



EU Coastal and Open Sea Observatories

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Workshop on Interoperability Technologies and Best Practices in Environmental Monitoring

Brest, 10-12 October 2018

Long-term *in situ* marine observation, be it coastal or open sea, seafloor or water-column, is achieved by a variety of devices and systems operated by a number of teams meeting different demands in multiple contexts. In spite of this diversity, operators and users are facing a set of common constraints and have obvious benefits in sharing practices and means. Under the auspices of the European Commission, JERICO-RI, EMSO ERIC and AtlantOS, are participating to the international effort to harmonize the practices of this domain and to push up the interoperability technologies for sharing ocean instruments:

- The Joint European Research Infrastructure Network For Coastal Observatories (JERICO-RI, www.jerico-ri.eu) is a solid and transparent European network dedicated to provide operational services for the timely, continuous and sustainable delivery of high quality environmental data and information products related to marine environment in European coastal seas.
- The European Multidisciplinary Seafloor and water-column Observatory European Research Infrastructure Consortium (EMSO ERIC, www.emso-eu.org) is a distributed Research Infrastructure of marine observatories addressing natural hazards, climate change and marine ecosystems in the service of science researchers, marine technology engineers, policy makers, and the public.
- AtlantOS (Optimising and Enhancing the Integrated Atlantic Ocean Observing Systems, www.atlantos-h2020.eu) is a Blue Growth research and innovation project that proposes the integration of ocean observing activities across all disciplines for the Atlantic, considering European as well as non-European partners.

On the occasion of the Sea Tech Week 2018 in Brest (France) (www.seatechweek.eu), EMSO ERIC JERICO-RI and AtlantOS are jointly proposing a 3-day workshop for technical and scientific staff, aiming to increase the level of marine observation practices.



Building on the results of previous similar interoperability workshops¹, the event will focus on:

- Sensor Web Enablement implementation.
- Cabled coastal observatories operations
- Metrology of dissolved oxygen, pCO₂ and pH in marine environment
- Dissolved oxygen and temperature: seafloor and water column data, from sensor to users.

Organisers: **Ifremer:** Jérôme Blandin, Ingrid Puillat, Laurent Delauney, Virginie Thierry, Chantal Compère; **HCMR:** George Petihakis, Manolis Ntoumas; **OGS:** Rajesh Nair; **HZG:** Wilhelm Petersen; **GeoMar:** Eric Achterberg; **CNRS:** Mathilde Cannat, Déborah Chavrit; **UPC:** Joaquin del Rio.

¹ - WS on Interoperability Technologies for sharing ocean instruments and real-time data, AtlantOS - EMSO ERIC, OI London March 2018.

- WS on Best practices, EMSO ERIC, Rome, October 2017.

- WS on Cable Observatories, JERICO-NEXT, Barcelona 2016.

- WS on Harmonizing New Network Sensors, JERICO NEXT, Paris December 2016.



Agenda

Wednesday 10th October (Chamber of Commerce and Industry, Brest)

08:45-09:00 Welcome of participants

09:00-12:00 Sensor Web Enablement implementation

Chairs: Eric Delory (PLOCAN) and Jay Pearlman (IEEE France)

1) **Introduction** - Objectives of the session – 5'

2) Debriefing on “**Interoperability technologies for sharing ocean instruments and real-time data**”, AtlantOS - EMSO ERIC Workshop at OI-2018 London (15th march 2018) and Best practices repository - 30'

3) **Industrial experiences of SWE implementation** (effort, difficulties, results) – 60'

- SWE implementation of acoustic sensors on the NKE Provor Float – Damien Malardé, Yves Dégrés – 15'
- SWE implementation tools – 52 North - Matthes Rieke – 15'
- SWE implementation on observatories: EGIM – Bertrand Moreau – 15'
- SWE implementation on observatories: OBSEA – Joaquin del Rio – 15'

Coffee break 25'

4) **Discussion** - 60'

- How to implement interoperability technology for on the shelves instruments (O2, CO2 Optode, pH sensors, etc.) and platforms (Gliders, Floats, USV, etc.)?
- How long will be the race to achieve the full chain to produce traceable measurements in databases, from sensor construction to measurement production at sea?
- How efficient is the actual situation when the components are fully interoperable?
- What is the European situation versus the other continents?
- Is the research community ready for such interoperability practices?
- R&D needed for smart sensors?

