

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES NETWORK FOR COASTAL OBSERVATORIES

JERICO-NEXT Presentation WP2 - WP3 - TransNational Access to Research Infra-Structures

**JERICO-NEXT Presentation
+ WP2 – WP3 and TransNational Access to Research Infra-Structures**

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www.jerico-ri.eu

*NeXOS final GA – Plocan – 14^o of
september 2017*

JERICO-NEXT: Quick-look



Important figures

- **Duration:** Sept. 2015- Aug. 2019, 4 years
- **EU funding:** 10M€
- **Consortium:** 34 partners, 910 MM
- **Organisation:** 9 WPs + STAC + Label committees (3)
- **Coordination:** Ifremer: jerico@ifremer.fr
- **66 deliverables, 63 milestones**

The JERICO mind...

- The JERICO-NEXT community

“ We cannot understand the complexity of the coastal ocean if we do not understand the coupling between physics, biogeochemistry and biology.”

- new technological developments for continuous monitoring of a larger set of parameter
- **a priori definition of the optimal deployment strategy**

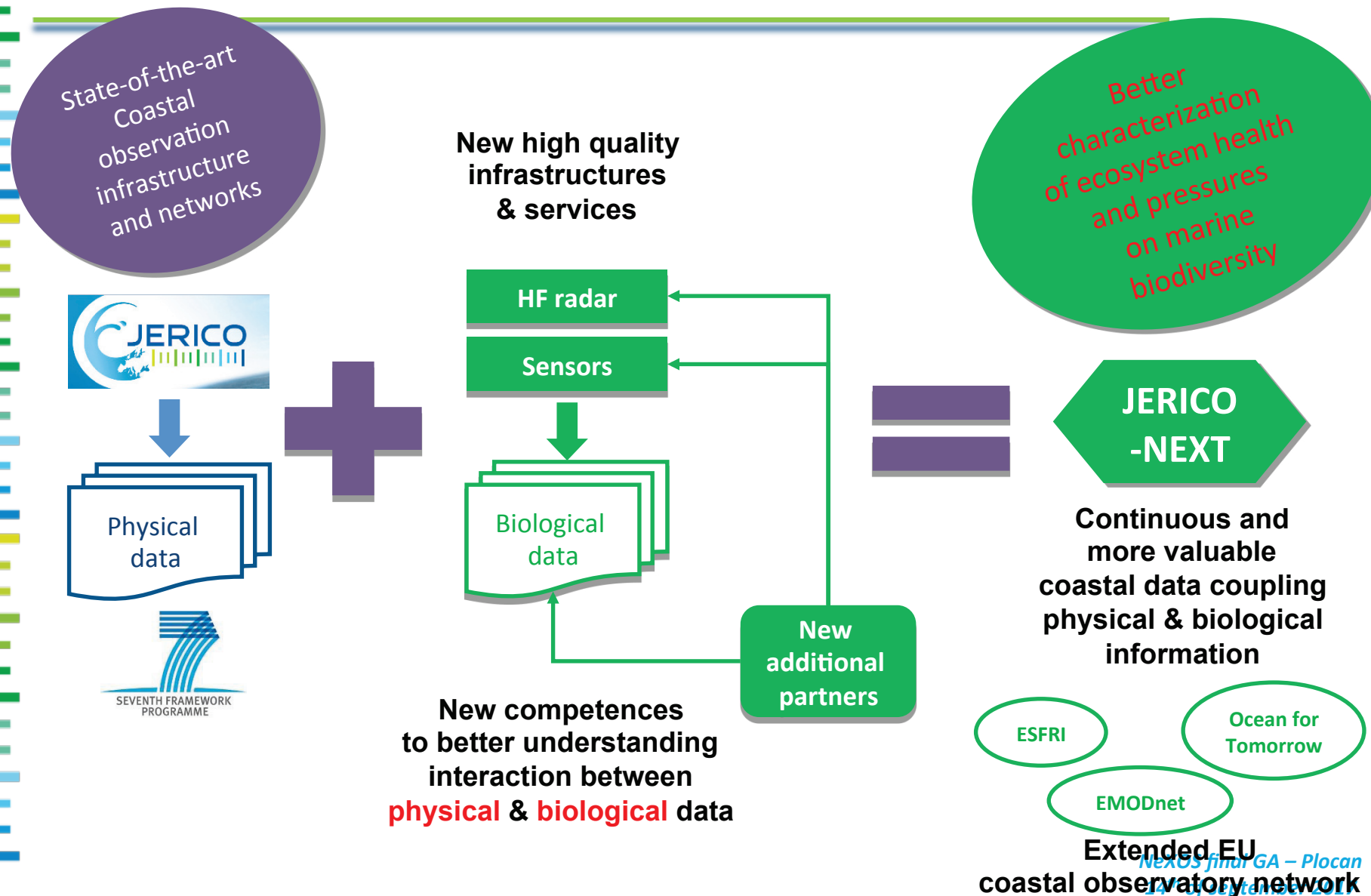
- JERICO-NEXT focus

- interactions between physics, biogeochemistry and biology
- not restricted to pure technological aspects : include fundamental scientific considerations

JERICO-NEXT: Quick-look



From JERICO to JERICO-NEXT...



JERICO-NEXT: Quick-look



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 (WP1)

JERICO-NEXT: Quick-look

LIST of WPs



- **WP1** - Integrated Science Strategy and Governance from local to European Scales (**COVARTEC**, **CNRS-EPOC**)
- **WP2** - Harmonization of technologies and methodologies - technical strategy (**OGS**, **HZG**)
- **WP5** - Data management (**HCMR**, EuroGOOS)
- **WP8** - Outreach, communication and engagement (**Blue Lobster**, CEFAS)
- **WP6** - Virtual Access (**CEFAS**)
- **WP7** - Transnational Access to Coastal Observatories (**CNR-ISMAR**)
- **WP3** – Innovations in **Technology and Methodology** (**HCMR**, **Ifremer**)
- **WP4** - Valorization through **applied joint research** (**Ifremer**, **CNRS-EPOC**)

Networking Activities **Transnational Activities** **Joint Research Activities**



Harmonization of technologies and methodologies - technical strategy

WP2

Wilhelm Petersen (HZG)

WP2 Main Objectives



Harmonization of technologies, methodologies and procedures across the JERICO observing network in the JERICO-NEXT project.

