Joint European Research Infrastructure network for Coastal Observatories

Report after 1st General Assembly and JERICO Best Practices Workshop –Oct. 2012

Grant Agreement n° 262584

Project Acronym: JERICO

Project Title: Towards a Joint European Research Infrastructure network for Coastal Observatories

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Involved Institutions: Ifremer and JERICO partners

Version and Date: Version 2.1 - 8 April. 2013

TABLE OF CONTENTS

1. Document description

REFERENCES

Annex 1 to the Contract: Description of Work (DoW) version of the 22 Feb. 2011

Document information	
Document Name	Report after 1st General assembly
Document ID	MS11.2
Revision	2.1
Revision Date	8 April. 2013
Author	P. Farcy, I. Puillat
Security	

History			
Revision	Date	Modification	Author
0.1		first draft	Puillat, Farcy
0.2	29/10/12	add-on and corrections on WP4	G. Petihakis
0.3	26/11/12	add on WP8 and WP6	J. Foden, S. Sparnocchia
0.4	7/12/12	minor modifications	J. Foden
0.5	13/12/12	modification after WP3, WP5 WP7 review	C. Fanara, W. Petersen, L. Petit de la Villéon
1.0	31/12/12	Add on & modification on WP1	P. Morin
2.0	7/01/13-30/03/13	Add on from best Practices workshop minutes; correction, insertion on of slides	G. Petihakis N. Rossignol
2.1	8/04/13	Formatting and corrections	N Beaume, I. Puillat

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

2. Statement of Decisions

WP#	Decisions / Recommendations
WP1	***- TO PROPOSE A MULTI-STAGE METHODOLOGY*** *FOR THE DEFINITION OF THE JERICO LABEL TO BE CONCLUDED BY A WORKSHOP BEFORE END OF JERICO (THE DELIVERABLE IS THE FIRST STAGE)*
WP2	***- TO STRENGTHEN THE INTERFACE BETWEEN*** *JERICO AND THE EUROGOOS COMMUNITY. MAYBE PLAN A WP2 Workshop WITH PARTNERS BEFORE ANNUAL EUROGOOS MEETING* ***- TO SEND DRAFT OF THE DELIVERABLES D2.1 & D2.2 before end of October***
WP3	***- TO CLARIFY THE USE OF GOOGLE TOOLS*** *WITH WP6* ***- TO PROVIDE A MEETING/WS AGENDA FOR 2013***
WP4	***- THE DRAFT OF D4.1 TO DELIVER BEFORE CHRISMAS*** ***- TO PROVIDE A MEETING/WS AGENDA FOR 2013*** ***- JERICO Working Group ON CALIBRATION TO BE ORGANISED AND ALSO A SCIENTIFIC WORKSHOP DURING NEXT PERIOD***
WP5/WP7	***- PARTNERS NEED TO HAVE A DEDICATED WORKSHOP WITH PARTNERS INVOLVED IN WP5 AND WP7*** *(MAY BE A "HOTLINE" WILL BE NECESSARY)* ***- ACTION OF THE PARTNERS: TO PROPOSE OR VALIDATE THE CONTACT PERSONS FOR THE # INFRASTRUCTURES*** ***-WP7: TO PROPOSE A "KICK-OFF" FOR TOP IN 2013***
WP6	***- PERMANENT ACTION OF PROMOTION OF OCEANBOARD*** *-CONFIRMATION OF THE PROGRAM AND AGENDA OF THE FIRST SUMMER SCHOOL AND PROPOSAL FOR THE THEME OF 2nd SUMMER SCHOOL*
WP8	***- TO FINISH THE 1st CALL EVALUATION PROCESSUS*** *BEFORE END OF OCTOBER (AND COST EVALUATION)* ***- TO PREPARE THE DRAFT OF THE NEXT CALL IN THE EARLY NOVEMBER***
WP9	***- TO ENHANCE COLLABORATION WITH WP2 AND WP10*** *+ PROMOTION OF THE TNA INFRASTRUCTURES*
WP10	***- TO EXCHANGE BETWEEN CNRS AND CNR ON BIOFOULING*** ***- TO ORGANISE A SCIENTIFIC WORKSHOP IN THE EARLY AUTUMN 2013*** ***- TO PREPARE A WP10 INTERMEDIATE REPORT FOR THE MID TERM REVIEW***

3. Organisation & overview of the week's agenda

The First JERICO General Assembly was organised in Heraklion on 1st & 2nd Oct. 2012. The coordinators took the opportunity of this important meeting, where most of partners were present, to organise other specific workshops and meetings plus individual WP meetings.

