GRANT N°: 871153
PROJECT ACRONYME : JERICO-S3
PROJECT NAME : Joint European Research Infrastructure for Coastal Observatories - Science, services, sustainability
COORDINATOR : Laurent DELAUNEY - Ifremer, France - jerico-s3@ifremer.fr

JERICO-S3 MILESTONE Joint European Research Infrastructure network for Coastal Observatory **Science, Services, Sustainability**	
MS#, WP# and full title	JERICO-S3 MS.3 - WP13 - "ALL REGIONS WORKSHOP 2"
5 Key words	Regions - Workshops - PSS - IRS - Jerico Week
Lead beneficiary	Ifremer
Lead Author	Laurent Delauney, Bastien Tagliana
Co-authors	
Contributors	All partners
Submission date	08/07/2021

→ **Please specify the type of milestone**:

- ❏ Report after a workshop or a meeting (TEMPLATE A)
- ❏ Report after a specific action (TEMPLATE B) (test, diagnostic, implementation,…)
- ❏ Document (TEMPLATE B) (guidelines,...)
- ❏ Other (TEMPLATE B) (to specify) …………………….

Diffusion list			
Consortium beneficiaries	Third parties	Associated Partners	other

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A) TEMPLATE A - report after a workshop or a meeting

1.A - Attendees

c.f. Annex: See attendees list for each session

2.A - Statement of Decisions

cf. Annex: See report of each session

3.A - Main Report

The Jerico-S3 "All Regions Workshops 2" took place from Monday 19 to Friday 23 April 2021 as a virtual event organized by the Jerico-S3 Coordination team (Ifremer).

Following ARW#2 Sessions were hold:

- Session 1: Science Strategy of JERICO-RI and Regional approach
- Session 2.1: Relations with other RIs and initiatives in regions
- Session 2.2: Modelling Workshop (Workshop on coastal model-observation integration)
- Session 3.1: Harmonisation of the observation of biological variables
- Session 3.2: Biological data flow
- Session 4: User Workshop

cf Annex: Full reports of the sessions are available in annex

4.A - Conclusions

Despite the constraint to held such an event as a virtual event, the ARW#2 reached its main objectives.

5.A - Annexes and references

ARW SESSION 1 - PARTs 1,2,3

Science Strategy of JERICO-RI and regional approach

Monday 19 April 2021/14:15- 17:30 Tuesday 20 April 2021/13:30 - 14:10

JERICO-S3 session on Science Strategy and regional approach:

From science strategy towards operation, variables, sensors and joint operation of future thematic centers

Scope of the workshop:

JERICO-S3 largely relies on practical developments and experimentations, which are associated with a set of scientific topics and are to be implemented in regions at different spatial scales. The main scope of the workshop is to strengthen the link between the science strategy and the experimentation.

Specific objectives:

- Present the general architecture of the JERICO science strategy and its regional dimension according to D1.1 (link) and the review of D3.1 and D4.1: KSC, Specific Scientific Challenges (SSC) and Research axes (Section 3.1 from D1.1 and tables I and II)
- Present the strategy for technological innovation and the approach towards variable packages - Here we need to present the process and outcomes of the action for the definition of variable packages (WP1-3-4-7) and the sensor module (WP7), both focused in the thematic of “plankton dynamics” and discuss the way forward the definition of variable packages for other tematics - relation with research axes?.
- Open session on the concept, objectives and future joint operation of thematic centers/services - link with JERICO e-infrastructure. We will present some examples, to illustrate their added-value (visibility, across-regions: so approaching IRSs and PPSs developments, product/service-oriented).

Then in the plenary collaborative sessions we will work on identifying Specific Scientific questions for the development of thematic centers and further conception of variables packages.

Expected outcomes:

- A common view of the Science strategy and its development in regions
- A work plan for the definition of variable packages on other thematics
- A clear concept of thematic centers, their role, operation and a list of possible tematics.

Targeted audience: Regions leads // WP 2, 3, 4, 5, 7 and 1 leads (link with e-infrastructure)

Type of organisation:

PART ONE (45') - monday 14:15 - 15:15

***PLENARY SESSION*:**

KEYNOTE TALK 1 : Introductory talk - A. Grémare General architecture of the JERICO science strategy and its regional dimensions 10' + 5' question/discussion (=> 15')

KEYNOTE TALK 2 : (Anna + Dominique + Eric) Strategy for technological innovation and the approach towards thematic variable packages and sensor development for the technological demonstration in JERICO-S3 10' wp1 + 10' WP7 and exchanges with WP5 5' question/discussion => Total =25'

KEYNOTE TALK 3 : Thematic centers - I. Puillat first ideas on the concept, possible added-value and operation 5-10' + 5-10' question/discussion => Total(15')

PART TWO (45') monday 15:45 -17:30

PLENARY COLLABORATIVE SESSIONS :

PART 1 - Selection of Specific Scientific Questions (from table in D1.1) for the development of thematic centers and variables packages. (20')

PART 2 - Requirements (variables, research needs, services, product development) enabling the development of the Specific Scientific Questions after selection. (20')

PART 3 - Round table on Thematic centers - their role, operation and a list of possible thematics. (20')

16:45 - 17:30 Synthesis of the session (restricted session for synthesis elaboration WP1,3,4,5,7 leads + other volunteers)

PART THREE (40') - CONCLUSION - Tuesday 13:30

***PLENARY SESSION*:**

Short Debrief - synthesis of Monday Session 20' + Discussion 20'

Main reference persons: Ingrid Puillat (WP9), Eric Delory (WP7), Dominique Durand, Antoine Grémare, Laurent Coppola, Anna Rubio (WP1)

#	Description	Leading person	Link
1 15' **Monday**	**KEYNOTE TALK 1 : Introductory talk -** General architecture of the JERICO science strategy and its regional dimensions	**A. Grémare**	
2 25'	**KEYNOTE TALK 2 :** Strategy for technological innovation and the approach towards thematic variable packages and sensor development for the technological demonstration in JERICO-S3	**A. Rubio, D. Durand, E. Delory (WP1,5,7)**	
3 15'	**KEYNOTE TALK 3 : Thematic centers -** first ideas on the concept, possible added-value and operation 5-10' + 5-10' question/discussion => Total(15')	**I. Puillat & A. Griffa**	
4 - 30'	COFFEE BREAK		
5 20'	PLENARY COLLABORATIVE SESSIONS PART 1 - Specific Scientific questions (from table in D1.1) for the development of thematic centers and variables packages.	A. Rubio, A. Grémare, A. Griffa, I. Puillat	
6 20'	PLENARY COLLABORATIVE SESSIONS PART 2 - Requirements (variables, research needs, services, product development) enabling the development of the Specific Scientific Questions after selection.	A. Rubio, A. Grémare, A. Griffa, I. Puillat	
7 20'	PLENARY COLLABORATIVE SESSIONS PART 3 - Round table on Thematic centers - their role, operation and a list of possible thematics.	A. Rubio, A. Grémare, A. Griffa, I. Puillat	
8 45'	16:45 - 17:30 Synthesis of the session (restricted session for synthesis elaboration	A. Rubio (WP1,3,4,5,7 leads + other volunteers)	
9 40' **Tuesday**	Short Debrief - synthesis of Monday Session 20' + Discussion 20'	A. Rubio, A. Grémare, A. Griffa, I. Puillat	

NOTES AND MINUTES

NOTES and MINUTES

→ **SECRETARY.IES (responsible for notes and minutes)** :

Scope of the session was threefold:

(i) to review and discuss on the JERICO Key and Specific Scientific Challenges(SCC) (SCC and Research axes to be added?)
(ii) to present the strategy for technological innovation and the approach towards variable packages (WP1-WP7-WP5) and discuss on further steps
(iii) to launch discussions on the concept, objectives and future joint operation of JERICO Thematic Centers

The main results linked to each of this objectives were:

i	● Collected new suggestions, mostly at the level of Research Axes - to be analyzed further and incorporated to D1.1 ● KSC# and the SSC jointly reviewed, to be fixed after minor adjustment. List of “Research Axes” to be completed and kept alive
ii	● Selected the three questions that will benefit the from further integrated actions (definition of variable packages, thematic centers ● Joint brainstorming on the requirements (variables, research and tools/services) – First exercise, representative of the ARW audience (to be left open further inputs)
iii	Diversity in possible Thematic Centres: Scientific/Thematic-, Technical-, User-oriented. Need to analyze further the collected ideas and set up a working group

Questions from Slack &/or Zoom (chat & vocal):

⇒ LINK TO THE KEYNOTES PRESENTATIONS_HERE

Eric Delory : On KSC, do specific challenges include anthropogenic electromagnetic and acoustic noise?

Antoine Gremare : yes, if they are in the table they are measured by at least one PSS/IRS

Ian Salter: Would it be useful to have an additional column linking Research Axes to specific EOVs?

Joaquin Tintore : On **Anna Rubio'**s presentation ..... very nice ... however, a quick comment on the example selected: focusing on Plankton dynamics without a strong satellite and/or modelling and data interoperability components is very risky.... HABS etc are very difficult science topics...and I suggest joining forces along the above lines ... otherwise we might be able to provide data ,,. But it will be very difficult to respond to stakeholders' needs ...
On **Dominique Durand's** co design ... for Plankton dynamics under climate change ... yes indeed... this co design is essential ! But I am missing the notion of ocean scales and variability in the coastal ocean, and for this satellite data (new Sentinel 10 m resolution) and modelling at different resolutions (from 1 Km to 50 m...) are essential …

→ **Laurent Coppola** : I agree with you Joaquin, but it depends on the size of the plankton. For phyto, it is obvious that ocean color images are essential to delineate bio-regions, but at the moment, satellites lack precise resolution for coastal waters (see ACRI + LOV actions in NW MedSea PSS). For zooplankton, satellite is not a key indicator, but rather DCM.

→ **Joaquin T.** : Thanks Laurent... but the present Sentinel with 10 m resolution are impressive ! You can see some work on this from Isabel Caballero work from CSIC institute ICMAN in Cadiz, and related papers well recognised by the EC (innovation price or something Like this ...) ...

Andrew King : Consider the Turner Designs C3 that can measure turbidity, cDOM flu, and chl flu combined into a single sensor body.

Klas over muller : Hi Dominic, we at Hereon have a moored and profiling sensor platform measuring 11 of the 13 variables (part of the North Sea System - happy to contribute to further discussions…

George Petihakis : We must be careful on what we call EOV's. These are defined in the framework of GOOS and there are specification sheets for each of them including all the sub-variables (https://www.goosocean.org/index.php?option=com_content&view=article&id=170&Itemid=114)

Joaquin Tintore : On Ingrid's presentation, good, we need to better explain the difference between a RI and a Network... and more specifically on the 4 Thematic Centers were pilot ones that we identified in the preparation as realistic and of scientific and societal interest ....

Sebastien Legrand : As a reply to Laurent (3:13PM) and Joaquin (3:16PM) : high resolution ocean colour images will be delivered by CMEMS for all coastal zones at the next release

(4th of May https://marine.copernicus.eu/user-corner/user-notification-service/cmems-new-service-release-4th-may-2021-update)

---Mentimeter exercise---

Four fit-for-purpose questionnaires in Mentimeter.com were used to gather input on the different aspects presented during the KeyNotes 1-2 and 3. Discussion after the mentimeter exercise were focused on the concept and definition of possible future Thematic Centers.

Comments on the mentimeter exercise

Jay Pearlman : This is interesting for the directions/requirements for JERICO-CORE e-infrastructure
Martin Pfannkuchen : This is really a very fascinating exercise
Inga Lips : would be very interesting to gather the same answers from the users
Annalisa Griffa : a similar survey will be proposed to stakeholders (≠ format)
Martin Pfannkuchen : surprised for example that "disentangling" anthropogenic/natural effects came in 3rd position (after studying anthropogenic // natural effects)
Holger Brix : seems to be 2 different approaches to a similar question

Thematic Centers discussion

Jay Pearlman : What type of thematic center will provide a foundation for stable and sustained funding?
felipe artigas : Yes, but nations could support only some themes of the thematic center but not all...what about that?
Inga Lips (EuroGOOS) : national needs can change over time…
Andrew Luke King : some suggestions about link to most national policies related to coastal oceans: 1) climate change, 2) any WFD/MSFD, 3) aquaculture
Eric Delory : EMSO is based on service groups: Data (Mgt), Science, Innovation/Industry, Communication, Engineering/logistics.

Dominique Durand : I like "Expert Centre" better than "thematic centre".. It links better to our motto : Coastal observatories, facilities expertise and data for Europe. → keep the structure as simple as possible in the beginning

Jay Pearlman: Dominique, is the name "service center" appropriate?
Dominique Durand : Maybe Jay, if services are the only target of this internal organization, which I don't know, at present. At least the service centre will link naturally to users and cash flow. I like this. While science will alway be funded by nations and EU, it would be great to have, as an ambition, that JERICO-RI would have a business model leading to some level economic independency, and thereby enabling engaging on strategic technological developments on our own (based on non-research grants).

Anna Rubio AZTI : I agree with the diversity, but maybe we should focus on a few ideas to start with a short list. The mechanism on how to advance on this topic is also important to be defined - should this be a working group like for the modelling?

Julien Mader : HF Radar community - building a DL in Eurosea on a possible governance of the HR radar community, thinking about how to integrate communities

Tuesday 20. April

#9 Conclusion / Synthesis / Discussion

KeyNote #1

- Discussion on interlinking with modelling and satellite communities: needs of data to interpret the in situ observation to provide information at greater spatial scale; the context. IT was pointed out that in task 7.5 this is to be minded in the design of the e-services (link to thematic centers) without stepping on the feet of CMEMS etc.
  Laurent D: Antoine Mangin is one of our possible Satellite interface contact
  Someone: Satellite interfacing should more visible

Keynote #2

- Thematic center on land ocean continuum discussion :
  Laurernt D: It's a very large topic to provide "services" on this subject since it concerns so many topics.
- Ingrid + Laurent: Thematic centers are user oriented… providing services thanks to our knowledge and expertise…

Keynote #3 - Centers

- **George:** Is there any estimation on the effort that will be required for each thematic center and how this will be resourced?
  Laurent D: I don't think we are at this level of analysis about this subject… but it's a good point to mention…
  Nevertheless, George, I think we can already ask to nations « how this will be resourced? » (you second question). Even before knowing the effort required)
  Sylvie P: I agree with Georges that long term funding has to be adressed…
  George: Of course we can think big but at the end of the day commitments must be made by the countries and at the level of ERIC commitment means legal bindings. And available resources will depend on the participation.

- Ingrid: We need to establish our needs and user needs to structure the Centers in the right way.
- Annalisa: ok to be part of the WG, we should have technical centers and science one that cross each other
- **Ingrid:** 1st dimension : techno
  2nd dimension: science
  3rd dimension: training

- **Laurent D:** We should remain simple… in order to be understandable from the outside (users)
- **Antoine:** The number of centers should be kept limited as well and I fully agree that their overall logic should be easily readable
- **Ian Salter:** Is it an idea to organize thematic centers around observing infrastructure types? Deployment of technologies, the spatial and temporal resolution afforded, data transfer and storage capacity and reporting, and by extension the scientific phenomena and products and services, are to some extent governed by the observational infrastructure. Is there too much redundancy in deployable technologies across infrastructures for such a thematic organisation to function??
- **Ingrid:** Ian, it's not the main objective, but it can be seen as a mean to to feed thematic centers which will integrate from technologies/platforms
  Actually these platform oriented centers can be technical centers dedicated to harmonisation etc... that would support science/thematic ones.

Attendees MONDAY (75) → Zoom participants (at 14:45, session started at 14:15)

Léa G. (Co-host, me)
Laurent D (JERICO-RI Coord)
Anna Rubio AZTI
JERICO RI (Co-host)
Antoine Grémare
alain lefebvre
Ana
Andres Cianca (PLOCAN)
Andrew Luke King
annalisa
Baptiste Mourre (SOCIB)
Bastien Tagliana
Begoña Pérez
blauw
Carolina Cantoni (CNR)
Catherine Boccadoro
Christian Autermann
Christiane Eschenbach
Costas Frangoulis
David Kaiser - hereon-KDG
Dominique Durand
Emilie Breviere
Eric Delory
Fabio Brunetti
felipe artigas
François Bourrin
George Petihakis
Martti Honkanen
Melanie Juza (SOCIB)
Milla Johansson, FMI
Mirta Smodlaka
Naomi Smith
Nelli Rünk (TalTech)
Paul Gaughan
Pauline Smpson (UNESCO/IOC/IO...
Pirjo Kuuppo SYKE
Samu Elovaara
Saskia Rühl
sebastian ehrhart
Simon Jirka
Simon Keeble
Simone Marini
Sylvia Christodoulaki (HCMR)
Sébastien Legrand, RBINS
Taavi Liblik (Estonia, TalTech)
Timo Tamminen, SYKE, Finland
Urmas Lips (TalTech)
veronique Creach
Yoana Voynova
Zéline Hubert
Guillaume Charria
Helene Frigstad (NIVA)
Henning Wehde
Holger Brix
iansalter
Inga Lips (EuroGOOS)
JAllen
Joanne Burden
Joao Vitorino
Joaquín Tintoré
Juanga
Jukka Seppälä
Julien Mader (AZTI)
Julien Meillon (IFREMER)
Kate
Kees Borst (RWS-NL)
Kieran Reilly
Klas Ove Möller
Laurent Coppola (CNRS)
Lennert Schepers (VLIZ)
Leonidas Perivoliotis (HCMR)
Lisette Enserink
lluciaribot
Lucie Cocquempot
Lumi
Maristella Berta
Martin Pfannkuchen

Attendees TUESDAY (47) → Zoom participants (at 14:00, session wrap-up started at 13:30)

- Henning Wehde
- Holger Brix
- Ian Salter
- Inga Lips (EuroGOOS)
- Joao Vitorino
- Jukka Seppälä
- Julien Mader (AZTI)
- Kees Borst (RWS-NL)
- Lumi
- Maristella Berta
- Martin pfannkuchen
- Martti Honkanen
- Melanie Juza (SOCIB)
- Milla Johansson (FMI)
- Nelli Rünk (TalTech)
- Paul Gaughan
- Pauline Simpson (UNESCO/IOC-IODE)
- Samu Elovaara
- sebastian ehrhart [syke]
- Simone Marini
- Sébastien Legrand, RBINS
- Urmas Lips (TalTech)
- veronique Creach
- Léa G. (Host, me)
- Anna Rubio AZTI
- Bastien Tagliana (Co-host)
- ingrid (Co-host)
- Laurent D (JERICO Coord) (Co-host)
- Dominique Durand
- Timo Tamminen, SYKE, Finland
- alain lefebvre
- Ana Lara Lopez
- Andres Cianca (PLOCAN)
- Andrew King (NIVA)
- annalisa
- Antoine Grémare
- Behzad Mostajir (CNRS)
- Carolina Cantoni (CNR)
- Carolyn Graves
- Christian Autermann
- Costas Frangoulis
- Emilie Breviere
- Eric Delory
- Eva
- Fabio Brunetti
- François Bourrin
- George Petihakis

SLIDES PRESENTED DURING THE SESSION

ARW SESSION 1 - PARTs 1,2,3

Science Strategy of JERICO-RI and regional approach

Monday 19 April 2021 / 14:15- 17:30
Tuesday 20 April 2021 / 13:30 - 14:10

JERICO-S3 session on Science Strategy and regional approach:

From science strategy towards operation, variables, sensors and joint operation of future thematic centers

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Brief intro to the session - Scope /objectives

JERICO-S3 largely relies on practical developments and experimentations, which are associated with a set of scientific topics and are to be implemented in regions at different spatial scales.

The main scope of the Session is to **strengthen the link between the science strategy and the experimentation**.

Specific objectives:

- Present the **general architecture of the JERICO science strategy** and its regional dimension according to D1.1 (link)
- Present the **strategy for technological innovation and the approach towards variable packages** (WP1-WP7-WP5)
- Open session on the **concept, objectives and future joint operation of thematic centers/services**

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Brief intro to the session - Organization

KEYNOTE TALK 1 : General architecture of the JERICO science strategy and its regional dimensions	**A. Grémare**
KEYNOTE TALK 2 : Strategy for technological innovation and the approach towards thematic variable	**A. Rubio, D. Durand, E. Delory (WP1,5,7)**
KEYNOTE TALK 3 : Thematic centers - first ideas on the concept, possible added-value and operation 5-10' + 5-10' question/discussion => Total(15')	**I. Puillat & A. Griffa**
15:15 COFFEE BREAK	
15:45 -17:30 *PLENARY COLLABORATIVE SESSIONS* Work together (mentimeter) in the **selection of Specific Scientific Questions** for the development of thematic centers and variables packages. (20'+20+20')	A. Rubio, A. Gremare, A. Griffa, I. Puillat
SHORT DEBRIEF- ***TOMORROW 13:30***	A. Rubio, A. Gremare, A. Griffa, I. Puillat

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ARW SESSION 1 - PARTs 1,2,3

Science Strategy of JERICO-RI and regional approach

KEYNOTE TALK 1 : General architecture of the JERICO science strategy and its regional dimensions (10’ + 5’ questions)

A. Gremare (WP1)

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Main specificities of the coastal (European) Ocean

Triple interface

- Continent
- Open ocean
- Atmosphere

Complex functioning

-Strong interactions between compartments and processes
- Importance of biological and biogeochemical processes
- Range of nested spatiotemporal scales

Major socio-economic importance

- A large variety of ecosystem services
- Associated anthropogenic disturbances
- Durability?

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The JERICO approach/strategy has been designed to handle these specificities

Structuring observation at the regional level

Pillar #1

Fostering societal impact for a larger community of stakeholders

Pillar #2

Developing innovative technologies for coastal ocean observing and modelling

Pillar #3

Interfacing with other ocean observing initiatives

Enhancing integration of coastal observations

Implementation

Strategy

Objective

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

A RI is aiming at being more than the coordination of national/regional initiatives: **identification of common scientific questions**

Methodology
San Sebastian **Kick off Meeting**
Actions conducted within **WP3** and **WP4** (D3.1 and D4.1)
Synthesis and homogenization within **WP1** (D1.1)

Results
Identification of **3 Key Scientific Challenges**
Listing of **Specific Scientific Challenges**
Listing of **Research axes**

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Current status of Key/Specific Scientific Challenges and Research axes

Keys Scientific Challenges	Specific Scientific Challenges	Research axes
Assessing and predicting changes under the combined influence of global and local drivers	Land Sea Ocean continuum. Impacts of land-derived discharges and exchanges with open ocean	Nutrients, particles and organic matter, inorganic carbon, litter and contaminants
	Sea-atmosphere interface. Quantification of inputs	Particles, nutrients, contaminants
	Connectivity and transport. Pathways of water masses and materials	Water masses, nutrients, contaminants, particles, organisms
	Biodiversity trends	Phytoplankton, zooplankton, benthos
	Ecosystem biogeochemical processes and interactions	Pelagic, benthic, pelagic/benthic coupling
	Carbon budget and carbonate system	Carbon fluxes and budget, carbonate system trends, effects of acidification
Assessing the impacts of extreme events	Impacts of rare and extreme events	Floods, storms/large waves, heat waves, landslides/sudden erosion, harmful algae blooms, pollution due to accidents
Unravelling the impacts of natural and anthropogenic changes	Resolving climate change impacts	Temperature, salinity, currents, sea level, waves, biological production, species distribution ranges, nutrients
	Resolving anthropogenic impacts	Eutrophication, habitat and biodiversity loss, contamination, coastal engineering, use of marine space, use of marine nonliving resources, use/cultivation of living resources, invasive species, maritime traffic, underwater noise
	Disentangling impacts	Meta analysis , coupled modelling

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Main identified remaining questions at this stage

- **Delimitation/Interactions between KSC #1 and KSC #3?**
- **Specific Scientific Challenges and Research axes to be added?**
- **Which level is to be used for further integrative actions?**
  (1) Recommendations for technological developments (Keynote Talk #2)
  (2) Set up of future Thematic Centers (Keynote Talk #3)

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ARW SESSION 1 - PARTs 1,2,3

Science Strategy of JERICO-RI and regional approach

KEYNOTE TALK 2 : Strategy for technological innovation

Approach towards thematic variable packages and sensor development for the technological demonstration in JERICO-S3

(10' + 5' questions)

A. Rubio (WP1), D. Durand (WP1) , E. Delory (WP7)

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Approach towards thematic variable packages

Variable package: set of variables (generic + specific sub-packages) that are required to fulfill the needs of a coastal site and application or domain.

Science-driven backbone list and specification of the variables to be measured concerning the Physical, Chemical, biochemical and biological environments

Sensor package: set of sensors (generic + specific sub-packages) that are required to fulfill the needs of a coastal site and application or domain.

From a technological perspective, the sensors may be connected to a common control, power and communication system and form an instrumentation **module**.

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DCS7010L

Framework

Science strategy WP1, 3, 4, 5 → WP7

KSC#1
Assessing and predicting changes of coastal marine systems under the combined influence of global and local drivers

KSC#2
Assessing the impact of extreme events on changes of coastal marine systems

KSC#3
Unravelling the impacts of natural and anthropogenic drivers of climate change

WP1

Coastal Variable Sub-Package for JERICO-RI

Common ones: CEoV: Generic Variable Sub-Package

Region/site/topic - Specific ones: Specific Variable Sub-Packages

WP1, 3, 4

Sensor Sub-Packages

Generic Sensor Sub-package

Specific Sensor Sub-packages

WP7, 5, 3, 4

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DCS7010L JERICO RI
SCIENCE - SERVICES - SUSTAINABILITY

Framework

Science strategy WP1, 3, 4, 5 → WP7

KSC#1
Assessing and predicting changes of coastal marine systems under the combined influence of global and local drivers

KSC#2
Assessing the impact of extreme events on changes of coastal marine systems

KSC#3
Unravelling the impacts of natural and anthropogenic drivers of climate change

WP1

Coastal Variable Sub-Package for JERICO-RI

Common ones: CEoV: Generic Variable Sub-Package

WP1, 3, 4

Region/site/topic - Specific ones: Specific Variable Sub-Packages

Sensor Sub-Packages

Generic Sensor Sub-package

Specific Sensor Sub-packages

WP7,5, 3, 4

Towards a harmonised & operational RI

Demonstration module

Design, build, test and demonstrate a prototype of JERICO Interoperable Instrument Module.
(JIIM is now c-EGIM => coastal EGIM!)

WP7 - Task 7.2
WP1- Task 1.2.1
Regions (WP3 + WP4)
WP5

EGIM: EMSO Generic Instrument Module

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Sensor Module design (M1-M12) and demonstration (M36-M48)

WP1 : Main scientific drivers

After JERICO-NEXT plankton dynamics (e.g. algal blooms) seen as one the key topics for the integrated observation of the coastal area

<u>"Pelagic Sensor Package for the integrated observation of plankton dynamics"</u>

Subtask #	Name	Lead	Begins	Ends
7.2.1	Specify, design and build the cEGIM prototype	IFREMER	M1	M18 (July 2021)

Need to define observational requirements

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More info here

QUESTIONNAIRE (NOV 2020) - ALL JERICO REGIONS

- The **main rationale for a demonstration according to the problematics and scientific stakes of the region**, including abstracts on up to three Scientific Actions (related to the JERICO-S3 KSCs)

- The observations needs driven by each Scientific Action, including **operational aspects** (remote connectivity, type of device, Frequency / type of access to information, Minimum duration of the deployment) and the **specification of the Variables to be measured** (Needed + already available observations, their accuracy, temporal resolution, depth range and preferred method/sensor)

- [DEMO] The need of other **associated technologies** (e.g. antifouling systems)

- [DEMO] The **interest of the regions for hosting** a technological & innovation in-situ demonstration.

- [DEMO] The **availability of sensors** that could contribute (as in-kind) to the list of needed sensors to the SC and required to be co-located with or integrated in the sensor module.

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QUESTIONNAIRE (NOV 2020) - Outcomes

5/5 PSS and 3/5 IRSs and gathered 13 SC with their associated list of observational and technological requirements

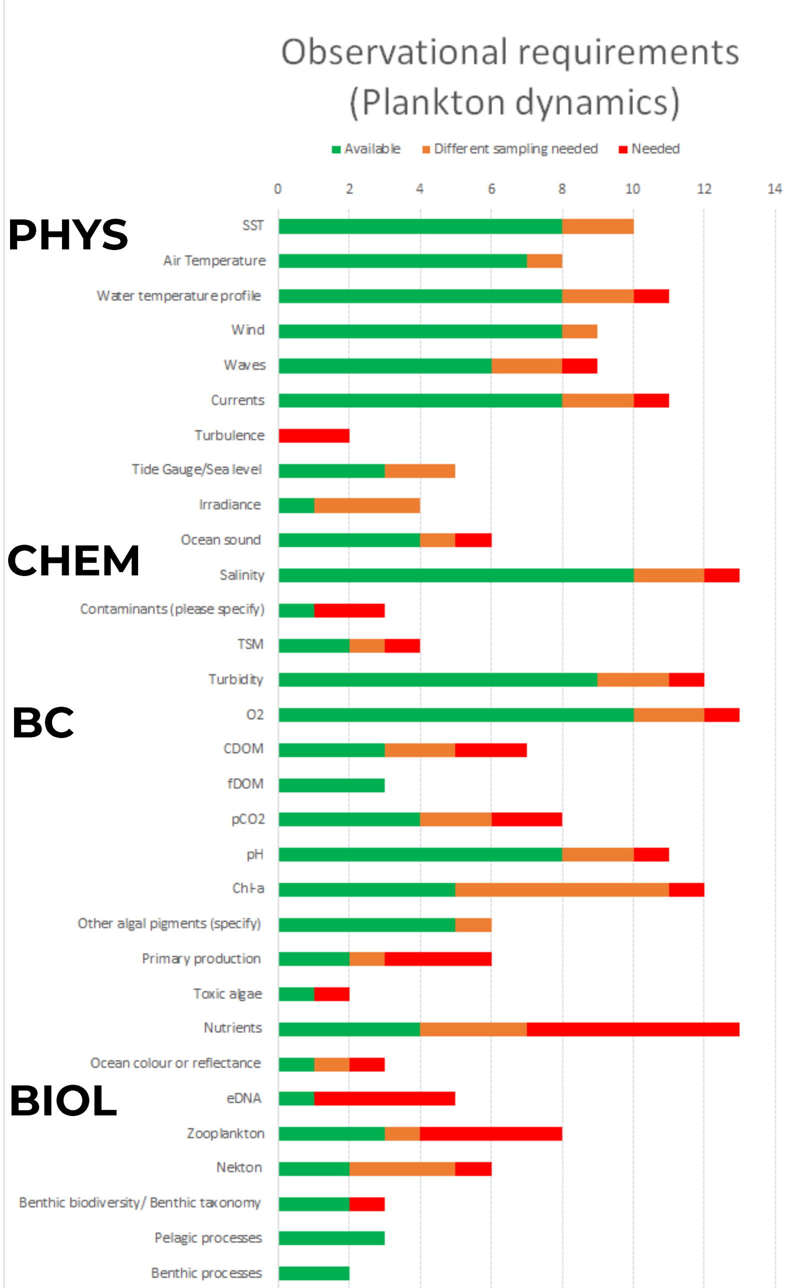
PSS

REGION	NW-MED		PSS_GOF / BALTIC SEA			PSS_CRETAN SEA	PSS_ ENGLISH CHANNEL	PSS_NORTH SEA
ID	SC#1	SC#2	SC#1	SC#2	SC#3	SC#1	SC#1	SC#1
keywords	*Riverine particle dynamics Flash-floods*	*Northern current pl...*	*Sensor intercomparis...*	*Benthic processes*	*Shallow station*	*Primary productivity*	*Phytoplankton dynamics*	*plankton and carbo... Multi-Sensor-Camer...*
KSC	2	1						
Remote connect.								
Type of device	Gliders	mc						
access	Real-time	del						
Duration (w)	4	24						
SST								
Air Temperature								
Water temperature profile	A	A						
Wind		A						
Waves								
Currents	A	A						
Turbulence								
Tide Gauge/Sea level								
Irradiance								
Ocean sound								

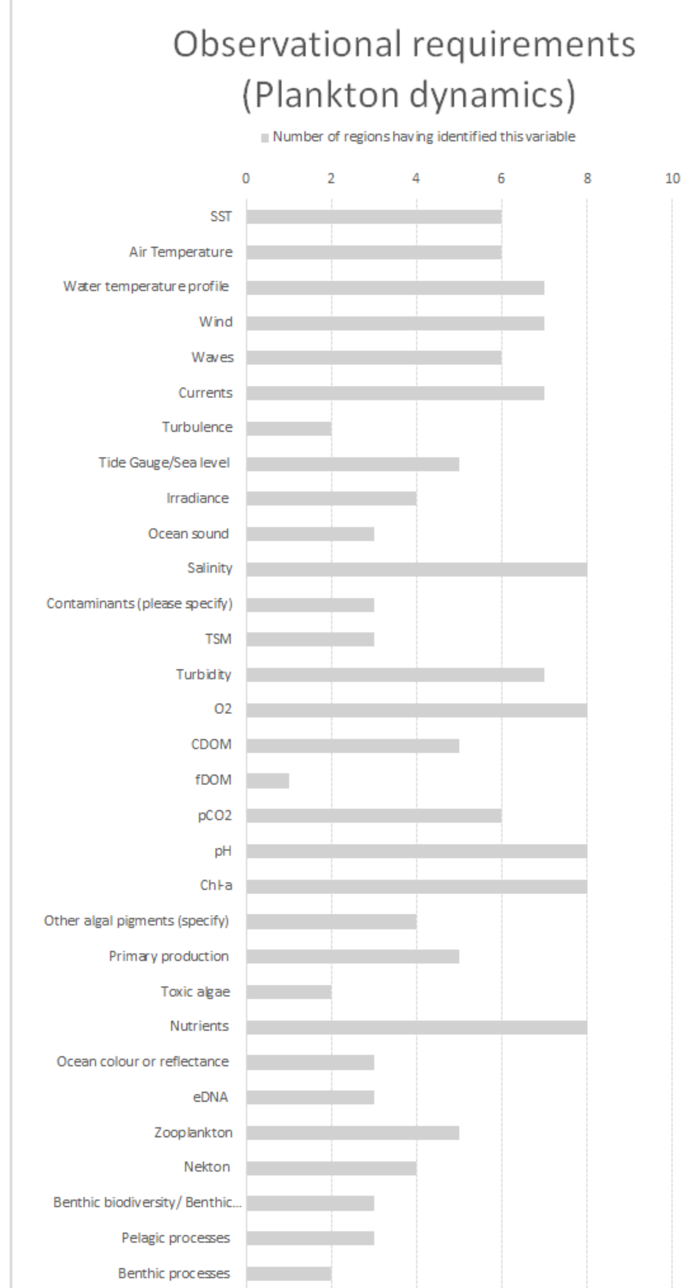
IRS

REGION	IRS_NORTHERN ADRIATIC SEA	IRS_IBERIAN ATLANTIC MARGIN			*IRS_BAY OF BIS...*		
ID	SC#1	SC#1	SC#2	SC#3	SC#1		
keywords	*intercalibration between stations*	*biological connectivity, invasive species, open ocean to inner shelf*	*Submarine canyons, bio-phys interactions*	*NAO, fish stocks*	*atmospheric ext... events, plankton dynamics*	*... detection, harmful algal blooms*	
KSC	1	1	1	1,3			
Remote connect.	yes	no	no	no	yes		
Type of device	Surface buoy	Standalone Sensor Package to operated at subsurface, installed in Multiparametric (MP) Buoy			Stand alone benthic instrumented station coupled with existing Surface Buoys.		
access	operational	no	no	no	Operational / on demand		
Duration (w)		24 - 48	24 - 48	24 - 48	48		
SST		A	A	A	A		
Air Temperature		A	A	A	A		
Water temperature profile		A	A	A	N		
Wind		A	A	A	A		
Waves		A	A	A	A		
Currents		A	A	A	N		
Turbulence							
Tide Gauge/Sea level					A		
Irradiance							
Ocean sound		A	A	A			
Salinity	N	A	A	A	A		
Contaminants (please specify)							
TSM							
Turbidity	N	A	A	A	A		
O2	N	A	A	A	A		
CDOM	N						

QUESTIONNAIRE (NOV 2020) - Outcomes



Number of Scientific actions requiring each variable



Number of regions requiring each variable

The JERICO-S3/DS pr
France.

From variable packages to sensor specifications

1. Coastal pelagic variables

- Physics
  - T, S, Current/turbulence, sediment transport, Light, Sound, TSS, Wind
- Biogeochemistry
  - O_2, DO, BOD, COD
  - Carbon biogeochemistry (pCO_2, pH, DOC, TOC)
  - Nitrogen BGC (NO_3, NO_2, NH_4)
  - Other (Phosphate, Silicate, CDOM)
- Biology
  - Phytoplankton pigments (Chl-a, PhycoCyanin, PhycoErythrin, Fucoxanthin)
  - Phytoplankton cell/colony size (pico, nano, micro)
  - Zooplankton (Size)
  - Nekton
  - Primary production
  - Genomics (e-DNA)
- Contaminants
  - Algae toxins
  - Trace metals
  - Plastics (microplastics)
  - Pharmaceuticals, etc...

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From variable packages to sensor specifications

2. A common focus: Plankton Dynamics under Climate Change stress

Co-design

between

WP1, WP3, WP4, WP5 and WP7

Technological constraints - Measurable variables in-situ

- Physics
  - T, S, Current, Light, Turbidity, Wind
- Biogeochemistry
  - O_2,
  - Carbon biogeochemistry (pCO_2, pH)
  - Nitrogen BGC (NO_3)
  - Other (CDOM)
- Biology
  - Phytoplankton pigments (Chl-a, PC, PE, Fuco)
  - Phytoplankton cell/colony size (pico, nano, micro)
  - Zooplankton (Size)
  - Primary production
- Contaminants
  - Algae toxins

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From variable packages to sensor specifications

3. Implementation on the Coastal EGIM

Co-design

between

WP7, WP1 and WP5

Technological constraints - C-EGIM 12 ports

Physics

1. CTD
2. ADCP
3. Turbidity

Light/PAR at sea surface not part of the EGIM, but data can be sent synchronised

Biogeochemistry

4. Optode-O_2
5. pCO_2 sensor
6. pH sensor
7. Nitrate sensor (NO_3)
8. Fluorometer (CDOM)

Biology

9. Chl-a
10. Spectrofluorometer (Chl-a, PC, PE, Fuco)
11. Flow cytometer (pico, nano, micro phytoplankton)
12. UVP (Zooplankton size)
13. FRRF (Primary production)

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From variable packages to sensor specifications

4. Implementation and demonstration of JERICO-CPD (Coastal Plankton dynamics sensor package)

To be Co-designed

between WP7, WP3, WP4 and the entire consortium

Make your sensor available to JERICO-S3 for the period October 2022 - June 2023

Sensor availability

Physics

1. CTD
2. ADCP
3. Turbidity

Light/PAR at sea surface not part of the EGIM, but data can be sent synchronised

Biogeochemistry

4. Optode-O_2
5. pCO_2 sensor
6. pH sensor
7. Nitrate sensor (NO_3)
8. Fluorometer (CDOM)

Biology

9. Chl-a
10. Spectrofluorometer (Chl-a, PC, PE, Fuco)
11. Flow cytometer (pico, nano, micro phytoplankton)
12. UVP (Zooplankton size)
13. FRRF (Primary production)

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Technological demonstration WP7 - E.DELORY

Select demonstration site (ranking needed) and scientists commitments on lending specific sensors (7.3)

Site commitment (several sites are highly interested in demo + plankton dynamics + bring sensors) – 7.6 + WP3-4

Procurement of COSTOF2 (7.2) - Delivery of system in June 2021

Drivers development, data Web Service standard (7.2) - once sensors are confirmed

Processing board add-on for AI integration (7.2 + 7.4) - possible focus on plankton cytometry/imaging, TBC, processing on external CPU

Integration of WASP on cEGIM discarded, Ferrybox as alternative

Data / Web Services available through Jerico CORE e-infrastructure, EPOS MoU signed (7.5), in progress. Aquaculture pilot under discussion (EATIP + Norway cluster)

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PSS REGIONS	NW-MED	PSS-GOF/ Baltic Sea	CRETAN Sea	ENGLISH CHANNEL	NORTH SEA PSS
TYPE of DEVICE	Glider / mooring	ICOS SOOP line / benthic lander	surface buoy	Stand-alone benthic lander and surface buoys	Profiling lander system
Access	Delayed	Operational / on demand	Operational	Operational / on demand	All
Atmospheric Variables			Yes	Yes	Yes- external
Sea surface variables (SST)			Yes		
Water col. Variables profiler	Yes	Yes			Yes
Biological variables					
Chemical variables					
INTEREST	5	4- 5	3	5	3
AVAILABLE SENSORS	UVP6 and GUARD cameras. Integrated	*T, S (SBE 45), O2 optode, pCO2, pCH4, pH, Chla and C-DOM. Co-located or Integrated*	None	COSTOF 2 system, Multispectral fluorometer benchtop (2), Multispectral fluorometer profiler (2), In situ imaging profiler (1), Automated Flow Cytometer – submersible (2), Automated Nutrient analyser (2), Fluorometer (2) and spectrophotometer (2)	None
				(1) co-located	
				(2) connected to cEGIM	

IRS REGIONS	NORWEGIAN SEA	ADRIATIC SEA	IBERIAN MARGIN	BAY OF BISCAY	NORTH SEA IRS
TYPE of DEVICE		surface buoy	surface buoy and mooring(water column)	Benthic station and surface buoy	
Access		Operational	Operational/ standalone	Operational	
Atmospheric Variables			Yes	Yes	
Sea surface variables (SST)			Yes	Yes	
Water col. Variables profiler			Yes	surface and bottom	
Biological variables			Yes		
Chemical variables			Yes	Yes	
INTEREST		3	5	nothing included	
AVAILABLE SENSORS		*None*	YSI-EXO PROBE EQUIPPED WITH DEPTH, TEMPERATURE, CONDUCTIVITY, O2 (OPTICAL), pH, FLUOROMETER, NEPHELOMETER, fDOM SENSORS AND WITH ANTI-FOULING SYSTEMS TO BE (1) CO-LOCATED	COSTOF2 system (Iroise, Molit2021), Automated Flow Cytometer – submersible (1)	

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Availability, connectivity, logistics, next steps

Availability for Jerico-S3 : reserve sensors for test and demonstration time periods

Assess and implement connectivity: sensor owner(s) + T7.2 team, number of ports reserved (AI, antifouling)

--

Financial support for deployment and logistics at PLOCAN test site and demonstration site, costs covered up to 70k€

Next steps: 1) sensor+site selection 2)AI algorithm selection 3) start developments and integration 4) integration of e-infrastructure work with EPOS software (access pending)

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ARW SESSION 1 - PARTs 1,2,3

Science Strategy of JERICO-RI and regional approach

KEYNOTE TALK 3 : Thematic centers - First ideas on the concept, possible added-value and operation

(10’ + 5’ questions)

I. Puillat (WP9)

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A Distributed RI: Definition https://www.esfri.eu/glossary:

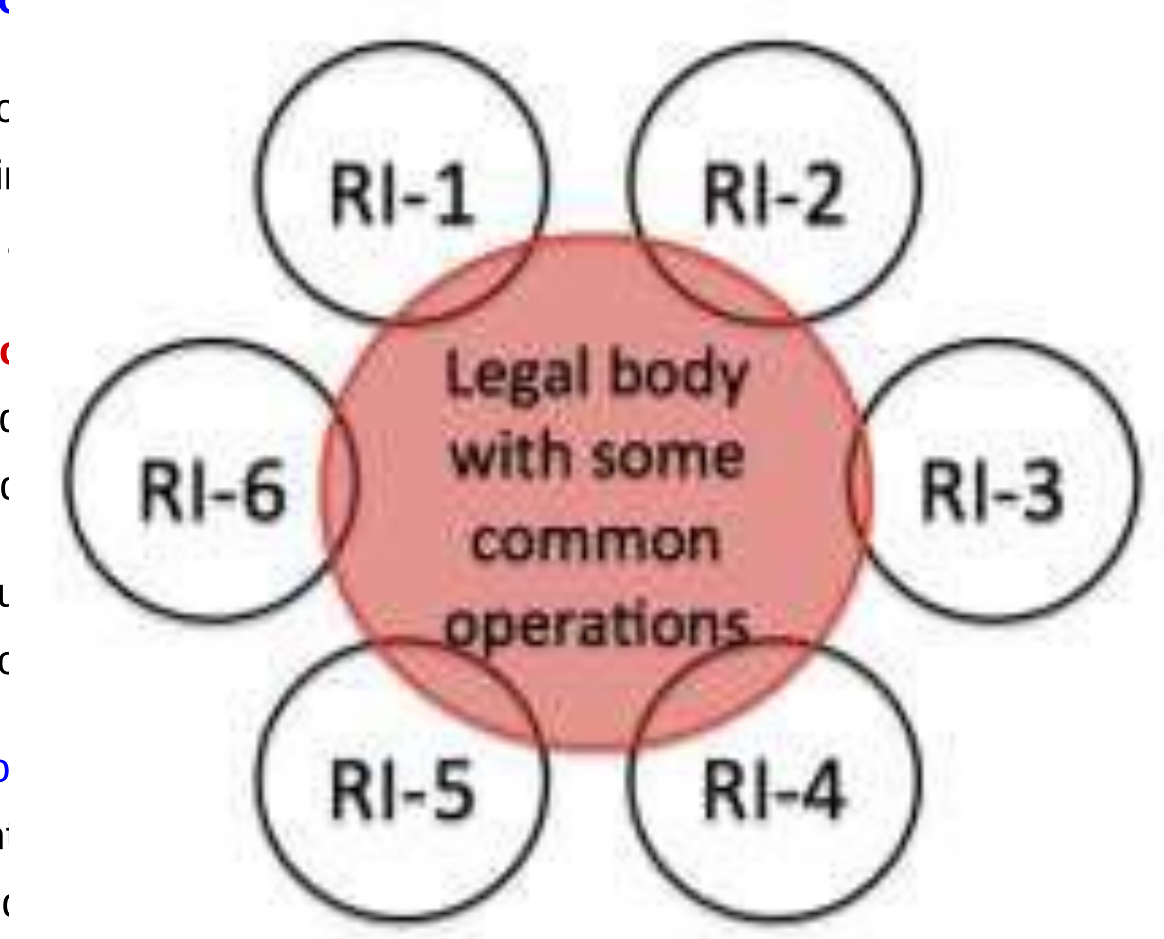
A distributed RI co… …and needs to:

- have a unique spec… …esponsibilities
and reporting lines, i… …ory bodies; -
have legally binding … …entral Hub;

- have a **common a**… …**users** with a
support structure de… …a user
programme designe…

- identify and agree … …addressing
both excellence of s…

- have a human reso… …the effective
operation of the Cen… …s hiring, equal
opportunities, secon…



- define a joint investment strategy aimed at strengthening the RI **through the Nodes and common/shared facilities**.

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The concept: few examples

ACTRIS core components are the National facilities, constituting in observatory and exploratory platforms, and the Central Facilities, fundamental for the provision of harmonized high-quality data.

On the European level, ACTRIS operations are performed by **ACTRIS Central Facilities (CFs)**

National Facilities

- Observational Platforms
- Exploratory Platforms

Central Facilities

- Data Centre
- Head Office
- Centre for Aerosol In Situ (CAIS)
- Centre for Aerosol Remote Sensing (CARS)
- Centre for Cloud In Situ (CIS)
- Centre for Cloud Remote Sensing (CCRES)
- Centre for Trace Gases In Situ (CiGas)
- Centre for Trace Gases Remote Sensing (CREGARS)

6 Topical centers

The ACTRIS CFs : provide services to the users as well as operation support to the National Facilities (NFs) to increase their performance.

Each CF may have several operational Units that can be situated in the same or different locations and are operated by research performing organizations (RPOs) or by ACTRIS ERIC.

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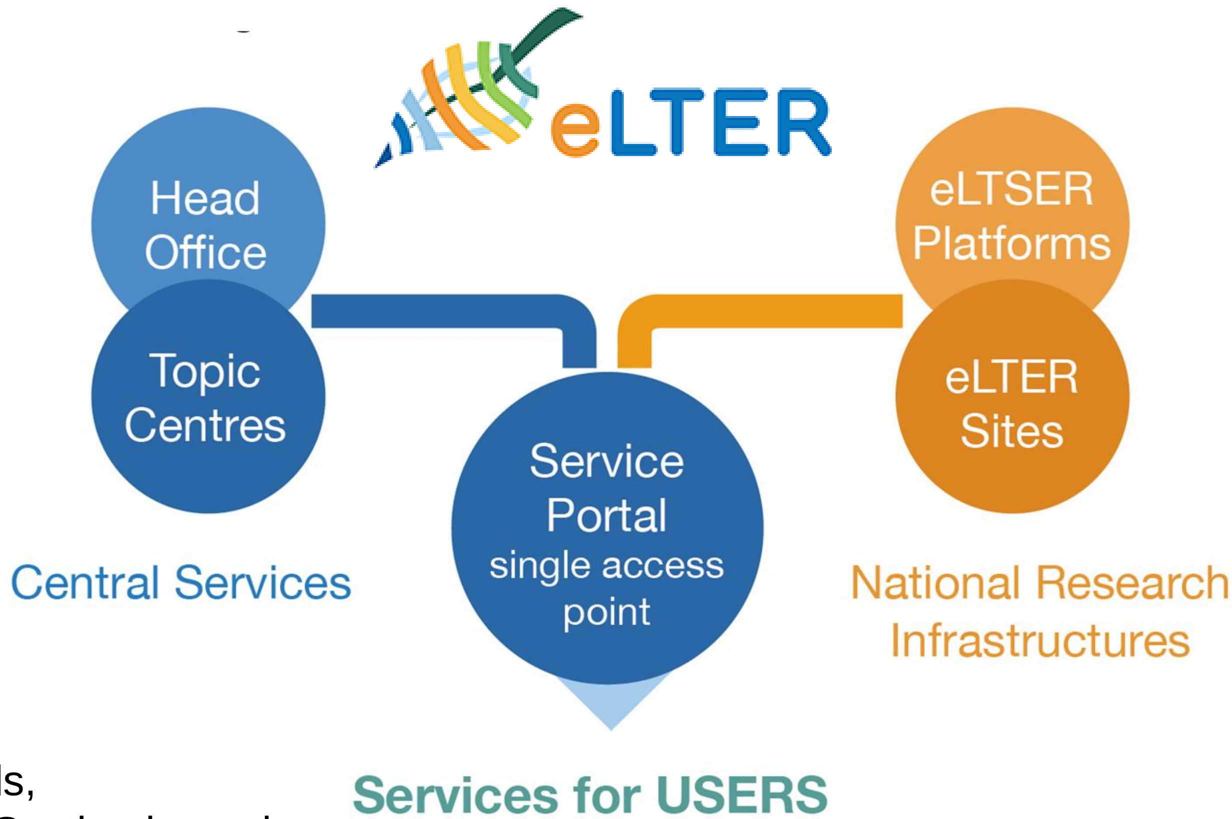
The concept: few examples



Topic Centres: covering

- Quality Assurance for Data,
- Modelling and Analysis Tools,
- Design Interoperability and Synthesis, and
- Technological Innovation and Development

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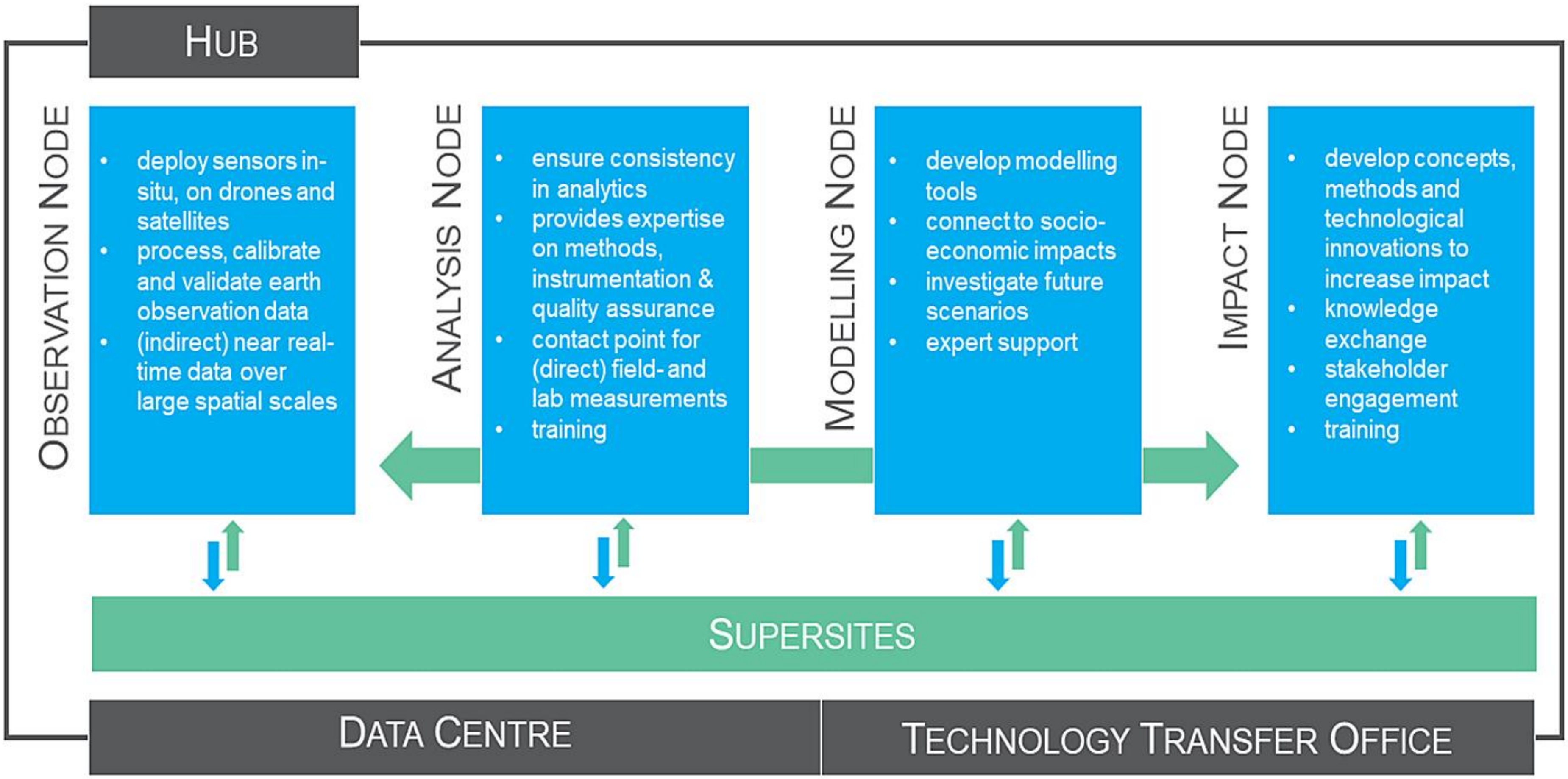
The concept: few examples

International Centre for Advanced Studies on River-Sea Systems



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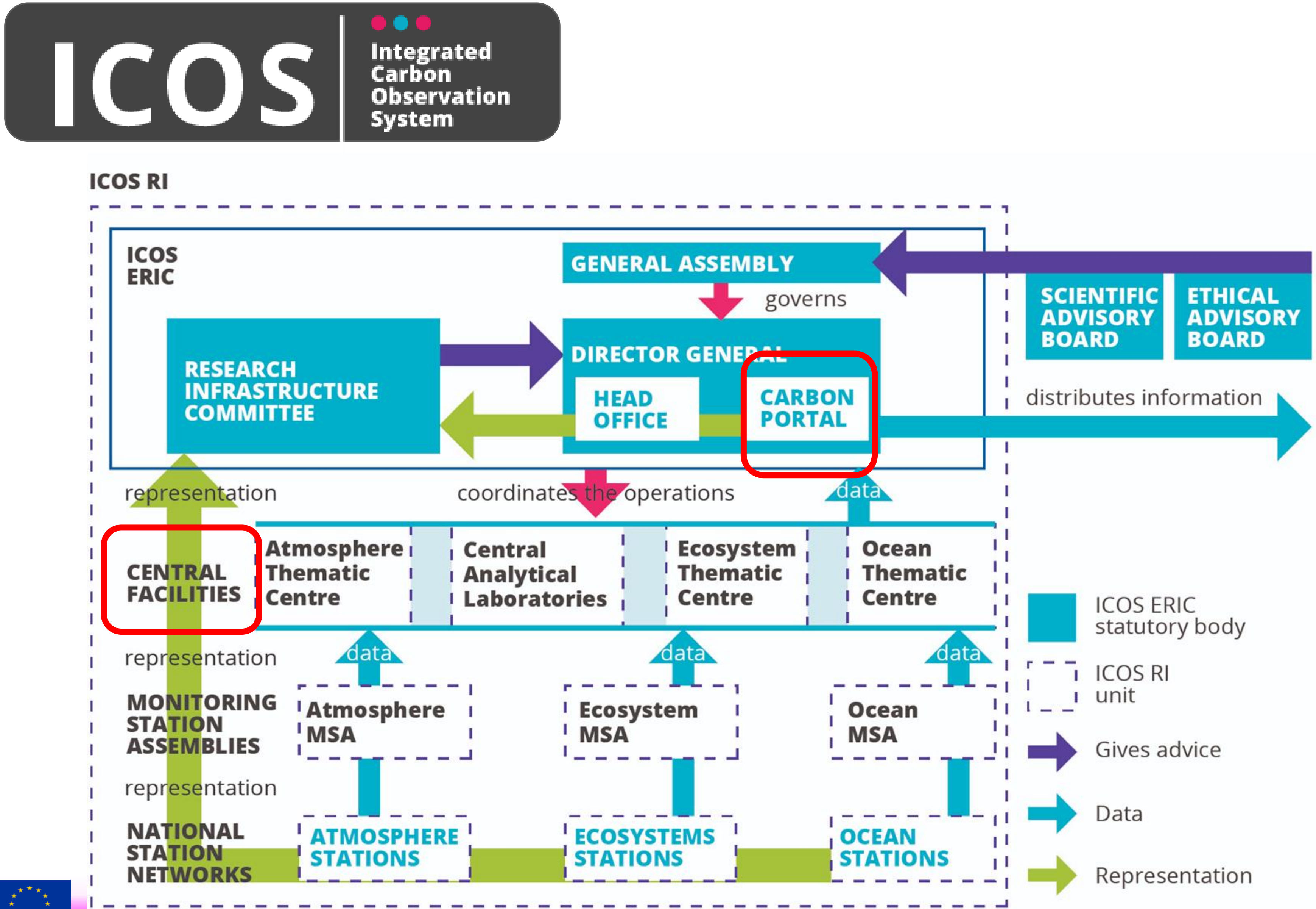
The concept: few examples



The concept: The case for JERICO-RI

Thematic and tool needs: Science and Technicals needs

Tools:

- Data and added value products
- Libraries: protocols, codes
- knowledge: training, webinars, bib ref. and articles …
- ...

In development: eJERICO prototype: Data to Product Thematic services (D2PTS)

- HF radar tailored products
- Estimation of Sea water masses types and transport (gliders x BGC obs)
- BGC state of coastal areas
- JERICO ecoTaxa

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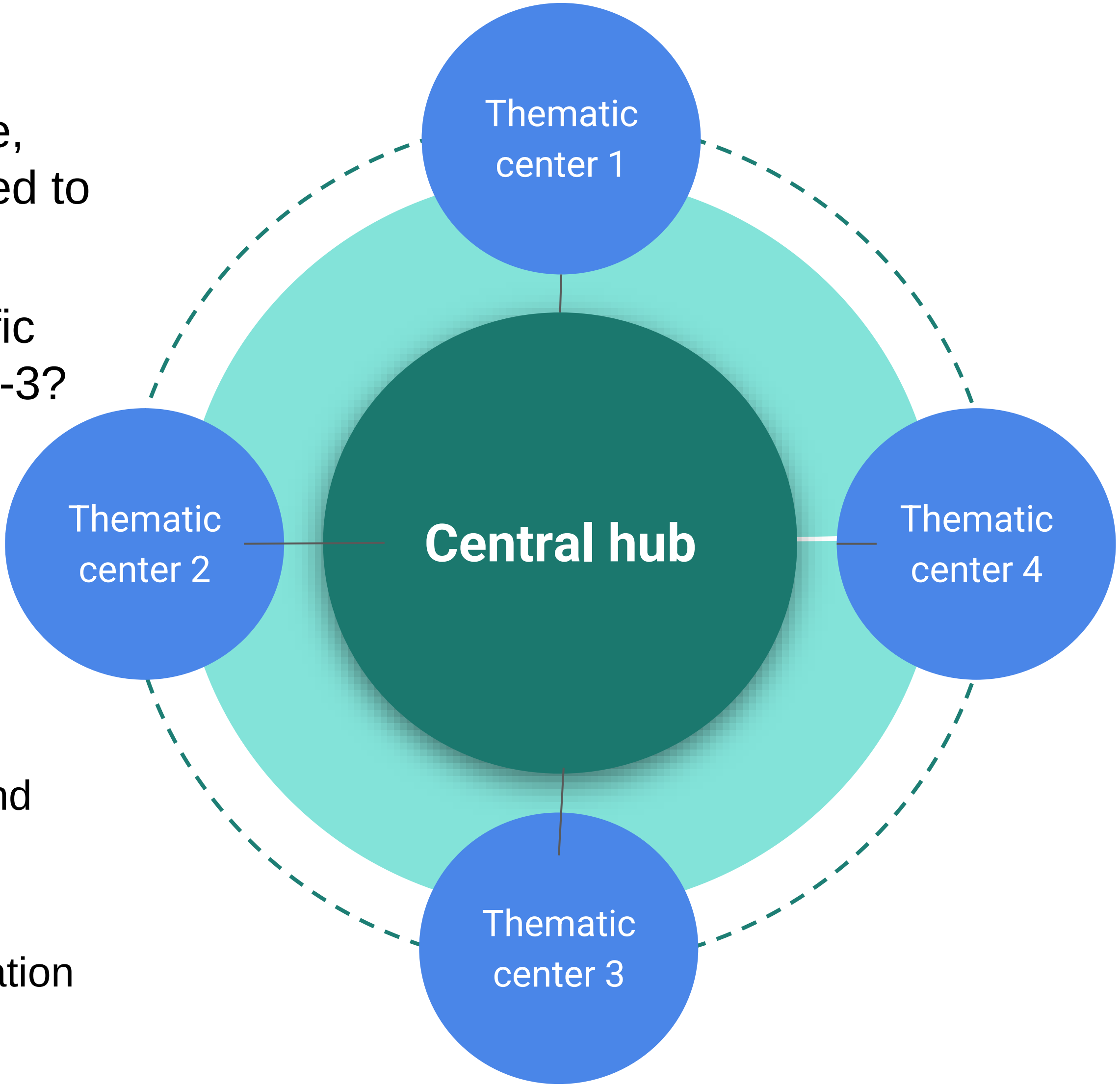
The concept: The case for JERICO-RI

- Thematic centers would consolidate products, expertise, tools as specific services related to a thematic/topic
- => Thematics related to Specific Scientific Questions in KSCs 1-3?



Examples:

- **Th#1: Transport processes** and applications to pollutants and biological quantities
- **Th#2: Extreme events** observation and detection
- **Th#3: Algal bloom and Eutrophication**

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ARW SESSION 1 - PARTs 1,2,3

Science Strategy of JERICO-RI and regional approach

PLENARY COLLABORATIVE SESSIONS

Let's work together (mentimeter) in the **selection of Specific Scientific Questions used for further integrative actions : the development of thematic centers and variables packages**.

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Go to **www.menti.com** and use the code **2873 0655**

Mentimeter

Science Strategy of JERICO-RI and regional approach

From science strategy towards operation, variables, sensors and joint operation of future

JERICO-Week#2_19-23 April 2021

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Go to **menti.com**

KSC # - Specific Scientific Question	MENTI CODE	QR
KSC1 - Selected Specific Question: Ecosystem BGC processes and interactions	**6563 087**	
KSC2 - Selected Specific Question: Harmful algae blooms	**9934 3936**	
KSC3 - Selected Specific Question: Resolving climate change impacts	**5132 7614**	

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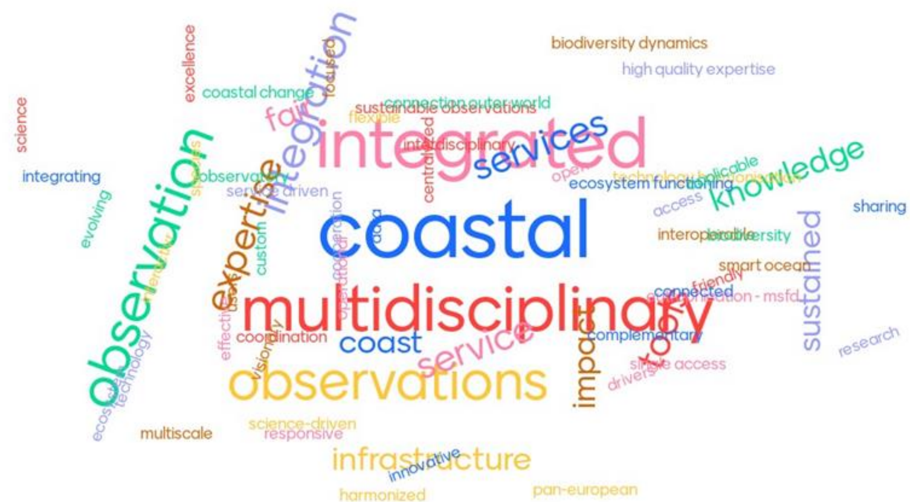
Mentimeter

And the last question, in your opinion what three words should be part of the definition of a JERICO Thematic Center?



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ARW SESSION 1 - PARTs 1,2,3

Science Strategy of JERICO-RI and regional approach

Tuesday 20 April 2021 / 13:30 - 14:10

Debrief session

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Debriefing ARW SESSION 1

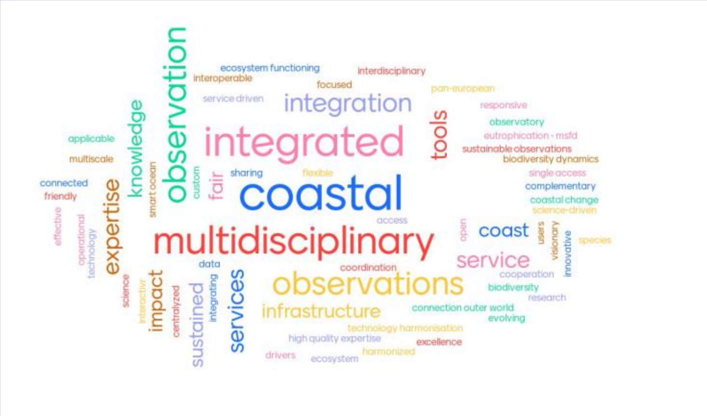
Science Strategy of JERICO-RI and regional approach

KEYNOTE TALK 1 : General architecture of the JERICO science strategy and its regional dimensions	**A. Grémare**
KEYNOTE TALK 2 : Strategy for technological innovation and the approach towards thematic variable	**A. Rubio, D. Durand, E. Delory (WP1,5,7)**
KEYNOTE TALK 3 : Thematic centers - first ideas on the concept, possible added-value and operation 5-10' + 5-10' question/discussion => Total(15')	**I. Puillat & A. Griffa**
15:15 COFFEE BREAK	

15:45 -17:30 *PLENARY COLLABORATIVE SESSIONS*

Work together in the **selection of Specific Scientific Questions** for the development of thematic centers and variables packages. (20'+20+20')

Mentimeter



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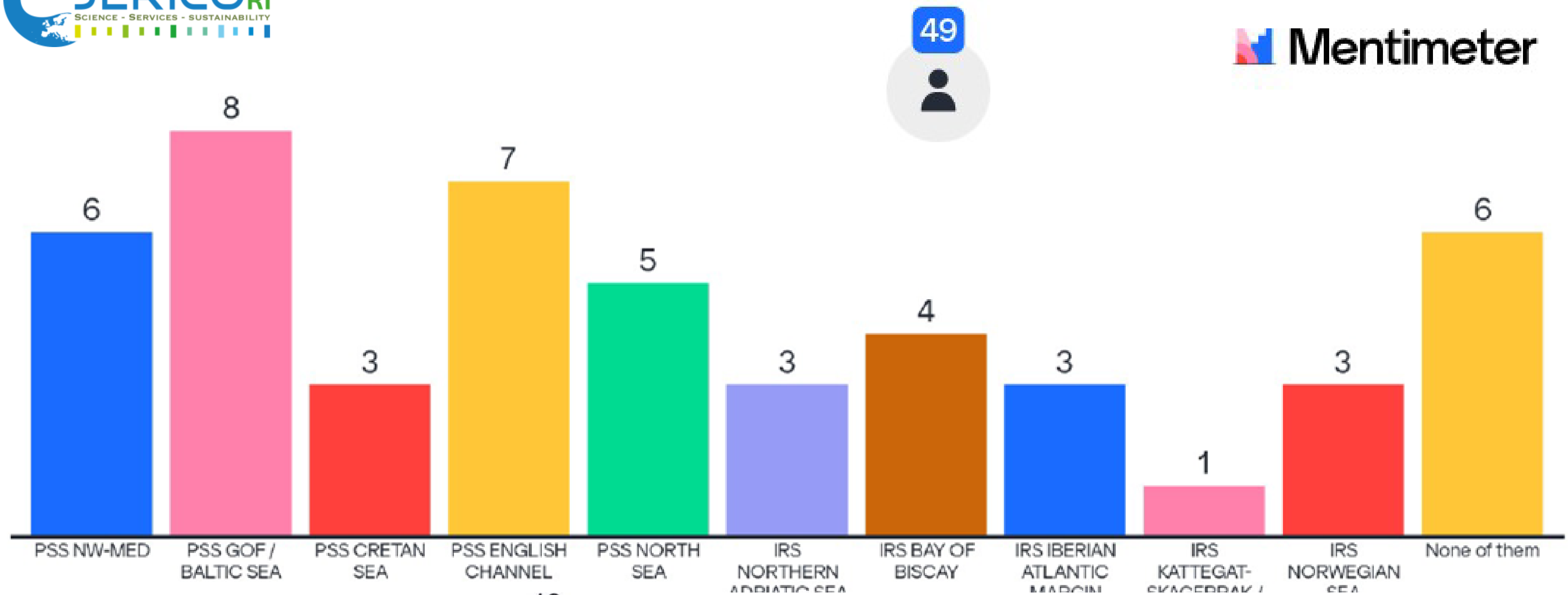

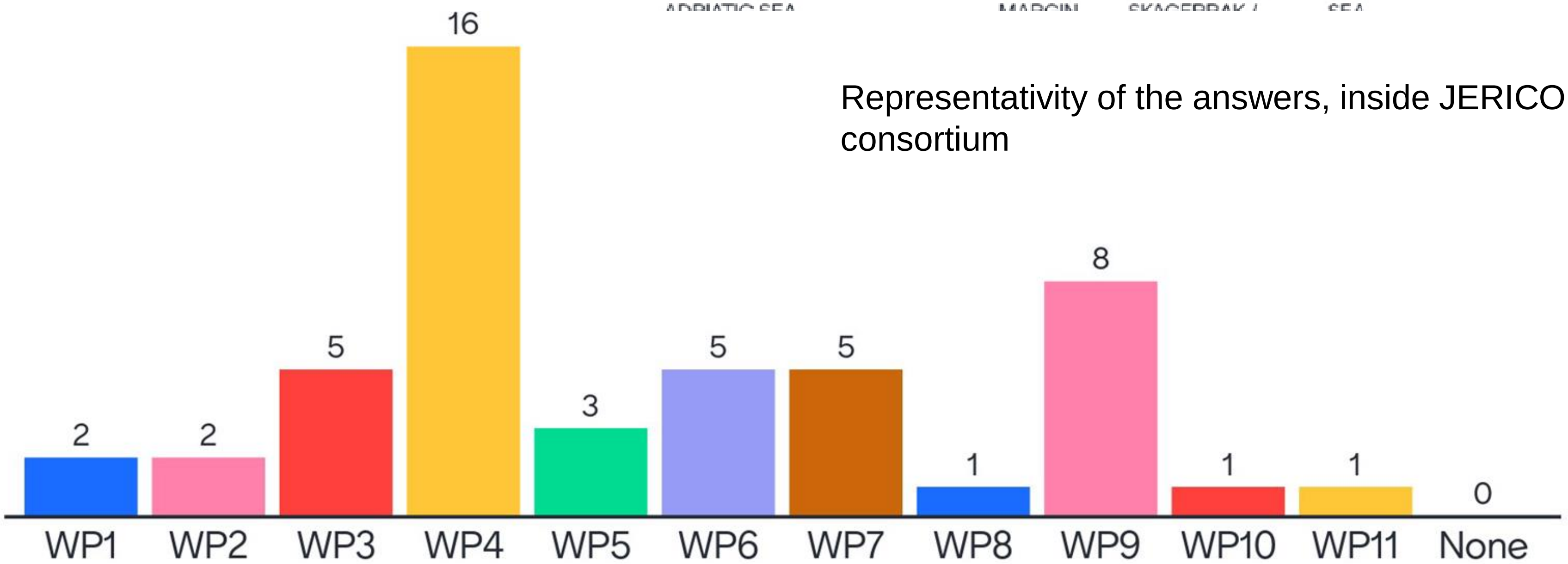

Representativity of the answers, inside JERICO consortium

France.

