuous and more valuable coastal data coupling physical & biological information

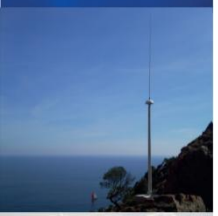
ESFRI

EMOD net

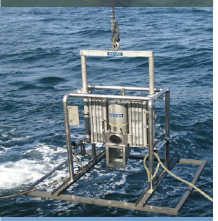
Ocean for Tomorrow

Extended EU coastal observatory network









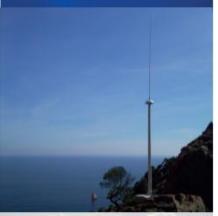

Jerico-next research infrastructure

- Fixed stations (moorings, piles, etc.)
- HF radar sites
- Ferrybox routes
- Gliders
- Models
- Sensors

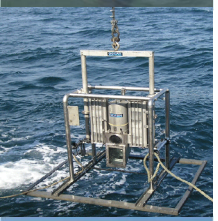
+

Combined use in observatories



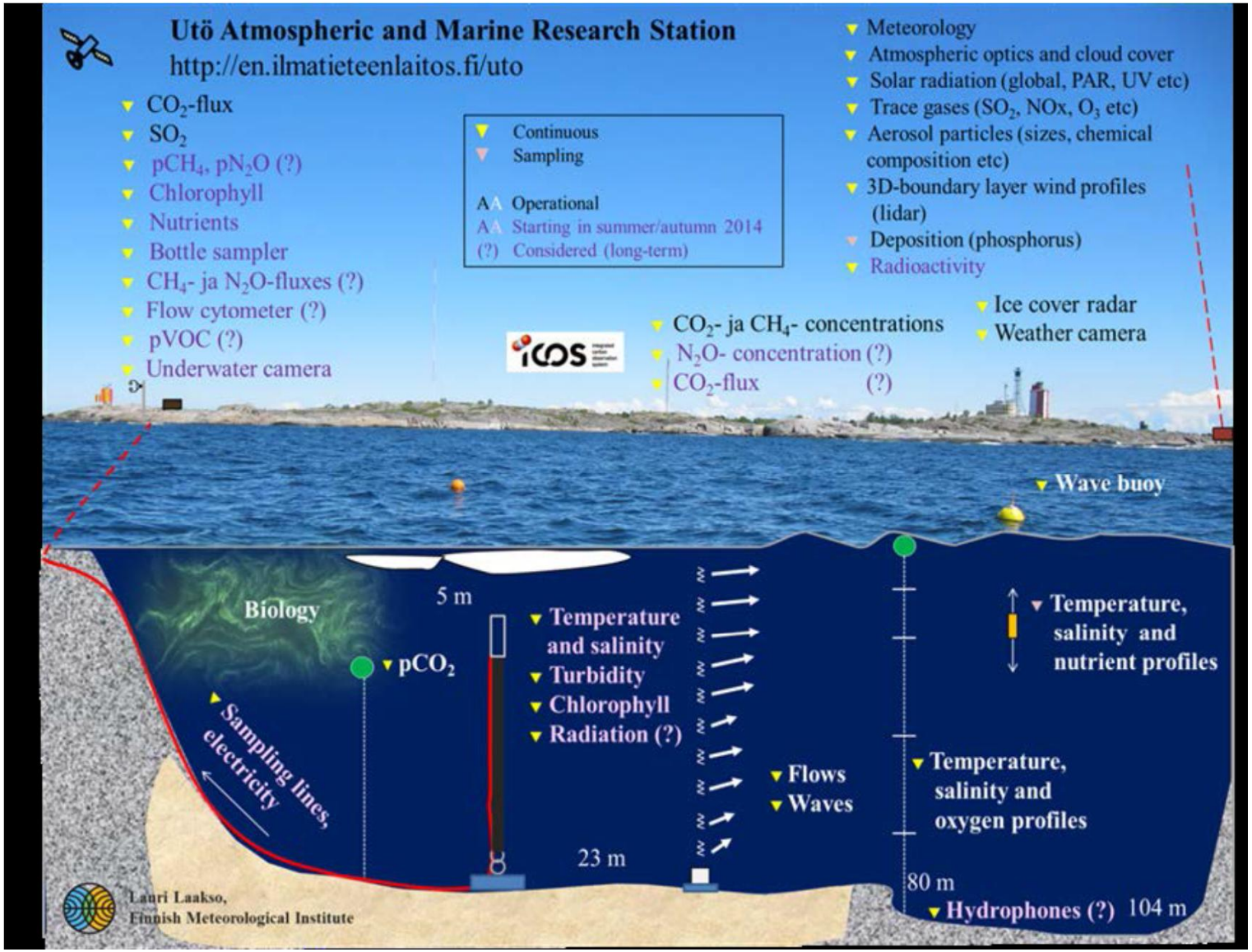


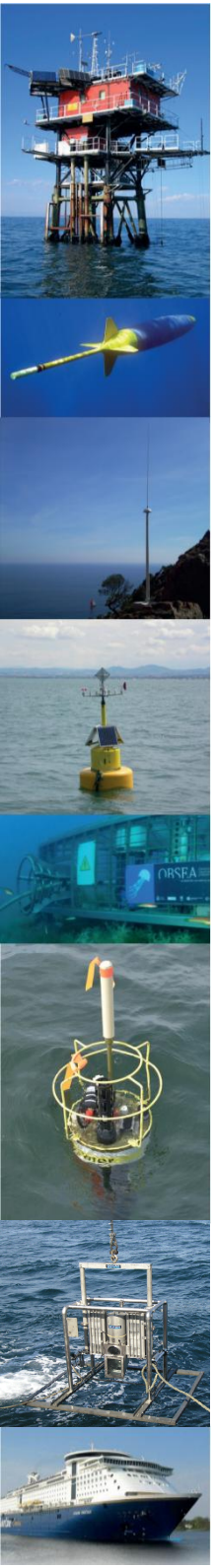




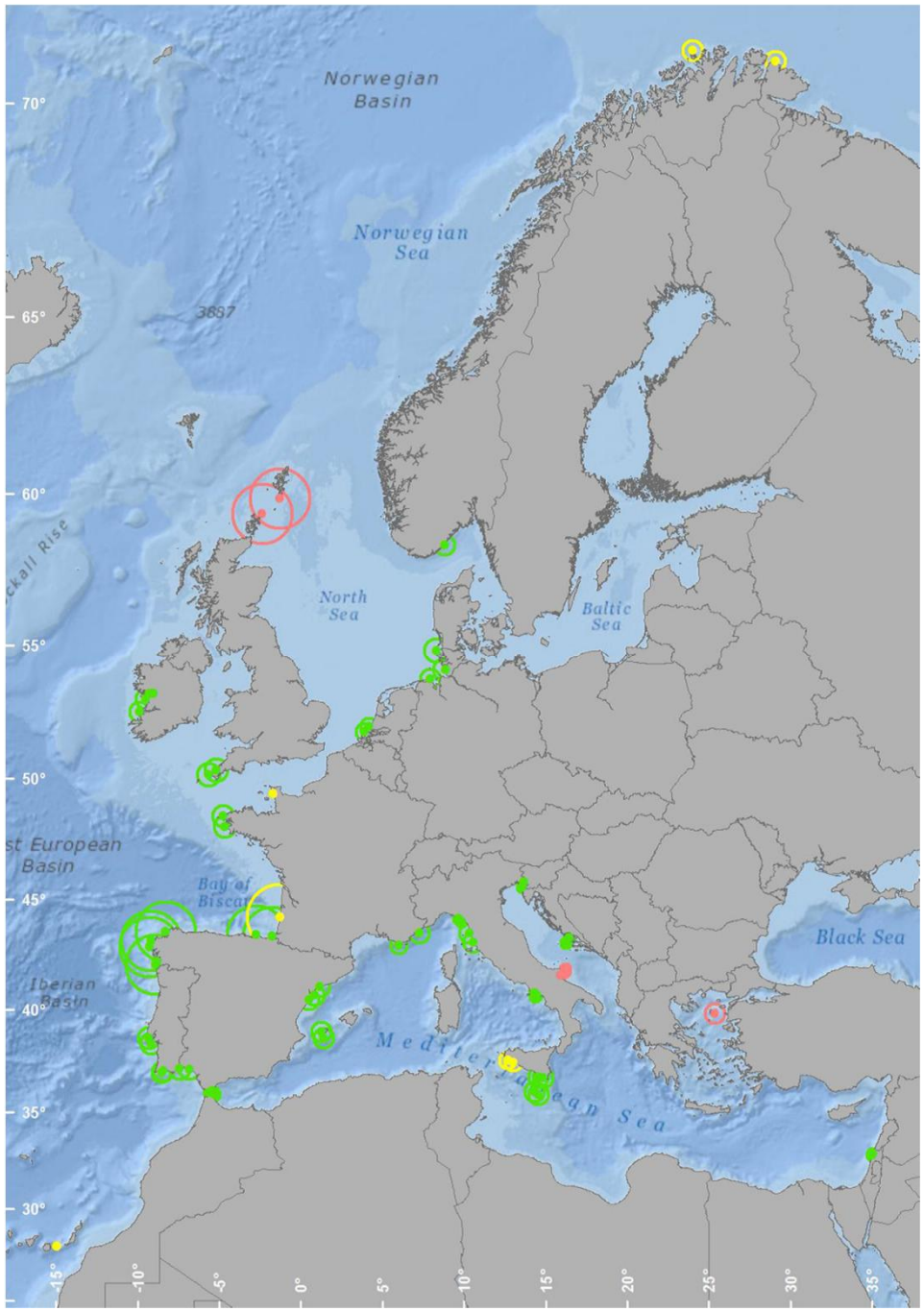

Fixed stations

Ranging from tide gauges to observatories



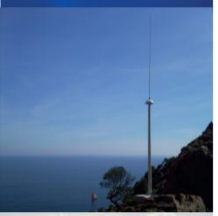


HF radar sites

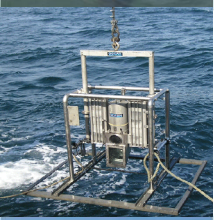


HF radar sites observe surface currents

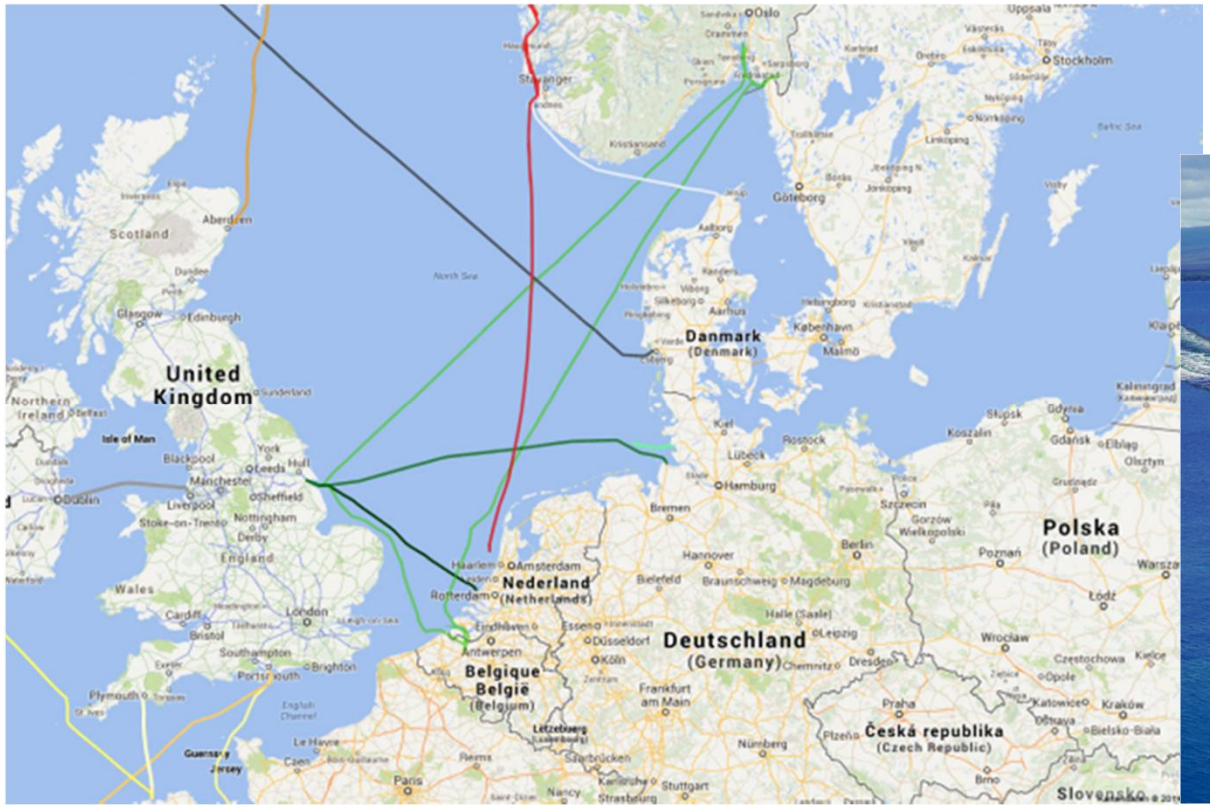


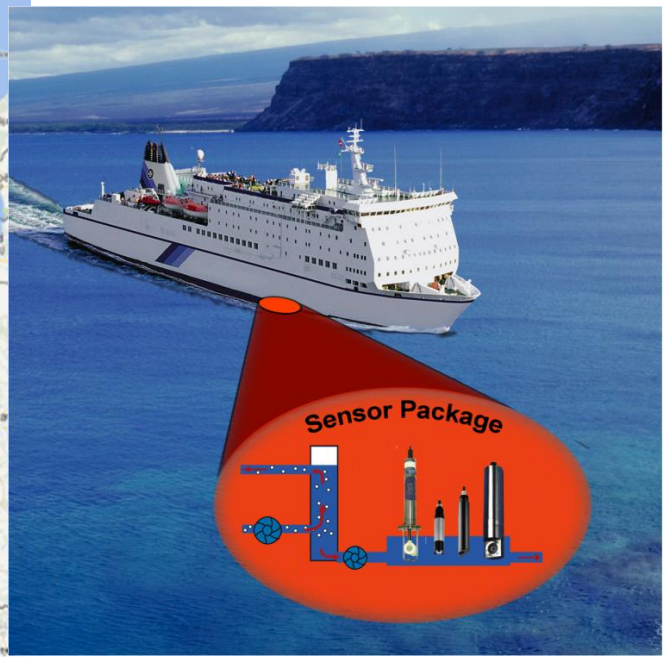




