Final week
27-30th April 2015

Ifremer

Brittany Center, Brest, France

SEVENTH FRAMEWORK PROGRAMME

Version 1.1 – 23 April 2015

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Week Agendas

Final JERICO week and side events

27-30th April 2015
Brest, France

JERICO Research Infrastructure (RI) is the coastal component of the European marine observing system, and is funded by the FP7 program and recently extended through a newly awarded H2020 project (JERICO-NEXT). It gathers 33 partners from 15 European countries. This research infrastructure aims at further developing, harmonizing and integrating nationally funded marine observing systems, collecting physical, chemical and biological parameters from different platforms (ferryboxes, fixed platforms, gliders, HF radars, benthic systems …).

After the final General Assembly meeting of the JERICO(FP7) project (28th April 2015), the JERICO Science day will present research and developments already supported by the JERICO infrastructure. The last day, 30th of April, will address the strategy of the coastal observatories in the future and will build a bridge towards JERICO-NEXT with the workshop "Strategy towards JERICO-NEXT". The workshop will focus on 5 topical discussions dedicated to address key issues for the JERICO long term sustainability in the context of European Strategies, with objective to initiate exchanges and follow up along the duration of the JERICO-NEXT project.

THE JERICO WEEK AT A GLANCE:

When?	What and Who?	Where?
Monday 27 Apr. 2015 14:00-16:00	JERICO NEXT preparation meeting focused on WP4 (only WP leaders and co-leaders + JRAPs leaders)	Ibis Styles hotel Brest
Monday 27 Apr. 2015 16:00-18:30	Preparation of the GA meeting and of the workshop	Ibis Styles hotel Brest
Monday 27 Apr. 2015 19:30-…	Ice Breaker	Ibis Styles hotel Brest
Tuesday 28 Apr. 2015 8:30-15:30	JERICO Final General Assembly meeting (for Jerico partners)	Ifremer centre Plouzané
Tuesday 28 Apr. 2015 15:30-19:30	JERICO Science day: part 1	Ifremer centre Plouzané
Tuesday 28 Apr. 2015 19:30 - …	Social event & dinner	Yacht club Brest
Wednesday 29 Apr. 2015 8:30-18:00	JERICO Science day: part 2	Ifremer centre Plouzané
Thursday 30 Apr. 2015	"Strategy towards JERICO-NEXT" Workshop	Ifremer centre

8:30-15:30		Plouzané

Preparatory meetings
27th April 2015
Ibis Styles Hotel (Brest)

Agenda

Time slot	Topic	Lead

Monday, 27th of April – Preparatory Meetings		
14:00–16:00	**JERICO-NEXT WP4 – Preparatory meeting (Restricted to WP4 members, WP leaders and co-leaders)**	I.Puillat
17:00-18:30	**Steering Committee - Preparatory meeting (open, not only SC members)**	P. Farcy
End of first day meeting		
19:30	*Ice Breaker at Ibis Hotel Brest Port*	

Final General Assembly meeting
28th April 2015
Ifremer premises (Plouzané)

Agenda

Time slot	Topic	Lead

Tuesday, 28th of April – General Assembly		
07:30-08:15	**Bus to Ifremer (Stop at Ibis Styles & Railway station)**	
08:30-09:00	**GA Welcome Speeches**	A. Dosdat, P. Farcy
09:00-10:40	**General Assembly:** *- WP 2 (09:00 – 09:20): Strengthening regional and trans-regional activities* *- WP 3 (09:20 – 09:40): Harmonizing technological aspects* *- WP 4 (09:40 – 10:00): Harmonizing operation and maintenance methods* *- WP 5 (10:00 – 10:20): Data management and distribution* *- WP 6 (10:20 – 10:40): Outreach*	 H. Wehde (IMR) W. Petersen (HZG) G. Petihakis (HCMR) R. Nair (OGS) S. Keeble (BL)
10:40-11:00	*Coffee break*	
11:00-12:50	**General Assembly:** *- WP 7 (11:00 – 11:20): Service and data access* *- WP 1 (11:20 – 11:50): A Common Strategy*	 L. P. de la Villéon (IFREMER) P. Morin (CNRS)

	- WP 8 (11:50 – 12:20): Transnational access to coastal observatories *- WP 9 (12:20 – 12:50): New methods to assess the impact of coastal observing systems*	S. Sparnocchia (CNR) T. Vukicevic (CMCC)
12:50-14:00	*Lunch*	
14:00-15:30	**General Assembly:** *- WP 10 (14:00 – 14:30): Improved existing and emerging technologies* *- WP 11 (14:30 – 15:30): Management*	G. Nolan (MI) P. Farcy (IFREMER)
15:30-15:50	*Coffee break*	
End of General Assembly meeting		

JERICO Science day
28-29th April 2015
Ifremer premises (Plouzané)

The JERICO Science Day will present researches and developments supported by the JERICO infrastructure, including scientific results after TNA experiments, Observing Simulation Experiments and Observing SS, and technologies updated or developed. Each talk will be divided into a 15-minute presentation and a 5-minute discussion.

Poster session: during coffee breaks and after lunch

Agenda

Time slot	Topic	Speaker
Tuesday, 28th of April – Science Day		
16:00–17:45	**Topic 1: Harmonisation, Technology, sensors & platforms** **Chairpersons: Wilhelm Petersen (HZG) & Georges Petihakis (HCMR)**	
16:00-16:20	**1.** *Comparison of 3 ferrybox ferry observations in the Baltic Sea*	S.Kaitala (SYKE)
16:20-16:40	**2.** *Unmanned Surface Vehicles and Voluntary Observing Ship for oceanographic in situ measurements*	L. Delauney (Ifremer)
16:40-17:00	**3.** *Evaluation of different typology of commercial sensors to be used on fishing gears*	M. Martinelli (CNR)
17:00-17:20	**4.** *JERICO - Biofouling Monitoring Program (BMP): biofouling diversity on different materials, exposure conditions and locations.*	G. Pavanello (CNR)
17:20-17:45	**5.** *Results from 3 TNA calibration experiments (CIEBIO, RTC and TOFU) and Toward a networking approach for metrology in oceanography*	M. Ntoumas (HCMR) and F. Salvetat (Ifremer)
End of first day – Science Day [18:00: Bus to Railway station & Ibis Styles]		
19:30	*Dinner at the Yacht Club*	

Wednesday, 29th of April – Science Day (con't)		
07:30-08:15	**Bus to Ifremer (Stop at Ibis Styles & Railway station)**	
08:30-08:45	**Welcome**	
08:45-10:45	**Topic 2: Integrated monitoring, Modelling & in situ observation, network assessment** **<u>Chairpersons:</u> Stefania Sparnocchia (CNR) & Julien Mader (AZTI)**	
08:45-09:05	***6.*** *Optimizing observation networks in the Bay of Biscay and English Channel*	G. Charria (Ifremer)
09:05-09:25	***7.*** *Evaluation of numerical models by FerryBox and Fixed Platform in-situ data in the southern North Sea*	M. Haller (HZG)
09:25-09:45	***8.*** *Observation system experiments and observation system simulation experiments in the Baltic Sea*	Z. Wan (DMI)
09:45-10:05	***9.*** *Hydrography and fluorescence variability induced by 3 eddies, observed during the GESEBB mission*	J. Mader (AZTI)
10:05-10:25	***10.*** *Multiscale monitoring in Mediterranean with gliders: the Jerico TNA experience (ABACUS, FRIPP, GABS, MUSICS)*	A. Ribotti (CNR)
10:25-10:45	**11.** *Particle fluxes in the Sicily Channel - Preliminary results from the JERICO TNA METRO (MEditerranean sediment TRap Observatory) experiment*	S. Sparnocchia (CNR)
10:45-11:15	*Coffee break and poster session*	
11:15-12:15	**Topic 3: Monitoring of biological compartment** **<u>Chairpersons:</u> Antoine Grémare (CNRS) & Jukka Seppälä (SYKE)**	
11:15-11:35	***12.*** *Monitoring phytoplankton taxonomy and productivity using fluorometry*	J. Seppälä (SYKE)
11:35-11:55	***13.*** *Algal bloom observations using the JERICO infrastructure*	M. Mohlin (SMHI)
11:55-12:15	**14.** *Surveying the whole plankton community with imaging systems*	J.B. Romagnan (CNRS)
12:15-12:45	*Poster session*	
12:45-14:00	*Lunch (Ifremer)*	

14:00-15:00	**Topic 3: Monitoring of biological compartment** **<u>Chairpersons:</u> Antoine Grémare (CNRS) & Jukka Seppälä (SYKE)**	
14:00-14:20	***15.*** *Image analysis developments within JERICO*	A. Gremare (CNRS)
14:20-14:40	***16.*** *Dissolved oxygen variability of the LIW in the Ligurian Sea (OXY-COR TNA results)*	L. Coppola (CNRS)
14:40-15:00	**17.** *Field test of microLFA modules for on-line measurement of NH3 and PO4 in Ferrybox (FITO MicroLFA)*	L. Sanfilippo (Systea)
15:00-18:00	**Topic 4: Monitoring of Chemicals and contaminants, pH & carbonate systems** **<u>Chairpersons:</u> Kai Sorensen (NIVA) & Laurent Delauney (Ifremer)**	
15:00-15:20	***18.*** *Physicochemical characterization of aerosols in the Adriatic Sea (MAPOM)*	J. Piazzola (CNRS/MIO)
15:20-15:40	***19.*** *Unmanned tools for monitoring chemical pollution in coastal waters study (MEDACID)*	L. Nizzetto (NIVA)
15:40-16:10	*Coffee break and poster session*	
16:10-16:30	***20.*** *Legacy and Emerging Chemical Contaminants in European Coastal waters (ECCECs)*	M. Brumovsky (RECETOX)
16:30-16:50	***21.*** *Sensor developments for continuous measurements of pH and alkalinity on FerryBox systems*	W. Petersen (HZG)
16:50-17:10	***22.*** *Combined pCO2-pH in situ metrology: assessing acidification in Norwegian coastal waters*	E. Reggiani (NIVA)
17:10-17:30	**23.** *Seasonal pH variability in the Saronikos Gulf: a year study (MEDACID)*	M. González-Davila (ULPG)
17:30-18:00	*Poster session*	
End of the Science Day [18:00: Bus to Railway station & Ibis Styles]		

JERICO Strategy towards JERICO-NEXT

30th April 2015
Ifremer premises (Plouzané)

The workshop "**Strategy towards JERICO-NEXT"** will take place on 30th April 2015, in Brest, as a closure for the JERICO(FP7) project and to step ahead towards JERICO-NEXT (H2020). The workshop will focus on four topical round table addressing key issues for the JERICO RI long term sustainability in the context of European Strategies. It aims at initiating a strong coordination between JERICO-NEXT and relevant European organizations, to be followed up during the JERICO-NEXT project.