Debriefing Round table/Key note #1

3-level Scientific approach as in D1.1, from D3.1 and D4.1 ...

Keys Scientific Challenges	Specific Scientific Challenges	Research axes
Assessing and predicting changes under the combined influence of global and local drivers	Land Sea Ocean continuum. Impacts of land-derived discharges and exchanges with open ocean	Nutrients, particles and organic matter, inorganic carbon, litter and contaminants
	Sea-atmosphere interface. Quantification of inputs	Particles, nutrients, contaminants
	Connectivity and transport. Pathways of water masses and materials	Water masses, nutrients, contaminants, particles, organisms
	Biodiversity trends	Phytoplankton, zooplankton, benthos
	Ecosystem biogeochemical processes and interactions	Pelagic, benthic, pelagic/benthic coupling
	Carbon budget and carbonate system	Carbon fluxes and budget, carbonate system trends, effects of acidification
Assessing the impacts of extreme events	Impacts of rare and extreme events	Floods, storms/large waves, heat waves, landslides/sudden erosion, harmful algae blooms, pollution due to accidents
Unravelling the impacts of natural and anthropogenic changes	Resolving climate change impacts	Temperature, salinity, currents, sea level, waves, biological production, species distribution ranges, nutrients
	Resolving anthropogenic impacts	Eutrophication, habitat and biodiversity loss, contamination, coastal engineering, use of marine space, use of marine nonliving resources, use/cultivation of living resources, invasive species, maritime traffic, underwater noise
	Disentangling impacts	Meta analysis , coupled modelling

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Debriefing Round table/Key note #1

- Delimitation/Interactions between KSC #1 and KSC #3?
- Specific Scientific Challenges and Research axes to be added?
- Which level is to be used for further integrative actions?
  (1) Recommendations for technological developments (Keynote Talk #2)
  (2) Set up of future Thematic Centers (Keynote Talk #3)

Maybe assessment/observation should be limited to KSC#1 and tools/approaches for unraveling natural v. anthropogenic variability is the sole focus of KSC#3?

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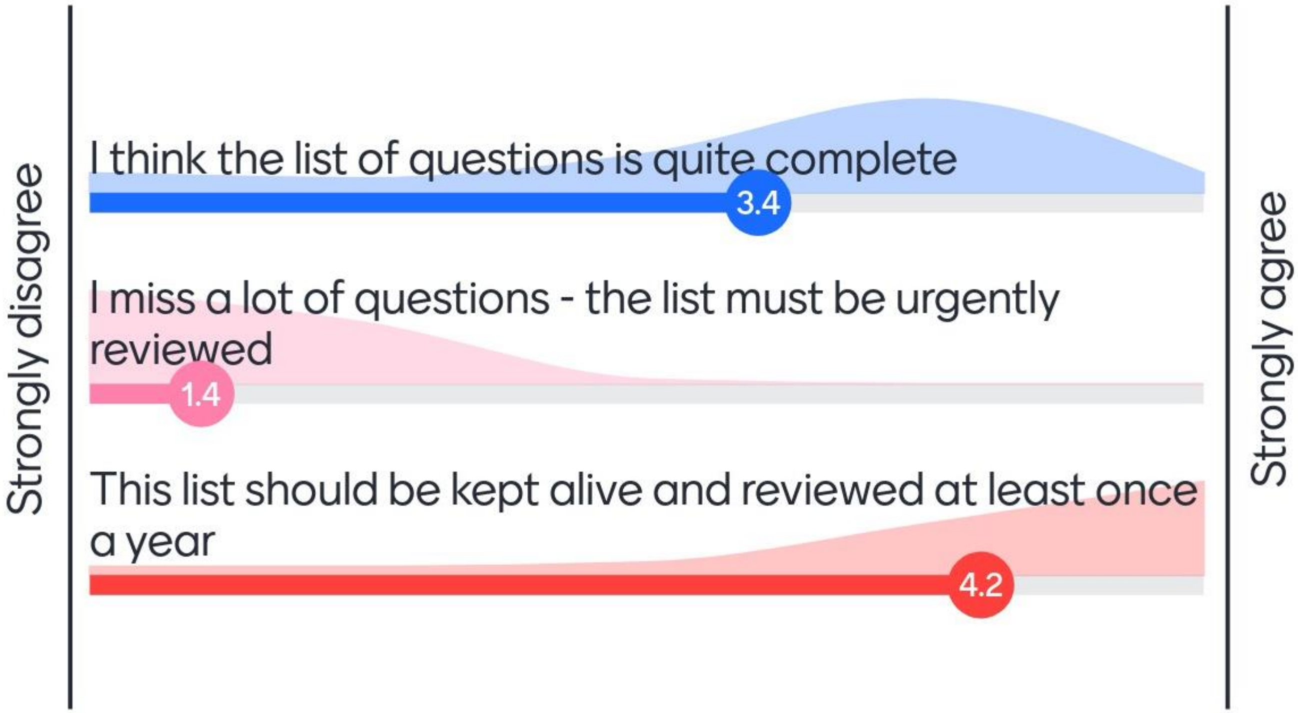
Debriefing Round table/Key note #1

Specific Scientific Challenges and Research axes to be added?



Collected a number of suggestions- The most of them quite specific, mostly at the level of Research Axes - to be analysed further

As suggested by Antoine a good compromise could be fixing the KSC# and the SSC and the list of "Research Axes" alive ??

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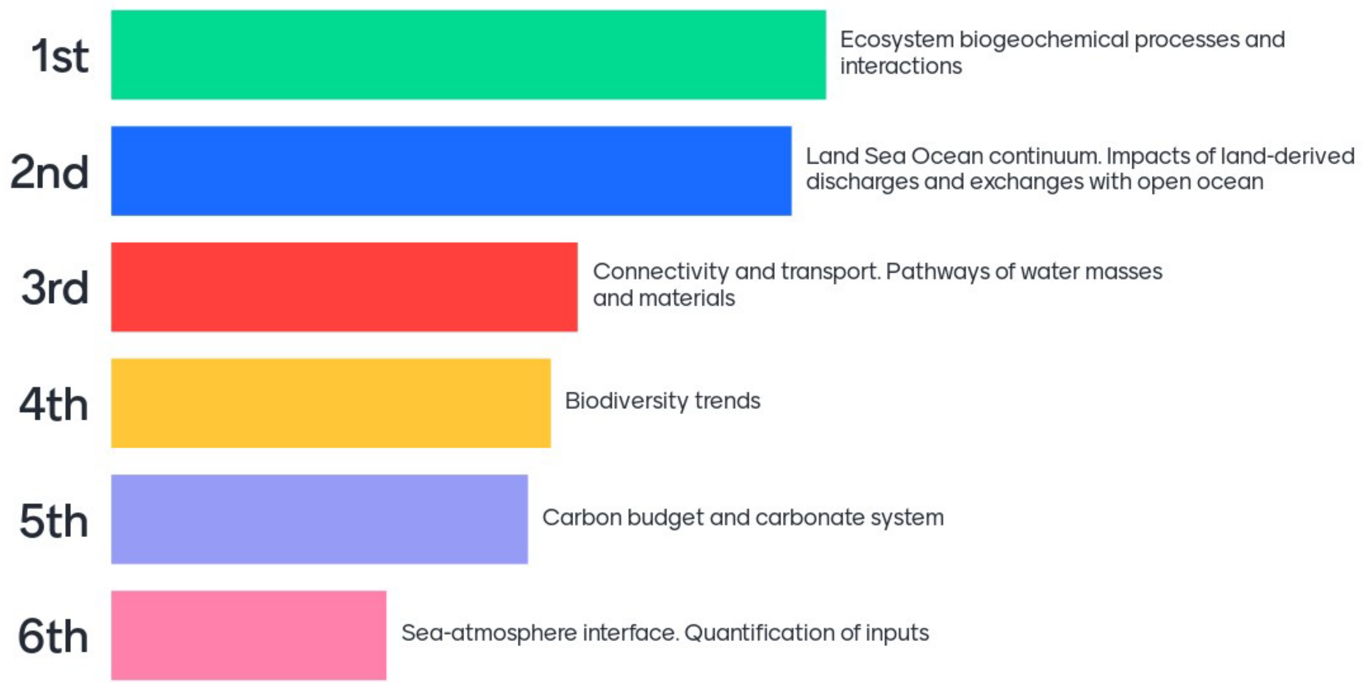
Debriefing Round table/Key note #1

Which Specific Scientific Challenges/Questions/RA would benefit the most from an integrated approach?

KSC#1



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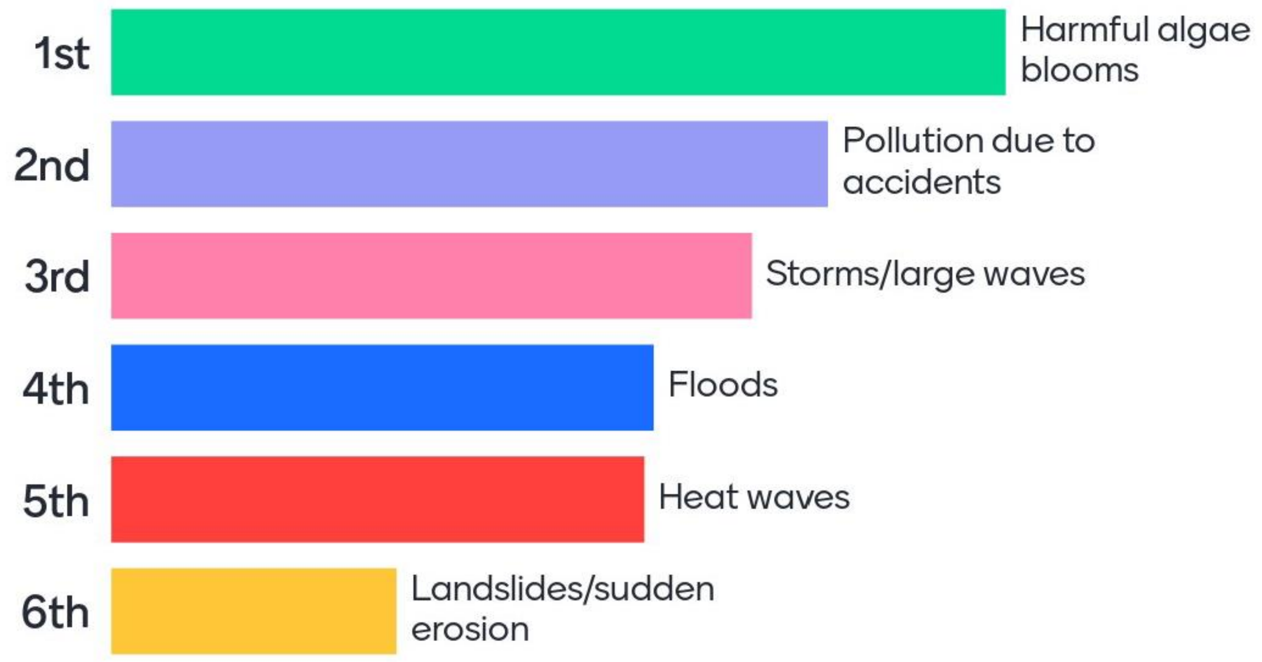
Debriefing Round table/Key note #1

Which Specific Scientific Challenges/Questions/RA would benefit the most from an integrated approach?

KSC#2



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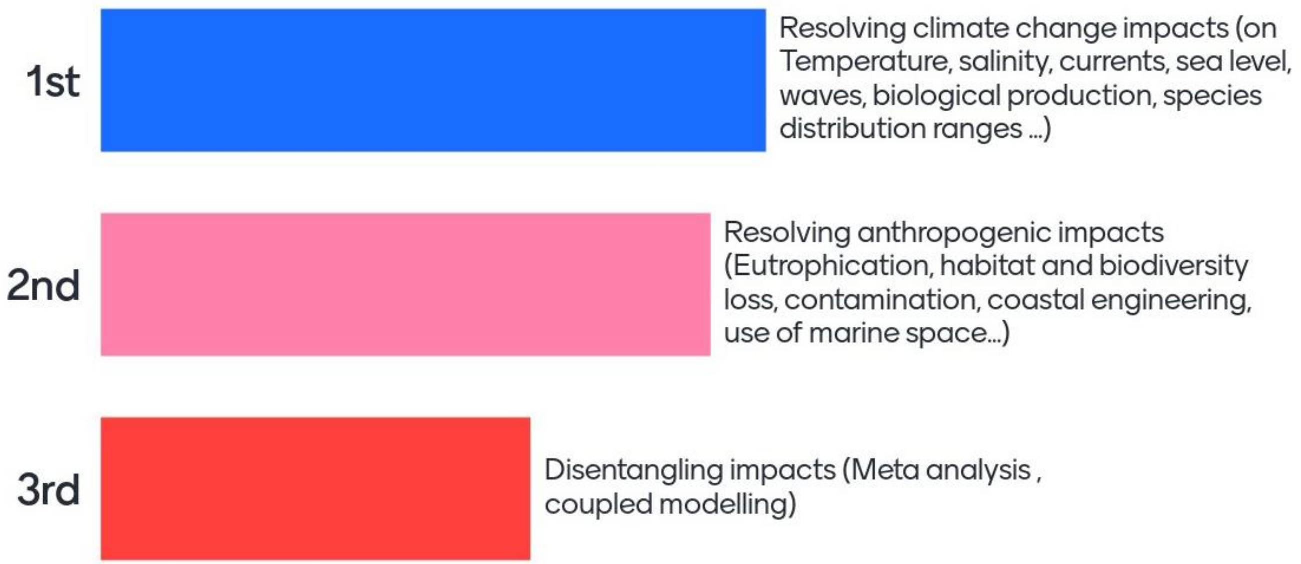
Debriefing Round table/Key note #1

Which Specific Scientific Challenges/Questions/RA would benefit the most from an integrated approach?

KSC#3



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Debriefing Round table/Key note #2

Process towards the definition of VARIABLE PACKAGES

From variable packages to sensor specifications

Technological demonstration in WP7

PLANKTON DYNAMICS

slack

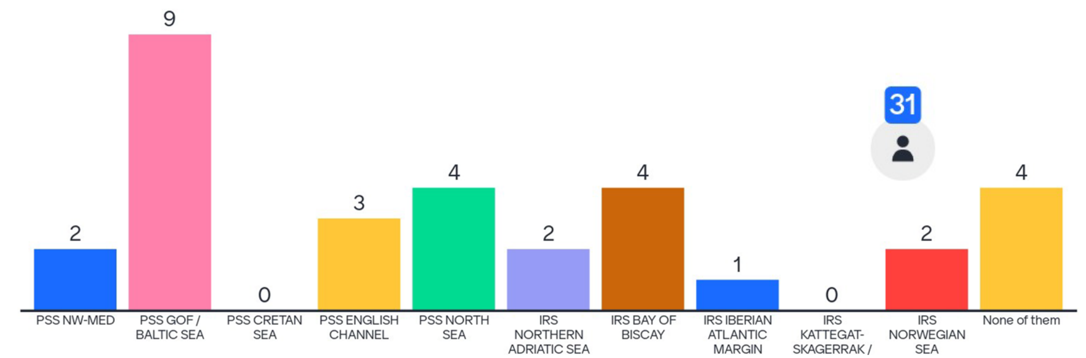
J. Tintoré : Strong satellite and/or modelling and data interoperability components needed for this thematic

Mentimeter

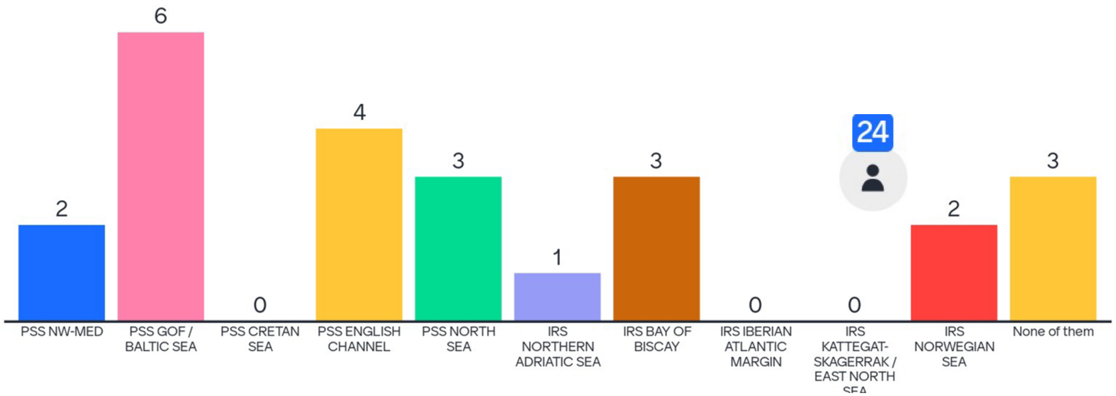
Initial joint brainstorm on the requirements (in terms of variables, research and tools/services) on the three Scientific questions identified

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

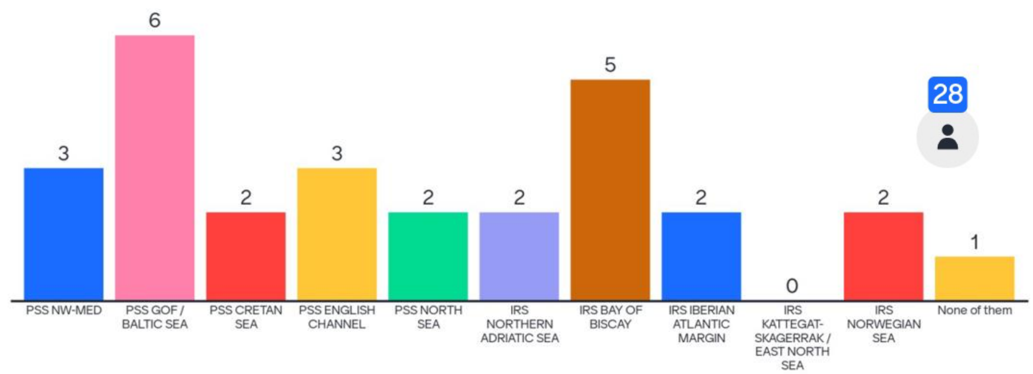
KSC#1 -On the selected Specific Science Question: ecosystem BGC processes and interactions



KSC#2 -On the selected Specific Science Question: Harmful algae blooms



KSC#3 -On the selected Specific Science Question: Resolving Climate Change impacts



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Debriefing Round table/Key note #2

KSC#1 -On the selected Specific Science Question: ecosystem BGC processes and interactions

What are the most pressing needs in terms of new (or differently sampled) observations (variables, accuracy, resolution, coverage)?

[COVERAGE /RESOLUTION/SAMPLING] Consistent measurements **across coastal regions**; Coast to coast coverage; Temperature, salinity, currents in the **water column** (instead of only surface); expansion of subsurface measurements

Improve the spatial and temporal resolution of samplings and observations; An increase in resolution will increase the accuracy - relevant for the assessment; Finding solutions for the correct spatial and temporal resolution; Resolution and coverage; Simultaneous measurement campaigns

Coherence between locations and multidisciplinarity

Consistent **Sustained Observations** is important

Interoperability of data and information to support modeling and products

Easier to deploy and to maintain systems; Needs in getting more accurate and cost-effective biogeochemical and biological sensors in order to widening their use in most automated moving and fixed platforms

Providing **error bars for measurements; understanding and documenting the methods used** for observations; Data management (including storage, QA/QC, harmonization)

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Debriefing Round table/Key note #2

KSC#1 -On the selected Specific Science Question: ecosystem BGC processes and interactions

What are the most pressing needs in terms of new (or differently sampled) observations (variables, accuracy, resolution, coverage)?

[VARIABLES] CTD and other basic parameters to validate 3D ecological models

Reliable easy-to-deploy pH sensors

[CARBON] **Coverage of the whole aquatic carbonate system**; For stationary platforms, carbon system parameters would be essential (incl pH). The bottleneck is the QC over time of deployment; Coupling of Carbon/carbonate-pH-nutrients-productivity and phytoplankton diversity observations both in fixed stations and in ships of opportunity; particulate carbon; Good spatiotemporal coverage of pCO2

[NUTRIENTS] **Continuous records of nutrient** data; high resolution QCeed nutrient data would be essential (i.e. optical) to be deployed on SOOPS and floats; High resolution **food web components and nutrients**; **Macronutrients**: 0.1-0.01 uM precision, LOD similar to autoanalyzer, weekly resolution, ~<10 km resolution; In-situ measurements of nutrients.

Light availability

Benthic compartments and processes

Biogeochemical processes different from primary pelagic production; ecosystem rates and processes

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Debriefing Round table/Key note #2

KSC#1 -On the selected Specific Science Question: ecosystem BGC processes and interactions

What are the most pressing needs in terms of knowledge and research actions?

Impacts on end users in terms of trust worthiness of information for decision making

Phytoplankton response to eutrophication, climate change and wind farms; Understanding seasonal variability and anthropogenic/climate change impacts;What is the resilience of the ecosystem under major changes → KSC#3?

Ecological function of biodiversity

[INTEGRATION, SCALES] vertical transport (to/from atmosphere, sedimentation to seabed, release from the sediments); **Subsurface processes; scale interactions** : how global changes will impact at local scales and vice versa; short term, event type, variability; Developping integrated (and truly holistic) actions; Integration of several kind of data; integrated evaluation of carbonate system dynamics and effects of the shifts

Dynamics in biogeochemical variables in the stratified seas.

Linking biodiversity and ecosystem structure to the provision of services

BGC processes and their parametrization in relatively **shallow but stratified environments**

Uncertainty and provenance

Quantification of remineralitsation

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Debriefing Round table/Key note #2

KSC#1 -On the selected Specific Science Question: ecosystem BGC processes and interactions

What are the most pressing needs in terms of services, products development (for internal/external use)?

[INTERNAL-EXTERNAL, DATA SERVICES, BEST PRACTICES] C**oherent integrated services** (first a clear, harmonized **access to the information**); For internally, we need to advance in data quality; Integration of different kind of data to answer diverse questions; one stop shop for data; Data related services, overview of best practices for different types of instruments/variables; Easier data access; observations/data that can be fed into biogeochemical models;Development of information system services on the near real-time information on nutrients, O2, pH and pCO2, phytoplankton functional and taxonomic diversity; Easier data access; observations/data that can be fed into biogeochemical models;

[INTERNAL-EXTERNAL, MORE DATA or DATA PRODUCTS]] **Sensor development**; Urgent **deployment of observation systems** over an area to respond to an extreme event like (eg: pollution); Easy to access and interpret **information products showing spatial patterns and trends**; Products on range of variability and dynamics of biogeochemical and biological variables of coastal systems; High throughput and near real time information on biodiversity and ecophysiology

[STAKEHOLDERS, USERS]**Synthesis for policy makers**; **Applications** for users/stakeholders; Integrated Data products to provide as a **service to end users**; providing information/knowledge to the **general public**

Interfacing to atmospheric observations

Material fluxes (nutrients, pollutants, carbon);Organic matter production, oxygen consumption, phosphorus release from sediments - all needed to improve the confidence of predictions

Site specificity

Integrated assessment of ecological status (link with the MSFD)

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Debriefing Round table/Key note #2

Way forward?

This is a first exercise, very limited and only representative of the ARW audience

The questionnaires, can be left open and shared out for further inputs

Inga Lips : would be very interesting to gather the same answers from the users
Annalisa Griffa : a similar survey will be proposed to stakeholders (≠ format)

Other actions?? ideas??

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Debriefing Round table/Key note #3

What three words should be part of the definition of a JERICO Thematic Center?

JERICO-Week#2_19-23 April 2021

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Debriefing Round table/Key note #3

About Expert Centres of JERICO-RI:

- **Diversity in possible expert centres**: **Thematic** ones, **Technical** ones, **User type** ones (follow the money), etc.
  - Examples
    - Algae thematic centre: added value products + any related information
    - HF radar Tech. centre: Library of BP procedures + computing codes, related training capacity, computing facilities, …
    - Partnership centre: e.g. renewable energy, Aquaculture, spatial planning…
    - High education: online courses, training workshop …
  - Key considerations
    - Permanent centres for pan EU long-term needs vs medium-term ones
    - Priorities level to assign to centres types/topic in term of development timeline.

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Debriefing Round table/Key note #3

About Expert Centres of JERICO-RI:

❖ **Strategy**

➢ Set up a Working group: WP leaders + ??? (to be discussed)

➢ Use of the Mentimeter results to get a first idea of the priorities => Revision strategy on short term (increase its representativeness from the consortium and in nations) => Revision on medium term (yearly?)

➢ Timeline? To discuss with JDS WP3 + Task 7.5 of JS3?

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ARW SESSION 2 - PART 1

Relations with other RIs and initiatives in regions for the future

Tuesday 20 April 2021 / 14:45 - 17:00 (with coffee break)

Scope of the session:

JERICO-RI addresses the challenges of the coastal domain. As such it operates at the interface between different parts of the Earth system and will have to address overlap with other geographically adjacent RIs from the marine, river and terrestrial communities. To establish an interface infrastructure, JERICO-RI has begun to forge connections with other relevant RIs in the land-ocean continuum (such as e-LTER, Danubius, EMBRC, ICOS, EMSO, EuroARGO, AQUACOSM). This session will serve to analyze and structure those dialogues with the goal to avoid overlap and to facilitate synergies between RIs, on a management level as well as on a regional level with the goal to establish regional "use cases".

It will also serve to present some (or all) the "successful stories" of collaborations that have been implemented in this first year within the PSS and IRS activities with the aim of inspiring people for future actions and further collaborations in other areas and/or with other RIs.

Expected outcomes:

- Setup of the JERICO RIs Board
- Collection of comments on the Term of Reference (ToR) for the establishment of a set of rules for cooperation with other RIs
- Identification of possible and/or existing sites for regional cooperation
- List of cooperation topics relevant on a regional level
- Stock taking of existing collaborations, their nature (where, what, how)
- Share successful approaches on how to organize collaboration

Targeted audience:

Representatives of other RIs (JERICO's RIs Board), Regions leads, WP 1, 2, 3, 4 leads
Colleagues involved in cooperation with other RIs

Type of organisation: Plenary session

- Introduction of concept of cooperation
- introduction of other RIs with opportunity to identify overlap as seen from other RIs
- Introduction of region leads and existing cooperation
- Discussion of proposed RIs Board and Tor

Main reference persons: *(Organisers/leaders)*

Holger Brix, Ghada El Serafy, Carolina Cantoni, George Petihakis (WP2), Ingrid Puillat, Laurent Delauney (JERICO coordination)

WHAT IS EXPECTED ASKED FROM REGIONS (PSS and IRS) ?

To have every PSS and IRS fill in a slide like that and present it briefly (no more than 3 minutes) during the session **: SLIDES HERE**

#	Description	Leading person	Link
1 5 min	Introduction of concept of cooperation (RIs Board, ToR)	Holger Brix	
2 30 min	Presentation / introduction of some /all environmental RIs: Aim of the RI, level of maturity (ESFRI roadmap, implementation, etc), map with sites, plus information on access	RI representatives	
	Coffee Break		
3 40 min	"Successful stories from PSS and IRS" – one/two people for the site present their activities - region leads	PSS/IRS representatives	Link to slides
4 30 min	Discussion about collaborations: ● What actions at coordination level can help pave the way toward a better integration? Role of RIs Board? ● Collaboration through mutual access ● How can the "seeds" of collaborations grow also in other sites?	George Petihakis	

NOTES AND MINUTES

NOTES and MINUTES

→ **SECRETARY.IES (responsible for notes and minutes)** : David Kaiser (Hereon) // Carolina Cantoni (CNR)

- - - - - - - - - - - - -

Discussion about collaborations:

- What actions at coordination level can help pave the way toward a better integration? Role of RIs Board?
- Collaboration through mutual access
- How can the "seeds" of collaborations grow also in other sites?

- - - - - - - - - - - - -

Nicolas Pade : Is there no link between Channel-PSS and the Plymouth observatories?

Sébastien Legrand, RBINS : for Channel PSS and BE, LifeWatch is important for plankton monitoring. EMBRC could also be important for other biology / biodiversity questions.

Richard Sanders ICOS OTC : Nicolas PML is a partner in DANUBIUS-RI and joint lead in our Observation Node
Nicolas PADE - EMBRC : So, the Tavy is part of Danubius then?
Michael Schultz (DANUBIUS-RI) : Tavy is not a DANUBIUS-RI Supersite

Veronique Creach : it will be interesting to know a bit more about **MINKE** because we have two work packages dealing with Best practices. thanks

Laurent D: MINKE - 2021 - 2025
Kick off is not made yet and on my knowledge not yet planned regarding the dates.
Programme: H2020 – Research and Innovation Actions
Project title: Metrology for Integrated Marine Management and Knowledge-Transfer Network
Lead : CSIC, Jaume Pierra
The summary of the project:
MINKE will integrate key European marine metrology research infrastructures, to coordinate their use and development and propose an innovative framework of "quality of oceanographic data" for the different European actors in charge of monitoring and managing the marine ecosystems. MINKE proposes a new vision in the design of marine monitoring networks considering two dimensions of data quality, accuracy and completeness, as the driving components of the quality in data acquisition. The present proposal, through the

different Integration Activities (Networking, Transnational-Virtual Access and Joint Research), aims to lay the groundwork for creating the necessary synergies among the different involved actors in the quintuple helix model of innovation, creating a new community with complementary capabilities for Ocean & Coastal Observation, that will facilitate the transition towards a blue growth socio-economic system.

Laurent Coppola : Just a little reminder for everyone. For the regions that have a connection with the French EEZ, ILICO is of course present in the list of IRs (like for NW MedSea for example). But I think that here the relevant connections are those with ERIC.

Jay Pearlman : I am hearing comments about best practices used or in development. How many have been documented and submitted to the Ocean Best Practices System?

Laurent Coppola : @Jay: some JERICO BP have been submitted to OBPS but I don't know if all of them but it is essential nowadays

Richard S : There is a copy of the draft calls here https://sciencebusiness.net/sites/default/files/inline-files/Annex%203%20Research%20Infrastructures.pdf

Ian Salter: @Jay: BOPs for omics/eDNA were discussed at an OBPS workshop last year and contributed to shaping a UN Decade Programme proposal for Investigating life in the ocean using bimolecular techniques

George P. : about Joint TNA exercise: easier in projects which have dedicated funds than in ERICs

Sylvie : comment: ERIC is also a good tool to enhance the collaboration at national level because we have access to ministries. So there is a way to strengthen collaborations

Nicolas P. : Yes, there is a strong argument of complementarity to justify long-term investment in observation through national collaboration .
+1Sylvie

Inga L. : Totally agree on the need to develop a plan on concrete collaboration, benefits to be gained to the broader community

Nicolas P.: Europe wants to see that all these investments lead to solutions, and this could be one of them. Tuning into aspects of Mission Starfish

George P. : open the discussion to the RIboard

Holger B. : introduces the Board of RIs; can be a place for coordination, where RIs can communicate; avoidance of overlapping RI action can be discussed here

Sylvie P.: To answer the societal needs we need to know what's in the water and can we do it jointly.

Laurent C. : Wouldn't it be relevant to have more joint workshops between ERICs more often, as EURO-ARGO will do on the BGC and deep Argo part with GO-SHIP and EMSO/Oceansites to see how and where demonstrations can be set up

Joaquin T. : In relation to the collaboration between RIs there is an international framework for "Collective Impact" approach that could be relevant ... https://ssir.org/articles/entry/collective_impact.

Nicolas P. : Yes, I think the avoidance of overlap is important. complementarity is an important argument in funding as well.

COMMENTS IN ZOOM

From Léa G. to Everyone: 03:53 PM

Link to the slides : ARW#2 - SESSION2.1 - PSS / IRS - Collaboration with other RIs

From Joaquin to Everyone: 03:54 PM

Great comments from Sylvie, not all platforms are good and adequate in all regions, and this is the strong power and potential of true multi platform approach of JERICO !

From Nicolas PADE - EMBRC to Everyone: 04:07 PM

Is there no link between Channel-PSS and the Plymouth observatories?

From Sébastien Legrand, RBINS to Everyone: 04:08 PM

For Channel PSS and BE, LifeWatch is important for plankton monitoring. EMBRC could also be important for other biology / biodiversity questions.

From Michael Schultz (DANUBIUS-RI) to Everyone: 04:17 PM

Nicolas PML is a partner in DANUBIUS-RI and joint lead in our Observation Node

From Nicolas PADE - EMBRC to Everyone: 04:18 PM

So, the Tavy is part of Danubius then?

Thanks for the clarification

From Michael Schultz (DANUBIUS-RI) to Everyone: 04:18 PM

Tavy is not a DANUBIUS-RI Supersite

From veronique Creach to Everyone: 04:21 PM

It will be interesting to know a bit more about MINKE because we have two work packages dealing with Best practices. thanks

From Laurent Coppola to Everyone: 04:21 PM

Just a little reminder for everyone. For the regions that have a connection with the French EEZ, ILICO is of course present in the list of IRs (like for NW MedSea for example). But I think that here the relevant connections are those with ERIC.

From Jay Pearlman to Everyone: 04:23 PM

I am hearing comments about best practices used or in development. How many have been documented and submitted to the Ocean Best Practices System?

From Laurent Coppola to Everyone: 04:24 PM

@Jay: some JERICO BP have been submitted to OBPS but I don’t know if all of them but it is essential nowadays

From Richard Sanders ICOS OTC to Everyone: 04:27 PM

There is a copy of the draft calls here
https://sciencebusiness.net/sites/default/files/inline-files/Annex%203%20Research%20Infrastructures.pdf

From Ian Salter to Everyone: 04:29 PM

@Jay: BOPs for omics/eDNA were discussed at an OBPS workshop last year and contributed to shaping a UN Decade Programme proposal for Investigating life in the ocean using bimolecular techniques

From Nicolas PADE - EMBRC to Everyone: 04:30 PM

@jay, EMBRC has not submitted ours yet, we will wait till we have been running for a while to make sure that our SOPs are solid

From Jay Pearlman to Everyone: 04:30 PM

Thanks Laurent about submission to OBPS. My question is also to raise the question of how many of those mentioned today by the PSS and IRS are being documented.

From Christos Arvanitidis to Everyone: 04:31 PM

I can provide some examples on the first question of George

From Laurent Coppola to Everyone: 04:32 PM

@Jay hard to say but each PSS/IRS should provide info for WP4 and WP5. I will look for mine

From Nicolas PADE - EMBRC to Everyone: 04:40 PM

Yes, there is a strong argument of complementarity to justify long-term investment in observation through national collaboration

+1Sylvie

From Inga Lips (EuroGOOS) to Everyone: 04:42 PM

Totally agree on the need to develop a plan on concrete collaboration, benefits to be gained to the broader community

From Nicolas PADE - EMBRC to Everyone: 04:47 PM

Europe wants to see that all these investment leads to solutions, and this could be one of them. Tuning into aspects of Mission Starfish

From Laurent Coppola to Everyone: 04:53 PM

Wouldn't it be relevant to have more joint workshops between ERICs more often, as EURO-ARGO will do on the BGC and deep Argo part with GO-SHIP and EMSO/Oceansites to see how and where demonstrations can be set up

From Joaquin to Everyone: 04:53 PM

In relation to the collaboration between RIs there is an international framework for “Collective Impact” approach that could be relevant ... https://ssir.org/articles/entry/collective_impact.

From Nicolas PADE - EMBRC to Everyone: 04:54 PM

Yes, I think the avoidance of overlap is important. complementarity is an important argument in funding as well.

From Richard Sanders ICOS OTC to Everyone: 04:55 PM

I think the EOOS - RI - EMODNET dialogue is important

From Nicolas PADE - EMBRC to Everyone: 04:55 PM

+1 Richard

From Laurent Coppola to Everyone: 04:56 PM

OceanOPS

From Richard Sanders ICOS OTC to Everyone: 04:57 PM

I also think JPI is crucial

That's the place where funding agencies come together from member states which is ultimately where observing money comes from

Creating a collective vision of what success looks like and how to deliver it is crucial

From Nicolas PADE - EMBRC to Everyone: 04:57 PM

So EOOS could be a good medium for what Sylive and George suggest

From Richard Sanders ICOS OTC to Everyone: 04:57 PM

It's a huge job as George says. But the funding is there now to create the vision

From Christos Arvanitidis to Everyone: 05:00 PM

LOICZ as well

From Joaquin T. to Everyone: 05:03 PM

The framework is more detailed in oceanography in Bob Wellers paper, OcesanObs 2019 https://www.frontiersin.org/articles/10.3389/fmars.2019.00105/full and Figure 6 and 7

OPEN DISCUSSION COMMENTS

Main points:

- What actions at coordination level can help pave the way toward a better integration? Role of RIs Board?
- Collaboration through mutual access
- How can the “seeds” of collaborations grow also in other sites?

Christos A: ERICs can be an umbrella, but more exchange than now needs to happen; funding is not secure long-term. There is “organic” collaboration between science clusters (which provide global science hypotheses and challenges) and RIs.

Collaboration is (scientifically) important because the boundaries between research areas are future scientific frontiers.

Nicolas P: interest of collaboration can be more openly communicated. At which levels do discussions about collaboration happen?

Sylvie P: ERICs are a good collaboration tool because they have access on a national level. A joint-RI proposal could be worked out (funded via ERICs, national level, or projects). RIs need to be brought to the attention of a community outside the RIs themselves.

George P: financial sustainability is a common/shared RI challenge

Jens N: joint TNA activity, via co-location, can be a tool to increase mutual access

Nicolas P: Defining a joint grand challenge scientific topic and the contributions from different RIs can increase collaboration between and the use of RIs. An open (hackathon-like) workshop could kick this off.

Jens N: This is a very promising approach, but proper coordination is critical

George P: A call around a grand challenge could bring collaborators together

Nicolas P: such calls are expected in the near future

See also link shared by Richard S: There is a copy of the draft calls here https://sciencebusiness.net/sites/default/files/inline-files/Annex%203%20Research%20Infrastructures.pdf

Holger B: introduces the Board of RIs; can be a place for coordination, where RIs can communicate; avoidance of overlapping RI action can be discussed here

Sylvie P: “What is in the water?” Can we create an infrastructure to see all operational platforms on a European level?

Laurent: OceanOps, EuroGOOS would be the place for this

Joaquin T: Integrated Coastal Zone Management is a framework that works in a collaborative way between different “stakeholders”, with common agenda, measurement, etc.

Attendees (62) → Taken at 15:15 (session started at 14:45)

Léa G. (Host, me)
CA Christos Arvanitidis
Bastien Tagliana (Co-host)
ingrid (Co-host)
LD Laurent D (JERICO Coord) (Co-host)
HB Holger Brix
JN Jens Nejstgaard (IGB)
AC Andres Cianca (PLOCAN)
al alain lefebvre
AL Ana Lara Lopez
AL Andrew Luke King
AR Anna Rubio AZTI
Antoine Grémare
BP Begoña Pérez
BM Behzad Mostajir (CNRS)
CC Carolina Cantoni (CNR)
CG Carolyn Graves
CA Christian Autermann
CF Costas Frangoulis
DK David Kaiser - hereon-KDG
EB Emilie Breviere
Eric Delory - PLOCAN
FB Fabio Brunetti
François Bourrin
GU Georg Umgiesser - ISMAR-CNR
George Petihakis
HF Helene Frigstad (NIVA)
HW Henning Wehde
IS Ian Salter
Inga Lips (EuroGOOS)
Joanne Burden
JV Joao Vitorino
J Joaquin
JS Jukka Seppälä
JM Julien Mader (AZTI)
KB Kees Borst (RWS-NL)
Kieran Reilly
Klas Ove Möller
L Lumi
Mp Martin pfannkuchen
MH Martti Honkanen
MJ Melanie Juza (SOCIB)
MS Michael Schultz (DANUBIUS-RI)
MC Miguel Charcos (SOCIB)
MJ Milla Johansson (FMI)
Nelli Rünk (TalTech)
NP Nicolas PADE - EMBRC
Nikolaos Zarokanellos
PF Paolo Favali (EMSO ERIC)
Paul Gaughan
SE Samu Elovaara
SR Saskia Rühl
se sebastian ehrhart [syke]
SM Simone Marini
SM Simone Marini
Sylvia Christodoulaki (HCMR)
SP Sylvie Pouliquen Euro-Argo ERIC
TT Timo Tamminen, SYKE, Finland
UL Urmas Lips (TalTech)
vC veronique Creach
YV Yoana Voynova
ZH Zéline Hubert

SLIDES PRESENTATION DURING SESSION

LifeWatch ERIC: mission, recent developments and what is offered for climate change ipmacts on biodiversity and ecosystems research

Christos Arvanitidis, Juan Miguel González-Aranda, Alberto Basset, Peter Van Tienderen and Lucas de Moncuit de Boiscuillé

Online talk to the JERICO-S3 WP2, on the cooperation between JERICO and other RIs | April, 20, 2021

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

What is LifeWatch ERIC?

What is LifeWatch ERIC?

LifeWatch ERIC is the e-Science and Technology European Infrastructure for Biodiversity and Ecosystem Research that:

> Establishes and operates the infrastructure and information systems necessary to mobilise and integrate data and algorithms for biodiversity and ecosystem research, including enhancing understanding, linkages and synergies with other societal challenges such as climate change adaptation and mitigation, and to provide analytical capabilities;

> Provides access to data collected by science at a global level and offers ICT services, tools, storage capacity and computational power, to transform information into new knowledge;

> Connects and brings together physical observatories, research centres and scientific communities into a single web space accessible to all; in doing so

> Offers researchers and stakeholders wherever they are, regardless of their access to funding and facilities, the resources to enact their own innovative scientific approach; and

> Empowers citizens to engage with science and contribute to their own well-being and survival.

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

What is LifeWatch ERIC?

LifeWatch ERIC invests in three essential components: open access data, reproducible analytics and mobilised communities.

LifeWatch ERIC in a nutshell:

https://www.youtube.com/watch?v=m4n-cAcgpl0&feature=youtu.be

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

How is LifeWatch ERIC organised?

The core structural components are the three **Common Facilities**, serving the entire ERIC and responsible for the implementation, coordination and management of all activities:

> Statutory Seat and ICT e-Infrastructure Technical Office (SSO, ICT-Core), Seville, Spain;

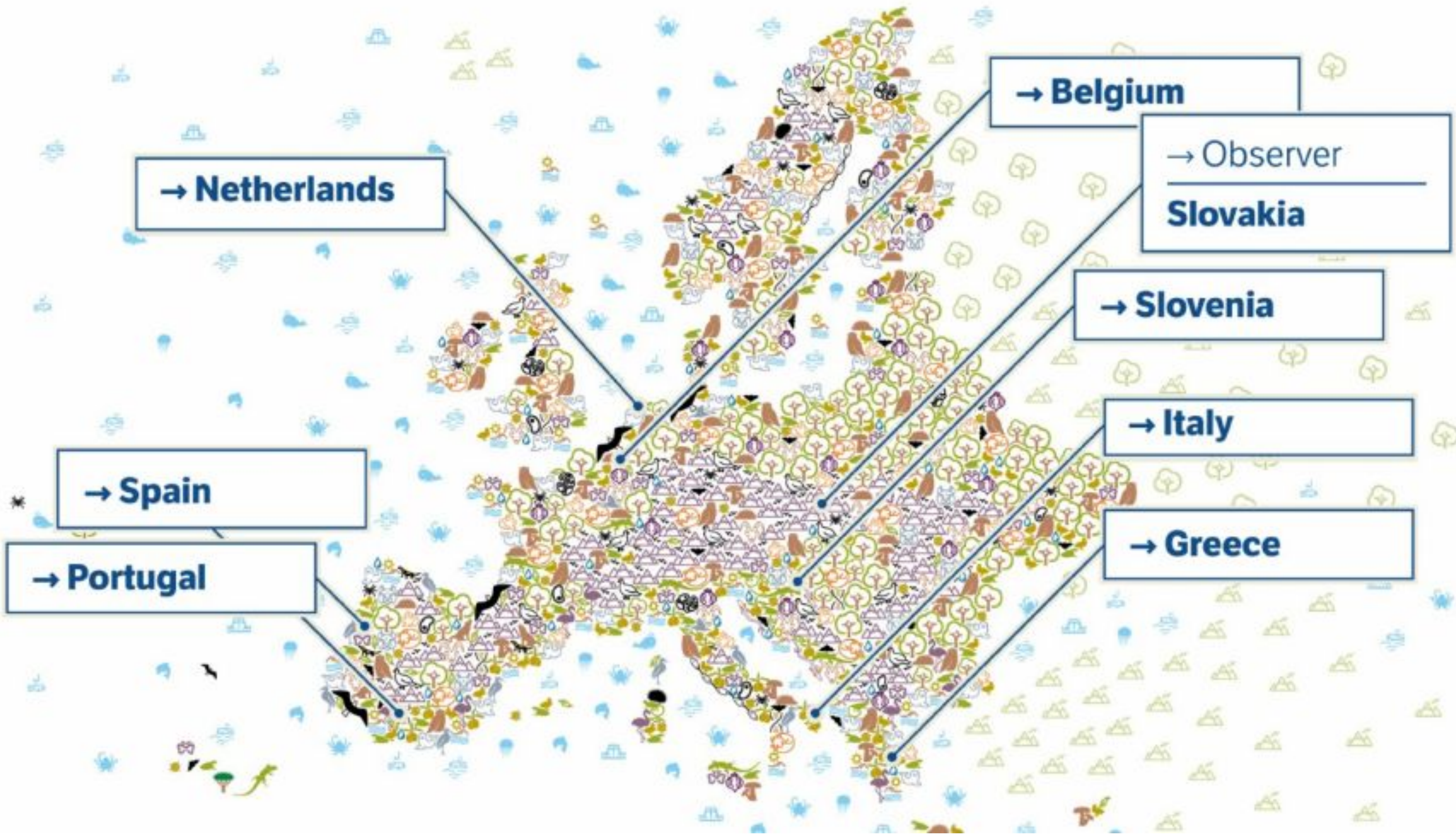
> Service Centre (SC), Lecce, Italy;

> Virtual Lab and Innovation Centre (VLIC), Amsterdam, The Netherlands.

Distributed Centres are facilities that are hosted by Member States, and coordinate national contributions to the consortium.

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

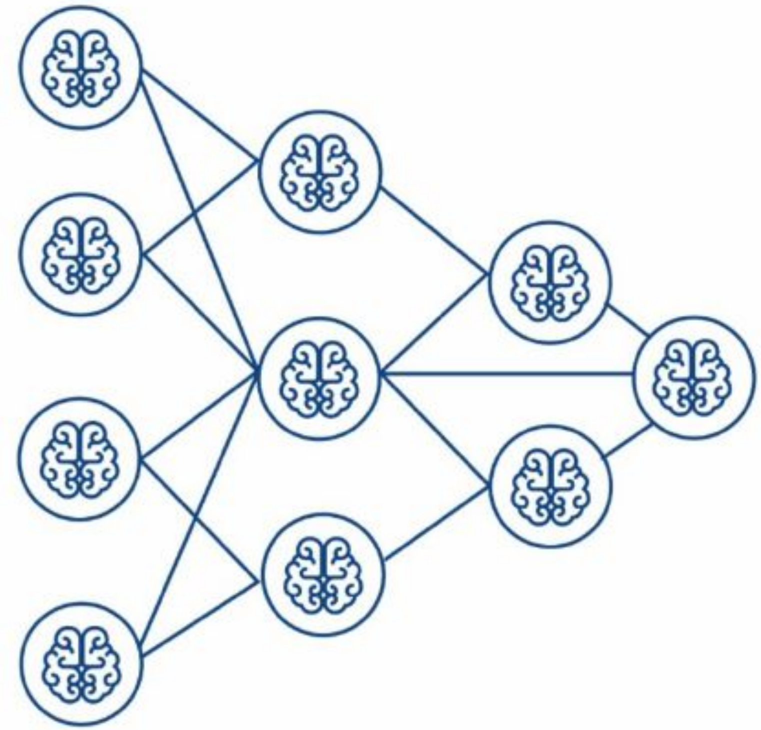
_How we work | National Nodes



The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

_Cultural challenge

"This change would direct most of the scientific effort from a single-core (SCBs) operation, or **brain-etics**

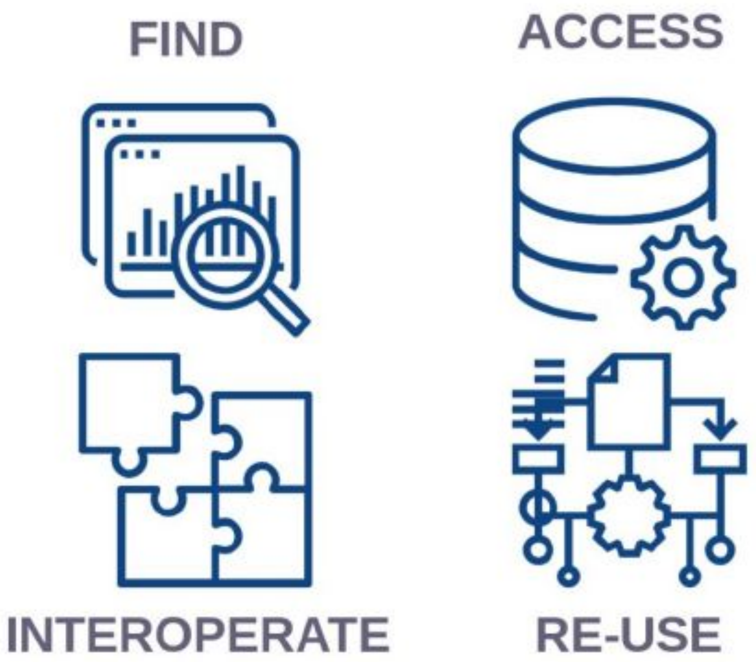


to high performance brain network synthesis (HPBNs) or **brain-omics**"

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

_What we offer | FAIR DATA

- Find the data and metadata you are looking for, thanks to our **Catalogue of resources**;
- Freely access, use and share large datasets of different types and sources;
- Work with interoperable data, thanks to our standards, thesauri and ontologies;
- Reuse and combine data for different research questions, generating new services and meeting community standards.

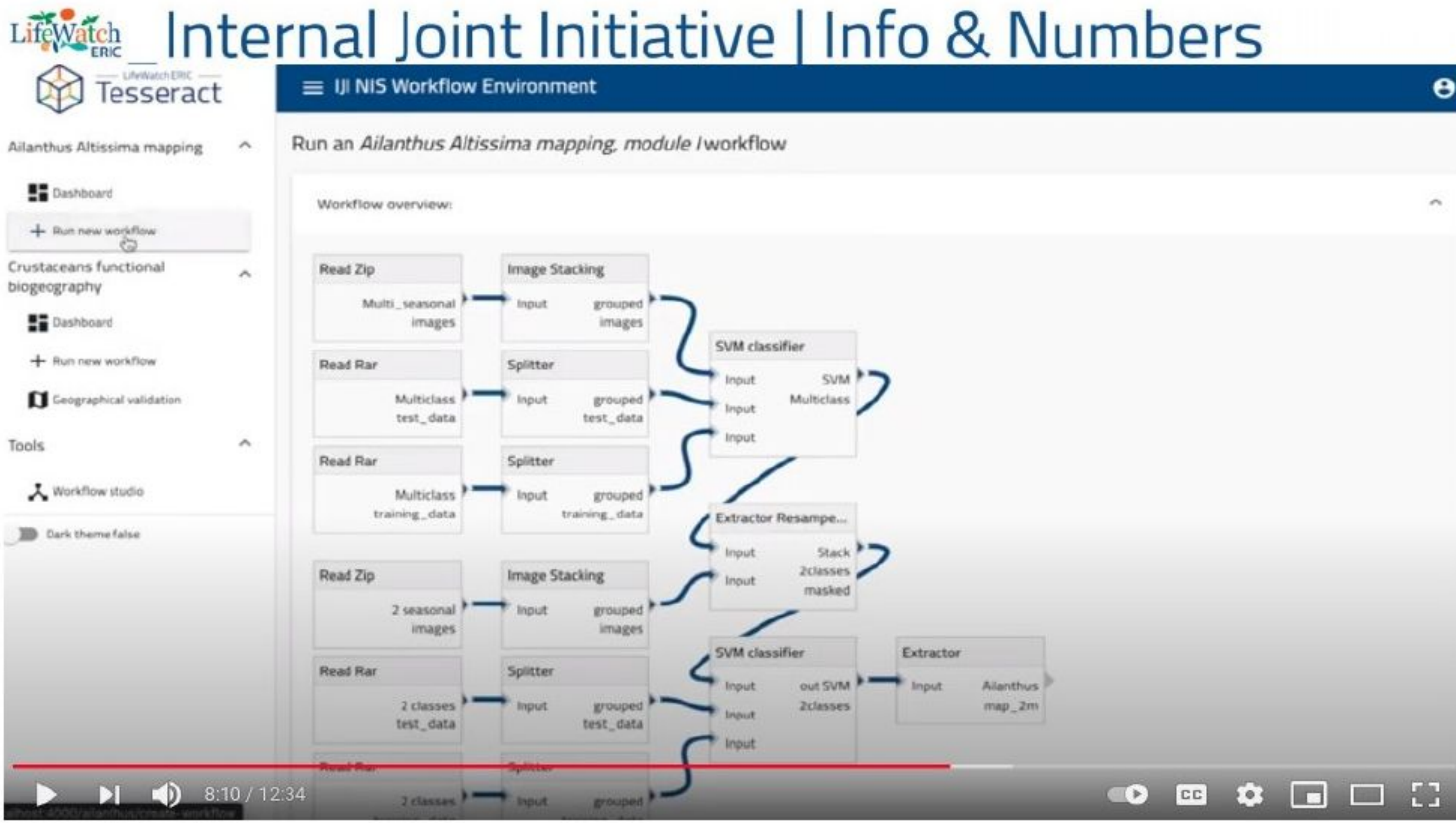


The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

LifeWatch ERIC _What we provide | VREs

Virtual Research Environments, Open science e-Labs to run experiments, backed up with Decision Making Tools to support smart ecosystem management

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.



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Thank you for your attention and questions

Do you need more information?
Please don't hesitate to get in touch at
statutoryseat@lifewatch.eu

www.lifewatch.eu

its No. 871153/951799. Project coordinators: Ifremer, France.

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Session 2: Relations with other RIs

Scope of this session:

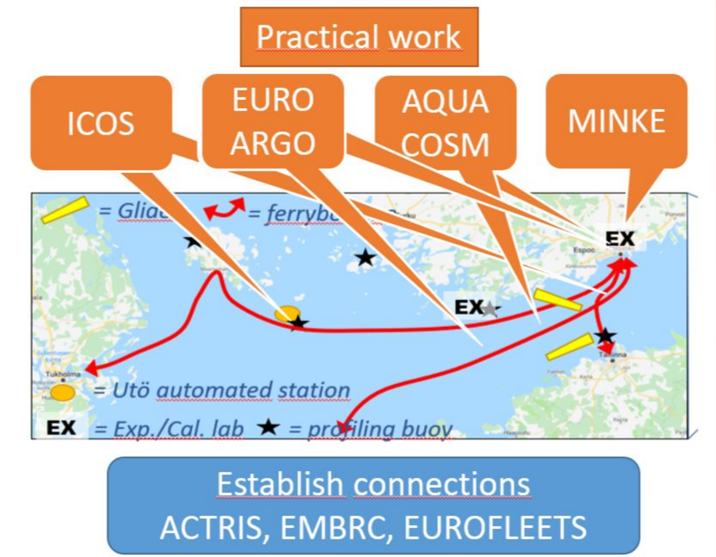
- JERICO operates at the interface of different parts of the Earth system
- Therefore, JERICO needs to address overlap with other RIs
- Get started on creating an interface infrastructure
- Analyze and structure dialogue to avoid overlap and facilitate synergies

Schedule:

- Introduction of RIs
- Coffee break
- Reports from JERICO Pilot Supersites (PSS) and Integrated Regional Sites (IRS) on existing collaboration
- Discussion

Gulf of Finland PSS - collaboration with other RIs

- GoF PSS links to major environmental RIs active in Baltic
  -ICOS: knowledge sharing, coordination of carbonate system measurements, data-analysis
  -EURO ARGO: knowledge sharing for calibrations, use of Argo data for model performance evaluation, and O2 mapping
  -AQUACOSM: joint study how observations and experiments improve knowledge on ecosystem responses
  -MINKE: knowledge sharing for calibration
  -ACTRIS, EMBRC, EUROFLEETS: seeking possibilities for future joint activities

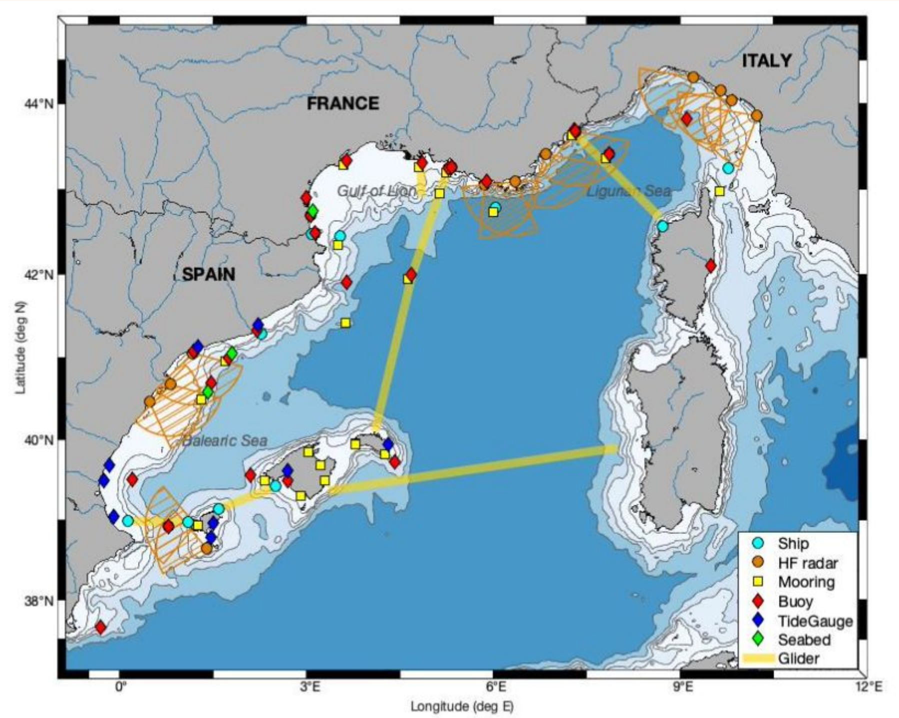


- Contacts well established, mostly in-house
- Important to clarify to ourselves the different roles of RIs (nationally, regionally and Europeally) and bring a clear message to decision makers. WP2 to be communicated, before strategic regional connections started by local JERICO-RI group.
- Practical work well planned and ongoing. The more strategic actions need still planning.

NW-Med-PSS - collaboration with other RIs

- List RIs your PSS/IRS has been in contact with - in what areas?

- EMSO ERIC: open sea moorings
- EURO-ARGO: Argo floats deployment and collection; data QC procedures
- ICOS: pCO2-pH measurements with autonomous sensor on fixed platforms (Dyfamed) and monthly cruises visits for CO2 variables (AT, CT, pH)
- EMBRC: collection of zooplankton species in coastal waters + expertise in imagery sensor (eg. UVP)
- DANUBIUS: river inputs (sediments, nutrients) and impact in the coastal area (Ebro-Llobregat supersite)



NW-Med-PSS - collaboration with other RIs

- What are those contacts about (e.g., meetings, best practices, shared facilities, ….)?

Joint workshops EMSO-EURO-ARGO meetings
Set up best practices for Eulerian Obs (EUROSEA), gliders with OceanGliders (EUROSEA)
Shared research vessels for EMSO moorings and Argo floats deployment
Case studies through EU and national projects, collaboration with PhD students focused on data integration in the PSS region

- What works well?

Deeply involved in EMSO ERIC at different stage (RF leaders, advisor) and O2 expertise in EURO-Argo and Oceangliders, expertise in QC procedures for Argo (SOCIB, CNRS)

- Where are critical points and / or difficulties?

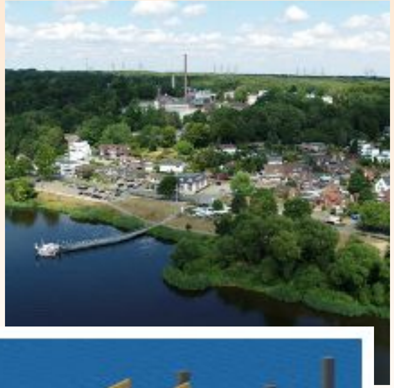
Search for funding for the implementation of demonstration missions between several RIs

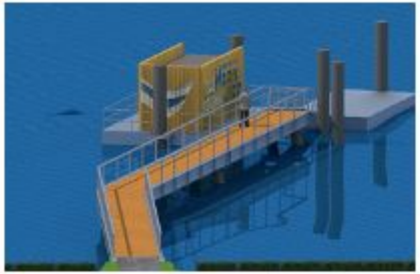
- Future plans?

Implication in the new call HORIZON-INFRA-2022-TECH-01 with EURO-ARGO (new sensors integration). Implication in on going projects EA-RISE, EUROSEA...

North Sea-PSS - collaboration with other RIs

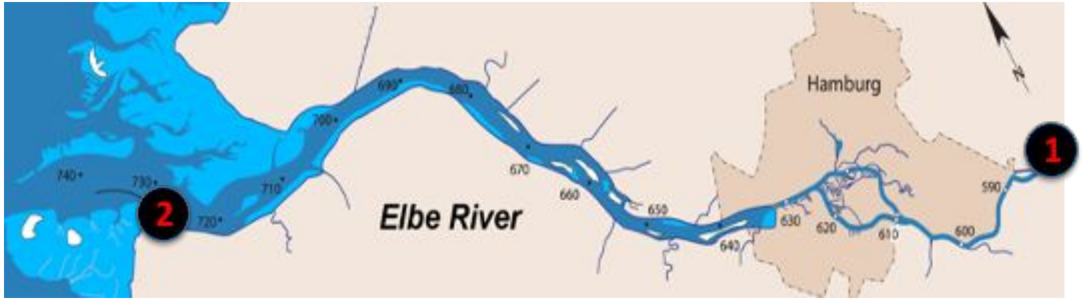
- Cooperation with DANUBIUS-RI in their Tidal-Elbe Supersite
- Setting up a shared station at Tesperhude (1), considering existing infrastructure at Cuxhaven (2) to ensure highest degree of shared technology:
  - Shared planning, starting in the early planning phase
  - For example, COSYNA/JERICO operates Cuxhaven FerryBox station and is part of setting up the Tesperhude FerryBox station (DANUBIUS)
  - Shared data center (Helmholtz Coastal Data Center)
  - To be operational summer 2021
- "Low hanging fruit" as both groups are from the same institute (Hereon, former HZG)
- Cooperation with ICOS community: started in 2019 FB workshop
- Financing is an issue - how are "services" from one RI to another financed
- How to integrate other players? Networks operated by states, local agencies, funded consortia, etc.





1 Tesperhude Station (Danubius)

2 Cuxhaven Station (COSYNA / JERICO)



Channel-PSS - collaboration with other RIs

IR-ILICO (Seashore and coastal research infrastructure)

=> 5 elementary networks (= labelled monitoring services) are of primary importance for the Channel-PSS

=> 2 are support for J-S3 experiments/numerical dvpt

COAST-HF, *Coastal Ocean Observing System - High frequency*
PHYTOBS, *Phytoplankton Monitoring Program*
SOMLIT, *Coastal Hydro. Biolog. Observation Service*
DYNALIT, *Coastline and Shoreline Dynamics*
SONEL, *Coastal Sea Level Observation System*

Data Flow

French Scientif. Community

EU. Community (ICSU, IOC, EuroGOOS, EOOS, Copernicus)

Objectives:

- Ensure that observations made respond primarily to the **societal issues** and **scientific questions** associated with them,
- Federate and animate the network of observation systems of the seashore and coastal environments in a **multidisciplinary perspective**,
- Guarantee the **relevance** and **quality** of the observations made.

What works well? Networking, shared best practices, shared facilities

Where are critical points and / or difficulties? Too low financial supports, human resources acknowledging the objectives

Future plans? build SMART, LOW-COST and FAIR tomorrow's Observation Systems!

Cretan Sea-PSS - collaboration with other RIs

- RIs contacted by Cretan Sea PSS

- AQUACOSM-plus: access to mesocosm for calibration of sensors //provision of mesocosm monitoring via sensing

Contacts made. Planning ongoing. First tests in June 2021. Join experiment planned for late spring 2022

-ICOS-ERIC: access to supporting data (CO_2 data in the region), training activities, guidelines best practices / provision of data of carbonate system

Contacts made. CO2 and other carbonate data collection initiated. Participation in ICOS intercomparison workshop in June 2021.

-EMBRC-ERIC: access to new technologies providing additional EBV data /provision of samples and access to related physicochemical data

Contact (in house) made. Planning initiated. Joint sampling to start in June 2021

-LifeWatch-ERIC: access to additional EBV data/ provision of related physicochemical data (e.g. pH)

Contact (in house) made, planning TBD

- EURO-ARGO ERIC: access to supporting data/ provision of reference data.

Access to supporting data ongoing.

-MINKE: knowledge sharing for calibration

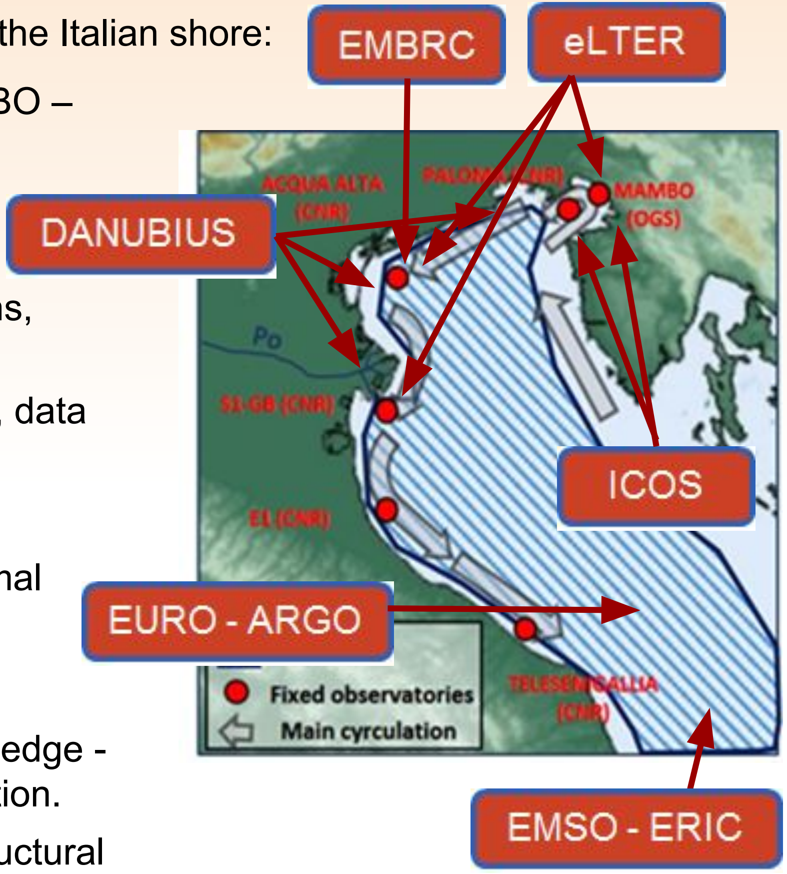
Project started April 2021. Contact and planning TBD

No critical points and / or difficulties at this stage

Northern Adriatic-IRS - collaboration with other RIs

Several RIs are co-located in the Northern Adriatic, mainly along the Italian shore:

- ICOS-ERIC: pCO2-pH measurements network sites: MAMBO – C1, PALOMA.
- eLTER: network sites: Aqua Alta, S1-GB, MAMBO – C1.
- EMBRC-ERIC: data access point: Aqua Alta.
- DANUBIUS-RI: Po river delta – Venice and Marano Lagoons, Italian National waters.
- EURO-ARGO-ERIC: Argo floats deployment and collection, data QC procedures.
- EMSO-ERIC: Southern Adriatic E2M3A Buoy, network site.



Contacts: informal, sharing best practices; DANUBIUS-RI Informal meetings on planning how to share facilities providing different services, framing possible collaborations and synergies.

Good/Critical point: good on practical activities and share knowledge - expertise / difficulty in formalising collaboration.