12:00 - 13:30 Lunch at CCI



13:30-17:30 Cabled coastal observatories operations

Chair: Joaquin del Rio (UPC)

1) Introduction - Objectives of the session – 5'

From the operational experience of each presented observatory, this session aims to propose solutions likely to enhance operations on most cabled coastal observatories.

2) Debriefing on “**JERICO-NEXT Cabled Observatories**” Workshop, UPC Vilanova i la Geltrú, Barcelona 2016 – 10'

3) Five case studies - 75'

- OBSEA: Joaquin del Rio Fernandez, Marc Nogueras, Universitat Politècnica de Catalunya
- SmartBay: Alan Berry, Marine Institute, Ireland
- EMSO Nice/Molène: Nadine Lantéri, Xavier Bompais, Ifremer, France
- Utö: Lauri Laakso: Finnish Meteorological Institute
- LoVe: Henning Wehde, Institute of Marine Research, Norway

Coffee break - 30'

4) Two case studies - 30'

- UNH/UNS: Philipp Fischer: Alfred Wegener Institut, Germany
- Boknis Eck observatory: Hermann Bange, Geomar, Germany

5) Discussion - 90'

- What is most critical in running a coastal cabled observatory?
- What are the operational issues that need most urgent improvement?
- How to decrease access costs while maximizing availability of coastal cabled observatories?



Thursday 11th October 09:00-12:00 (Chamber of Commerce and Industry, Brest)

Metrology of dissolved oxygen, pCO₂ and pH in marine environment

Chair: Laurent Delauney (Ifremer)

- 1) **Introduction** - Objectives of the session – 10'
- 2) **Debriefing** on “JERICO-NEXT Harmonizing New Network Sensors” Workshop, Paris December 2016 – 30'
- 3) **Oxygen metrology**, present situation for the marine community - Florence Salvetat, Ifremer, France - 20'
- 4) **CO₂ metrology**, present situation for the marine community – Meike Becker and Ingunn Skjelvan, ICOS OTC - 20'
- 5) **pH metrology**, present situation for the marine community - Mario Esposito, GEOMAR – 20'

Coffee break 20'

- 6) **Discussion** - 60'
 - Interoperability and metrology, what does it mean?
 - Metrology tools, laboratory or/and on board equipment and protocols?
 - Metrology for carbon fluxes and acidification, are absolute in situ measurements achievable?
 - Metrology for carbon fluxes and acidification, is traceability a dream?
 - R&D needed for sensors?

12:00 - 13:30 Lunch at Chamber of Commerce and Industry

13:30 Bus departure from the **Chamber of Commerce and Industry** to Ifremer Brittany Center, Plouzané



Thursday 11th October 14:00-17:00 (Ifremer Brittany Center)

Building 211 FREZIER, Salon de l'Océan, upstairs

Metrology facilities and dissolved oxygen sensor calibration

Chair: Florence Salvetat (Ifremer)

- Breakout session in three rotating groups:
 - Presentation of the Ifremer calibration facilities all along a demonstration of a O2 reference calibration experiment at the Ifremer metrology laboratory.
 - Demonstration of the EMSO O2 calibration bench under development.
 - Traceability management, explanation and discussion.
- Plenary session: Round table on possibilities and performance of the EMSO O2 calibration bench and associated best practices that could be proposed.

17:00 Bus departure to Brest

Friday 12th October 08:15 Bus departure from Brest Place de la Liberté (blue star on the second map below) to Ifremer Brittany Center, Plouzané

Friday 12th October 09:00-17:00 (Ifremer Brittany Center)

IPEV building, first floor

Dissolved oxygen : seafloor and water column data, from sensor to users

Chairs : M. Cannat (CNRS-IPGP), Virginie Thierry (Ifremer)

This two half-day session will bring together producers and users of dissolved oxygen from seafloor and water column sensors, in deep sea and coastal environments. The objectives will be to promote Best Practices regarding the acquisition, qualification, distribution of dissolved oxygen data and to develop synergies around these two widely used categories of data, between EMSO, JERICO-RI and AtlantOS communities, and between users of seafloor and water column data. After a brief update on the scientific objectives specific to each community, the session will focus on the practical aspects of time series data production in each context, from sensors characteristics, acquisition parameters, quality control and calibration procedures, to data processing and interpretation.