Workshop organizing Committee: Chairpersons and JERICO coordination Team.

Round table 1: JERICO RI expansion: approach following the observing system simulation experience (OSSE) and link to non JERICO national coastal infrastructures.

- *Chairpersons*: E. Buch (EuroGOOS), P. Morin (CNRS, JERICO/WP1)
- *Key participants:* H. Wehde (IMR), T. Vukicevic (CMCC)

Objective: to assess the JERICO possible expansion and strategy (ref: D1.11, D9.5, D9.6) in the context of EuroGOOS and Copernicus, to conclude on common priorities.

Round table 2: Scientific needs, innovation potential and the role of the industry

- *Chairpersons:* E. Delory (PLOCAN, NEXOS project coordinator), G. Nolan (MI, JERICO/WP10)
- *Key participants:* G. Petihakis (HCMR), L. Delauney (Ifremer)

Objective: to agree upon technological developments needed to answer scientific priorities and societal requirements/challenges.

Round table 3: European policy for coastal data.

- *Chairpersons: JB. Calewaert (*EMODnet), P. Gorringe (EuroGOOS, JERICO-NEXT/WP1&WP5)
- *Key participants:* F.Colijn (HZG), L. Perivoliotis (HCMR), L. Petit de la Villéon (Ifremer)

Objective: to be informed on the status of the European strategy in marine data management with a focus on the integration of multidisciplinary data. Considering JERICO-NEXT will support harmonization of new data types, a specific attention will be paid to agree on cross cuttings between the H2020 project and European initiatives.

Round table 4: European Strategy for sustainability of Infrastructures.

- *Chairpersons*: A. Robin (DG Research, Infrastructures PO), D. Durand (IRIS, JERICO-Next/WP1).
- *Key participants*: F. Coroner (JPI)

Objective: to discuss the possible European governance and economical model to sustain a European infrastructure such as JERICO-RI, considering national and European long-term priorities.

Agenda

Time slot	Round table	Speaker

	Thursday, 30th of April	
07:30-08:15	**Bus to Ifremer (Stop at Ibis Styles & Railway station)**	
08:30-08:45	**Introduction**	I. Puillat (Ifremer)
08:45-09:15	**Round table 1: JERICO RI Expansion - *Feedback after the observing system simulation experiment and expansion with national coastal infrastructures.***	
10’	*Introduction and presentation of D1.11*	P. Morin (CNRS)
15’	*EuroGOOS, JERICO and EOOS*	E. Buch (EuroGOOS)
5’	*Standardization of OSE/OSSE technology*	T. Vukicevic (CMCC)
09:15-09:45	**Round table 1: Discussions**	
09:45-10:15	*Coffee break*	
10:15-10:45	**Round table 2: Scientific and technological needs - *The innovation potential and role of the industry***	
5’	*Introduction (Eurogoos + WP10 Jerico)*	G. Nolan (MI)
15’	*Innovations for the monitoring of environmental status of the ocean and the link with future blue-growth activities*	E. Delory (PLOCAN)
10’	*Presentation 2.2 (title to be given:/ WP3 J-NEXT)*	G. Petihakis (HCMR)
10:45-11:15	**Round table 2: Discussions**	
11:15-11:45	**Round table 3: European policy for coastal data**	
5’	*Introduction (WP5 JERICO-NEXT)*	L. Perivoliotis (HCMR)
15’	*Presentation 3.1 (title to be given)*	JB. Calewaert (EMODnet)
10’	*Presentation 3.2 (title to be given)*	P. Gorringe (EuroGOOS)
11:45-12:15	**Round table 3: Discussions**	

12:30-13:45	*Lunch*	
13:45-14:20 5' 15' 15'	**<u>Round table 4</u>: European Strategy for sustainability of infrastructures** *Introduction (WP1 JERICO-NEXT)* *EU strategy to address RI sustainability - towards sustainable ocean and coastal Research Infrastructure – the expectation from JERICO-NEXT* *The coastal component of the JPI-Oceans – ambitions and interaction with JERICO-NEXT*	 D. Durand (IRIS) A. Robin (DG Research) F. Coroner (JPI)
14:20-14:50	**<u>Round table 4</u>: Discussions**	
14:50-15:15	**Workshop synthesis and conclusions**	
End of Strategy Workshop [15:30: Bus to the airport]		

JERICO Science Day: Talk abstracts, Poster list

Topic 1: Harmonization, Technology, sensors & platforms

01- Comparison of 3 ferrybox ferry observations in the Baltic Sea

Seppo Kaitala, Petri Maunula, Mikko Jalo, Jukka Seppälä, Pasi Ylöstalo, (all SYKE)

- 4 key words: Ferrybox, chlorophyll fluorescence, salinity, temperature, instrument calibration
- 2 Regional key words: Baltic Sea

The annual Alg@line ferrybox instrument calibration is carried out in February in Finnish Environment institute (SYKE). In the calibration workshop also SMHI, EMI and MSI participate with their own instruments. The CDOM fluorimeters are calibrated with solid standards, turbidity with formazin standard and chlorophyll with algae culture. All equipment are compared also with each other. The ferries with these instruments operate in the Central Baltic and occasionally occur in the same area within the 24 hours. This gives the opportunity to compare the ferrybox observations in the same area by different ferries. Spatiotemporal comparisons of chlorophyll fluorescence, temperature and salinity observations are demonstrated.

02- Unmanned Surface Vehicles and Voluntary Observing Ship for oceanographic in situ measurements

Laurent Delauney (Ifremer), Loic Dussud, Patrick Rousseau, Thierry Terre & Olivier Menage (Ifremer)
Laurent.delauney@ifremer.fr

- 4 key words: USV, in situ, measurement, oceanography
- 2 Regional key words: every regions

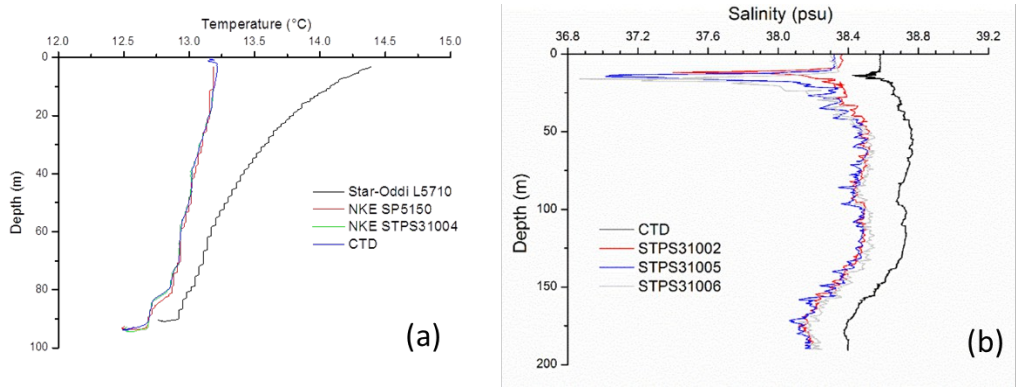
Unmanned Surface Vehicle (USV) and Voluntary Observing Ship (VOS) are a growing trend for ocean *in situ* monitoring. However, the use of such medium for *in situ* automated measurement is not without problems and questions. In addition, the diversity of possibilities from ferry boat to drone through racing or pleasure yachts requires to well adapt its choices based on precise specifications.
This presentation proposes to review existing and futuristic systems and to give feedbacks of already running usage.
Actual market and commercial catalogue is mainly orientated to lake application and gas/petroleum offshore services. Scientific surface vehicle is growing little by little and few systems are available for deployment. Actual medium can be categorized in function of their purpose and capability in term of autonomy, navigability, payload capacity, energy availability, adaptability to *in situ* measurement; real time data transfer possibility, maintenance frequency for the embedded instrumentation, and, in some extent, global operation cost.
These new vehicles (USV) and VOS will be as well compare to actual well known oceanographic *in situ* measurement methodologies like drifters, profiling floats, gliders, and Ferrybox.

03- Evaluation of the measurement accuracy of different typologies of commercial sensors to be used on fishing gears

Michela Martinelli, Stefano Guicciardi, Pierluigi Penna, Andrea Belardinelli, Camilla Croci, Filippo Domenichetti, Alberto Santojanni, Elio Paschini, Stefania Sparnocchia (all CNR-ISMAR)

- 4 key words: vessels of opportunity, fishing vessel, next generation probes, measurement accuracy
- 2 Regional key words: Adriatic Sea, Mediterranean Sea

In order to assess the accuracy of probes already in use by monitoring systems installed on fishing vessels (Star-Oddi and NKE probes), comparison tests were performed in the Adriatic Sea with a calibrated CTD instrument. The results showed that the temperature data collected by Star-Oddi sensors are reliable only considering the data portion where a dwell time at a fixed depth permanence is longer than 50 s, which happens usually when the net/gear is actively fishing and not during the deployment of the gear. The data collected by NKE sensors are definitely much more accurate for both depth and temperature measurements and could be usefully considered for broader oceanographic purposes since their temperature accuracy is half that of XBTs. The weak point of the NKE sensors is the salinity measurement whose accuracy is out of the nominal accuracy range in most cases. The above evaluation underlined the optimal conditions for the usage of the considered sensors and produced a series of offsets that might be used to enhance the accuracy of the already recorded datasets.