Future plans: Reinforce collaborations and make them more structural

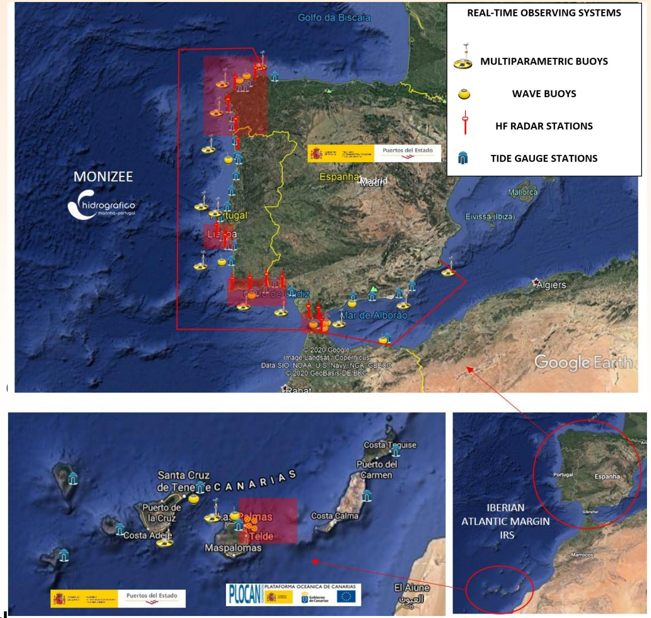
Iberian Atlantic Margin-IRS - collaboration with other RIs

PLOCAN (Canary Islands – Spain)

EMSO: Sharing of EMSO EGIM information for a coastal module, ocean continuum (use of open-ocean station as reference point)
Works well: Good cooperation through common partners and needs for technological innovations

ICOS: Support from ICOS OTC to maintain carbon cycle time-series and integration new stations (coastal and open-ocean)
Works well: Official integration of Spain in ICOS in 2020

GROOM: Contribute to the creation of a specific ocean glider-based RI
Works well: well harmonized data management platform and community track record (two EU projects)



Critical points/difficulties: Cost of maintenance of open-ocean activities, national coordination of ship-time use

Iberian Atlantic Margin-IRS - collaboration with other RIs

IH (Portugal): Articulation in the framework of ATL2MED (ICOS)

FUTURE PLANS

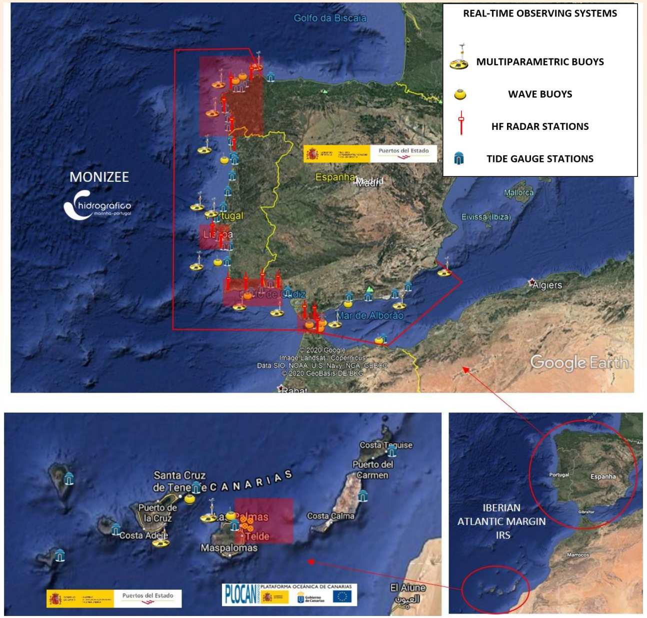
PLOCAN (Canary Islands - Spain)

EMSO: update and redeployment of EMSO EGIM at PLOCAN ESTOC site and coastal test site for validation purposes. EMSO TSC Ocean sound observing conference, Gran Canaria 20-22 Oct 2021.

ICOS: integration of ESTOC station carbon sensors in ICOS OTC

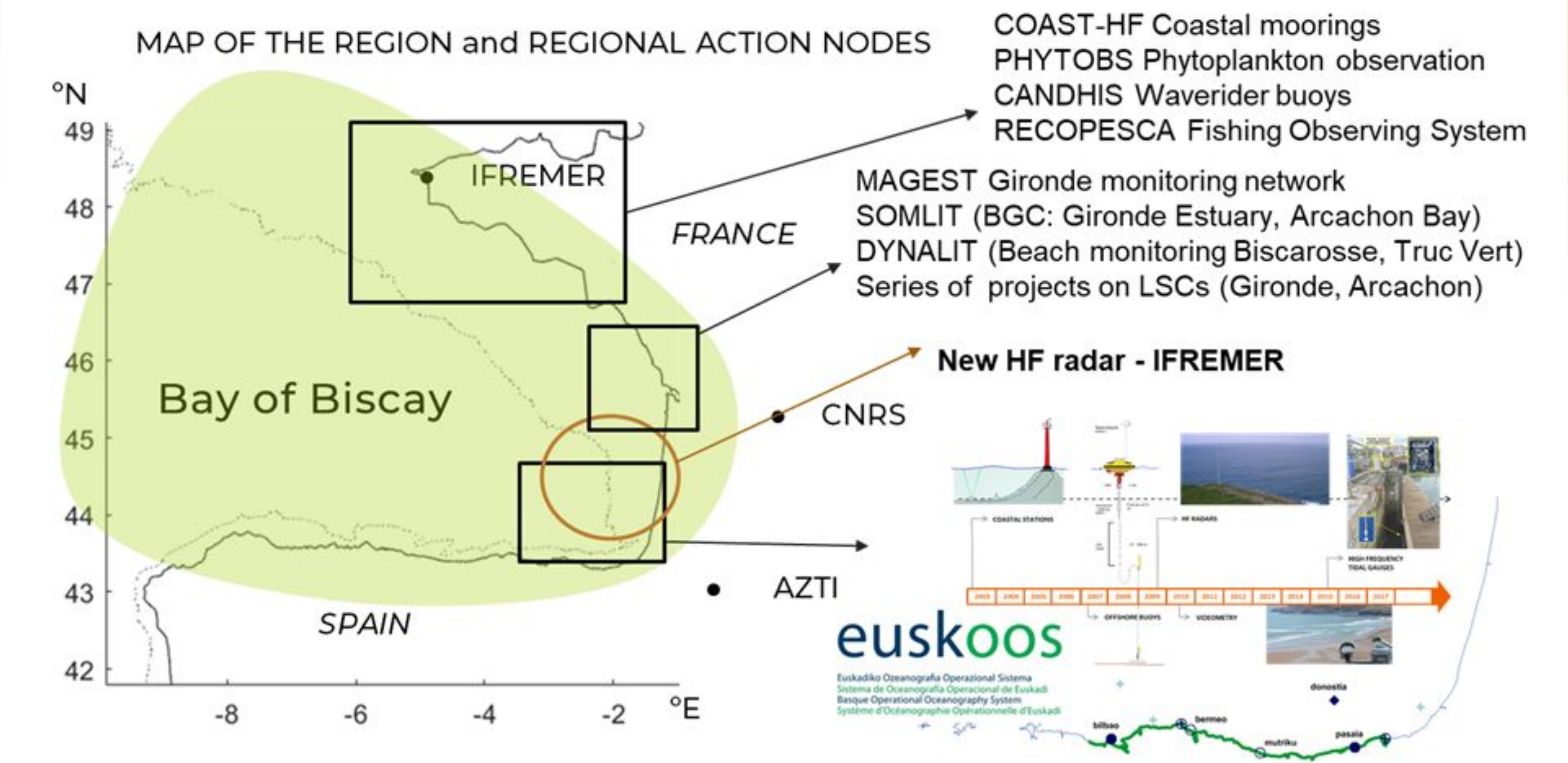
GROOM: Inventory of Spanish glider fleet

IH (Portugal): Contacts to be developed aiming future collaboration with **EMSO PT** and **EMBRC PT.**



Bay of Biscay-IRS - collaboration with other RIs

- List RIs your PSS/IRS has been in contact with - in what areas? -> **MAIN FRENCH IR ILICO**



Bay of Biscay-IRS - collaboration with other RIs

- List RIs your PSS/IRS has been in contact with - in what areas?What are those contacts about (e.g., meetings, best practices, shared facilities, ….)?

    - **SE BoB : Collaborations with Plentzia Marine Station (Research Centre for Experimental Marine Biology and Biotechnology), member of EMBRC ERIC - Joint MSC programme : plans for future collaboration**
    - **DANUBIUS-RI : Underrepresented in the BoB, while there are IRS thematics related to River-Sea Systems**

- ***Delay on the establishment of contacts/collaboration (COVID situation)***
- Future plans?
    - **Organization of one IRS BOB Stakeholders workshop in first half 2021.**
    - **ISOBAY conference in June 2021**

EMBRC
EUROPEAN MARINE BIOLOGICAL RESOURCE CENTRE

DANUBIUS-RI
International Centre for Advanced Studies on River-Sea Systems

Skagerrak-Kattegat-IRS - collaboration with other RIs

- List RIs your PSS/IRS has been in contact with - in what areas?
  E.g. a map of the site with JERICO's facilities and highlighted the areas of the on site collaborations with the different RIs
- What are those contacts about (e.g., meetings, best practices, shared facilities, ….)?
- What works well?
- Where are critical points and / or difficulties?
- Future plans?

Norwegian Sea-IRS - collaboration with other RIs

- **EuroARGO-ERIC**: Institute of Marine Research is leading NorArgo the Norwegian contribution on Argo. Common strategy, research etc are part of the overall development in IMR
- **EMSO-ERIC**: IMR and NORCE are partner in norEMSO, the Norwegian node in EMSO-ERIC. Collaboration is ongoing between the Norwegian nodes of EMSO and JERICO on BGC especially
- **EMBRC**: IMR research station Austevoll and NIVA Solbergstrand research station are part of the EMBRC network and JERICO, the centre of excellent innovation Smart Ocean and EMBRC Austevoll aiming for collaborative development
- **ICOS-ERIC**: NORCE is leading the ICOS-OTC and is the representative for ICOS in Norway. Coastwatch (the Norwegian contribution to JERICO) has taken initial discussions, SOOP collaboration (mainly via NIVA - NIVA's coastal FerryBox that is part of JERICO will be a new ICOS marine station in 2022)
- **AQUACOSM**: Discussions ongoing via the partners NIVA (Solbergstrand) and NORCE, both part of AQUACOSM and JERICO-S3, shared facilities, collaboration on best practices
- **ERGA** and **BIOSCAN Europe**: Discussions around DNA based biomonitoring, common strategies BOPs and SOPs reference genomes
- **EUROFLEETS**: IMR managing Norwegian Research vessel fleet and is member of EUROFLEETS

ARW SESSION 2 - PART 2

MODELLING WORKSHOP

JERICO-S3 workshop on coastal model-observation integration

Thursday 21 April 2021 / 13:30 - 17:00

Scope of the workshop:

Modelling, as one of the ocean monitoring instruments to provide a 4-Dimension continuous proxy and digital ocean, has been significantly advanced in the last two decades to cover physical, biogeochemical and high trophic marine systems. Jerico-S3 is a research infrastructure to improve EU multidisciplinary coastal ocean observations, but also has its own modelling activities, i.e., “Modeling in regions” WP2, WP3, WP4. The aim of this workshop is to discuss how coastal monitoring and modelling communities both in and outside JERICO can be benefited through model-observation integration and collaboration with non-JERICO modelling action and users. Questions are to be discussed in the workshop e.g., how are JERICO observations feeding modelers activities towards other modelling actors like CMEMS, national and local actors, for what purposes? What observations are needed by modelling (optimisation of sampling). And reversely, how can JERICO community benefit from modelling activities (optimize the design of observatories, tools for multidisciplinary integration)....

Expected outcomes:

COASTAL OCEAN MODELLING GROUP IN JERICO

The main questions behind this group/action are : What we can offer from JERICO, what is our role in helping to develop model activities, what are the benefits for the JERICO community?

- Define the requirements of the modelling community (high resolution modelling, BGC modelling) in terms of data (variable, coverage, resolution, accuracy of the measurements) and observations (optimize existing observatories) - Key variables needed by the modelling community and how JERICO contribution can benefit the modelling community
- Define the requirements of observing community from modelling
- Follow new developments in the modelling community to update the list of requirements

The **concrete outcomes of the JERICO WEEK#2 MODELLING SESSION** will be:

- Define the modelling competences inside the JERICO community and this group
- Provide an overview of what are the requirements from the modelling community

- Provide an overview of what JERICO can offer & review of the benefits of coastal observations for modelling Define the next iteration - open to external expert that complete the expertise we already have in the consortium

Targeted audience:

- PSS/IRS leads
- WP 2, 3, 4, and 1 leads
- Experts in modelling from the consortium
- All interested JERICO-S3 partners

It is decided no external experts will be invited for this first iteration buy that we will build a competence matrix to see what expertise we are lacking and what experts we should identify to invite further iterations.

Type of organisation:

i- THREE KEYNOTE SPEECHES summarizing the state of the art and key background for discussions

KEYNOTE 1 : Jun She - Integration of coastal modelling and observations - General Overview and general requirements from the modelling community (considering both operational applications & models for research - filling knowledge gaps and BGC modelling and pollution).

What are the value of coastal observations for the modelling, model assessment/improvements of hindcast/forecasts, open the possibilities of using data in modelling systems (not only assessment or data assimilation, multimodel/data approaches, reanalysis, AI for data blending, modelling as a proxy ocean to study the observational needs - OSSE/OSE, also direct info for OBCs...)

Major items related to JERICO-S3 modelling

1. Model-observation integration for improving models
    a. Reduce model parameter errors
    b. Reduce errors in boundary conditions and forcing
    c. Reduce errors in initial conditions
2. Model-observation integration for improving model products
    a. Model product validation using in-situ observations
    b. Model product correction using in-situ observations
    c. Multi-model ensemble (MME) forecast
3. Fit-for-the-purpose model-observation integration
4. Using modeling tool to assess and optimize sampling strategies
    a. Availability and use of observations in CMEMS and national modelling systems
    b. Major gaps identified in observations esp. BGC data, results from existing projects OPEC, CMEMS in-situ requirements and COINS

KEYNOTE 2 : L. Coppola & A. King - Overview of JERICO activities relevant to the model community and needs from JERICO observing community (NW MED PSS and IRS Norwegian Sea cases)

- Provide an overview on relevant JERICO-RI activities and strengths.
- Overview of observations covered by JERICO - What is the request from the observational community to the modellers
- Gaps in term of observations to be filled by models
- Also metrics, task on harmonization/standardizations/flagging, definition of data quality control.
- Integration of JERICO OBSERVATIONS and satellite data.

KEYNOTE 3 : Costas Frangoulis / Baptiste Mourre - JERICO modelling activities

- **Review of past actions in JERICO-NEXT based on JRAP6 outcomes (10'm) - Baptiste**

  HF radar, glider, mooring and FerryBox model assessment exercises and observation impact studies

- **Modelling activities in JERICO-S3 PSS (10' m) - Costas**

  (i) presentation of PSS modelling planned actions with focus on modelling-observation linkages that will be used
  (ii) some examples of existing modelling-observation linkages using different data sets (satellite, mesocosm, FB data, ...) from the Cretan Sea PPS

ii- ROUND TABLES to discuss around given questions related to the KEYNOTE SPEECHES

2 round tables divided by PSS/IRS - 75' each (all 6 questions will be addressed)

Round Table 1: PSSs GoF, NSEA, CHANNEL + IRSs KS, NS

Round Table 2: PSSs NW Med., CRETAN + IRSs BB, IB, NA.

Moderators : Joanna (modeler) ; Jun (modeler) ; Baptiste (modeler); Anna (expert in observations); Costas (expert in observations) - any volunteers are welcome please add your names here!!

Questions to be tackled:

i. What are the modelling competences inside the JERICO-RI community and this group ? -> COMPETENCE MATRIX 10' to work collaboratively in the matrix canvas; link to COMPETENCE MATRIX table modelling_competence_matrix_v0
ii. What are requirements on JERICO-RI for filling the gaps of observations for seamless service (e.g. coastal-estuary, BGC, BIO)? (KN1, KN2) 14'
iii. What are the main research themes that need integrated monitoring infrastructure (JERICO-RI)? (KN1, KN2) 14'
iv. What are the requirements of the JERICO observing community from modelling? What additional modelling activities should be developed for integration of JERICO-data and improvement of final services offered by JERICO?(KN2, KN1, KN3) 14'
v. What kind of observations are provided in JERICO but not exploited in the models for the moment? Why are these observations not used? What are the reasons preventing the use of this information? (KN2, KN3) 13'

vi. What are the next steps from the modelling group? What strategic actions would you propose for the next months and in a longer term? (GENERAL)10’

WHAT IS EXPECTED FROM REGIONS (PSS and IRS) ? (presentations? leading the roundtable? report on activities? sharing content or “stories”?)

PSS/IRS leaders should prepare short answers to questions ii-v (max 2’ each question)

All the participants should previously have a look to the competence matrix (modelling_competence_matrix_v0) and if possible start to fill in the template

Also important: Would be necessary to record roundtable session for workshop minutes

20’ break

iii - PLENARY SESSION: 30’ Common debrief

Main reference persons: Jun She (WP2), Joanna Staneva (WP2), Baptiste Mourre (WP), Costas Frangoulis (WP4), Anna Rubio (WP1)

#	Description	Leading person	Link
1 13:40 (10’)	Introduction to the workshop	Joanna Staneva	
2 13:50 (20’)	KEY NOTES SPEECH 1 - Integration of coastal modelling and observations	*Jun She, DMI*	
3 14:10 (20’)	KEY NOTES SPEECH 2 - Overview of JERICO activities relevant to the model community and needs from JERICO observing community (NW MED PSS case, Norwegian Sea IRS)	L. Coppola, A. King	
4 14:30 (20’)	KEY NOTES SPEECH 3 -Modelling activities in JERICO-NEXT and JERICO-S3	*Baptiste Mourre (SOCIB) and Costas Frangoulis (HCMR)*	
5 14:50 (20’)	QUESTIONS / DISCUSSION	*Jun She, DMI*	
6 15:10 (20’)	COFFEE BREAK	→ WonderMe !	LINK

7 15:30 (75' discussion)	Two round tables (75' discussion) Round Table 1: PSSs GoF, NSEA, CHANNEL + IRSs KS, NS Round Table 2: PSSs NW Med., CRETAN + IRSs BB, IB, NA		
8 16:45 (15')	Common debrief	*Jun She, DMI*	

Attendees WEDNESDAY PM (55) →

Zoom participants (at 14:00, session started at 13:30): 60 participants

- Lea G. (Co-host, me)
- Laurent D (JERICO Coord) (Host)
- JS Jun She, DMI (Co-host)
- Bastien Tagliana (Co-host)
- ingrid Puillat (Co-host)
- JS Joanna Staneva (Co-host) Ask to Unmut
- JS Johannes Schulz-Stellenfleth (hereon) (Co-host)
- SL Sébastien Legrand, RBINS (Co-host)
- al alain lefebvre
- AL Andrew Luke King
- AR Anna Rubio AZTI
- BM Baptiste Mourre (SOCIB)
- BM Behzad Mostajir
- b blauw
- CC Carolina Cantoni (CNR)
- CU Caroline ULSES
- CG Charria Guillaume
- C- CNR - Marcello Magaldi
- CF Costas Frangoulis
- Dominique Durand
- EB Emilie Breviere
- EM Enoc Martínez
- fa felipe artigas
- François Bourrin
- George Petihakis
- HF Helene Frigstad (NIVA)
- HW Henning Wehde
- HB Holger Brix
- Inga Lips (EuroGOOS)
- IM Inês Martins - IH - Portugal
- JP Jay Pearlman
- j jmu
- J Juanga
- JS Jukka Seppälä
- JM Julien Mader (AZTI)
- KC Kate Collingridge
- KB Kees Borst (RWS-NL)
- Kieran Reilly
- k kostas
- LC Laurent Coppola
- MG Marcos Garcia Sotillo
- MB Maristella Berta
- MP Martin Pfannkuchen
- MC Miguel Charcos (SOCIB)
- MJ Milla Johansson (FMI)
- PS Pauline Simpson
- RG Roland Garnier
- r romaric
- SE Samu Elovaara
- se sebastian ehrhart [syke]
- SM Simone Marini
- TL Taavi Liblik (Estonia, TalTech)
- TT Timo Tamminen, SYKE, Finland
- UL Urmas Lips (TalTech)
- Vicente Fernandez - EuroGOOS
- ZH Zéline Hubert

NOTES AND MINUTES

Jun She, DMI: @All, delivery of quality controlled near real-time observations in the coastal waters is still a challenge, both for physical and BGC variables. As they are not part of GTS, Argo.
@All, for marine climate service, establish long-term in situ observation time series is still a challenge, including rescue of data in historical period (eg before 1950/1930 or even earlier)

Jun She, DMI: @Andrew: since single bad data can destroy the model forecast performance, NRT QC is very important for forecast applications. Is there a NRT QC for all ferrybox data? It Still a challenge to assimilate very high resolution data (eg hourly data), and data in an area with large spatial grdient (eg a front)

Sébastien Legrand: In 2016, NOOS organized a workshop on data assimilation in BGC model. We concluded that lack of good quality data at a right resolution was the biggest challenge. One of the advice to tackle this challenge was to increase the desnity of the observing network of light availabilty (PAR) instead of for instance fluorocimeter.

Ingrid P.: FB data are not channeled to EMODNET and eurogoos for modellers?

Jun She: @Ingrid, FB data in EMODnet is not useful for our forecast, not only due to QC but mainly due to the time of delivery in INSTAC and EMODnet. The data is one-day delay in EMODnet, eg for time now, I can only get FB data earlier yesterday. However our forecast is four times a day. We need a coastal data delivery similar to Argo/GTS.

Andrew K. : @Jun, that is indeed a big challenge to overcome!
Totally agree Jukka, that's why we also need to connect to the work that is carred together with colleagues dealing with technical, best practices and data treatment/provision issues within JERICO S3.
As, for example, in vivo fluorescence is not necessarily chlorophyll concentration, as Jukka said, and chlorophyll is not a variable that represents a goal per se, whereas phytoplankton biomass (and also abundance, diversity and/or productivity) should be, instead...depending on the type of model we are targeting on.

DISCUSSION FROM ZOOM CHANNEL:

From **romaric verney (**Ifremer) to Everyone: 04:10 PM
But modelers are also (sometimes…) collecting data … we should not oppose these communities…
But JERICO is aggregating national observation networks…
Close to the coast…and at the estuarine/coastal interface, a critical gap is to collect regular knowledge on morphological data and sediment distribution (as physical habitats). Just to mention that coastal is not only a water column…

From **Dominique Durand** to Everyone: 04:18 PM
very good point Jukka
Interesting Romaric !

From **Laurent D** (JERICO Coord) to Everyone: 04:19 PM
Indeed, good points romaric

From **Ingrid P.** to Everyone: 04:21 PM
JERICO has a strength on providing long-term high resolution monitoring, which well service the needs of marine climate change adaptation (trend, human pressure impacts...)

From **Joanna Staneva** to Me: (Privately) 04:25 PM
Would you like to proceed with the 4. and 5. question?

From **Dominique Durand** to Everyone: 04:26 PM
Alain is touching a very sensible and therefore complicated issue

From **Sébastien Legrand**, RBINS to Everyone: 04:28 PM
Alain was touching the question of models intercomparison and the multi-model ensemble (MME) approach. So far I don't know if there exists a MME initiative for BGC model applied to eutrophication.

From **alain lefebvre** to Everyone: 04:29 PM
This kind of MME approach is lead by Hermann Lernhardt (HZG) within the OSPAR Eutrophication Modelling group (ICG EMO)

From **Ingrid P.** to Joanna Staneva: (Privately) 04:33 PM
@Johannes, I did similar QC using model sea level for checking tide gauge data quality

From **Andrew Luke King** to Everyone: 04:34 PM
@Johannes, this also happens to observationalists where they think the observation is an artefact only to later discover using supporting data that it was in fact "real". :)
waterhypernet.org
examples of hyperspectral device to make the gap between in-situ obs of and satellite ocean colour

From **romaric verney** (Ifremer) to Everyone: 04:46 PM
I agree with Johannes (reliable, continuous data). And observation is also critical for alerting about system dynamics…observation with gaps is not useful…

From **romaric verney** (Ifremer) to Everyone (4:59 PM)
What about the benthic compartment in JERICO? Not accounted yet…but crucial ?

Laurent Coppola to Everyone (5:00 PM)
@romaric: i mentioned that for the NW MedSea

romaric verney (Ifremer) to Everyone (5:01 PM)
This is not related to this « Modelling » meeting but a question I have had for quite a long time...
felipe artigas to Everyone (5:02 PM)
Maybe modellers and observers would need to converge on common scientific questions to tackled and to combine both "traditional" and "novel" observation and modelling techniques…

Round table 1:

PSSs GoF, NSEA, CHANNEL + IRSs KS, NS

Attendees:

Round Table Group 1	
Group 1 - LINK TO DOC HERE	PSSs GoF, NSEA, CHANNEL + IRSs KS, NS
Round table leader: Jun SHE	
Chairs: Joanna Staneva, Johannes (rapporteur), Andrew	
NAME	First name
LEFEBVRE	Alain
King	Andrew
blauw	anouk
Durand	Dominique
Artigas	Felipe
frigstad	helene
Staneva	Joanna
Schulz-Stellenfleth	Johannes
Seppälä	Jukka
She	Jun
Collingridge	Jun
Delauney	Laurent
Johansson	Milla
Verney	Romaric
Elovaara	Samu
Ehrhart	Sebastian
Liblik	Taavi
Tamminen	Timo
Lips	Urmas
Wehde	Henning
Legrand	Sebastien
Borst	Kees
Murawski	
Total in Group 1	**23**

Questions and Notes:

i. ***What are the modelling competences inside the JERICO-RI community and this group ? -> COMPETENCE MATRIX 10' to work collaboratively in the matrix canvas; link to COMPETENCE MATRIX table***
modelling_competence_matrix_v0

Will be filled in asap

ii. ***What are requirements on JERICO-RI for filling the gaps of observations for seamless service (e.g. coastal-estuary, BGC, BIO)? (KN1, KN2) 14'***

Notes:

Do we have sufficient obs data to cover a large variety of variables?
Multidisciplinary services have specific requirements
JERICO has a coordination role (modelling, research obs, operational obs, …)

What is the data with highest priority?
Observation errors important
Requirements not well defined and dialogue needs improvements
Quality control needs improvements in particular for BGC

What are the main priorities?
Contribute all observed data to easy accessible platforms, so less data are hidden for people outside the observation community.
Many data are not yet available because there is no money/ time for the last required QC & harmonisation step before being good enough to share
Many sensor platforms now only provide the 'easy' physical data and shy back from the more complicated sensors. This is an important hurdle to take.
Light climate data (at high spectral resolution) are required to link & validate in-situ data with optical satellite data.
Different applications: forecasting, process studies, digital twin
Definition of applications is key
Cruise/campaigns very short term - JERICO should be more continuous coordination of best practices across Europe
Provide good information on the interpretation of novel sensor data in comparison with 'traditional' data sources. Otherwise modellers cannot use numbers that they don't know what they mean.
And also "translate" the meaning of the data generated by most "traditional ongoing" and "novel" sensors as sometimes this is not sufficiently clear from the observational community to the modelers community. On the other side, some model products are not well understood by the observational community.
This is mostly important when dealing with biological diversity (functional or taxonomical) connected to BGC and productivity and biological trophic fluxes connected with BGC, which are main issues for dealing with the main questions

about climate/global change, anthropic pressures and health of both pelagic and benthic coastal ecosystems.
Providing data/knowledge about the coastal/estuarine morphology (as this will drive in this environment the global dynamics, not only physics!) remind that many activities or ecosystem functions are located in very shallow water / intertidal areas (aquaculture, fish nursery, benthic primary production…)

iii. *What are the main research themes that need integrated monitoring infrastructure (JERICO-RI)? (KN1, KN2) 14'*

Notes:

Combined time series at fixed locations for meteorology, ocean physics (T, S,, SPM, light climate), chemistry (nutrients, ,TIC,pCO2, O2) and biology (chlorophyll, fluorescence, phytoplankton species & size composition, zooplankton), in order to evaluate the interacting processes involved in climate change, wind farms and eutrophication that will occur at the same time.

To what extend can new observations improved/optimise models in the future?
Coastal ocean health
- Harmful algae blooms
- biodiversity & pelagic and benthic habitats
- cynobacteria
- dedicated experiments are required
- MSFD (do we really get what we need?)
- Thresholds for critical parameters based on obs and model (models and obs need assessment)
- Blue Economy

Operational forecast
- machine learning new approach for integration in the future

Climate change / global change
- Extremes in models may be improved using obs
- long term observation provide validation data for long term modelling (and uncertainties of our long term modelling capacity) and then anticipate knowledge on trends and trajectories of the coastal ecosystem

Coastal use
- Interaction between humans and ecosystem (coastal engineering - port development, aquaculture, fisheries, (continental inputs…)
- Offshore - Windfarms
- Ocean energy

iv. *What are the requirements of the JERICO observing community from modelling? What additional modelling activities should be developed for*

integration of JERICO-data and improvement of final services offered by JERICO?(KN2, KN1, KN3) 14'

Notes:

OSE-OSSE (optimal measurement types, locations etc), where to expect largest effects, e.g. in climate change
Interpolate sparse observations
Triple collocation
Use model to quality control observations (identify outliers)
observation locations for climate change detection can be based on scenario model predictions on where the effects will be large / select most sensitive locations for climate change.

v. ***What kind of observations are provided in JERICO but not exploited in the models for the moment? Why are these observations not used? What are the reasons preventing the use of this information? (KN2, KN3) 13'***

Notes:

Esoteric question: should models adapt to observations? or vice versa?
RVerney : I would say both models and observations must adapt to societal challenges and related research questions...

I would say that scientific questions will drive both observation techniques/approaches and modelling approaches development...But we really need dialogue between both!

There are various new types of observations bubbling under, not necessarily yet available fluently from data aggregators. Due to new data formats or due to pending issues with QC. These include some optical and imagery based observations.

The interest in consolidating these novel automated sensors relies on the spatial and temporal scales that can be tackled with them. But of course, this requires that models also acquire the possibility of dealing with these scales and to integrate these types of data…
The scales tackled as well as the type of data generated is complementary to "traditional long-term data".

Rverney : should we extend and extend parameters to be monitored or keep them "reasonably limited" and put our effort to maintain these observations available, continuous, reliable?

Availability/continuous/reliable are key requirements

Combination of satellite and in situ observations can improve interpretation and usefulness of data (e.g., functional groups) (true, together with model results)

Availability, Error estimates, continuity can be problems (RVerney : to me this is the challenge, not an issue…)

vi. ***What are the next steps from the modelling group? What strategic actions would you propose for the next months and in a longer term? (GENERAL)10'***

More efficient use of high frequency observation in coastal areas
Consolidated statistical methods

Pick the low hanging fruit - e.g., gather all JERICO-RI SST for incorporation with a European sea model with SST? (but this might already be happening via CMEMS/EMODnet?)
Maybe modellers and observers would need to converge on common scientific questions to tackle and to combine both "traditional" and "novel" observation and modelling techniques in order to solve them…

Round Table 2:

PSSs NW Med., CRETAN + IRSs BB, IB, NA

Attendees:

Round Table Group 2	
Group 2 - LINK TO DOC HERE	PSSs NW Med., CRETAN + IRSs BB, IB, NA
Baptise MOURRE	
Anna Rubio (rapporteur), Costas, Laurent C.	
NAME	First name
Rubio	Martin
Mourre	Baptiste
Mostajir	Behzad
Cantoni	Carolina
Ulses	Caroline
Frangoulis	Costas
Petihakis	George
Charria	Guillaume
Pearlman	Jay
Tsiaras	Kostas
Coppola	Laurent
Magaldi	Marcello
Berta	Maristella
Pfannkuchen	Martin
Marini	Simone
Emma	Reyes
GARNIER	Roland
Total in Group 2 :	**17**

Questions and Notes:

i. ***What are the modelling competences inside the JERICO-RI community and this group ? -> COMPETENCE MATRIX 10' to work collaboratively in the matrix***

canvas; link to COMPETENCE MATRIX table
modelling_competence_matrix_v0

No doubts - all the participants filled the competence matrix.

ii. What are requirements on JERICO-RI for filling the gaps of observations for seamless service (e.g. coastal-estuary, BGC, BIO)? (KN1, KN2) 14'

Georges P.: What observations we are missing if we want to provide a seamless service.

Anna R.: Not only in terms of observation but also in term of QC, timing, lack of information on the accuracy of observations

Joao V.: Lack of real-time observations really ready to be used - even more difficult when trying to observe chemical/biological variables
Investing in observation systems for BIO and CHEMICAL variables in RT or delayed time with good timing.

Marcello M.: JERICO can provide a standard way to provide the data for the modelling community. Also providing the estimates of the error of the observations for DA
Also geographical gaps - the coverage of HFR is by far not optimal, and this should be improved

Marcelo M.: What is the future of DA ?? are the classical schemes still be there in the future?? this can change the requirements on data from the modelling community.
Baptiste THere will be changes but no revolution, so data wuill be needed.

Laurent C.: Need to maintain High QA long-term data series - but there are also synthetic data from neural networks - so new machine learning tools could be also a solution to fill observational gaps and modellers to develop new modules and improve the calibration of models outputs. The propagation of errors must be taken into account

Joao V.: other two roles: JERICO can be a framework for citizen science - how local communities contribute to observational efforts, also how we can make the most of local coastal sensors fro sea users
JERICO can have a role on creating/defining observing proxys - or use different ly existing information (for instance zoo from backscatter data from ADCPs)

iii. What are the main research themes that need integrated monitoring infrastructure (JERICO-RI)? (KN1, KN2) 14'

Laurent D.: this is a very large question - BGC dynamics and cycles - all the chain from Physics to BGC to BIOLOGY; Biological carbon cycle, bioregions, biological production

Marcello M.: already identified three integrated teams: ecosystems approach, impact of extreme events and coastal forecasting -- maybe we should rethink this questions taking as reference the Science Questions defined in JERIOC-DS and S3

Behzad Mostajir (from chat): maybe biodiversity, microbial communities (bacteria(, etc.)? to add this idea - however this kind of observation is more in the classical way not operational monitoring.
Observations that are not operational can also be key for validation and process studies.
Connectivity - biological buy also in terms of contaminants (need integration of disciplines, spatio-temporal scales and also aspects related to climate) - not only in RT but also in DT for validation - Baptiste: In the PSS NWMed there is an action that has also this integrated perspective modelling-observations

Joao V.: Put together the observations of to improve the description of the boundary current (long distance transport linked to slope circulation)

iv. What are the requirements of the JERICO observing community from modelling? What additional modelling activities should be developed for integration of JERICO-data and improvement of final services offered by JERICO?(KN2, KN1, KN3) 14'

Emma R.: Possibility of develop a common OSEEs packages that could be use as a tool for future observatory locations or extension plans? Baptise: I missed this

Emma R.: 4D added-value products from model-observations
(integrate 3D model data with surface measurements) in continuity with what was done in JERICO-NEXT (WP3) , for instance CNR, AZTI were working on that in JERICO-NEXT it would be nice to have continuity and develop community tools

Laurent C.: Missing expertise on OSEEs, and more reconstruction methods - need to tackle this!

Jay P.: Requirements on the observation communities to help minimize unknown uncertainties - Baptiste: More information from instruments provides, intercalibrations (cross platform calibration) and also (Guillaume) more knowledge on the variability of the given area
(Workshop on the uncertainties - to come in the future - G. Charria can provide soon more info on this)
G. Petiakis also working on We will be looking at the issue of uncertainty in MINKE project.

Guillaume C: Mind that OSEES will tell you if the observation will improve or not your model, but modelling in the region can also not be the mail goal , also is dependent on what scientific questions we have in mind - so it is important to have this in mind

v. ***What kind of observations are provided in JERICO but not exploited in the models for the moment? Why are these observations not used? What are the reasons preventing the use of this information? (KN2, KN3) 13'***

Plankton, phytoplankton and zooplankton, biodiversity and species
Benthic community not part of modelling outputs - or not enough data everywhere
What is modelled and what is observed? so model and observations are not compatible even if there are trying to answer to common question

George P.: In biological variables this is especially critical because the definition of the variables is not so standardized. It makes this more difficult.
Costas: Difficulties also to convert biological data measured to the data that correspond to the model variables
Also in the coastal area DA is a challenge because of the variability in the coastal area and also due to the HF measurements in general (gliders, HF radar for example)

vi. ***What are the next steps from the modelling group? What strategic actions would you propose for the next months and in a longer term? (GENERAL)10'***

Compilation of the info and ideas of today of course
Lining the actions with the needs for the ongoing actions in PPS and JERICO-RI in general

SLIDES PRESENTED DURING THE MEETING

Integration of coastal modelling and observations to fit for the purpose of seamless service

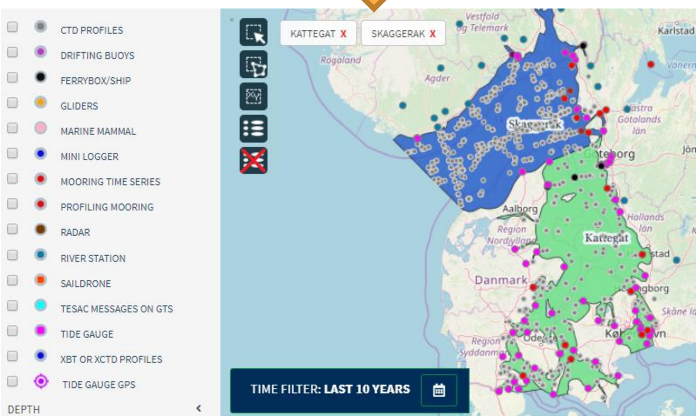
Jun She, js@dmi.dk
Danish Meteorological Institute

JERICO W#2 Modelling Workshop, APRIL 21 2021

Rational: JERICO-S3 T2.4

Regional connectivity in Baltic-North Sea:

- **Identify benefits from JERICO (IRS-KS) on climate change, ecological service and operational oceanography in the Baltic-North Sea via integrating JERICO with RS+ modelling**
- **Identify gaps of current monitoring systems in the Baltic-North Sea transition region**
- **Establish links between JERICO and Baltic-North Sea regional modelling communities**



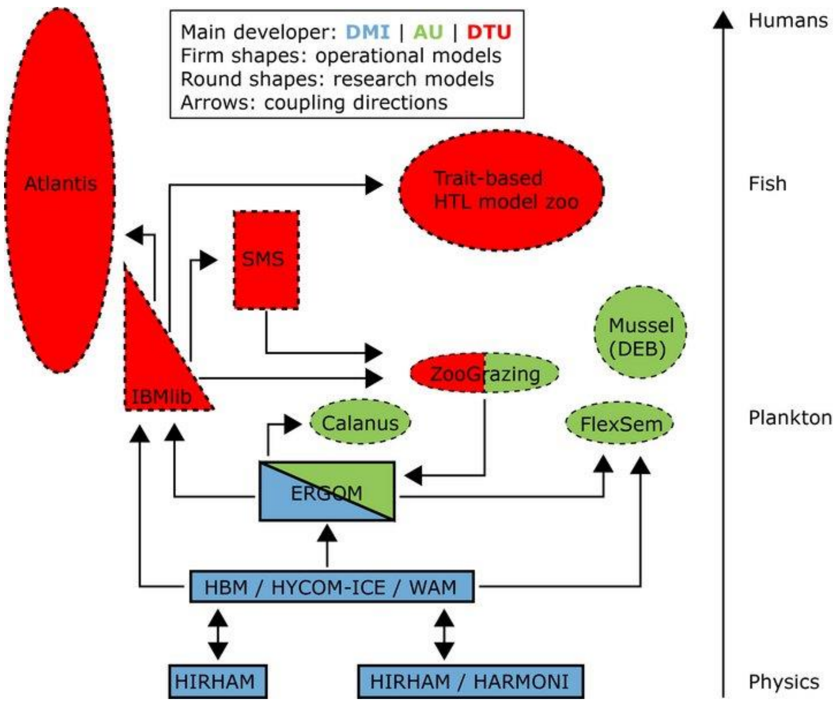
Multi-scale processes in land-coast-open sea continuum

- **Establish links between JERICO PSS/IRS and member states (Finland, Denmark, Germany, Norway, Spain)**
- **Identify benefits from JERICO PSS/IRS on applications in national waters**
- **Make recommendations for nations to take up and use JERICO results in national applications, as well as filling the gaps in national monitoring systems.**

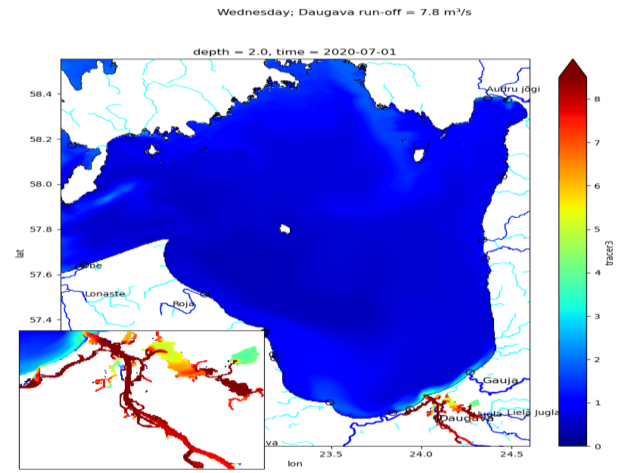
Contents: Model-observation integration to fit for the purpose of seamless service

- An overview of coastal modelling and data assimilation capacity
- For improving models
- For improving model products
- Fit-for-the-purpose of CC Adaptation and ocean health
- For assessing and optimising sampling strategies
- For filling knowledge gaps

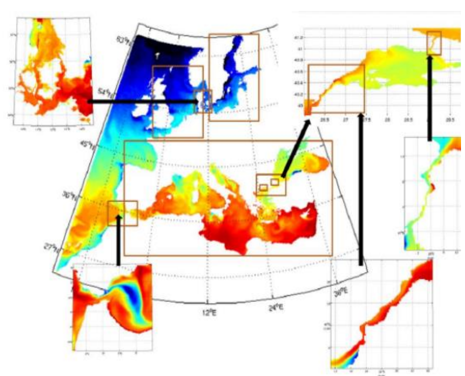
Seamless modelling capacity developed in Denmark



Danish Marine Ecological Modelling Centre Modelling Framework (www.memc.dk)



Marine plastic modelling from open sea to coastal to inland rivers (90m resolution)



Pan-European Two-way nested ocean model HBM: 0.1-3nm resolution

Model-observation integrated capacity developed at DMI

- **Data Assimilation**
  - Satellite SST DA (Larsen et al., 2007)
  - T/S profile DA (Zhuang et al., 2011, Fu et al., 2012)
  - Sea level DA (Madsen et al., 2014)
  - DA schemes: 3DVAR, EnOI, En Karman Filter (PDAF)
  - BGC DA Schemems are currently developed by SMHI and BSH, will be shared

- **Non-assimilative methods:**
  - Objective analysis
  - Spatial pattern/category analysis
  - Time series analysis
  - Machine learning

Model-observation integration for improving model performance

- **DMI Operational forecasting system:**
  - Two-way nested model HBM for Baltic-North Sea-Danish fjords
  - 100m – 5km resolution

$Dx/dt=f(x, \lambda_0 \wedge \delta\lambda)$

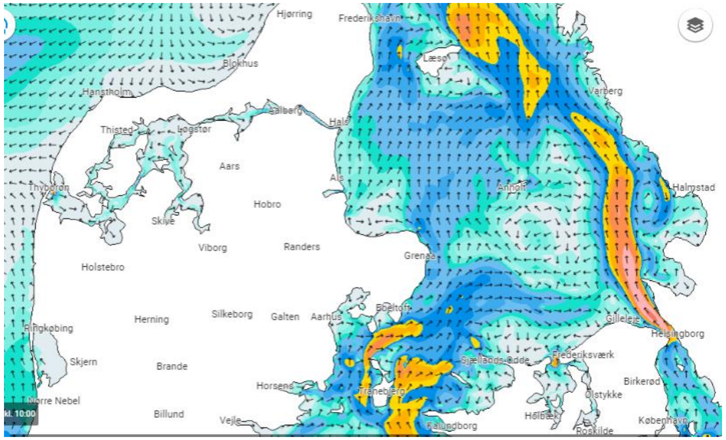
X: state vector

λ_0: model parameter vector

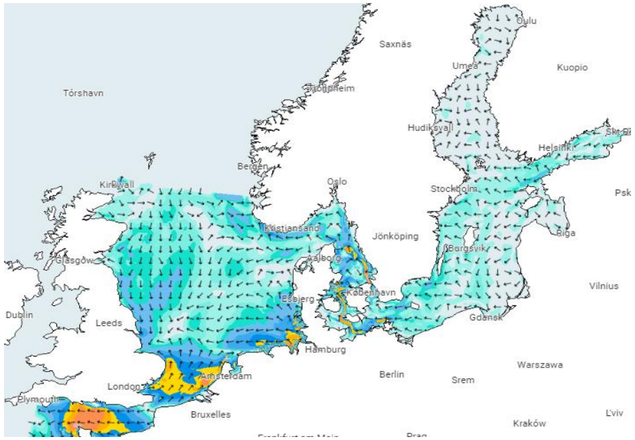
$\wedge$: operator

$\delta\lambda$: error of λ_0

- **Reduce model parameter errors**
- **Reduce errors in boundary conditions and forcing**
- **Reduce errors in initial conditions**



Source: www.dmi.dk



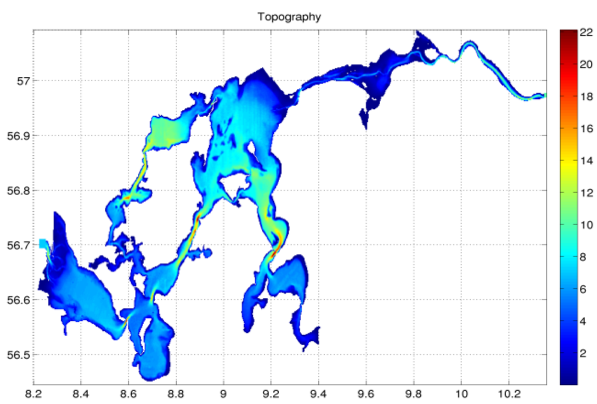
Reduce model parameter errors: an example

Shallow water SST improvement

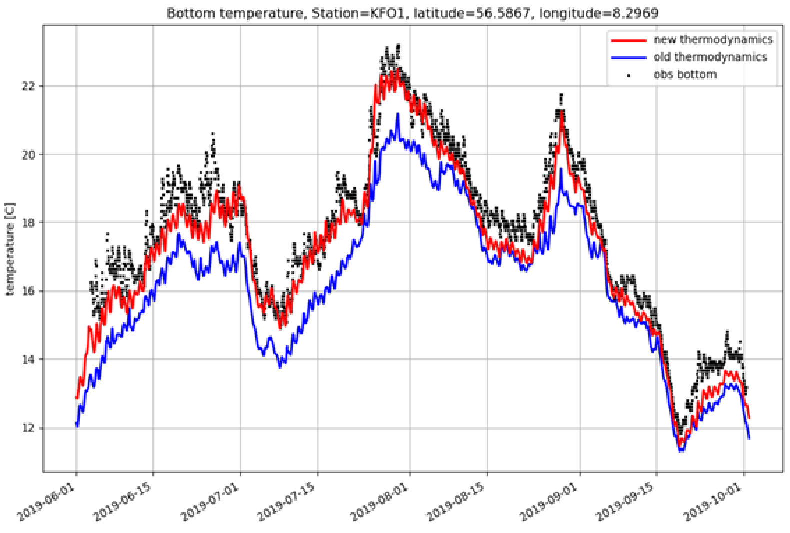
$$I = Q_{SW}[R_{SW}\exp(-h/\zeta_1) + (1 - R_{SW})\exp(-h/\zeta_2)]$$

$$\tilde{\zeta}_i = \zeta_i \cdot max(0.2, h/H_{max})$$

$$H_{max} = 5 \text{ m}$$

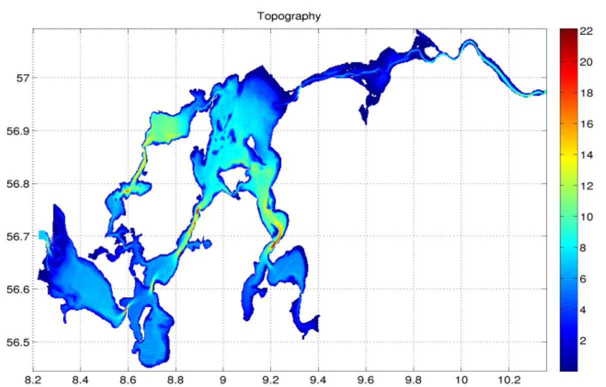


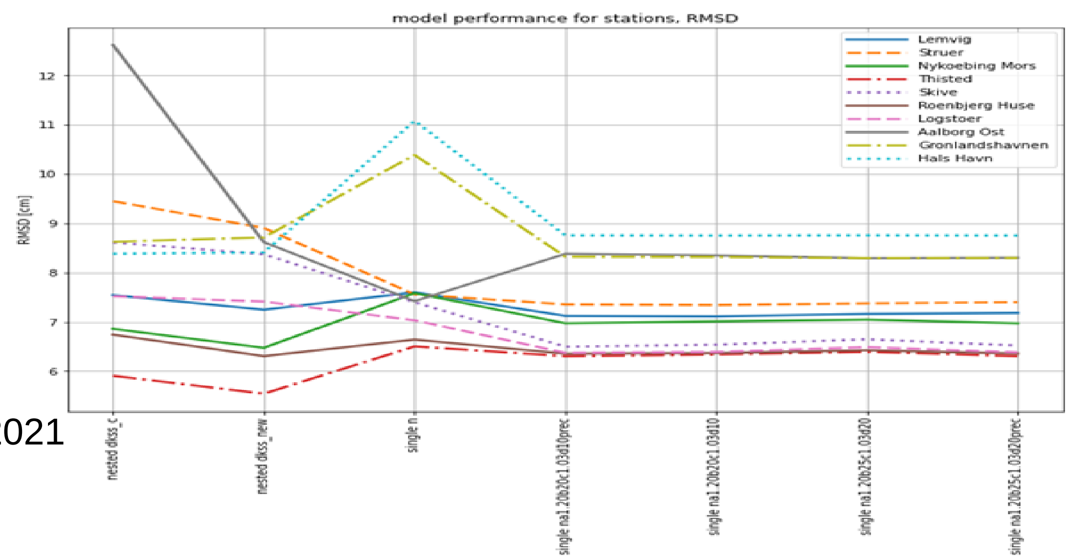
Source: Murawski et al. 2021



Reduce errors in boundary conditions and forcing: an example

- **Use observations tuning LBCs for a stand alone Limfjorden model**
- **Optimal setup is achieved by tuning LBCs (sea level, salinity, river runoff); systematic bias in LMCs are removed**



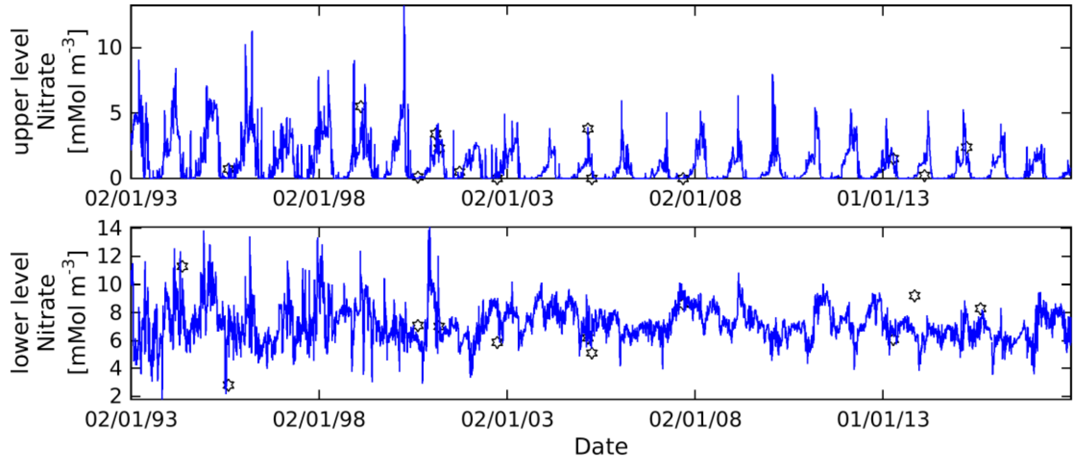


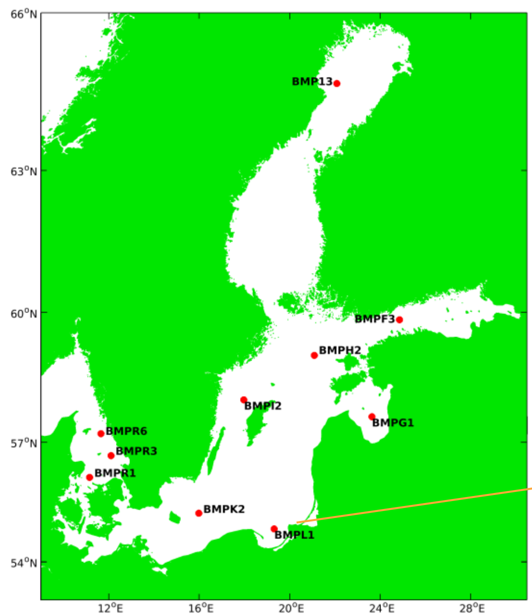
Source: Frishfelds et al. 2021

FORCOAST
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870465.

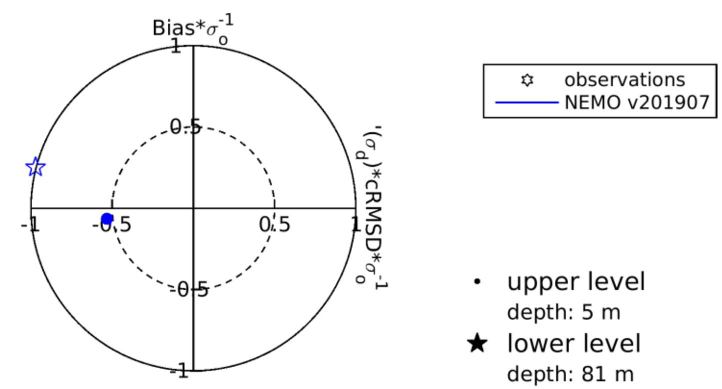
Reduce errors in initial conditions: BAL MFC BGC reanalysis

- T/S/O2/Nutrient assimilation
- NEMO-SCOBI model





BMPL1



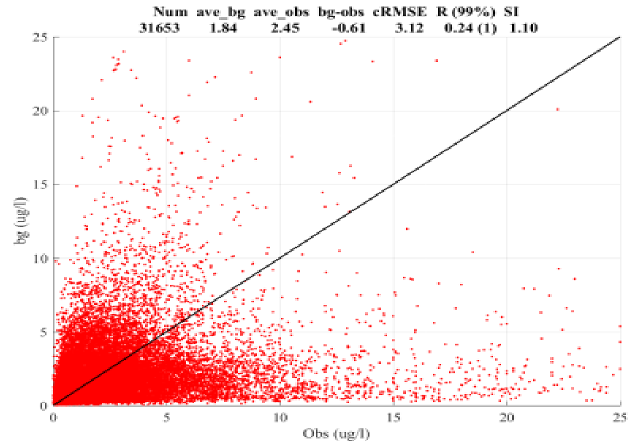
Source: www.boos.org

Model-observation integration for improving model products

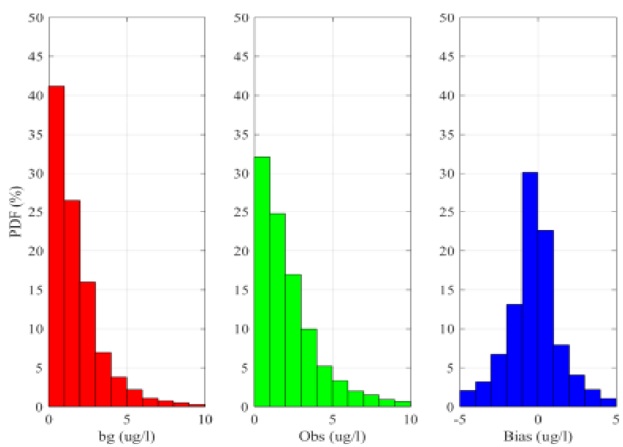
- Model product validation
- Model product correction
- Multi-model ensemble (MME) forecast

Model product validation using in-situ observations

- **Intercomparing in-situ and reanalysis BGC observations in the Baltic Sea**
- **Input data:**
    - CMEMS BALMFC reanalysis 2014-2016: chl-a, DIN, DIP
    - ICES and HELCOM data data in 2014-2016: chl-a, DIN and DIP; CMEMS chl-a satellite L3 data

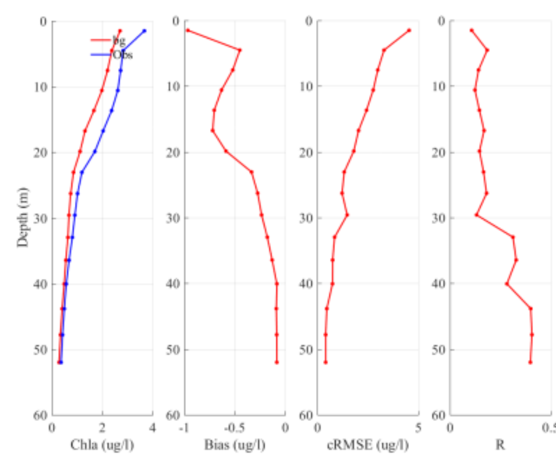


scatter maps of reanalysis chl-a and observed one. The reanalysis has a bias of -0.61ug/l, cRMSE 3.21ug/l and a correlation of 0.24.



Discrete PDF (Probability Distribution Function) of reanalysis (left), observed (middle) and difference between the reanalysis and observations (right) chl-a data. For the reanalysis, 99% of the data is between 0-10 ug/l while it's 97% for the observations.

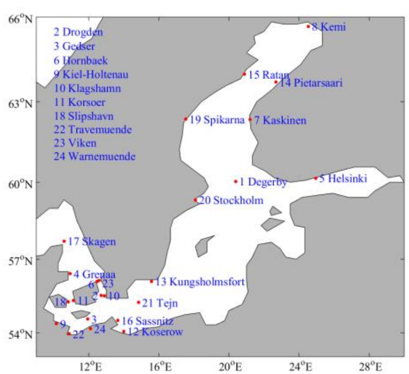
Nork:



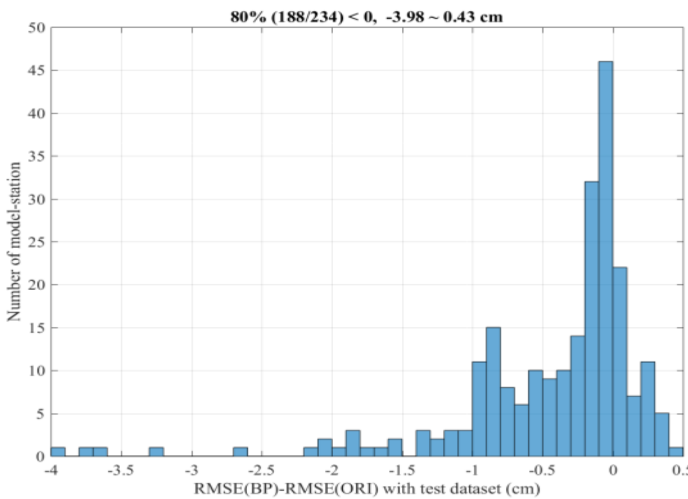
Model product correction using in-situ observations

- **Use BP neural network to improve sea level forecast**
- **Observations**: hourly data from 24 sea level stations in the Baltic Sea
- **Model data**: 48h forecast from 11 models were used, i.e.:

SMHI.WL01
SMHI.WL03
BSH
BSH_HBM
DMI
BAL.FMI
FCOO
SMHI NEMO
IOPAS
BALMFC
MSI_HBM



Source:
She, 2021

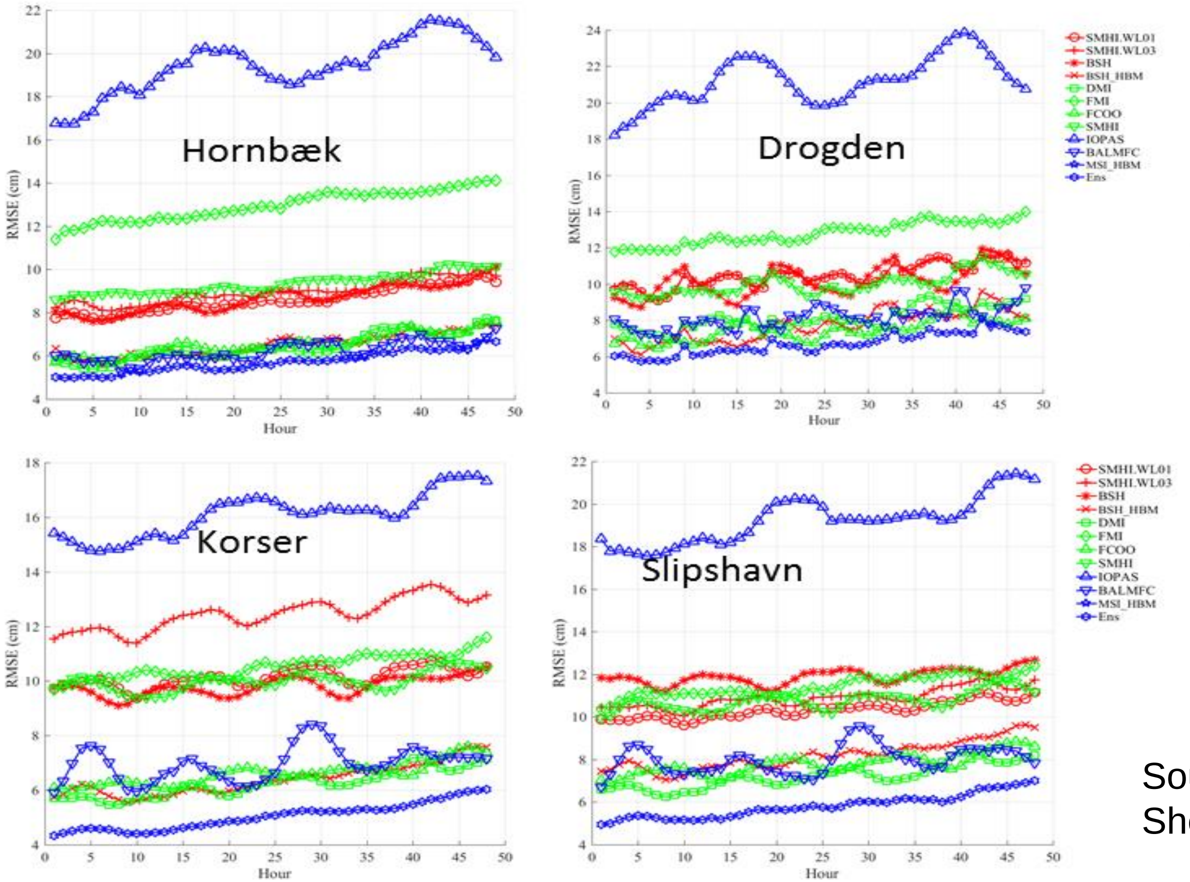


Number of model-stations in the interval of cRMSE difference, showing a decrease of cRMSE by using BP NN in most of the stations

Table 1 Sensitivity of using different number of neuro cells for training (Slipshavn_BSH model)

Amount of data for training	RMSE（cm）with 10 cells and 5 training iteration		RMSE（cm）with 20 cells and 5 training iteration	
	Range	Mean value	Range	Mean value
100	7.22-7.92	7.39	7.38-7.76	7.60
200	6.91-8.10	7.18	6.98-7.12	7.04
300	6.82-7.17	6.88	6.70-6.82	6.78

Weighted multi-model ensemble (MME) forecast

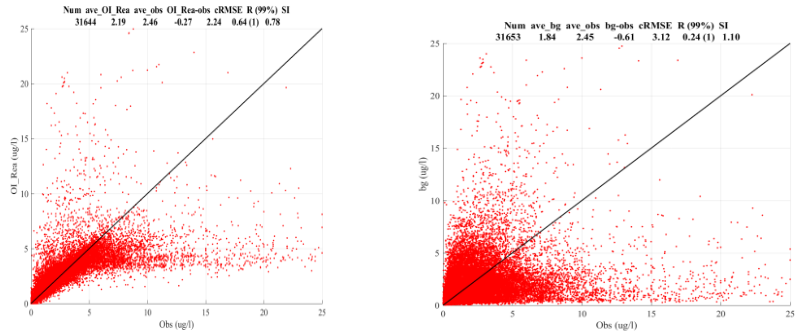


Source:
She, 2021

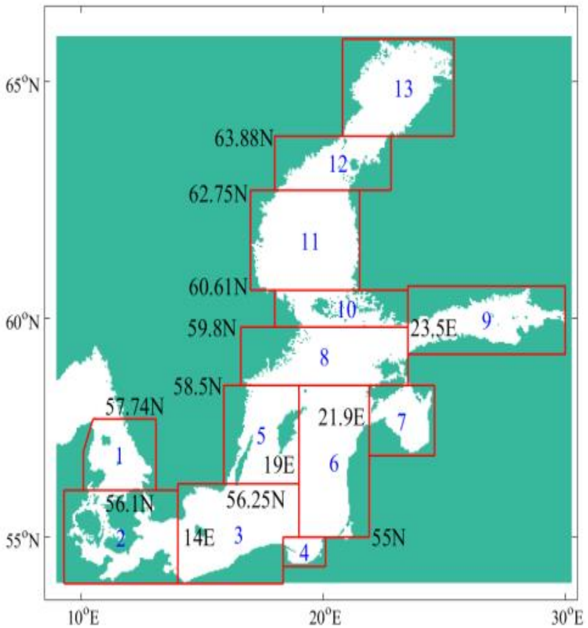
Mulri-model ensemble forecast at some DK stations. MME performs the best, followed by DMI-DKSS, FCOO, BSH-HBM and BALMFC-HBM

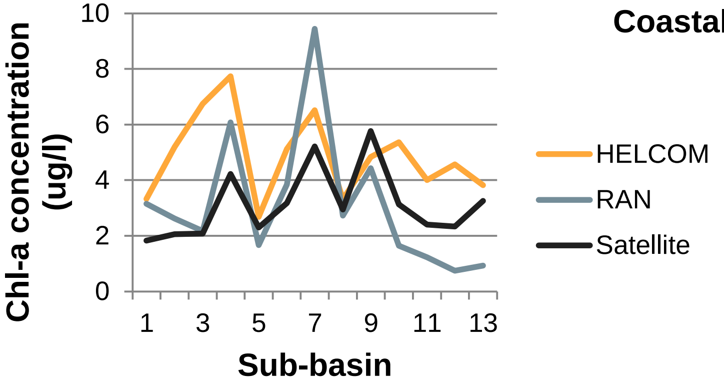
Fit-for-the-purpose model-observation integration

- Integrate BALMFC reanalysis with ICES in-situ data for eutrophication assessment
- Indicators: summer chl-a (upper 10m mean) chl-a and winter nutrient (up 10m mean).
- Spatial scale: sub-basin; coastal/open sea



Use OI (left) to improve chl-a reanalysis product (right)

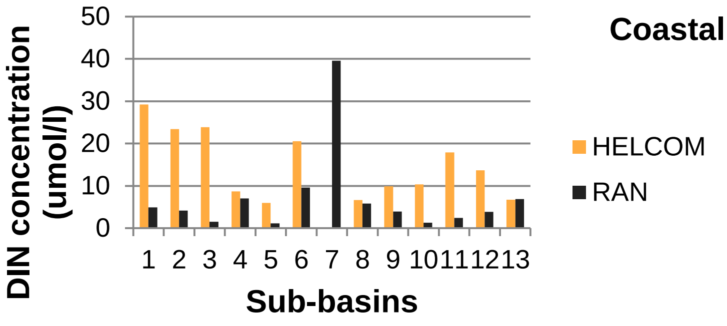


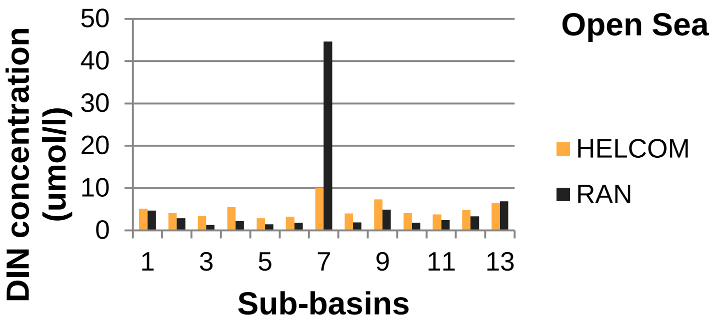


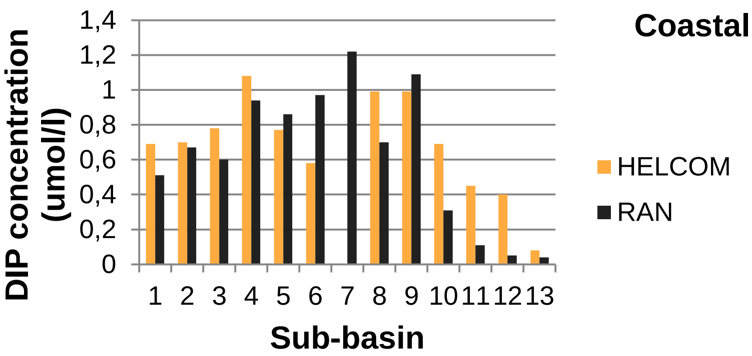
Source: She, 2021

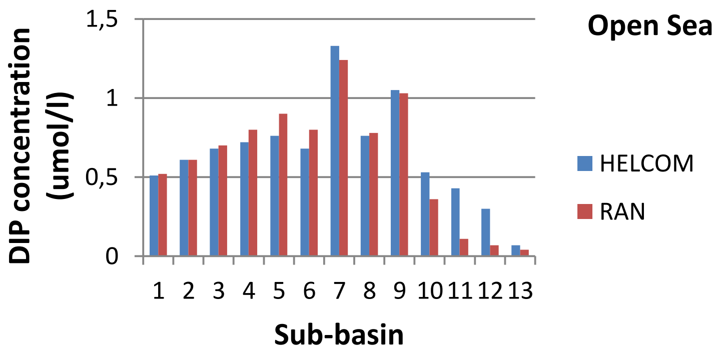
elling Workshop, APRIL 21 2021

Fit-for-the-purpose model-observation integration: winter DIN & DIP in upper 10m: sub-basin mean









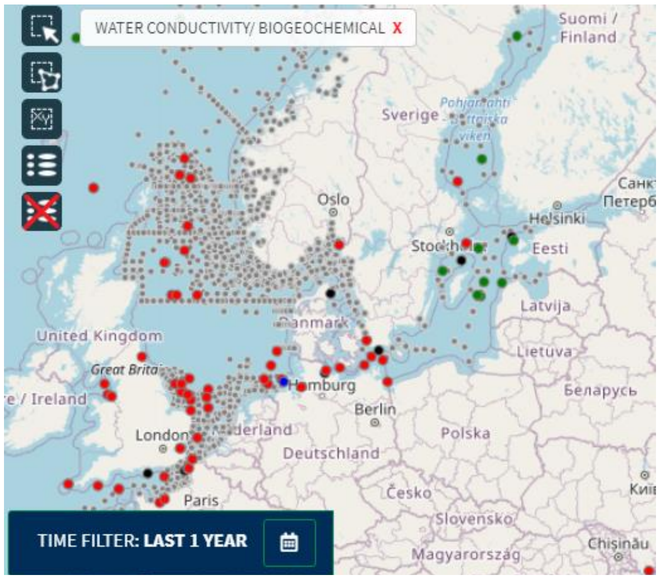
Source:
She, 2021

Using modeling tool to assess and optimize sampling strategies (BGC component)

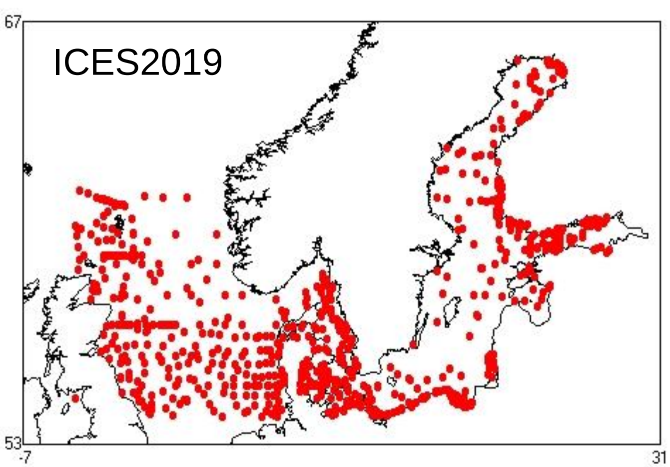
- Availability and use of observations in CMEMS and national modelling systems
- Major gaps identified in observations esp. BGC data, results from existing projects OPEC, CMEMS in-situ requirements and COINS
- References:

  - Mészáros L., J. She and G. El Serafy (2021). Copernicus requirements for Biogeochemistry Essential Ocean Variables in the coastal ocean. EEA COINS Rep.
  - Meszaros L., GE Serafy, J. She, H. Frigstad, G. Umgiesser, A. Tyler, S. Groom (2021). Inventory of existing European Biogeochemical observations Support to Copernicus In Situ Data Coordination. EEA COINS Rep.
  - She J., E. Buch and G. Nolan (2017), Report on lessons learned from OSSE experiments in support of the definition of requirements to an in-situ observing system. CMEMS Rep.
  - She, J., I. Allen, S. S. Arkin, M. Butenschon, S. Ciavatta, W. Fu, etc. (2014). Effectiveness of routine monitoring of ecosystem properties in European regional seas. OPEC Report, D5.2
  - She, J., B. Armstrup, K. Borenas, E. Buch, L. Funkquist, P. Luyten and R. Proctor (2006). ODON: Optimal Design of Observational Networks, ODON Final Report.