Indeed, partners met in an informal way in short parallel WP meetings on Monday morning to prepare for the General Assembly discussions and to coordinate WP activities.

In the afternoon of 1st Oct., a dedicated meeting officially gathered the TNA (Trans National Access) selection panel to debrief and conclude after the first TNA call and selection process. Up until the meeting date, 6 proposals have been given the green light and needed to be definitively validated to start. In addition, 3 proposals were still on post-evaluation and the panel had to conclude these post-evaluations. A minute of the TNA selection panel meeting, including final decisions, is provided in this report (see section 4).

The General Assembly started on Monday afternoon and finished Tuesday evening. This is reported in section 5. Then a Steering committee meeting concluded the General Assembly and is reported in a dedicated document.

Considering the need to anticipate the strategy for the future of coastal observatories, one of the main JERICO final objectives (deliverable D1.11), the coordinator decided to initiate discussions on the related topic by organising a dedicated workshop on Wednesday. Discussions and conclusions are reported in a dedicated report.

To carry on WP3 and WP4 activities and to improve cross exchanges between both WPs, a workshop on Best Practices was organised on Thursday and Friday. Outcomes of the workshop are reported in section 6.

A synthesis of the week agenda is presented hereafter.

GENERAL AGENDA FOR GA & WORKSHOP IN HERAKLION

Monday October the 1st	8.30-10.15	WP3/4 preparatory meeting – room 1
		WP6 preparatory meeting – room 2
	10.30-12.30	WP10 preparatory meeting – room 1
		WP2 preparatory meeting – room 2
		WP8 preparatory meeting – room 3
	Lunch	
	14.00-15.45	TNA evaluation panel committee meeting
	15.30-16.00	Welcome coffee
	16.00-18.30	GA – Coordination and reporting
Tuesday October the 2nd	9.00-12.30	GA WP 1 to 7
	Lunch	
	14.00-16.15	GA WP 8 to 10 and conclusion
	16.30-18.30	Steering Committee
Wednesday October the 3rd	9.00-12.30	Workshop on future coastal prospective/strategy (presentation)
	Lunch	
	14.00-17.00	Workshop on future coastal prospective/strategy (discussion)
	Evening event	
Thursday October the 4th	9.00-12.30	Best Practices Workshop – session 1
		Lunch
	14.00-18.30	Best Practices Workshop – session 2
Friday October the 5th	9.00-12.30	Best Practices Workshop – session 3
	14.00-15.00	Best Practices Workshop - conclusion

4. TNA evaluation panel committee meeting

4.1. Agenda of the TNA Selection Panel meeting

14.00-15.45 Monday October the 1st
1) Status of JERICO TNA submitted proposals, next steps, 2nd call
2) Approval of the Firs TNA Call Evaluation Report
3) Approval of received revised proposals
4) Debate of the evaluation procedure, critical points and suggestion for improving it.
5) Formal approval of TNA web pages at http://www.jerico-fp7.eu/tna

4.2. Minutes of the meeting

1) Status of JERICO TNA submitted proposals, next steps, 2nd call.

We received 13 proposals, of which two were rejected not fulfilling the requisite of a score greater than 60. Amongst the rejected proposals, one was not eligible since the Principal Investigator leading the User Group works in the same country where the legal entity operating the targeted facility operates. The other one was withdrawn by the Principal Investigator.

As regards the remaining proposals, three are still under revision (see next point 3) and six proposals were approved and the operators of the targeted facilities are presently interacting with the User Groups to define the detailed work plans and to schedule the experiments.

The next call will open on 14 January 2013 and will close on 18 March 2013. The evaluation by the Selection Panel will be from 8 April to 15 May, 2013. The promotion of the next call will be also done through EUROGOOS, IMOS and Janet Newton towards the US coastal scientific community.
An extra call will be organized within the end of 2012 for short projects to conclude before the end of 2014.

2) Approval of the Firs TNA Call Evaluation Report.

The Report was distributed to the Selection Panel by email in July and made also available at a Dropbox link. We already received the approval by email from Franciscus Colijn, Roger Proctor, Alicia Lavin (confirmed during the videoconference), Janet Newton (confirmed at the meeting). Laurent Mortier and Hans Dahlin approved during the meeting. The approvals by Richard Dewey and George Zodiatis, were still expected after receiving these minutes.

3) Approval of received revised proposals.

Since 2 of the 3 proposals were received between Friday 28 September and Sunday 30 September, the final approval is postponed. Stefania Sparnocchia will summarize the status of the review, including also comments by the facility operators, in an Addendum to the evaluation report.
She will send the report to the Panel within next Wednesday (Oct 17th) for final approval.