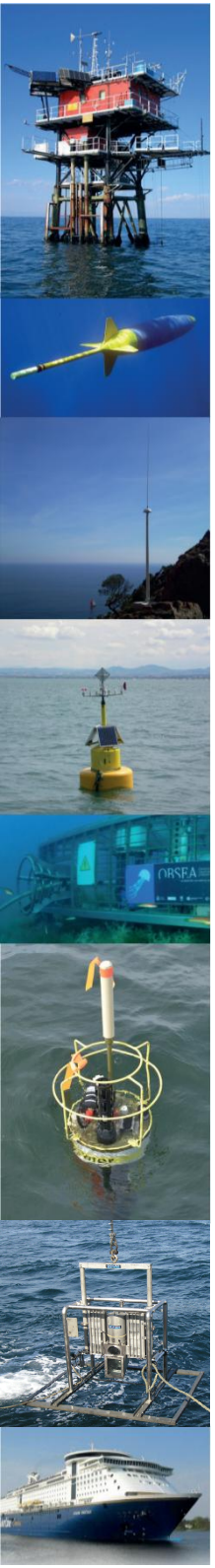



Ferrybox routes





Name of platform	Sampling interval (d)	T	S	pCO2	Turb	Chl-a	pH	DO	Nutrients
M/S Trans Carrier	3-4	X	X	X	X	X	X		
Duchess of Scandinavia	1-2	X	X		X	X	X	X	X
TorDania	1-2	X	X		X	X	X	X	X
LysBris	2	X	X		X	X	X	X	X



All Ferrybox routes

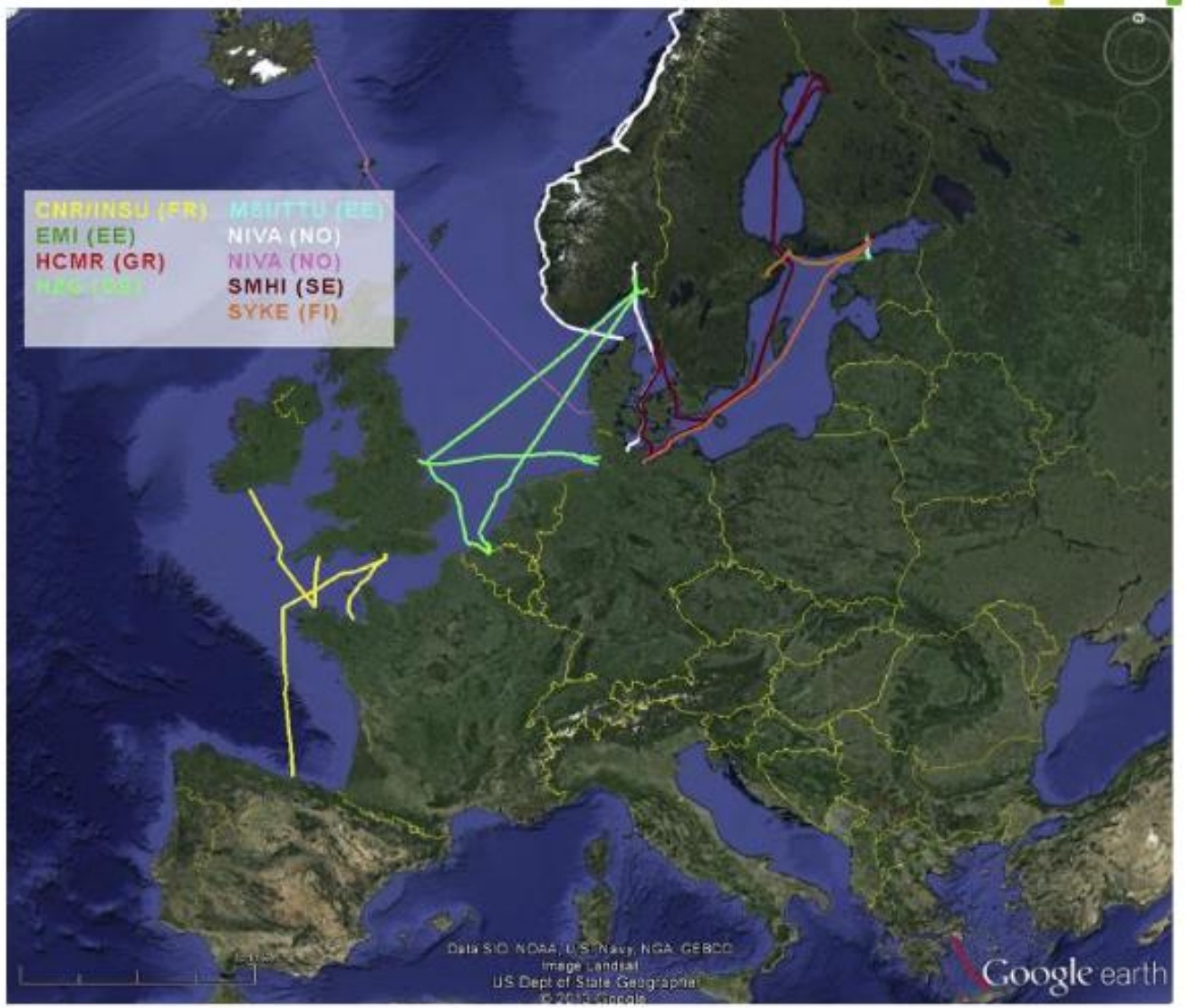
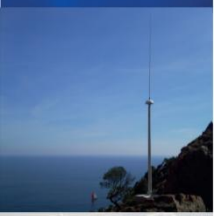
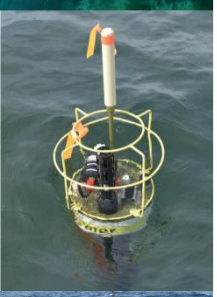
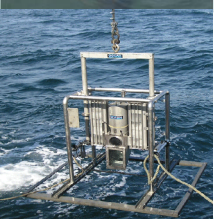