- *consolidating ongoing network harmonization efforts carried over from the concluded JERICO project (**Fixed Platforms, FerryBoxes, Gliders**);*
- *extending these efforts to include:*
 - *new systems (**HF-radar systems, cabled coastal observatories**)*
 - *new sensors (**nutrients, optical sensors for biol. parameters, sensors for carbonate system, coastal profiler**);*
- *standardizing operations and processes, as much as possible*
→ ***definition of best practise***
- *Harmonization of Calibration and Assessment*
- *Definition of a JERICO Label (Technical Committee)*

WP2 Deliverables



D2.1.: Report on the status of **HF-radar systems** and cabled coastal observatories

Table of contents

1. Executive Summary.....
2. Introduction.....
3. HF-Radars.....
 - 3.1 Introduction to HF-radar.....
 - 3.2 Phased array and direction finding systems.....
 - 3.3 Applications.....
 - 3.4 Planning and installation phase.....
 - 3.5 Main Operational Issues.....
 - 3.6 Quality Assessment.....
 - 3.7 Data Management.....
 - 3.8 References.....

Operator	Country	Number & Type	Applications	Network	Location
Euskalmet – Basque Government / AZTI	Spain	2 DF	Cur, DA	Basque Country	SE Bay of Biscay
HZG	Germany	3 PA	Cur, Wav, DA, SD	COSYNA	German Bight
ISMAR-CNR	Italy	2 DF	Cur, (expected) DA	TirLig	Ligurian Sea
MIO-CNRS	France	3 DF	Cur	MOOSE HF-Radar	Ligurian Sea
SOCIB	Spain	2 DF	Cur, RT-MV, DA (expected)	Ibiza Channel	Ibiza Channel

WP2 Deliverables



D2.1.: Report on the status of HF-radar systems and **cabled coastal observatories** (cont.)

4. Cabled Observatories.....	Organization	Country	Installation	Location
4.1 Issues during the installation phase.....	UPC	Spain	OBSEA	Barcelona, Catalan Coast (Spain), Western Mediterranean
4.2 Main operational issues.....	SBI	Ireland	CPO	Galway Bay, Ireland, Atlantic Ocean
4.3 Site maintenance.....	FMI	Finland	UTÖ	Utö Island, Archipelago Sea, Baltic Sea
4.4 Quality assessment.....	IFREMER	France	EMSO-Molene	Molène Island, France, Atlantic Ocean
4.5 Data management.....	IMR	Norway	LoVe	Norwegian Sea
4.6 Applications.....	AWI	Germany	UNH	German Bight, North Sea
4.7 Biofouling.....			UNS	Kongsfjord (Ny Ålesund), North Sea
5. Conclusions.....				

WP2 Deliverables



D2.2: Report on the status of

- nutrients sensors
- optical sensors for biology-related properties
- sensors for marine carbonate system
- coastal profiling systems

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WP2 scheduled Deliverables



- 2.3 Report on initiated network harmonization actions (**Fixed Platforms, Gliders, FerryBoxes**).
- 2.4 Report on **Best Practice** for new network systems: **HF-radar /cabled coastal observatories**.
- 2.5 Report on **Best Practice** for **new network sensors**.
- 2.6 Report on project activities relating to **calibration and assessment**.
- 2.7 Definition of **JERICO Label**

WP2 Upcoming workshops



- International Radiowave Oceanography Workshop (ROW) 19-21 Sep 2017, Lüneburg, Germany (<https://www.hzg.de/ms/row>)
- FerryBox workshop (www.ferrybox.org) 17-19 Oct 2017 onboard Ferry Color Fantasy
- Assimilating Technical Best Practice Improvements to Optimize Network Data Flow. 05 Oct 2017, Bergen (connected to EuroGOOS conference)



JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

Innovations in Technology and Methodology

WP3

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*NeXOS final GA – Plocan – 14^o of
september 2017*

WP3 Objectives



To enhance the capability and the quality of measurements in the coastal infrastructures

- Experience gained from JERICO
- Multi-disciplinary approach
- Emphasis to the biological components of the ecosystem

WP3 Partners



PARTNER	EFFORT		PARTNER	EFFORT
IFREMER	19.50		IMR	3.00
AZTI	6.41		IRIS	8.50
CEFAS	3.30		NIVA	2.30
CMCC	9.00		RWS	2.20
CNR-ISMAR	8.88		SMHI	7.60
CNRS	18.30		SOCIB	2.00
CSIC	1.50		SYKE	4.00
EuroGOOS	1.00		VLIZ	1.20
FLUIDION	4.00		HCMR	31.00
HZG	16.39			

19 Partners,
46 people
connected

TOTAL EFFORT
150,08 person months

TOTAL COST
1,499,976 €

WP3 - Innovations in Technology and Methodology



Task 3.1 AUTOMATED PLATFORM FOR THE OBSERVATION OF PHYTOPLANKTON DIVERSITY IN RELATION TO ECOSYSTEM SERVICES (M0-M44) - *Leader: Felipe Artigas*

Task 3.2 DEVELOPMENTS ON CURRENT OBSERVATIONS FROM HF RADARS (M0-M46) – *Leader: Annalisa Griffa*

Task 3.3 PROFILING COASTAL WATERS (M0-M44) - *Leader: Manolis Ntoumas*

Task 3.4 MICROBIAL & MOLECULAR SENSORS (M0-M44) – *Leader: Catherine Boccadoro*

Task 3.5 COMBINED SENSORS FOR CARBONATE SYSTEMS (M0-M40) – *Leader: Andrew King*

Task 3.6 BENTHIC COMPARTMENT AND PROCESS (M0-M40) – *Leader: Antoine Gremare*

Task 3.7 OBSERVING SYSTEM EXPERIMENTS (OSEs) & OBSERVING SYSTEM SIMULATION EXPERIMENTS (OSSEs) TECHNOLOGY (M0-M24) - *Leader: Stefania Ciliberti*

