PRESENT EUROPEAN COASTAL OBSERVATORIES: STATUS & CHALLENGES
A coastal specificity?

Why long term?
- Humanity and societies are changing (too) fast...
  -> Impacts on economy and environment on long term

Needed answers
- Adaptability of uses & behaviors: understanding and forecasting

Why operational?
- Crisis response management
- Forecasting
- No data, no information, no modeling, no ...

Operational monitoring and knowledge acquisition must be sustained... on very long term at European level...integration and harmonisation!!!!!!!
Table of content

I. JERICO-NEXT summary

II. And after? Towards a sustainable JERICO-RI

III. Illustration with 4 examples

IV. “What else?” ... the Jericexpresso
I. JERICO-NEXT summary

II. And after? Towards a sustainable JERICO-RI

III. Illustration with 4 examples

IV. “What else?” ... the Jericexpresso
JERICO-NEXT: a summary

Important figures

- **Duration**: Sept. 2015 - Aug. 2019, 4 years
- **H2020 EU funding**: 10M€
- **Consortium**: 34 partners, 910 MM, 15 countries
- **Coordination**: Ifremer: jerico@ifremer.fr
- **66 deliverables, 63 milestones**

[www.jerico-ri.eu](http://www.jerico-ri.eu)
JERICO-NEXT: a summary

• 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

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

 ✓ Delivery of an Harmonised data flow and application of the Inspire Directive
Delivery of **an harmonized research infrastructure for coastal observations**, compliant with EMODNET and Copernicus/CMEMS.

- **Sustainable** provision of high-quality coastal multidisciplinary observations
- 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: a summary

Today: JERICO-NEXT Time line

From Thoughts............

Toward Implementation......

- Roadmap for the future (D1.4)
- The JERICO Label (D2.7)

- Release of JERICO-NEXT catalogue (Data Man. D5.2)
- Legal governance and financial structure (D1.3)

Sep. 2015
KOM & 1st discussion on science strategy

Approach to monitor European Coastal seas


- Report on data management best practices and generic and metadata models (D5.9)
- Recommendations on open and free data policy (D5.1)
- Review of sites at threat (D1.1)

Oct. 2017
GA#1
Mar. 17

Mid-term review

Aug. 2019

GA#2
Sep. 18
## Table of content

I. JERICO-NEXT summary  
II. And after? Towards a sustainable JERICO-RI  
III. Illustration with 4 examples  
IV. “What else?” ... the Jericexpresso
And after? Towards a sustainable JERICO-RI

✓ What are the pillars for a sustainable JERICO-RI?

✓ The processes, the organisation, the roadmap
Pillars

1- Hardware level: Equipments: vectors and sensors

2- Community of users, customers...

3- Software level: Data portal: delivery of processed and qualified data to env. agencies and companies that will produce products and services (some of the users).

3- Qualification of the data….and of the hardware of the RI...
System Def. (Mapping hardware + usages)
Organisation of the network: humans communities

Developments: products and tech

Data, products, services

JERICO RI web portal

Users: academic

Users: non academic

Training and feedback

Funding agencies and policy makers

RI -Partners

International initiatives

PMEs, industry

Students

Scientists

USERS

Public
And after? Towards a sustainable JERICO-RI

Some of the requirements to get a sustainable JERICO-RI

- Raised and keep the quality high according to the needs!!!
  - Sensors and measurement
  - Processing
  - Quality control
  - Quality in the distribution and disseminations

- Deploy the suitable technologies and methods
  - Up to date technologies
  - Keep tracking of the emerging concepts and thoughts to be visionary
  - Keep understanding the needs and their evolution

- Raise funds = Convince the identified users and the funders!!!
And after? Towards a sustainable JERICO-RI

• Continuation after JERICO & JERICO-NEXT
  • About harmonisation: THE JERICO Label
  • About way forward operational running:
    • (semi)automated + on demand deployments: biology!!!! + episodic event sampling
I. JERICO-NEXT summary

II. And after? Towards a sustainable JERICO-RI

III. Illustration with 4 examples

IV. “What else?” ... the Jericexpresso
Illustration with 4 examples

Operational monitoring of phytoplankton and HAB
Illustration with 4 examples

Example of phytoplankton monitoring

- Local, regional hydrodynamics Transport? Physical processes: scales?
- Biological processes? Scales?
- TechnologySSSSS?
- Data flow: technology too!
- Interpretation/analysis methods?
- Usages, users?