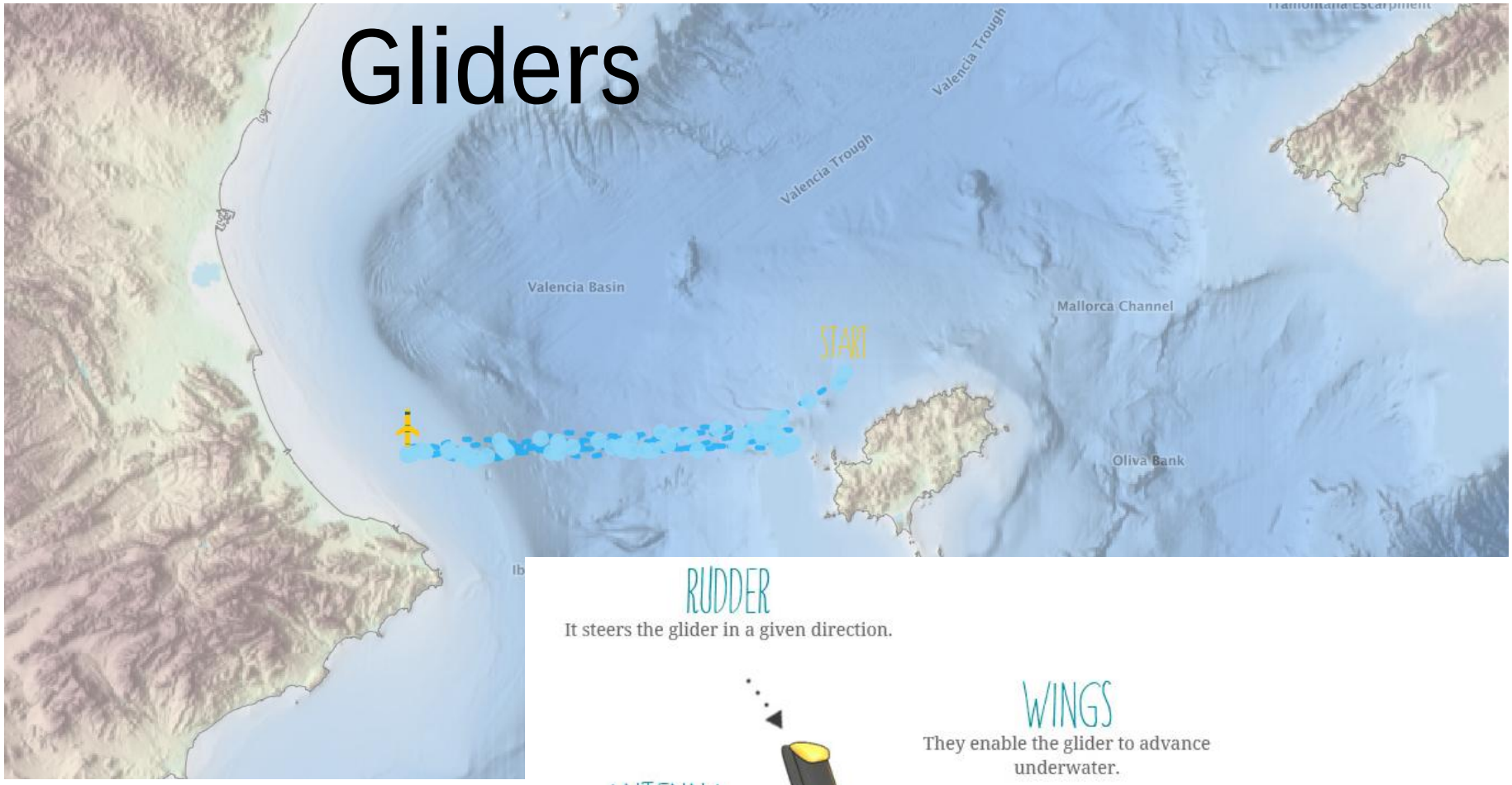
Figure 1 : FerryBox routes currently operating in European coastal waters (effective end of 2014)






Gliders



RUDDER

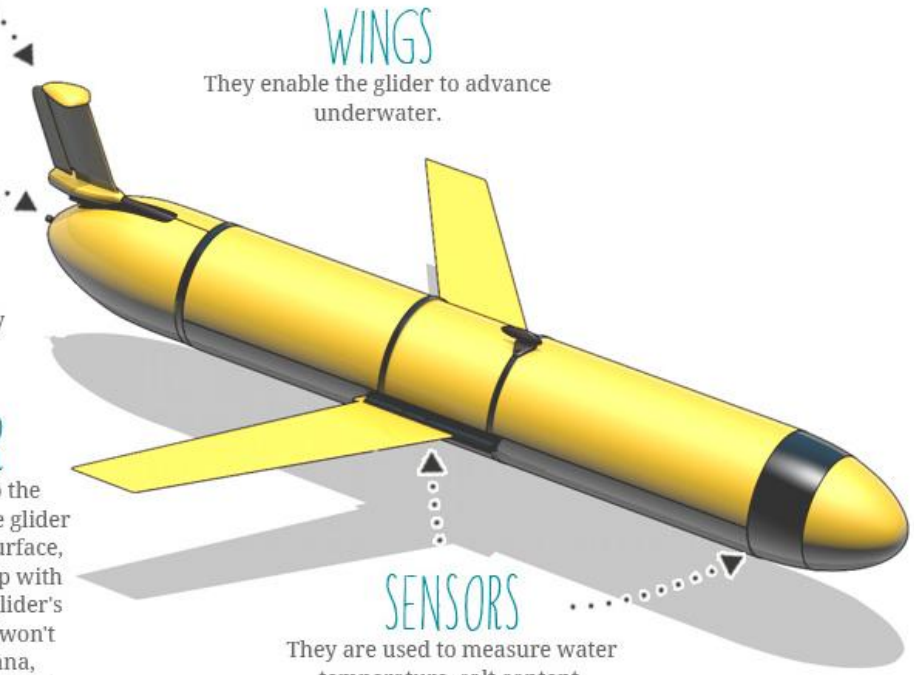
It steers the glider in a given direction.

WINGS

They enable the glider to advance underwater.