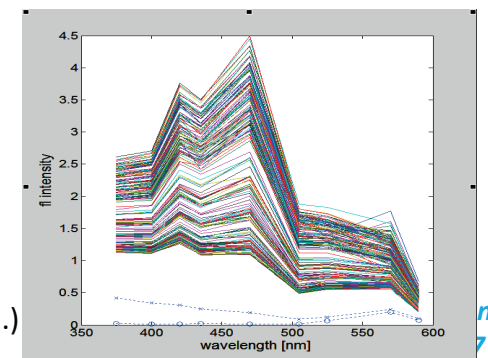
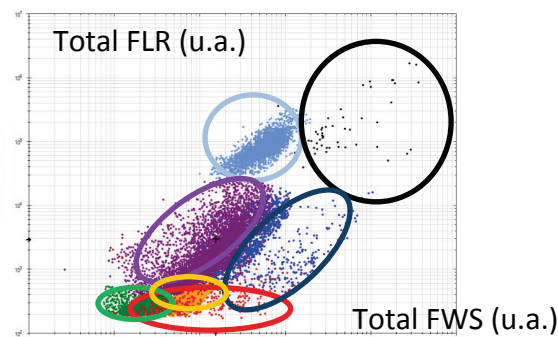
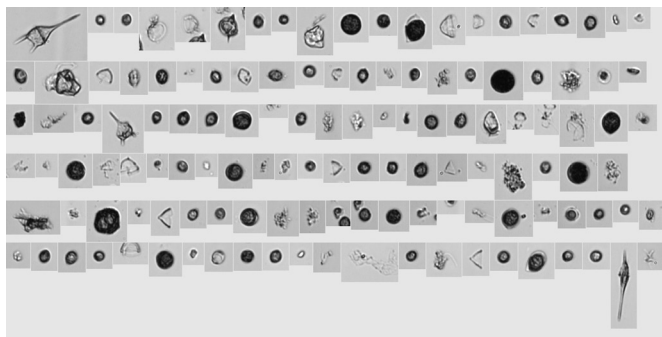
Task 3.1 AUTOMATED PLATFORM FOR THE OBS. OF PHYTOPLANKTON.
DIVERSITY IN RELATION TO ECOSYSTEM SERVICES

(M0-M44) – Leader Felipe Artigas



Development of innovative optical techniques for assessing phytoplankton abundance and/or biomass equivalents, per size/functional groups, photosynthetic activity/physiological status:

- Subtask 3.1.1 : Image acquisition and analysis (in flow/*in situ*)
- Subtask 3.1.2: Single-cell optical analysis (pulse-shape recording FCM)
- Subtask 3.1.3: Optical bulk multispectral techniques (fluorometers, spectrophotometers)



Task 3.1 AUTOMATED PLATFORM FOR THE OBS. OF PHYTOPLANKTON. DIVERSITY IN RELATION TO ECOSYSTEM SERVICES

(M0-M44) – Leader Felipe Artigas



- Pulse-shape recording Flow Cytometer (+ Image acquisition) module (VLIZ, CNRS LOG-MIO-BOREA, RWS, CEFAS)
- Imaging Flow Cytometer (SMHI coll.WHOI , SYKE)
- Flow Cytometer (HZG)
- FlowCAM (IFREMER, SYKE, AZTI)
- FastCAM (IFREMER)
- Absorption meter - PSICAM (HZG, SYKE)
- Spectral fluorometer - AOA or Fluoroprobe (CNRS-LOG-BOREA, IFREMER, SYKE)
- PAM or Phyto-PAM (CNRS LOG-BOREA, CEFAS)
- FRRF or spectral FRRF (SYKE, CNRS LOG-BOREA, VLIZ-RWS-NIOZ, CEFAS)
- Underwater Vision Profiler - UVP5 (CNRS-OSU V)
- (Semi-)Automated data analysis (CNRS LOG-MIO, RWS-TRP, IFREMER, SYKE)

Task 3.2 DEVELOPMENTS ON CURRENT OBSERVATIONS FROM HF RADARS (M0-M46) – Leader Annalisa Griffa

Partners: CNR-ISMAR, AZTI, HZG, MIO, UIB-CSIC, EuroGOOS, SMHI

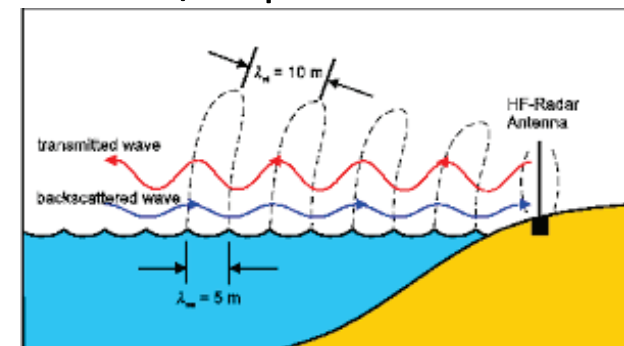
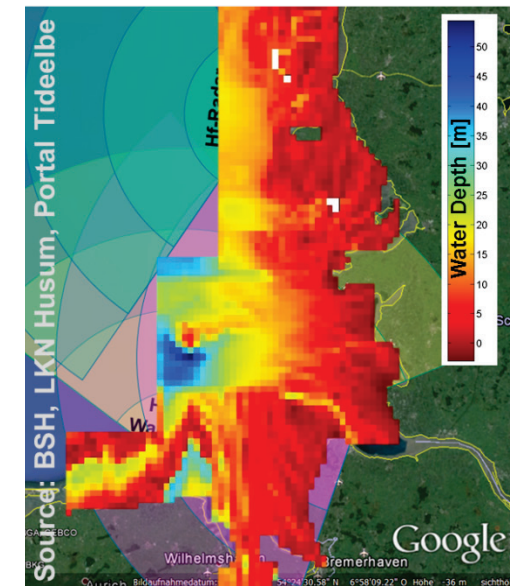


Improve the quality of surface current estimates and the design of radar networks. Integrate radar surface information with vertical information from other components of the observing system to improve 4D transport estimates.