09:00 - 12:30

- 1) Introduction - Objectives of the session – 10'
- 2) Presentation of the scientific issues and corresponding needs (spatial coverage, accuracy, data availability, etc..) associated with dissolved oxygen data for each community
 - a) Seafloor data - Pierre-Marie Sarradin - 20'
 - b) Water column data - Laurent Coppola - 20'
- 3) Data acquisition, state of the art of sensor knowledge, implementation and recommendations



- a) Oxygen optodes - Henry Bittig - 20'
- b) Moorings: known issues, recommendations for implementation and qualification - Dominique Lefèvre - 20'

10:30 Coffee break - 20'

- c) Autonomous platforms (Argo and gliders): known issues, recommendations for implementation and qualification - Henry Bittig - 20'
 - d) O2 data acquired from SBE43 sensor during an hydrographic casts: known issues, recommendations for implementation and qualification - Laurent Coppola - 20'
 - e) The case of very low oxygen concentration area - Aurélien Paulmier - 20'
 - f) Presentation of the White Paper on Best Practices prepared for OceanObs19 by Jay Pearlman - 20'
- 4) Data management: Dissolved oxygen data in the Coriolis Data Base - V. Racapé - 20'

12:30 - 14:00 Lunch, Salon de la Rade

14:00 - 17:00 Discussion

- 5) Open session on best practices regarding data analysis

Coffee break

- 6) Final discussion and synthesis of best practice recommendations

Main sponsors: EMSO ERIC – JERICO-NEXT – AtlantOS - ENVRIplus

VENUE

**On 10th and 11th morning at the Chamber of Commerce
and Industry in Brest**



**1 Place du 19eme Régiment d'Infanterie
29200 Brest
In the city center near train station**

From the airport: the best is to take a taxi or take airport shuttle service :