ANTENNA

It allows the glider to send data to the lab, and receives information for making any necessary adjustments to the mission.

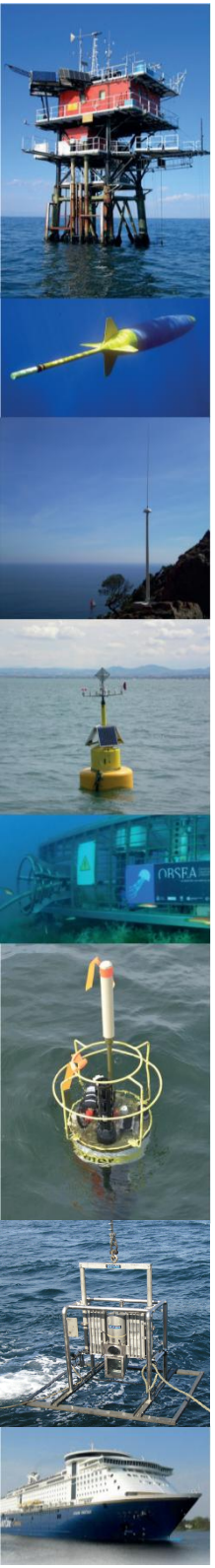


BLADDER

It's very close to the antenna. When the glider comes up to the surface, the bladder fills up with air. This lifts the glider's tail so the waves won't cover the antenna, enabling it to send and receive data without interference

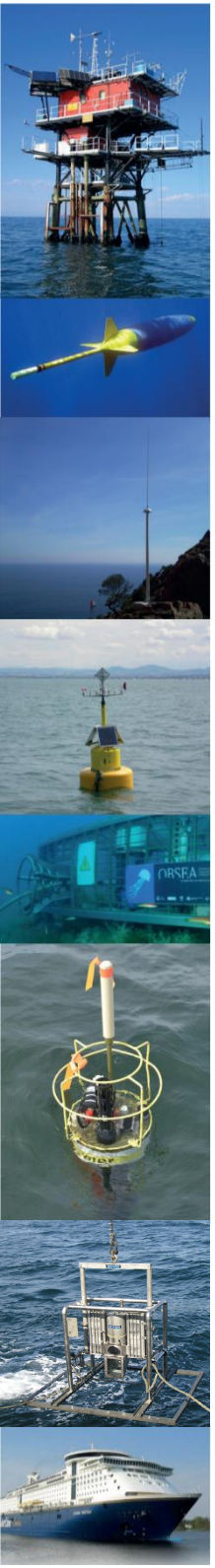
SENSORS

They are used to measure water temperature, salt content, chlorophyll, oxygen, the distance from the sea floor, etc.



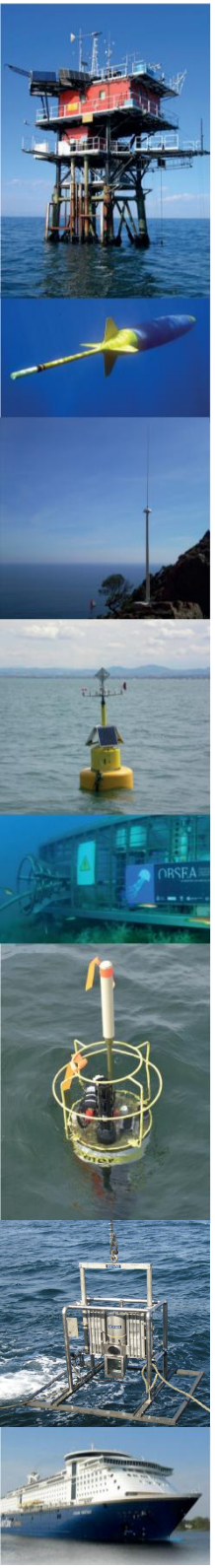
Models

- Data interpretation
- Data interpolation
- Data assimilation
- Operational forecasting



Sensors

- Wide range of novel sensors
- (pH, phytoplankton species, nutrients, carbonate system etc.)
- Jerico-next works on:
  - Best practices
  - Harmonization
  - Demonstration
  - Information

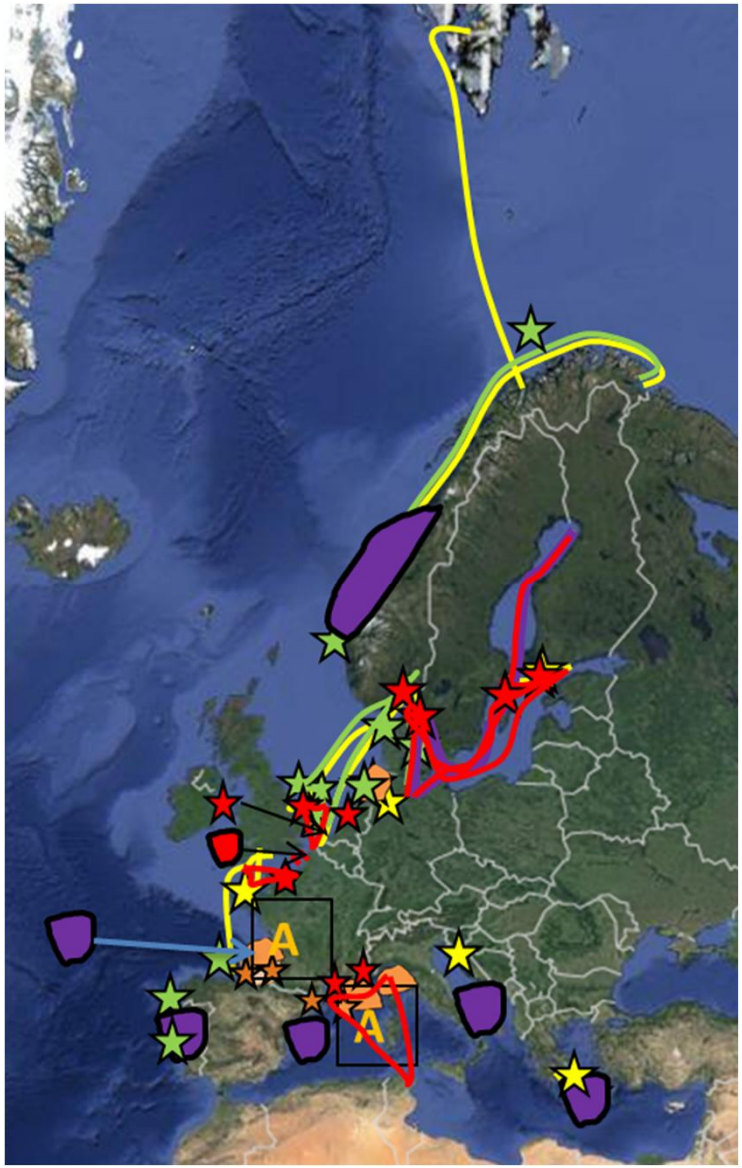


Observatories

Example: SOCIB at Mallorca: http://www.socib.eu/

Research and technology in JERICO-NEXT

- 6 science areas:
  1. Pelagic biodiversity
  2. Benthic biodiversity
  3. Chemical contaminant occurrence and related biological responses
  4. Hydrography and transport
  5. Carbon fluxes and carbonate system
  6. Operational oceanography