BGC data: where are the gaps?



Source:
EMODnet

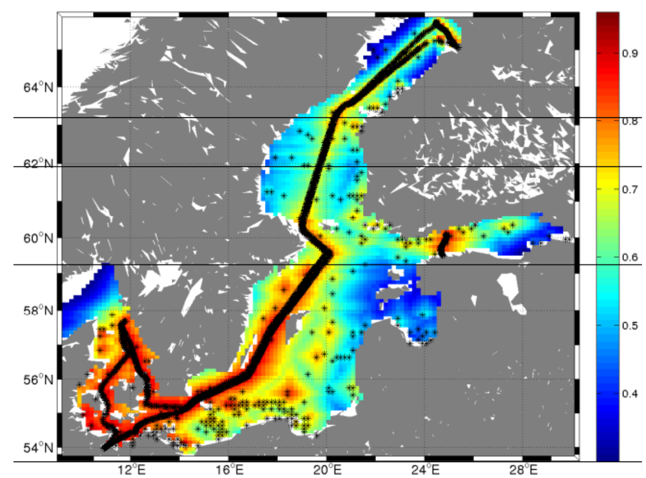


Source:
ICES

Chl-a data in the Baltic-North Sea

- EMODnet: R/Vs, Argo, Ferrybox, moorings
- ICES2019: R/Vs
- EMODnet and ICES data compensate each other

Effective coverage

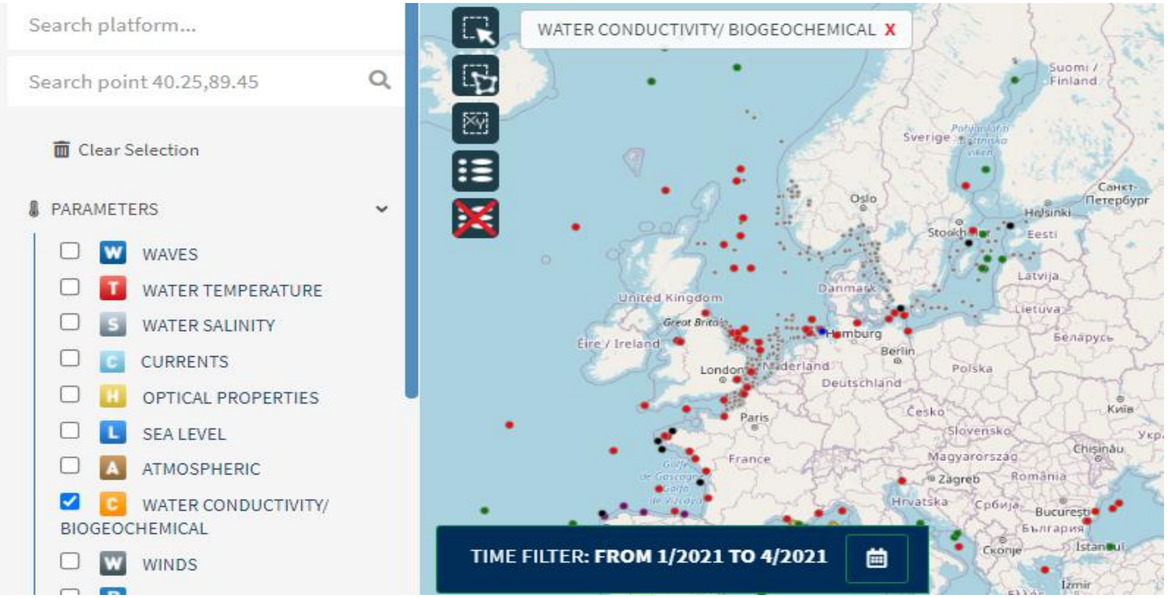


Source: She et al., 2014

BGC data: timeliness

- For data assimilation in operational forecast
- Near real-time delivery is required:
    - Ferrybox, mooring, Argo data fit for the purpose
    - Most of the R/V BGC data are in delayed mode

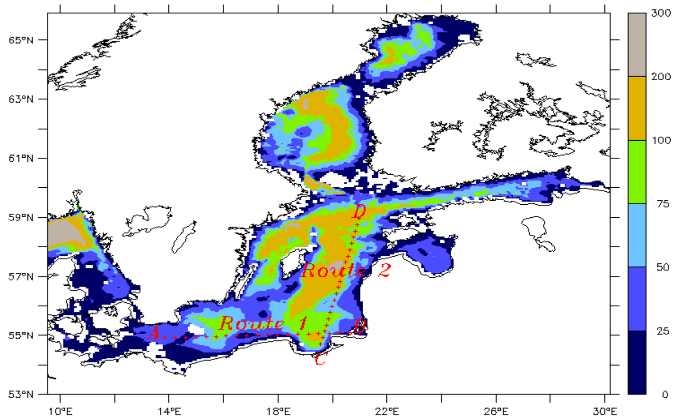
- For data assimilation in interim reanalysis
- Rapid interim delivery (eg within 3 months) is required:
    - Ferrybox, mooring, Argo data and some of the R/V data fit for the purpose
    - Many of the R/V BGC data are yet to meet the requirement



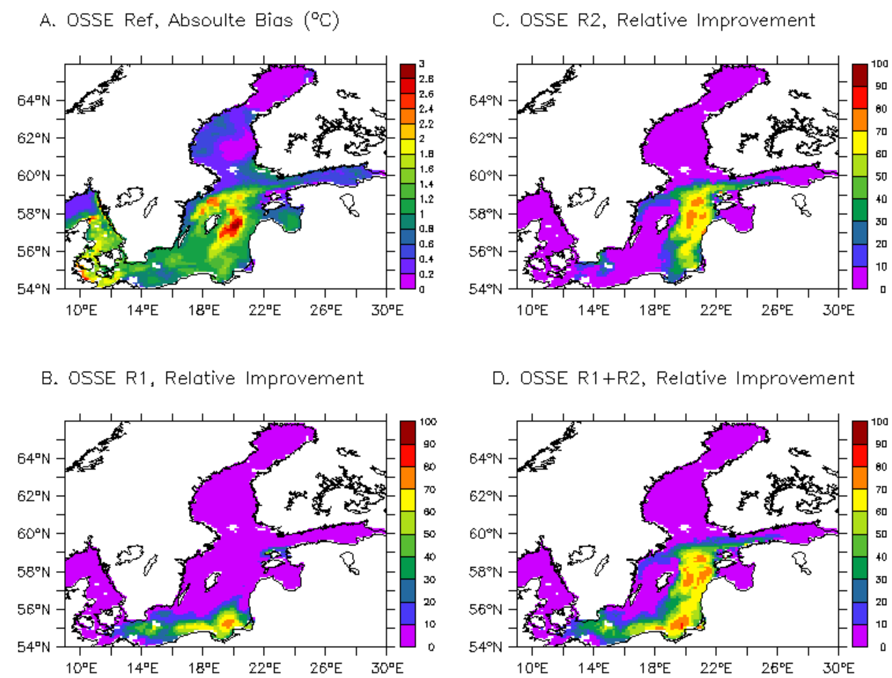
Source: EMODnet

Sampling design – adaptive monitoring

- OSSEs on Glider route design in Baltic Sea: Route 1 and Route 2 (JERICO-WP9)
- Models: HBM-ERGOM
- Assimilation method: EnOI
- Conclusion: due to the model error features in the Baltic Sea, route R2 is much more efficient than R1.



Source: Wan and She, 2013



The glider route R1 and R2 can reduce mean salinity deviations for the entire Baltic Sea up to 3.8% & 27% respectively

Modelling-monitoring integration for filling knowledge gaps

- **EuroGOOS Strategy 2030**: to expand marine service from operational to climate and ocean health.
- **Major knowledge gaps**, e.g.
    - Constal-estuary continuum dynamics
    - Upper layer physical-optical-bio-geochemical coupling
    - Biofouling and sedimentation of pollutant particles
    - Interaction between pressures, marine climate change and ecosystems (flooding- nutrient load-warming-oxygen- eutrophication; acidification-warming-sea weed-blue carbon etc)

Final remarks

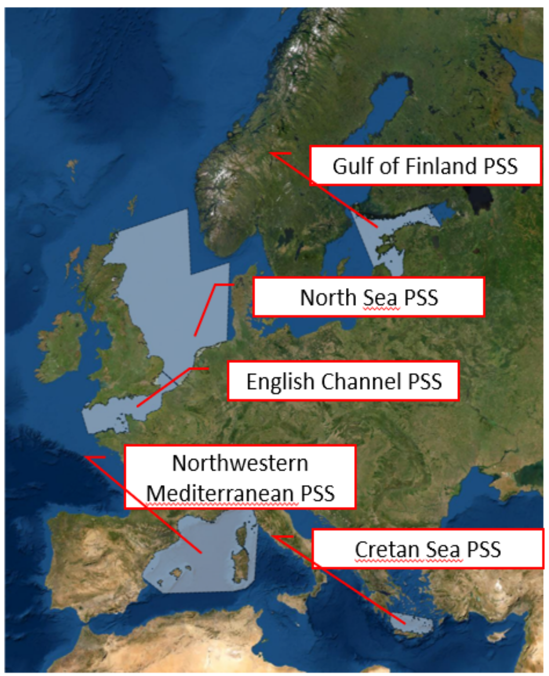
- Current modelling and assimilation capacities provide a seamless platform for using in-situ observations (more dedicated modelling capacity needs to be developed for using coastal observations)
- Five areas of integrated modelling-monitoring applications have been discussed, using examples from DMI and BALMFC: Improving models; Improving model products; Fit-for-the-purpose of climate change, ecosystem-based management; Assess and optimize sampling strategies; Filling knowledge gaps in operational oceanography
- Modelling is part of ocean observing, integrated modelling-monitoring should be used as an approach for next generation JERICO-RI
- Call JERICO for a major role in filling data and knowledge gaps in expanding marine service from operational to climate and ocean health
- Hopefully this talk reminds you the model-observation integration in your country

This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 871153.

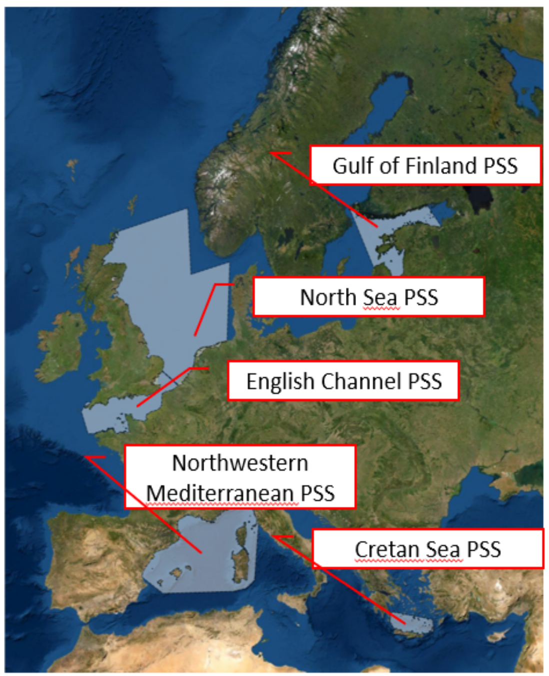
Project coordinator: Ifremer

- END -

Modelling activities in JERICO-S3 PSSs



Modelling activities in JERICO-S3 PSSs
(modelling-observation linkages)



a. PSS modelling-observation integration actions planned during JericoS3

Dec 2020 to August 2022
Implementation of PSS actions

b. Examples of modelling-observation integration actions from the past (taken from Cretan Sea PSS)

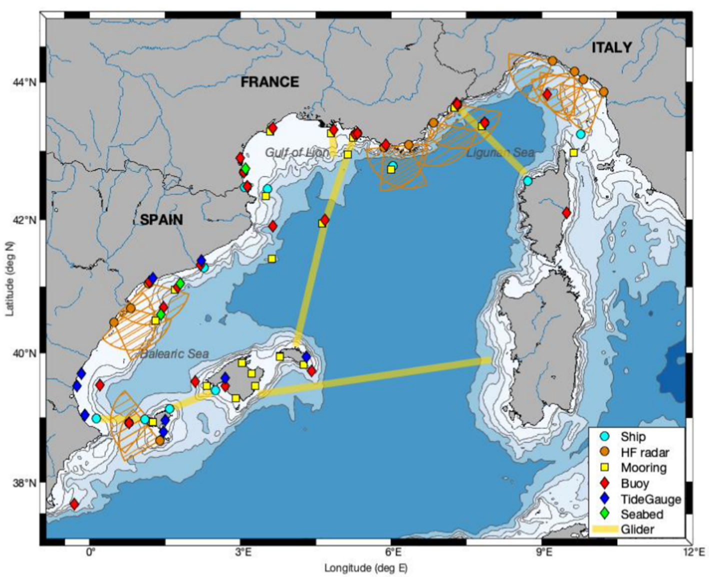
NW MEDSEA PSS Actions # 1 and #4

- Institutes : CNRS (Laurent, Caroline), SOCIB (Baptiste), CNR (Maristella, Annalisa), Ifremer (Pierre, Ivane), PdE

General objectives: variability air-sea CO_2 fluxes, reconstruction of 3D dynamics and impacts on ocean dispersion of biological component and pollutants, BGC regional models assimilation and validation

Model Objectives : development of new CO_2 module, integration of multiplatform coastal observations through data assimilation, analysis of cross-shelf exchanges and dispersion

Main target variable(s) : AT, DIC, pCO_2, T, S, currents



KEY ELEMENTS of the action	TYPE (NAME)	Variables to be used
Key platform(s)	Fixed platforms (CNRS, SOCIB, CNR, PdE, UPC)	T, S, currents, Fluo, O2, pCO2, pH
	Glider (CNRS, SOCIB)	T, S, O2
	HF radar (CNRS,SOCIB, CNR, PdE)	Surface currents
	Ship visits (CNR)	T,S,O2; AT-CT, pH
	Argo floats	T, S, O2, pH
Model(s)	SYMPHONIE ECO3MS CANYON-MED (neural network)	T, S, currents, O2, Chl, AT, DIC, pCO2, Nutrients, pH, MES
	WMOP	T, S, currents
	Ifremer MENOR model	T, S, currents
Other data sources	Drifter data of opportunity (CNR) Satellite?	Surface currents ? Chl SST

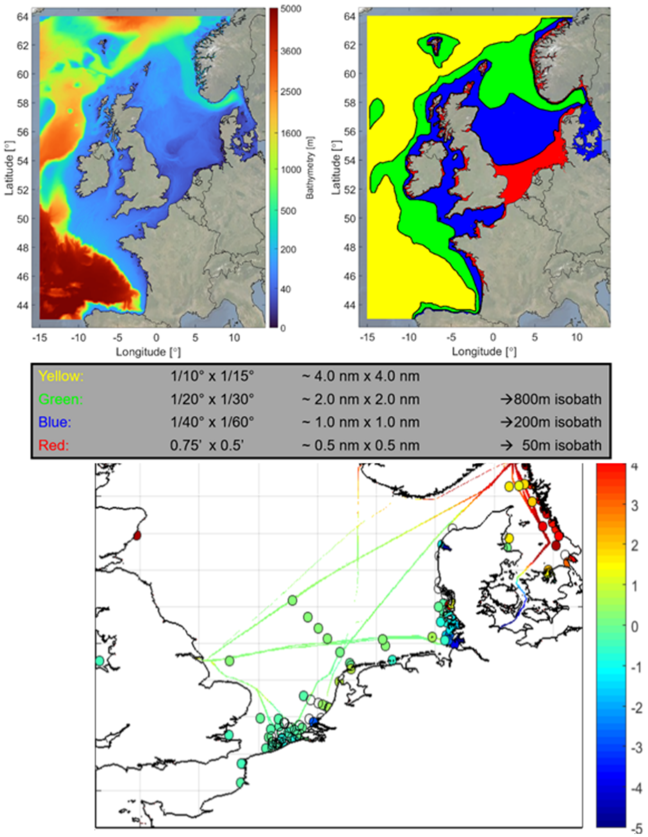
North Sea and Channel PSS Action #5 Intercomparison of phytoplankton distribution using data integration

- Institutes : Deltares (Anouk, Thijs, Willem), IFREMER (Martin)

General objectives: Reconstruction of nutrient and carbon fluxes with models and observation data

Model Objectives : Model validation and cross-validation of observed data

Main target variable(s) : chlorophyll, nutrients, turbidity, O_2, pCO_2



KEY ELEMENTS of the action	TYPE (NAME)	Variables to be used
Key platform(s)	Ferryboxes	T, S, Fluo, turb, O2 ,CO2
	Fixed Platforms	Meteo, T,S, Fluo, Turb, O2, pH, prim. production (PP)
	R/V	T, S, O2, Fluo, Turb, pH, inorganic nutrients, Chla, TIC, alkalinity
Model(s)	hydrodynamic/BGC/Carbonate ecosystem model (Delft-Flexible-Mesh, Dutch Continential Shelf Model: DFM-DCSM)	T, S, Fluo, Turb, nutrients, Chla, PP, O2, pCO2, pH
Other data sources	Satellite	SST, Chl-a, TSM

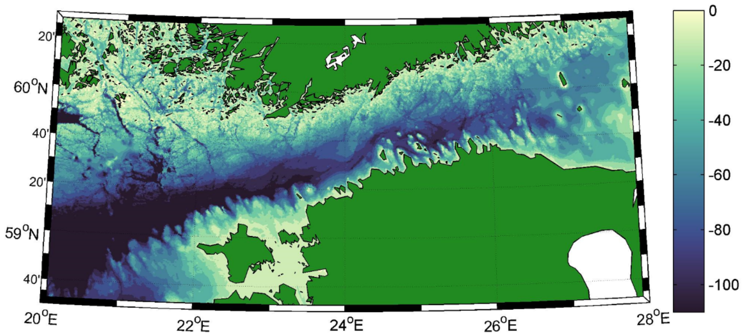
Salinity validation of earlier model version, showing Ferrybox lines and part of available in-situ monitoring locations

GoF PPS
Action#2 The performance of operational forecast models

- Institutes : TALTECH (Liblik), SYKE (Seppälä, Ehrhart), FMI (Laakso), IOW (Rehder)

General objective(s): Analyse and disseminate discrepancies in hydrography and biogeochemistry between in-situ and CMEMS operational forecast model products at the GoF PSS
Model Objective(s) : performance test

Main target variable(s) : temperature, salinity, O_2, nutrients, chla



KEY ELEMENTS of the action	TYPE (NAME)	Variables to be used
Key Platform(s) for this action	Ferryboxes	T, S, chla
	Fixed Platforms	T, S, O2
	Argo-Floats	T, S, O2
	RV surveys	T, S, O2, nutrients, chla
Model(s)	CMEMS physical, biogeochemical operational model products for the Baltic Sea	T, S, O2, nutrients, chla
Other data sources		

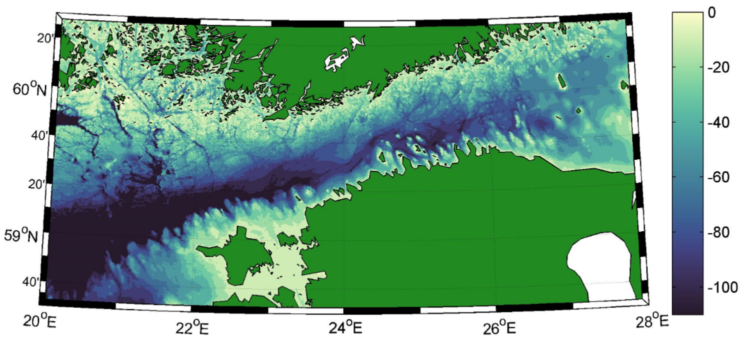
GoF PSS Action #5 Mapping the deep water oxygen conditions

- Institutes : TALTECH (Liblik), SYKE (Seppälä), FMI (Laakso), IOW (Bittig)

General objective(s): Estimate oxygen distribution in the gulf with at least weekly temporal resolution

Model Objective(s) : Contribute to the estimates. Not clear however, if model results will be used in the estimation or not. Depends on performance of the models (GoF PSS Action 2)

Main target variable(s) : temperature, salinity, O_2, nutrients, chla



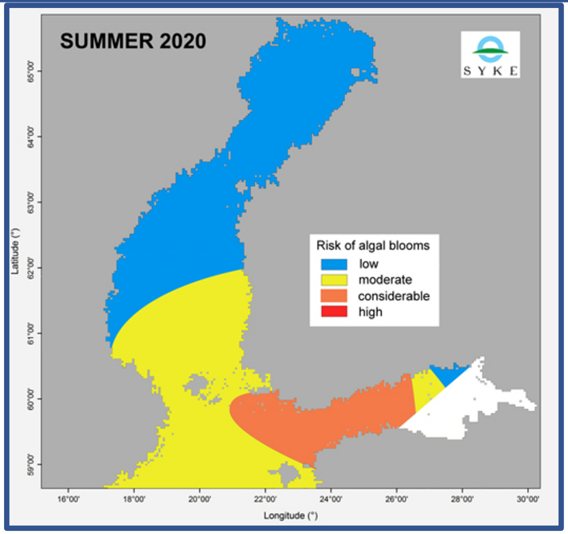
KEY ELEMENTS of the action	TYPE (NAME)	Variables to be used
Key Platform(s) for this action	Argo-Floats	T, S, O2
	Fixed Platforms	T, S, O2
	RV surveys	T, S, O2
Model(s)	CMEMS physical, biogeochemical operational/reanalysis model products for the Baltic Sea	T, S, O2
Other data sources		

GoF PSS Action #7 Forecast models for cyanobacterial blooms

- Institutes : FMI (Laakso), SYKE (Seppälä, Lehtinen)

General objective(s): Analyse the performance of the forecast models for cyanobacterial blooms
Model Objective(s) : Estimate the performance and greatest challenges of the current models and develop ideas on how the models could be advanced.

Main target variable(s) : temperature, currents, nutrients, chla, phycocyanin,



KEY ELEMENTS of the action	TYPE (NAME)	Variables to be used
Key platform(s)	FerryBox	T, chla, phycocyanin, nutrients
	Utö Observatory	T, chla, phycocyanin, nutrients
	Profiling buoys	T, chla, phycocyanin
Model(s)	CMEMS physical, biogeochemical operational/reanalysis model products for the Baltic Sea	T, S
Other data sources	Satellite data as available, data from R/V cruises	

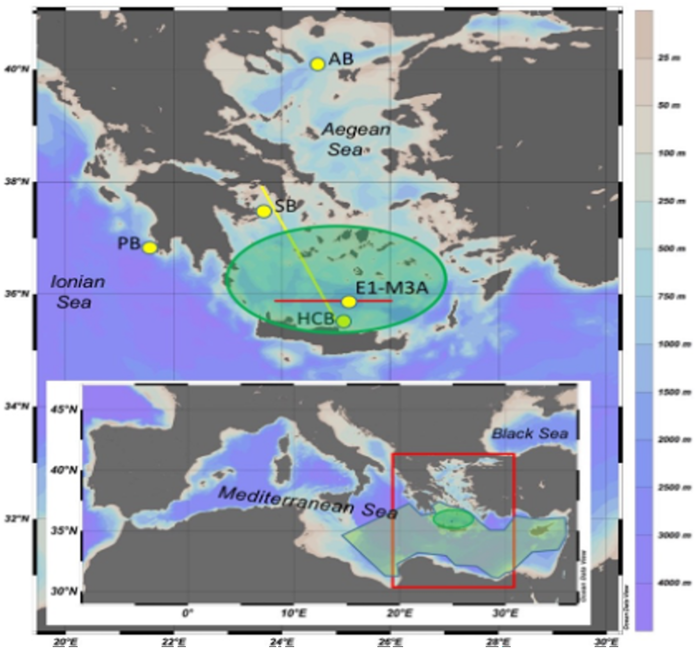
Cretan Sea PSS Actions
#2 Improved approximations of PP &
#4 Upscale of Regional Data to a wider area

- Institutes : HCMR (Frangoulis, Tsiaras), CNRS-MIO (Thyssen), NIVA (King, Marty), SYKE (Seppälä, Ylöstalo)

General objectives: improved simulation of air-sea CO2 fluxes and of PP predictions

Model Objectives : performance improvement, upscaling

Main target variable(s) : Chla, PP, CO2



KEY ELEMENTS of the action	TYPE (NAME)	Variables to be used
Key platform(s)	Ferryboxes (PFB)	T, S, Fluo, O2 +CO2
	Fixed Platforms (HCB, E1-M3A, SB)	Meteo, T,S, Fluo, O2 pH, air+water CO2
	Glider	T,S, O_2
	R/V surveys	T, S, O2, Fluo, pH, CT&AT, inorganic nutrients, Chla, bacteria to phytoplankton
Model(s)	hydrodynamic/BGC/Carbonate ecosystem model (POM-ERSEM-HALTAFAL)	Chla, pCO_2, PP, CT/AT
Other data sources	Satellite	SST, Chl-a

b. Modelling-observation linkages using various observation sources

some examples from the past

Modelling-observation linkages using various observation sources
examples from the Cretan Sea PSS

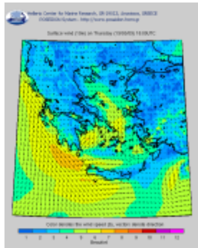
Ecosystem modelling applications (examples)

Observing system	Modelling publication	Area
E1-M3A buoy	Triantafyllou, et al 2003 Assessing the performance of the Cretan Sea ecosystem model with the use of high frequency M3A buoy data set, Ann. Geophys. Hoteit et al 2003 A singular evolutive extended Kalman filter to assimilate real in situ data in a 1-D marine ecosystem model, Ann. Geophys.	Cretan Sea
CTD, bottle, bathythermograph	Triantafyllou, et al 2003 Assessing the phenomenology of the Cretan Sea shelf area using coupling modelling techniques, Ann. Geophys.	Cretan Sea
Trawling data	Petihakis, et al. 2007 Scenario testing of fisheries management strategies using a high resolution ERSEM–POM ecosystem model, ICES Journal of Marine Science	Cretan Sea
Satellite	Triantafyllou, et al 2007 Assimilation of ocean colour data into a Biogeochemical Flux Model of the Eastern Mediterranean Sea. Ocean Sci Tsiaras, et al. 2017. A hybrid ensemble-OI Kalman filter for efficient data assimilation into a 3-D biogeochemical model of the Mediterranean. Ocean Dyn.,	Eastern Med
E1-M3A buoy & bottle data	Petihakis, et al. 2009 Eastern Mediterranean biogeochemical flux model – Simulations of the pelagic ecosystem Ocean Sci	Eastern Med
Mesocosm	Tsiaras et al 2017. Model Simulations of a Mesocosm Experiment Investigating the Response of a Low Nutrient Low Chlorophyll (LNLC) Marine Ecosystem to Atmospheric Deposition Events, Front. Mar. Sci., 2017.	Cretan Sea
Satellite, DYFAMED, E1-M3A, buoy and bottle data	Kalaroni, et al. 2016 Data assimilation of depth-distributed satellite chlorophyll-α in two Mediterranean contrasting sites, JMS Kalaroni, et al. 2020 Modelling the Mediterranean pelagic ecosystem using the POSEIDON ecological model. Part I: Nutrients and chlorophyll-a dynamics DSR II Part II: Biological dynamics DSR II	Ligurian Sea Cretan Sea Med Sea

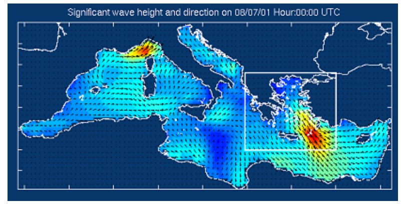
Hydrodynamic modelling applications (examples)

Observing system	Modelling publication	Area
Ferrybox	Korres et al. 2014. Assimilating Ferry Box data into the Aegean Sea model, J. Mar. Syst.,	Cretan Sea
Argo Floats	Kassis and Korres 2020. Hydrography of the Eastern Mediterranean basin derived from argo floats profile data. DSR II	Eastern Med

POSEIDON
overview of modelling applications



1) **Meteorological**



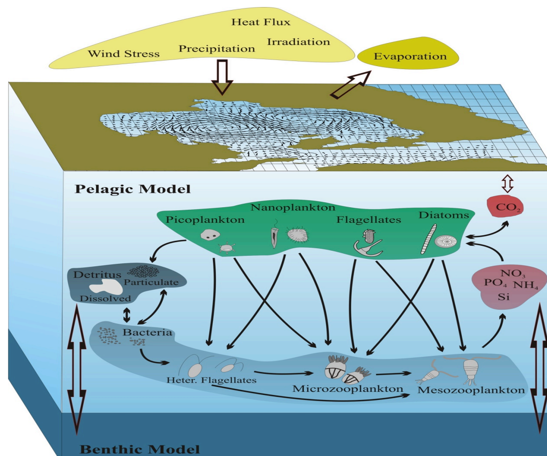
2) **Sea circulation, waves**
(responsible for Med Sea in Copernicus)

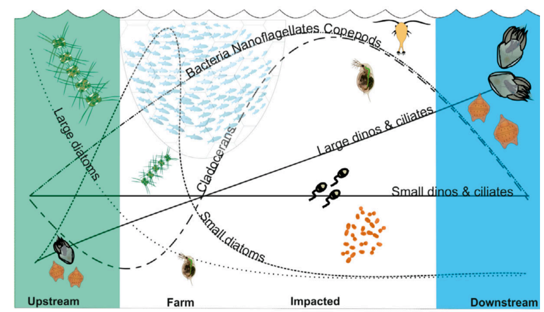
3) **Biogeochemical-Ecological**
- Pelagic Ecosystem

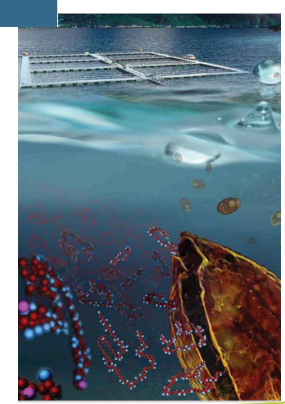
4) Ecological end-user oriented
- Fish farming
  Tsagaraki et al. 2010, Ecol. Mod.
  Petihakis et al. 2012 J. Mar. Sys
- Mussel farming
  (Stamataki et al. 2020, Ocean Science)
- Small pelagic fishes
  Politikos et al., 2015, Gkanassos et al., 2019
- Fisheries management
  Petihakis, et al. 2007 ICES J.Mar.Sci
- Eutrophication, HABs
  Tsiaras et al. 2014, J.Sea Res
  Petihakis et al. 2012, J. Mar. Sys

5) Other end-user oriented
- Simulations for search and rescue
- Simulation for sea pollution
- National
- Regional

REMPEC



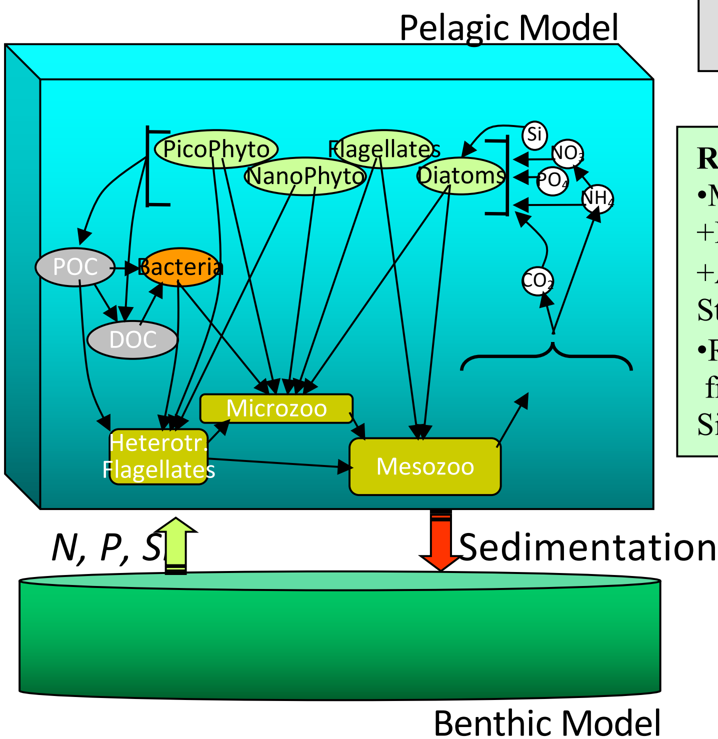




JERICO S3 SCIENCE - SERVICES - SUSTAINABILITY

Biogeochemical model

ERSEM-II (Baretta et al., 1995)
-adequate food web description
-multiple nutrients & variable cell-quotas (C, N, P, Si)
-benthic model



MODEL SETUP

Gibraltar
•Climatology (MEDATLAS) for inorganic nutrients

Dardanelles
•Two-layer OBC with climatological water exchange and salinity
•Nutrients (NO3, PO4)
•DON, DOP, DOC, NH4

River Inputs
•Major MED rivers (Po, Rhone, Ebro, Nile)
+EMED Rivers
+Aegean rivers (Evros, Axios, Nestos, Strymon)
•River runoff & nutrient inputs (NO3, PO4) from river modelling (DOC, POC, NH4, Sio2)

Model upgrades

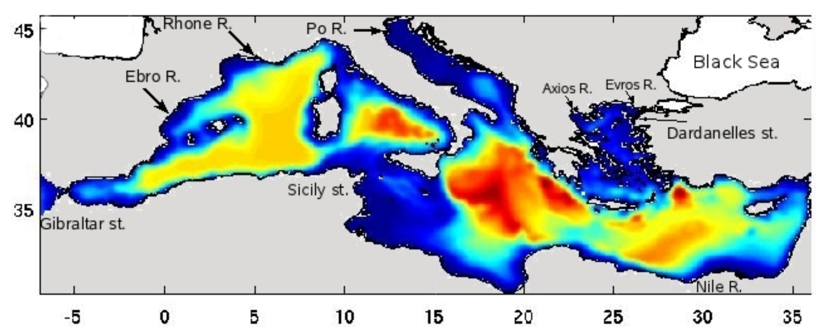
Improved bacterial dynamics

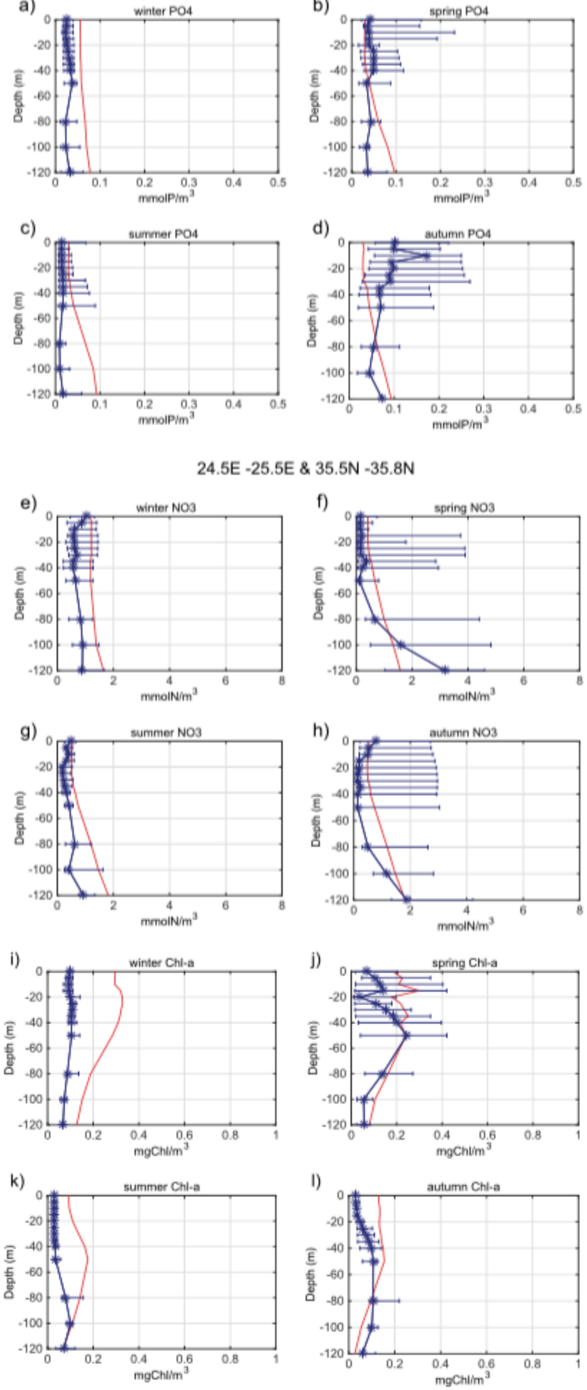
Atmospheric deposition of inorganic nutrients

Carbonate chemistry model (pH, pCO2)

Assimilation of ocean colour data

Small pelagic fish model
Anchovy (+sardine) IBM





Observational Data :
Satellite, buoy and bottle POSEIDON E1-M3A, DYFAMED

Using multiple PSSs

Biogeochemical model (ERSEM)

Hydrodynamic model (POM)

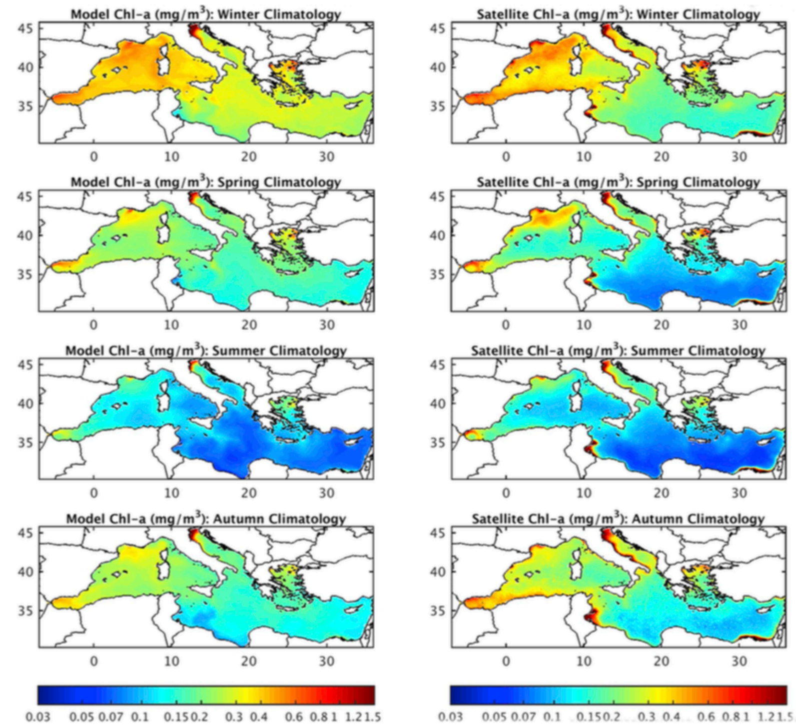


Fig. 2. Model-derived (average 0–10 m, left) and satellite (right) seasonal mean climatology (Winter: January–March, Spring: April–June, Summer: July–September, Autumn: October–December 1998–2007) of near surface Chl-a concentration (mg m^{-3}) computed for the 1998–2007 time period.

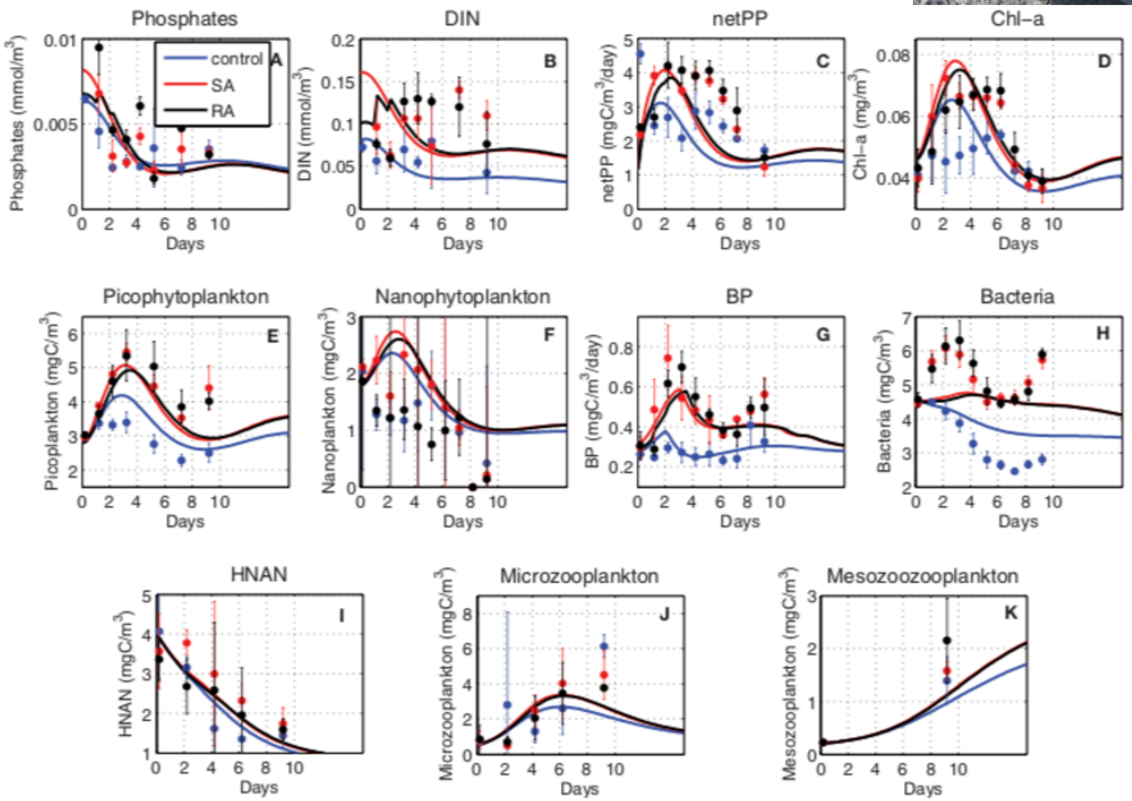
Seasonal average profiles of modelled (red charts) phosphate (a: winter, b: spring, c: summer, d:autumn), nitrate (e: winter, f: spring, g: summer, h: autumn) and Chl-a concentrations (i: winter, j: spring, k: summer, l: autumn) against in-situ seasonal average profiles at the POSEIDON-E1 M3A station.

Kalaroni, et al. 2020 Modelling the Mediterranean pelagic ecosystem using the POSEIDON ecological model. Part I: Nutrients and chlorophyll-a dynamics DSR II

Linking to another RI

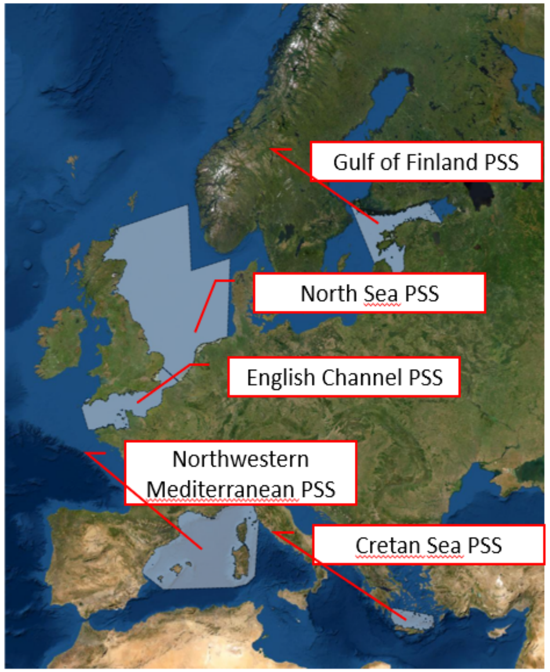
Observational Data :
mesocosm
(Cretacosmos)

Biogeochemical model
(ERSEM)



Tsiaras et al 2017. Model Simulations of a Mesocosm Experiment Investigating the Response of a Low Nutrient Low Chlorophyll (LNLC) Marine Ecosystem to Atmospheric Deposition Events, Front. Mar. Sci., 2017.

Modelling activities in JERICO-S3 PSSs



Modelling activities in JERICO-NEXT

WP4-JRAP6
Operational oceanography and coastal forecasting

Partners: SOCIB, IH, CMCC, CNR, AZTI, FMI, HCMR, IMR

Contributor(s): B.Mourre (SOCIB), J. Vitorino (IH), S. Cilliberti (CMCC), E. Jansen (CMCC), G. Coppini (CMCC), A. Griffa (CNR), M. Berta (CNR), M. Martinelli (CNR), P. Penna (CNR), S. Sparnocchia (CNR), L. Ferrer (AZTI), J. Mader (AZTI), A. Rubio (AZTI), L. Laakso (FMI), J.-V. Björkqvist (FMI), G. Korres (HCMR), L. Perivoliotis (HCMR), E. Mpouma (HCMR), M. Doumas (HCMR), H. Wehde (IMR), J. Hernandez-Lasheras (SOCIB), M. Juza (SOCIB), E. Heslop (SOCIB), E. Aguiar (SOCIB), E. Reyes (SOCIB), J. Tintoré (SOCIB)

Observing System Experiments in JERICO 2011-2015 project


OSE FINAL REPORT
D9.5

Grant Agreement n° 262584
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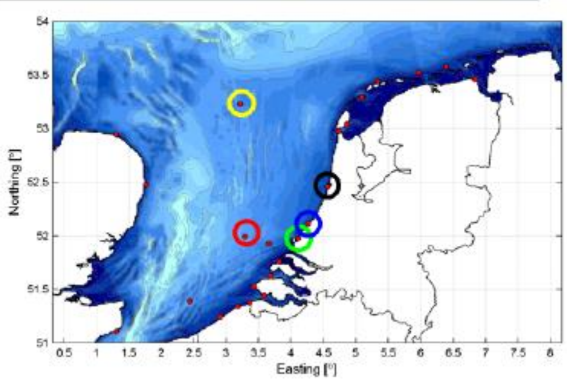
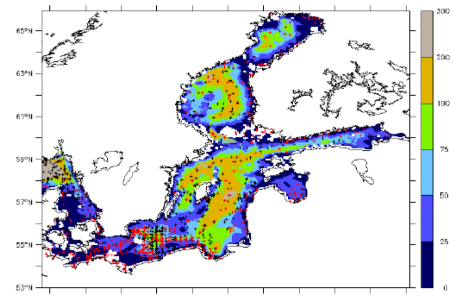
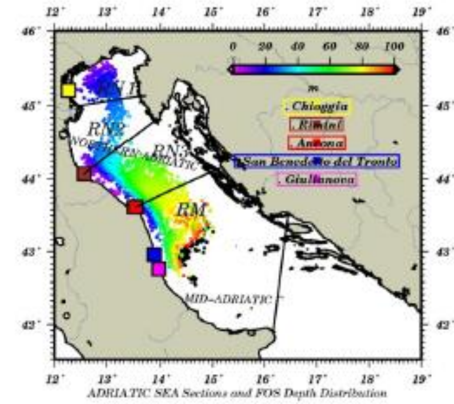
Project Title: Towards a Joint European Research Infrastructure network for Coastal Observatories
Coordination: P. Farcy, IFREMER,
jerico@ifremer.fr, www.jerico-fp7.eu:

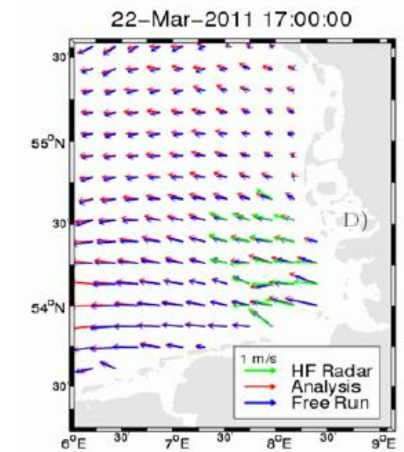
Authors: Z. Wan, A. Aydogdu, N. Pinardi, G. Korres, J. Schulz-Stellenfleth, M. Verlaan, J. Sumihar, S. Ponsar
Involved Institutions: DMI, CMCC, HCMR, HZG, DELTARES, MUMM
Version and Date: Version 1.0 Dec 2014

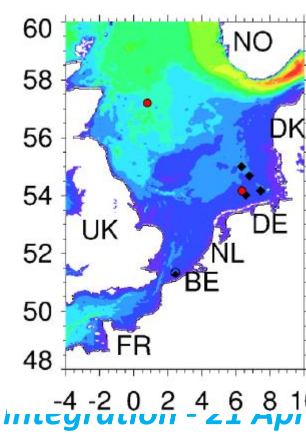


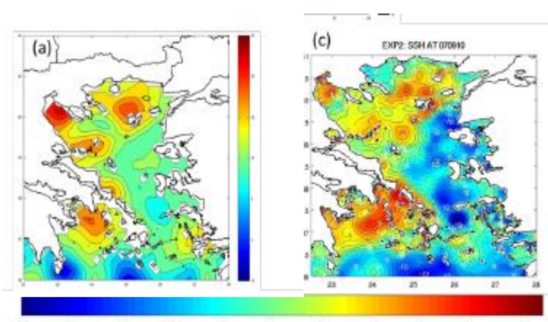




Observing System Experiments in North Sea (x4), Aegean Sea & Adriatic Sea.
Evaluating the impact of T/S profiles from **CTD** casts and **fixed platforms**, temperature profiles from the **Fishing Vessels Observing System, tide gauges, HF Radars and FerryBox** systems







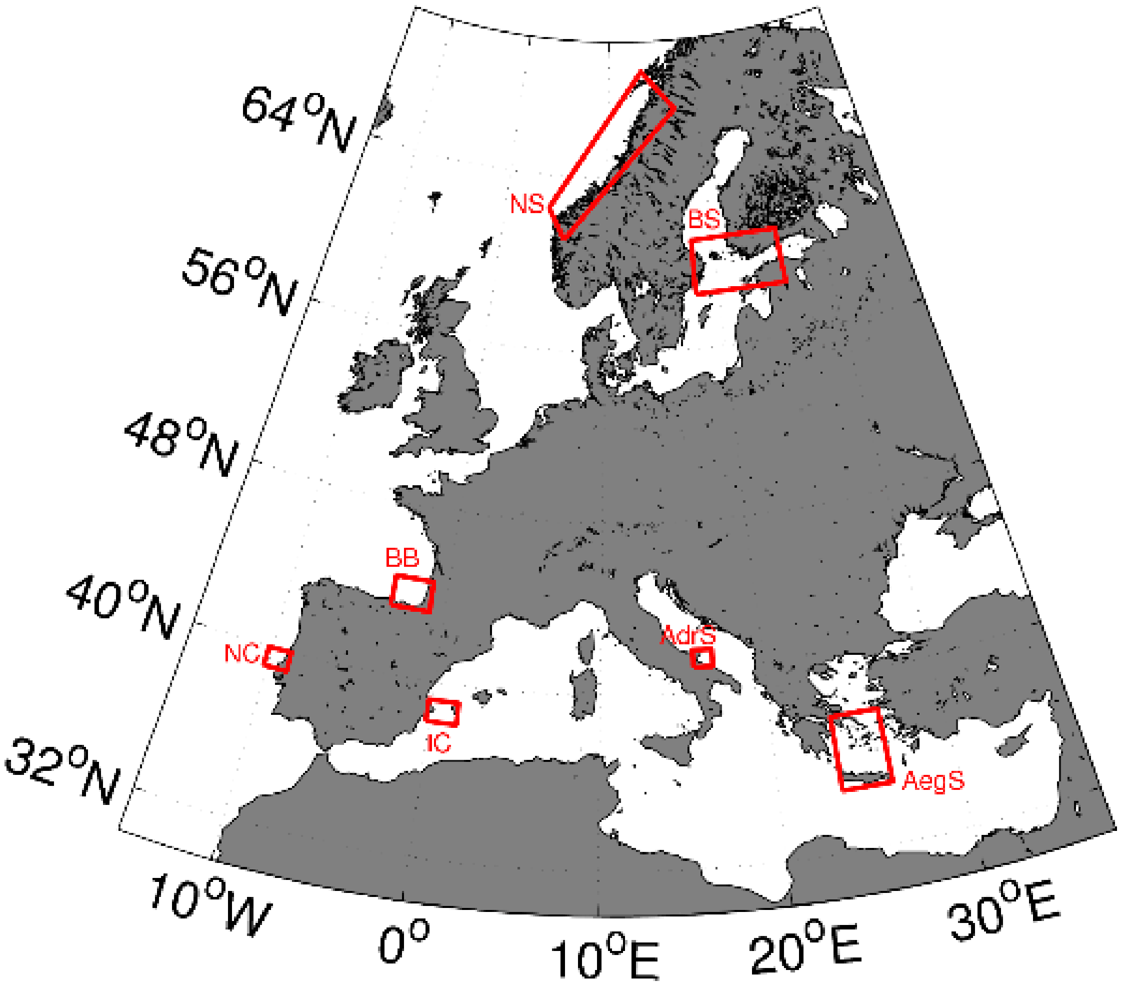
JRAP-6

Main goal: To show the importance of JERICO-RI observations for the **assessment** and **improvement** of operational **models** implemented in the coastal ocean

Specific objectives

- Perform **model assessment** and **sensitivity studies** using JERICO-NEXT observations
- **Evaluate the impact of coastal observations** on model forecasts (in particular HFR radar, glider, fixed moorings and FerryBox) after **data assimilation** ("OSEs and OSSEs")
- Provide **recommendations** for coastal forecasting systems, both in terms of models and observations

Strategy: regions and ocean processes

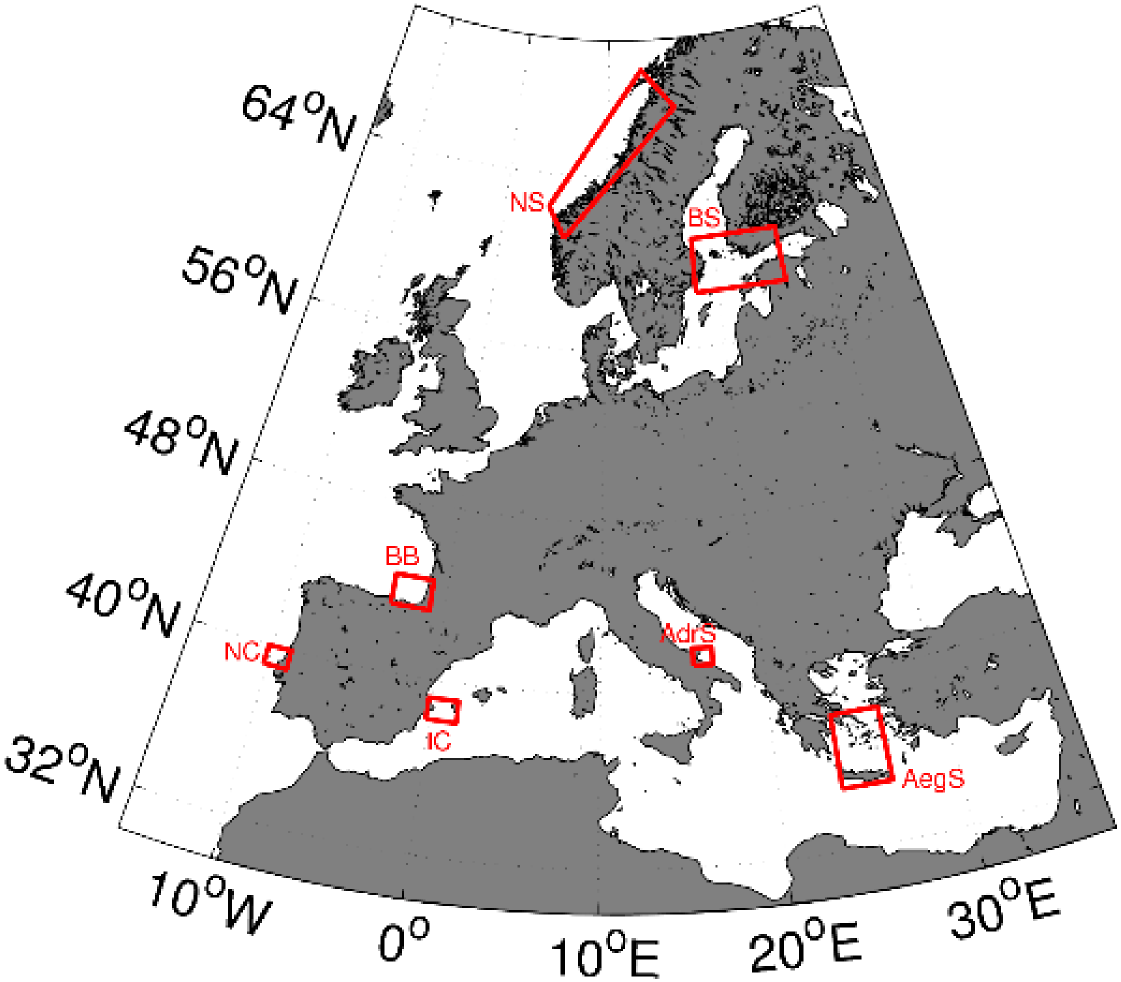


Ocean processes:

- upwelling / downwelling
- slope current
- shelf circulation under the influence of a submarine canyon
- wind-driven circulation
- mesoscale
- meridional water mass exchanges
- buoyancy-driven circulation
- wave-induced turbulence

NC: Nazare Canyon (IH)
BB: southeastern Bay of Biscay (AZTI)
IC: Ibiza Channel (SOCIB)
AdrS: Adriatic Sea (CMCC-CNR)
AegS: Aegean Sea (HCMR)
NS: Norwegian Sea (IMR)
BS: Baltic Sea (FMI)

Strategy: observations, models and data assimilation



Data and sampling:

- Continuous observatory :

  Ibiza Channel, Bay of Biscay, Aegean Sea, Baltic Sea

- Past measurement campaigns:

  Nazare Canyon, Adriatic Sea

- JERICO-NEXT campaigns:

  Aegean Sea

NC: Nazare Canyon (IH)
BB: southeastern Bay of Biscay (AZTI)
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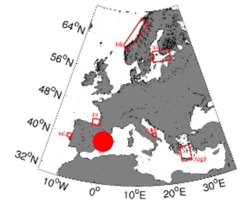
Strategy: observations, models and data assimilation

Partner	Study area	JERICO-NEXT observations used for model assessment / data assimilation	Other observations	Model (resolution)	Data assimilation approach
SOCIB	Ibiza Channel	Fixed station, HF radar, glider	Satellite SLA and SST, ARGO, surface drifters	ROMS (2km)	EnOI
IH	Atantic margin (Nazare Canyon)	Fixed stations, HF radar	Satellite SST, CTDs	HOPS (300m) WW3	OI
CMCC-CNR	Adriatic Sea	HF radar	Fishery & Oceanography Observing System, satellite SLA and SST, ARGO, surface drifters	NEMO (2km)	EnKF
HCMR	Aegean Sea	Glider, FerryBox	Satellite SLA and SST, ARGO	POM (3km)	SEEK filter
AZTI	Southeastern Bay of Biscay	Fixed stations, HF radar		ROMS (670m)	--
IMR	Norwegian Sea	Fixed stations, FerryBox	CTDs	ROMS (800m)	--
FMI	Baltic Sea	FerryBox		WAM (1.8km)	--

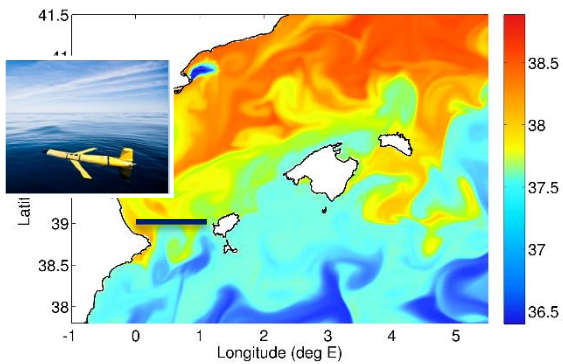
Model assessment and sensitivity experiments: examples

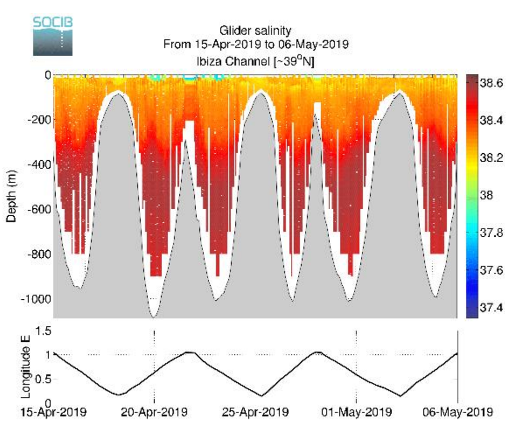
Results: Model assessment and sensitivity experiments

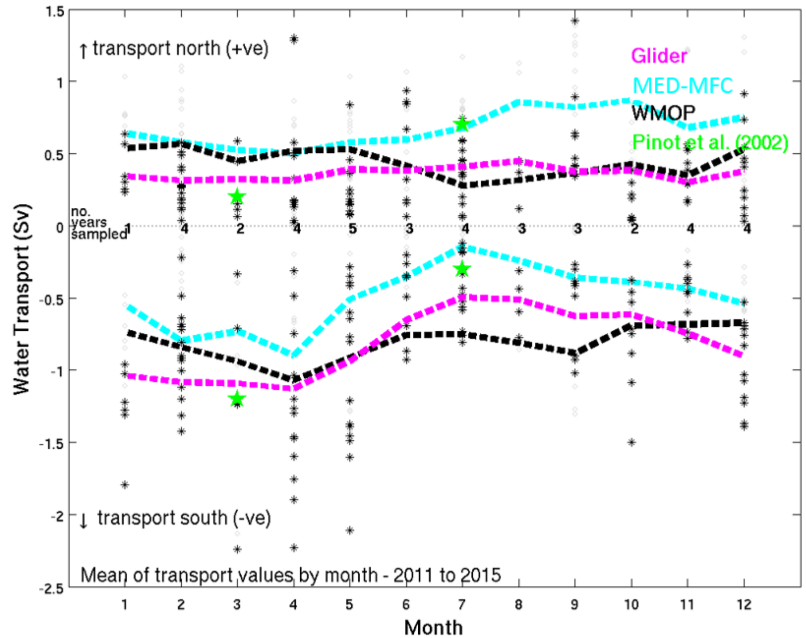


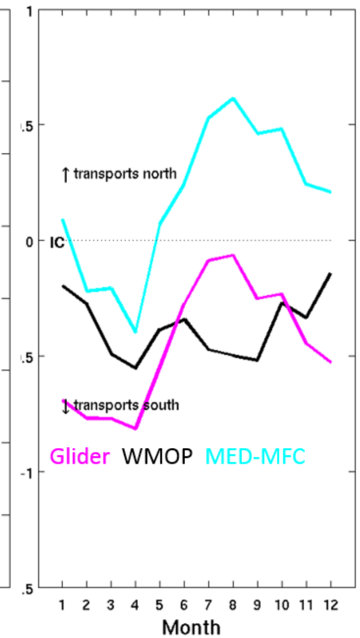
Example 1: Seasonal cycle of net meridional transports as observed by underwater gliders in the Ibiza Channel (SOCIB)

WMOP surface salinity
1 May 2019



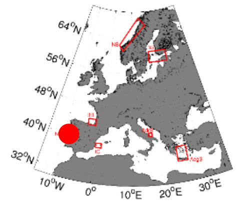




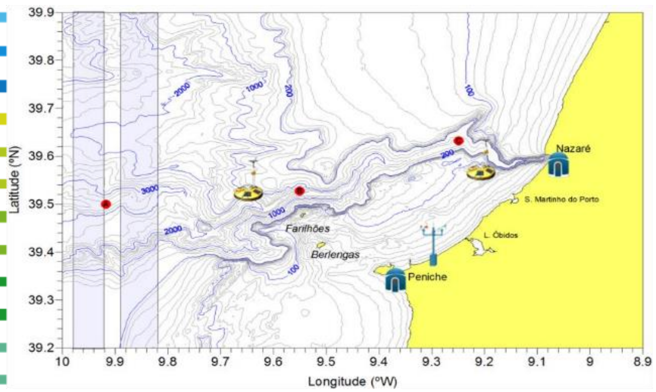


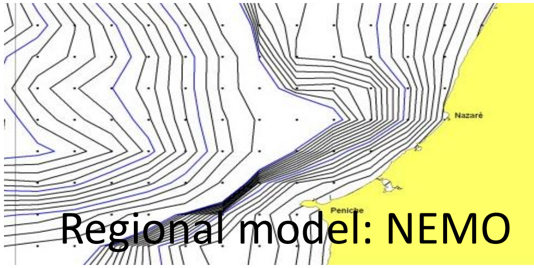
- Total southward transport across the Ibiza Channel larger in winter and early spring (maximum of 1.2 Sv in April)
- Seasonal cycle less marked in the northward transport
- WMOP model is able to reproduce some of the inflow and outflow variability, but overestimates the southward flow in summer
- The CMEMS MED-MFC represents a realistic seasonal cycle but with a significant northward shift throughout the year

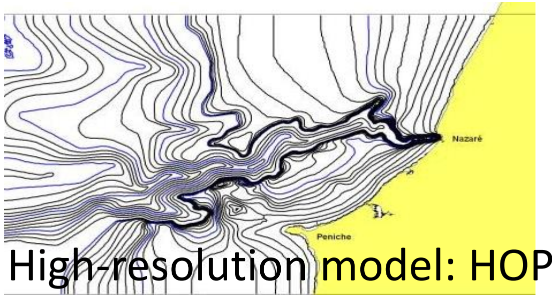
Results: Model assessment and sensitivity experiments



Example 2: Impact of model resolution in the area of the Nazare Canyon (IH)



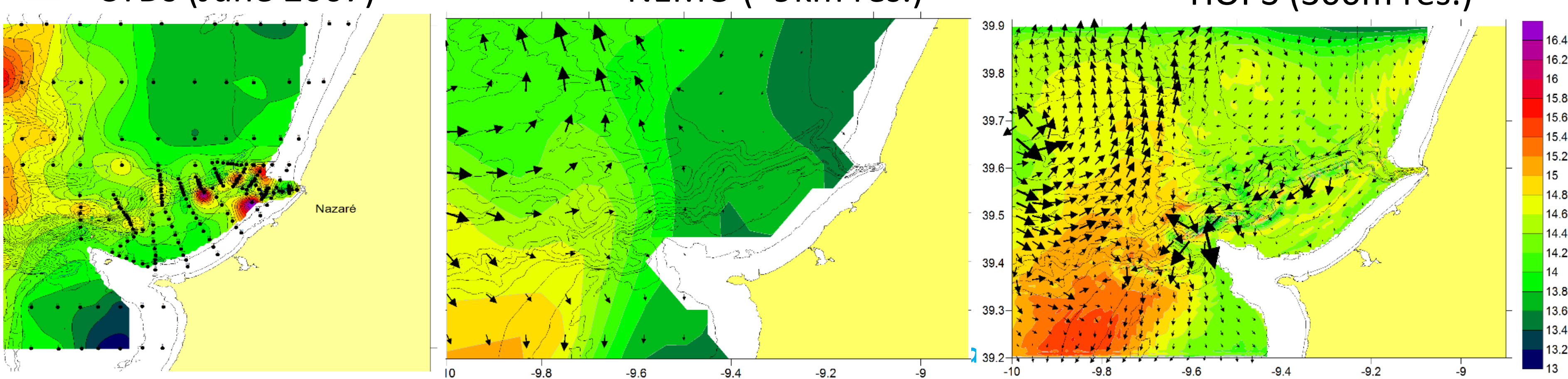




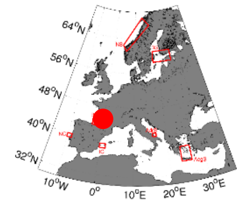
- The high-resolution model is able to represent the canyon circulation
- …helping to understand the interaction between the canyon and the slope circulation, and the impact over broader areas, including transboundary effects

Temperature @50m

CTDs (June 2007) NEMO (~9km res.) HOPS (300m res.)