How to?
Example of need: Phytoplankton monitoring

- Pulse-shape recording flow cytometer (Cytosense)
- Imaging in-flow (imaging in-flow Cytobot)
- FlowCAM
- FastCAM
- Spectral fluorometer (AOA, Fluoroprobe, Multiexciter)
- Absorption meter (PSI-CAM)
- Pulse Amplitude Modulated Fluorometers (PAM)
- Fast Repetition Rate Fluorometer (FRRF)
- Underwater Vision Profiler (UVP5)
- (Semi-)Automated data analysis

Outcomes:
Recommendations + combination of methods + complementary sensors in combined platforms.
Example of need: Phytoplankton monitoring

- CytoSenses–Fluoroprobe FRRF continuous + profiler
- Fluorometer + FRRF
- Ifremer/CNRS-BOREA Smile Buoy
- Fluorometers, Imaging Cytobot
- VLIZ cruise “Simon Stevin” R/V
- Cefas cruises « Endeavour »
- FB + CytoSense
- SMHI Tangesund observatory
- Some field implementation (May 2016-August 2017)
- ETOILE cruise “Côtes de la Manche” R/V
- Fluoroprobe CytoSense,
- CNRS-LOG cruise PHYCO “Côtes de la Manche” R/V
- FB + CytoSense
- “Le Carthag” Ferry line CNRS-MIO
- PhytoPAM, CytoSense, FRRF
1) Case of phytoplankton monitoring in the Baltic Sea

Accumulations of cyanobacteria in the Baltic Proper near Oxelösund, 25 July 2014 Photo Swedish Coast Guard

Today in JERICO-NEXT

Observations from ferrybox systems on R/V & M/S

Contribution of B. Karlson (SMHI), S. Lehtinen (SYKE), F. Artigas, A. Louchart, Fabrice Lizon (CNRS-LOG), L. Stemmann (CNRS-OOV), J. Seppälä (SYKE)
2) Case of phytoplankton monitoring in the Channel

A. Louchart (1), A. Lefebvre (2), M. Didry (1), G. Wacquet (1), L.F. Artigas (1)

1) CNRS -LOG, Université du Littoral-Côte d’Opale, Wimereux, France
2) IFREMER LER/BL, Boulogne sur mer, France
3) Case of phytoplankton monitoring in the Skagerrak (B. Karlson, SMHI)

**Nemo ocean model**
- SMHI set up
- Nemo-Nordic
- 3-D model
- Coupled to biogeochemical model

**HF Radar**
- Two antennas installed in autumn 2014
- Surface currents
- Waves
- Data assimilation in Nemo

Surface currents, 1 May 2015

Surface currents, 1 Aug. 2016
4) Example in the SE Bay of Biscay

HF radar + model + Microplastics + phytoplankton

Contribution of: A. Rubio, O. C. Basurko, A. Caballero, X. Davila, L. Ferrer (AZTI) and L.F. Artigas (CNRS-LOG)
Illustration with 4 examples

• Illustration of progresses and strengths

  1) Integration of physics with biology
  2) (Semi) automated systems are working
  3) Harmonisation of methods across systems
  4) Work and integration at European scale: Baltic, North Sea, Channel, Bay of Biscay, Western Med. Sea.
I. JERICO-NEXT summary

II. And after? Towards a sustainable JERICO-RI

III. Illustration with 4 examples

IV. “What else?” ... the Jericexpresso
What else? ... in JERICEXPRESSO mode

➢ Toward a phytoplankton operational monitoring
  - Merging of products: ex : satellite + ferrybox data
  - Linking hydrodynamic modeling, including forecasting with phytoplankton product (sat + FB) to forecast phytoplankton transport
  - Phytoplankton modeling to progress a lot
  - Warning and communication system towards the users (aquaculture etc...) ...
  - Collaboration with Users to be formalised

➢ One of the expected developments in technology
  - Progress in Marine Genomics : DNA sensors ... towards an operational process? Automation & integration
What else? ...
The end...

More on [www.jerico-ri.eu](http://www.jerico-ri.eu)  
jerico@ifremer.fr

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