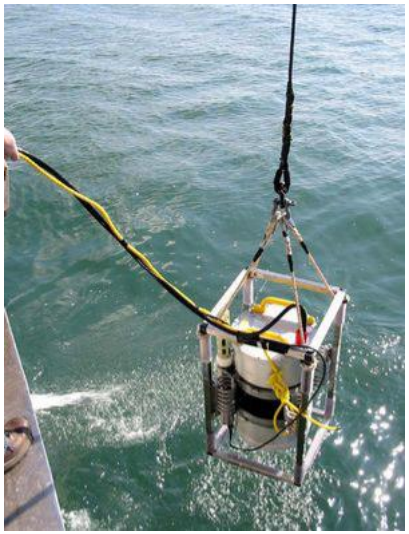
New developments

Task 3.1 Observing pelagic biodiversity

Science Area 1, Task 4.1

Combine novel methods with established ones:

- Automated water sampling and traditional water sampling
- Automated in situ sensors for bio-optical parameters such as chl. fluorescence and spectral fluoro-metry for photosynthetic pigments
- Automated identification and enumeration of organisms
  - Pulse-shape recording Flow Cytometry (in situ and on ship)
  - Imaging Flow Cytometry (in situ and on ship)
  - High Troughput sequencing of 16S and 18S rDNA
- Counting and identifying organisms using the light and electron microscope



New developments

Task 3.2 Observing benthic communities

- Integrated multi-sensors video array towed fish (led by IFREMER)

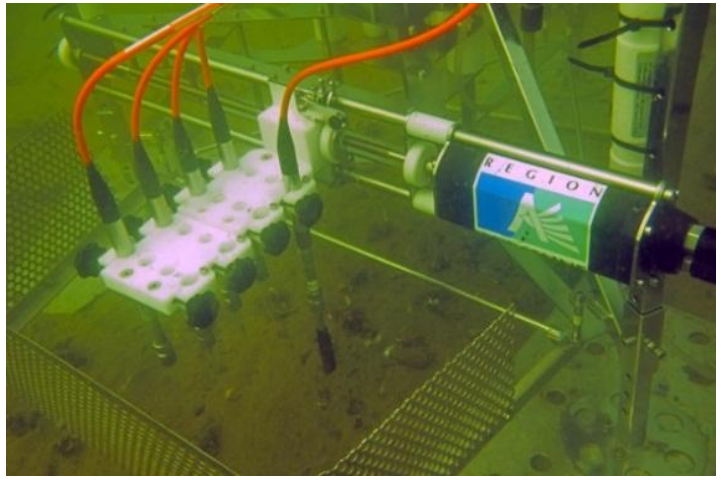
Based on existing ‘Pagure’ video system.

The new array is designed with removable skates and specific floats, offering a ‘towed flying array’ option.

- Organic Matter mineralisation (led by CNRS)

  - Sediment Oxygen Microprofiler and Eddy Covariance System.
  - Implementation of a longer life power supplies (battery)

  => long observation periods deployment.



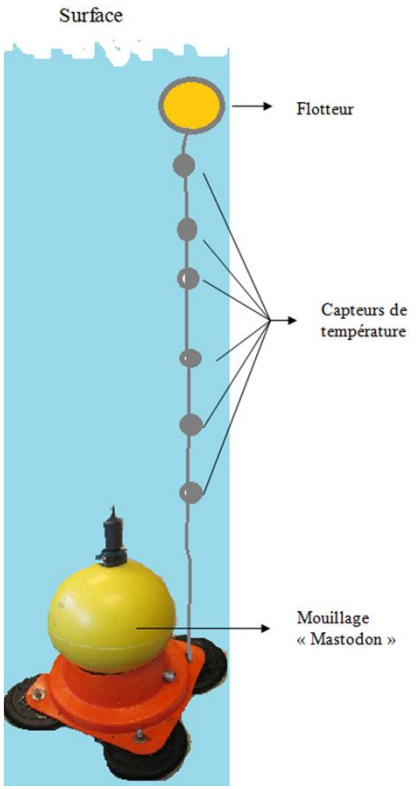
New developments

Task 3.3 PROFILING COASTAL WATERS (HCMR, Greece)

3 different coastal profiling technologies are being improved and developed of which:

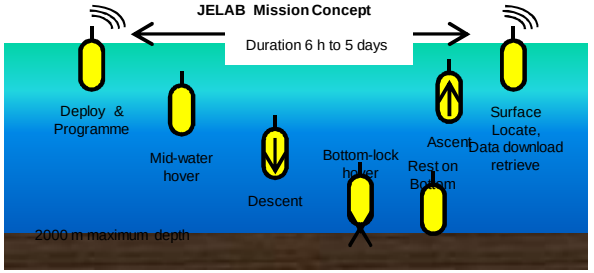
MASTODON2D: A low cost temperature profiler

☑ New housing of the temperature and pressure loggers have been tested to reduce time response from 9 min. down to 2 min.



JELAB: a new version of float able to trigger measurements according to the shape of the fluorescence profile

☑ Two different optic module technologies have been tested, evaluated and now are being developed. Several lenses configurations and sampling schemes are being tested.



New Developments

Task 3.4 : Microbial and Molecular sensors *(C. Boccadoro, IRIS, Norway)*

Science Area 3, Task 4.3

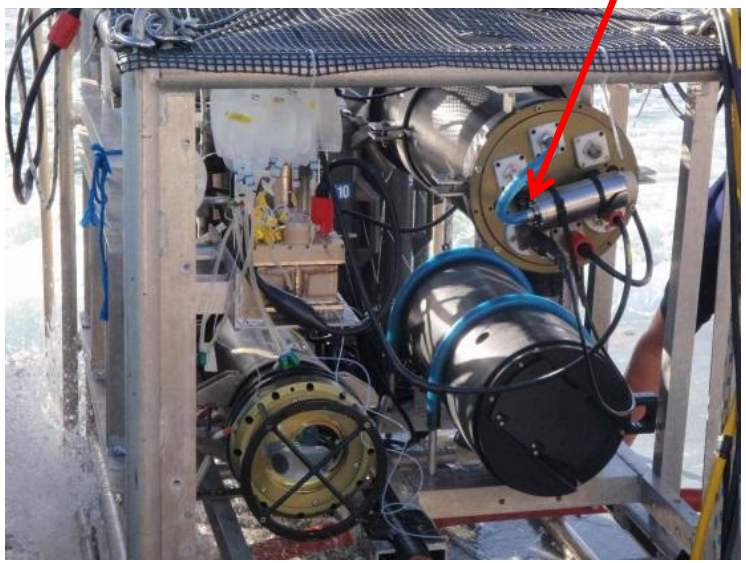
- Detection of hydrocarbon exposure through their impact on microbial communities.