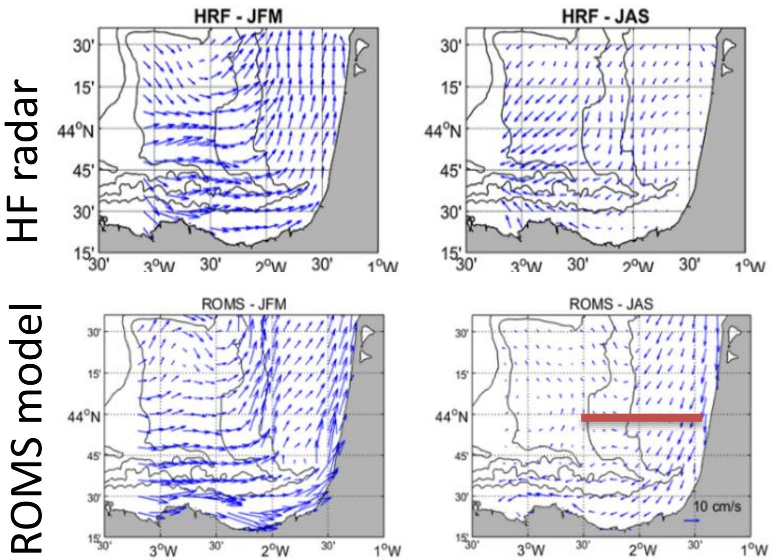


Results: Model assessment and sensitivity experiments



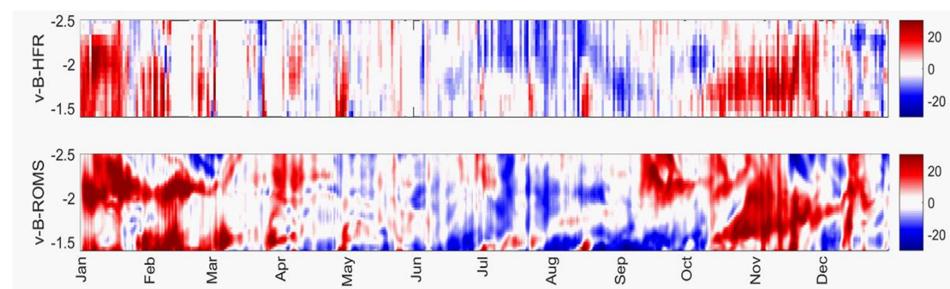
Example 3: HF radar model assessment in the southeastern Bay of Biscay (AZTI)

Winter | Summer



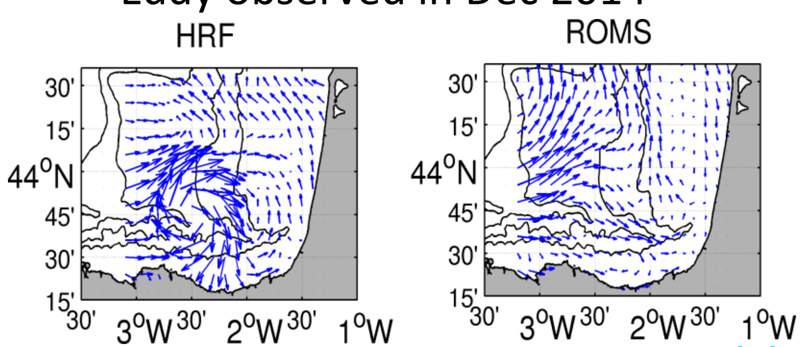
- Strong seasonality of surface currents, also depicted in the model
- The currents tends to be more confined to the shelf area in the model
- Shorter northwards/southwards events also quite well reproduced
- Significant eddy missed in Dec 2014

Hovmöller diagram of v-velocity along red section

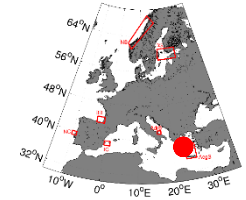


2014

Eddy observed in Dec 2014

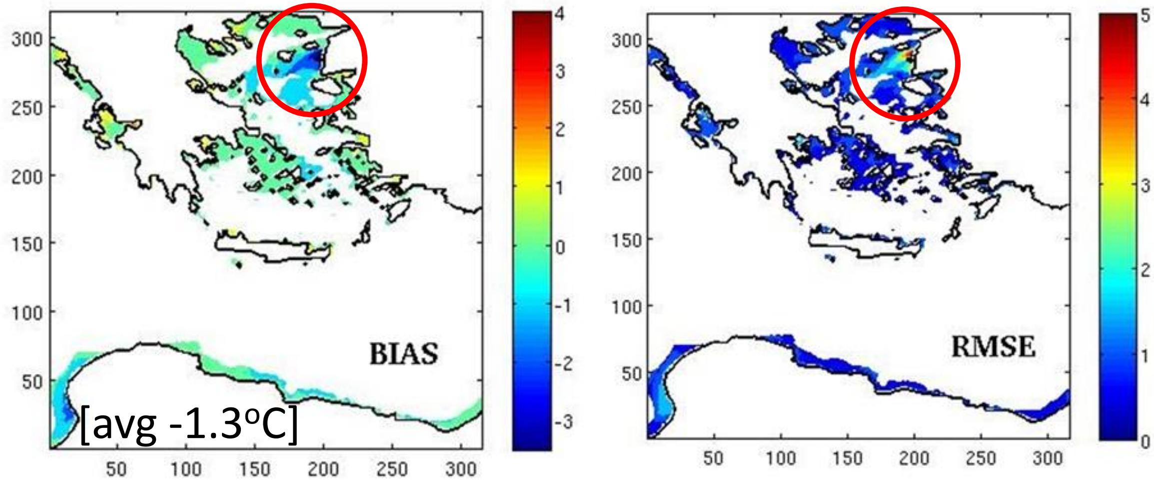


Results: Model assessment and sensitivity experiments



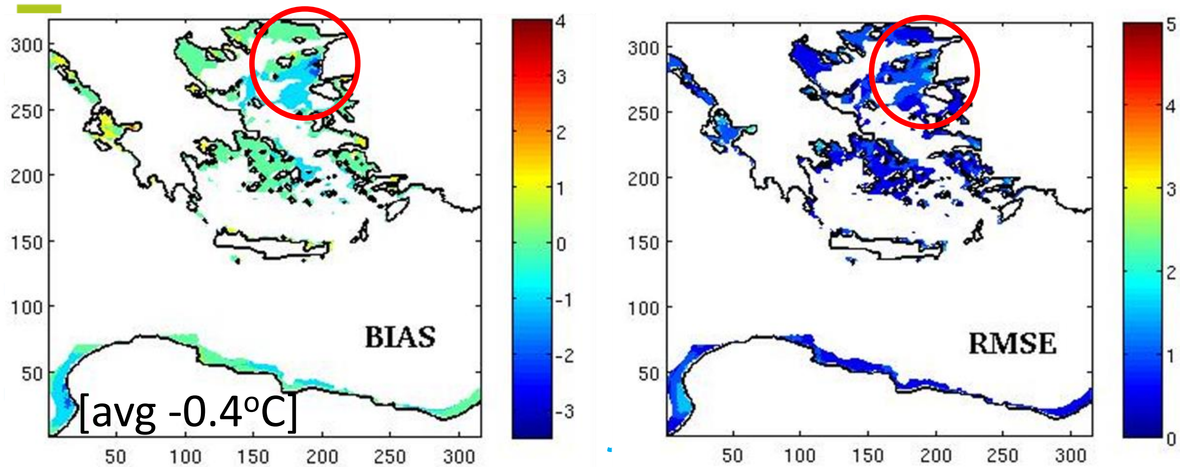
Example 4: Impact of Dardanelles Strait open boundary conditions in the Aegean Sea (HCMR)

(Color limited to areas with depth of the first level <1m)



With standard Open Boundary Condition

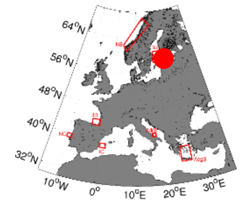
Skin SST model error



- The improved boundary condition imposed at Dardanelles Straits leads to a reduction of the temperature bias and RMSE in the northeastern Aegean Sea

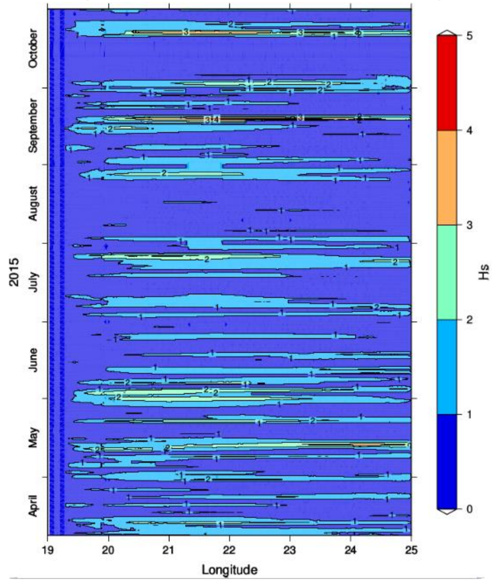
With improved Open Boundary Condition, daily (Maderich et al., 2015)

Results: Model assessment and sensitivity experiments

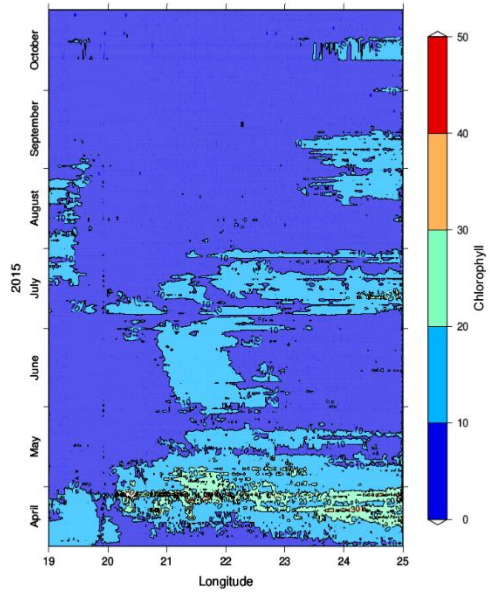


Example 5: influence of wave-induced mixing on phytoplankton in the Baltic Sea (FMI)

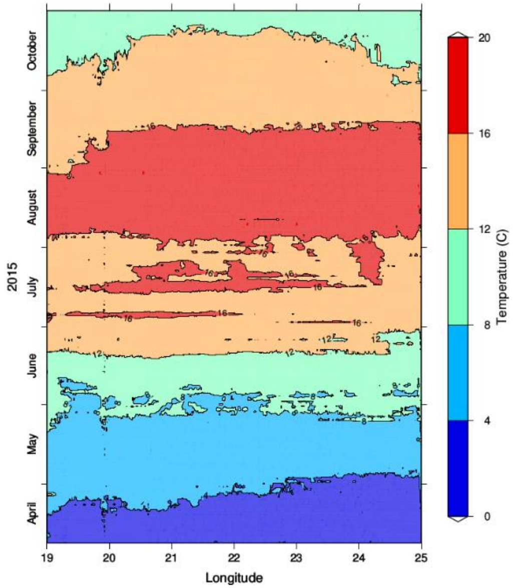
Model significant wave height



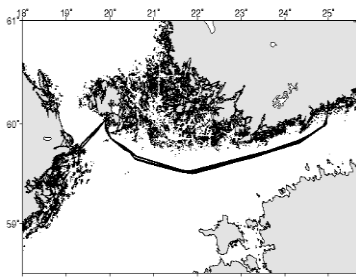
Chlorophyll



Temperature

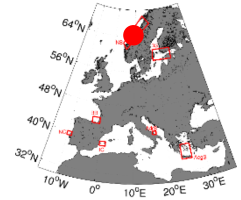


FerryBox line
Helsinki- Stockholm



- No clear overall connection between chlorophyll and wave height, indicating the dominant role of biological processes
- However, Chla (and temperature) drops seem to be occasionally associated with wave height increases (e.g. May, July)

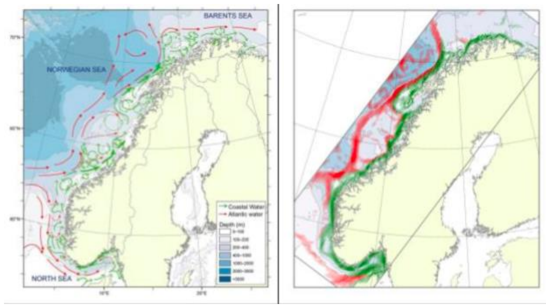
Results: Model assessment and sensitivity experiments

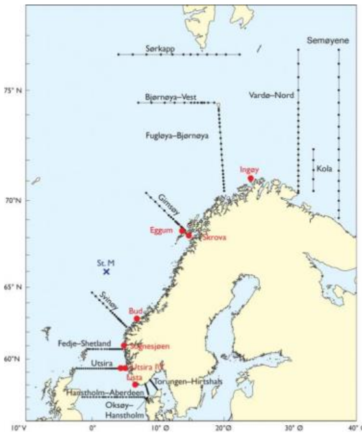


Example 6: Evaluation of a national salmon lice monitoring system (IMR)

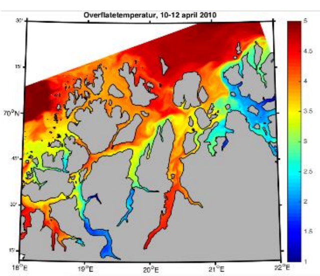
Norwegian Sea
Circulation

ROMS 800 m

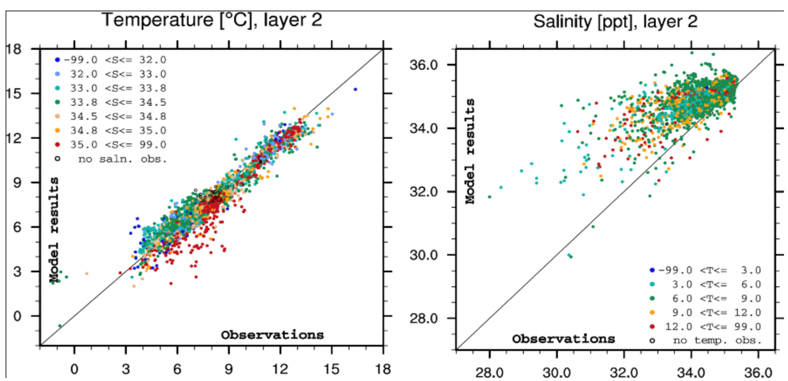


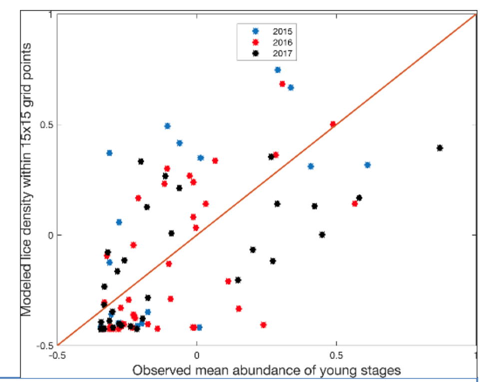


Observations
- Fixed stations
- Repeated transects
- Ferrybox
- Salmon lice monitoring



ROMS 160 m





ROMS
800 m resolution whole Norwegian Coast
160 m specific focal fjords

T, S and Salmon lice comparison
Model-Observations

Evaluation of the impact of observations

OSEs: Observing System Experiments

→ Evaluate the impact of real data on the forecasting system after data assimilation

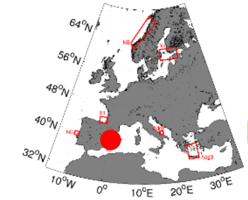
OSEs/OSSEs infrastructure developed in WP3

(parallel OSEs performed to calibrate/validate OSSEs)

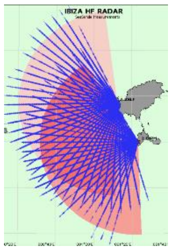
OSSEs: Observing System Simulation Experiments

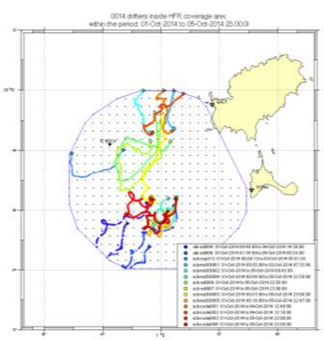
→ Evaluate the impact of potentially future observations (« virtual observations »)

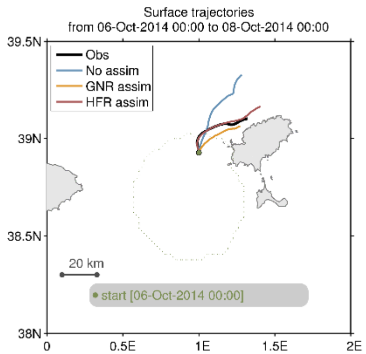
Evaluation of the impact of observations: OSEs examples

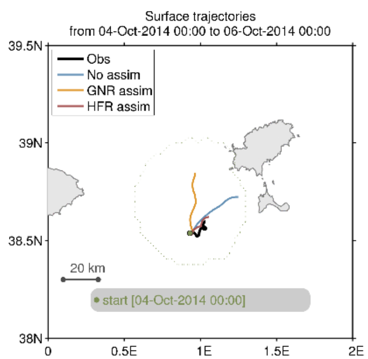


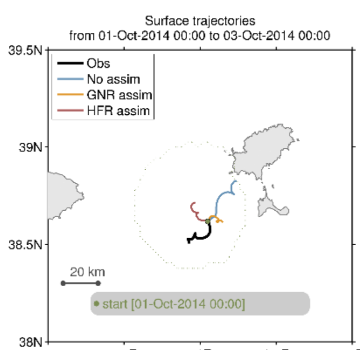
Example 1: impact of HF radar observations in the Ibiza Channel (SOCIB)

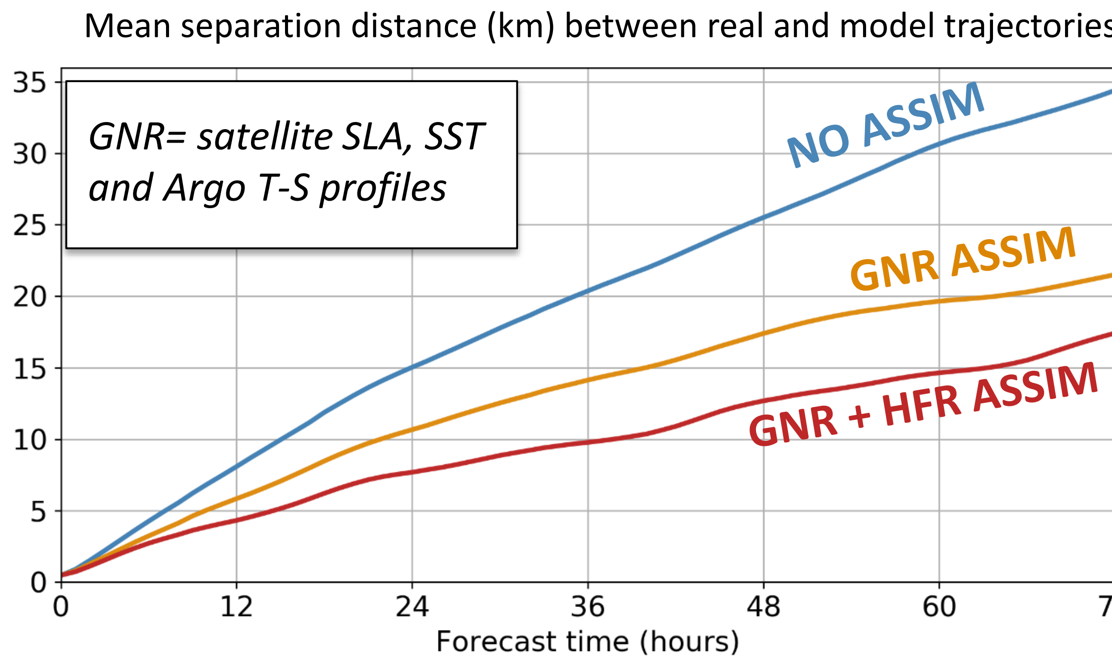






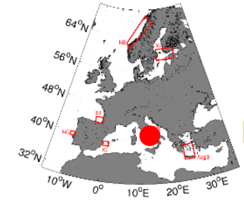






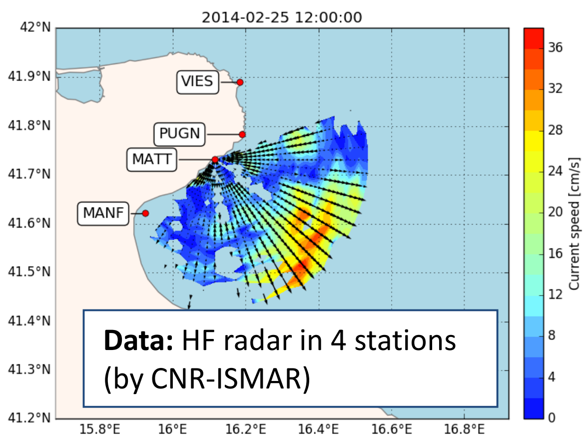
- Reduction of RMSD error
  around 35% for SLA, SST and TS profiles
  around 50% for surface velocities
- HFR DA improves the prediction of Lagrangian trajectories (separation distance after 48h reduced by 50% with respect to NO ASSIM / 29% with respect to GNR)

Evaluation of the impact of observations: OSEs examples



Example 2: impact of HF radar observations in the Adriatic Sea (CMCC)

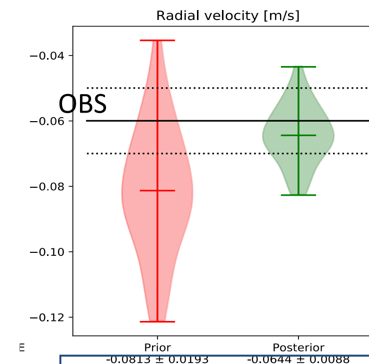
Gulf of Manfredonia



Data: HF radar in 4 stations (by CNR-ISMAR)

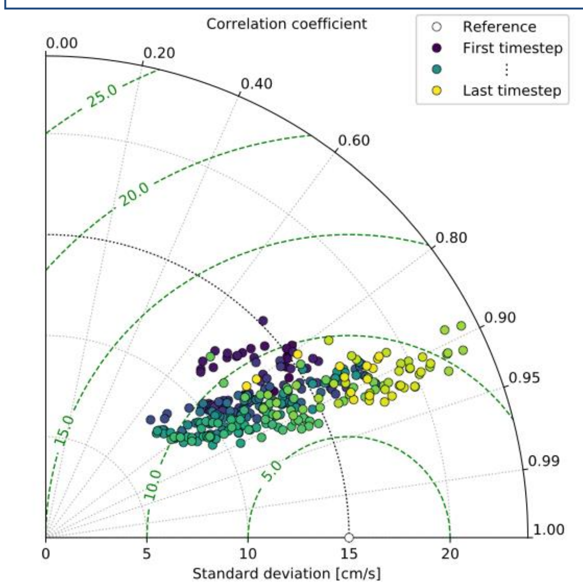
Experiment:
Hourly assimilation of radial velocities with obs. uncertainty = 1cm/s
Period: 26/02/2014 until 09/03/2014

Exp	Obs. uncertainty	Assim frequency
1	1	Daily
2	0.5	Daily
3	1	Hourly

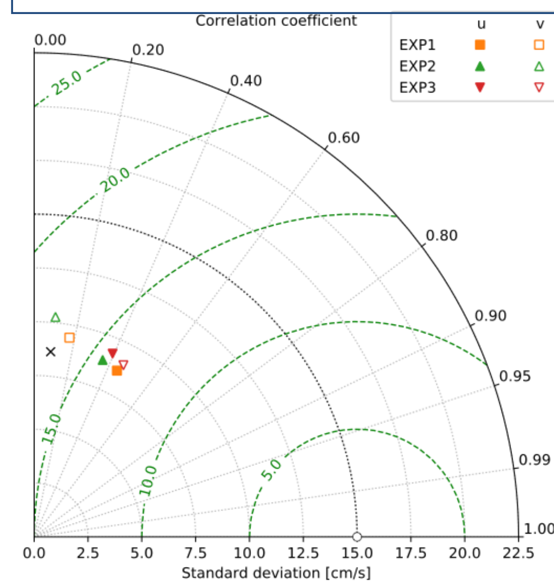


Prior and posterior ensemble spread

Validation in terms of radial velocities

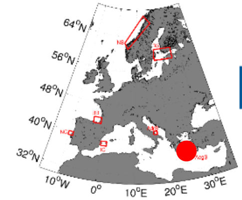


Validation using drifter trajectories



- Improvement of radial velocities over time as the assimilation progresses
- Zonal component better constrained than meridional component for daily DA frequency
- The meridional velocity benefits from the hourly DA frequency

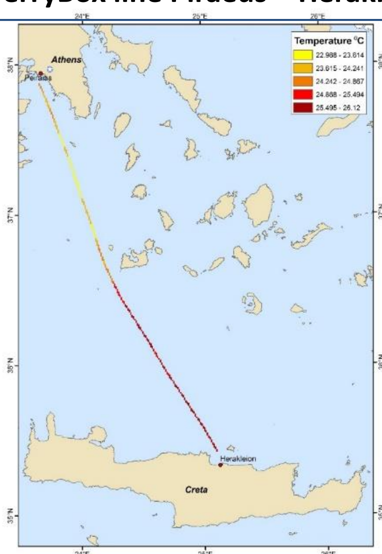
Evaluation of the impact of observations: OSEs examples



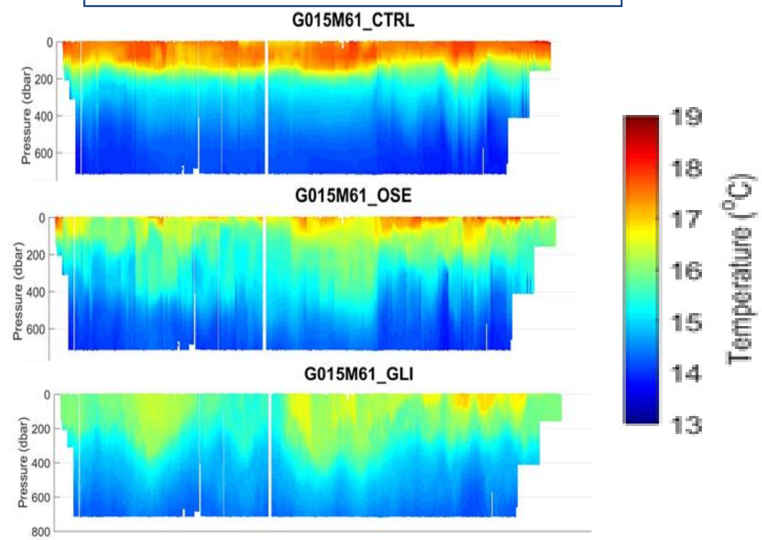
Example 3: impact of glider and FerryBox observations in the Aegean Sea (HCMR)

4th glider mission 7-June 17-July 2018

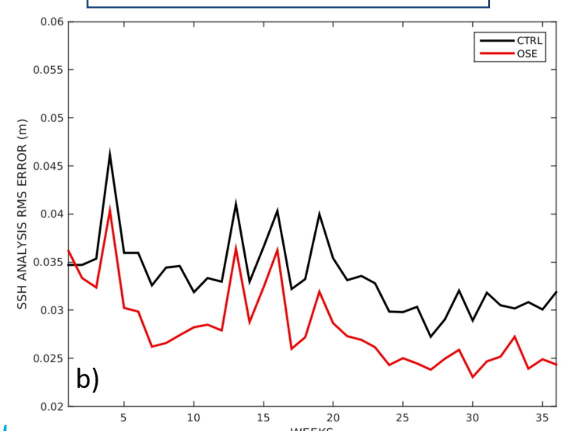
FerryBox line Piraeus – Heraklion



Temp. section along glider line

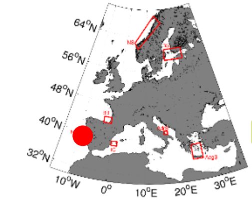


SSH analysis RMSE (m)

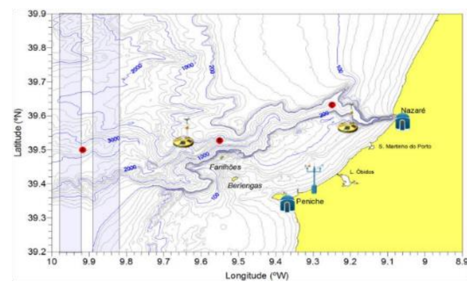


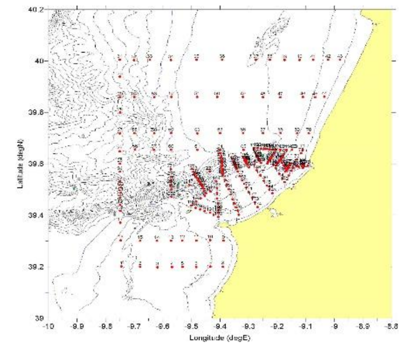
- Reduction of model error when FerryBox and glider data are assimilated together with SST, SSH and Argo TS profiles.
- Added value of the combined assimilation of Ferrybox and glider observations

Evaluation of the impact of observations: OSEs examples

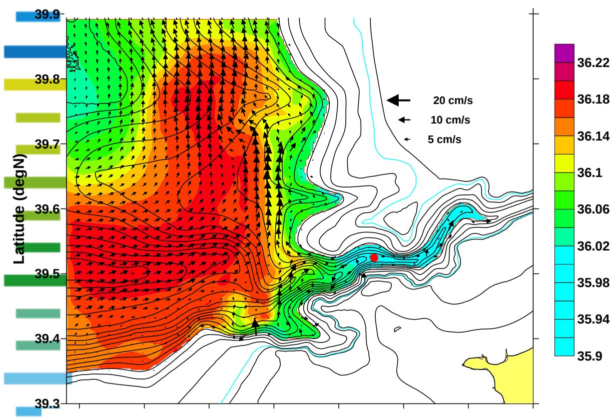


Example 4: impact of fixed stations in the area of the Nazare Canyon (IH)



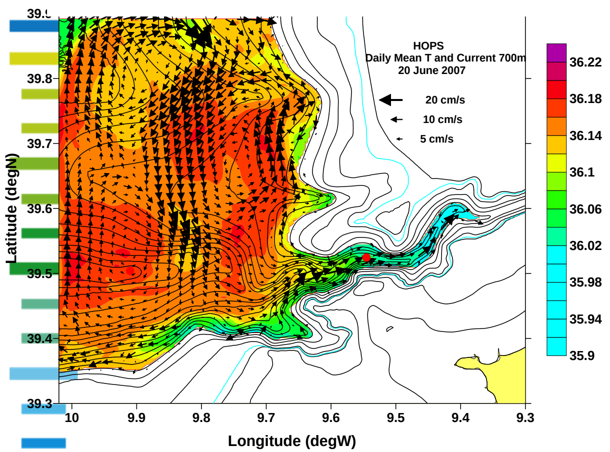


No assim

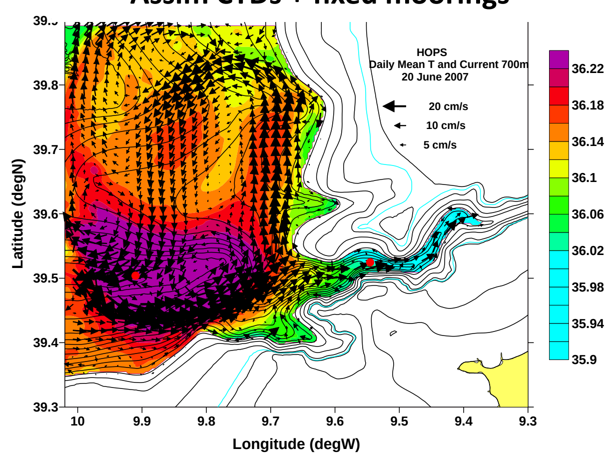


Daily mean salinity and currents at 700m

Assim CTDs

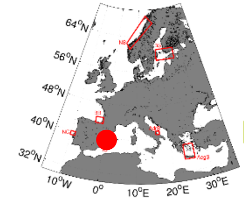


Assim CTDs + fixed moorings



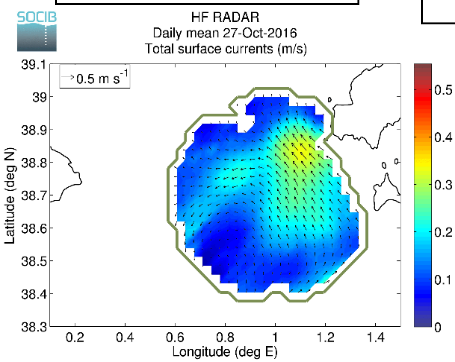
- Assimilation of CTDs improves the representation of the Mediterranean Water and its influence in the canyon
- Additional assimilation of fixed moorings data further refines the picture leading to a better match with independent current measurements

Evaluation of the impact of observations: OSSEs examples

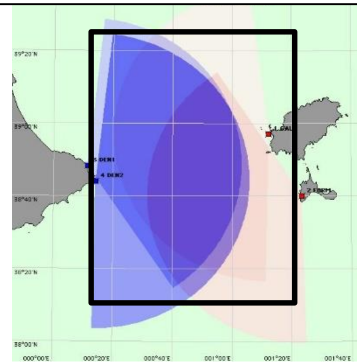


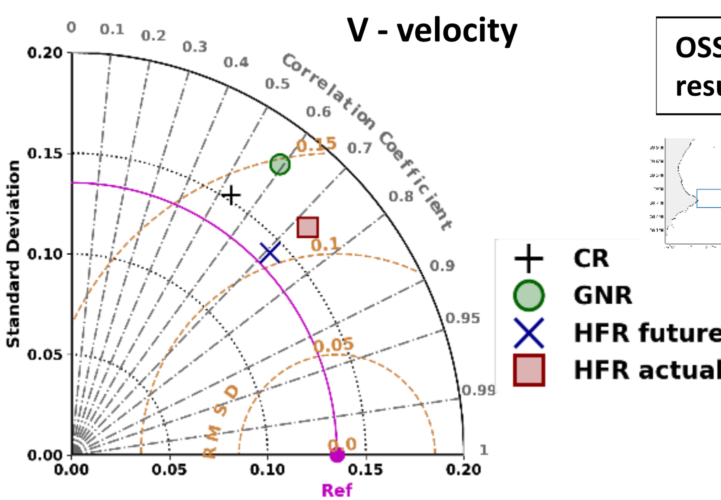
Example 1: impact of new HF radar antennas in the Ibiza Channel (SOCIB)

Current coverage

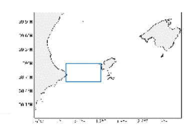


Potential coverage with 2 additional antennas on the western side





OSSEs results



- OSSE calibration: when considering present observations, OSSE error reductions consistent with the OSE experiment for SLA, SST, TS profiles and surface currents
- The two additional antenas would improve around 10% the representation of surface velocities in the Ibiza Channel.

Summary: main outcomes

- Demonstrated **high value of HF radars, gliders, fixed moorings and FerryBox data** to **evaluate models and understand** coastal ocean variability over a broad range of scales in different European coastal environments.

  → identification of limitations & recommendations for modelling systems

- Models with data assimilation have allowed to **quantify the impact** of HF radar, gliders, moorings and FerryBox in conjunction with complementary observations from CTDs and satellites.

Difficulties

- **Variety** of European coastal environments, models and data assimilation setups.
- **Biogeochemical** coastal modelling component not mature enough to be considered in the JRAP.

For the future …

- Keep considering models as important components of coastal observatories: capacity of **data integration**
- Strengthen **multidisciplinary** approach including BGC modelling.

ADDITIONAL INFO

ARW SESSION 2 - PART 2
MODELLING WORKSHOP

Thursday 21 April 2021 / 13:30 - 17:00
JERICO-S3 workshop on coastal model-observation integration

"MODELLING IN REGIONS" WORKSHOP TO BE ORGANIZED IN THE NEXT JERICO-Week#2

13:40 – 17:00pm, 21st APRIL 2021

Thematic #2	**"Modeling in regions" WP2, WP3, WP4 → collaboration with non JERICO modelling action and users " Ref. to Dec. VSC for previous discussion** Reminder from previous VSC meeting: "Modelling questions are to be discussed during the next JERICO Week in region and across regions: How are JERICO observations feeding modelers activities towards other modelling actors like CMEMS? Towards national /local actors? For what purposes? And reversely modelling needs for Observation (optimisation of sampling). => JERICO week#2"

1 OBJECTIVES

COASTAL OCEAN MODELLING GROUP IN JERICO

The main questions behind this group/action are : What we can offer from JERICO, what is our role in helping to develop model activities, what are the benefits for the JERICO community?

- Define the requirements of the modelling community (high resolution modelling, BGC modelling) in terms of data (variable, coverage, resolution, accuracy of the measurements) and observations (optimize existing observatories) - Key variables needed by the modelling community and how JERICO contribution can benefit the modelling community
- Define the requirements of observing community from modelling
- Follow new developments in the modelling community to update the list of requirements

The **concrete outcomes of the JERICO WEEK#2 MODELLING SESSION** will be:

- Define the modelling competences inside the JERICO community and this group

- Provide an overview of what are the requirements from the modelling community
- Provide an overview of what JERICO can offer & review of the benefits of coastal observations for modelling Define the next iteration - open to external expert that complete the expertise we already have in the consortium

2 PARTICIPANTS JERICO WEEK#2 MODELLING SESSION

INTERNAL:

- PSS/IRS leads
- WP 2, 3, 4, and 1 leads
- Experts in modelling from the consortium
- All interested JERICO-S3 partners

It is decided no external experts will be invited for this first iteration buy that we will build a competence matrix to see what expertise we are lacking and what experts we should identify to invite further iterations.

3 BACKGROUND INFO

What info can we already use? What info we need to collect?

JERICO-S3 D4.1 already contains a list of the modelling activities - link here to final version: DL_JERICO-S3_DELIVERABLE_4.1.docx

JERICO-NEXT

- D3.11: http://www.jerico-ri.eu/download/jerico-next-deliverables/JERICO-NEXT-Deliverable_3.11_v1.1_GP.pdf
- D3.12: http://www.jerico-ri.eu/download/jerico-next-deliverables/JERICO-NEXT-Deliverable_3.12_v1.1.pdf
- D4.4 JERICO-NEXT where there is an inventory of the modelling activities per region of JERICO, after page 168, chapter 4, - here (not in the web) . Can this be a starting point to be updated?
- D4.5 Section 8 (paes 128-161) summarizes the actions undertaken in the JRAP6. The deliverable is not in the web, but can be consulted here: https://drive.google.com/file/d/1Zh4Gna8PWSN16wJiVinx4UKUWYULn6xh/view

EuroGOOS Coastal Modelling inventory: http://eurogoos.eu/models/ ; review of coastal ocean models in Europe:

- EU coastal modelling - https://www.frontiersin.org/articles/10.3389/fmars.2020.00129/full

DTO - JERICO & Danubius contribution

- Working document summarizing modelling activities, coastal modelling capacities (link to the document here: https://drive.google.com/file/d/1jxRlG_pvXH5D_R6p5LoOA-0wu_bR7UH1/view?usp=sharin)

COAST-PREDICT - Submission of idea of project proposal for a EU integrated coast predict system (observations + modelling)

- create the bridge between communities, integrate coastal observations , address uncertainties in data and modelling systems https://docs.google.com/document/d/1nIxHgSo9p9sV0J1Pt4rrxeQJxXiqi95BpVtVJvV4RyI/edit?usp=sharing

ARW SESSION 3 - INTRO

INTRODUCTION, WP5 and WP6 JS3 in ARW

(for PART 1-Harmonisation, LINK HERE)

(for PART 2-DataFlow, LINK HERE)

Thursday 22 April 2021 / 14:00 - 13:30

FINAL_V1 (15/04, evening)
→ HAS BEEN UPLOADED IN THE PDF PROGRAM, PLEASE DON'T EDIT
(or tell me by email, thanks ! Léa)

Short summary of the introduction to the workshop :

WP5 and WP6 aim to improve the "readiness level" on harmonisation in the JERICO-RI with a coordinated and interactive implementation of multiplatform and multidisciplinary best practices among the RI operators. WP5 is tacking platform operations and WP6 the data management. In this ARW Session 3, the status of the work on Best Practices will be presented with a specific focus on the automated observations of biological variables, sharing and discussing progress with scientists and engineers from the different IRS-PSS.

Main reference persons:
Intro Part 1: Harmonisation, WP5 (F.Artigas, J.Mader) (20')
Intro Part 2: Biological data flow, WP6 (MS32, MS33) - V.Creach (10')

#	Description	Leading person	Link
1	Intro Part 1: Harmonisation, WP5, Status on the review of the state of the art on BPs towards a homogenized handbook	J.Mader	
2	Intro Part 1: Harmonisation, WP5	F. Artigas	
3	Intro Part 2: Biological data flow WP6 (MS32, MS33)	V. Creach	

For reporting:

No questions asked.

ATTENDEES List :

Cf Harmonization PART 1 and Biological data Flow Part 2

General Assembly

ARW SESSION 3 - HARMONISATION

Introduction

Thursday 22 April 2021

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Agenda
ARW SESSION 3

13:30 Zoom 13:20	**14:00**	**ARW#2 - Session 3 (starts)** **Intro Part 1: Harmonisation, WP5** (F.Artigas, J.Mader) (20') **Intro Part 2: Biological data flow** (MS32, MS33) - V.Creach (10') **LEAD** : Julien M., Felipe A., Veronique C.
14:00	**15:30**	**ARW#2 - Session 3 part 1 (continues)** **Harmonisation workshop, WP5** Interaction with regions to propose harmonisation of platforms and discuss if the status of the implementation in regions (discussion on application of metrics) **LEAD** : Felipe A., Veronique C.
15:30	*16:00*	*COFFEE BREAK ON A CROATIAN BEACH (WonderMe Link)*
16:00	**17:30**	**ARW#2 - Session 3 part 2 (continues)** **Biological data flow workshop, WP6** Analysis of the dataflows in each region for Imagery, Flowcytometry all regions receive questionnaires in advance to describe their dataflow (or intended dataflow) and present these here in 5 mins. Analysis of the dataflows and identification of needs. (Veronique, Patricia, Peter) **LEAD** : Veronique C., Patricia C.
		END OF DAY

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WP5 and WP6 aim to improve the "readiness level" on harmonisation of Operations and Data management

		WP5	WP6
		Pan-European Coordination of Observational Elements	Data Management & Information products
Mature	Level 9	Periodic review	Information products routinely available
	Level 8	Regional implementation of the Best Practices	Data availibility globally available
	Level 7	Best Practices Peer Review certified	Validation of Data Policy
Pilot	Level 6	Procedures are documented Maintenance plan	Demonstrator of data flow folowing the agreed practices
	Level 5	A network is in place	How to store the data is defined (archival plan)
	Level 4	Pilot platforms/sensors are in operations	Agree to Management Practices (QC, QA, Calibration, Provenance)
Concept	Level 3	A prototype validated on the field	First data sets are produced from the field and fitting the data model
	Level 2	Feasibility test done / preliminar design done	Expert interaction and interoperability check of the data model
	Level 1	System formulation (sensors, platforms, candidate technologies, innovative approaches)	Specification on internal data model taking into account existing standards

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ARW SESSION 3 - HARMONISATION

Introduction Part 1

Harmonisation for mature coastal observing platforms (WP5, T5.2.1)

Thursday 22 April 2021

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WP5 Harmonisation of integrated Multiplatform & Multidisciplinary systems

T5.2

Harmonisation for mature coastal observing platforms

T5.2.1

A homogenized electronic handbook in the OBPS repository

		WP5	WP6
		Pan-European Coordination of Observational Elements	Data Management & Information products
Mature	Level 9	Periodic review	nformation products routinely available
	Level 8	Regional implementation of the Best Practices	Data availibility globally available
	Level 7	Best Practices Peer Review certified	Validation of Data Policy
Pilot	Level 6	Procedures are documented Maintenance plan	Demonstrator of data flow folowing the agreed practices
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WP5 Harmonisation of integrated Multiplatform & Multidisciplinary systems

T5.2

Harmonisation for mature coastal observing platforms

T5.2.2

Functional tools for contributing to international efforts on harmonising best practices

		WP5	WP6
		Pan-European Coordination of Observational Elements	Data Management & Information products
Mature	Level 9	Periodic review	nformation products routinely available
	Level 8	Regional implementation of the Best Practices	Data availibility globally available
	Level 7	Best Practices Peer Review certified	Validation of Data Policy
Pilot	Level 6	Procedures are documented Maintenance plan	Demonstrator of data flow folowing the agreed practices
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WP5 Harmonisation of integrated Multiplatform & Multidisciplinary systems

T5.4

Performance Monitoring for the operation and integration of JERICO-RI platforms

		WP5 Pan-European Coordination of Observational Elements	WP6 Data Management & Information products
Mature	Level 9	Periodic review	nformation products routinely available
	Level 8	Regional implementation of the Best Practices	Data availibility globally available
	Level 7	Best Practices Peer Review certified	Validation of Data Policy
Pilot	Level 6	Procedures are documented Maintenance plan	Demonstrator of data flow folowing the agreed practices
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WP5 Harmonisation of integrated Multiplatform & Multidisciplinary systems
T5.2 Harmonisation for mature coastal observing platforms

T5.2.1 A homogenized electronic handbook in the OBPS repository

OBJECTIVE: To achieve a technical handbook on Best Practices for implementing and operating mature platforms for coastal observatories

MAIN CHALLENGES:

- To unify practices from wide coastal communities (compared with open sea observing networks)
- To integrate platform-specific practices and sensors-specific practices
- To give special emphasis on coastal issues for Glider and Fixed Platform Practices

WORK PLAN

MAIN PARTNERS INVOLVED AND CONTACT POINTS

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Proposed work plan toward an homogenized electronic handbook

Initial Review (May 2021):

- Select relevant manuals released as Jerico-Next deliverables and/or under other projects (e.g. FixO3, EMSO-Link)
- Share the manuals' list with coordinators, other WPs (e.g. WP6 data management), other projects (e.g Eurosea), task team leaders of EuroGOOS -> avoiding overlapping, duplication, missed manuals
- Define a final list of manuals for the handbook

Harmonisation level 1 (July 2021): Evaluate the applicability, for each manual, of the guidelines from the UNESCO manual "Best Practice for Developing Best Practices in Ocean Observation". In particular, formatting each manual following a suggested template and describing it with appropriate metadata for machine discovery and readability

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Proposed work plan toward an homogenized electronic handbook

Harmonisation level 2 (Sep 2021): Gap analysis -> define a minimum common set of topics that should be addressed in the homogenised manuals of the handbook (e.g. platform deployment/recovery of platform/sensor, essential ocean variables, maintenance, calibration, power management, data transmission etc.), according also with **Jerico readiness level definitions** and **Jerico label deliverable**

Harmonisation level 3 (Dic 2021): update manuals according to the gap analysis

Delivery of D5.2 (March 2022): Handbook with publication on OBPS repository

Final tasks:

- Definition of an endorsement process for the updated manuals in collaboration with OBPS representatives (e.g. submission to EuroGOOS Task Teams or GOOS panels for approval)
- Other versions may be released within the project. Possible submission to peer review process.

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Proposed work plan toward an homogenized electronic handbook

Link with other WPs

- WP6: needed coordination with WP6 for best practices in data management

- WP7: integration of best practices docs and (possibly) functional tools for mature platforms (subtask 5.2.2) inside Jerico e-infrastructure.

- WP10 training workshop M29

  WS#1 (M29, MS60, WP10/WP5/WP6) is to be focused on Mature Platforms, specifically HF radars and Gliders. This WS#1 provides training on aspects related with best practices on operations (WP5) and on data management, QC, use of VRE (WP6)

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WP5 Harmonisation of integrated Multiplatform & Multidisciplinary systems

T5.2 Harmonisation for mature coastal observing platforms

T5.2.1 A homogenized electronic handbook in the OBPS repository

T5.2 leader	Carlo Mantovani
Subtask 5.2.1 leader	Jay Pearlman
Task 5.2 contributor	Pauline Simpson
Link with WP6.1 BP	Leonidas Perivoliotis
ST1 (HF Radar) leader	Carlo Mantovani
ST1 contributors	Lorenzo Corgnati, Annalisa Griffa; Anna Rubio, Emma Reyes, Jochen Horstmann
ST2 (Glider) leader	John Allen
ST2 contributors	Nikolaos Zarokanellos, Laurent Coppola, Laura Tuomi, Lauri Laakso
ST3 (Ferrybox) leader	Yoana Voynova
ST3 contributors	Andrew King, Jukka Seppälä
ST4 (Fixed platform) leader	Manolis Ntoumas
ST4 contributors	Lauri Laakso, Laurent Delauney, Inês Martins, Bastianini Mauro, Annalisa Griffa, Julien Mader, Benjamin Casas
ST5 (Multiplatform biogeochemical sensors) leader (Subtask 5.3.1)	Andrew King
ST5 contributors	Eva Alou, Laurent Coppola, Manolis Ntoumas, Carolina Cantoni

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ARW SESSION 3 - HARMONISATION
Introduction Part 1

Procedures and best practices for observing biological and biogeochemical variables from JERICO-RI platforms
(WP5, T5.3)

Harmonisation on Biological automated sensors
(WP5, T5.3.3)

Thursday 22 April 2021

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Task 5.3: Procedures and best practices for observing biological and biogeochemical variables from JERICO-RI platforms

SMHI, SOCIB, NIVA, CNRS, HCMR, CNR, AZTI, NORCE, IFREMER, CEFAS, IRB, VLIZ, HZG, SYKE) M1-M42

The actions will be performed within the following Steering Teams:

- **ST5 Biogeochemical variables from various platforms (NIVA, SOCIB, CNRS-LOV, HCMR, CNR),**
- **ST6 Automated sampling for DNA analysis (AZTI, NORCE, CEFAS, IRB),**
- **ST7 Biological automated platforms (CNRS, CEFAS, SMHI, IFREMER, VLIZ, HZG, SYKE, NIVA).**

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Subtask 5.3.3 Biological automated sensors

ST7 : CNRS, CEFAS, SMHI, IFREMER, VLIZ, HZG, SYKE, NIVA).

Progress towards the definition of **best practices on the implementation/deployment of biological automated sensors**. The focus will be mainly on :

- **phytoplankton functional diversity** (using flow cytometry and multispectral fluorometry)
- **phytoplankton and zooplankton diversity** (addressed by in flow and in situ imaging)

This task will define **operational and calibration procedures**, determine **flags to be implemented in the metadata base** (WP6), develop **specific recommendations** according to the **IRS and PSS specificities and platform types** for sampling strategy (D5.6) that will be exploited for **further technological development of flow cytometry sensors** in T7.2.2.

In collaboration with the sensor providers, a **checklist on sensor performance will be established** (e.g catalogue of the specificities for each sensor, diagnostic after maintenance, troubleshooting guide) and annually reviewed by the ST7 (D5.1).

To move towards **physiological measurements** as well at the **interface with biogeochemistry (primary productivity)**, the fast repetition rate fluorometry (FRRF) will be discussed as an emerging technology for measuring primary production.

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Subtask 5.3.3 Biological automated sensors: Actions, Deliverables and Milestones

- D5.1: a *"catalogue and checklists for existing biological sensors that will be implemented in JERICO-S3"* by M14 (April 2021).

- MS5.1: an harmonization workshop (co-organised with WP6) on the *"State of the art capturing and analysing gaps in BP's for implementing and operating biological data acquisition in coastal observatories"* M6 delayed to:
  - M13 (FCM Workshop)
  - M14 (current workshop JS3 Week)
  - M16 (two remaining workshops on automated imaging and multi-spectral fluorometry)

- Actions undertaken during the first year of JERICO S3:
  - Writing a questionnaire about current practices in automated flow Cytometry that was published on November 20, 2020, in the JERICO-RI website
  - Starting writing the D5,1
  - First JERICO-S3 workshop best practices for automated *in vivo* flow cytometry on March 9, 2021
  - Writing a questionnaire about current practices in plankton automated imagery published on April 16, 2021, in the JERICO-RI website
  - Writing a questionnaire about current practices for in vivo fluorometry published on April 16, 2021, in the JERICO-RI website

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Our progress on D5.1

□ Catalogue and checklists for existing biological sensors that ware and will be implemented in JERICO-S3

DELIVERABLE TITLE:

JERICO-S3 D5.1 Catalogue and checklists for existing biological sensors that will be implemented in JERICO-S3

DELIVERABLE NUMBER: **D5.1, Task 5.3, Subtask 5.3.3 – ST 7**

WORK PACKAGE N° and NAME: WP5-NA4: Harmonisation of integrated Multiplatform & Multidisciplinary systems

Authors: Artigas, F. Gallot, C. & coll.

Involved Institution: Lead: SMHI; Partners: SOCIB, NIVA, CNRS, HCMR, CNR, AZTI, NORCE, IFREMER, CEFAS, IRB, VLIZ, HZG, SYKE

Due date // Submission date: 31/03/2021 *// in progress*

Nature: **R**
(R = Report, P = Prototype, D = Demonstrator, O = Other)

Dissemination level : Public
PU = Public, PP = Restricted to other programme participants (including the Commission Services), RE = Restricted to a group specified by the consortium (including the Commission Services), CO = Confidential, only for members of the consortium (including the Commission Services)

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https://www.jerico-ri.eu/2020/11/20/best-practices-in-flow-cytometry-questionnaire-launched/

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Best practices in flow cytometry questionnaire launched

Posted on 20th November 2020 | by admin

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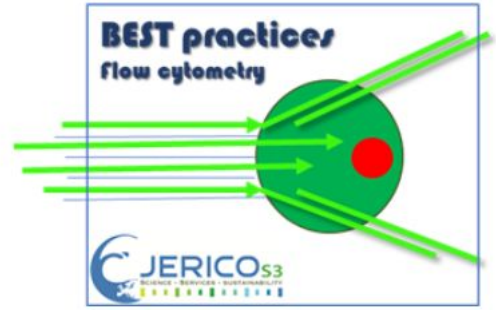
Join our effort!



In JERICO-S3, we continue our efforts towards measuring synchronously different variables (especially biogeochemistry and biology) and filling observational gaps in under-sampled areas to understand phytoplankton dynamics and distribution in coastal waters. Our task is to improve the readiness of ship-based and autonomous platform observing networks by guaranteeing their robustness, reliability, and long-term sustainability.

A questionnaire (not longer than 15 minutes to fill) aims to collect the different practices followed by the users and to define the best practices for in vivo automated (including online) flow cytometry. The results will be presented and discussed during a virtual workshop early next year. Participants will be invited to join through existing networks.

The questionnaire is available to complete online.

Deadline 8th of January 2021.

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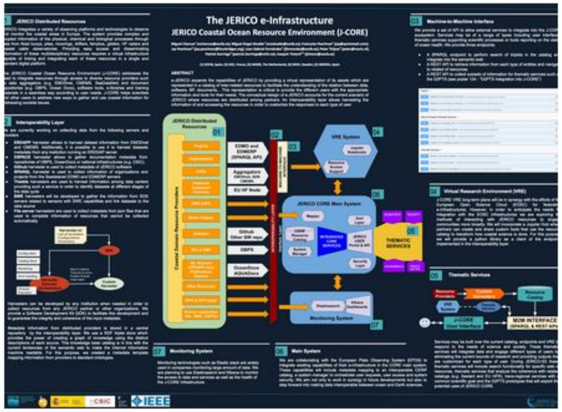
News

More news

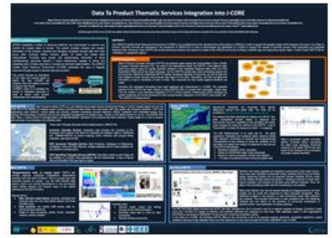


The JERICO e-Infrastructure – Joint Coastal Ocean Research Environment (J-CORE): IMDIS 2021 Poster

19th April 2021

Miguel Charcos, SOCIB (Spain) presents a poster on "The JERICO e-Infrastructure - Joint Coastal Ocean Research Environment (J-CORE)" at the International Conference on Marine Data and Information Systems (IMDIS) 12-14th April 2021 virtual conference. The JERICO e-Infrastructure Poster, IMDIS 2021 Introduction to e-JERICO The Joint European Research Infrastructure network for Coastal Observatory (JERICO) integrates a variety of observing platforms and technologies to observe and monitor the coastal areas in Europe. This meta-observing system provides complex and coupled information of the physical, chemical and biological processes through data from fixed buoys, piles, moorings, drifters, ferrybox, gliders, HF radars and coastal cable observatories. Achieving an understanding of the coastal processes requires high-quality data...

Read More



Data To Product Thematic Services Integration into J-CORE:...

19th April 2021

Miguel Charcos, SOCIB (Spain) presents a poster on "Data to Product Thematic Services...

Read More

Best practices for in vivo fluorometry

14th April 2021

Join our quest! In JERICO-S3, we continue our efforts towards measuring synchronously...

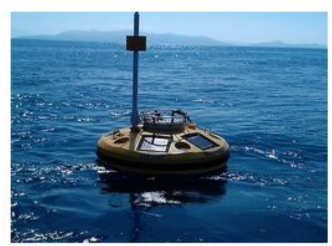
Read More

Best practices for plankton automated imagery

14th April 2021

Join our quest! In JERICO-S3, we continue our efforts towards measuring synchronously...

Read More



JERICO-S3: 2nd Call for Transnational Access Now Open

29th March 2021

The JERICO-S3 Research Infrastructure wishes to announce the 2nd call of 3 Transnational...

Read More

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

WP5 Harmonisation of integrated Multiplatform & Multidisciplinary systems

T5.3 – SubT 5.3.3

Harmonisation on Biological automated sensors

Current status

		WP5	WP6
		Pan-European Coordination of Observational Elements	Data Management & Information products
Mature	Level 9	Periodic review	Information products routinely available
	Level 8	Regional implementation of the Best Practices	Data availibility globally available
	Level 7	Best Practices Peer Review certified	Validation of Data Policy
Pilot	Level 6	Procedures are documented Maintenance plan	Demonstrator of data flow folowing the agreed practices
	Level 5	A network is in place	How to store the data is defined (archival plan)
	Level 4	Pilot platforms/sensors are in operations	Agree to Management Practices (QC, QA, Calibration, Provenance)
Concept	Level 3	A prototype validated on the field	First data sets are produced from the field and fitting the data model
	Level 2	Feasibility test done / preliminar design done	Expert interaction and interoperability check of the data model
	Level 1	System formulation (sensors, platforms, candidate technologies, innovative approaches)	Specification on internal data model taking into account existing standards

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WP5 Harmonisation of integrated Multiplatform & Multidisciplinary systems

T5.3 – SubT 5.3.3

Harmonisation on Biological automated sensors

Next step

		WP5 Pan-European Coordination of Observational Elements	WP6 Data Management & Information products
Mature	Level 9	Periodic review	Information products routinely available
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WP5 Harmonisation of integrated Multiplatform & Multidisciplinary systems

T5.3 – SubT 5.3.3

Harmonisation on Biological automated sensors

By the end of the project

		WP5	WP6
		Pan-European Coordination of Observational Elements	Data Management & Information products
Mature	Level 9	Periodic review	Information products routinely available
	Level 8	Regional implementation of the Best Practices	Data availibility globally available
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JERICO RI
SCIENCE - SERVICES - SUSTAINABILITY

Workshop on harmonisation of automated biological observations

Agenda

- 14:00 Welcome and introduction of participants (10 min) Felipe Artigas
- 14:10 Presentation and discussion about the update on capability for plankton observation in both PSS and IRS *D5.1* (15 min) Felipe Artigas
- 14h25 Presentation of the results from the first workshop on best practices for automated flow cytometry followed by a discussion on framing the best practices template document (IOC/IODE) (15 minutes presentation + 10 min discussion) Véronique Créach
- 14h50 Presentation and discussion about questionnaires and workshops to be scheduled on image analysis and multispectral fluorometry (15 min) Felipe Artigas
- 15:05 Round table about next steps to take and about the requirements to be addressed to sensor providers in order to specify sensor performances (e.g. catalogue of the specificities for each sensor, diagnosis after maintenance, troubleshooting guide, requirements for in automated platforms)
- 15:30 End of the session

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

ARW SESSION 3 - HARMONISATION

Introduction Part 2

Biological data flow (WP6)

Thursday 22 April 2021

The JERICO-S3/DS projects are funded by the European Commission’s H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

WP6 Data management for multidisciplinary coastal data
T6.3 Data management activities on selected biological and biogeochemistry sensor types

T6.3.1 Biological imagery data

T6.3.2 Use of biological sensors for acquiring diversity and functionality data of the phytoplankton communities

T6.3 leader	Véronique Créach
Subtask 6.3.1 leaders	Patricia Cabrera, Jean-Oliver Irisson
contributors	Klas ove Möller, Markus Lindh, Fabien Lombard
Subtask 6.3.2 leaders	Melilotus Thyssen, Felipe Artigas
contributors	Gerald Gregori, Alain Lefebvre, Markus Lindh, Jukka Seppala, Peter Rubbens

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Biological Data Management

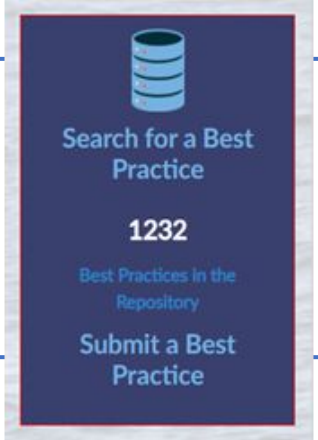
Describing best practices and develop a strategy towards data management of biological data, ensuring effective data flow towards European data infrastructures.

1. Develop standardised protocol descriptions and minimal technical metadata elements for effective re-use; Identify and extension of appropriate vocabularies;
2. Identify tools for data integration and platforms for trustworthy long-term archival;
3. Map sensor-specific formats to standardized data formats to be ingested by European data infrastructures;

Deliverables: M26 (February 2022)

- **D6.4 (imagery)**
- **D6.5 (biological optical sensors)**

Best Practices guidelines & strategy for biological data management



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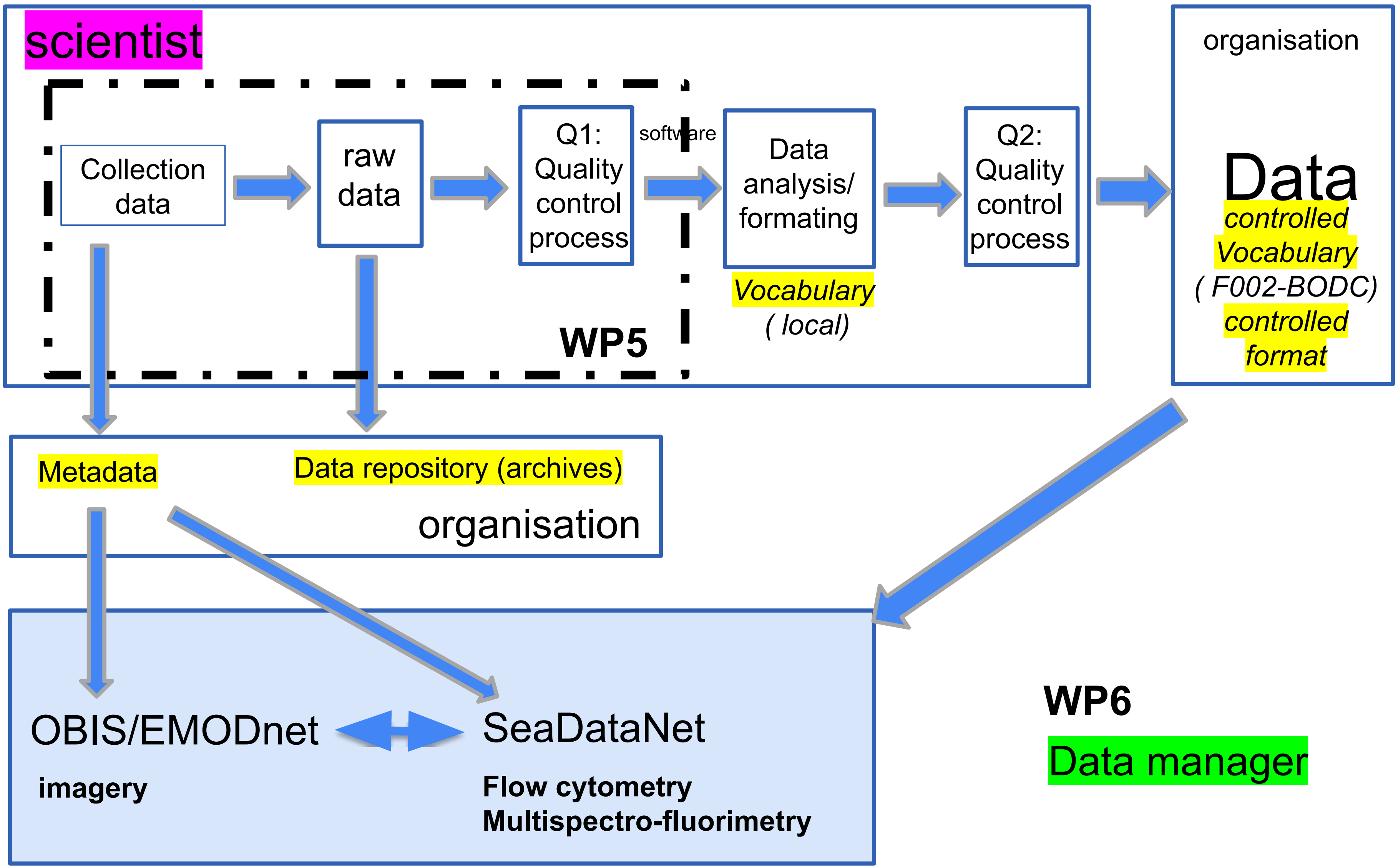

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JERICO RI
SCIENCE - SERVICES - SUSTAINABILITY

Flow cytometry:

- Vocabulary (F02)

The NERC Vocabulary Server (NVS)

Service Status

NVS Home | Vocabularies | Thesauri | Search NVS | SPARQL | Other Tools | About NVS

Vocabulary

SeaDataCloud Flow Cytometry Standardised Cluster Names

Done:

Alternate Profiles

Different views and formats:

Alternate Profiles ?

URI	http://vocab.nerc.ac.uk/collection/F02/current/
Description	Terms recommended by the SeaDataCloud working group on flow cytometry data to standardise the naming and definition of clusters.
Creator	SeaDataNet
Modified	2021 03 13
Version Info	5
Identifier	F02
Register Manager	British Oceanographic Data Centre
Register Owner	SeaDataNet

DONE

Members

Identifier	PrefLabel	Definition	Date
F0200009	Heterotrophic prokaryotes DEPRECATED	Heterotrophic prokaryotes include both bacteria and Archea. They do not contain any photosynthetic pigments and thus do not have any autofluorescence properties exploitable by flow cytometry. Thus, they require a staining with some fluorescent dye to be resolved by flow cytometry. In most studies a nucleic acid dye is	2021-03-08

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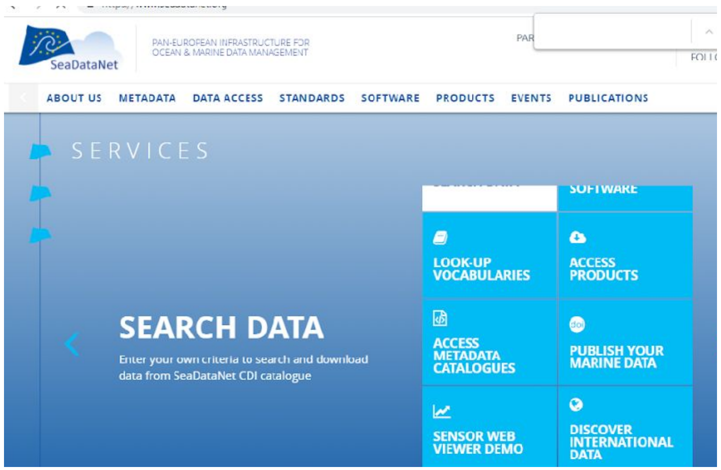
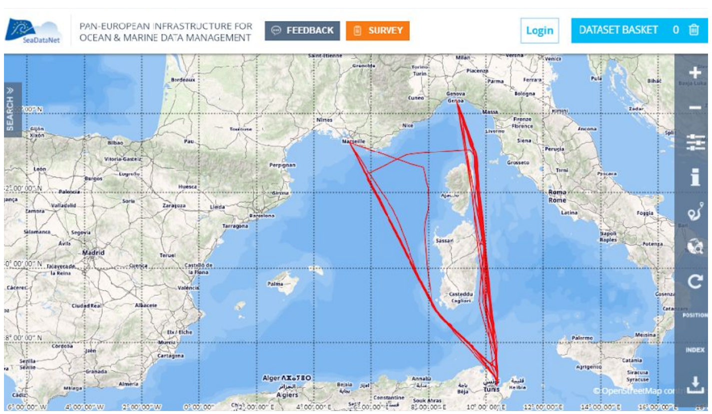
Flow cytometry:





- Metadata consultation

'Project', 'Project.starting.Date', 'Project.ending.Date', 'PI', 'Cytometer.ID', 'Station', 'Depth', 'Latitude', 'Longitude', 'Study.area', 'Samples.Operator', 'Standards.Reference', 'Clustering.Method', 'Observation.Type', 'Platform.Type', 'Platform.ID', 'Platform.Nationality', 'Sampling.Date', 'Analysis.Date',

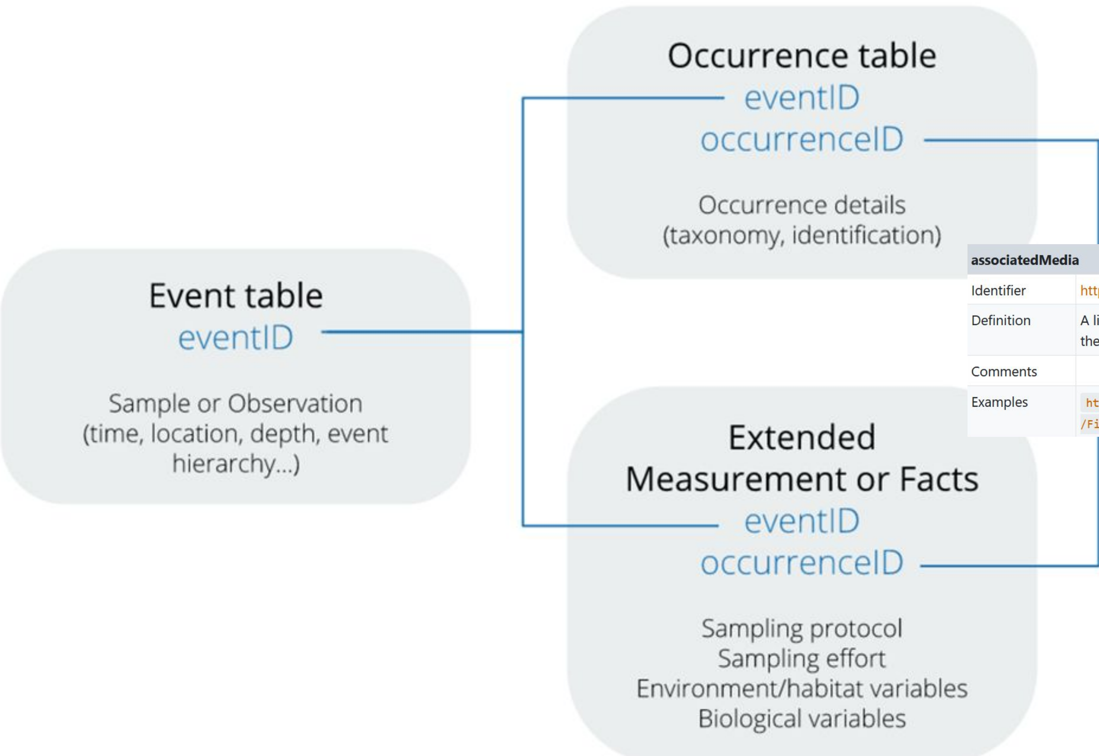
- Data format consultation

'Standardized.name', 'Selection.Set', 'File', 'Volume', 'Trigger.Channel', 'Trigger.level', 'SWS.amplification', 'FLO.amplification', 'FLR.amplification', 'Abundance', 'Mean.Total.FWS_varx1', 'SD.Total.FWS_varx2', 'Mean.Total.SWS', 'SD.Total.SWS', 'Mean.Total.FLR', 'SD.Total.FLR', 'Mean.Total.FLO', 'SD.Total.FLO', 'Mean.Max.FLR', 'SD.Max.FLR', 'Beta.0', 'Beta.1', 'Mean.Length', 'SD.Length']

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Imagery:

OBIS-ENV format for imagery datasets



associatedMedia	Property
Identifier	http://rs.tdwg.org/dwc/terms/associatedMedia
Definition	A list (concatenated and separated) of identifiers (publication, global unique identifier, URI) of media associated with the Occurrence.
Comments	
Examples	`http://arctos.database.museum/SpecimenImages/UAMObs/Mamm/2/P7291179.JPG` , `http://204.140.246.24/Fish/Collection%20Pictures/10118-00.jpg | http://204.140.246.24/Fish/Collection%20Pictures/10118-00a.jpg`

- Darwin Core Multimedia extension http://rs.gbif.org/extension/gbif/1.0/multimedia.xml

Metadata about multimedia resources: type, format, identifier, etc...