(a) Temperature-depth profile of four different sensors deployed together with the SeaBird CTD. Only the descent part of the cast is shown.
(b) Salinity-depth profile for three NKE sensors and SeaBird CTD. Only the descent part of the cast is shown.

04- Biofouling Monitoring Program (BMP): biofouling diversity on different materials, exposure conditions and locations

Marco Faimali (CNR-ISMAR), Giovanni Pavanello, Giuliano Greco, Silvia Morgana, Mauro Bastianini, Kada Boukerma (Ifremer), Manolis Ntoumas (HCMR), Laurent Delauney (Ifremer)

- 4 key words: Biofouling, antifouling, materials, oceanographic sensors

Biological growth on man-made structures immersed in the water (biofouling) is a major problem for nearly all the activities related to the marine environment, including oceanographic monitoring. In order to study the differences in biofouling development related to materials, exposure conditions and locations, ISMAR-CNR

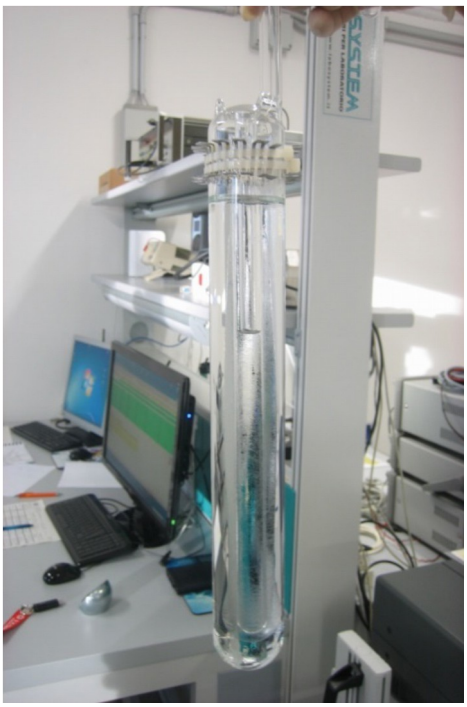
developed a special sampling system (Biofouling Monitoring Box - BMB). The BMB provides substrates made of different materials, with spatial and structural heterogeneity that can simulate the complexity of oceanographic sensors and of their housing/container.
BMBs have been sent to JERICO partners interested in the biofouling monitoring activity, for a total of 11 different monitoring sites (open water and coastal water) along a European geographical gradient. Each partner immersed the BMB close to an oceanographic sensor, selected as the reference sensor, for this long-term study.
Aim of this study is to highlight any differences and / or similarities of biofouling settlement process at different spatial scales (local and geographic) in order to characterize in more detail the types of potential organisms that make up the biofouling of the sensors at different latitudes of some of the major European Marine Regions.

05.1– Results from 3 TNA experiments

Manolis Ntoumas (HCMR), Rajesh Nair (OGS), Nevio Medeot (OGS), Roberto Bozzano (CNR), Sara Pensieri (CNR), Tatiana Tsagkaraki, Manolis Potiris, Costas Frangoulis, Dimitirs Podaras, Fotis Pantazoglou, George Petihakis (All HCMR)

- 4 key words: Calibration, Harmonization, In-situ observations, M3A network
- 2 Regional key words: Adriatic, Aegean

Reference Temperature Calibration (OGS-HCMR)



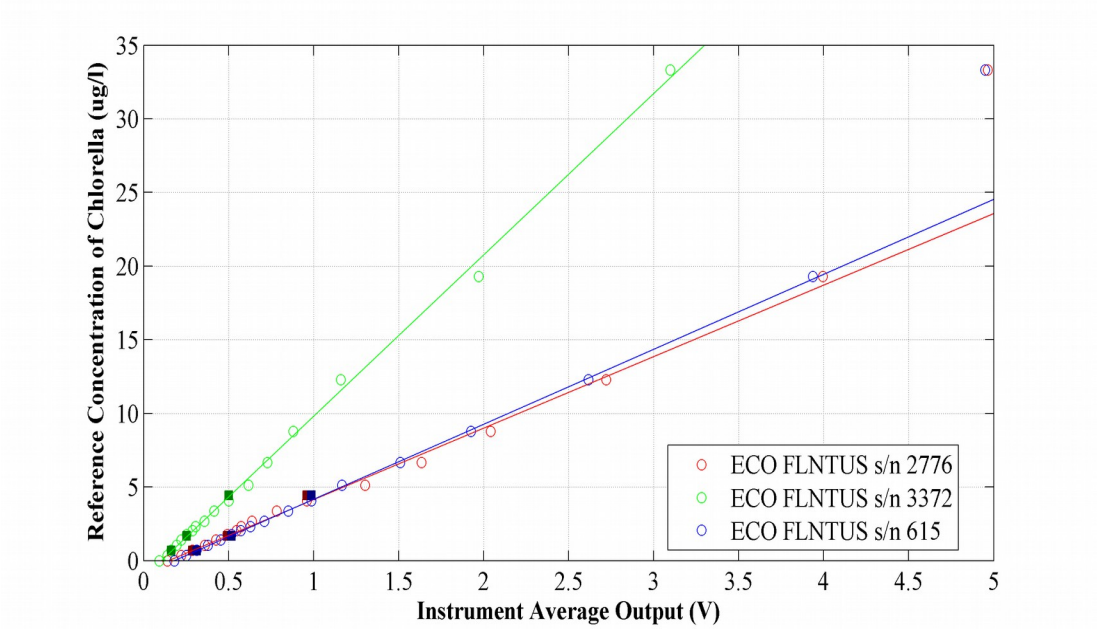
The Triple Point of Water

The experiment was conducted at the OGS-Oceanographic Calibration Centre (OGS-CTO), the facility for oceanographic testing and calibration of the Department of Oceanography of the OGS (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale), located in Trieste, Italy. The purpose of the experiment was to acquire expertise, receive guidance, and gain "hands-on" experience in applying the procedures and Best Practice conventions for the calibration of oceanographic temperature sensors using primary reference standards. The long-term goal is for HCMR to be able to perform such calibrations on its own premises. This is essential in order to ensure the quality of the data collected by the POSEIDON network (http://poseidon.hcmr.gr) and field surveys performed by HCMR.

Calibration and inter-calibration exercise of bio-geochemical sensors, Tools for Oxygen, Fluorescence and tUrbidity sensors testing and intercomparison (HCMR-CNR)

The experiments addresses the main scope of performing a calibration and inter-calibration exercise of bio-geochemical sensors to be operationally and routinely deployed on off-shore marine observatories making part on a continuous basis of the marine monitoring network of the Mediterranean Sea. The W1-M3A observatory, together with the E1-M3A buoy moored in the south Aegean Sea and the E2-M3A buoy positioned in the South Adriatic, is part of the M3A network, developed within the framework of the MFSTEP project in order

to answer to the needs of the Mediterranean Forecasting System of real-time physical and biogeochemical observations of the upper thermocline. Indeed, the possibility to use sensors calibrated with the same procedures installed on the different sites belonging to the M3A network makes feasible a comparison between the involved sites thanks to a homogenous database in order to verify at a quantitative level the observed differences and to enhance the quality of the in-situ observations.



05.2- Toward a networking approach for metrology in oceanography

Florence Salvetat, (Ifremer)

- 4 key words: Metrology, Harmonization, Quality, COST project
- 2 Regional key words:

In a few slides, we will present a proposal currently in progress that Ifremer intends to submit to the COST programme in order to improve metrology in the oceanographic field.
At first, we will present the current status of metrology in oceanography: we will focus on the benefits provided by metrology but also on the remaining traceability issues for oceanographic data.
Then we will explain the main objectives of the COST proposal in terms of traceability, harmonization and collaboration. We will emphasize how the networking structure of COST projects could contribute significantly to the success of this metrology project especially in terms of harmonization, efficiency and reliability of data collected.
We will finally present a draft structure that has been discussed between several partners (PTB, LNE, InRim, SYKE, MIKES, University of Plymouth): we will have a look at the oceanographic parameters that may be investigated, the issues addressed, the possible working groups and tasks, the collaborative opportunities and the proposed deliverables.

Topic 2: Integrated monitoring, in situ observation & modeling, network assessment

06- Optimizing observation networks in the Bay of Biscay and English Channel

Guillaume Charria, (IFREMER), Julien Lamouroux (Noveltis), Pierre De Mey (LEGOS), Stéphane Raynaud, Catherine Heyraud, Philippe Craneguy (Actimar), Franck Dumas (Ifremer), Matthieu Le Hénaff (NOAA, USA, Miami)

- 4 key words: Design of observation network, ensemble model simulations, glider, FerryBox
- 2 Regional key words: Bay of Biscay, English Channel

In the Bay of Biscay and the English Channel, existing in situ observation networks aim to sustain research activities and to monitor the coastal environment over the continental shelf. Diverse platforms (fixed stations, coastal profilers, FerryBox) are combined to optimally describe this region. However, an efficient network, considering the technical and financial constraints, needs to be regularly improved.
In this context, we used the ArM method, based on an ensemble model approach to assess extensions of existing networks:
- a network of coastal profiles from fishing vessels (RECOPESCA programme),
- a glider section in the Loire river plume in the Bay of Biscay,
- a glider section in the vicinity of the FerryBox line in the western English Channel.
These three experiments allowed quantifying the efficiency of the different network in different configurations (e.g. number of profiles, direction of glider section). Major orientations have been drawn on the importance of coastal profile locations (instead of the large number of profiles), the potential efficiency of a glider line close to Loire river, and the capacity of the FerryBox line to describe the dynamics in a tidally-mixed coastal region.