Subtask 3.2.1 New HF radar procedures for current retrievals and data quality control (led by HZG)

Subtask 3.2.2 HF radar network development (led by AZTI)

Subtask 3.2.3 New products for 4D characterization of shelf/slope hydrodynamics and transport (led by CNR-ISMAR)



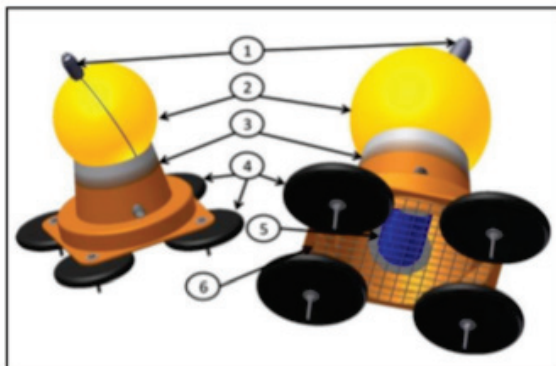
Task 3.3 PROFILING COASTAL WATERS (M0-M44) - Leader: Manolis Ntoumas



Task 3.3 PROFILING COASTAL WATERS (M0-M44): will enhance our capacities for innovative, cost-effective, autonomous observing systems investigating the physical and biogeochemical processes throughout the water column from the surface to the sea floor in coastal waters.

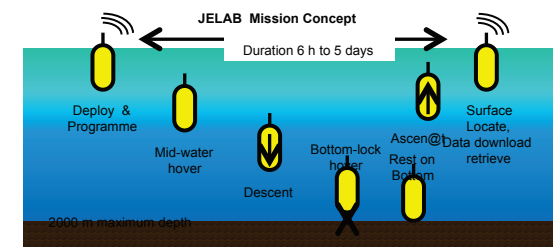
3 different coastal profiling technologies are being improved and developed even further.

MASTODON2D (IFREMER) is an extension of the Mastodon project which provides time series of bottom temperature with low cost mooring.



YOYO trawl-secured profiling system (IMR) aims at developing an automated system that conducts daily full profiles measuring T, S, Chl fluorescence and oxygen, including quasi real time automatic data transmission for dissemination.

JELAB: Jerico Extended Lagrangian Bio-Geo-profilers (HCMR) Will expand the capacities of advanced Argo-type floats by extending available payload with a camera system

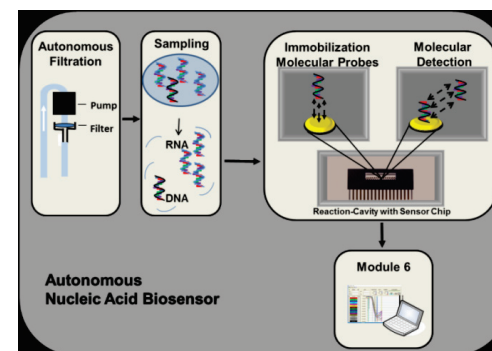
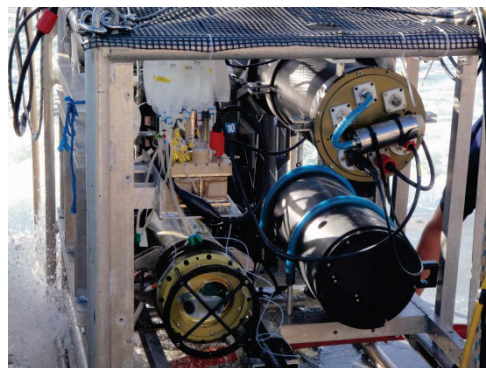


Task 3.4 MICROBIAL AND MOLECULAR SENSORS (M0-M44) – Leader: Catherine Boccadoro



The main objective of this task is to develop biosensors for harmful algal blooms, microbial community changes and pollutants and improve current platforms and sampling methods to accommodate these technologies.

- development of sensors for the molecular detection of phytoplankton, harmful algae blooms, and pollutants **through their effect on microorganisms**
- Optimisation of a biosensors for the detection of toxic algae
- Automated sampling of rDNA adapted to the Ferrybox



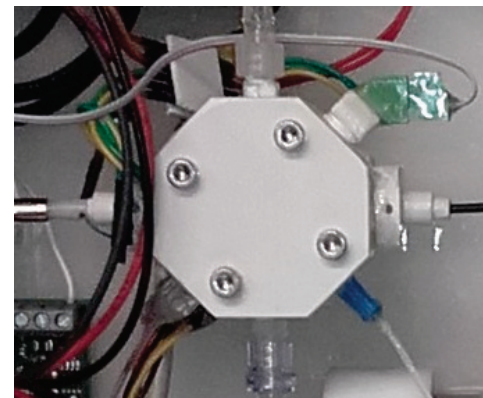
Task 3.5 COMBINED SENSORS FOR CARBONATE SYSTEMS (M0-M40) – Leader: Andrew King



To develop sensors that can measure **two seawater carbonate system variables simultaneously**.

Three different systems will be constructed and tested during the project:

- pH and carbonate,
- pH and total alkalinity,
- Spectrophotometric pH and potentiometric pH.



Task 3.6 BENTHIC COMPARTMENT AND PROCESS (M0-M40) – Leader Antoine Gremare



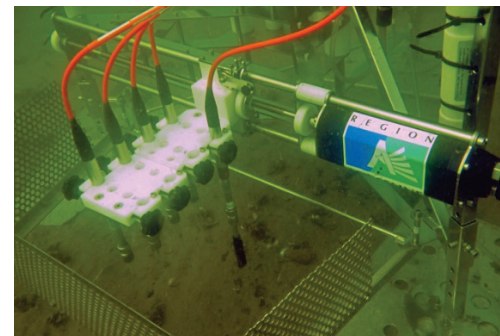
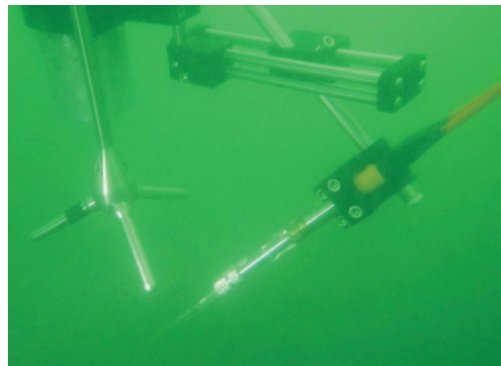
➤ ***Subtask 3.6.1 Integrated multi-sensors towed video system***

Developing an integrated multi-sensors towed video system.