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Imagery:

L22: Instruments

Instrument	URL
Hydroptic Underwater Vision Profiler 5 DEEP {UVP5} imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1577/
Hydroptic Underwater Vision Profiler 6 LP {UVP6} imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1578/
unspecified **PlanktoScope** [custom build] imaging sensor - Pollina et al. (2020)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1579/
Ifremer-LDCM **FastCAM** (Prototype) Flow Imaging Microscope - Karlson et al. (2017)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1580/
Hydroptic **ZooSCAN** imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1581/
CoastalOceanVision **CPICS-1000-e** imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1582/
Yokogawa Fluid Imaging Technologies **FlowCam** VS [imaging only system without light scatter measurement] (Benchtop) particle imaging system series	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1583/
Video Plankton Recorder {**VPR**} imaging system - Davis et al. (1992)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1584/
Sequoia Scientific **LISST Holo** 2 Digital Holographic Particle Imaging System	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1585/
iSiTEC Lightframe On-sight Keyspecies Investigation {**LOKI**} imaging sensor - Schulz et al. (2009)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1586/
ZooCam imaging sensor - Colas et al. (2017)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1587/
McLane Research Laboratories Imaging **FlowCytobot** imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1588/

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Technical metadata related to image data processing

Square micrometres	http://vocab.nerc.ac.uk/collection/P06/current/SQUM/	Created
Square milimetres	http://vocab.nerc.ac.uk/collection/P06/current/MILM/1/	Created
Equivalent spherical diameter	http://vocab.nerc.ac.uk/collection/S06/current/S0600260/	Created
Pixel size in mm (y)	https://github.com/nvs-vocabs/S06/issues/24	Requested
Mayor axis length (in digital image)	https://github.com/nvs-vocabs/S06/issues/23	Requested
Minor axis length (in digital image)	https://github.com/nvs-vocabs/S06/issues/22	Requested
Area (in digital image)	https://github.com/nvs-vocabs/S06/issues/21	Requested
Width (in digital image)	https://github.com/nvs-vocabs/S06/issues/20	Requested
Volume of an organism, in mm3 with a spherical assumption (based on area and ESD)	https://github.com/nvs-vocabs/P01/issues/61	Requested
Volume of an organism, in mm3 with an ellipsoidal assumption (based on major and minor)	https://github.com/nvs-vocabs/P01/issues/62	Requested

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Next steps

Flow cytometry:

- **Future actions**
  - Finalise the metadata and data format
  - Q&C processes

Imagery:

- **Future actions (long term):**
  - Identify tools for data integration and platforms for trustworthy long-term archival;
    - Contact the BioImage archive to discuss its potential as a open image archive for our best practices.

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Workshop on biological data flow (M32)

Agenda

- 16:00 Welcome and introduction of participants (10 min) Veronique Creach
- 16:05 ECOTAXA dataflow (10 min presentation + 15 min discussion) Fabien Lombard (CNRS-LOV)
- 16:30 Flow cytometry dataflow (10 minutes presentation + 15 min discussion) Melilotus Thyssen (CNRS-MIO)
- 16:55 Presentation of the survey on data management per partner (5 minutes) Veronique Creach
- 17:00 Discussion with the partners about the way to facilitate the dataflow from researcher to European infrastructure (25 minutes) Veronique Creach/Patricia Cabrera
- 17:30 End of the session

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

GRANT N°: 871153
PROJECT ACRONYME : JERICO-S3
PROJECT NAME : Joint European Research Infrastructure for Coastal Observatories - Science, services, sustainability
COORDINATOR : Laurent DELAUNEY - Ifremer, France - jerico-s3@ifremer.fr

JERICO-S3 MILESTONE Joint European Research Infrastructure network for Coastal Observatory **Science, Services, Sustainability**	
MS#, WP# and full title	**JERICO-S3 MS25** - WP5 Subtask 5.3.3 **"State of the art capturing and analysing gaps in Best Practices for implementing and operating biological data acquisition in coastal observatories "**
5 Key words	Best practices, biological data, biological sensors
Lead beneficiary	CNRS (LOG)
Lead Author	Luis Felipe Artigas
Co-authors	Véronique Créach, Clémentine Gallot, Zéline Hubert, Mélilotus Thyssen
Contributors	Kees Borst, Catherine Boccadoro, Fabio Brunetti, Carolina Cantoni, Weinche Eikrem, Costas Frangoulis, Gerald Grégori, Andrew King, Alain Lefebvre, Fabien Lombard, Klas Over Moller, Martin Pfannkuchen, Ian Salter, Jukka Seppälä, Joao Vitorino
Submission date	25/06/2021

→ Please specify the type of milestone:

✔ **Report after a workshop or a meeting (TEMPLATE A) ⇒ JERICO-Week#2, April 19-23 2021**
□ Report after a specific action (TEMPLATE B) (test, diagnostic, implementation,…)
□ Document (TEMPLATE B) (guidelines,...)
□ Other (TEMPLATE B) (to specify) ……………………..

Diffusion list			
Consortium beneficiaries **X**	Third parties	Associated Partners	other

ARW SESSION 3 - **PART 1**

Harmonisation of the observation of biological variables

(for PART 2-DataFlow, LINK HERE)

Thursday 22 April 2021 / 14:00 - 15:30

Scope of the session:

The aim of this session is to present and discuss the ongoing work on collecting operational procedures and defining best practices for the automated observation of biological variables. We bring together colleagues from partners of different regions involved in automated high resolution biological monitoring focusing on phytoplankton functional (applying flow cytometry and multispectral fluorometry) and/or plankton taxonomic diversity (applying imaging in flow/in situ).

Expected outcomes:

1. Update on capability for plankton observation in the PSS and IRS.
2. Summary of the results from the first workshop on best practices for automated flow cytometry followed by a discussion on framing the best practices template document (IOC/IODE)
3. Discussion on questionnaires and workshops to come on image analysis and multispectral fluorometry

The outcomes will be to make progress in defining common operational and calibration procedures, discussing quality control procedures that will be put as flags in the metadata base (in connexion with WP6), developing specific recommendations on sampling/measuring strategy regarding different platform types. We will start presenting the international template for the definition of best practices and start to fill it.

We will formulate together what requirements to be addressed to sensor providers in order to specify sensor performances (e.g. catalogue of the specificities for each sensor, diagnosis after maintenance, troubleshooting guide). A discussion will also be effective on further technological developments or improvements for effective implementation in the demonstration observation module, as well as about the automation in raw data analysis (in connexion with WP7).

Targeted audience:

JERICO-S3 partners: Scientists and Engineers operating and/or analysing biological (plankton) data from automated platforms in the different IRS-PSS.

Type of organisation : Working group session (plenary)

After the presentation of the main objectives of the session and the work on common operational procedures and best practices for plankton automated observation, a presentation will be made about the current implementation of biological (plankton) observation in automated platforms per institution through the different PSS/IRS.

Main reference persons: (Organisers/leaders)

Luis Felipe Artigas (CNRS-LOG) - Véronique Créach (CEFAS)

WHAT IS EXPECTED FROM REGIONS (PSS and IRS) ?

Applicable to experts and users of automated biological sensors from JERICO partners and institutions. A questionnaire will be sent one week prior to the session to help summarise the state of the deployment of automated sensors in the different platforms of each PSS/IRS, that will be discussed in previous IRS/PSS sessions of the JERICO week.

#	Description (duration in minutes ?)	Leading person	Link
1	Welcome and introduction of participants (10 min)	Felipe Artigas	
2	Presentation and discussion about the update on capability for plankton observation in both PSS and IRS (15 min)	Felipe Artigas	
3	Presentation of the results from the first workshop on best practices for automated flow cytometry followed by a discussion on framing the best practices template document (IOC/IODE) (25 min)	Véronique Creach	
4	Presentation and discussion about questionnaires and workshops to be scheduled on image analysis and multispectral fluorometry (15 min)	Felipe Artigas	
5	Round table about newt steps to take and about the requirements to be addressed to sensor providers in order to specify sensor performances (e.g. catalogue of the specificities for each sensor, diagnosis after maintenance, troubleshooting guide, requirements for in automated platforms) (25 min)	Felipe Artigas	

NOTES and MINUTES

→ **SECRETARY.IES (responsible for notes and minutes)**: Felipe Artigas, Zéline Hubert

After presenting the slideshow about the state of advancement of the WP5.3.3 task, the questionnaires that had been released and the results of the first workshop on operational practices for automated flow cytometry held by April 2021 (the two other workshops to be organised in summer 2021), a roundtable took place in order to have a mostly updated information on automated techniques and autonomous platforms that are been used by JERICO S3 colleagues in the different PSS and IRS areas.

Klas Over Moller (Hereon/HZG - North Sea PSS): Video Plankton Recorder (VPR)

- CPICS (profiling lander at Helgoland PSS North Sea)
- CPICS deployed in cruises

Saskia Ruhe (post-doc) CNRS-LOV cruise: harmonization and comparison between imaging sensors (8 instruments) UVP6 HF and UVP6 low power, UVP5, CPICS, Holographic camera system, FlowCAM + fluorescence triggering.

Alain Lefebvre (IFREMER LER/BL-Channel PSS): The ZooCam is used during fisheries Survey and works are mainly oriented towards fish larvae and eggs identification.

Felipe Artigas (CNRS LOG) **and Alain Lefebvre** (IFREMER LER/BL - Channel PSS): MAREL Carnot Fixed Station – Boulogne-sur-Mer – deployment of a CytoSub and expecting to also connect an automated nutrient analyser (Costof-2) on it.

Felipe Artigas and Fabrice Lizon (CNRS LOG): deployment of automated sensors (CytoSense, CytoSub, Fluoroprobe, FRRF) in dedicated (regular or seasonal) and opportunity cruises (in collaboration with IFREMER).

Jukka Seppälä (SYKE - Gulf of Finland PSS): plenty of sensors at Uttö, Baltic ferrybox,

Bengt Karlson has initiated an IFCB network (IMR, SMHI, NIVA, SYKE, HCMS, Marine Scotland and NAMC).

Aquacosm Project - Jens Nejgstgaard (IGB Berlin) IFCB for freshwater.

Weinke and Andrew (NIVA - Norway Sea IRS): IFCB in the Oslo-Kiel FerryBox (Skagerrak-Kattegat IRS) connected to the work in JERICO.

Ian Salter (Havostvan - Norway Sea IRS): On the Faroese activities - we have a flowcam which is used for our coastal observatory and which we are attempting to integrate into a research vessel using the scheduling software and some fluidic controls. We also just invested in a DAVPR for cruise work on the coastal shelf but have not received it yet.

NIVA (Norway Sea IRS): Initially Deltares and RWS to get biological sensors on a new FB from Norway to Netherlands UK (interaction with North Sea PSS).

Klaas Deneudt (VLIZ - Channel and North Sea PSS): LifeWatch operational CytoSense/FlowCAM.

Véronique Créach (CEFAS-Channel and North Sea PSS): CytoSense Endeavour + AOA FB.

IFREMER Brest (Bay of Biscay IRS): CytoSense in the Bay of Brest.

Fabien Lombard (CNRS LOV, Bay of Biscay IRS): MPA Iroise - Zooplankton and ECOTAXA.

Fisheries cruises AOA + ZooCAM

Joao Vitorino (Iberian Margin IRS - Portugal) multiparameter buoys - fluorometers - C point fluorometers - project proposal region partners, AOV imagery camera, ferry box.

Fabien Lombard (CNRS LOV - Western Mediterranean PSS) : UVP5, UVP6 low power-Argo float, gliders, CTD, Planktonscope, Bay of Villefranche sur Mer, different cruises - ECOTAXA.

Melilotus Thyssen and Gérald Grégori (CNRS-MIO - Western Mediterranean PSS): HF plankton - CytoSense continuously at Endoume fixed station another for different cruises (remote sensing and in situ CytoSense) FCM Platform (PRECYM) in Marseille - CtyoPro (heterotrophic prokaryotes as well) - FlowCAM and ZooScan.

Fabio Brunetti (National Institute of Oceanography and Applied Geophysics – OGS) **& Carolina Cantoni** (CNR – Cretan Sea PSS): CTD fixed platform, 3 buoys Italian coast fluorometers in Gulf of Trieste, Venice and…(Triplets fluorometers).

Martin Pfannkuchen (Ruder Boskovic Institute): 2 buoys + profiling CTD - chl a , cyano fluorescence (blue and red) + CDOM + CytoSense 2 lasers + NGS weekly metabarcode, metatranscriptome.

Costas Frangoulis (HCMR - Cretan Sea PSS): use of Fluorometers in buoy and FB. JERICO NEXT various tested sensors, tests continued during JERICO S3 (e.g PE sensor) + - connexion with AQUACOSM PLUS - Primary Production estimates via LabStaff sensor from Chelsea and chl*a* + O2 sensor (CytoSense may be available in near future). System similar to Zooscan used for more than 10 years (not part of JERICO).

Kees Borst (RWS, Channel and North Sea PSS): I am involved in the Ferrybox line from Rotterdam-Oslo together with Niva (Kai) and Andrew. We are now planning a comparable experiment later this year within TNA (RWS, Deltares and Niva-Norwegian Sea and Sakgerrak-Kattegat IRS) for the flow cytometer/FRRF, etc.

A discussion followed on deployment of automated sensors and possible common work to be carried out for getting into common operational practices for the different sensors.

Andrew King: TNA proposed for comparison of Imaging Flow Cytometers (NIVA, RWS…) - cultures, natural seawater, etc. - Harmonisation activity for other biological sensors (FRRF, PSiCAM, other multispectral, comparison with satellite work).

Klas Owe Moller: can we benefit from PSS - IRS field work (as we did in Gotheborg in September 2016)? Also intercomparison between simultaneous work within IRS and PSS.

Fabien Lombard: cooperating sensors together?

Gerald Grégori: but instead of inter comparing it will be better to combine sensors and discuss why we have or get differences, etc.

Jukka: JERICO S3 not a really science project, so little place to best practices intercomparisons… if we cannot do and what we need to plan to do in the future in our joint observatories - optical component, dial cycles, seasonal changes.

But we need to really understand what each of the sensors can bring as knowledge.

How to compare things that are not harmonised within the technology either?

Andrew King: apologies if I caused some issues here with "comparison" - I did not intend to say that we intend to directly compare these sensors, but just that the TNA exercise planned will be *similar* to the CO2 inter comparison we did in JERICO-NEXT. But the idea for the biological sensors (so far) is to assess the operability of these sensors with flow-through observing systems and different types of phytoplankton classes/sizes. And also try to bring in other phytoplankton-related sensors (basic in vivo chl*a* fluorometer) and others.

JPI Oceans sounds like a reasonable venue for the work Jukka suggested?

Catherine Boccadoro: Sensors could be made available during several months for the demonstration module (coastal EGIM) according to coupling between biology-biogeochemistry.

Finally, the Workshop ended on the need to convey common targeted actions and workshops to continue the discussion on how to get into common operational practices for each sensor in order to move towards the common definition of best operational practices and to make the link to the best common practices for data providing, analysis and inclusion into common databases (being as Findable, Accessible, Interoperable, Reusable – FAIR as possible).

Attendees (49) → Taken at 14:30, session started at 14:00

- Léa G. (Co-host, me)
- Laurent D (JERICO Coo... (Host, Guest)
- felipe artigas (Co-host, Guest)
- ingrid P (Co-host)
- Patricia Cabrera (Co-host, Guest)
- veronique Creach (Co-host, Guest)
- alain lefebvre (Guest)
- Andres Cianca (PLOCAN) (Guest)
- annalisa (Guest)
- Carlo Mantovani (CNR) (Guest)
- Carolina Cantoni (CNR) (Guest)
- Catherine Boccadoro (Guest)
- Costas Frangoulis (Guest)
- Eva Alou (SOCIB) (Guest)
- fabien lombard (Guest)
- Fabio Brunetti (Guest)
- WEI (Guest)
- Zéline Hubert (Guest)
- Lennert Schepers (VLIZ) (Guest)
- Leonidas Perivoliotis (HCMR) (Guest)
- Lisette Enserink (Guest)
- Lumi (Guest)
- Marc Nogueras (UPC) (Guest)
- Martin Pfannkuchen (Guest)
- Martti Honkanen (Guest)
- Miguel Charcos (SOCIB) (Guest)
- Milla Johansson (Guest)
- Nikolaos Zarokanellos (Guest)
- Pirjo Kuuppo SYKE (Guest)
- Saskia Rühl (Guest)
- sebastian ehrhart [syke] (Guest)
- thyssen (Guest)
- Timo Tamminen, SYKE, Finland (Guest)
- Fabrice LIZON (Guest)
- Gerald GREGORI (Guest)
- Gisbert Breitbach (Hereon) (Guest)
- Henning Wehde (Guest)
- iansalter (Guest)
- Inga Lips (EuroGOOS) (Guest)
- Isabelle Rombouts (Guest)
- JAllen (Guest)
- Joao Vitorino (Guest)
- Jukka Seppälä (Guest)
- Julien Mader (AZTI) (Guest)
- Kate Collingridge (Guest)
- Kate Collingridge (Guest)
- Kees Borst (RWS-NL) (Guest)
- Klas Ove Möller (Guest)

Workshop on the harmonisation of the observation of biological variables

Organiers: Luis Felipe Artigas (CNRS-LOG) - Véronique Créach (CEFAS)

Contributors: Kees Borst, Catherine Boccadoro, Fabio Brunetti, Carolina Cantoni, Weinche Eikrem, Costas Frangoulis, Clémentine Gallot, Gerald Grégori, Zéline Hubert, Andrew King, Alain Lefebvre, Fabien Lombard, Klas Over Moller, Martin Pfannkuchen, Ian Salter, Jukka Seppälä, Mélilotus Thyssen, Joao Vitorino

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Subtask 5.3.3 Biological automated sensors

- ***Scope of the session:*** to present and discuss the ongoing work on collecting **operational procedures** and **defining best practices** for the automated observation of biological variables.
- ***Approach:*** bringing together scientists and engineers operating and/or analysing biological (plankton) data from automated platforms in the different IRS-PSS, focusing on ***phytoplankton functional diversity*** (applying *automated flow cytometry and multispectral fluorometry*) and/or both ***phyto- and zooplankton taxonomic diversity*** (applying *imaging in flow/in situ*).
- ***Expected outcomes:***

1. Update on **capability for plankton observation** in the PSS and IRS.
2. Summary of the results from the first workshop on **best practices for** *automated flow cytometry* followed by a discussion on **framing the best practices** template document (IOC/IODE)
3. Discussion on questionnaires and workshops to be scheduled in June on *image analysis* and *multispectral fluorometry*
4. Discussion on next steps to make (including asking for contribution of sensor

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Workshop on harmonisation of automated biological observations

Agenda

- 14:00 Welcome and introduction of participants (10 min) Felipe Artigas
- 14:10 Presentation and discussion about the update on capability for plankton observation in both PSS and IRS *D5.1* (15 min) Felipe Artigas
- 14h25 Presentation of the results from the first workshop on best practices for automated flow cytometry followed by a discussion on framing the best practices template document (IOC/IODE) (15 minutes presentation + 10 min discussion) Véronique Créach
- 14h50 Presentation and discussion about questionnaires and workshops to be scheduled on image analysis and multispectral fluorometry (15 min) Felipe Artigas
- 15:05 Round table about next steps to take and about the requirements to be addressed to sensor providers in order to specify sensor performances (e.g. catalogue of the specificities for each sensor, diagnosis after maintenance, troubleshooting guide, requirements for in automated platforms)
- 15:30 End of the session

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Our progress on D5.1

→ Catalogue and checklists for existing biological sensors that ware and will be implemented in JERICO-S3

DELIVERABLE TITLE:

JERICO-S3 D5.1 Catalogue and checklists for existing biological sensors that will be implemented in JERICO-S3

DELIVERABLE NUMBER: **D5.1, Task 5.3, Subtask 5.3.3 – ST 7**

WORK PACKAGE N° and NAME: WP5-NA4: Harmonisation of integrated Multiplatform & Multidisciplinary systems

Authors: Artigas, F. Gallot, C. & coll.

Involved Institution: Lead: SMHI; Partners: SOCIB, NIVA, CNRS, HCMR, CNR, AZTI, NORCE, IFREMER, CEFAS, IRB, VLIZ, HZG, SYKE

Due date // Submission date: 31/03/2021 *// in progress*

Nature: **R**

(R = Report, P = Prototype, D = Demonstrator, O = Other)

Dissemination level : Public

PU = Public, PP = Restricted to other programme participants (including the Commission Services), RE = Restricted to a group specified by the consortium (including the Commission Services), CO = Confidential, only for members of the consortium (including the Commission Services)

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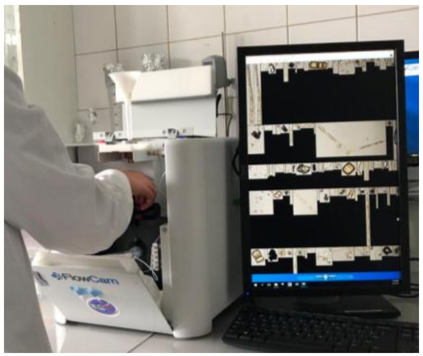
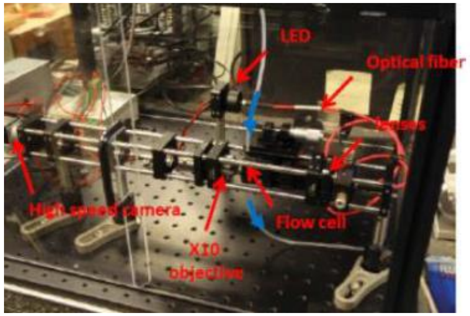
Automated imaging systems

Describing the plankton taxonomical composition based on morphology by imaging individual cells/colonies by applying imaging in-flow devices, in situ imaging devices and scanning imaging devices.

FlowCAM
Fluid Imaging Technologies



FastCAM prototype
IFREMER – LDCM

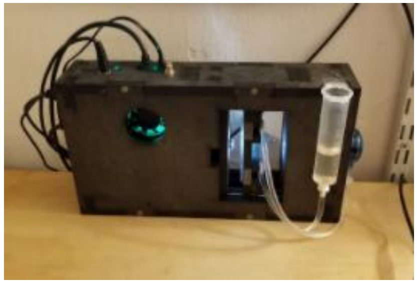


Imaging FlowCytobot
McLane Research Laboratories

Continuous Plankton Imaging and Classification Sensor (CPICS)
Coastal Ocean Vision

ZooScan
Hydroptic

Planktoscope
Planktoscope



CytoSense/CytoSub
CytoBuoy b.v.

Underwater Vision Profilers UVP5-UVP6
Hydroptic

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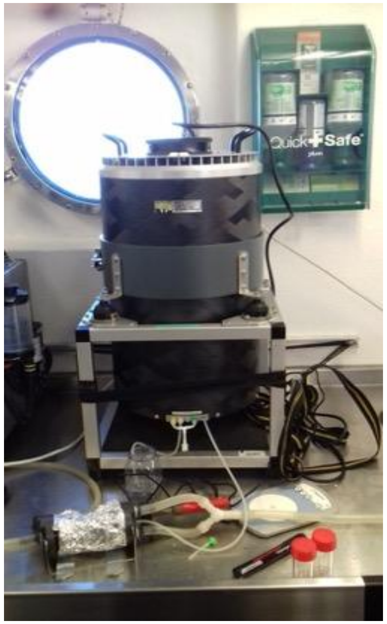
Single-cell/particle optical analysis
Pulse shape-recording Flow cytometry

Describing and characterizing the phytoplankton size/functional groups based on the fluorescence properties (pigment content) and scattering properties (size, composition) of individual cells and/or colonies. Counting all living or non-living particles

Automated flow Cytometrer (CytoSense/CytoSub)
CytoBuoy b.v.



LISST-Holo2
Sequoia

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In vivo bulk optical approaches

Multi-spectral Fluorescence or absorption/variable fluorescence

Describing the phytoplankton community based on bulk properties: fluorescence or absorption of a large number of cells. Multi wavelength approaches makes it possible to differentiate pigment groups of microalgae, whereas variable fluorometry addresses photosynthetic parameters and potential productivity

Multispectral fluorometers

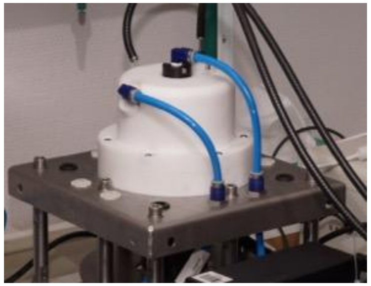
LED fluorometers
Chelsea,…

Multiexciter
JFE Advantech Co, Ltd, Japan

Fluoroprobe
bbe Moldaenke

AlgaeOnlineAnalyzer
bbe Moldaenke

Spectophotometer (HyAbs, PsiCAM)
HZG



Fast Repetition Rate Fluorometers (FRRF)
Chelsea

Pulse Amplitude Modulation Fluorometer (Phyto-PAM)
Waltz

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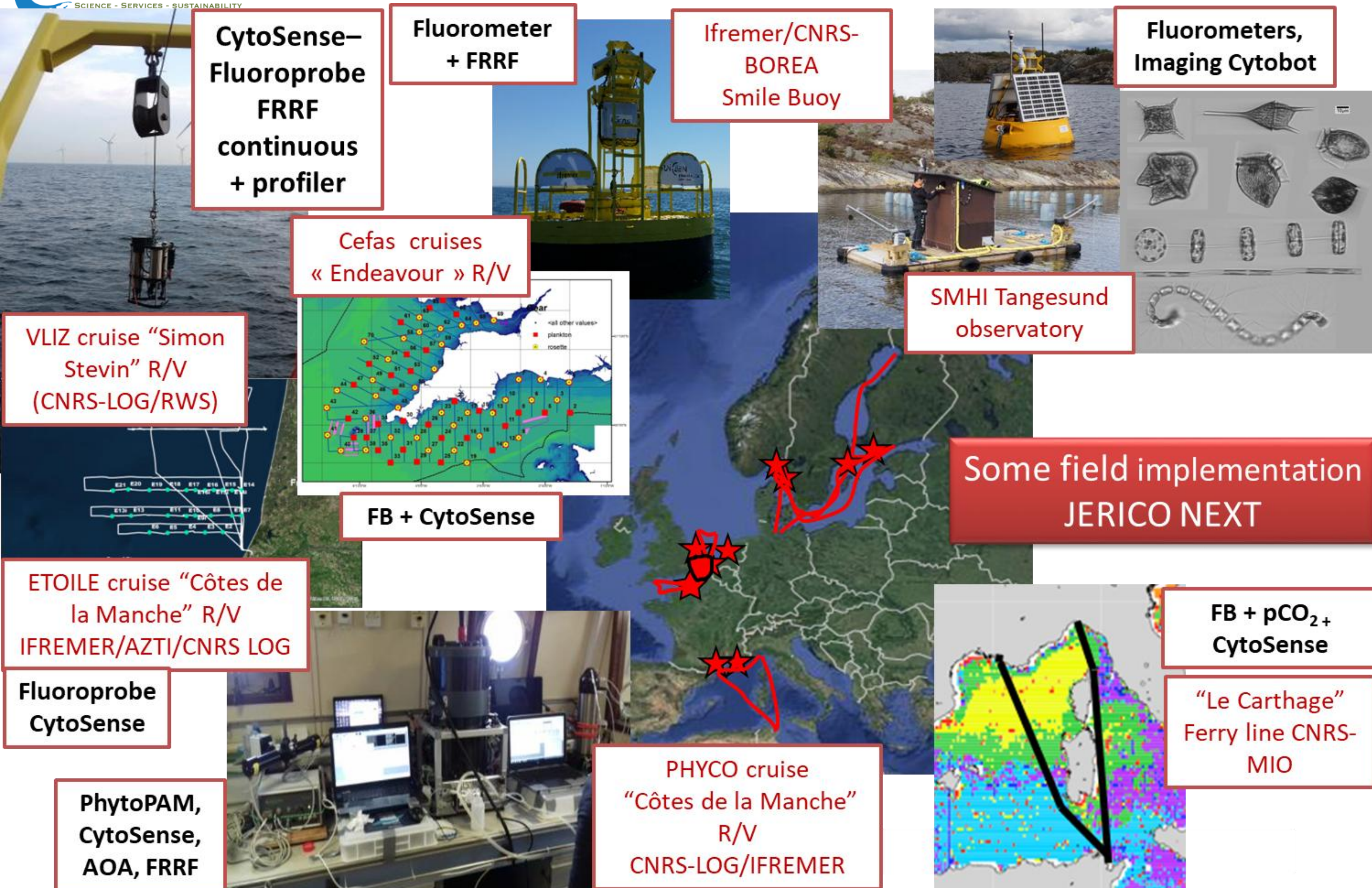

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https://www.jerico-ri.eu/2020/11/20/best-practices-in-flow-cytometry-questionnaire-launched/

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Best practices in flow cytometry questionnaire launched

Posted on 20th November 2020 | by admin

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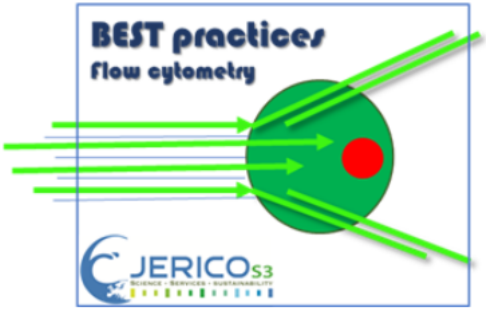

In JERICO-S3, we continue our efforts towards measuring synchronously different variables (especially biogeochemistry and biology) and filling observational gaps in under-sampled areas to understand phytoplankton dynamics and distribution in coastal waters. Our task is to improve the readiness of ship-based and autonomous platform observing networks by guaranteeing their robustness, reliability, and long-term sustainability.

A questionnaire (not longer than 15 minutes to fill) aims to collect the different practices followed by the users and to define the best practices for in vivo automated (including online) flow cytometry. The results will be presented and discussed during a virtual workshop early next year. Participants will be invited to join through existing networks.

The questionnaire is available to complete online.

Deadline 8th of January 2021.

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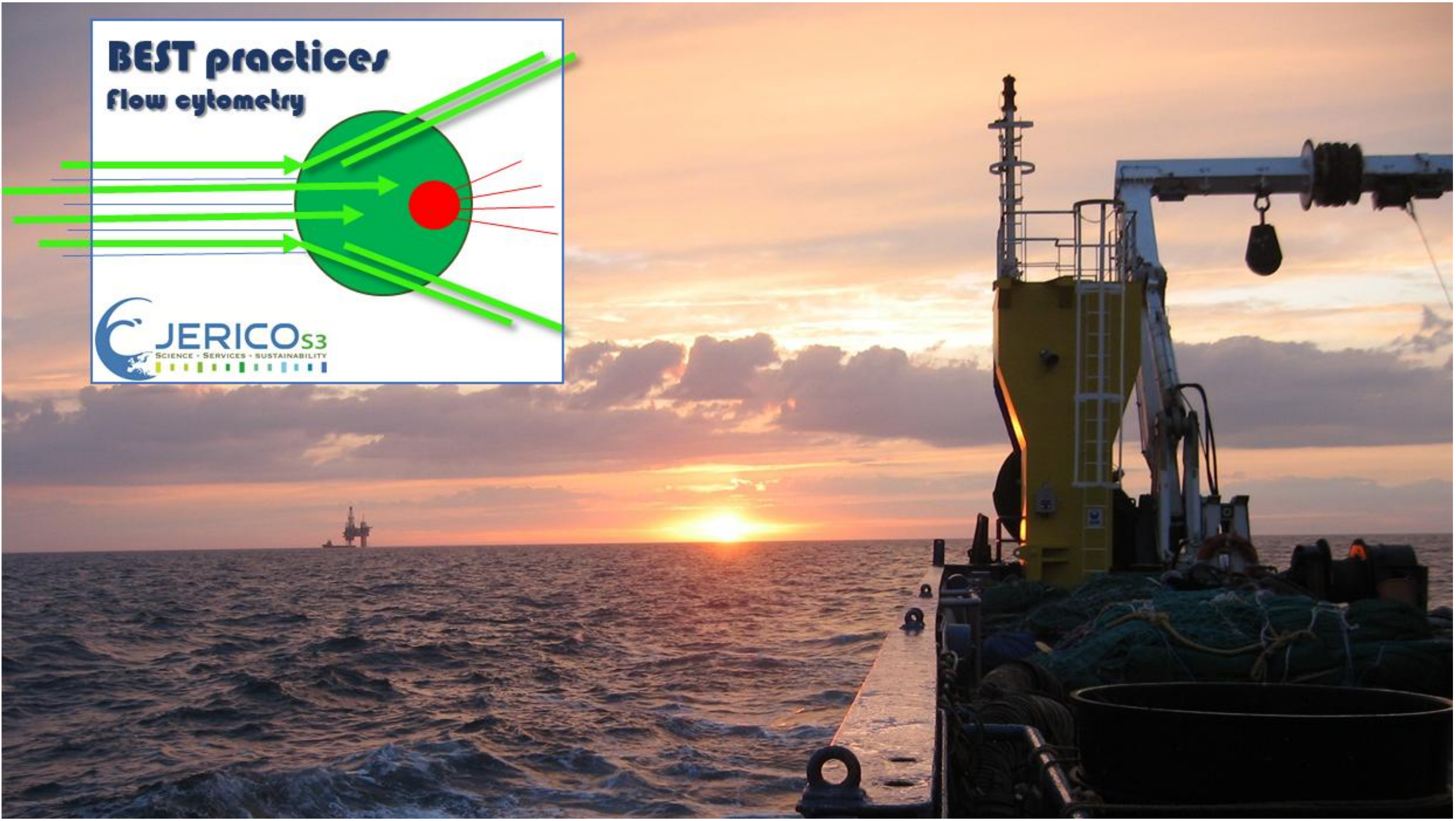
WORKSHOP BEST PRACTICES FLOW CYTOMETRY: part 1 9TH of March 2021



JERICO-Week#2_19-23 April 2021

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Open to the partnership and people who replied to the questionnaire

- Section 1. Personal information
- Section 2. Institute details
- Section 3. Description of the operational equipment
- Section 4. Maintenance
- Section 5. Operational procedures
- Section 6. Post-analysis process
- Section 7. Further information

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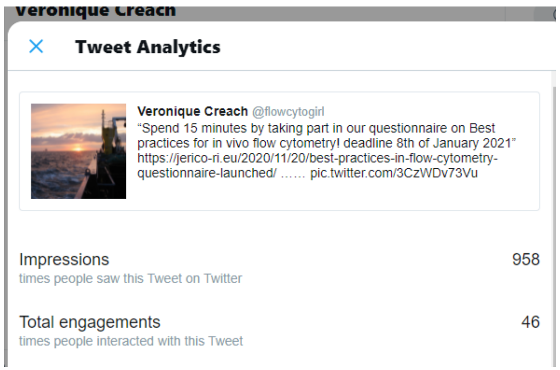
Who fill the questionnaire:

Our network



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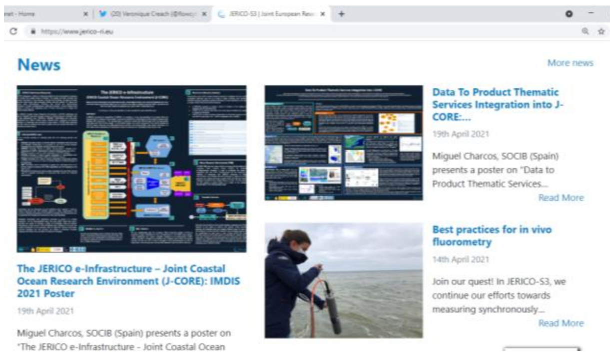
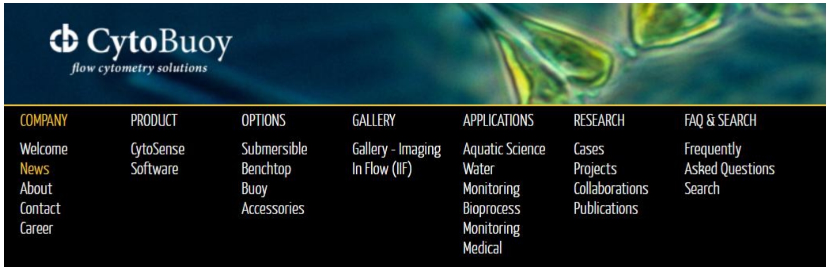
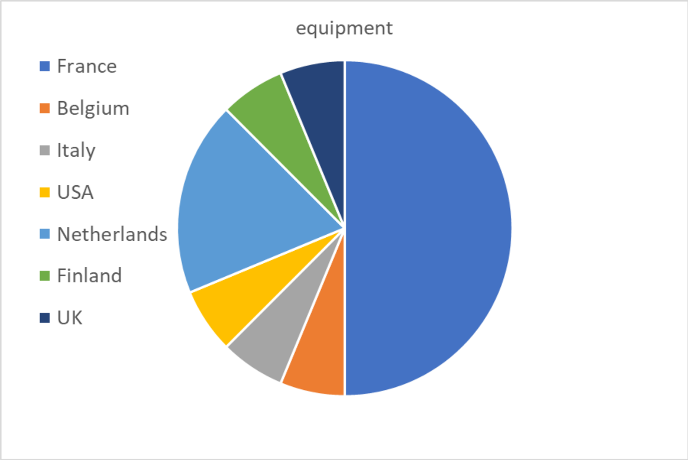


News JERICO website



Company



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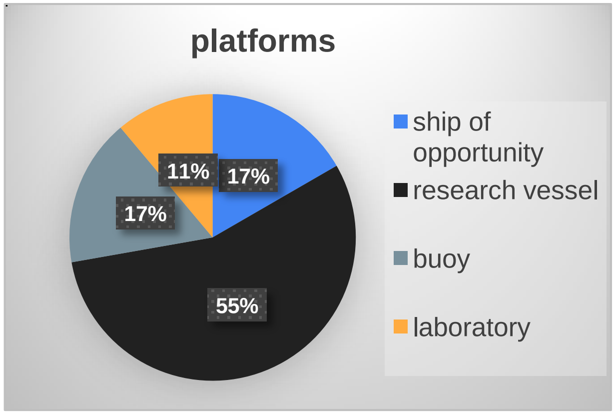
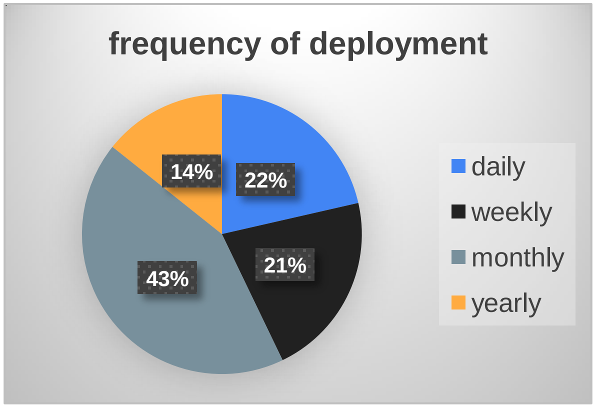
3. Description of the operational equipment

- The participants worked mainly in marine environment, with less than 5 years cytosense from Cytobuoy (NL) with camera.
- All have at least a blue laser (chlorophyll detection) and the standard two filters.
- 55% of the instruments are installed on a research vessel with circulating water supply, less than 20% on a buoy and sip of opportunity.
- Deployment: 22% daily, 21% weekly, 43% monthly, 14% yearly





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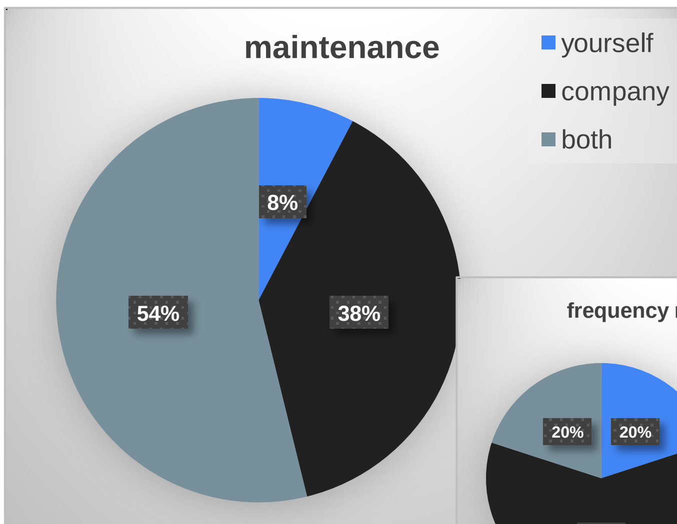
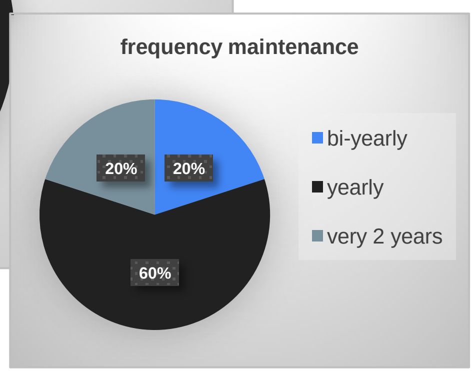
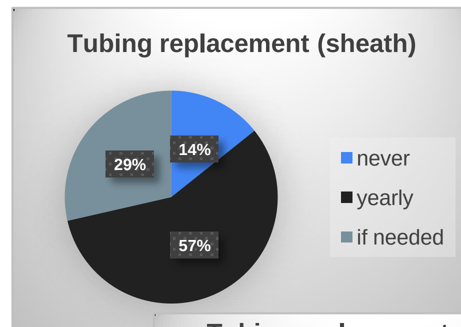
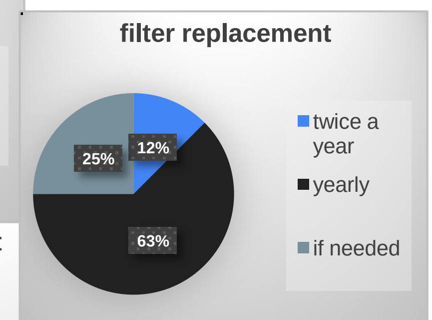
4. Maintenance

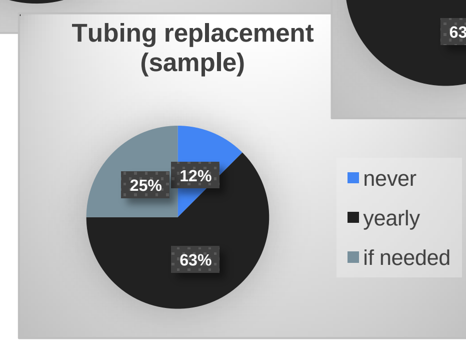
- All have a logbook, most people have a yearly revision with the company where specific parts are changed in the maintenance.
- In parallel, most people do themselves the regular maintenance when it is needed according to their use.











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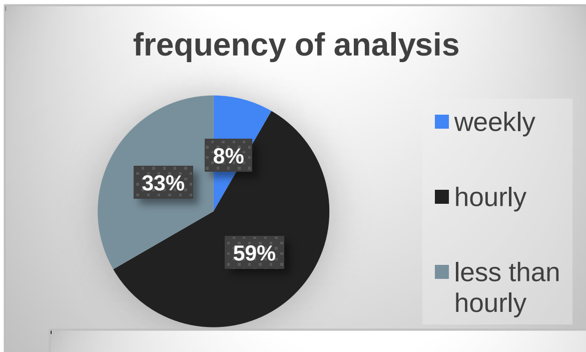
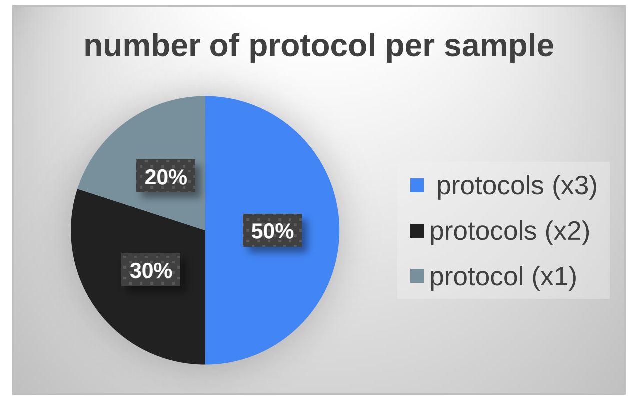
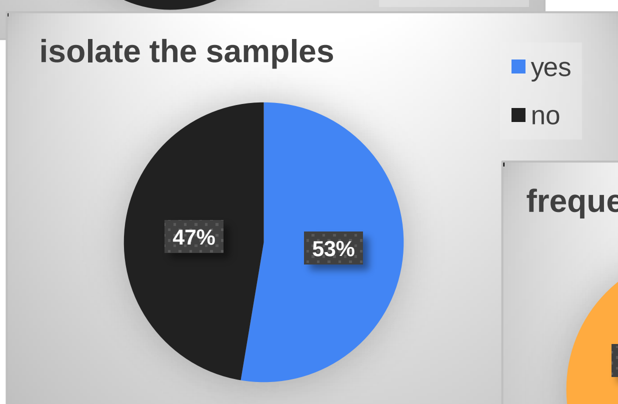
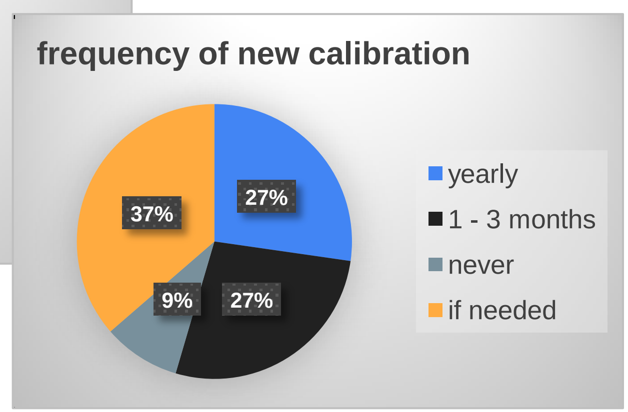
5. Operational procedure

- for the analysis on line, different analytical procedures are used as well as frequency of measurement.









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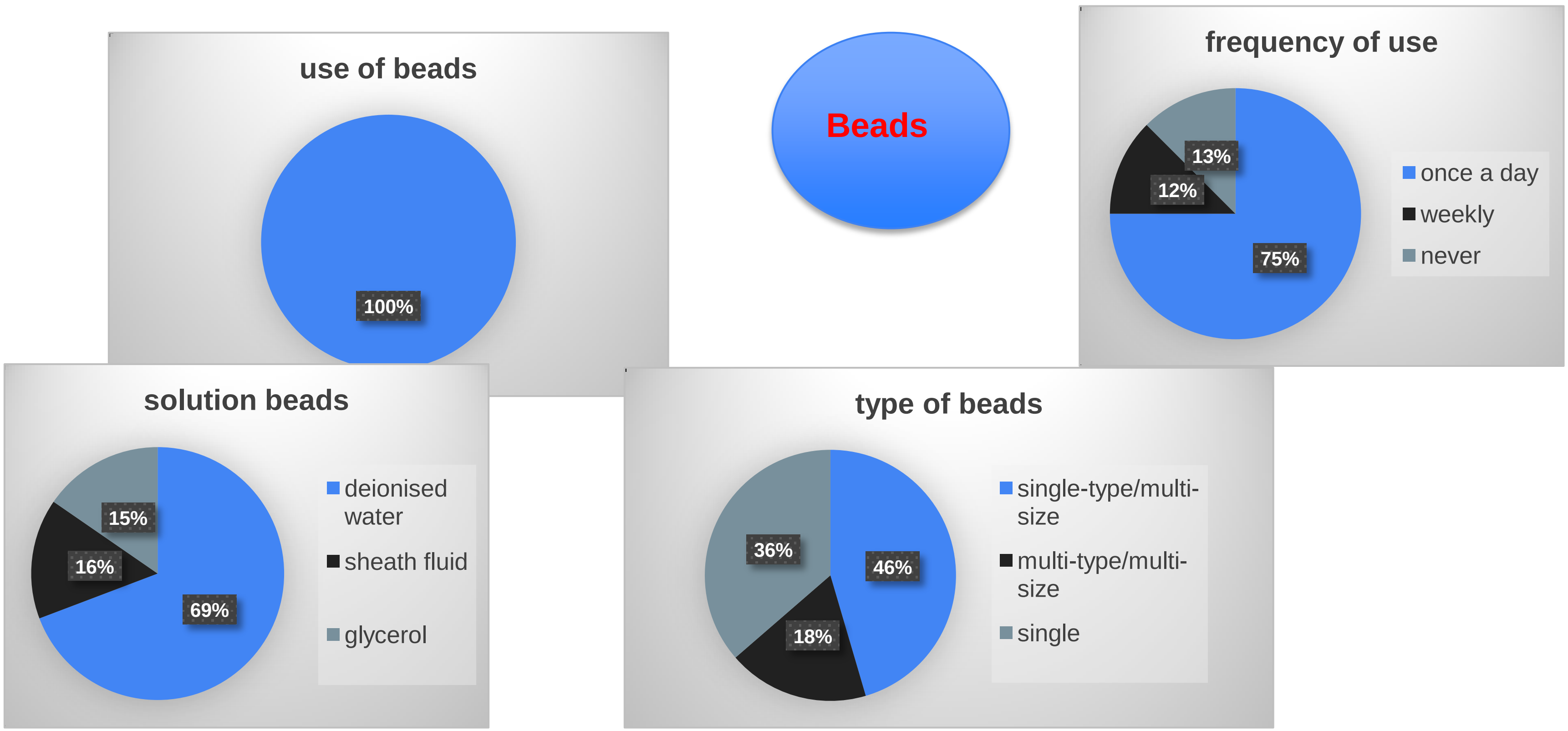
- Q&C for on line measurement is done by everybody but not following the same procedure and not using the same standard.



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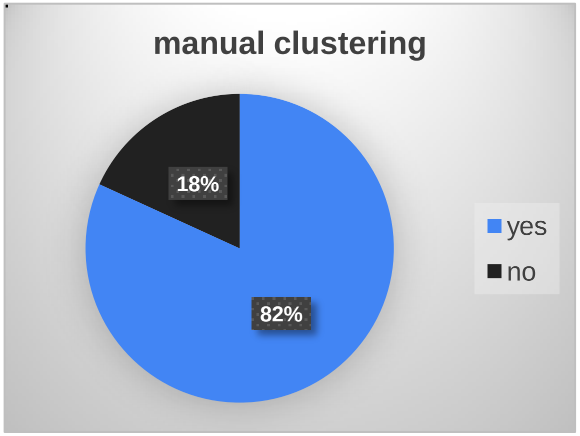
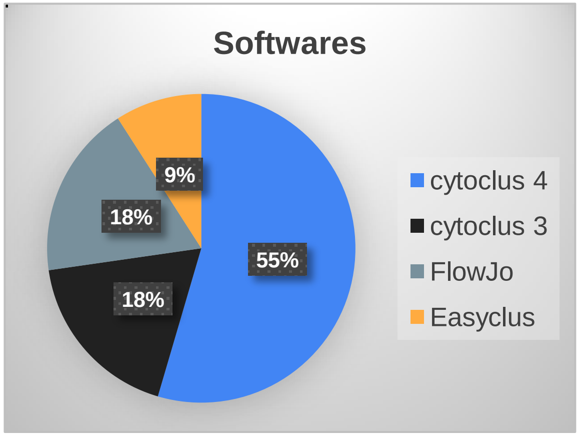
6. Post analysis process

- The analysis of data is done mainly manually with the software from the company.





Final question

Will you be interested to be part of a Laboratory Performance Network: YES.

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Lessons learned:

From the questionnaire:

- There are general trends that can be made as general operational procedures

But

- The complexity of the environment and the different objectives of the studies make difficult a complete harmonisation of the procedures

Also

- Only few people replied (9) despite the communication
- The questions were sometimes not clear enough to get an appropriate answers

From the workshop:

- People are engaged and their question and comments need to be taken into consideration (25 people for both workshop)

- Need to continue together

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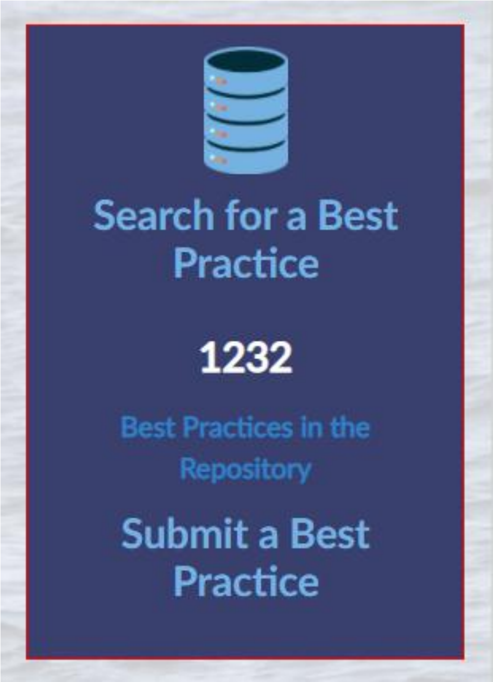
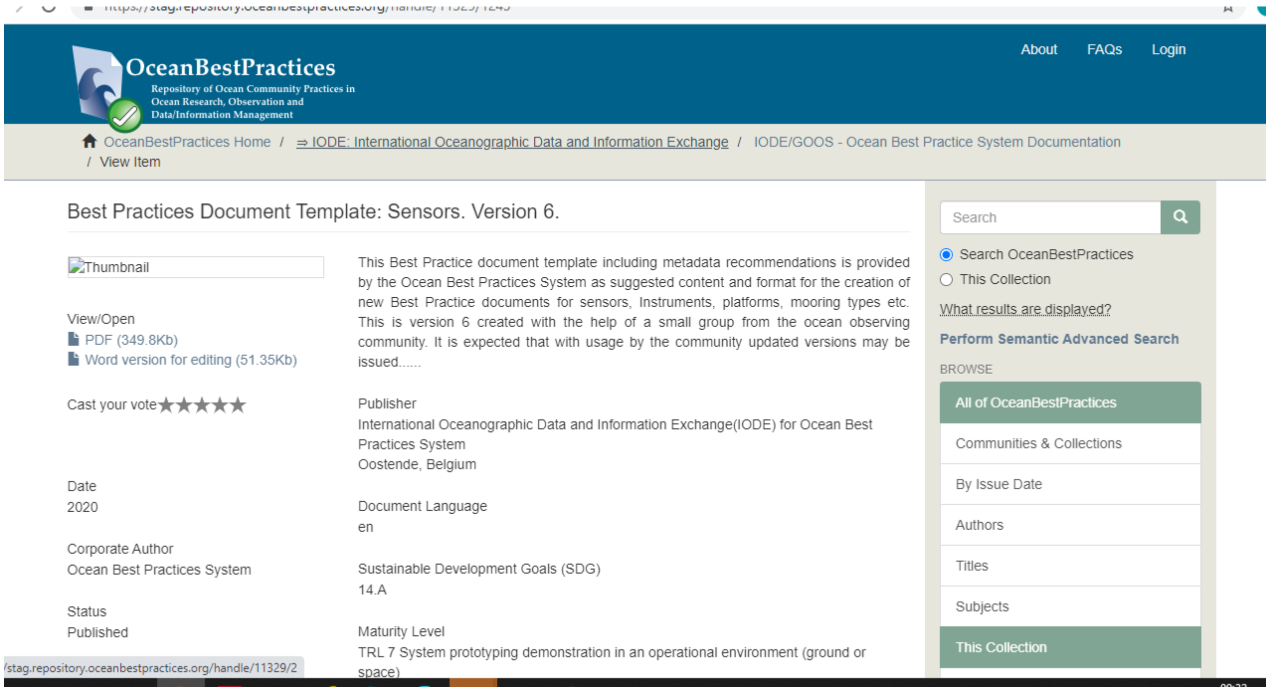
Next steps:

- To summarise the information from the questionnaire and the workshop to the Best Practice document, with the collaboration of the experts inside and outside the partnership.





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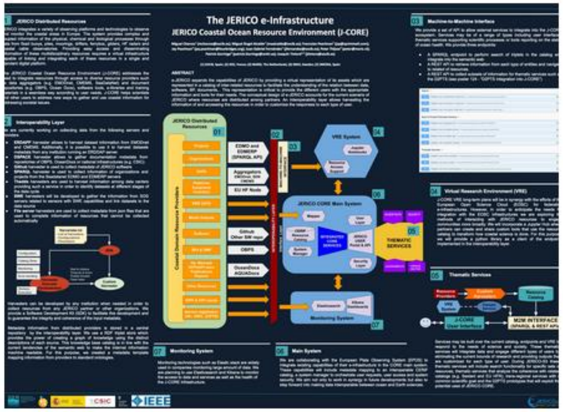

The JERICO e-Infrastructure – Joint Coastal Ocean Research Environment (J-CORE): IMDIS 2021 Poster

19th April 2021

Miguel Charcos, SOCIB (Spain) presents a poster on "The JERICO e-Infrastructure - Joint Coastal Ocean Research Environment (J-CORE)" at the International Conference on Marine Data and Information Systems (IMDIS) 12-14th April 2021 virtual conference. The JERICO e-Infrastructure Poster, IMDIS 2021 Introduction to e-JERICO The Joint European Research Infrastructure network for Coastal Observatory (JERICO) integrates a variety of observing platforms and technologies to observe and monitor the coastal areas in Europe. This meta-observing system provides complex and coupled information of the physical, chemical and biological processes through data from fixed buoys, piles, moorings, drifters, ferrybox, gliders, HF radars and coastal cable observatories. Achieving an understanding of the coastal processes requires high-quality data...

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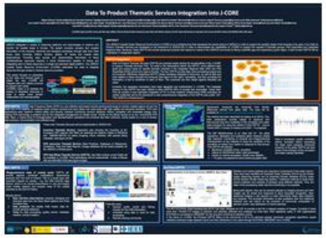

Data To Product Thematic Services Integration into J-CORE:...

19th April 2021

Miguel Charcos, SOCIB (Spain) presents a poster on "Data to Product Thematic Services...

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Best practices for in vivo fluorometry

14th April 2021

Join our quest! In JERICO-S3, we continue our efforts towards measuring synchronously...

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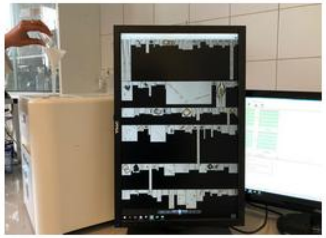

Best practices for plankton automated imagery

14th April 2021

Join our quest! In JERICO-S3, we continue our efforts towards measuring synchronously...

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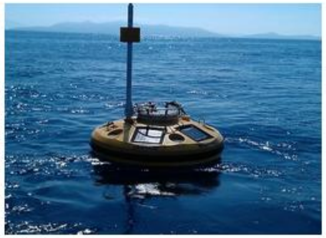

JERICO-S3: 2nd Call for Transnational Access Now Open

29th March 2021

The JERICO-S3 Research Infrastructure wishes to announce the 2nd call of 3 Transnational...

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https://www.jerico-ri.eu/2021/04/14/best-practices-for-in-vivo-fluorometry/

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Best practices for in vivo fluorometry

Posted on 14th April 2021 | by admin

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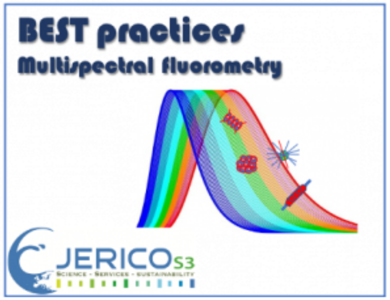

Join our quest!

In JERICO-S3, we continue our efforts towards measuring synchronously different environmental variables (especially biogeochemistry and biology) at high frequency and spatial resolution and filling observational gaps in under-sampled areas or periods. This helps to understand phytoplankton dynamics and distribution in coastal waters. Our task is to improve the readiness of ship-based and autonomous platform observing networks by guaranteeing their robustness, reliability, and long-term sustainability.

We are pleased to present you our questionnaire on in vivo fluorometry (single wavelength or multispectral) for phytoplankton biomass and pigmentary groups analysis.

This questionnaire (not longer than 15 minutes to fill) aims to collect the different practices followed by users and to help us define common best practice guidelines for in vivo fluorometry.

Complete the questionnaire

The results will be presented and discussed during a virtual workshop by mid-June. All participants will be invited to join.

Deadline May 30, 2021.

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Part C: Questionnaire

1. Instrument characteristics:

1.1 Type of instrument: *

1.2 Instrument manufacturer and sensor model: *

1.3 Year of instrument *

1.4 LED characteristics:

1.4.1 Wavelength(s): *

1.4.2 Specification (full width and half maximum): *

1.5 Photo Multiplier Tube (PMT)/detector characteristics:

1.6 Manufacturer pigmentary group classification: *

- No (if no, please go to section 1.7)
- Yes (if yes, please answer sections 1.6.1-1.6.3 below)

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1.6.1 Number:

1.6.2 Names of classes:

1.6.3 Spectra:

1.7 CDOM (yellow substances) measurement? *

- Yes
- No

1.8 Turbidity sensor? *

- Yes
- No

1.9 Temperature sensor? *

- Yes
- No

1.10 Depth sensor? *

- Yes
- No

1.11 Do you use additional single-wavelength sensors? *

- No (please go to section 2)
- Yes (please complete sections 1.11.1-1.11.3 below)

1.11.1 Spectra:

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1.11.2 Targeted variables/groups:

1.11.3 Open comments:

Please provide any additional information here.

2. Measurement strategy: *

- Discrete sampling
- Continuous recording
- Profiling (*in situ*)

3. Deployment platforms: *

- Buoy (please specify measurement frequency in section 3.1 below)
- Fixed station (please specify measurement frequency in section 3.2 below)
- Ship of opportunity (alone or included into a FerryBox) (please specify measurement frequency in section 3.3 below)
- Research vessel (alone or included into a FerryBox) (please specify measurement frequency in section 3.4 below)
- Other (please complete section 3.5 below)

3.1 Measurement frequency for Buoy(s):

3.2 Measurement frequency for fixed station(s):

3.3 Measurement frequency for ship(s) of opportunity (alone or included into a FerryBox):

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3.4 Measurement frequency for research vessel(s) (alone or included into a FerryBox):

3.5 If other, please specify the platform and the measurement frequency:

4. Do you have a logbook where you record your deployment, problems and maintenance? *

- No
- Yes

5. Do you test the stability of the fluorometer yourself? *

- No (please go to section 6)
- Yes (please answer sections 5.1 and 5.2 below)

5.1 If yes, please provide further details of the testing methods (check all that apply):

- [ ] With pure water and its stability
- [ ] With filtered seawater and its stability/variability for the study region
- [ ] With a fluorochrome solution
- [ ] With a solid standard
- [ ] With a phytoplankton culture solution (new fingerprints)

5.2 Please indicate the frequency of testing:

- [ ] Yearly
- [ ] Before/after long deployment
- [ ] Other (please specify below)

If other, please specify:

6. Do you replace the manufacturers spectra for pure water and CDOM on your own? *

- No
- Yes

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7. Do you produce your own phytoplankton fingerprints? *

- No (please go to section 8)
- Yes (please specify below)

If yes, please specify which ones?

8. Do you send the fluorometer to the company for maintenance? *

- No (please go to section 9)
- Yes (please specify below)

If yes, please specify the frequency:

- Yearly
- Before/after long deployment
- Only when an issue occurs
- Other (please specify below)

If other, please specify?

9. Do you perform any check of the manufacturer fingerprints? *

- No (please go to section 10)
- Yes (please specify below)

If yes, at what frequency?

10. Do you clean your machine's optics? *

- No, the company does it at each maintenance (please go to section 11)
- Yes (please complete sections 10.1-10.3 below)

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10.1 Regularly (specify):

10.2 When an issue is detected (specify):

10.3 Automated cleaning (specify):

11. What kind of data you use for analysis? *

- [ ] LED raw data
- [ ] Manufacturer defined groups
- [ ] Specific fingerprints (from cultures)
- [ ] Specific fingerprints (from natural blooms)
- [ ] Other combination (please specify below)

If other combination, please specify:

12. Dark acclimation before measurements? *

- ○ No (go to section 13)
- ○ Yes (please complete section 12.1)

12.1 If yes, time of dark acclimation:

12.2 Other (specify):

13. Do you use other methods and techniques to calibrate/validate data for total chlorophyll and per spectral groups? *

- ○ No (please go to section 14)
- ○ Yes (please complete section 13.1)

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13.1 If yes, please check all that apply from the options listed:

- [ ] *In vivo* Fluorometry
- [ ] *In vitro* Fluorometry or Spectrophotometry of chlorophyll *a*
- [ ] HPLC
- [ ] Chemotaxonomy

14. Do you use any additional single or multi-wavelength active/variable fluorescence measurement (ex. Fv/Fm, alpha, ETRmax, Ek,...): *

- No (go to section 15)
- Yes (please complete sections 14.1-14.3 below)

14.1 If yes, which device?

14.2 Measurement type (select all that apply):

- [ ] Discrete sampling
- [ ] Continuous recording
- [ ] Profiling (*in situ*)

14.3 Open comments:

Please enter any other comments here

15. Is there any other operational issue that you would like to underline or share?

16. Would you like to leave feedback about the questionnaire? We are constantly trying to improve our questionnaire best practices!

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Best practices for plankton automated imagery

Posted on 14th April 2021 | by admin

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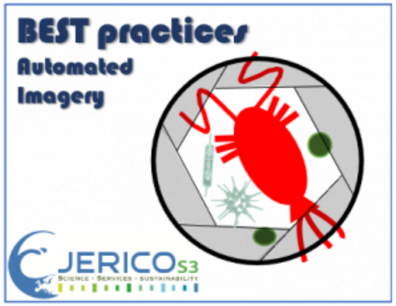

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In JERICO-S3, we continue our efforts towards measuring synchronously different environmental variables (especially biogeochemistry and biology) at high frequency and spatial resolution and filling observational gaps in under-sampled areas or periods. This will help to understand phytoplankton dynamics and distribution in coastal waters. Our task is to improve the readiness of ship-based and autonomous platform observing networks by guaranteeing their robustness, reliability, and long-term sustainability.

We are pleased to present you our questionnaire on automated imagery (in vivo/in situ, in vivo/in flow, in vitro) for plankton analysis.

This questionnaire (not longer than 15 minutes to fill) aims to collect the different practices followed by users and to help us define common best practice guidelines.

Complete the questionnaire

The results will be presented and discussed during a virtual workshop by mid-June. All participants will be invited to join.

Deadline May 30, 2021.

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Part C: Questionnaire

1. Instrument characteristics:

1.1 Instrument name and model: *

1.2 Year of instrument: *

1.3 Type of instrument:

- ☐ *In situ*
- ☐ In-flow
- ☐ Benchtop

1.4 Instrument characteristics:

1.4.1 Total effective size range (ESD, length, width): *

1.4.2 Sample volume: *

1.4.3 Analysed volume: *

1.4.4 Imaging method (e.g. dark field illumination, bright field): *

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1.4.5 Size calibration procedure: *

1.4.6 Frames per second: *

1.4.7 Other (please specify):

1.5 Do you use sub-sampling (not imaging the full sample)? *

1.6 Sheath fluid (for in-flow devices) *

- ○ No (please go to section 1.7)
- ○ Yes (please specify pore/mesh size below)

If yes, which pore/mesh size?

1.7 Pre-filtering (for in-flow devices) *

- ○ No (please go to section 2)
- ○ Yes (please specify pore/mesh size below)

If yes, which pore/mesh size?

2. Measurement strategy: *

- ☐ Discrete sampling
- ☐ Continuous recording
- ☐ Profiling (*in situ*)

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3. Deployment platforms: *

- ☐ Buoy (please specify measurement frequency in section 3.1 below)
- ☐ Ship of opportunity (please specify measurement frequency in section 3.2 below)
- ☐ Research vessel (please specify measurement frequency in section 3.3 below)
- ☐ *in situ* (profiling) (please specify measurement frequency in section 3.4 below)
- ☐ *in situ* (stationary) (please specify measurement frequency in section 3.5 below)
- ☐ On deck continuous recording (please specify measurement frequency in section 3.6 below)
- ☐ On deck manual samples (please specify measurement frequency in section 3.7 below)
- ☐ At the laboratory (please specify measurement frequency in section 3.8 below)
- ☐ Other (please complete section 3.9 below)

3.1 Measurement frequency for Buoy(s):

3.2 Measurement frequency for ship(s) of opportunity:

3.3 Measurement frequency for research vessel(s):

3.4 Measurement frequency for *in situ* (profiling):

3.5 Measurement frequency for *in situ* (stationary):

3.6 Measurement frequency for on deck continuous recording:

3.7 Measurement frequency for on deck manual samples:

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3.7 Measurement frequency for on deck manual samples:

3.8 Measurement frequency at the laboratory:

3.9 If other, please specify the platform and the measurement frequency:

Please describe your protocol and/or important issues to consider:

4. Samples for imaging (select all that apply): *

- [ ] Fixative
- [ ] Living samples
- [ ] Concentrated
- [ ] Pre-filtered

Please describe your protocol and/or important issues to consider:

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5.1 Magnification used (number): *

5.2 Objectives specifications:

5.3 Camera settings: *

5.4 Flow cell/chamber characteristics (for in-flow devices): *

5.5 Calibration of the instrument: *

Please describe your protocol and/or important issues to consider:

6. Spatiality/types of image acquisition (check all that apply): *

- ☐ Surface (discrete)
- ☐ Surface (continuous)
- ☐ Different depths (discrete)
- ☐ Profiles (please complete section 6.1 below)
- ☐ Plankton nets (surface)
- ☐ Plankton nets (vertical)
- ☐ Plankton nets (oblique)
- ☐ Other (please specify in section 6.2 below)

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6.1 If you selected "Profiles", please specify the frequency of image acquisition and the maximum depth below:

Frequency of image acquisition (please specify):

Maximum depth (please specify):

6.2 If other, please specify:

6.3 Please describe your protocol and/or important issues to consider:

7. Type(s) of analysis and image recovery:

7.1 Please check all that apply: *

- [ ] Distance settings between particles
- [ ] Software used for determining Regions/objects of interest
- [ ] Software used for image analysis
- [ ] Software used for image classification
- [ ] Other (please specify in section 7.4)

7.2 Raw images saved? *

- No
- Yes

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7.3 Do you validate the full samples? *

- ◯ No
- ◯ Yes

7.4 If other, please specify?

8. Do you send the imagery device to an external company for maintenance? *

- ◯ No (in lab maintenance) (please go to section 8.1)
- ◯ Yes, to the manufacturer
- ◯ Yes, to another company

8.1 Please describe your protocol and/or important issues to consider:

Please give details of your in lab maintenance procedures.

8.2 Please specify the frequency of maintenance: *

- ☐ Yearly
- ☐ Before/after long deployment
- ☐ Other (please specify below)

If other, please specify?

9. Do you clean your machine's optics? *

- ◯ No, the company does it at each maintenance (please go to section 10)
- ◯ Yes (please complete sections 9.1 and 9.2 below)

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9.1 Regularly (specify):

9.2 When an issue is detected (specify):

9.3 Please specify the biofouling solution used to maintain your device's optic (for stationary):

- [ ] Mechanical wipers
- [ ] UV-light
- [ ] Other (please specify below)

If other, please specify:

10. For imagery in-flow: What kind of sheath fluid do you use?

- ○ Filter seawater
- ○ Artificial seawater
- ○ Filtered freshwater
- ○ Filtered deionised water
- ○ Other (please specify below)

If other, please specify:

11. How do you identify if the volume analysed is adequate? *

- [ ] Targeted group count is above 100 particles
- [ ] Ratio signal /noise is above a certain value
- [ ] Other (please specify below)

If other, please specify:

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11.1 Do you proceed to a statistical test to detect questionable samples? *

- No
- Yes

12. Do you use more than one process/magnification to analyse your sample? *

- No (please define this process in section 12.1)
- Yes (please specify in section 12.2)

12.1 If no, please define the process used to detect questionable samples:

12.2 If yes, please specify:

13. Would you like to share your full imaging protocol? *

- No (please go to section 14)
- Yes (please provide a link to the document below)

13.1 Please provide a link to your full imagining protocol document:

14. Is there any other operational issue that you would like to underline or share?

15. Would you like to leave feedback about the questionnaire? We are constantly trying to improve our questionnaire best practices!