07- Evaluation of numerical models by FerryBox & Fixed Platform in-situ data in the southern North Sea

Michael Haller (HZG), Frank Janssen (BSH), John Siddorn (Met Office), Wilhelm Petersen (HZG), Stephan Dick (BSH).

- 4 key words: FerryBox, hydrodynamic model, model data evaluation, salinity
- 2 Regional key words: North Sea, German Bight

FerryBoxes installed on ships of opportunity (SoO) provide high-frequency surface biogeochemical measurements along selected tracks on a regular basis. Within the European FerryBox Community, several FerryBoxes are operated by different institutions. Here we present a comparison of model simulations applied to the North Sea with FerryBox temperature and salinity data from a transect along the southern North Sea and a more detailed analysis at three different positions located off the English East coast, at the Oyster Ground and in the German Bight. In addition to the FerryBox data, data from a Fixed Platform of the MARNET

network are applied. Two operational hydrodynamic models have been evaluated for different time periods: results of BSHcmod v4 are analysed for 2009-2012, while simulations of FOAM AMM7 NEMO have been available from MyOcean data base for 2011 and 2012. The simulation of water temperatures is satisfying; however, limitations of the models exist, especially near the coast in the southern North Sea, where both models are underestimating salinity. Statistical errors differ between the models and the measured parameters, as the root mean square error (rmse) accounts for BSHcmod v4 to 0.92 K, for AMM7 only to 0.44 K. For salinity, BSHcmod is slightly better than AMM7 (0.98 psu and 1.1 psu, respectively).
The study results reveal weaknesses of both models, in terms of variability, absolute levels and limited spatial resolution. In coastal areas, where the simulation of the transition zone between the coasts and the open ocean is still a demanding task for operational modelling, FerryBox data, combined with other observations with differing temporal and spatial scales serve as an invaluable tool for model evaluation and optimization. The optimization of hydrodynamical models with high frequency regional datasets, like the FerryBox data, is beneficial for their subsequent integration in ecosystem modelling.

08- Observation system experiments and observation system simulation experiments in the Baltic Sea

Zhenwen Wan, Jun She, Weiwei Fun (all DMI)

Buoy observation system and satellite remote sensing system are two fundamental data resources for correcting and improving operational oceanographic predictions in the Baltic Sea. A three-dimensional variation data assimilation scheme and the Danish operational circulation model HBM are employed to experiment the effects from operating individual observation systems and combining two of them. The effects are examined throughout spatio-temporal dimensions. The results indicate that the buoy observation system can improve operational predictions better than satellite remote sensing system for both temperature and salinity, and the combination of two systems can be better than each of individuals.
Model simulation in the year 2009 with data assimilation from both observation systems is assumed as a 'real' ocean. Two routes to operate gliders in the 'real' ocean are designed to examine the effects of glider observation system. Observation system simulation experiments include Scenario 1 – running model HBM with perturbance of initial fields but without data assimilation, Scenario 2 – running the same model with same perturbance and assimilating data from glider operating along Route 1, Scenario 3 – same as Scenario 2 but along Route 2, Scenario 4 -- same as Scenario 2 but operating two gliders along Route 1 and Route 2 respectively. Comparison between the results from four scenarios and the 'real' ocean is made to analyze the effects in seasonal pattern, vertical profiles and regional difference. The scheme of observation system simulation experiments can serve to optimize the design of operating glider observation system.

09- Hydrography & fluorescence variability induced by 3 eddies observed during the GESEBB mission

Ainhoa Caballero (AZTI), Julien Mader (AZTI), Anna Rubio (AZTI), Simón Ruiz (IMEDEA), Bernard Le Cann (LPO), Pierre Testor (LOCEAN), Carlos Hernández (AZTI)

- 4 key words: Eddies, SWODDIES, mode-water eddies, Ekman pumping
- 2 Regional key words: Bay of Biscay, Southeastern Bay of Biscay

The analysis of deep-water glider hydrographic and fluorescence data, together with satellite measurements provides a new insight into eddy-induced anomalies within the South-Eastern Bay of Biscay, during summer. Two cyclonic eddies (C13E and C13W) and a SWODDY (X13) have been observed in different glider transects and by means of different source satellite images/data. Vertical profiles reveal complex structures (characteristic of the second baroclinic mode): upward/downward displacement of the seasonal/permanent

thermocline in the case of X13 and the opposite thermocline displacements in the case of the cyclones. This is a typical behaviour of mode-water (X13) and "cyclonic thinny" (C13E and C13W) eddies. A qualitative analysis of the vertical velocities in X13 indicates that though geostrophic currents dominate the main water column, depressing the isopycnals, near the sea surface the eddy-wind interaction affects the vertical currents, favouring Ekman pumping. These two types of intrathermocline lenses appear to deeply impact the fluorescence profiles, since the maximum fluorescence is located just below the seasonal thermocline. The mean fluorescence was higher in the anticyclone than within the cyclones and the mean for the entire study period; the highest values were observed in the centre of X13. The analysis of the Θ-S properties corroborate that inside cyclones and between the 26 and 27 isopynals, net downwelling occurs. Significant differences in the Θ-S properties of the two cyclonic mesoscale structures have been observed: higher temperatures and lower salinity in C13E, in comparison to C13W. Finally, time variation of the salinity content of the shallowest water masses of X13 (salinity decreasing over time), probably indicates advective mixing processes occurred during the mission.

10- Multiscale monitoring in Mediterranean with gliders: the Jerico TNA experience (ABACUS, FRIPP, GABS, MUSICS)

Alberto Ribotti (CNR), Giuseppe Aulicino, Giorgio Budillon, Yuri Cotroneo (Pathenope University), Antonio Olita, Bruno Buongiorno Nardelli (CNR), Slim Gana (SAROST S.a.), Daniele Ludicone (SZN), Pierre Testor, Laurent Mortier (LOCEAN), Joaquin Tintoré, Ananda Pascual, Simon Ruiz (IMEDEA)

- 4 key words: hydrodynamics, Western Mediterranean, glider, general circulation
- 2 Regional key words: Western Mediterranean

Between the 2012 and 2014 experiments with deep gliders have been conducted in the Western Mediterranean in four JERICO TNA projects. Their data may substantially help to new insights on the dynamics of the area, encompassing physical biological relationships, at scales ranging from the sub-regional to the sub-mesoscale.
The investigated regions include the Sardinia Channel, between Sardinia and Balears, the Algerian basin (Balears – Algeria) and the Alboran Sea. Almost all experiments have been planned contemporary with oceanographic cruises, making possible both an integration and an intercomparison of the different datasets collected from different platforms. Altimetric and SST satellite data have been also used for comparison and to provide a synoptic view of the situation during the experiments.
A paper has been published on results from the first experiment of the GABS TNA project, when the bloom initiation was detected through gliders data in a frontal area. Then preliminary results from FRIPP suggest possible interesting topics as the relation between oxygen and chlorophyll distribution in a frontal region during DCM period. In other projects (ABACUS, MUSICS) data are very promising and still in elaboration.
In a future TNA program, a larger coordination among various PI would be desirable in order to fully exploit the capabilities of this platform and partly bypass the problem to resolve spatial and temporal scales through the planning of synchronous glider experiments.

11- Particle fluxes in the Sicily Channel: Preliminary results from the JERICO TNA METRO (MEditerranean sediment TRap Observatory) experiment

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- 4 key words: sediment trap, particle flux, carbon

- 2 Regional key words: Sicily Channel

The main objective of the METRO (MEditerranean sediment TRap Observatory) project is to characterize the environmental factors that drive the particulate carbon pump (which includes photosynthesis, particle settling and advection, and organic matter remineralization) at three key locations in the Western Mediterranean. The carbon pump cause sequestration of carbon dioxide in the deep sea due to the sinking of particles, thus an accurate quantification of the export flux of particulate organic carbon, and knowledge on physical processes affecting it during its descent to the seafloor (i.e. advection by strong currents), is fundamental for the understanding its magnitude and efficiency. This study has been achieved through the installation of 3 sediment traps at 25-30 meters above the seafloor over 1 year (October 2013 to October 2014) at the three key locations in the Western Mediterranean which are the Gulf of Lion, the Algero-Balearic basin and the Sicily Channel. Sinking particles collected by the sediment traps are being processed in the laboratory to obtain several geochemical parameters including organic carbon, calcium carbonate, opal and lithogenics, the stable isotopes of organic carbon and grain size. Geochemical results will be integrated with physical variables (current speed, temperature, salinity) to determinate which are the physical forcings affecting particle and specially carbon export to the deep sea.

Topic 3: Monitoring of biological compartment

12- Monitoring phytoplankton taxonomy and productivity using fluorometry

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- 4 key words: Fluorescence, phytoplankton, taxonomy, productivity
- 2 Regional key words: Baltic Sea

In vivo fluorescence methods are increasingly used in estimating phytoplankton biomass, taxonomy and primary production. We review phytoplankton pigmentation, principles of phytoplankton fluorescence, fluorescence measuring techniques and their recent developments. We discuss the challenges in the instrument calibration, field validation and data-analysis.
Spectral fluorometry can be used to resolve main taxonomic phytoplankton classes, based on their differences in pigmentation. Discrimination of spectral phytoplankton classes is typically done with spectral libraries of reference species. In ideal species mixtures of phytoplankton cultures this turns out well but the performance in natural waters may be less satisfactory. Alternative analytical and statistical multivariate methods to analyze spectral fluorescence data are demonstrated.
Variable fluorescence techniques allow determination of the electron transport rate in photosystems, which is correlated with the rate of photosynthesis. Variability in the conversion factor between the electron transport and carbon fixation rates is illustrated with field data from the Baltic Sea. We also demonstrate recent developments including automated measurements of fluorescence-light curves with several excitation channels improving the sensitivity under varying community composition, and instruments designed for flow-through systems.