➤ ***Subtask 3.6.2 Organic matter mineralization***

Achieving new technological developments regarding the monitoring of organic matter remineralization.



Task 3.7 OSE/OSSE technology

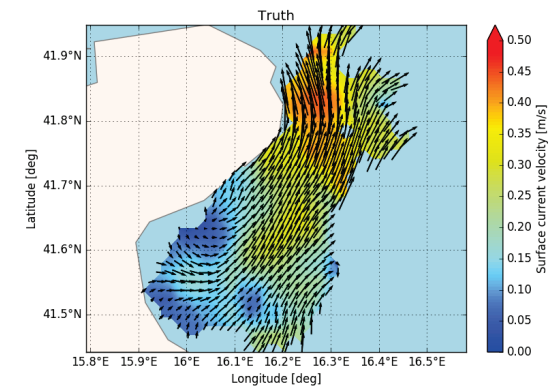
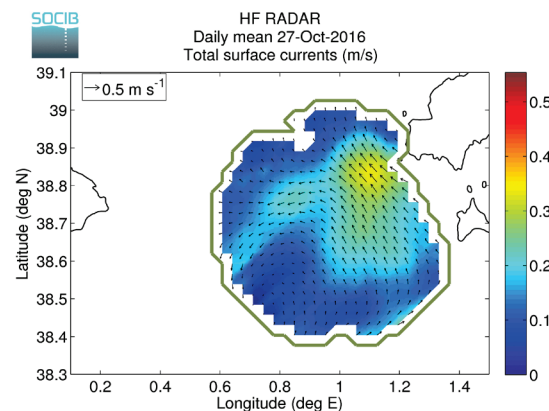
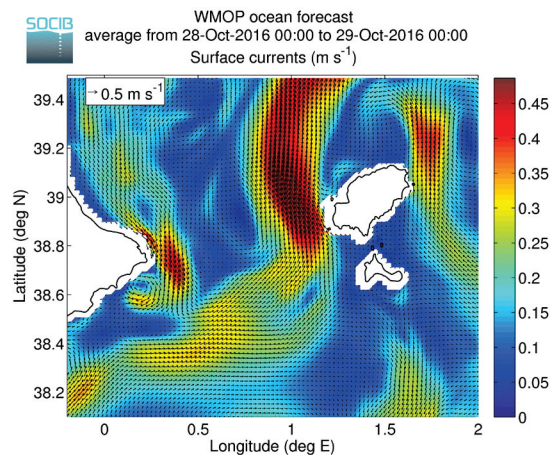
(M0-M24) Leader: Stefania Ciliberti, Giovanni Coppini



3.7.1 Transport in high-resolution Data Assimilation systems (CMCC, HZG, CNR-ISMAR)

3.7.2 OSE/OSSE infrastructure (CMCC, HZG, Ifremer, CNR-ISMAR)

3.7.3 Optimization of HF-radar Data Assimilation for the tracer transport (HZG, CMCC/CNR-ISMAR, Ifremer/CNRS and SOCIB)



JERICO-NEXT TRANSNATIONAL ACCESS (TNA)

WP7

Stefania Sparnocchia (CNR)

JERICO-NEXT Transnational Access (TNA)



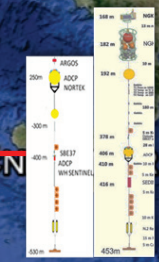
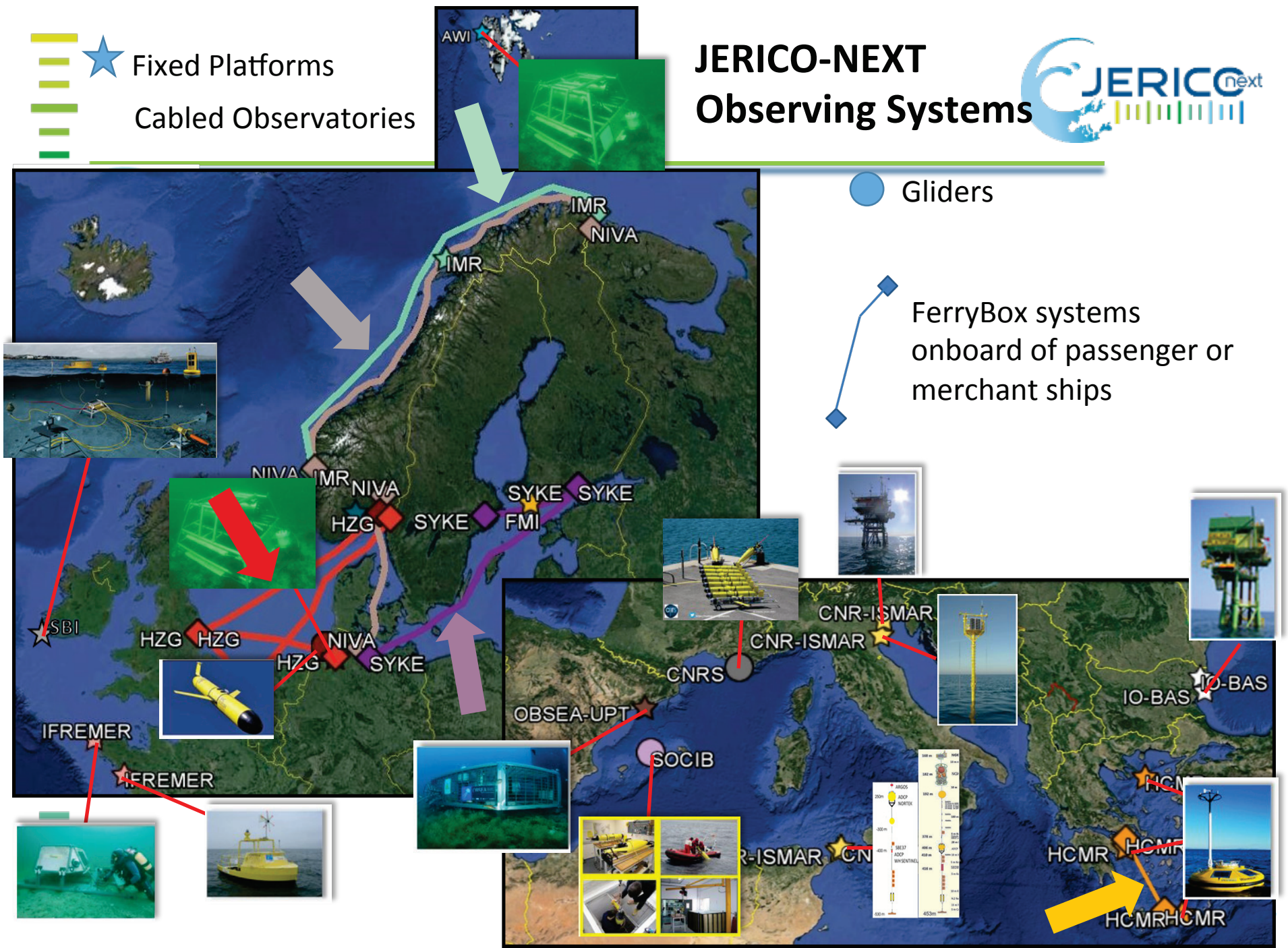
JERICO-NEXT is providing coordinated 'free of charge' trans-national access to researchers or research teams (users) from academy and industry to original coastal infrastructures.

