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PROJECT NAME : Joint European Research Infrastructure for Coastal Observatories - Science, services, sustainability
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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
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→ **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			
<u>Consortium beneficiaries</u>	Third parties	Associated Partners	other
<u>X</u>			

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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 new 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	

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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 Nejstgaard (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, Planktoscope, 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 metabarcoding, 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

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|--|---|---|
|  Léa G. (Co-host, me) | | |
|  Laurent D (JERICO Coo... (Host, Guest) |  LS Lennert Schepers (VLIZ) (Guest) |  FL Fabrice LIZON (Guest) |
|  fa felipe artigas (Co-host, Guest) |  LP Leonidas Perivoliotis (HCMR) (Guest) |  SG Gerald GREGORI (Guest) |
|  ingrid P (Co-host) |  LE Lisette Enserink (Guest) |  GB Gisbert Breitbach (Hereon) (Guest) |
|  Patricia Cabrera (Co-host, Guest) |  L Lumi (Guest) |  W Henning Wehde (Guest) |
|  vC veronique Creach (Co-host, Guest) |  MN Marc Nogueras (UPC) (Guest) |  i iansalter (Guest) |
|  al alain lefebvre (Guest) |  MP Martin Pfannkuchen (Guest) |  Inga Lips (EuroGOOS) (Guest) |
|  AC Andres Cianca (PLOCAN) (Guest) |  MH Martti Honkanen (Guest) |  R Isabelle Rombouts (Guest) |
|  a annalisa (Guest) |  MC Miguel Charcos (SOCIB) (Guest) |  J JAllen (Guest) |
|  CM Carlo Mantovani (CNR) (Guest) |  MJ Milla Johansson (Guest) |  V Joao Vitorino (Guest) |
|  CC Carolina Cantoni (CNR) (Guest) |  NZ Nikolaos Zarokanellos (Guest) |  S Jukka Seppälä (Guest) |
|  CB Catherine Boccadoro (Guest) |  PK Pirjo Kuuppo SYKE (Guest) |  M Julien Mader (AZTI) (Guest) |
|  CF Costas Frangoulis (Guest) |  SR Saskia Rühl (Guest) |  KC Kate Collingridge (Guest) |
|  EA Eva Alou (SOCIB) (Guest) |  se sebastian ehrhart [syke] (Guest) |  KC Kate Collingridge (Guest) |
|  fabien lombard (Guest) |  t thyssen (Guest) |  KB Kees Borst (RWS-NL) (Guest) |
|  FB Fabio Brunetti (Guest) |  TT Timo Tamminen, SYKE, Finland (Guest) |  Klas Ove Möller (Guest) |
|  W WEI (Guest) | | |
|  ZH Zéline Hubert (Guest) | | |