13- Algal bloom observations using the JERICO infrastructure

Bengt Karlson (SMHI), Malin Mohlin (SMHI), Ye Liu, Anders Andersson (KTH Royal Institute of Technology)

- 4 key words: Phytoplankton algal bloom, harmful algae, barcoding
- 2 Regional key words: Baltic Sea, the Kattegat-Skagerrak

Phytoplankton growth supports most of the life in the seas. The phytoplankton community usually consists of a large number of different species. Sometimes the phytoplankton grow to high cell densities often termed algal blooms, some of these may be harmful. The biodiversity and biomass of phytoplankton and the frequency of algal blooms are used to describe the ecological state of the seas in EU Water Framework Directive and the Marine Strategy Framework Directive which includes also invasive species and harmful algal blooms. A general problem with algal bloom observations is to resolve the natural variability. Standard monitoring programs often have sampling frequencies that are too low. In JERICO a number of different approaches were used to observe algal blooms with a focus on harmful species. Measurements of chlorophyll fluorescence using FerryBox-systems and oceanographic buoys in the Baltic Sea and the Kattegat-Skagerrak made it possible to follow the development of the spring bloom in detail. Using phycocyanin fluorescence as a

proxy for cyanobacteria biomass it was possible to investigate the development of summer cyanobacteria blooms in the Baltic Sea. Using FerryBox systems as platforms for automated water sampling for later microscope analysis of samples has provided a cost efficient way to investigate the biodiversity of the phytoplankton, also a study comparing microscope and gene-barcoding-based results was made.

14- Development of new tools and strategies for the monitoring of bottle and net collected plankton. A system based on image acquisition and semi-automatic analysis.

Jean-Baptiste Romagnan, Claire Desnos, Amanda Elineau, Gaby Gorsky, Natalia Llopis-Monferrer, Marc Picheral, Lars Stemmann (all UPMC, CNRS UMR 7093 LOV),

- 4 key words: Zooprocess, imaging, whole-plankton, integrated monitoring
- 2 Regional key words: Western Mediterranean

Marine communities are essential in the context of sustainable services provided by coastal ecosystems. Their monitoring is still largely based on time consuming and expensive procedures, which are not suitable for high frequency monitoring or for extensive spatial coverage. In the planktonic realm, difficulties result from analyzing plankton on a size range which encompasses tiny phytoplankton to large zooplankton. Recently developed imaging instruments and image analysis techniques now enable the fast and reliable enumeration and measurement of both phytoplankton and zooplankton. The Zooscan and its associated open source software, the Zooprocess, offer a solution for analyzing the zooplankton which is open, efficient and now widely used. Open platforms allow users to develop specific applications which can be shared in the community. In the framework of the JERICO WP10, we upgraded and used the Zooprocess which now has specific modules and dedicated toolboxes for analyzing Zooscan, FlowCAM, Underwater Vision Profiler, HD camera and ISIIS images, manage metadata associated with samples, and perform some quality check operations. We will present challenges in collecting times series of plankton, methodological and practical improvement of the Zooprocess and the whole analysis procedure in the framework of the Villefranche Imaging Platform for Plankton and Particles (VIP3), and recent achievements, in particular the results of a coastal, whole-plankton integrated study.

15- Image analysis developments within JERICO: The AviExplore software

Alicia Romero-Ramirez (MNHN), Jean-Claude Duchêne (EPOC, CNRS), Guillaume Bernard (University of Helsinki), Ludovic Pascal (EPOC, U. Bordeaux), Olivier Maire (EPOC, U. Bordeaux), Antoine Grémare (EPOC, U. Bordeaux)

- 4 key words: Video analysis, long-term, large-scale, benthos survey, benthic behavior.
- 2 Regional key words:

One of the aims of Jerico is to strengthen the use of image analysis techniques to monitor biological compartments and processes that are recorded either at high frequency and/or over large spatial scales using automated or semi-automated procedures.
Epibenthos video and image analysis provides a complementary and yet more holistic description of the habitat than benthic sampling (Roberts et al., 2004). Depending on the objectives of the study, imaging devices for epibenthos surveys can be carried on different platforms types (Smith and Ruhmohr, 2005): static platforms like benthic landers or mobile platforms like Remote Operated Vehicules (ROV) and Autonomous Underwater Vehicles (AUV). Each type of platforms provides imaging recordings that may deal with different difficulties. Static platforms produce long-series of images acquired under different light conditions, different water

turbidity produced by sediment suspension and different degrees of biofilm development. Those parameters reduce directly the visibility and affect the quality of images. Apart from the visibility reduced issues, image analysis of mobile platforms need also to take into consideration the position and speed of the platform so that the exact position of observed organism is located.
AviExplore has been developed to overcome those difficulties. Thus, AviExplore provides a unique environment for video analysis. Its main original features include: 1) image(s) selection tools for extraction on videos, (2) automatic extraction of targeted information, (3) solutions for long-term series, (4) real time acquisition and in some cases analysis and (5) wide range of video analysis possibilities allowing for your own script edit. We will briefly describe AviExplore and focus on its use with different case studies.
Potential applications of AviExplore are numerous. AviExplore intend to become a standard tool for the analysis of benthos video surveys.
Roberts, D., Davies, D., Mitchell, A., Moore, H., Picton, B., Portig, A., Preston, J., Service, M., Smyth, D., Strong, D., Vize, S., 2004. Towed video analysis and Macrobenthic Infauna: 1993-2002, In: University, Q.s. (Ed.), Strangford Lough Ecological Change Investigation (SLECI). Environmental and Heritage Service Belfast
Smith, C.J., Ruhmohr, H., 2005. Imaging Techniques, In: A., E.A.a.M. (Ed.), Methods for the Study of Marine Benthos. Blackwell Science LtD: Oxford, p. 418

16- Dissolved oxygen variability of the LIW in the Ligurian Sea (OXY-COR TNA results)

Laurent Coppola (UPMC-CNRS), Katrin Schroeder (CNR), Stefania Sparnocchia (CNR), Mireno Borghini (CNR), Dominique Lefevre (CNRS)

- 4 key words: dissolved oxygen, Levantine Intermediate Water, ocean mixing
- 2 Regional key words: Mediterranean Sea, Ligurian Sea

The Levantine Intermediate Water (LIW) is the warmest and saltiest water resulting from the dense water formation processes that occur in several zones of the Mediterranean Sea. This water mass is formed in the Levantine basin and circulates from the Eastern basin to the Western basin through the Sicilian Strait. In the Northwestern basin, the Corsica Channel is a strategic site where a branch of the LIW is passing through before reaching the DYFAMED site. From previous time series data, a time lag has been observed in term of T-S change in the LIW level. To solve this issue, regular and long term oxygen measurements might provide a good opportunity to understand and to estimate accurately this time lag. This also gives us the possibility to quantify the variability versus anomalies of the LIW property due to the climate change already observed in the Mediterranean Sea. In addition to monthly oxygen monitoring at the DYFAMED site, DO sensors have been installed on mooring in summer 2014 (SBE63) but only the DO monthly profiles will be presented here. The objective of the access is to complete the oxygen observation in the Ligurian Sea by implementing a DO sensor on the CC mooring at the core of the LIW water mass. The collected data will provide information to track the water mass variability, the impact of the water mass change on the oxygen content and to estimate the time lag between the eastern (Corsica Channel) and the western (Dyfamed) part of the Ligurian Sea.

17- Field test of µLFR modules for on-line measurement of ammonia and orthophosphate in Ferrybox water quality monitoring systems

Luca Sanfilippo, (SYSTEA SpA), Enrico Savino, Pompeo Moscetta (SYSTEA SpA)

- 4 key words: µLFR technology, nutrients measurement in sea water, on-line monitoring in Ferrybox systems, ammonia and orthophosphate fluorimetric methods
- 2 Regional key words:

The proposed TNA project was aimed to test in operative conditions a new line of products specifically developed by SYSTEA S.p.A. to be extensively used in Ferrybox water quality monitoring systems for unattended nutrients on-line monitoring in sea and surface water.
The proposed field tests were performed in the facilities of Institute of Coastal Research / KOI of Helmholz Zentrum Geesthacht (HZG), partner of Jerico project.
Two kind of field tests were performed:
a first field test was performed in the Cuxhaven fixed monitoring station at the Elbe river mouth
a second field test was performed in the Ferrybox Lysbris, in operation on a regular route along North Sea.
Two independent analytical modules based on µLFR technology based on fluorimetric methods to on-line measure ammonia and orthophosphate were provided and integrated in the existing system layout and local control unit; a data comparison between existing Micromac-1000 on-line analyzers manufactured by SYSTEA and in use from several years by HZG were performed too.
SYSTEA provided the µLFR modules already prepared to be installed and to be operated unattended.
HZG allowed SYSTEA to install those units and provided the technical support during the field experiments.
Several weeks of unattended on-line measurements on both ammonia and orthophosphate chemical parameters were collected in both sites; the data results were elaborated by HZG and technically commented.