13 PARTNERS: CNR ISMAR (coord), CNRS, FMI, HCMR, HZG, Ifremer, IMR, IO-BAS, NIVA, SMARTBAY, SOCIB, SYKE, UPC

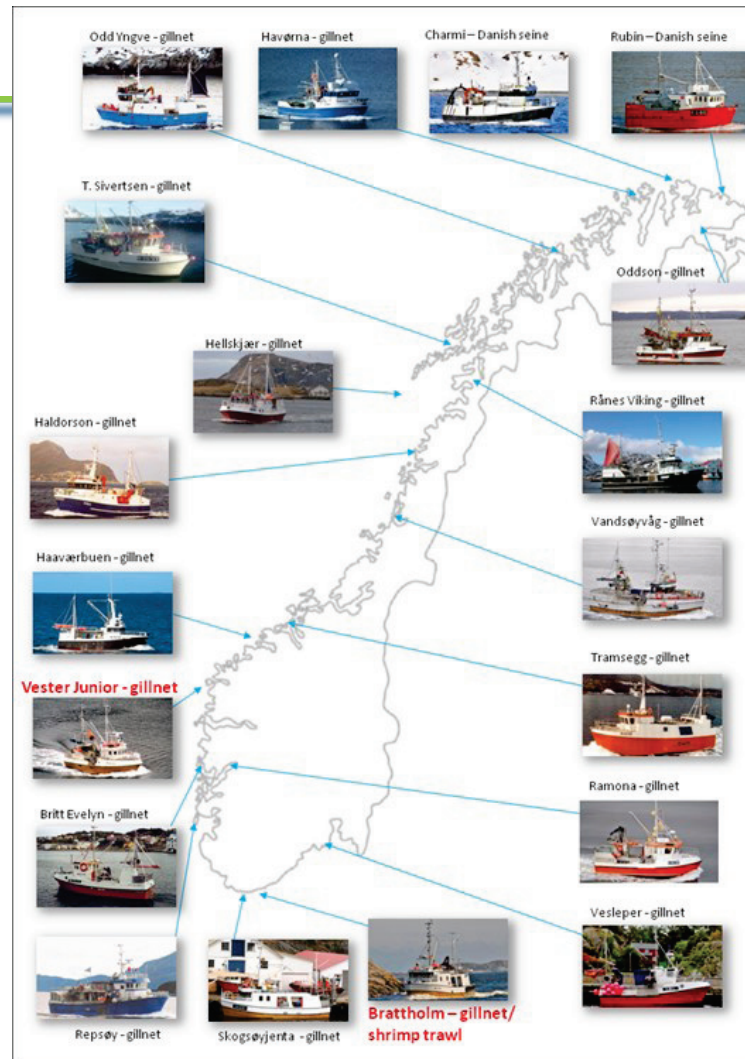
35 INSTALLATIONS/INFRASTRUCTURES: 30 Observing systems + 5 Supporting facilities and specialized equipment

- ★ Fixed Platforms
- Cabled Observatories

JERICO-NEXT Observing Systems



JERICO-NEXT Observing Systems



Two fishing boats of the coastal Norwegian Reference Fleet (IMR)

JERICO-NEXT

Supporting facilities and special equipment



Bains thermostatés

Bain d'huile

- Constructeur : Hirt Scientific
- Gamme : de -10°C à +60°C
- Volume de travail : 167l

Bains d'eau

- Constructeur : Ithamer
- Gamme : de -1,5°C à +40°C
- Volumes de travail : 95 ou 800
- Particularité : différente salinité entre l'eau douce et l'eau de mer

Points fixes de température

Cellule de point triple de l'eau

- Température : 0,010°C ± 0,007°C
- Diagramme de phases :

Cellule de point de fusion du palladium

- Cellule associée à un four
- Température : 29,7648°C ± 0,0013°C

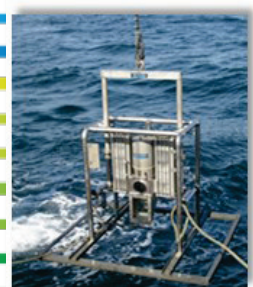
Sonde de température

- 4 sondes à résistance de platine Rosemount 250 gainées inox
- 1 sonde à résistance de platine Leeds and Northrup 250 gainée quartz.



- 2 Calibration laboratories
- 2 Experimental stations

- 1 Specialized equipment



TNA in JERICO-NEXT



Access to an infrastructure is provided to an user/user group to test an instrument or to collect data.

Modality of access (MoA)

Remote

In person/hands-on

Partially remote

Support offered to users:

- Scientific, technical and logistic support (facility operators) during users measurement campaign, including any special.
- A contribution to travel and subsistence costs for TNA users and shipping of their equipment.