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Round table about next steps to take

- Requirements to be addressed to sensor providers in order to specify sensor performances (e.g. catalogue of the specificities for each sensor, diagnosis after maintenance, troubleshooting guide, requirements for in automated platforms)
- Workshops to be held before summer (June or early July) including JERICO and external experts
  - Automated Imaging Analysis
  - Multispectral *in vivo* Fluorometry
- Planning of common deployment and sharing of operational practices to apply for shared sensors
- Discussion on sensors to be put into the common demonstration module (in relation to WP1, WP3, WP4 and WP7)
- Communication on the ST7 JS3 approach for developing and agreeing on best practices, in connexion with WP6
- Other…

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Thanks for your participation!

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MAIN OUTCOMES of the session

1. Update on the capability for plankton observation in the PSS and IRS (current and planned deployment of automated biological sensors in platforms) from the results of a form + information gathered from attendees.
2. Presentation of the summary of the results from the first workshop on best practices for automated flow cytometry followed by a discussion on framing the best practices template document (IOC/IODE)
3. Discussion on questionnaires and workshops to come on image analysis and multispectral fluorometry

Next steps ?

The outcomes will be to make progress in defining common operational and calibration procedures, discussing quality control procedures that will be put as flags in the metadata base (in connection with WP6), developing specific recommendations on sampling/measuring strategy regarding different platform types. We will start presenting the international template for the definition of best practices and start to fill it.

We will formulate together what requirements to be addressed to sensor providers in order to specify sensor performances (e.g. catalogue of the specificities for each sensor, diagnosis after maintenance, troubleshooting guide). A discussion will also be effective on further technological developments or improvements for effective implementation in the demonstration observation module, as well as about the automation in raw data analysis (in connection with WP7).

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JERICO WEEK #2 - MILESTONE REPORT

JERICO-S3 All Region Workshop#2

SESSION 3.2 - Biological Data flow

GRANT N°: 871153
PROJECT ACRONYME : JERICO-S3
PROJECT NAME : Joint European Research Infrastructure for Coastal Observatories - Science, services, sustainability
COORDINATOR : Laurent DELAUNEY - Ifremer, France - jerico-s3@ifremer.fr

JERICO-S3 MILESTONE Joint European Research Infrastructure network for Coastal Observatory **Science, Services, Sustainability**	
MS#, WP# and full title	*No Formal Milestone - This document is Part 3.2 of MS.3-WP13* JERICO-S3 - WP6 - "Workshop on biological data flow / Session 3.2 of ARW#2 - J Week#2"
5 Key words	Biological data flow - Biological data managment
Lead beneficiary	
Lead Author	
Co-authors	
Contributors	
Submission date	No formal Mileston - Document is part of MS.3

→ Please specify the type of milestone:

✔ **Report after a workshop or a meeting (TEMPLATE A) ⇒ JERICO-Week#2, April 19-23 2021**
□ Report after a specific action (TEMPLATE B) (test, diagnostic, implementation,…)
□ Document (TEMPLATE B) (guidelines,...)
□ Other (TEMPLATE B) (to specify) …………………….

Diffusion list			
Consortium beneficiaries	Third parties	Associated Partners	other

ARW SESSION 3 - **PART 2**

Biological Data Flow

(for PART 1-Harmonisation, LINK HERE)

Thursday 22 April 2021 / 16:00 - 17:30

Scope of the session:

The scope of the session is to demonstrate the data flow from acquisition to European data infrastructure taken for examples phytoplankton from flow cytometry dataset (MIO: Melilotus Thyssen) and one for plankton from imagery dataset (LOV: Fabien Lombard). These two demonstrations will be followed by an overview of biological data management already in place in the partnership and discussion on how gaps can be filled and data flow facilitated.

Expected outcomes:

Facilitate the biological dataflows from researchers to European Infrastructures by showing the facilities available or in progress in the partnership. Identify the barriers for the partners and discuss the solutions.

Targeted audience:

All partners who collect biological data using flow cytometry, imagery and multispectro- fluorimetry in JERICO-S3.

Type of organisation: Working group (plenary)

Main reference persons: Veronique Creach / Patricia Cabrera

WHAT IS EXPECTED FROM REGIONS (PSS and IRS) ? (presentations? leading the roundtable? report on activities? sharing content or “stories”?)

This workshop is on data management which should be applied in the PSS and IRS in general. No presentation expected from a PSS or IRS specifically

#	Description (duration in min)	Leading person	Link
1	Welcome and introduction of participants (10 min)	Veronique Creach	
2	ECOTAXA dataflow (10 min presentation + 15 min discussion)	Fabien Lombard	
3	Flow cytometry dataflow (10 minutes presentation + 15 min discussion)	Melilotus Thyssen	
4	Presentation of the survey on data management per partner (5 minutes)	Veronique Creach	
5	Discussion with the partners about the way to facilitate the dataflow from researcher to European infrastructure (25 minutes)	Veronique Creach/Patricia Cabrera	

NOTES AND MINUTES

NOTES and MINUTES

Lennert Schepers (VLIZ) to Everyone (4:38 PM) : indeed - also the creation of 'best practices' is done in Jerico (and the creation of vocabs etc)

Martin Pfannkuchen to Everyone (4:41 PM) : is there a way for data directly into emodnet?

Fabien Lombard to Everyone (4:41 PM) : in the future yes we plan this

Felipe Artigas to Everyone (4:41 PM) : great!

Fabien Lombard to Everyone (4:42 PM) : but it will be a two way decision: data owner will have to activate the option // émondent have to activate the request

Fabien Lombard to Everyone (4:42 PM) : (but we are not yet there: for the moment this is an export (émondent format) out of ecotaxa // manual import in emondnet

Lennert Schepers (VLIZ) to Everyone (4:43 PM) : Yes - the advantage of using Ecotaxa will be that the formatting of data and metadata will be automatically done into the EMODnet Format. Of course you can also use another workflow to format your data and metadata.

Fabien Lombard to Everyone (5:24 PM) : https://sites.google.com/view/piqv/ecotaxa
https://sites.google.com/view/piqv/instruments-manuals

Lisette Enserink to Everyone (5:33 PM) : dear all, thank you for this informative session. I cannot personally fill in the questionnaire, since I'm not a plankton expert and not involved in the practical aspects of monitoring. This comparison of methods and efforts to hamonise is very important for application by users. Keep up the good work!

Attendees (41) → Taken at 16:40 (session started at 16:10)

- Léa G. (Co-host, me)
- Laurent D (JERICO Coord) (Host)
- Patricia Cabrera (Co-host)
- W WEI
- Bastien T (Co-host)
- fa felipe artigas (Co-host)
- ingrid P (Co-host)
- vC veronique Creach (Co-host)
- fabien lombard
- ED Eric Delory
- al alain lefebvre
- AC Andres Cianca (PLOCAN)
- AL Andrew Luke King
- EA Eva Alou (SOCIB)
- FB Fabio Brunetti
- GG Gerald GREGORI
- IR Isabelle Rombouts
- J JAllen
- JS Jukka Seppälä
- JM Julien Mader (AZTI)
- KC Kate Collingridge
- KC Kate Collingridge
- KB Kees Borst (RWS-NL)
- Klas Ove Möller
- LS Lennert Schepers (VLIZ)
- LP Leonidas Perivoliotis (HCMR)
- l libes
- LE Lisette Enserink
- L Lumi
- MN Marc Nogueras (UPC)
- Mp Martin pfannkuchen
- MH Martti Honkanen
- MC Miguel Charcos (SOCIB)
- PG Patrick Gorringe, SMHI
- PK Pirjo Kuuppo SYKE
- SE Samu Elovaara, SYKE
- SR Saskia Rühl
- se sebastian ehrhart [syke]
- t thyssen
- TT Timo Tamminen, SYKE, Finland
- ZH Zéline Hubert

SLIDES PRESENTED DURING THE WORKSHOP

WORKSHOP on

BIOLOGICAL DATA MANAGEMENT

(Milestone 32)

Patricia Cabrera (Vliz) and Véronique Créach (Cefas)

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Agenda

- 16:00 Welcome and introduction of participants (10 min) Veronique Creach
- 16:05 ECOTAXA dataflow (10 min presentation + 15 min discussion) Fabien Lombard (CNRS-LOV)
- 16:30 Flow cytometry dataflow (10 minutes presentation + 15 min discussion) Melilotus Thyssen (CNRS-MIO)
- 16:55 Presentation of the survey on data management per partner (5 minutes) Veronique Creach
- 17:00 Discussion with the partners about the way to facilitate the dataflow from researcher to European infrastructure (25 minutes) Veronique Creach/Patricia Cabrera
- 17:30 End of the session

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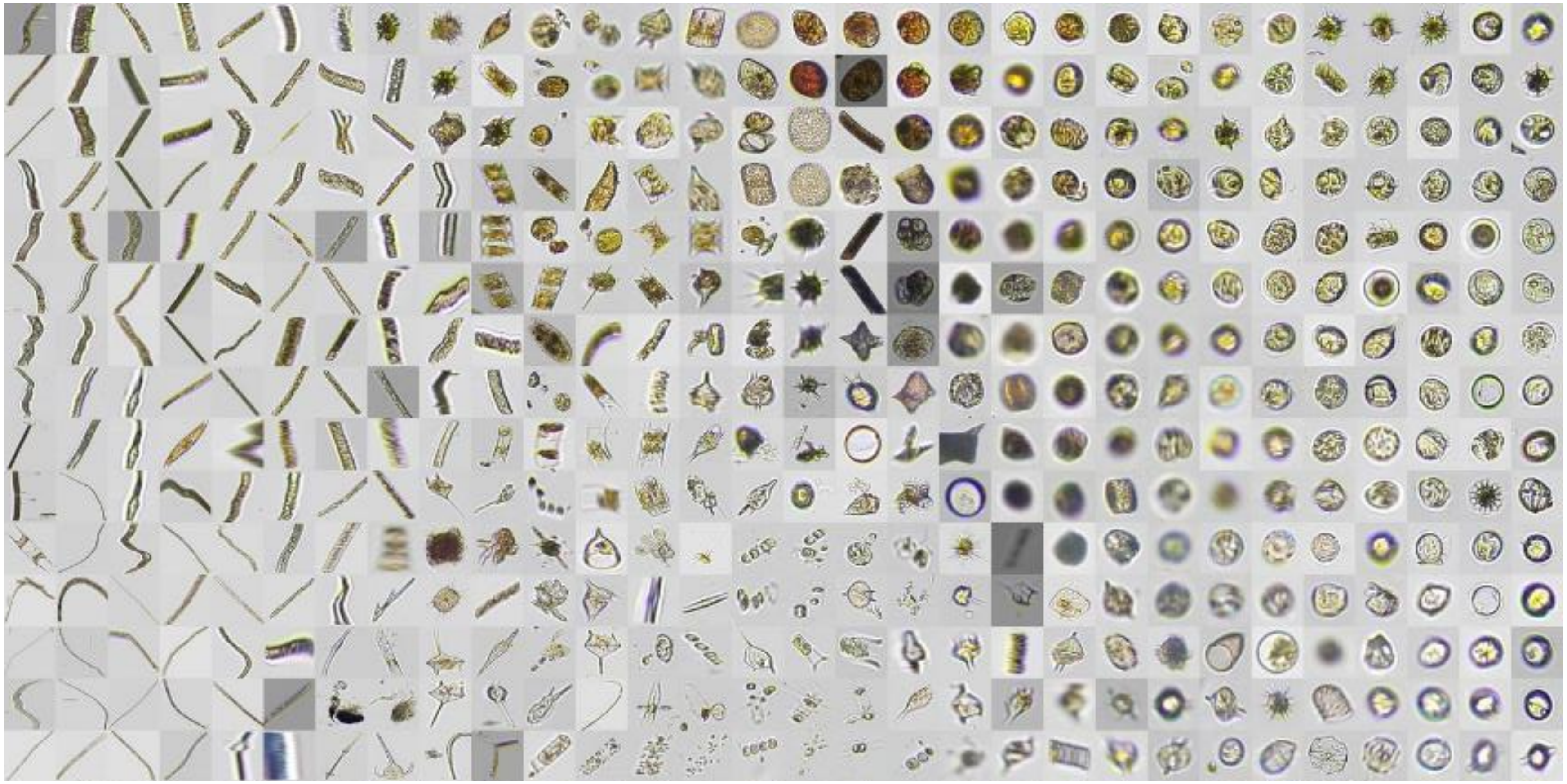
Quantitative imaging Dataflow

Fabien Lombard, Jean Olivier Irisson (CNRS-LOV)



JERICO-Week#2_19-23 April 2021

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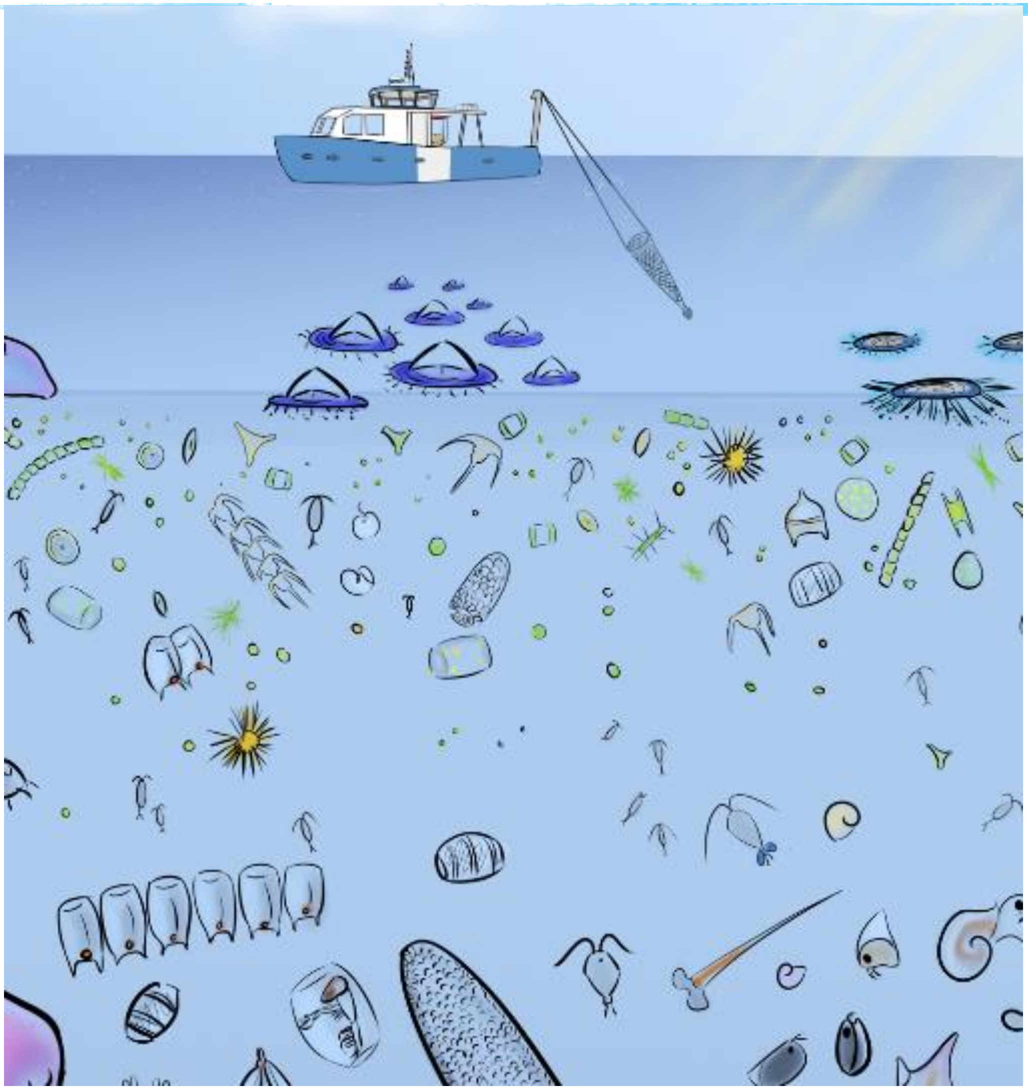
What is quantitative imaging?

- Taking images in a standardized way
- For **a full** sample (no selection, everything should be imaged)
- Measuring a maximum of morphological variables (including traits)
- With associated metadata (volume sampled/fraction imaged)

=> Quantitative imaging !

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.



Position
Depth
Date
Collected/Filtered volume
Fraction of sample analysed?

(integrate concentration steps if any)

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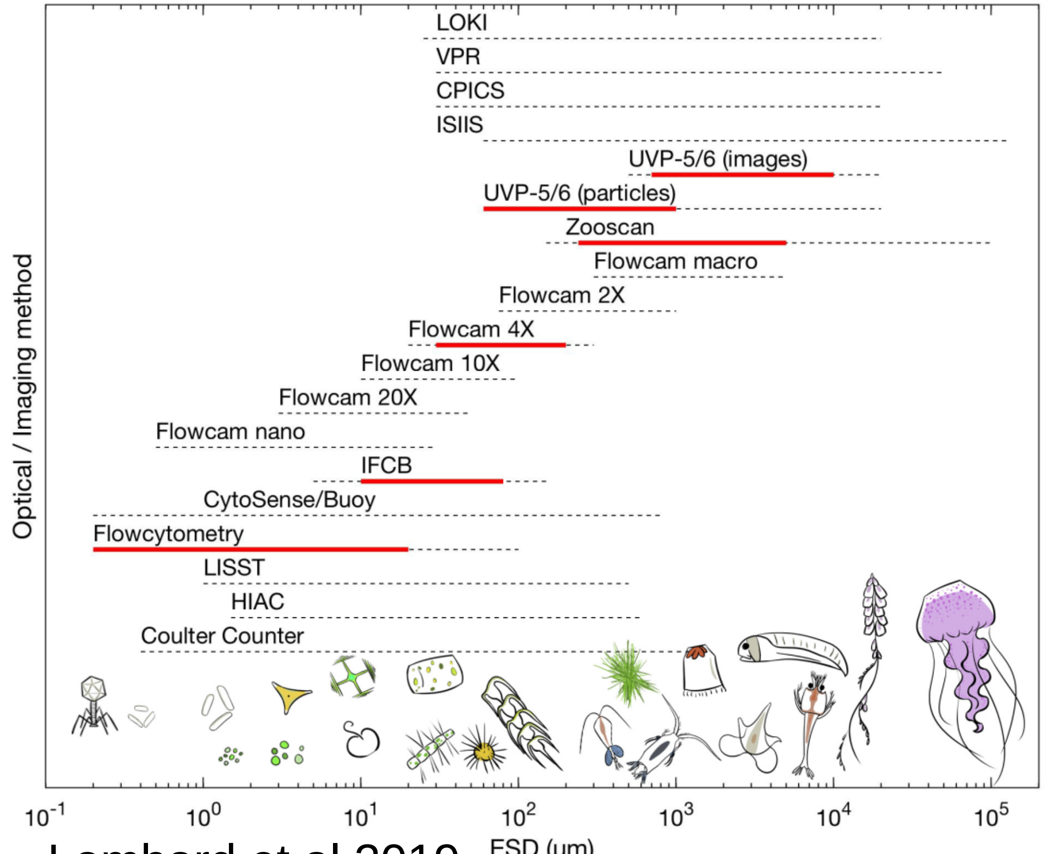
Choose your weapon

- Imaging can bring a common and unified measurement across plankton types
- But several tools are needed to capture the full plankton range
- Never trust the "specifications" of an Instrument

What is seen is not what is seen ***efficiently***

- ***Strong need for cross-calibration between instruments***



Lombard et al 2019

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The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Quantitative imaging process

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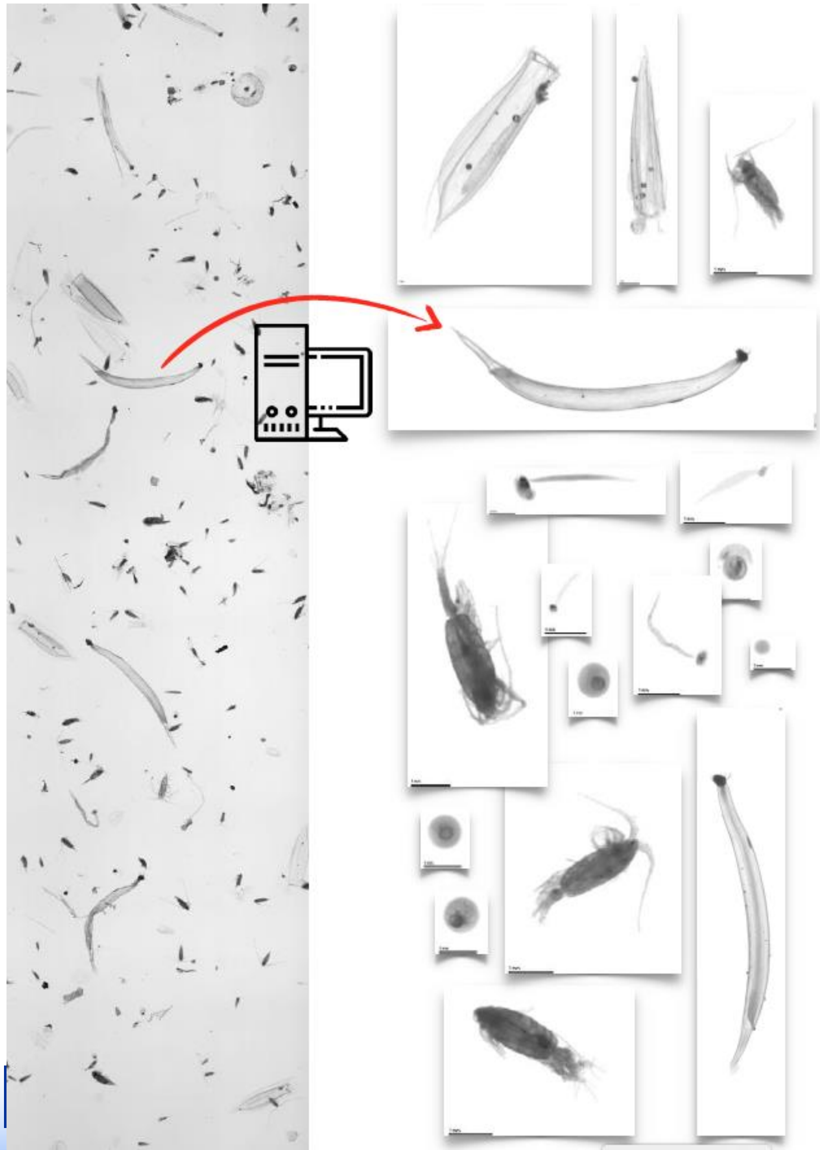
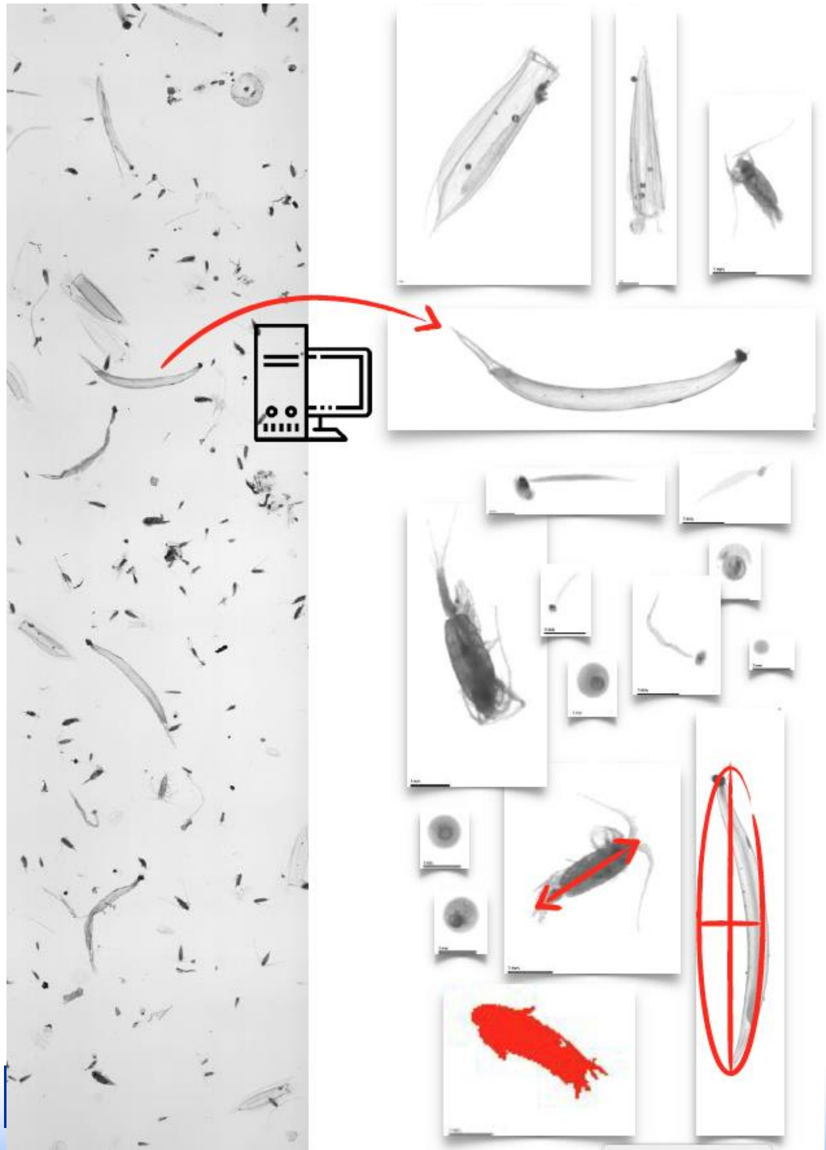
Quantitative imaging process



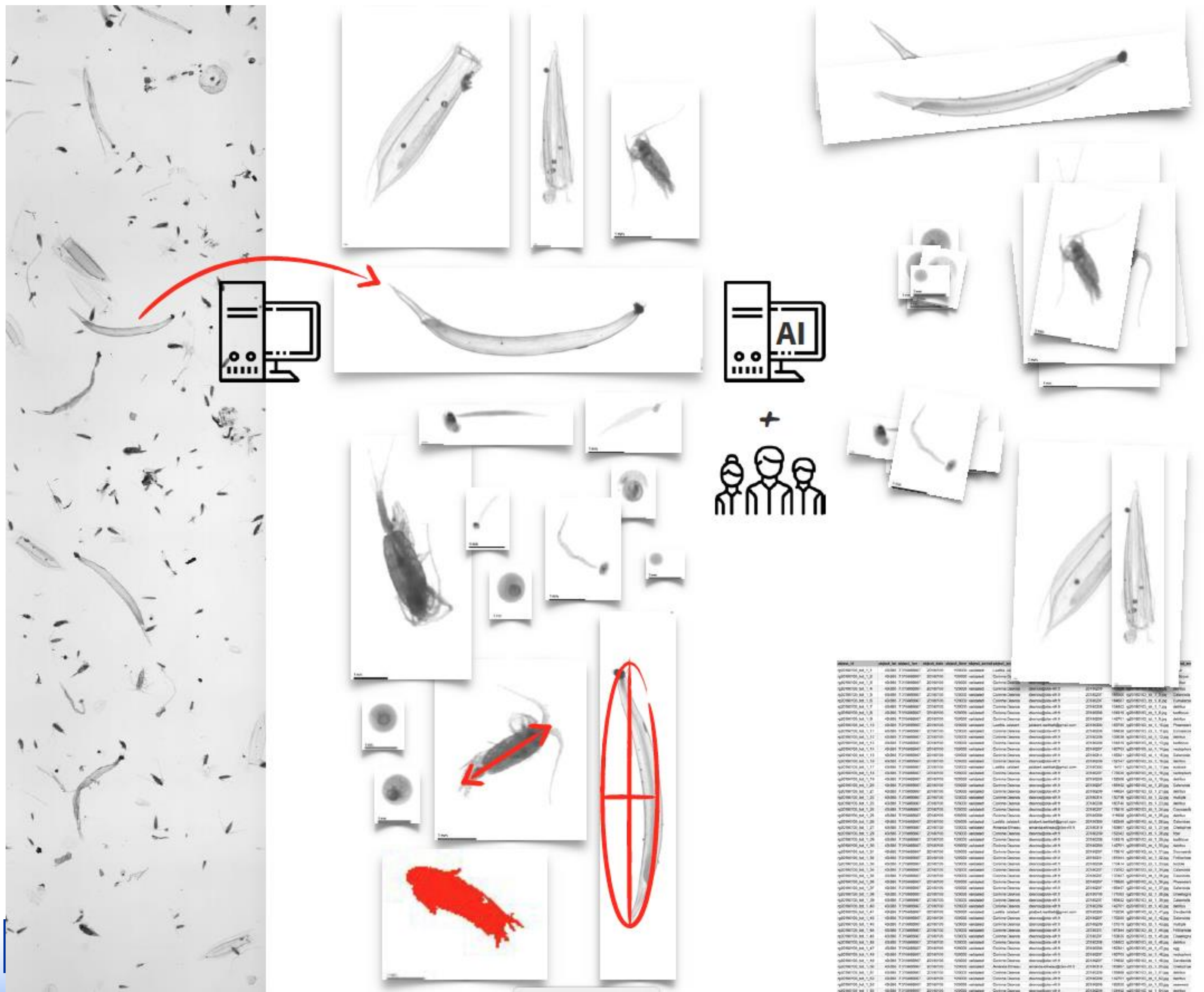
’s H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer,

Quantitative imaging process



's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer,

Quantitative imaging process



153/951799. Project coordinators: Ifremer,

Quantitative imaging process

- **Advantages**

Fully quantitative
Repeatable
Digital archive
Re-explorable
Collaborative
Individual level
Numbers +
Biovolume (~mass)

- **Limitations**

Relatively low taxonomic resolution

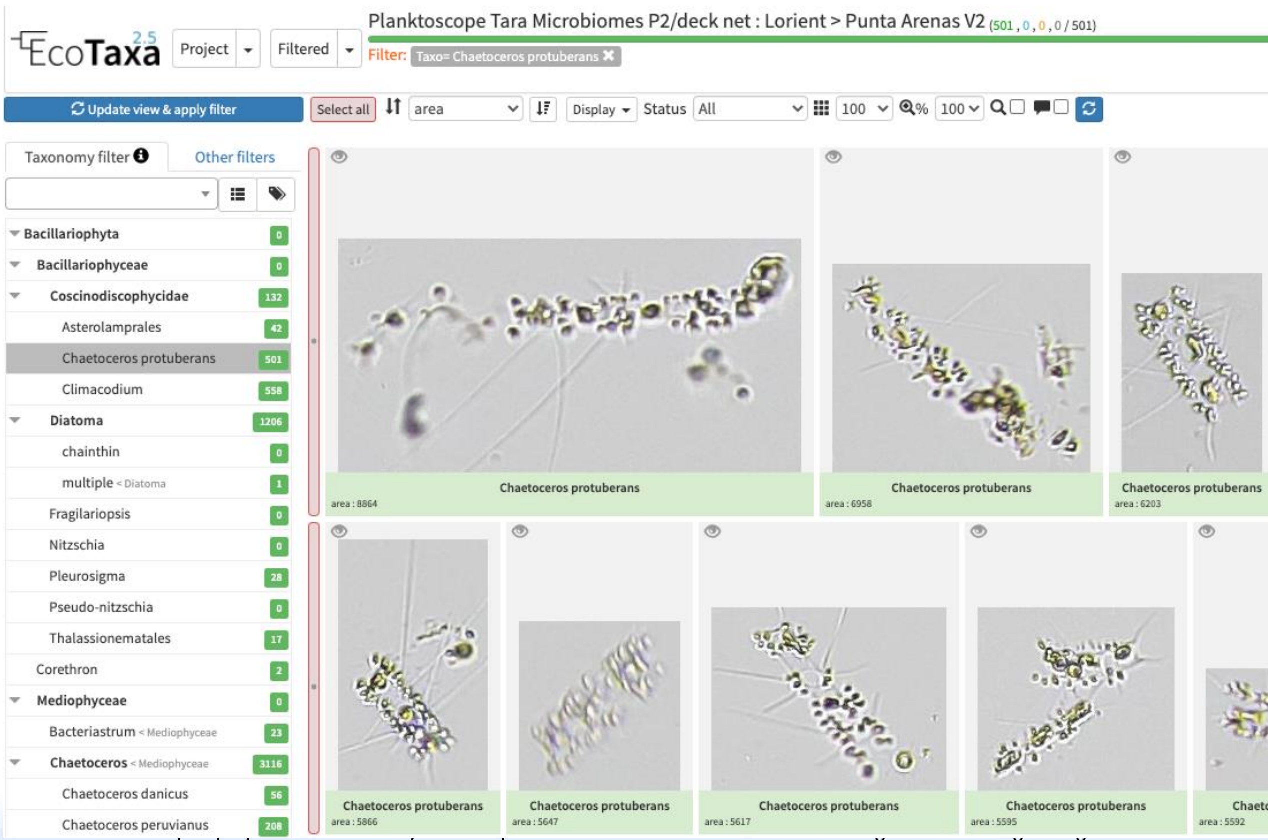
Still suffer from the “fragmentation bias”
Aka: none can “capture them all”

153/951799. Project coordinators: Ifremer,

Ecotaxa software

A free collaborative tool for hosting, sorting, annotating taxonomically and sharing images.

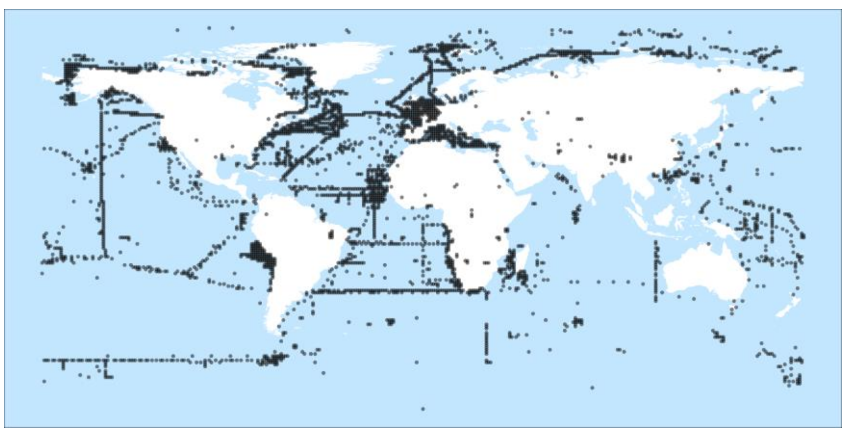
- Explicit taxonomy
- Built-in automatic classification algorithms (random tree forest, CNN networks)

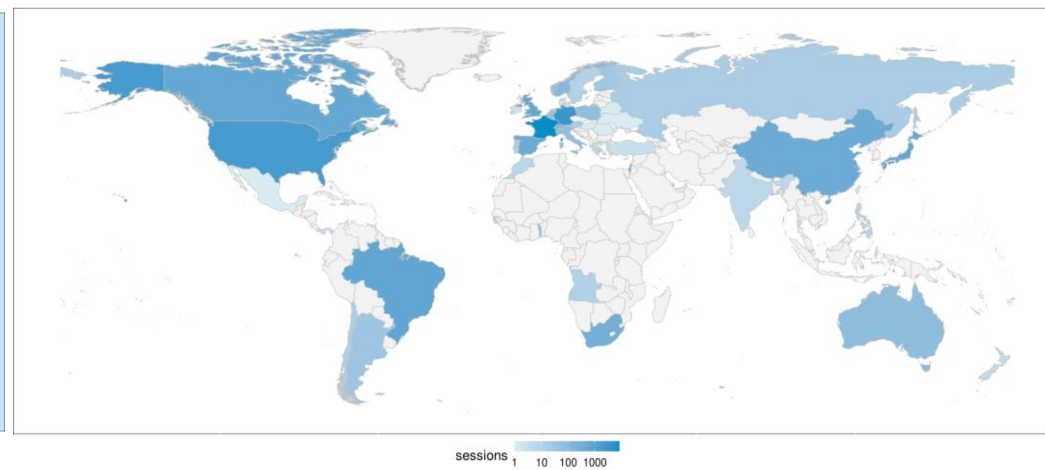


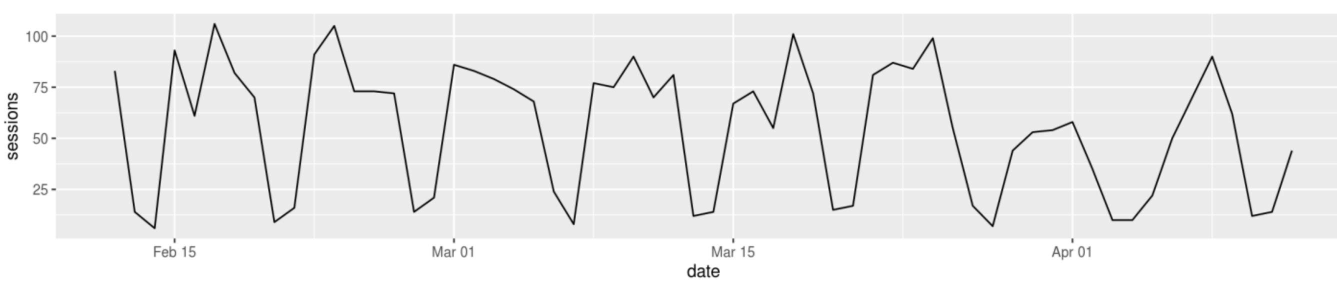
/951799. Project coordinators: Ifremer, France.

Ecotaxa software

- Explicit taxonomy
- Built-in automatic classification algorithms (random tree forest, CNN networks)
- Launched in 2016 … 149 million images now (43% validated)
- 1133 users/ 363 organisations
- 50-100 session/day 20-40 users/day

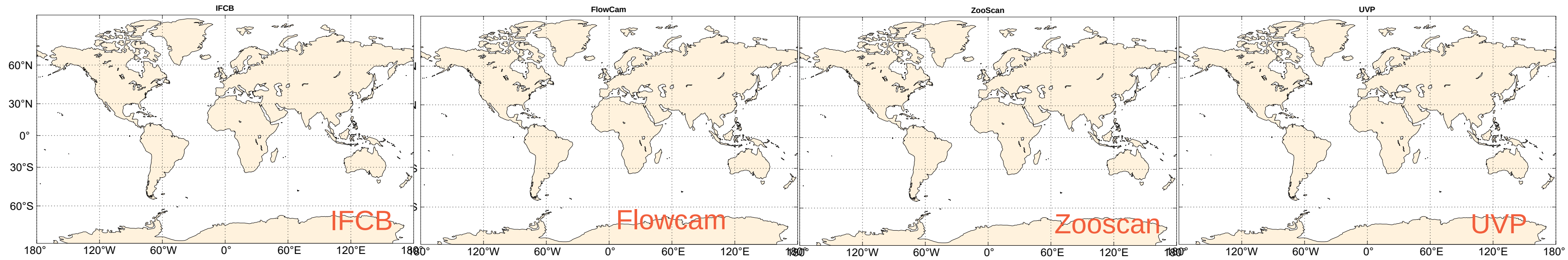






Ecotaxa software

- Explicit taxonomy
- Built-in automatic classification algorithms (random tree forest, CNN networks)
- Launched in 2016 … 149 million images now (43% validated)
- 1133 users/ 363 organisations
- 50-100 session/day 20-40 users/day
- About 11 types of instruments (AMNIS, IFCB, flowcam, zooscan, zoocam, UVP, LOKI, eHFCM, bioscope, planktoscope… keeping growing: Cytosense, CPICS in test; Flowcam direct import from machine)



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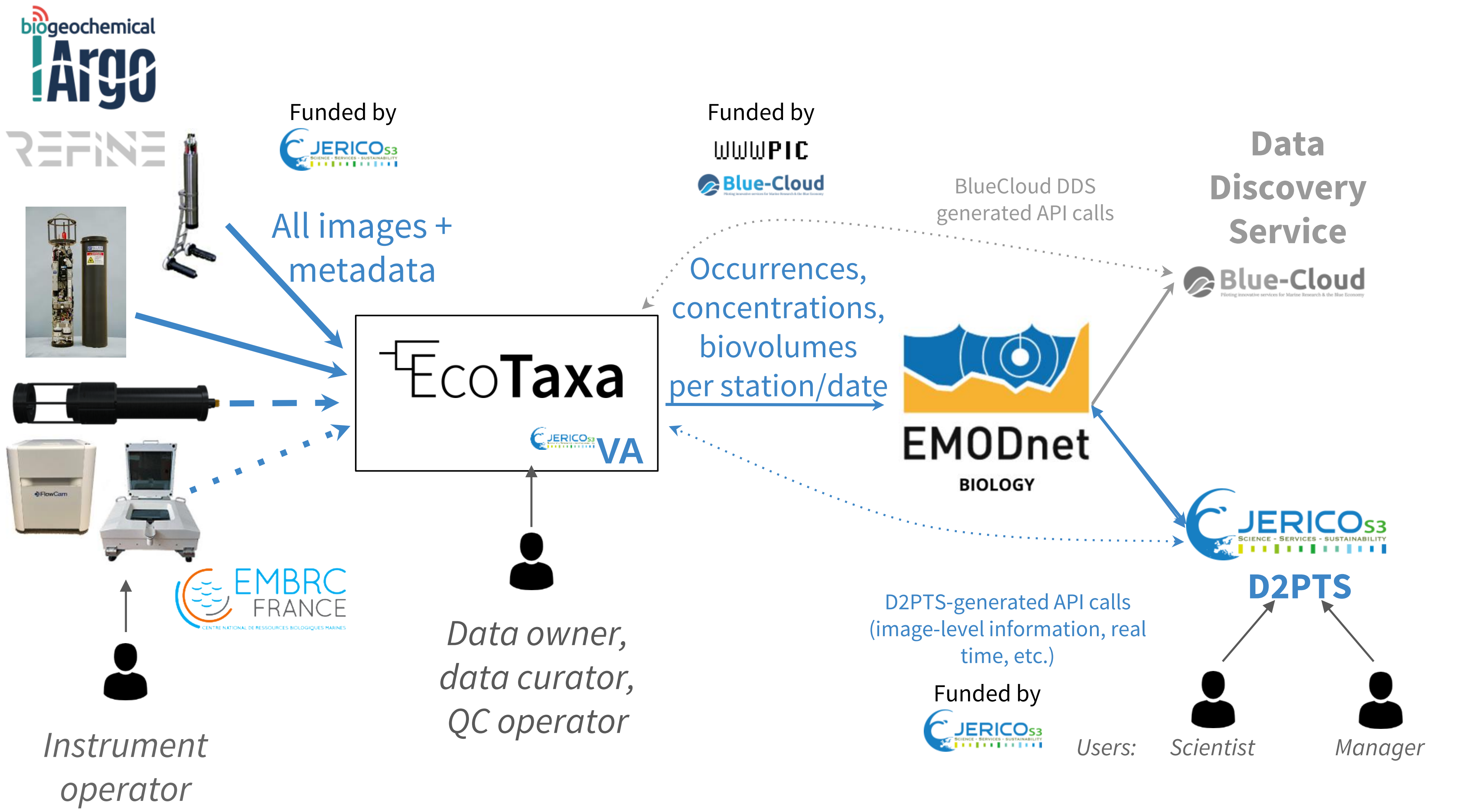
Plankton and particle data flow to and from EcoTaxa



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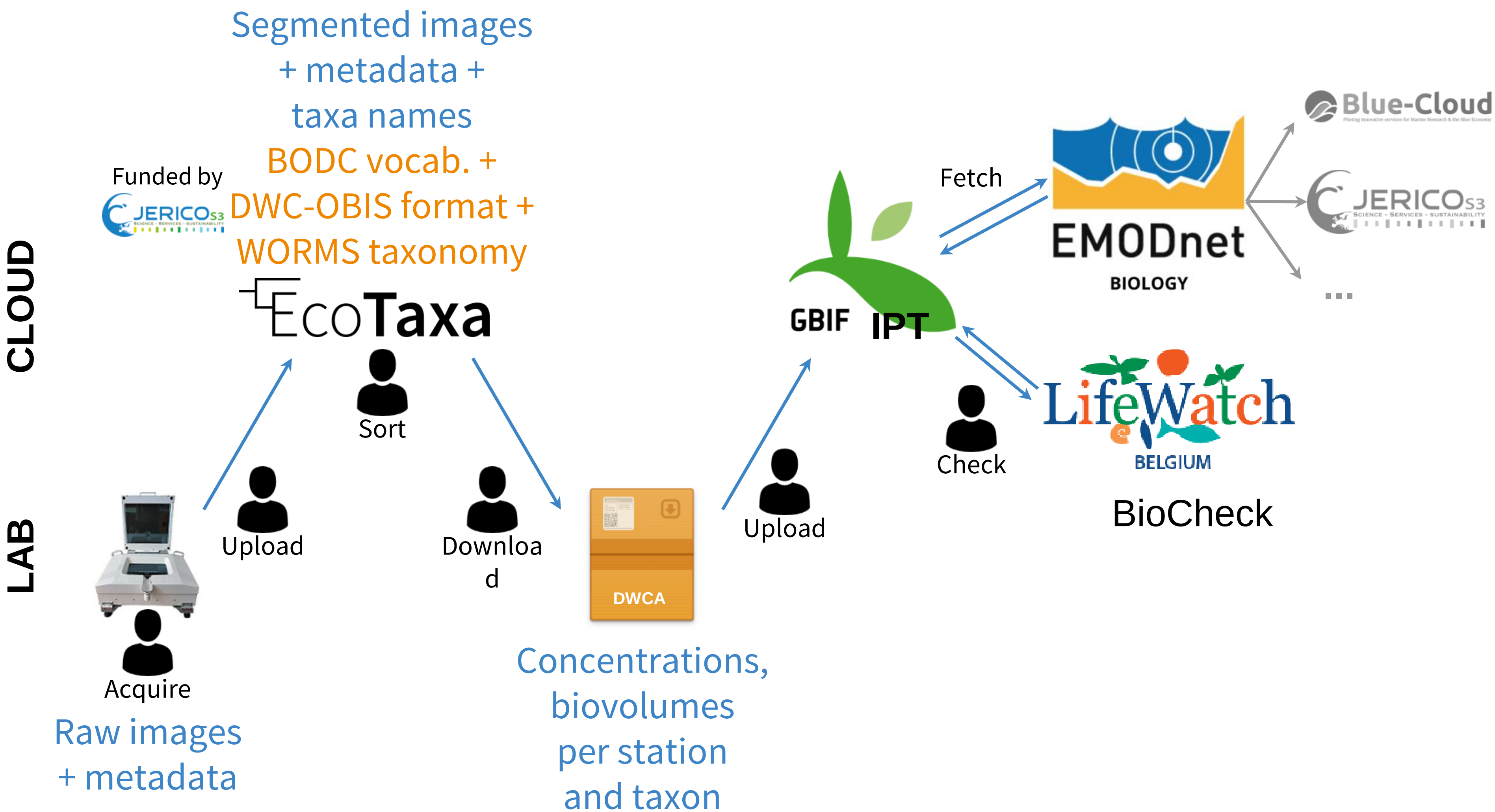
Zoom on what happens from instrument to database



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Funded by

EcoTaxa API

http://ecotaxa.obs-vlfr.fr/api/docs/

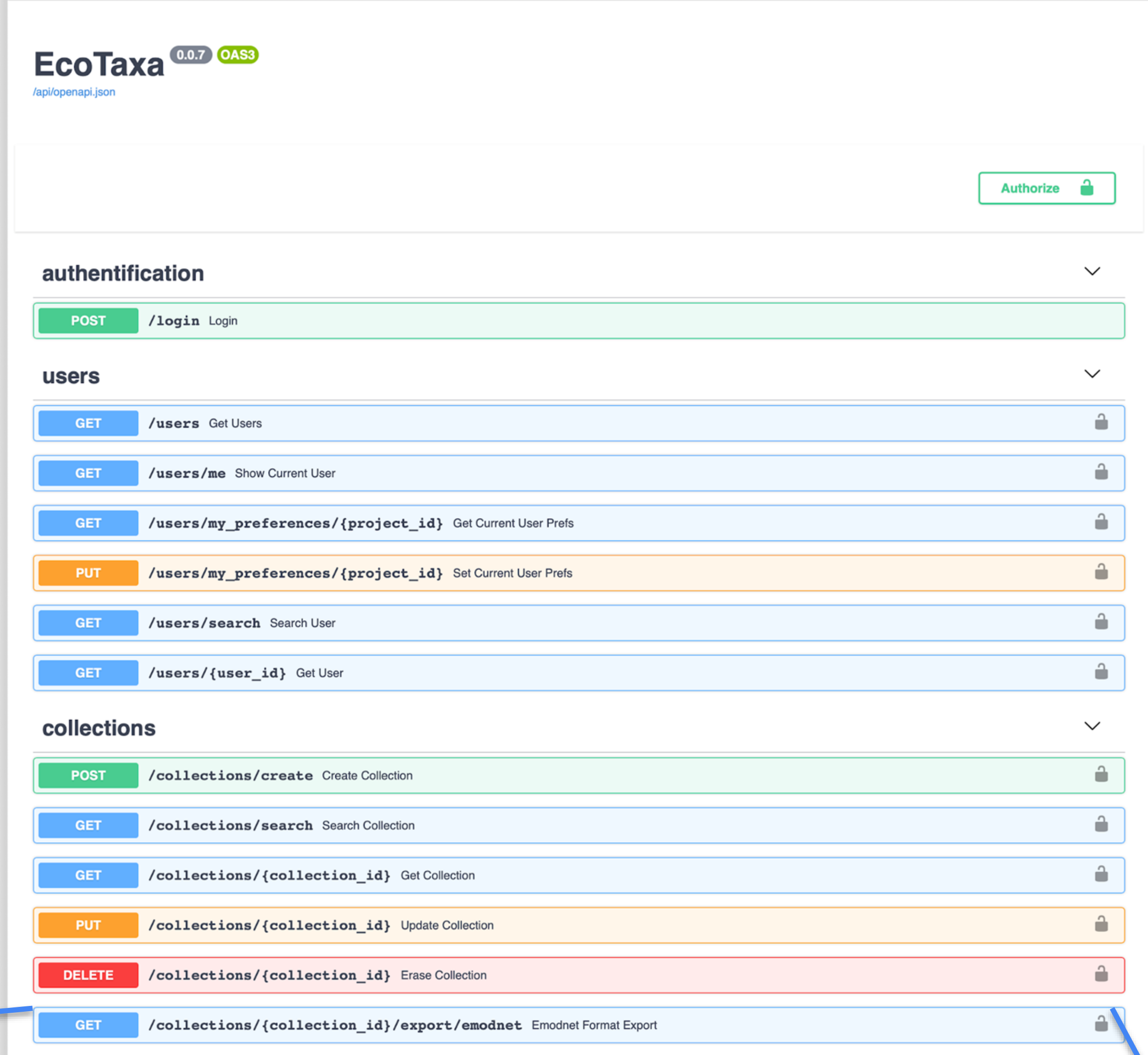
Self **documented** and always up to date

Still in **alpha** phase (endpoint names and arguments may change)

Allows **browsing** information at various levels (project, sample, image), **filtering** objects (by date, location, etc.), and **importing** images

Export is in the works

R (and Python) **packages** to access it are in development



France.

JERICO RI
SCIENCE - SERVICES - SUSTAINABILITY

Funded by

WWWPIC

Blue-Cloud

EcoTaxa options

License options included

Need to be RGPD « cleaned »

Need to include options for calculating concentrations

- CC-0: all registered EcoTaxa users are free to download, redistribute, modify, and build upon the data, with no conditions. Other databases can index the data. The data falls into the worldwide public domain. This is the license preferred by OBIS and GBIF.
- CC-BY: all registered EcoTaxa users are free to download, redistribute, modify, and build upon the data, as long as they cite the dataset and its authors. Other databases can index the data.
- CC-BY-NC: all registered EcoTaxa users are free to download, redistribute, modify, and build upon the data, as long as they cite the dataset and its authors, and do not use it for commercial purpose ("primarily intended for or directed toward commercial advantage or monetary compensation"). Other databases can index the data.
- **Copyright**: only contributors to this project have rights on this data. This prevents its distribution in any kind of database.
- Not chosen

Atlanta < Gastropoda < Mollusca < Metazoa < Holozoa < Opisthokonta < Eukaryota < living (id=92139)
validated by Fabien Lombard (lombard@obs-vlfr.fr) on 2019-01-29 14:28:07.212948

ifcb_tara_oceans_polar_circle_leg_07_quebec_lorient [3313] Pierre Luc Grondin

Inverted Microscope Tara Oceans microplankton [852] John Dolan

Planktoscope Tara Microbiomes P2/deck net : Lorient > Punta Arenas [3893] Fabien Lombard

Why GitHub? Team Enterprise Explore Marketplace Pricing Search Sign in Sign up

ecotaxa / ecotaxa_dev Notifications Star 3 Fork 4

Code Issues 202 Pull requests 3 Actions Projects 4 Wiki Security Insights

Specify correspondance between free fields and standard fields at project level, to compute concentrations and biovolumes #619 New issue

Sampled volume of the water body in m3 tot_vol / 1000

This is the volume of water sampled within the sample or subsample, as appropriate for this dataset.

Sub-sampling coefficient in [0,1] 1 / sub_part

This is the fraction of the volume above that has been imaged.

Sample fields: cruise, tot_vol, program, stationid, tow_nb

Subsample fields: fraction, sub_part, xoffset, lut_filter, lut_min

Mockup

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Providing Plankton data with ECOTAXA and D2PTS
Case studies: already acquired

1) **North Sea Super Site** for UVP6 and CPICS

Heincke HE570

Project "Fjord Export"

Area: Norway

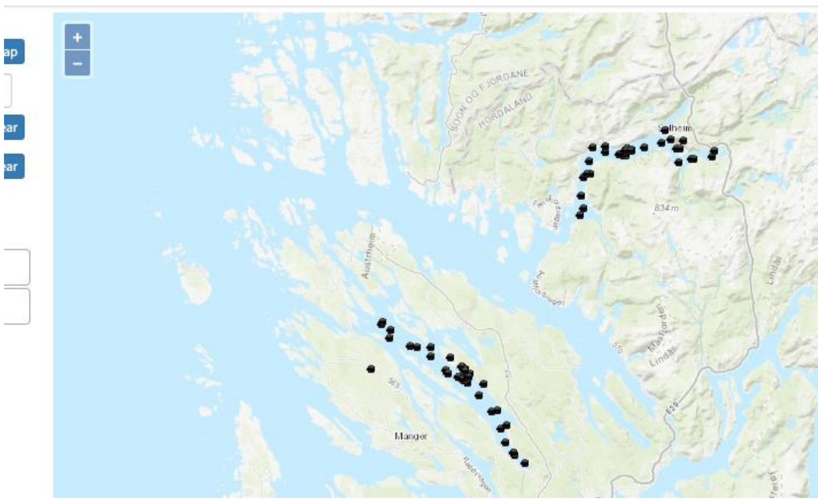
Time: 02.03.2021 - 19.03.2021

Participating Institutions: HZG/LOV/AWI/GEOMAR

Chief Scientists: Klas Ove Möller & Helena Hauss

PARTICLE module

Go to Ecotaxa

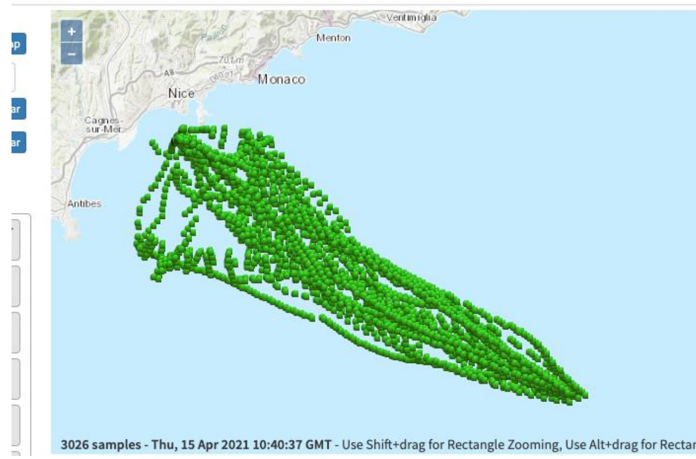


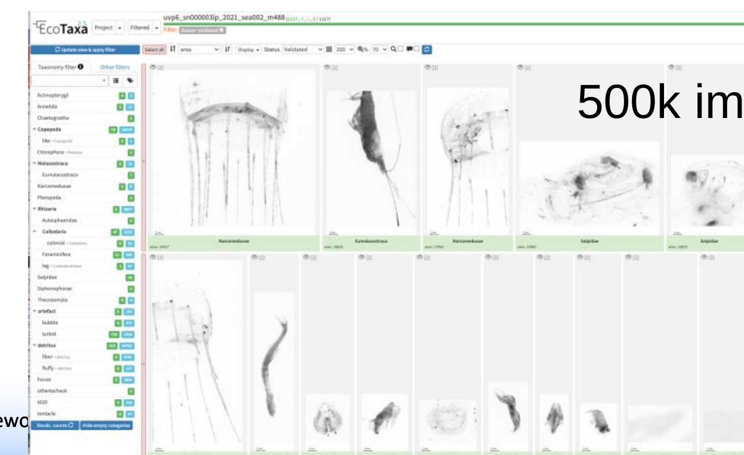
2) **Coastal NW Mediterranean Super Site**

→ Glider (on sea explorer)

PARTICLE module

Go to Ecotaxa

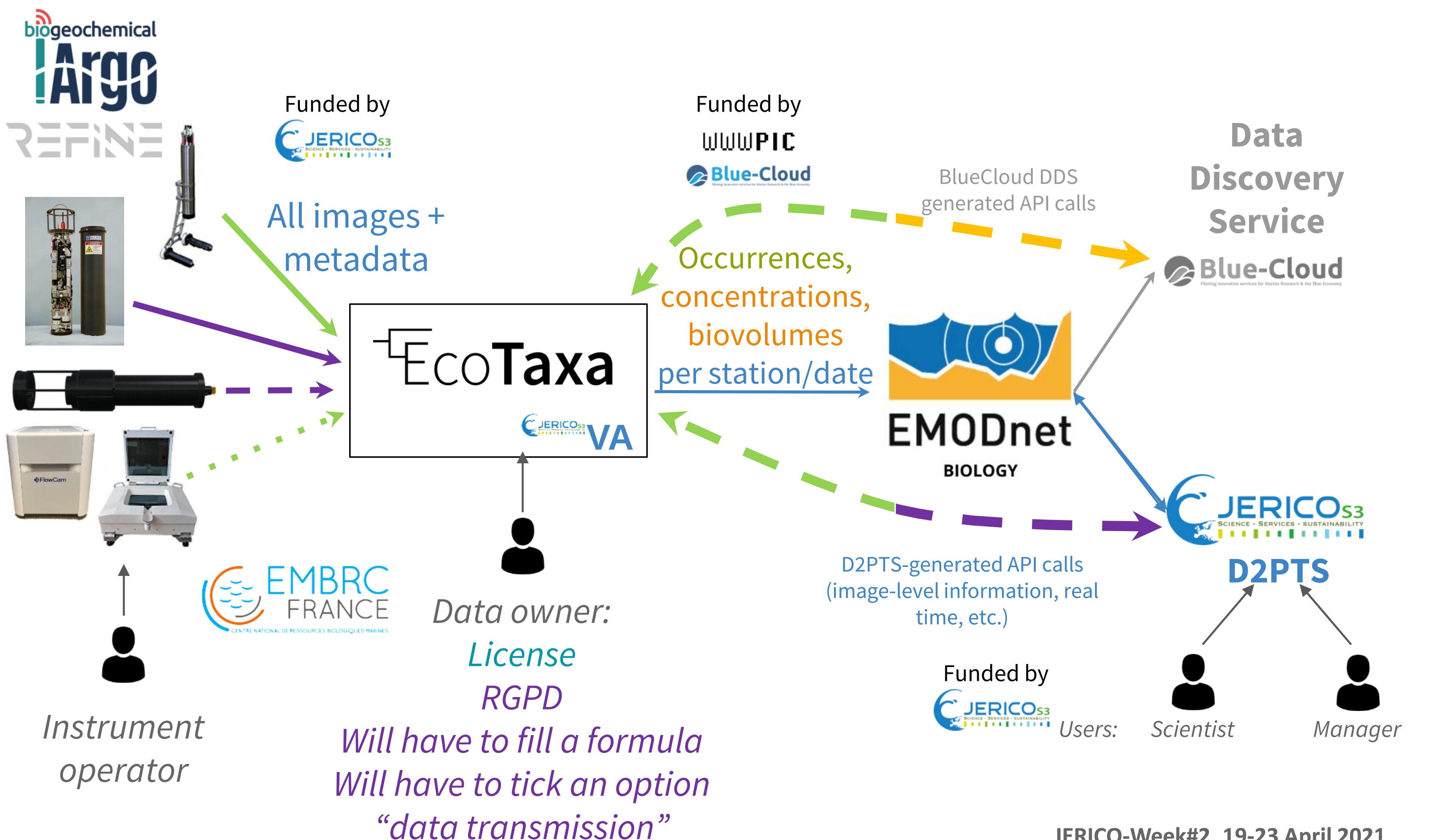




500k images

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framewo ... Ifremer, France.

Where we are, what is ready, what is in progress, What is still to be defined/specified



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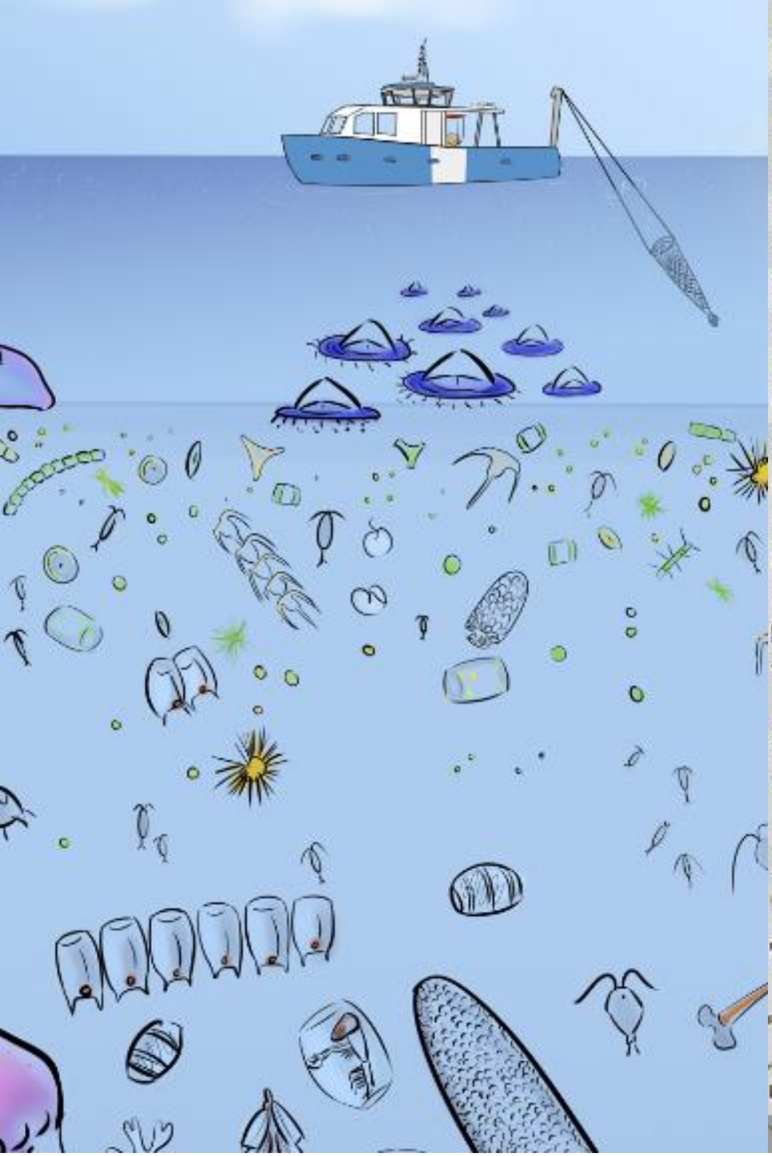
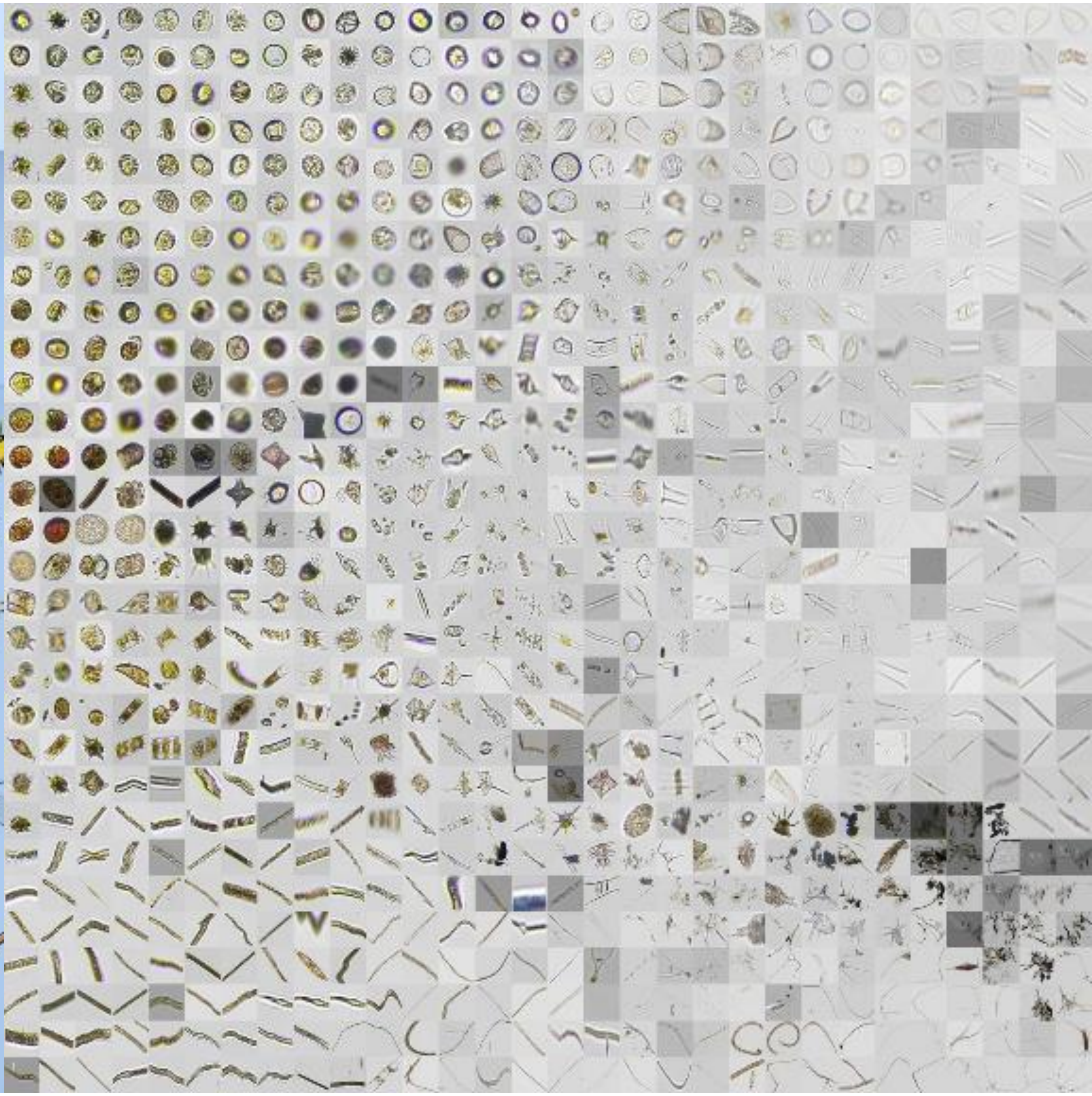
questions





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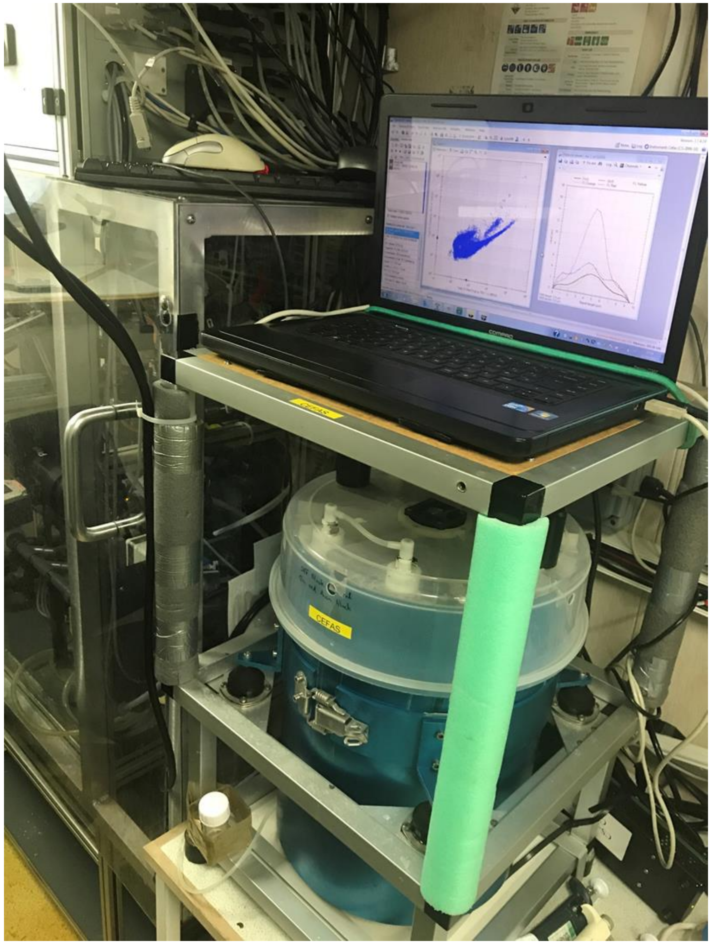
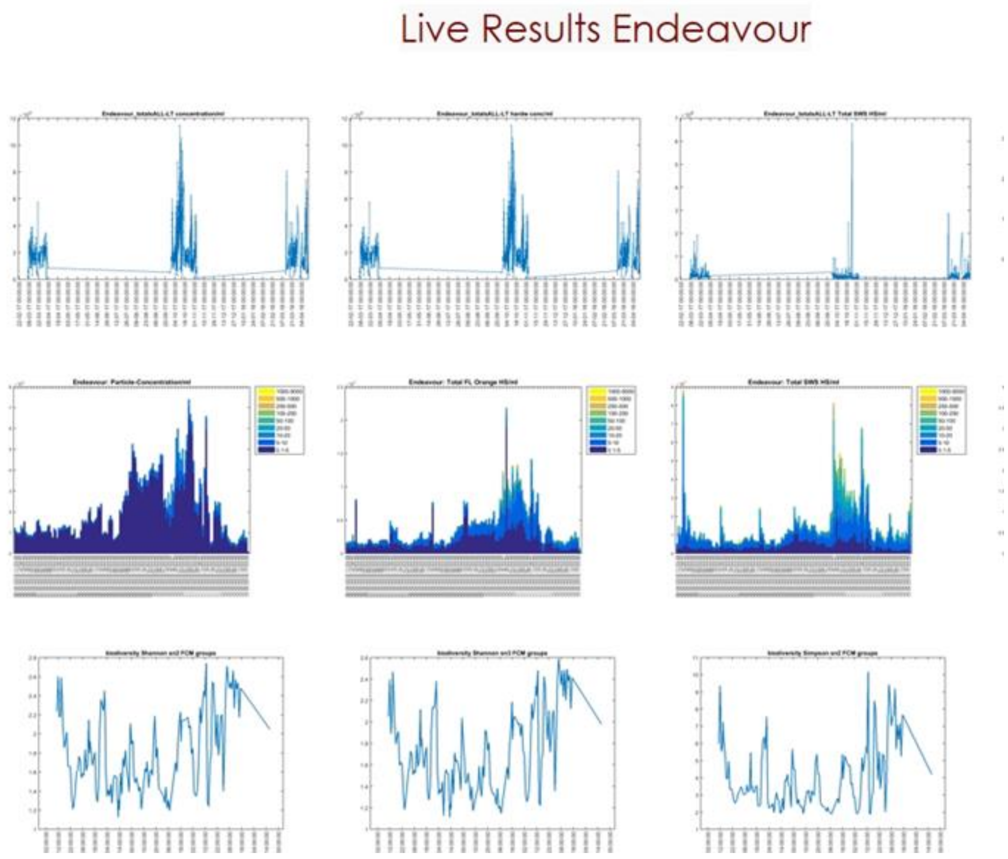
Flow cytometry data management workflow

Melilotus Thyssen, Maurice Libes, Loyd Izard, Gerald Gregori (CNRS-MIO; OSU PYTHEAS)





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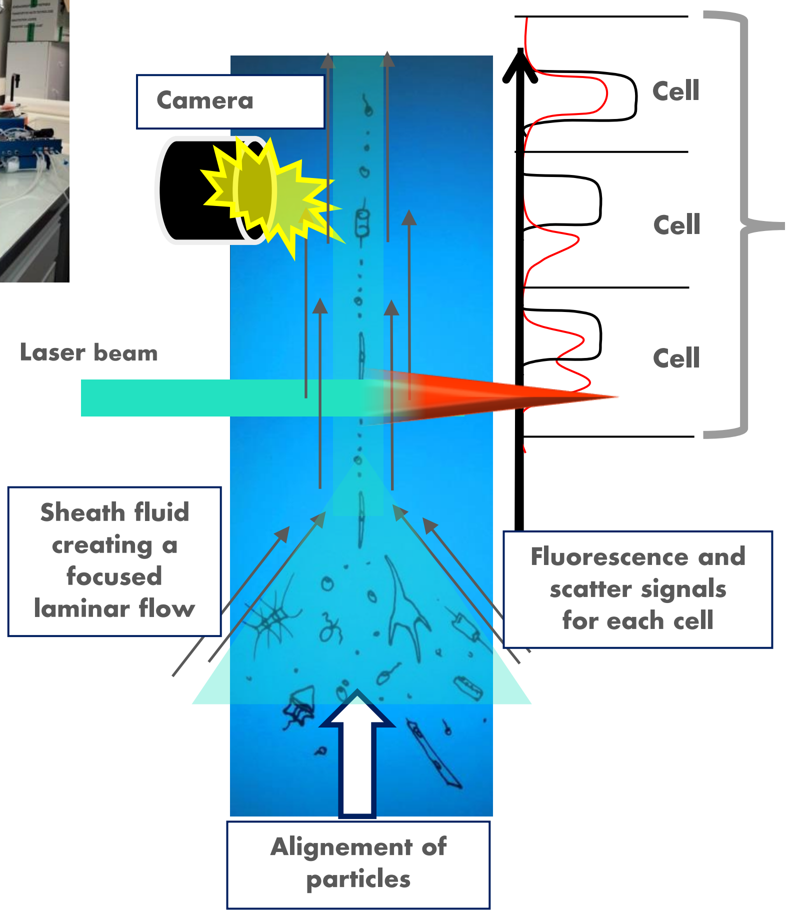
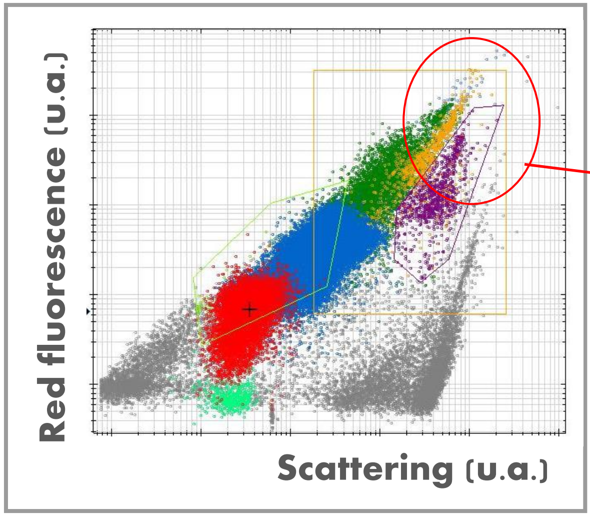
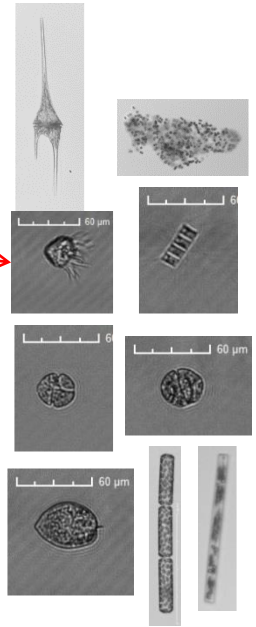
Flow Cytometry: a reminder







Expert name for most common observed groups=
Prochlorococcus like
Synechococcus like
Picoeukaryotes
Nanoeukaryotes
Microphytoplankton
Cryptophytes like
Coccolitophores like

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Flow Cytometry data management

- Flow cytometry phytoplankton and heterotrophic prokaryotes groups are now sharing a standard vocabulary (F02-BODC)
- For SeaNet: Specific flow cytometry metadata have been identified (cytometer.id, sampling.operator, Clustering.Method, standards.reference)
- For SeaDataNet: Selection of most relevant optical parameters for describing the groups is done (Total of FWS, Total of FLR..)