Topic 4: Monitoring of Chemicals and contaminants, pH & carbonate systems

18- Marine Aerosols Properties in the northern Adriatic

Jacques Piazzola, (Mediterranean Institute of Oceanography), Nikos Mihalopoulos (University of Crete), Elisa Canepa (CNR-ISMAR), Luigi Cavaleri (CNR-ISMAR)

- 4 key words: coastal aerosols; anthropogenic compounds; atmospheric transport
- 2 Regional key words: Mediterranean

Aerosol particles in coastal areas result from a complex mixing between sea spray aerosols locally generated at the sea surface by the wind-waves interaction processes and a continental component issued from natural and/or anthropogenic sources. This paper presents a physical and chemical analysis of the aerosol data acquired from May to September 2014 in the Adriatic Sea in the northern Italian coast. The aerosol distributions in the 0.1-240 µm size range were measured on the Acqua Alta platform using PMS probes and a chemical characterization was made using an Ion Chromatography analysis (IC) and a thermo-optical technique. This presentation focuses on two particular meteorological episodes, the Bora and Sirocco winds and characteristics of different aerosol conditions. The aerosols size distributions measured during Bora conditions show a stronger sea-surface production of aerosols through wave-breaking processes than in the Northern Mediterranean. From the chemical point of view, the results recorded during Sirocco conditions show atmospheric reaction of aged sea-spray aerosols with some species present the atmosphere.

19- Unmanned tools for monitoring chemical pollution in coastal waters study

Luca Nizzetto (NIVA, Norway), Kai Sørensen (NIVA), Malcolm Reid (NIVA), Jan Thomas Rundberget (NIVA), Christopher Hartman (NIVA), Ian Allan (NIVA)

- 4 key words: Marine pollution, Ferrybox, contaminant of emerging concern
- 2 Regional key words: North sea, Norwegian Sea

The development of analytical chemistry methods and sensors has fostered awareness on the complexity of the environmental burden of chemical substances of anthropic origins that reach water environment from agricultural, industrial and household sources. Coastal waters are receptors of these contaminants. Still there is a very limited capability for their cost-effective monitoring in marine waters, hence very little is known on their significance and possible impacts on the coastal ecosystem. We explored the viability of the automatic samplers on the Ferrybox fleet for detecting a range of anthropogenic contaminants of emerging concern in marine waters. We run two campaigns in the North sea and Norwegian sea remotely collecting bulk water samples. These were analyzed using novel non-target screening methods which allow screening for the presence of an arbitrary number of substances at trace levels. High dilution and interference of sea salt with extraction media can represent a challenge for the analysis of sea water samples. Nevertheless we could detect a range of human pharmaceuticals at ng L^{-1} levels. These included: some anti-allergic drugs, anti-pyretics (paracetamol), anti-depressants, caffeine and one antibiotic. We also tested a new unmanned sampler for the deployment of passive water samplers on board of the ships to target hydrophobic contaminants at ultra-trace levels. In this presentation we discuss performance and limitations of the existing technology.

20- Legacy and Emerging Chemical Contaminants in European Coastal waters (ECCECs)

Miroslav Brumovsky (RECETOX), Luca Nizzetto (RECETOX), NIVA

4 key words: emerging contaminants, legacy contaminants, spatial distribution, seasonal occurrence

- 2 Regional key words: Mediterranean Sea, North Sea

Monitoring of chemical contaminants in the environment is essential for providing the baseline data necessary for defining priorities for the establishment of Environmental Quality Standard concerning chemical pollution. Occurrence of several classes of emerging contaminants, i. e. pharmaceuticals and personal care products, artificial sweeteners, currently used pesticides and perfluorinated compounds, was studied in the Western Mediterranean and North Sea. To obtain more representative data, several water samples from each area were pooled and processed together. Along with spatial distribution, the seasonal variations were also investigated on the basis of occurrence of contaminants in spring and autumn period.
The vertical distribution of legacy contaminants in the Mediterranean Sea was studied using passive sampling. Passive samplers were deployed in the Gibraltar and Sicily channel for a period of 6 and 3 months. The data obtained from this activity could assess the budget of selected contaminants in marine water column and reveal the mechanisms controlling their vertical transport.
Access to MPLS-CNR and Cosyna 1_FB infrastructure as well as professional support is highly acknowledged.

21- Sensor developments for continuous measurements of pH and alkalinity on FerryBox systems

Wilhelm Petersen (HZG), Steffen Aßmann, Carsten Frank, (Contros GmbH)

- 4 key words: pH, Alkalinity, Spectrophotometry, FerryBox
- 2 Regional key words: coastal ocean, North Sea

Coastal oceans are a critical interface in the earth system between the land and open-ocean. Processes in the shelf seas play a crucial role in global biogeochemical cycles and the high productivity systems have a significant influence on ocean CO2 storage. To fully quantify the complete carbon system in seawater it is necessary to determine at least two of the following five variables (all can be measured directly); pH, total alkalinity (AT), inorganic carbon (CT), carbonate ion (CO3) and the partial pressure of CO2 (pCO2). Depending on the specific situation a combination of either pCO2 and CT (or AT), or pH and AT (or CT) can be used. Highly reliable measurements are required to resolve the carbonate system with adequate accuracy. As pH and pCO2 are inversely correlated this combination leads to rather high uncertainties for the calculated parameters. Spectrophotometry is currently the technique used to detect pH (directly) and total alkalinity and carbonate ion providing high precision measurements. Spectrophotometry can characterize the abundance of two forms of a suitable indicator mixed in a small volume of seawater. The equilibrium of these forms is directly connected to either pH or after acidification of the sample to total alkalinity (AT). An additional pCO2 sensor is strongly recommended at higher pCO2 levels (>500µatm) and provides inherent quality assurance since more than two parameters are measured. First tests and applications of new sensors for pH and AT designed for flow-through systems (e.g. FerryBoxes) will be demonstrated.

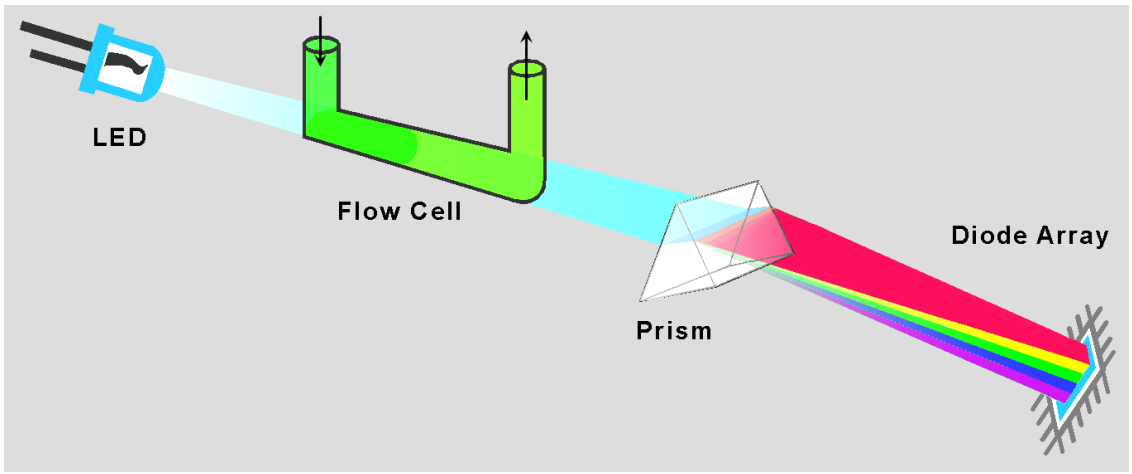

Figure: Schematic overview of the measurement principle.

22- Combined pCO2-pH in situ metrology: assessing acidification in Norwegian coastal waters by ferrybox operation

Emanuele R. Reggiani (NIVA), Richard G. J. Bellerby, Andrew King, Kai Sørensen, Marit Norli (all NIVA), Michel Masson (Franatech GmBH)

- 4 key words: pCO2, pH, acidification, ferrybox
- 2 Regional key words: CO2, coast

With over 20000 km of coastal line, Norway is extremely exposed to effects on climate driven by the North Atlantic current. A better understanding of the variability of the carbonate system fluxes around different ecosystems is fundamental for modeling ocean acidification and for developing scenarios of how rising CO2 may influence ecosystem structure and function. In addition to increasing CO2, inputs of total alkalinity, organic carbon and nutrients to coastal and shelf waters from rivers and ice can have important impacts on the buffering capacity of receiving waters, and thus the future CO2 uptake capacity. Informed ocean acidification scenarios, at both basin and local level are required to develop optimal management policies of securing and utilizing marine resources.
Among the currently available methods for measuring marine carbonate system variables, underway spectrophotometric pH and membrane-solid state pCO2 detection, provide a reliable pairing to implement unattended continuous monitoring systems in situ.
Systems developed with joint efforts by NIVA and Franatech, have demonstrated robustness and reliability under deployment on volunteer observing ships (VOS) along ferrybox systems, , delivering a significant, first level - quality checked data stream under challenging operating condition. We have implemented metrological routines to perform a (proxy) over-determination and crosscheck in underway mode in order to enable data retrieval and delivery in a post first-QC form.
We show here recent measurements following the advances made and how the combined monitoring of pH and pCO2 will deliver the level of accuracy of carbonate system classification required.

23- Seasonal pH variability in the Saronikos Gulf: a year study (MEDACID)

M. González-Davila (ULPG) et al.

Abstract not received.