- Biosensors for the detection of toxic algae

  - Testing of a new cost effective configuration with a low cost spectrometer
  - Development of another configuration to perform multi-detection at the same time.

- Automated sampling of rDNA adapted to the Ferrybox

  Development of the current Automatic Flow Injection Sampler to monitor microbially driven biogeochemical processes in the Baltic Sea water

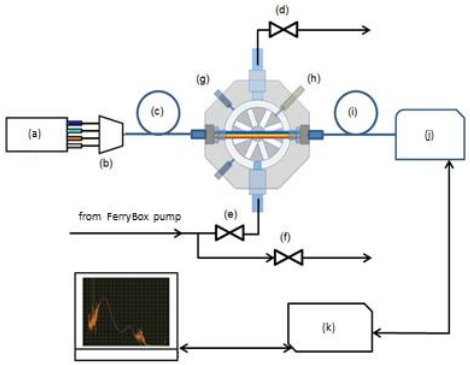


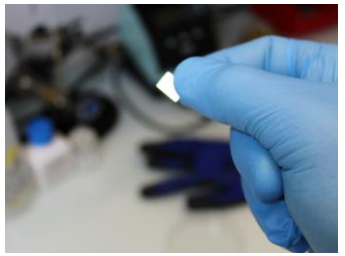
New Developments

Task 3.5 Combine carbonate sensors (NIVA, Norway)

Science Area 5, Task 4.5

- Combined spectrophotometric pH and CO_3 determination (NIVA – E. Reggiani)
- Combined spectrophotometric pH and alkalinity determination (HZG – W. Petersen)
- Combined electrode and spectrophotometric technology for high-accuracy, high-resolution pH determination (Ifremer/Fluidion – L. Delauney, A. Hausot, D. Angelescu)





WP5: Harmonisation of data flows with European standards

- **European standards:** Inspire directive, EMODNET, Copernicus, SeaDataNet/cloud & CMEMS systems

- **Task 5.1:** Data policy and distribution
- **Task 5.2:** Integration of biological data (with VLIZ)
- **Task 5.3:** Platform registration and metadata management system
- **Task 5.4:** Interoperable dataflow from in situ measurements to archiving in data centres
- **Task 5.5:** Enhancement of quality control procedures for sensors based biogeochemical data
- **Task 5.6:** Definition of quality control procedures for HFRdata (HFR TT)
- **Task 5.7:** Scientific calibration procedures on gliders data collection
- **Task 5.8:** Linking JERICO-NEXT activities to a virtual access infrastructure

- Eurogoos conference Workshop Thursday agternoon: Assimilating technical Best Practice Improvements to optimize network data flow

Portals – within WP6

ROOS	Name	Service name	Institute	Contact name	Contact email
Arctic	NorFerry	NorFerry	NIVA	Kai Sorensen	kai.sorensen@niva.no
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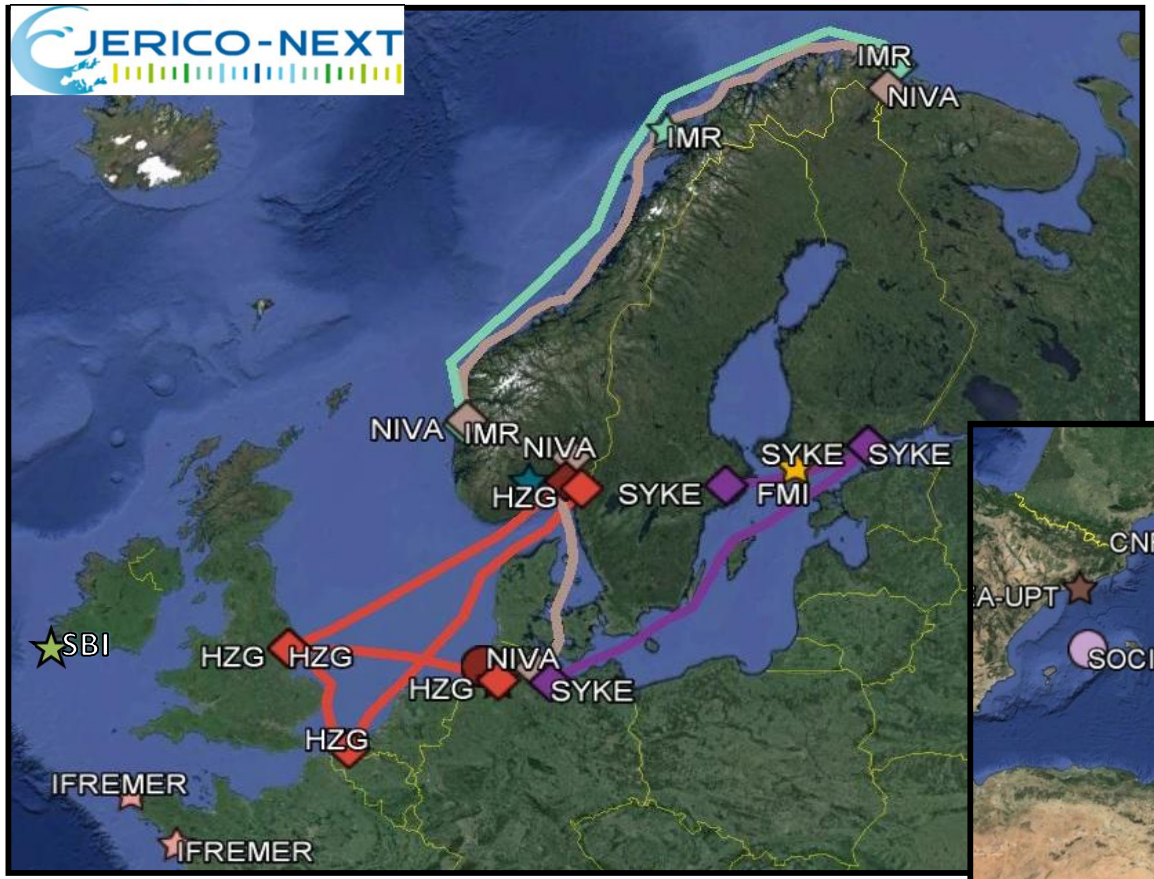
NOOS	EMECO	EMECO	CEFAS	Michelle Devlin	michelle.devlin@cefas.co.uk
BOOS	Utö	Utö Atmospheric and Marine Research Station	FMI	Lauri Laakso	Lauri.Laakso@fmi.fi
BOOS	MOS	SMHI Marine Observation System	SMHI	Bengt Karlson	Bengt.Karlson@smhi.se
BOOS	SYKE-Alg@line	SYKE Marine Research Centre	SYKE	Jukka Seppala	jukka.seppala@ymparisto.fi
BOOS	NIVA Research Station (NRS)	NIVA Research Station (NRS)	NIVA	Kai Sorensen	kai.sorensen@niva.no
MEDGOOS	LiSO-HFR	LiSO-HFR	CNR-ISMAR	Annalisa Griffa/	annalisa.griffa@sp.ismar.cnr.it;
	LiSO-HFR	LiSO-HFR	CNR-ISMAR	Marcello Magaldi	marcello.magaldi@sp.ismar.cnr.it
MEDGOOS	POSEIDON	Monitoring, forecasting and information systme for the Greek Seas	HCMR	Leonidas Perivoliotis	lperiv@hcmr.gr
MEDGOOS	SOCIB Data Centre Multi Platform Observatory	SOCIB Data Centre Multi Platform Observatory	SOCIB	Joaquim Tintore	jtintore@socib.es
MEDGOOS	Environmental Observable Littoral	Environmental Observable Littoral	CNRS	Laure Mousseau	laure.mousseau@obs-vlfr.fr
Black Sea	NOMOS	National Operational Marine Observing System	IO-BAS		palazov@io-bas.bg
IBIROOS	BHFR	BHFR	AZTI	Julien Mader	jmader@azti.es
IBIROOS	SPI-S	SPI-S	CNRS	A Gremare	a.gremare@epoc.u-bordeaux1.fr
IBIROOS	MONICAN	Monitoring of Nazare Canyon network	IH	Joao Vitorino	joao.vitorino@hidrografico.pt
IBIROOS	Eulerian observatory network data service	Eulerian observatory network data service	Ifremer	Guillaume Charria	guillaume.charria@ifremer.fr