What is needed now

- Efficient software tools & workflow to manage data
- Include standard metadata (sampling.site, depth, sampling.date, plateform.ID,..etc)
- Interoperability for sharing data (integrating standard vocabulary)

• Ultimately, **make FAIR data**: accessible to the scientific community and reusable in interoperable formats

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Steps to FAIR-isation of flow cytometry data workflow for Cytosense software

Data acquisition

3 mains steps from the gatting output file to the ODV data file

i) Cytosense *gating* ***output file data conversion*** to CSV file

1 Conversion tool

CytoClus4_toCSV

ii) CSV file ***insertion into a relational database***

2 CSV to BD

Cytobase_CSV2BD

iii) Database extraction to
- CDI ***XML metadata file***
- ***ODV data file***

- To SeadataNet portal

3 Local database to MIKADO

Cytobase_BD2MIKADO

il 2021

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Step1. Cytoclus4 output

Data acquisition

CytoClus4 Output files

??

272 possible parameters from cytoclus4 output files :

- select the optimal consensual parameters
- readable « pivot » shareable format

So we wrote a Python program : *cytoclus4_toCSV.py*

- ['Filename', 'Set', 'Count', 'Concentration', 'Min.Samplelength', 'Max.Samplelength', 'Mean.Samplelength', 'SD.Samplelength', 'Min.Arrivaltime', 'Max.Arrivaltime', 'Mean.Arrivaltime', 'SD.Arrivaltime', 'Min.FWS.Length', 'Max.FWS.Length', 'Mean.FWS.Length', 'SD.FWS.Length', 'Min.FWS.Total', 'Max.FWS.Total', 'Mean.FWS.Total', 'SD.FWS.Total', 'Min.FWS.Maximum', 'Max.FWS.Maximum', 'Mean.FWS.Maximum', 'SD.FWS.Maximum', 'Min.FWS.Average', 'Max.FWS.Average', 'Mean.FWS.Average', 'SD.FWS.Average', 'Min.FWS.Inertia', 'Max.FWS.Inertia', 'Mean.FWS.Inertia', 'SD.FWS.Inertia', 'Min.FWS.Center.of.gravity', 'Max.FWS.Center.of.gravity', 'Mean.FWS.Center.of.gravity', 'SD.FWS.Center.of.gravity', 'Min.FWS.Fill.factor', 'Max.FWS.Fill.factor', 'Mean.FWS.Fill.factor', 'SD.FWS.Fill.factor', 'Min.FWS.Asymmetry', 'Max.FWS.Asymmetry', 'Mean.FWS.Asymmetry', 'SD.FWS.Asymmetry', 'Min.FWS.Number.of.cells', 'Max.FWS.Number.of.cells', 'Mean.FWS.Number.of.cells', 'SD.FWS.Number.of.cells', 'Min.FWS.First', 'Max.FWS.First', 'Mean.FWS.First', 'SD.FWS.First', 'Min.FWS.Last', 'Max.FWS.Last', 'Mean.FWS.Last', 'SD.FWS.Last', 'Min.FWS.Minimum', 'Max.FWS.Minimum', 'Mean.FWS.Minimum', 'SD.FWS.Minimum', 'Min.FWS.SWS.covariance', 'Max.FWS.SWS.covariance', 'Mean.FWS.SWS.covariance', 'SD.FWS.SWS.covariance', 'Min.SWS.Length', 'Max.SWS.Length', 'Mean.SWS.Length', 'SD.SWS.Length', 'Min.SWS.Total', 'Max.SWS.Total', 'Mean.SWS.Total', 'SD.SWS.Total', 'Min.SWS.Maximum', 'Max.SWS.Maximum', 'Mean.SWS.Maximum', 'SD.SWS.Maximum', 'Min.SWS.Average', 'Max.SWS.Average', 'Mean.SWS.Average', 'SD.SWS.Average', 'Min.SWS.Inertia', 'Max.SWS.Inertia', 'Mean.SWS.Inertia', 'SD.SWS.Inertia', 'Min.SWS.Center.of.gravity', 'Max.SWS.Center.of.gravity', 'Mean.SWS.Center.of.gravity', 'SD.SWS.Center.of.gravity', 'Min.SWS.Fill.factor', 'Max.SWS.Fill.factor', 'Mean.SWS.Fill.factor', 'SD.SWS.Fill.factor', 'Min.SWS.Asymmetry', 'Max.SWS.Asymmetry', 'Mean.SWS.Asymmetry', 'SD.SWS.Asymmetry', 'Min.SWS.Number.of.cells', 'Max.SWS.Number.of.cells', 'Mean.SWS.Number.of.cells', 'SD.SWS.Number.of.cells', 'Min.SWS.First', 'Max.SWS.First', 'Mean.SWS.First', 'SD.SWS.First', 'Min.SWS.Last', 'Max.SWS.Last', 'Mean.SWS.Last', 'SD.SWS.Last', 'Min.SWS.Minimum', 'Max.SWS.Minimum', 'Mean.SWS.Minimum', 'SD.SWS.Minimum', 'Min.SWS.SWS.covariance', 'Max.SWS.SWS.covariance', 'Mean.SWS.SWS.covariance', 'SD.SWS.SWS.covariance', 'Min.FL.Orange.Length', 'Max.FL.Orange.Length', 'Mean.FL.Orange.Length', 'SD.FL.Orange.Length', 'Min.FL.Orange.Total', 'Max.FL.Orange.Total', 'Mean.FL.Orange.Total', 'SD.FL.Orange.Total', 'Min.FL.Orange.Maximum', ax.FL.Orange.Maximum', 'Mean.FL.Orange.Maximum', 'SD.FL.Orange.Maximum', Min.FL.Orange.Average', 'Max.FL.Orange.Average', 'Mean.FL.Orange.Average', 'SD.FL.Orange.Average', 'Min.FL.Orange.Inertia', 'Max.FL.Orange.Inertia', ean.FL.Orange.Inertia', 'SD.FL.Orange.Inertia', 'Min.FL.Orange.Center.of.gravity', 'Max.FL.Orange.Center.of.gravity', 'Mean.FL.Orange.Center.of.gravity', 'S

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Combination of the expert nomination with standard vocabulary

We need to keep the experts names still there, but the standard name will allow to share the dataset

The local databases will keep the expert names, the interoperable portals will make the link with the standard names:

Local DB

Expert name
picoEuk1
picoEuk2
Synechococcus
Pochlorococcus
Coccolithophoridea like
Cryptophytes likes
Ostreococcus
Pheaocystis pico

Cytoclus4_to_CSV.py

Expert name	Standard vocabulary (BODC)
picoEuk1	Redpicoeuk
picoEuk2	Redpicoeuk
Synechococcus	Orgpicopro
Pochlorococcus	Redpicopro
Coccolithophoridea like	Hsnano
Cryptophytes likes	Orgnano
Ostreococcus	Redpicoeuk
Pheaocystis pico	Redpicoeuk
..	

Interoperable portal

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Step 1 : *Cytoclus4_to_CSV.py*
CSV output file

Data acquisition

CytoClus4 output files

cytoclus4_tocsv.py

CSV file

['Project', 'Project.starting.Date', 'Project.ending.Date', 'PI', 'Cytometer.ID', 'Station', 'Depth', 'Latitude', 'Longitude', 'Study.area', 'Samples.Operator', 'Standards.Reference', 'Clustering.Method', 'Observation.Type', 'Platform.Type', 'Platform.ID', 'Platform.Nationality', 'Sampling.Date', 'Analysis.Date', 'Standardized.name', 'Selection.Set', 'File', 'Volume', 'Trigger.Channel', 'Trigger.level', 'SWS.amplification', 'FLO.amplification', 'FLR.amplification', 'Abundance', 'Mean.Total.FWS_varx1', 'SD.Total.FWS_varx2', 'Mean.Total.SWS', 'SD.Total.SWS', 'Mean.Total.FLR', 'SD.Total.FLR', 'Mean.Total.FLO', 'SD.Total.FLO', 'Mean.Max.FLR', 'SD.Max.FLR', 'Beta.0', 'Beta.1', 'Mean.Length', 'SD.Length']

- 43 parameters (measurements + metadata) kept in a readable CSV file

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1	Platform.Nationality	Sampling.Date	Analysis.Date	Standardized.name	Selection.Set	File	Volume	Trigger.Channe	Trigger.level	SWS.amplification	FLO.amplificatio	FLR.amplificatio	Abundance	Mean.Total.FWS
2	french	30/04/2019 17:40	30/04/2019 17:40	Eukaryote picophytoplankton	picoeucaryotes	FUMSECK-FLR25 2019-04-30 17h40.cyz	3,48826	FLR	25	-1	-1	-1	2987	2720.0
3	french	30/04/2019 17:40	30/04/2019 17:40	Cryptophytes	cryptophytes	FUMSECK-FLR25 2019-04-30 17h40.cyz	3,48789	FLR	25	-1	-1	-1	850	57680.0
4	french	30/04/2019 17:40	30/04/2019 17:40	Microphytoplankton	microphytoplancton	FUMSECK-FLR25 2019-04-30 17h40.cyz	3,48797	FLR	25	-1	-1	-1	2	423900.0
5	french	30/04/2019 17:40	30/04/2019 17:40	Eukaryote nanophytoplankton	Nano1	FUMSECK-FLR25 2019-04-30 17h40.cyz	3,48856	FLR	25	-1	-1	-1	4877	13010.0
6	french	30/04/2019 17:40	30/04/2019 17:40	Eukaryote nanophytoplankton	Nano2	FUMSECK-FLR25 2019-04-30 17h40.cyz	3,48782	FLR	25	-1	-1	-1	9738	40030.0

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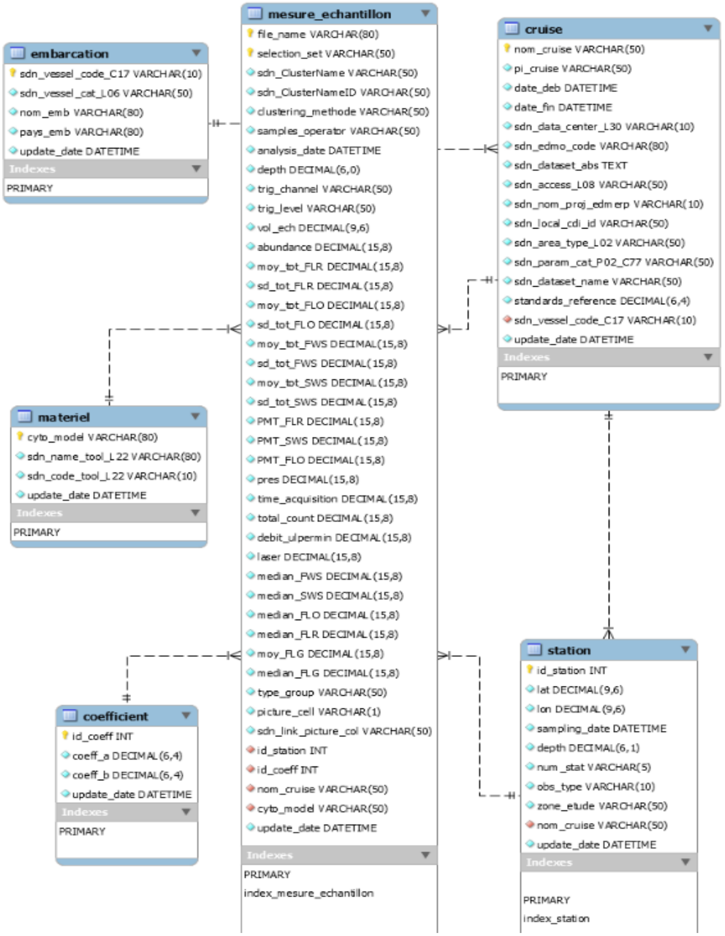
Step 2. : CSV_to_BD.*py*

CytoClus4 output files

CSV file

Data from CSV files are inserted in a relational database for better queries : 6 tables

- *Cruise*
- *Station*
- *Embarcation*
- *Material*
- *Sample_measurements*
- *Coefficients*



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Use of BODC controlled vocabulary

- During data insertion in the SQL database, as part of a necessary interoperability, we use **standard vocabulary BODC tables existing in SDN** :

- **17_SDN_Embarcation_code**.csv : name & code of the ships : 35LU "Le Suroit"

- **L06_SDN_Embarcation_Type**.csv : type of ship : research vessel

- **L22_SDN_cytometre_code**.csv : code for cytometers: TOOL1209,CytoBuoy CytoSense flow cytometer,

- and especially the table of codes for cytometry groups (cluster names)

- **F02_SDN_Cytometrie**.csv : code for phytoplancton groups *F0200003,Synechococcus,*

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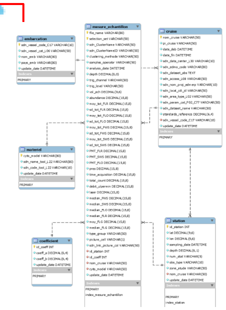
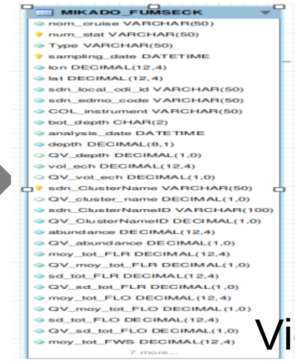
Step 3. : BD_to_SDN.*py*

CytoClus4 output files

CSV file





View for
A campaign

Step 3 consists in :

i) creating a « view » (=extract) of a specific campaign/dataset used to be converted in a ODV file

ii) using « mikado » tool to extract metadata in a XML format for a «dataset»

iii) sending cytometry metadata and data in Seadatanet European portal with the « replication manager » tool

Mikado Tool SDN

CDI metadata file

« mikado » is a SDN tool for extracting metadata in a XML format for the SDN portal

Replication manager Tool SDN

Cytometry **data** in **ODV file format**

JERICO-Week#2_19-23 April 2021

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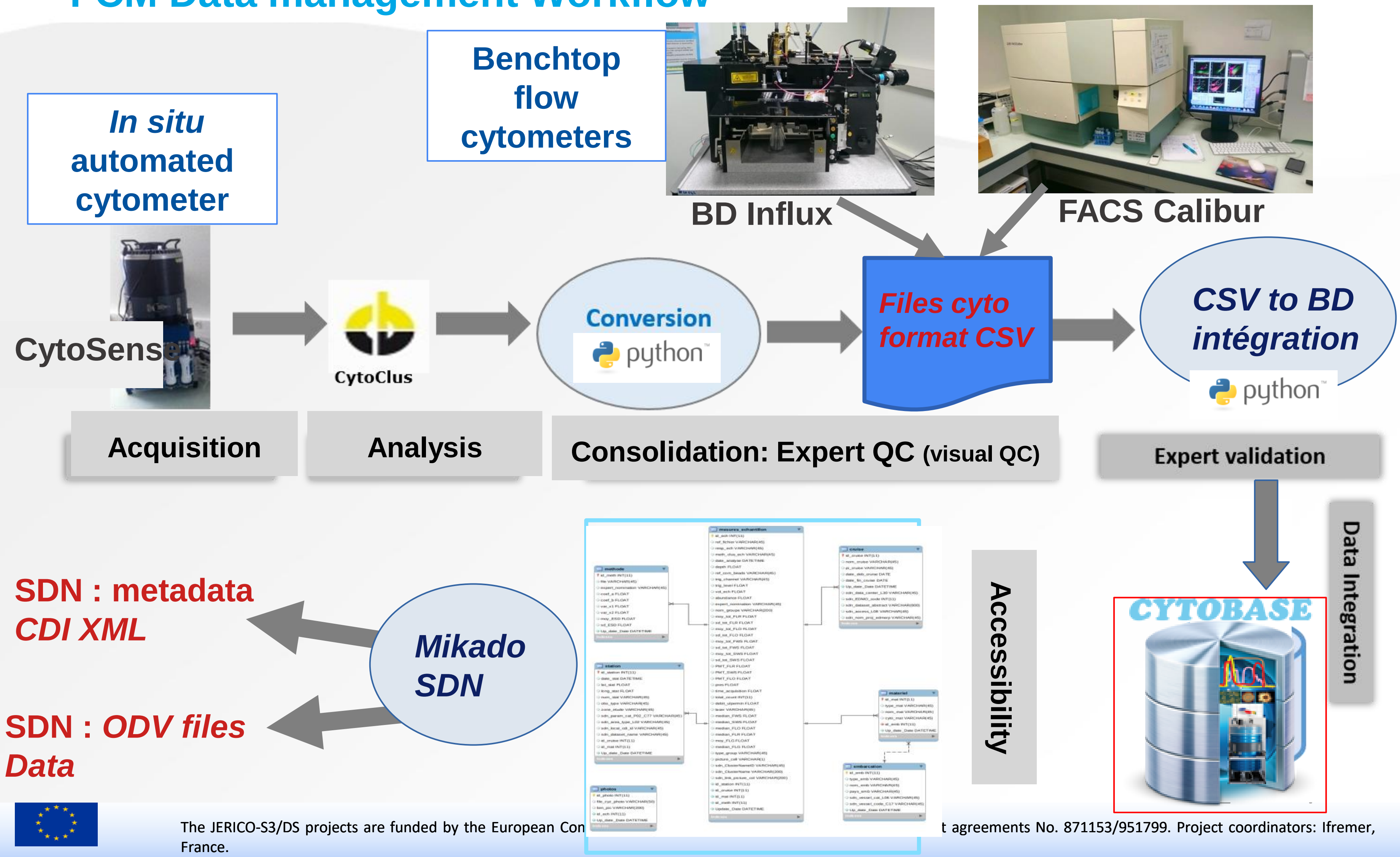
PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

SeaDataNet

mio Institut Méditerranéen d'Océanologie

cnrs dépasser les frontières

FCM Data management Workflow



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CDI - Marine data access - Mozilla Firefox

https://cdi.seadatanet.org/search

Débuter avec Firefox | YouTube | Webcalendar Pytheas | Google | Google Maps | My CoRe | Files - AmuBox | DeepL | Citadel | GitLab unistra | GitLab OSU | Autres marque-pages

SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

FEEDBACK | SURVEY

Hello Maurice LIBES
My CDI ▼

DATASET BASKET 0

NEW SEARCH | REFINE SEARCH | SEARCH RESULTS | SUMMARY | TIMESERIES

Filter search

You searched for: Reset all

Free search:
cytometry

Sea regions:
Mediterranean Sea

EXPORT RESULT | SAVE QUERY

INPUT FIELDS

Free search ?

Date search ?
From yyyymmdd To yyyymmdd

Geographic search ?
North | West | East | South

Search within bounding box

SEARCH | RESET

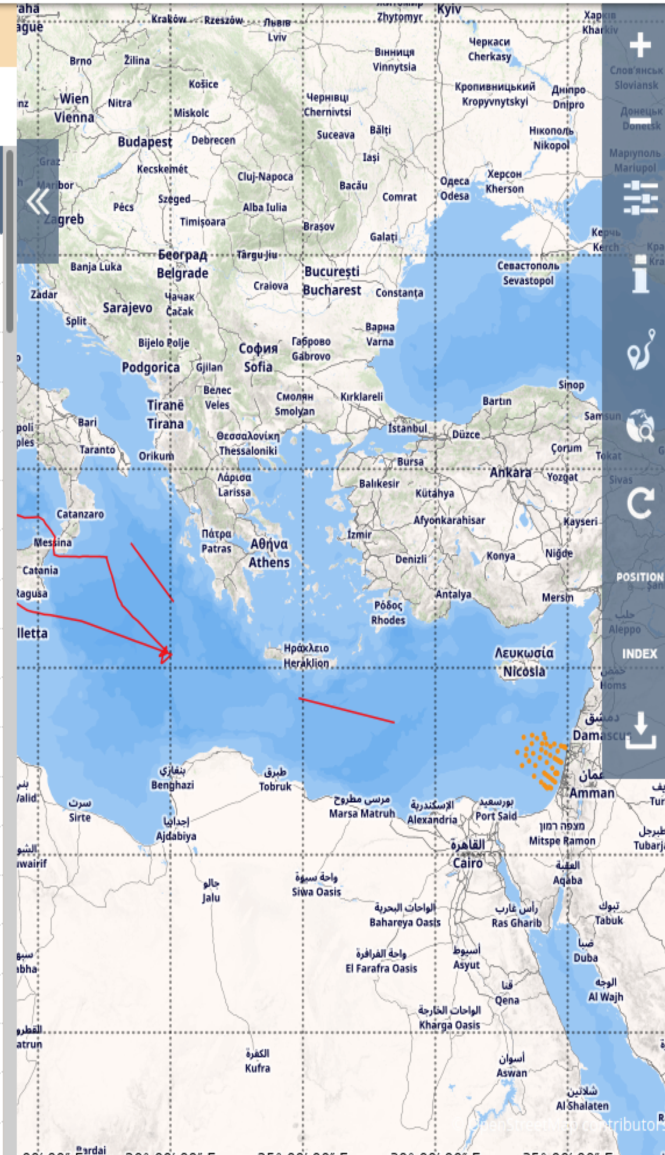
DISCIPLINE (P08) ?

Biological oceanography	(130)
Administration and dimensions	(61)
Chemical oceanography	(58)
Physical oceanography	(58)
Cross-discipline	(55)
Marine geology	(11)

100 | 1000 | 10000

Found 130 | Show (1 - 100) | First | Prev | Next | Last

Dataset name	Country originator	Start date	Instrument / gear type
CHROME_MARS2016_FCMW	France	20160324	flow cytometers
OSCAHR_FCMW	France	20151030	flow cytometers
DEWEX LEG1_FCMW	France	20130203	flow cytometers
DEWEX LEG2_FCMW	France	20130405	flow cytometers
BioArgoMed_FCMW	France	20150706	flow cytometers
PHYTOMIV_FCMW	France	20150909	flow cytometers
BERRE MISE 2014_FCMW	France	20140626	flow cytometers
DEWEX LEG2_H09	France	20130405	flow cytometers
DEWEX LEG2_H09	France	20130405	flow cytometers
DEWEX LEG2_H09	France	20130406	flow cytometers
DEWEX LEG2_H09	France	20130406	flow cytometers
DEWEX LEG2_H09	France	20130407	flow cytometers
DEWEX LEG2_H09	France	20130407	flow cytometers
DEWEX LEG2_H09	France	20130407	flow cytometers
DEWEX LEG2_H09	France	20130408	flow cytometers
DEWEX LEG2_H09	France	20130408	flow cytometers
DEWEX LEG2_H09	France	20130408	flow cytometers
DEWEX LEG2_H09	France	20130408	flow cytometers
DEWEX LEG2_H09	France	20130409	flow cytometers



Conclusions

- We now can manage *in situ near* real time flow cytometry data
- Sharing FCM data with scientific community can now be done
  - via SDN portal with metadata, with QC, in *interoperable* formats
- I) We convert complex FCM data files into CSV readable format
  - with numerous quality controls
  - with consensual vocabulary and FCM dedicated metadata
- ii) We insert FCM data into a relational DB in order to perform queries
- iii) We choose to use Seadatanet infrastructure to make our data **F**indable, **A**ccessible, **I**nteroperable and **R**eusable in the Seadatanet portal
- This work can also be used in the Odatis national marine data infrastructure

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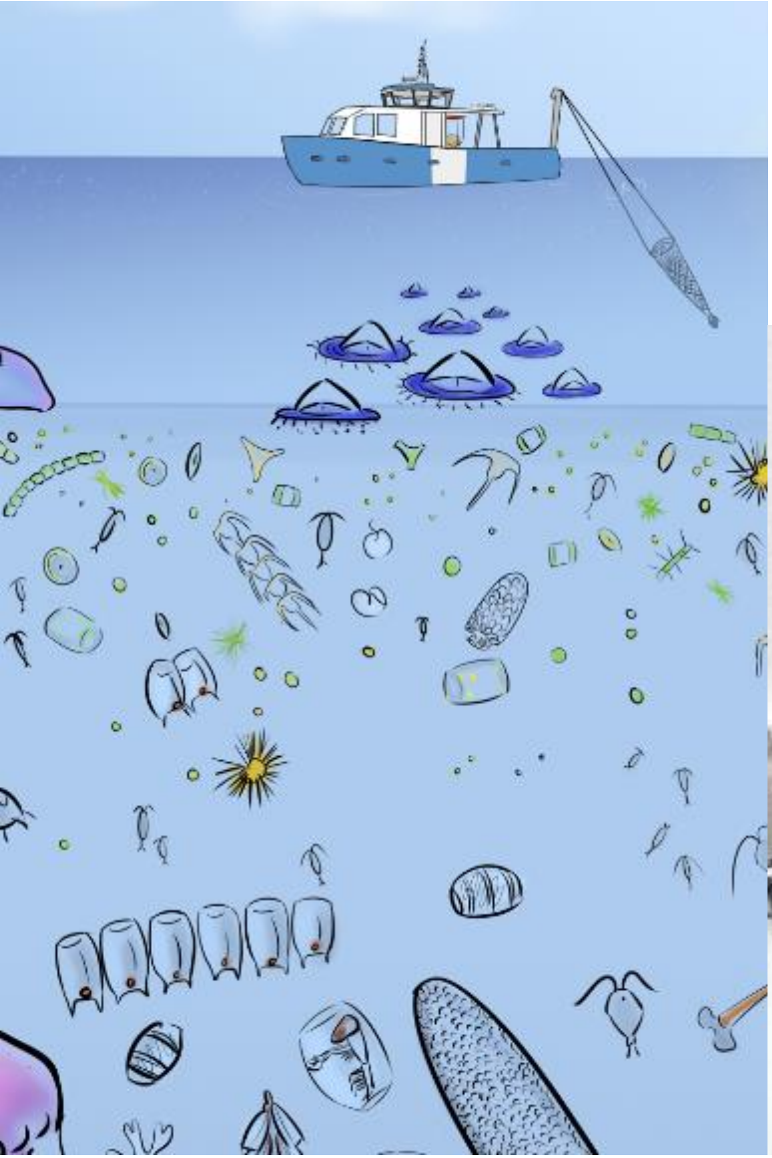
questions



JERICO-Week#2_19-23 April 2021

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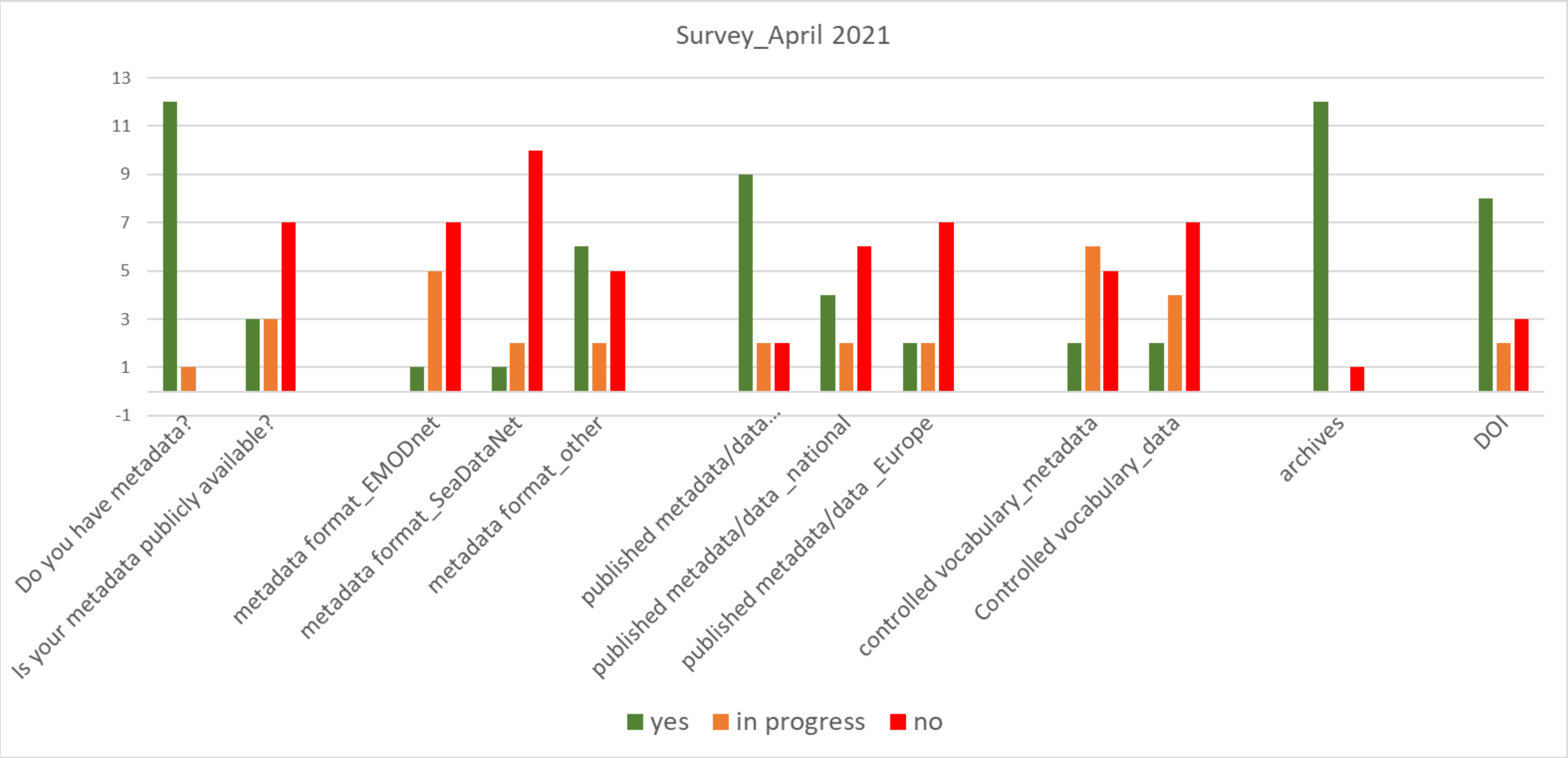
Data on Best Practices for Biological data management



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MIRO

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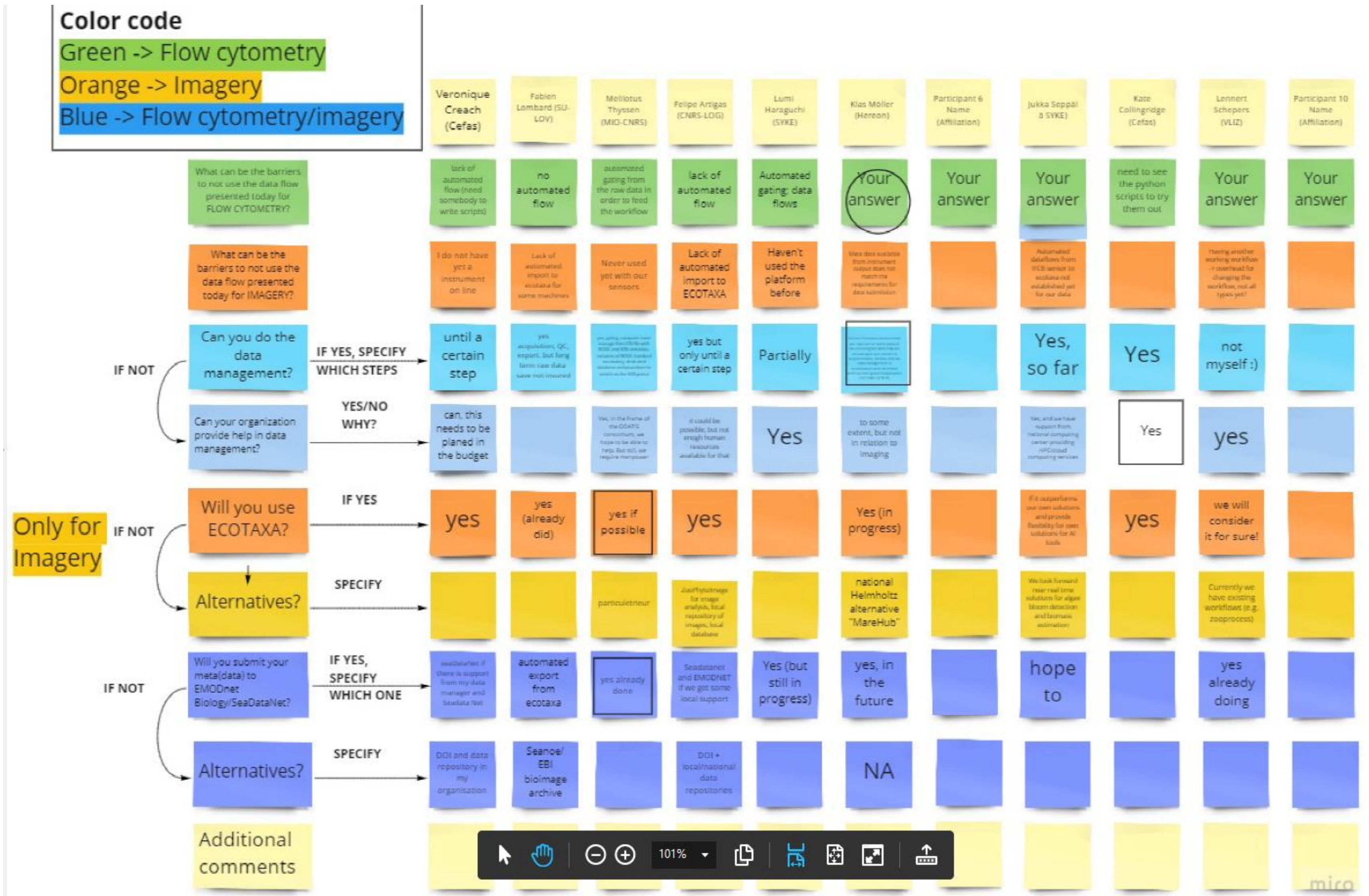

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General Assembly
ARW SESSION 3 - PART 2
Biological Data Flow

Thursday 22 April 2021

The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Agenda

- ➢ 16:00-16:05 Description of the objectives of the WP (Veronique Creach)
- ➢ 16:05-16:15 Imagery dataflow Fabien Lombard
  - ○ 16:15-16:30 Q&A (Moderated by Patricia Cabrera)
- ➢ 16:30-16:40 Flow cytometry dataflow (Melilotus Thyssen)
  - ○ 16:40-16:55 Q&A (Moderated by Veronique Creach)
- ➢ 16:55-17:05 Benchmark for the DM in the partnership (Veronique Creach)
- ➢ 17:05-17:20 Dataflow from researcher to European infrastructure: Miro session for partners input (Patricia Cabrera)
- ➢ 17:20-17:30 Summary of the session (Veronique Creach)

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Patricia’s 5 min presentation for the 10 min intro at 13:30

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Biological Imagery Data Management

Describing best practices and develop a strategy towards data management of biological imagery data, ensuring effective data flow towards European data infrastructures.

1. Develop standardised protocol descriptions and minimal technical metadata elements for effective re-use; Identify and extension of appropriate vocabularies;
2. Identify tools for data integration and platforms for trustworthy long-term archival;
3. Map sensor-specific formats to standardized data formats to be ingested by European data infrastructures;

Deliverable (March 2022):

Best Practices guidelines & strategy for biological imagery data management

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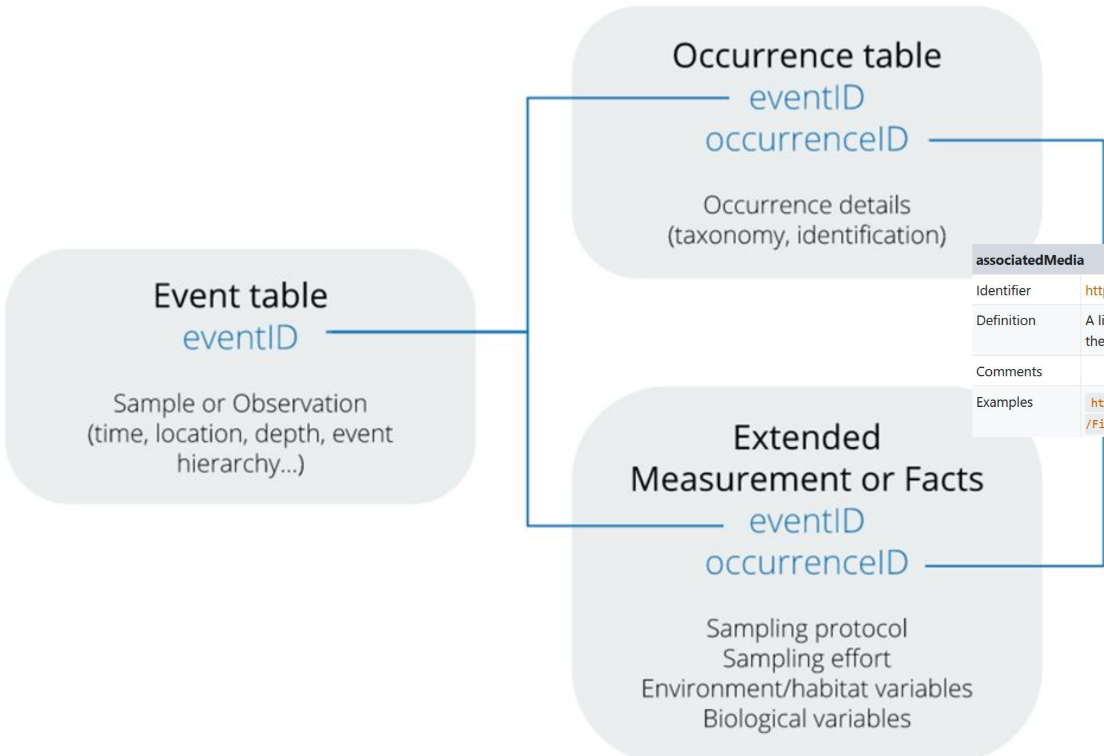
OBIS-ENV [format](#) for imagery datasets



associatedMedia	Property
Identifier	http://rs.tdwg.org/dwc/terms/associatedMedia
Definition	A list (concatenated and separated) of identifiers (publication, global unique identifier, URI) of media associated with the Occurrence.
Comments	
Examples	`http://arctos.database.museum/SpecimenImages/UAMObs/Mamm/2/P7291179.JPG` , `http://204.140.246.24/Fish/Collection%20Pictures/10118-00.jpg | http://204.140.246.24/Fish/Collection%20Pictures/10118-00a.jpg`

- Darwin Core Multimedia extension http://rs.gbif.org/extension/gbif/1.0/multimedia.xml

  Metadata about multimedia resources: type, format, identifier, etc...

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BODC vocabularies

Technical metadata related to image data processing

Square micrometres	http://vocab.nerc.ac.uk/collection/P06/current/SQUM/	Created
Square milimetres	http://vocab.nerc.ac.uk/collection/P06/current/MILM/1/	Created
Equivalent spherical diameter	http://vocab.nerc.ac.uk/collection/S06/current/S0600260/	Created
Pixel size in mm (y)	https://github.com/nvs-vocabs/S06/issues/24	Requested
Mayor axis length (in digital image)	https://github.com/nvs-vocabs/S06/issues/23	Requested
Minor axis length (in digital image)	https://github.com/nvs-vocabs/S06/issues/22	Requested
Area (in digital image)	https://github.com/nvs-vocabs/S06/issues/21	Requested
Width (in digital image)	https://github.com/nvs-vocabs/S06/issues/20	Requested
Volume of an organism, in mm3 with a spherical assumption (based on area and ESD)	https://github.com/nvs-vocabs/P01/issues/61	Requested
Volume of an organism, in mm3 with an ellipsoidal assumption (based on major and minor)	https://github.com/nvs-vocabs/P01/issues/62	Requested

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L22: Instruments

Instrument	URL
Hydroptic Underwater Vision Profiler 5 DEEP {UVP5} imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1577/
Hydroptic Underwater Vision Profiler 6 LP {UVP6} imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1578/
unspecified PlanktoScope [custom build] imaging sensor - Pollina et al. (2020)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1579/
Ifremer-LDCM FastCAM (Prototype) Flow Imaging Microscope - Karlson et al. (2017)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1580/
Hydroptic ZooSCAN imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1581/
CoastalOceanVision CPICS-1000-e imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1582/
Yokogawa Fluid Imaging Technologies FlowCam VS [imaging only system without light scatter measurement] (Benchtop) particle imaging system series	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1583/
Video Plankton Recorder {VPR} imaging system - Davis et al. (1992)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1584/
Sequoia Scientific LISST Holo 2 Digital Holographic Particle Imaging System	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1585/
iSiTEC Lightframe On-sight Keyspecies Investigation {LOKI} imaging sensor - Schulz et al. (2009)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1586/
ZooCam imaging sensor - Colas et al. (2017)	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1587/
McLane Research Laboratories Imaging FlowCytobot imaging sensor	http://vocab.nerc.ac.uk/collection/L22/current/TOOL1588/

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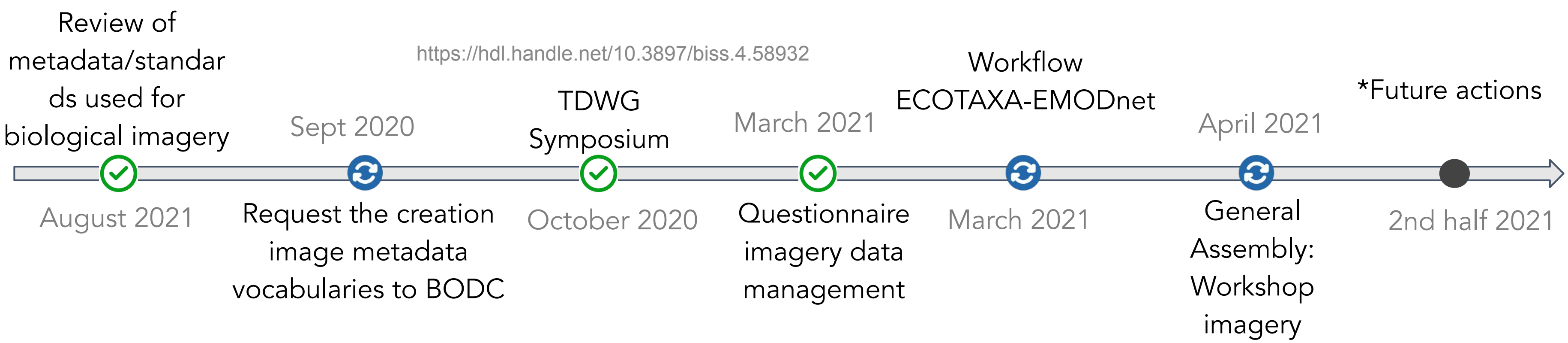
Timeline & Next steps



- *Future actions (long term):
  - Identify tools for data integration and platforms for trustworthy long-term archival;
    - Contact the BioImage archive to discuss its potential as a open image archive for our best practices.
  - Discuss on meaningful spatial and temporal data aggregation (D6.4).
  - 1st draft report D6.4 (December 2021)
  - Final report D6.4 (March 2022)

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User Workshop

Friday 23. April 2021 / 9:00 - 11:00 CEST

Scope of the workshop:

The WP9 of JERICO-S3 works on an analysis of the JERICO-RI User landscape, User Needs, and User Expectations. The analysis will enable the elaboration of a User Strategy which will support the development of a sustainable infrastructure (JS3 WP9, JDS WP4, ESFRI Roadmap). To achieve this, a preliminary step consists in assessing the User Landscape, their needs and expectations within the JERICO Regions. This *User Workshop* will contribute to this task in answering the following questions:

- What is the current status of the User Analysis ?
- What are the first outcomes and conclusions?
- Does the result match with the experience of the nations (NRI) and regions?
- What are the weaknesses of the analysis and how to improve it? (Comparison of results in regions)
- How can the region progress towards the analysis of the User landscape?
- What is the status of the elaboration of the business plan? What is the link with the user strategy?

Expected outcomes:

The expected outcomes are:

1) Provide the consortium with a clear overview on the status of knowledge on the JERICO-RI Users and on the purpose of the analysis to structure the business plan.
2) Collect feedback of the regions and nations on the preliminary analysis
3) Collect feedback of the regions on the way User Analysis and Strategy can contribute to the elaboration of JERICO-RI
4) Progress on the User Table and on the User Story Survey process in the regions. (Action plan)

Targeted audience:

-JERICO-S3 Region representatives
-JERICO-S3 IRS and PSS leads
-JERICO-S3 WP9 and JERICO-DS WP4

Type of organisation:

Plenary session + parallel sessions (breakouts by region).

Main reference persons:

JS3 WP9 - Inga Lips, Bastien Tagliana, Ingrid Puillat

Expectations towards regions:

Active participation in the workshop (breakout rooms) to:

-Discuss the relevance of the preliminary analysis and current status of the data (Table of users) provided in the regions.

-Provide regional feedback on the best way to approach Users in the region and on how the User Strategy can contribute to the elaboration of the Research Infrastructure.

-Agree on an action plan for the completion of the **User Table** and the **User Story Survey** request by the **16th June.**

#	Description	Leading person	Link
1 9:00-9:20	**Introduction** to the User Strategy + Preliminary analysis and results (20') - (Table + Survey) - Link with Business plan	Inga Lips, Bastien Tagliana, Kieran Reilly	JERICO-Week#2_SLIDE_ARW Session 4 User Workshop + User Workshop - regional groups
2 9:20-10:20	**Break out sessions**: 2*30'=1h Break out session 1 (30'): Room 1: Kattegat-Skag. + Baltic Sea Room 2: NW Med+Adriatic+Cretan Sea Break out session 2 (30'): Room 1: Norwegian Sea +NSea + EN Channel + irish Seas Room 2: Bay of Biscay + Iberian Content of the breakout rooms: -Providing feedback on the presented results of the analysis in regions and expressing eventual regional specificities. -Providing feedback on the approach of	Bastien Tagliana, Inga Lips	BALTIC SEA + KATT. SKAG. NW Med + Adriatic Sea + Cretan Sea - User Workshop Norw. Sea + North Sea + English C. + Irish Seas - User Workshop Bay of Biscay + Iberian - User Workshop

	users in the regions / on the way the user strategy can support the elaboration of the RI. -Completing the Table of Users and/or agreeing on an action plan to progress toward this in the regions. -Discussion on **User Story Survey** request and action plan to fulfill the request by the **16th June**.		
3 10:20-10-40	Debriefing from regional sessions: 4*5'=20'	Breakout session chairs	
4 10:40-11h	Plenary: **Conclusion** / Question / Open Discussion (10-20')	Inga Lips, Bastien Tagliana	

NOTES AND MINUTES

NOTES and MINUTES

→ **SECRETARY.IES (responsible for notes and minutes)** : Kieran R., Bastien T., Coord.

From the Zoom chat :

George Petihakis(9:36 AM): But industrial research is included in the RIs
Kees Borst (RWS-NL) (9:37 AM) : How to deal with direct and indirect users?
Felipe Artigas (9:38 AM) : Industry could get involved in development of research novel techniques and some are doing this in Europe...

Feedback KS + Baltic Sea, **Jukka Seppälä:**
Division of sectors is somewhat misleading (e.g. high level education vs. research).A better description of what is meant by the sectors is needed.Content of the sectors need to be defined better.
Survey is incomplete for regions (e.g. PSS is not equal to region), and some countries have not provided their entries.

Specificities: yes

- There are some specific scientific questions falling in between regions (Kattegat-Skagerrak - Baltic), e.g. water exchange (salinity, oxygen).
- Navigation/traffic (oil transport, passenger ships / ice conditions) is important user in the region, need to secure that it is appropriately notified in survey

- We should try to understand better which users will benefit from integrated JERICO-RI data/products, over the currently available ones (national/network).

Expectation:
Develop more fit-for-purpose products, including integration of models and real time observations, forecasts.
Increase the use of continuous/non-traditional marine observations in local and regional assessments.
Coordinate the integration of multi-sectoral national data (outside JERICO community).
Learn from other regions how to communicate with users in different categories.
Learn from each other how to create services to attract various users.

Feedback NW Mediterranean Sea, **Laurent Coppola**:
Analysis of distributions across regions shows that :
CF: Fisheries and Oil & gas are underestimated in the NW-M statistics.
I: The point is to balance the economic value of the sector with the interest in RI.
LC: Users, such as tourism or transportation, are interested in access to data to monitor impacts.
DR: The VA can be an important tool for engaging users.
AC: Users need to be empowered to use data.
FB: Regarding NA, statistics show that coastal Protection and Management and Academia have a strong presence, they are interested in access to data.
LC: One of the key aspects is data sharing.
CF: In NE-M we have strong interactions with aquaculture.
MP: In NA we need to strengthen the research provided by RI, for example an excellence in coastal ecology leads to important results for users.
CC: In NA we need to overcome the inhomogeneity of the distribution of platforms that are almost all distributed along the Italian coast and are missing on the other side.
LC: This is one of the objectives of JERICO.
MP: The problem is governmental, the presence of governments at the same tables for the Marine Strategy.
MM: In the NW-M two important problems able to attract users are: the monitoring and prediction of spreading pollutants on the coasts of the Tyrrhenian Sea and the monitoring of inversion currents in the Ligurian Sea.

Adriatic Sea: probably more research users. RI could provide excellent research for users and services (public sector important for the east region). Many research institutes in Italy. A sustained relation with the eastern part is missing but JERICO WP3 should help.

NW MedSea: port activities are close to the marine protected areas but missing the link with research institutes and knowledge of science (eg. circulation during pollution).

Important to balance between economics and interest in the JERICO data. Take into account the economic value of a sector.

Creatan Sea suggested taking into account the economic values generated by a sector as a representative of the sector in the balance, but it is also necessary to put this in front of their interest towards JERICO-RI.

More accurate feedback on access needed.

Fisheries and Aquaculture should be investigated and how JERICO could fulfill their needs (for instance “time series”).

Regional specificity in Adriatic Sea: research users are underestimated in the estern part. JERICO can provide excellence research there.
We are missing sustainability between estern and western parts of the Mediterranean Sea.

Expectations:
LC: Develop indicators, provide experts, data and tools to provide good views of indicator.
J: Provide data, expertise on best practices, QC services.

NW MedSea: difficult to communicate with non expert users to the data -> So need to better inform + better derived product easier to use and understand for general users. Add to the dataset some products easy to understand, provide indicators for ocean health, pollution etc. African research users (BP, data…) are missing in the users survey.

Feedback from Norwegian Sea + North Sea/Channel + Irish Seas, **Holger Brix**:
Paul: for Irish Sea graph has not been completed. No real weighing, not trying to achieve balance. Need to broaden.
Dominique: What about the energy sector? Seems to be missing in Norwegian Sea.
Sebastian: Only selected potential users were considered for Belgium, i.e. those involved in environmental monitoring programs of human activities at sea. Wind farms are indirectly listed in the table for Belgium because the environmental monitoring programs for OWF are partly done by public agencies and partly subcontracted to private consulting companies. Add TNA users to list.
Henning: Database for the analysis is incomplete, we don’t know if it is realistic. What are the expectations? Overall JERICO or limited as of now - present or future users - needs to be clarified. What about aquaculture - one user or hundreds? Not clear what this is about.
Inga: Not analysis is incomplete, the database is. Nation representatives need to be more active.
Dominique: Link to other aspects (?) Table is comprehensive, what to extract from these tables. Make pies for actual users (present users /agreement - where we stand) and other for potential users (business targets - where we could go). Clarify what is JERICO and what is NRI (link to JERICO-RI versus network of NRI). Number of users per category/sector is possibly not the best “unit” for representing the user landscape. Strong need to progress on quantifying the use of JERICO data/facilities.
Alain: For English Channel: analysis is only representative for what has been contributed from colleagues who accept to answer! - information lacking. Not clear, comfortable with what is expected from us, not primarily involved in WP9 actions. Analysis needed what sectors are missing (ex. Energy / wind farms). Out of expertise when filling part of this in.

Need to use existing expertise from other RIs which might have done this analysis already.
Need for a clear summary (chapo) from WP9 leader in order to engage close discussions with existing or future users.
Inga: Share lessons learned inside the community.
Paul: We do get information from other partners. We can provide info from existing business cases, e.g., EMBRC - has been used for a template - but cannot just be copied.
Felipe: Some important amounts of information on regions were collected and summarized within JERICO NEXT final WP4 reports...but some other could come from JERICO S3 participants and their connexions with the different sectors concerned by the survey. Also at the E.U. level as well.
Felipe Artigas: Users impact should be corrected by a quantitative estimation of the amount of people involved and concerned.
Sebastien : Have all the beneficiaries of TNA projects (in J-FP7, J-NEXT and J-S3) been listed in the users table?
To conclude:
Some sectors are missing (energy sector?).
Need to get some of the definitions clear (sectors/categories).
Not clear if addressing current or future/potential users.
Clarification of what is “JERICO” and the national research infra that users are accessing.
Do they need JERICO or are they just using their national infrastructure?
People felt out of expertise when answering the survey. Need for expertise from other Research infrastructure.
TA beneficiaries should be included in the list and taken into account.
No strong specificities.

Specificity:
Sebastian: There are a lot of ongoing human activities at Norwegian Sea. JERICO should provide data, observations etc. to national nodes. Close connection between human activities and experts.
Felipe: EC PSS : It is also a region of high fundamental and applied multidisciplinary research and higher education.
Alain : EC PSS : most important specificities = fisheries, eutrophication, marine protected areas + take into account new wind farm projects. Constraint: take into account transboundary aspects (Fr, UK, Be) in the Dover Strait area => common products for common/harmonised decision or environmental assessment.

Expectations:
Paul: User strategy should define the RI services.
Kieran: Feed in user stories, create structure to capture user feedback.
Kees: End users hope / expect harmonized vision (data streams/flows). Common acceptance of end results.
Felipe : highly heterogeneous coastal marine systems with a great variety of resources and services.

Feedback Bay of Biscay + Iberian Margin, **Anna Rubio / Joao Vitorino**
Anna R., Bay of Biscay. : insurance company missing / coastal erosion => key sector.

Insurance company is missing
Coastal erosion is a key for the French coast.
Coastal protection and management are too general and should be splitted and detailed: Coastal protection/consulting companies/engineers/infrastructures.
Proportion of coastal management and research is biased.
Aquaculture and Offshore wind are under-represented in the region.

<u>Iberian</u>
NGO important = missing in categories, coastal protection (regulations), offshore wind & energy misrepresented, reason small companies do not respond to surveys and we need to motivate them.
Canary: We are biased to technology tests. There is a missing link, when we have better products we will have better responses.
PdE (Spain): agree with PLOCAN missing insurance companies, small companies. There are requests from police or judicial systems.
ANNA: Is this included maybe in the Maritime safety/crisis responses??
JOAO: No, this corresponds to more specific cases, for example murders, legal disputes, and so).
IH: misrepresented sector of aquaculture because this corresponds to small companies and difficult to get feedback; (need to improve communication). Missing specific users for educational areas (not included in academia), missing specific users for public outreach about coastal ocean questions (use of our data in sessions directed to the general public, use of material and instruments in exhibitions for the general public - Question: how to include this in survey?).
IH: Work better in the Blue Economy (potential to increase expression of private sector / aquaculture and tourism. Improve communication directe to the small companies to motivate their feedback. Strong potential for interactions with users of the NW African areas and of the Atlantic basin area.
Joao: Aquaculture: high number of small companies so difficult to reach through the survey. We are also providing data to justice / police / court yards: should appear. Data is used for specific educational purposes.

<u>Bay of Biscay</u>
Proportion of fundamental research vs coastal management: on the French side the research is mainly for transitional water so is not correctly represented here. It should be in Danubius but France is not in Danubius.
Aquaculture and offshore wind are under-represented. More contacts to be identified.

Attendees (54) → Taken at 09:30 (session started at 09:00)

- Léa G. (Co-host, me)
- Laurent D (JERICO Coord) (Host)
- Bastien Tagliana (Co-host)
- Inga Lips (EuroGOOS) (Co-host)
- Ingrid (Co-host)
- KR Kieran Reilly, Marine Institute, Ireland (Co-host)
- al alain lefebvre
- AC Andres Cianca (PLOCAN)
- AR Anna Rubio AZTI
- a annalisa
- Antoine Grémare
- BP Begoña Pérez
- BM Behzad Mostajir (CNRS)
- CC Carolina Cantoni (CNR)
- CA Christian Autermann
- CL Christine Loughlin (Marine Institute)
- CF Costas Frangoulis
- DR Damia Rita
- David Kaiser - hereon-KDG
- Dominique Durand
- EB Emilie Breviere
- ED Eric Delory
- FB Fabio Brunetti
- fa felipe artigas
- George Petihakis
- HF Helene Frigstad (NIVA)
- HW Henning Wehde
- HB Holger Brix
- ip ivane pairaud
- J JAllen
- JV Joao Vitorino
- J Juanga
- JS Jukka Seppälä
- JM Julien Mader (AZTI)
- JS Jun She, DMI
- KB Kees Borst (RWS-NL)
- Klas Ove Möller
- LC Laurent Coppola
- MM Marcello Magaldi (CNR)
- MB Maristella Berta
- MP Martin Pfannkuchen
- MH Martti Honkanen
- MJ Melanie Juza (SOCIB)
- Nelli Rünk (TalTech)
- PG Paul Gaughan
- PK Pirjo Kuuppo SYKE
- SE Samu Elovaara, SYKE
- SR Saskia Rühl
- SM Simone Marini
- Sylvia Christodoulaki (HCMR)
- SL Sébastien Legrand, RBINS
- UL Urmas Lips (TalTech)
- vC veronique Creach
- ZH Zéline Hubert

User Workshop

(WP9 Sustainability)

Jerico Week #2 Session 4

Friday 23 April 2021 -- 9:00-11:00 CEST

Inga L. / Ingrid P. / Paul G. / Kieran R. / Bastien T.

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Workshop outlines

1) **Introduction** (plenary): Status of the User Strategy in JERICO-S3, links with Business Plan

1) **Regional Breakout sessions** (parallel sessions): Feedback on the preliminary analysis and action plan for the completion of the analysis

1) **Conclusion** (plenary): Question + Open Discussion

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2

1) Introduction: User Strategy

USER STRATEGY

- Gain more users / Reach all potential users / balance user distribution
- Development of fit-for-purpose Products and Services
- Involve users into the long term governance of the RI

User-driven Infrastructure

Higher Socio-economic impact

Sustainability

METHODE:
1) **ANALYSIS OF USERS and NEEDS**
2) **IMPLEMENTATION**

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3

1) Introduction: User Strategy

USER STRATEGY in JS3 -> WP9 Sustainability

ANALYSIS

T 9.2.1: Identification/mapping
ANALYSIS of USER LANDSCAPE
+ Elaboration of the JERICO User Committee (JUC)
≃ 80% done

T 9.2.2: Needs *vs* RI offer
ANALYSIS of user NEEDS and EXPECTATIONS
≃ just started

IMPLEMENTATION

T 9.3 -> Preliminary Design. Link with WPs 1, 2, 6, 8

T9.4 -> RI Business plan

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1) Introduction: User Strategy

USER STRATEGY in JS3 -> WP9 Sustainability

ANALYSIS

- CMEMS / Mercator
- OSPAR / HELCOM / Barcelona Convention
- Office français de la biodiversité
- EEA / ICES
- Instituto Espagnol de Oceanographica
- EATIP (European Aquaculture Technology and Innovation platform)

T 9.2.2: Needs *vs* RI offer
ANALYSIS of user NEEDS and EXPECTATIONS
≃ just started

IMPLEMENTATION

T 9.3 -> Preliminary Design. Link with WPs 1, 2, 6, 8

T9.4 -> RI Business plan

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Key Partners	Key activities / Key Resources	Value Proposition	Customer Relationship / Channels	Customer Segments
National RIs National institutes National and European funders European Commission Data aggregators Related marine environmental RIs Suppliers of equipment and infrastructure	**Key activities** Data collection, quality control, standardisation and management. Operation and maintenance activities Coordination by the central hub **Key Resources** National infrastructure and data Personnel Funding Sources listed	JERICO RI is an integrated multiplatform RI providing decision makers with complex observational data which is harmonised to tackle issues of global changes and anthropogenic stressors in the coastal area. JERICO RI deliver the following services: · Physical access to infrastructure · Virtual access to data · Access to calibration facilities · Access to knowledge (eg expert advice, training)	**Customer Relationship** JERICO User Committee and User Forum User stories **Channels** National e-infrastructures JERICO e-infrastructure Access programmes Workshops/exhibitions at targeted events	1. Coastal management 2. Fundamental and applied research 3. Weather services and ocean forecasting 4. High level education 5. Fisheries 6. Ocean technology 7. Tourism and recreation 8. Maritime safety/crisis response 9. Aquaculture 10. Shipping

Cost Structure	Revenue Streams
Annual capital and operational expenditure and upgrades of national infrastructure (sensors, personnel, maintenance, ship time, etc) Cost of service provision Coordination costs	National research and infrastructure funding European grant funding Income from provision of products and services

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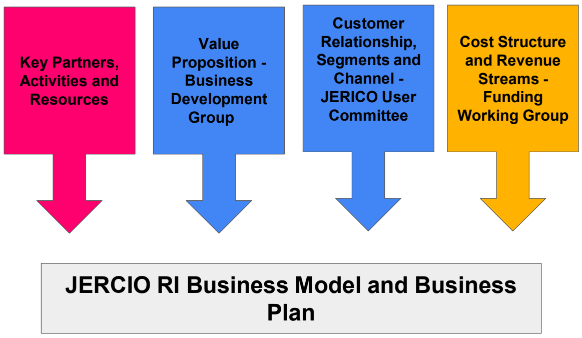

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7

1) Introduction: Preliminary results / User Landscape

Identification of the User landscape (T9.2.1-> Table of Users):

- Sectors
- Categories
- Scientific fields
- Regions

LINK to: Table of Users

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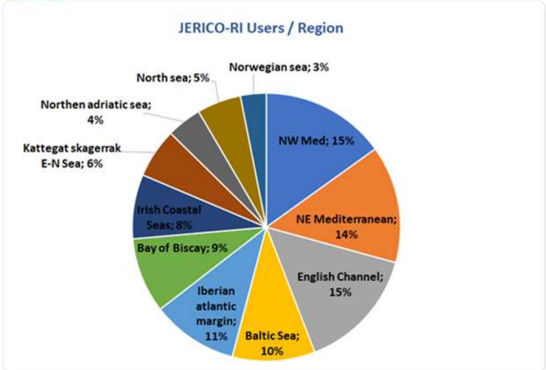

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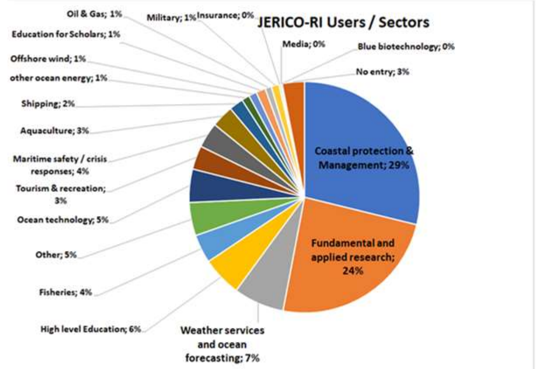

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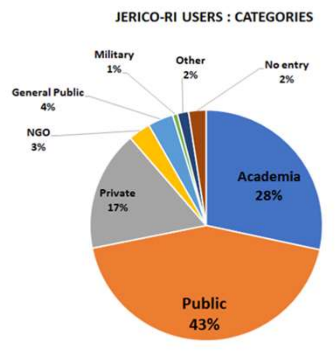

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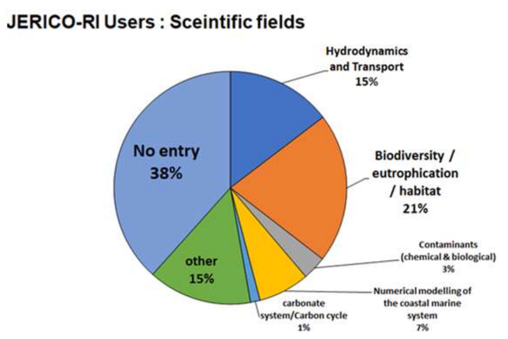

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1) Introduction: Preliminary results / User Landscape

Assessment of *Access Type* to the Research

Infrastructure (T9.2.1 -> Table of Users):

- Physical Access
- Virtual Access
- Knowledge access
- Calibration Facilities

LINK to: Table of Users

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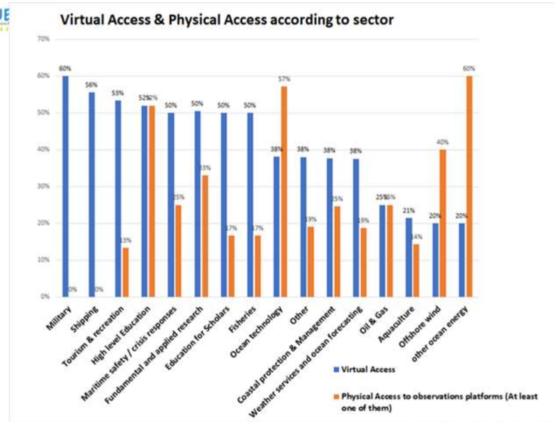

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1) Introduction: Analysis of Needs and Expectations

- Identification of needs (T9.2.2)
  - User story Survey

    LINK: User Story Survey

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1) Introduction: Analysis of Needs and Expectations

REQUEST TO IMPROVE THE ANALYSIS (Request for Region PIs and User contact Points)

-> **Select 5 Users** you have identified in the table of Users

-> **Quality check** of the information in the User Table

-> **Contact this 5 users** and ask them to **fill in the** User Story Survey

Deadline: Please before 16th of June!

LINK: User Story Survey

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2) Regional Breakout sessions:

PART 1: Feedback on the preliminary analysis in your region

a) Comment on the presented diagrams
b) Advice on the regional specificities

PART 2: Expectation towards the User Strategy

a) How the RI can answer the regional specificities

PART 3: Progress on Table of Users

a) Agreement on action plan to progress on the Table of User

PART 4: Progress on the User Story Survey

a) Agreement on action plan to progress on User Story Survey

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