LIST OF POSTERS

Authors list	Title	Corresponding author's Email address
Jaccard, P., Zibordi, G., Sorensen, K..	Radiometry for ocean colour validation from fixed and moving platforms (RAD)	pierre.jaccard@niva.no
Faimali, M., Pavanello, G., Greco, G., Trentin, I.	Overview of biofouling prevention methods currently used for oceanographic sensors: results of a survey from JERICO EU FP7 Project	giovanni.pavanello@ge.ismar.cnr.it
Joseph, E., Cano, E., Letardi, P., Albini, M.	Standardised Electrochemical in Situ Assessment of Metal Coatings (SESAM)	edith.joseph@unine.ch
Riminucci, F., Ravaioli, M., Bortoluzzi, G., Bergami, C.	E1 and S1 coastal observatories in the JERICO Project (Northern Adriatic sea, Italy)	francesco.riminucci@bo.ismar.cnr.it
Antonio Olita, Alberto Ribotti, Simon Ruiz, and Ananda Pascual	Deep Chlorophyll Maximum distribution in the Alboran sea and its relationship with mesoscale and frontal features through synchronous glider observations.	antonio.olita@cnr.it
Sparnocchia, S., Bastianini, M., Borghini, M., Letardi, P., Traverso, P., Schroeder, K.	The contribution of CNR fixed platforms to the JERICO TNA program	stefania.sparnocchia@ts.ismar.cnr.it
Brix, H., Baschek, B., Breitbach, G., Eschenbach, C., Horstmann, J., Petersen, W., Riethmüller, R., Schroeder, F., Stanev, E., Schulz-Stellenfleth, J.	The Coastal Observing System for Northern and Arctic Seas (COSYNA): Challenges and Solutions for an Integrated Measurement and Modelling Approach	wilhelm.petersen@hzg.de
Bachelier, C., Benabdelmoumène H., Bernardet, K., Duformentelle, P., Fuda, J.-L.,, Godinho, E.	The French National Glider Facility	jean-luc.fuda@cnrs.fr
A. Lavin, D. Cano, C González-Pola, E. Tel, C. Rodriguez, M. Ruiz and R. Somavilla	Enhance of knowledge and products provided by a time series hydrographic stations using a fixed-point water column observatory. The Biscay AGL Buoy.	alicia.lavin@st.ieo.es

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Venue, accommodations & maps

How to come to Ifremer premises?

VENUE:

Centre IFREMER Bretagne – Lucien Laubier Cpnference Room
ZI Point du Diable
29280 Plouzané
France

- **"JERICO" special Bus**

During the JERICO week, a bus will pick you up every day to bring everyone to our premises and back to the hotels. A sign "IFREMER" will be put in front of the bus to make sure you identify it.
There will be two stops, one in front of the IBIS STYLES hotel and the other in front of the main entrance of the railway station.

Below is the planned journey:

Tuesday 28 April (morning) :
- Departure from IBIS STYLES hotel at **7:30 am**, then stop at the railway station at 7:40
- Arrival in IFREMER around 8 :15 am

Tuesday 28 April (afternoon):
- Departure from IFREMER premises at **6:00 pm** (stop at the railway station and IBIS STYLES hotel)

:-:-:

Wednesday 29 April (morning):
- Departure from IBIS STYLES hotel at **7:30 am**, then stop at the railway station at 7:40
- Arrival in IFREMER around 8 :15 am

Wednesday 29 April (afternoon):
- Departure from IFREMER premises at **6:00 pm** (stop at the railway station and IBIS STYLES hotel)

:-:-:

Thursday 30 April (morning):
- Departure from IBIS STYLES hotel at **7:30 am**, then stop at the railway station at 7:40
- Arrival in IFREMER around 8 :15 am

Thursday 30 April (afternoon):
- Departure from IFREMER premises at **3:30 pm**, going straight to the airport

❖ **By Bus**

The line 2 will bring you to our premises in 40 minutes (from the city center). The bus ticket costs 1.45€ and can be used for 1 hour.
You can take the bus from “Liberté Quartz” (close to the tramway station and the city hall) direction “Technopôle” and stop at the “Piccard” stop.

Below are the timetables:

(City center -> Ifremer)

Réseau : Bibus Les Lignes régulières
Ligne : 02 - Technopôle - Hôpital Cavale
Arrêt : Liberté Quartz direction : Technopôle
Le : 27/04/2015

04h	05h	06h	07h	08h	09h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h
		00	10	09	03	03	03	03	11	10	09	10	11	14	11	20	05
		28	24	26	23	23	23	21	26	24	25	24	26	27	27	35	35
		53	38	43	43	43	43	41	40	39	40	40	42	43	52		
			49					57	55	54	57	56	58	57			

(Ifremer -> City center)

Réseau : Bibus Les Lignes régulières
Ligne : 02 - Technopôle - Hôpital Cavale
Arrêt : Piccard direction : Hôpital Cavale
Le : 27/04/2015

04h	05h	06h	07h	08h	09h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h
	31	00	06	13	11	10	07	11	08	11	08	06	06	08	11	14	16
		22	24	30	31	31	27	27	24	26	22	20	22	24	39	43	46
		40	40	52	50	50	39	39	40	40	38	35	37	46			
		55	58				55	51	55	54	52	50	53				

❖ **By Car**

First take the N12 road, direction Nantes-Quimper-Brest, then continue on the D112 road which will bring you to Brest.
After reaching the “Pen Ar C’hleuz” roundabout, take the first exit (D205, direction Le Conquet-Guilers-Plouzané-Brest ouest.
Keep straight for a few miles, then take the last exit at the roundabout, close to the Thales building.
Keep straight then turn right at the Brasserie du Portzic restaurant.
Keep straight, drive along the beach and continue for a few meters. At the roundabout, take the third exit: you arrived to our premises (a “visitor” parking lot is located on the right).

From the airport, the journey will take you around 30 minutes.

Accommodations

IBIS **STYLES*** **BUDGET**** - BREST CENTRE PORT (31, rue Jean-Marie Le Bris, 29200 Brest)

IBIS STYLES : 3 star hotel
Negociated rate :
- **85 €** Bed & Breakfast – 1P
- **95 €** Bed & Breakfast – 2P

Rate Code : C02
Breakfast : from 5am to 12pm
Reservations : 0033 298 204 969
@ : h7369@accor.com

IBIS BUDGET : 2 star hotel
Negotiated rate :
- **45 €** Room – 1, 2 or 3 P
- **6,15 €** Breakfast per person

Rate Code : ARR1
Breakfast : from 6am to 10am
Reservations : 0033 298 204 970
@: h6562@accor.com

Services : in this double hotel complex, you will find the following services :
- *Bar : open every day until 1am*
- *Parking : inside, secured and under video-surveillance, 5€ per vehicle and night*
- *Snack bar : available 24/7, with salty and sweet treats*
- *WIFI : free of charge and no password required*

Restaurants : there are several nice restaurants on the port, within a 5 minutes' walk range :
- *FUXIA : Italian restaurant. Get 10% off from being an IBIS guest !*
- *Le Carré : Brasserie. Get 10% off from being an IBIS guest !*
- *La Maison de l'Océan : Fish & Seafood restaurant. Get the free apéritif !*

ACCESS TO THE HOTELS

• From Rennes – Morlaix (by car) : Take the exit out of the freeway direction N265 Nantes-Quimper. Keep following N265 towards "Brest-ports". Take a right turn on D165 towards "Brest-Ports". Head on straight for 6km and you will arrive to IBIS STYLES & BUDGET.

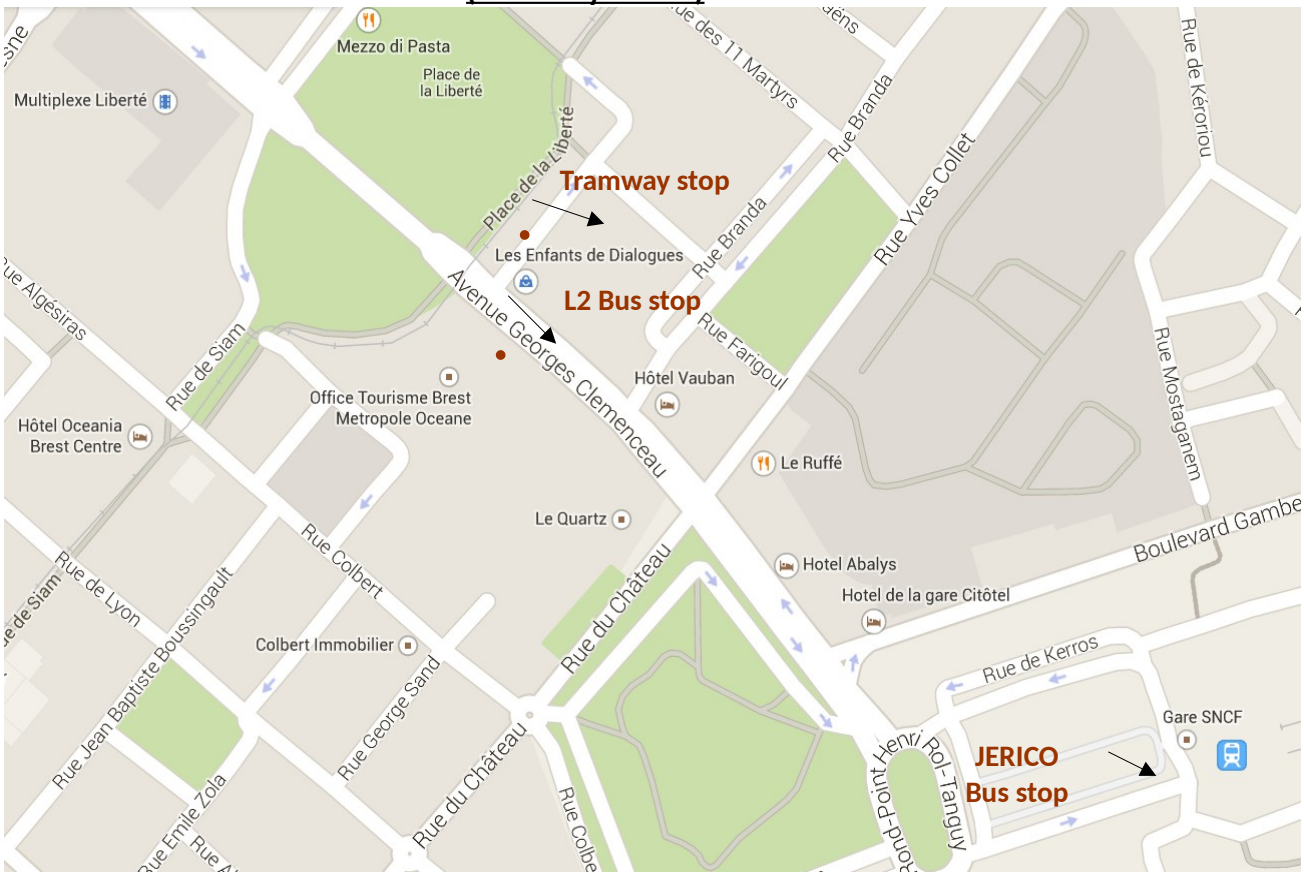
• From Nantes – Quimper (by car) : Keep heading on straight on the freeway, the exit being the bridge. Maintain on the left side of the road after the bride, and keep heading on straight for 6km and you will arrive to IBIS STYLES & BUDGET.