ROOS	Name	Location	Web address
Arctic	NorFerry	Baltic, North Sea, Atlantic Sea and Arctic areas.	http://www.niva.no
NOOS	COSYNA	North Sea	htto://www.cosyna.de
NOOS	EMECO	Lowestoft, UK	http://www.jerico-fp7.eu/datatool/
BOOS	Utö	Baltic Sea; Archipelago Sea, Island of Utö	en.ilmatieteenlaitos.fi/uto
BOOS	MOS	Gothenburg and Norrköping, Sweden	www.smhi.se
BOOS	SYKE-Alg@line	BOOS. Baltic Sea – Helsinki, Finland -> Travemünde, Germany; Helsinki, Finland -> Stockholm, Sweden	http://www.itameriportaali.fi/en/tietoa
BOOS	NIVA Research Station (NRS)	Oslofjord, Norway.	www.niva.no
MEDGOOS	LiSO-HFR	Ligurian Sea	http://radarhf.ismar.cnr.it
	LiSO-HFR		
MEDGOOS	POSEIDON	Aegean Sea, Cretan Sea	http://poseidon.hcmr.gr/
MEDGOOS	SOCIB Data Centre Multi Platform Observatory	Balearic Islands	www.socib.es
MEDGOOS	Environmental Observable Littoral	Ligurian Sea	http://www.obs-vlfr.fr/Innovations/EC
Black Sea	NOMOS	Western Black Sea	http://www.bgodc.is-bas.bg
IBIROOS	BHFR	SE Bay of Biscay	http://www.euskalmet.euskadi.net/s0
IBIROOS	SPI-S	Arcachon, France	http://spiarcbase.epoc.u-bordeaux1.
IBIROOS	MONICAN	Nazare, Portugal	http://monican.hidrografico.pt/
IBIROOS	Eulerian observatory network data service	Brest, France	http://www.coriolis.eu.org/Data-Serv

http://www.jerico-ri.eu/virtual-access/

WP 7 Trans-National Access

- *To provide 'free of charge' trans-national access to researchers or research teams including from industry to one or more infrastructures among those operated by participants of the JERICO NEXT Consortium*.

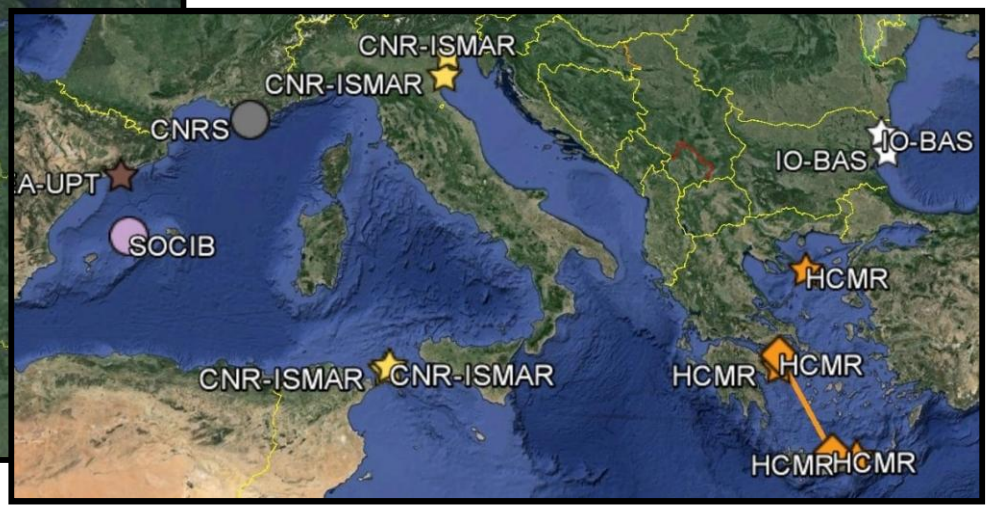


Fixed

Glider facility

Ferrybox

+ Fishing vessels and laboratories (not shown)



WP8 : Outreach, communication and engagement

Objective:
To maximise the impact of JERICO-NEXT for targeted end users

- Policy
- Industry
- Science and education
- Public

- ✓ Create an end-user panel with various user groups represented.
- ✓ Inform, engage with and identify requirements user groups.
- ✓ Ensure best possible uptake of new knowledge and evidence.
- ✓ Enhance European capacity building in operational marine sciences (through training).
- ✓ To maximise JERICO NEXT international impact.
- ✓ Support ocean science technological development through TNA.
- ✓ JERICO-NEXT website with integrated communication strategies.

Overview of jerico-next research infrastructure

- Operation oceanography Malta and other sites
- Local observatories like Uto and buoys
- Ferrybox network
- Gliders (follow the glider)

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