TNA - Eligibility of user groups



- The user group leader and the majority of the users must work in a **country other than** the country(ies) where the installation is located.
- Access for user groups with a **majority of users** not working in a EU or associated country is limited to 20% of the total amount of units of access provided under the grant.
- Only user groups that will **disseminate the results** they have generated under the action may benefit from the access, **unless the users are working for SMEs.**

NEW IN H2020 !!!

NEW IN HORIZON 2020 !!!

Scheme of TNA implementation



CALL

- Launching Calls for access proposals
- Promotion

3 Calls during JERICO-NEXT

EVAL

- Feasibility assessment
- Evaluation of the proposals
- Approval of selected user-projects

**Facility operators
Selection Panel
Selection Panel**

EXP

- Proposals implementation

Users and facility operators

Reporting results and outcomes

Users

TNA Call Program and results so far

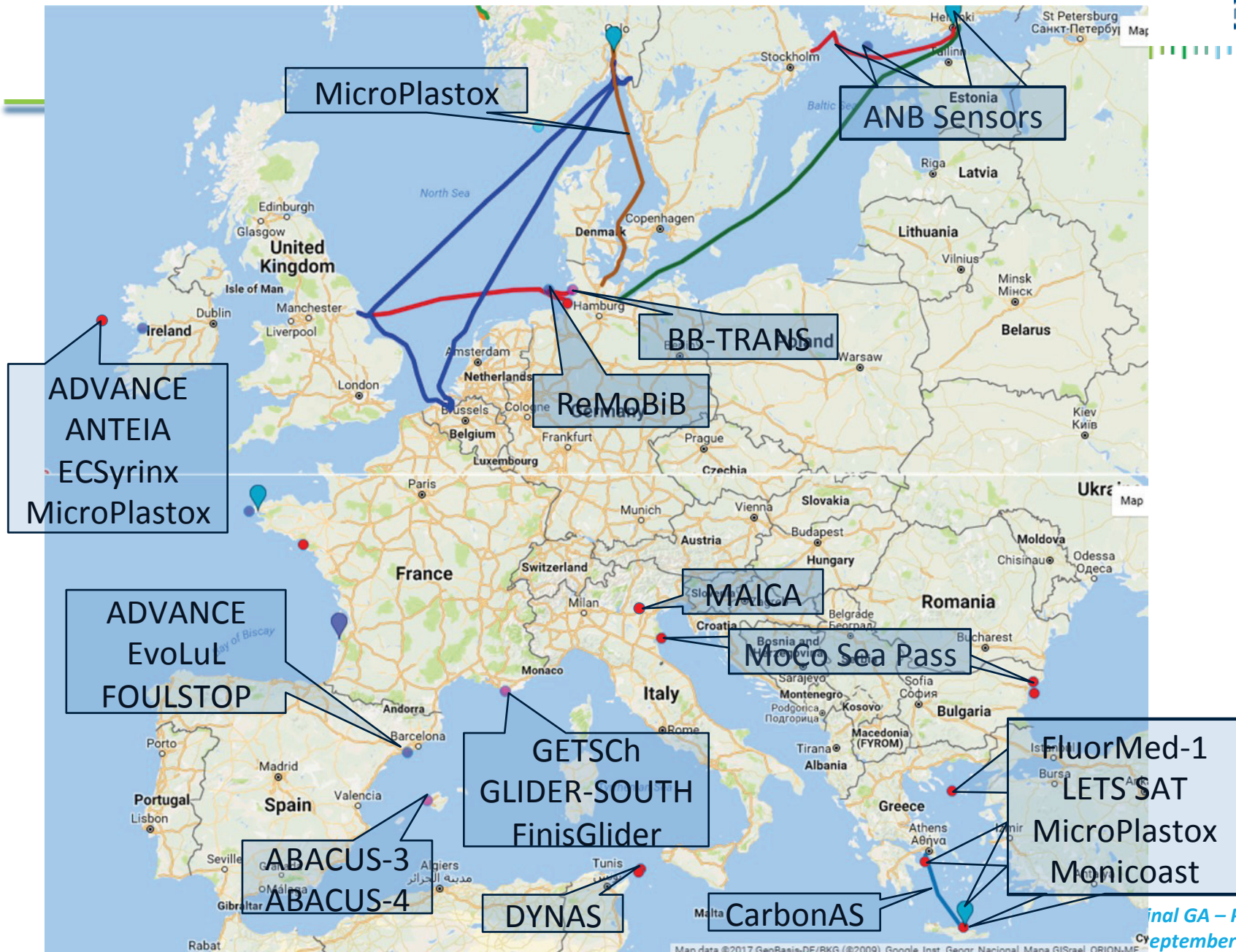


	1st Call	2nd Call	3rd Call
Call open	May 2, 2016	February 20, 2017	<u>January 2018</u>
Deadline	July 5, 2016	April 10, 2017	March 2018
No of proposals	12	16	
Supported user groups	6	15	