<https://www.brest.aeroport.bzh/transports-en-commun>

Taxi Brestois: +33 298 801 801

In the city center - Take public transport services

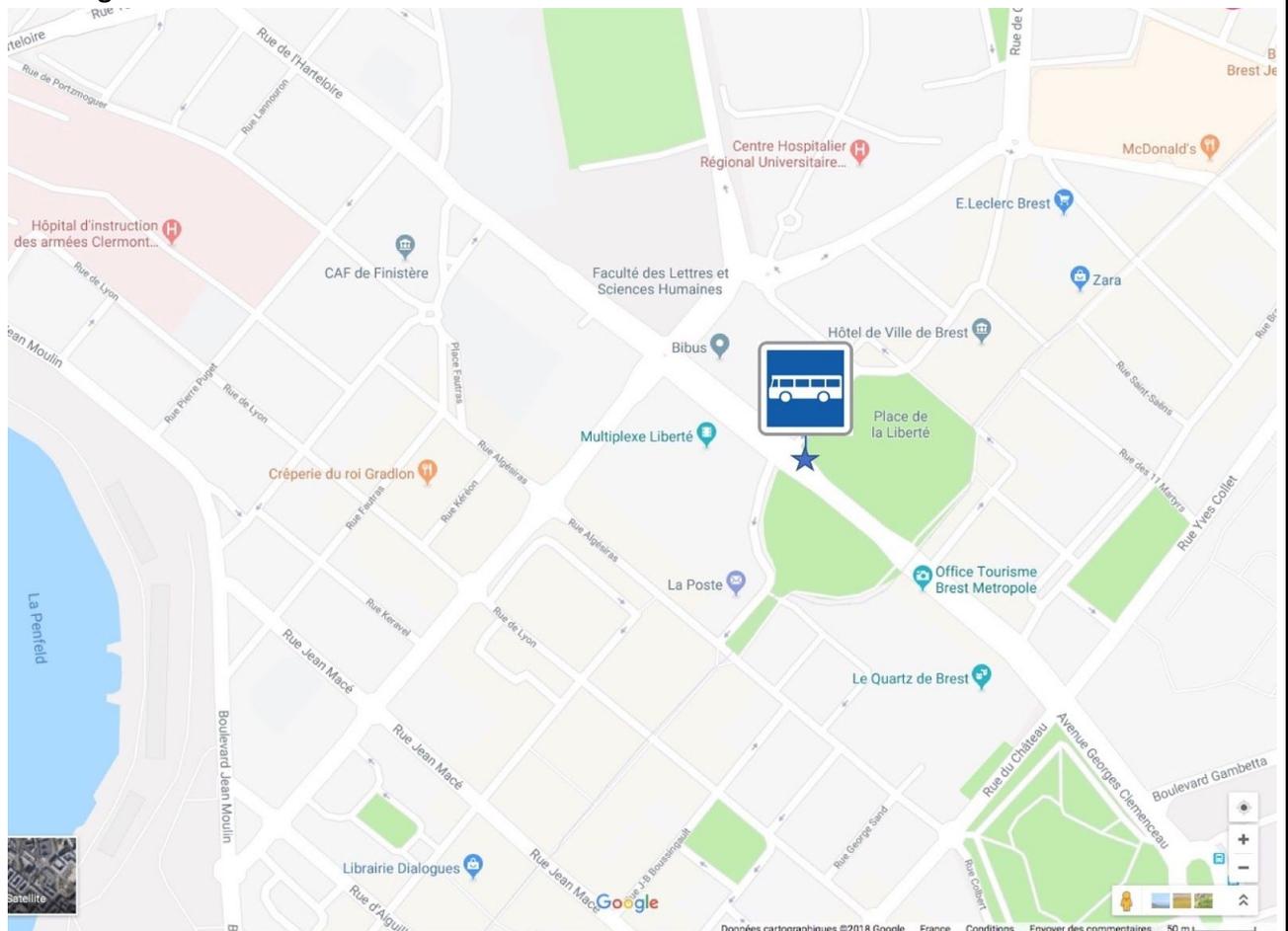
<http://www.bibus.fr/>

On 11th afternoon and 12th at Ifremer Brittany Center



1625 Route de Sainte-Anne, 29280 Plouzané

How to get there?



The blue star indicates the special bus service departure **Friday 12th 08:15**

List of hotels in the city center

Name of the hotels	Address	Phone number	Website
Oceania Centre	82 rue de siam	02.98.80.66.66	http://www.oceaniahotels.com/oceania-brest-centre.php
L'Amirauté	41 rue de Branda	02.98.80.84.00	https://www.oceaniahotels.com/h/hotel-l-amiraute-brest/presentation
Les voyageurs	2 rue Yves Collet	02.29.61.09.09	https://www.accorhotels.com/fr/hotel-A4A5-hotel-mercure-brest-centre-les-voyageurs/index.shtml
Bellevue	53 rue Victor Hugo	02.98.80.51.78	http://www.hotelbellevue.fr/
Kyriad	157 rue Jean Jaurès	02.98.43.58.58	http://www.kyriad-brest-centre.fr/fr
La Gare	2 Bd Gambetta	02.9844.47.01	http://www.hotelgare.com/
Hôtel le continental	41 rue Emile Zola	02.98.80.50.40	https://www.oceaniahotels.com/h/hotel-le-continental-brest/presentation
Abalis	7 av Clémenceau	02.98.44.21.86	http://www.abalys.com/
Hôtel de la rade	6 rue de Siam	02.98.44.47.76	http://www.hoteldelarade.com/
Hôtel St Louis	6 rue Algeiras	02.98.44.23.91	http://brest-hotel.com/
Agena	10 Frégate la Belle Poule	02.98.33.96.00	http://adena-hotel.fr/
Hôtel Vauban	17 av Clémenceau	02.98.46.06.88	http://www.hotelvauban.fr/