• From the train station (10 min walk) : Head on straight after the exit towards the roundabout. Take a left on Av. Salaün Penquer and left again on rue Pouillic al Lor. Take an immediate right on rue Porstein Lapierre and head down the stairs. Head to the right and the IBIS STYLES & BUDGET is only 2 minutes away.

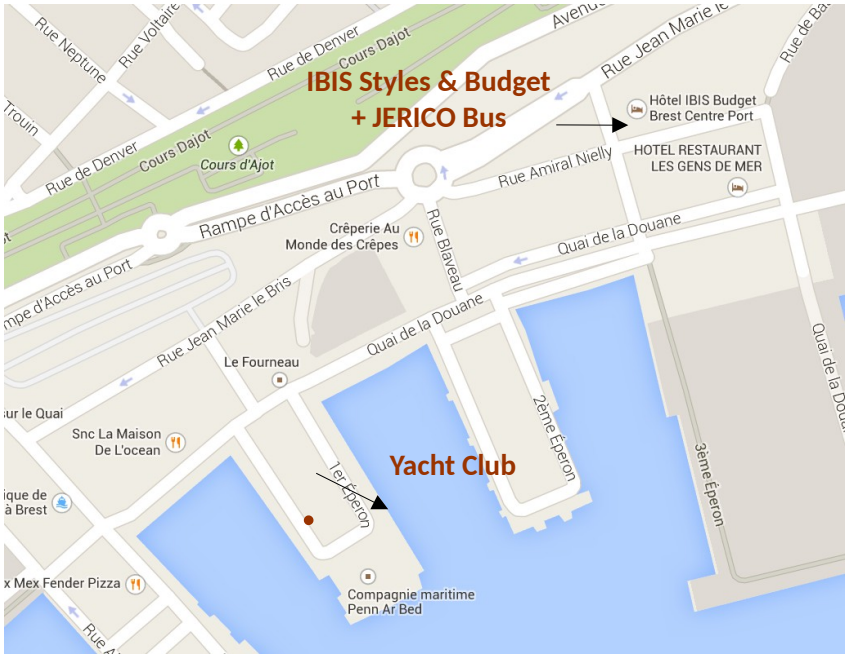
• From the Airport (15 min drive) : Same instructions than coming from the Rennes – Morlaix route.

Useful Maps

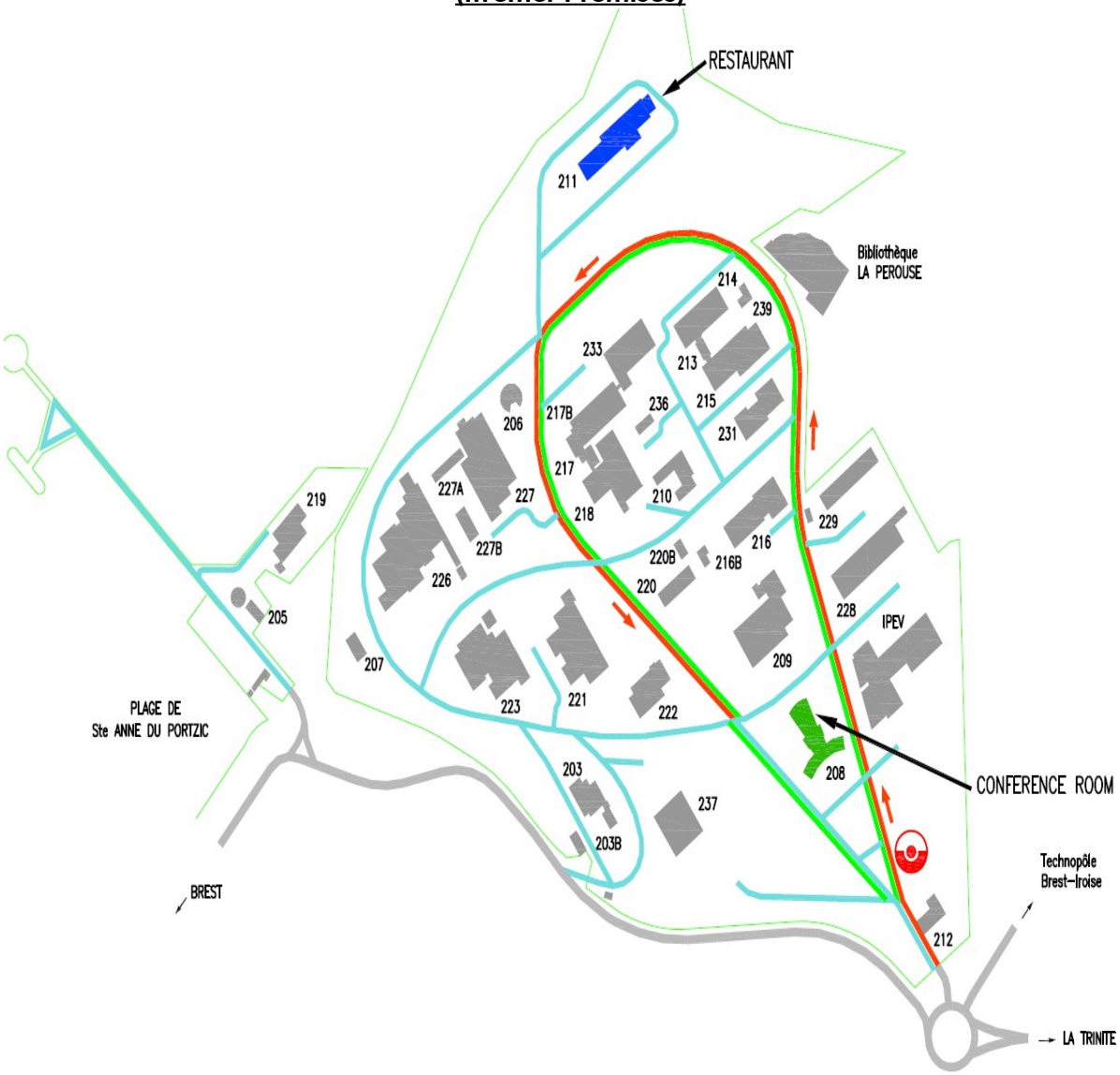
(Brest City center)



(Port area)



(Ifremer Premises)



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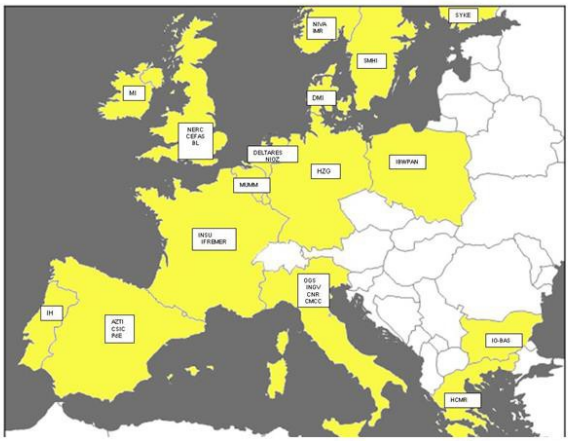
Taxis:

Allo Taxi Brest: +33 2.98.42.11.11
Taxi 806: +33 2.98.80.68.06
Taxis Brestois: +33 2.98.80.18.01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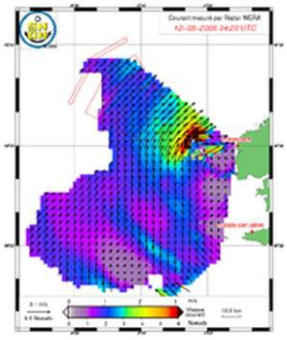

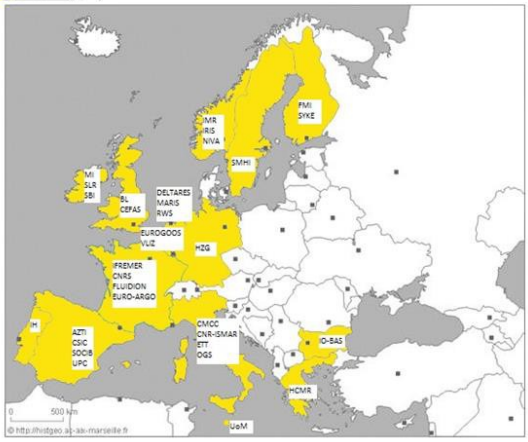
FMI
SYKE
IMR
IRIS
NIVA
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EUROGOOS
VLIZ
HZG
IFREMER
CNRS
FLUIDION
EURO-ARGO
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IO-BAS
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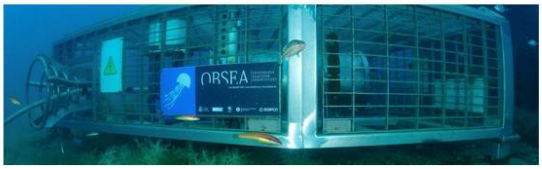
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THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION
HORIZON 2020