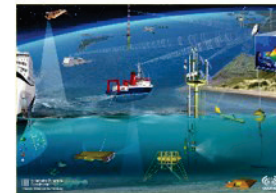
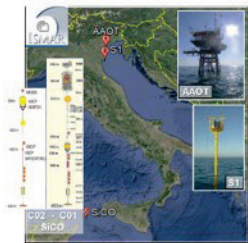
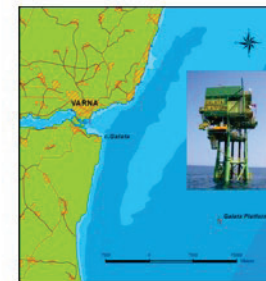
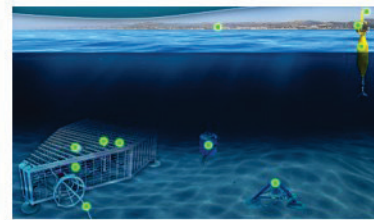
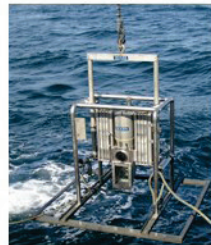
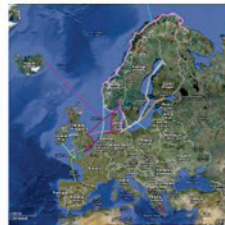
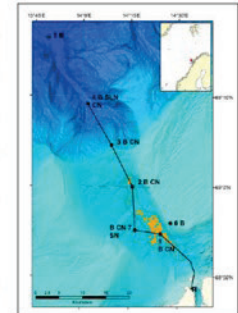
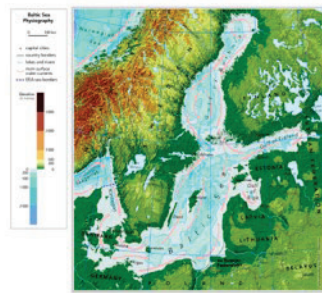
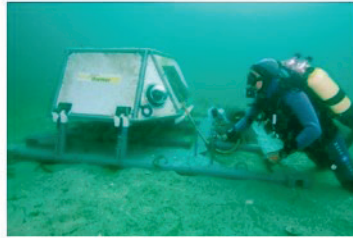
Consider responding to the next Call: this is an opportunity to further test the sensors developed in NeXOS !!!

Contact: JERICO NEXT WEB SITE - jerico.tna@ismar.cnr.it

1st & 2nd Calls: Supported proposals vs infrastructures



JERICO NEXT TNA Observatories and facilities



Gràcies, Thank
you!

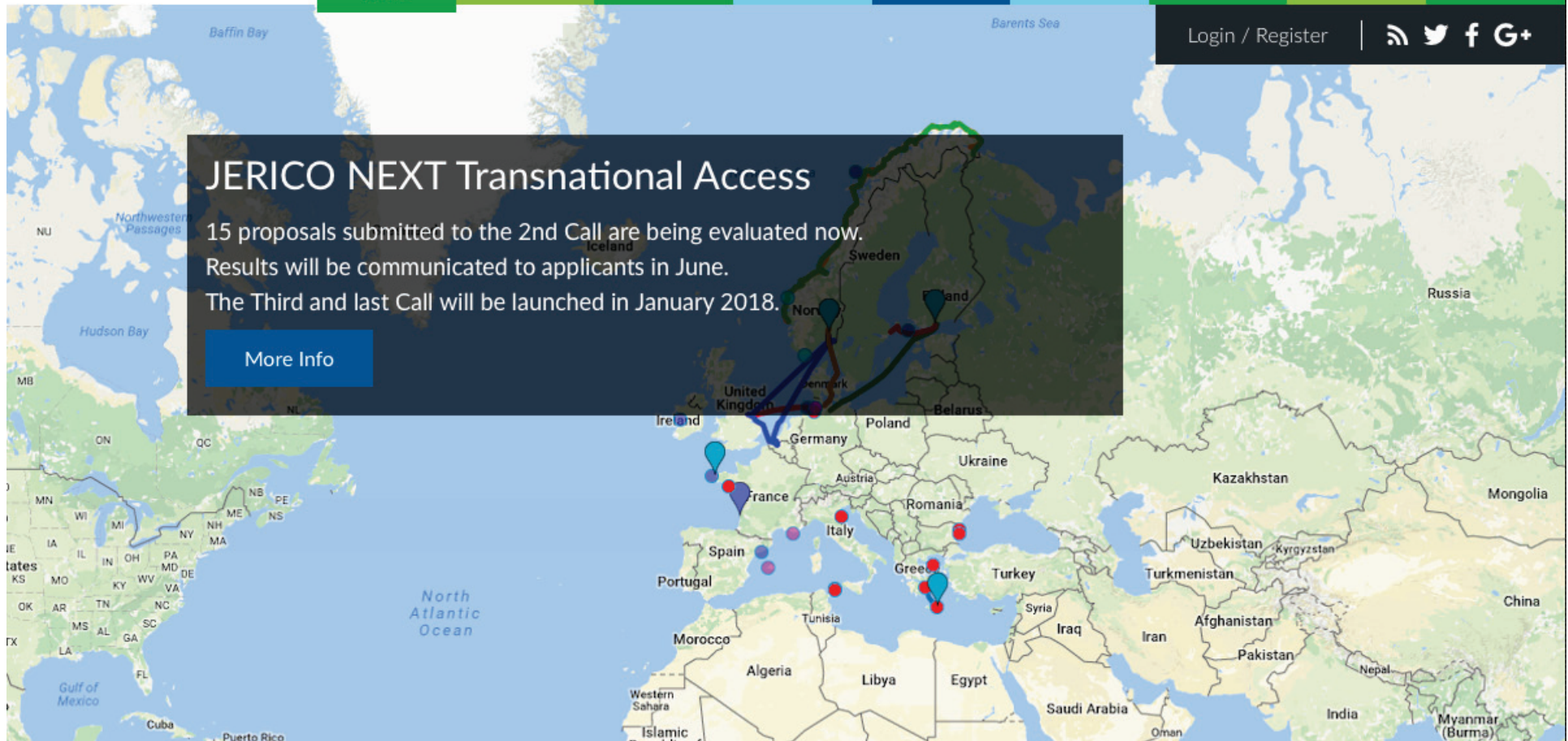
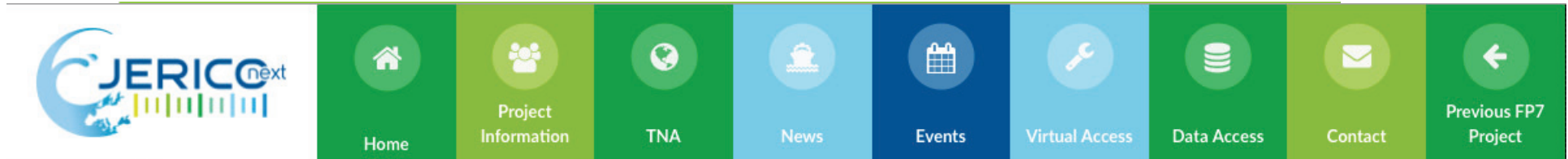
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NeXOS final GA – Plocan
14th of september 2017



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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654410.