4) Debate of the evaluation procedure, critical points and suggestion for improving it.

The Panel discussed the present selection procedure and selection criteria, also considering the results of discussion on the procedure made at the WP8 meeting in the morning.

The procedure implemented for the first call was as followed:

1. Evaluation by the Selection Panel (SP) based on scientific excellence, innovation and impacts on the state-of-the-art. Each proposal is evaluated by 3 members of the SP.
2. Validation of each proposal by the manager of the targeted facility.
3. Final assessment by the SP.

We proposed to amend the procedure as in the following, which still follows three steps but with feasibility assessment done by operators before the scientific evaluation, in order to avoid evaluating technically non-feasible proposals:

1. Validation of each proposal by the manager of the targeted facility (feasibility assessment).
2. Evaluation by the Selection Panel (SP) based on scientific excellence, innovation and impacts on the state-of-the-art.
3. Final assessment by the SP.

The evaluation criteria used for the first call were (threshold: total score > 60):

1. Fundamental, scientific and technical value - max 30
2. Quality of the work program - max 25
3. Feasibility - max 20
4. Potential for seeding links with industry - max 10
5. Quality of users groups - max 10
6. European representativity- max 5

The Selection Panel proposed to modify them to be better suited to our infrastructure. The amended evaluation criteria are (threshold: total score > 60):

1. Fundamental, scientific and technical value - max 30
2. Quality of the work program - max 25
3. Evaluation of risk and payoff - max 15
4. Potential for seeding links with industry - max 10
5. Quality of users groups - max 10
6. European relevance - max 10

Approval needed by Colijn, Dewey, Levin, Mortier, Proctor, Zodiatis after receiving these minutes.

5) Formal approval of TNA webpages at http://www.jerico-fp7.eu/tna.

The content of the webpage was approved by present members.
Approval needed by Colijn, Dewey, Levin, Mortier, Proctor, Zodiatis after receiving these minutes[1].

[1] Final approvals were conclude by 25th October 2012

5. General Assembly meeting

5.1. Agenda for JERICO General Assembly

<u>Monday October the 1st</u>

15.30 – 16.00 ***Welcome coffee***

16.00 – 16.15: Welcome by the Coordinator and HCMR: P. Farcy, G. Petihakis.

16.15 – 17.00: Coordination activities reporting, P. Farcy

17.00 – 17.30: Administrative and financial activities, D. Gueguen

17.30 – 18.30: Questions and discussion

<u>Tuesday October the 2nd</u>

9.00 – 9.30: WP1, Pascal Morin (CNRS)

9.30 – 10.00: WP2, Henning Wehde (IMR)

10.00 – 10.30: WP3, Wilhelm Petersen (HZG)

10.30 – 11.00: Coffee Break

11.00 – 11.30: WP4, Georges Petihakis (HCMR)

11.30 – 12.15: WP5/WP7, Caterina Fanara (OGS) & Loic Petit de la Villéon (Ifremer)

12.15 – 12.45: WP6, Jo Foden (Cefas)

12.45 – 14.00 : Lunch

14.00 – 14.45: WP8, Stefania Sparnocchia (CNR)

14.45 – 15.15: WP9, Srdjan Dobricic (CMCC)

15.15 – 16.00: WP10, Glenn Nolan (MI)

16.00 – 16.15: Conclusion, Patrick Farcy

16.15-16.30 : Coffee Break

16.30 - 18.30: Steering Committee (only steering committee members and WP leaders)

	Institute		Country	Partner's representative
1	Institut Français de Recherche pour l'Exploitation de la Mer	**Ifremer**	France	Patrick FARCY
2	Finnish Environment Institute	**SYKE**	Finland	Jukka SEPPALA
3	Institute of Hydro-Engineering of the Polish Academy of Sciences	**IBW PAN**	Poland	Piotr SZMYTKIEWICZ
4	Danish Meteorological Institute	**DMI**	Denmark	not represented
5	Norwegian Institute for Water Research	**NIVA**	Norway	Dominique DURAND
6	Institute of Marine Research	**IMR**	Norway	Henning WEHDE
7	Independent consulting and research institute	**DELTARES**	Netherlands	not represented
8	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale	**OGS**	Italy	Caterina FANARA
9	Consiglio Nazionale delle Ricerche	**CNR**	Italy	Stefania SPARNOCCHIA
10	University of Malta	**UOM**	Malta	Adam GANCI
11	Hellenic Centre for Marine Research	**HCMR**	Greece	George PETIHAKIS
12	Natural Environment Research Council	**NERC**	UK	David HYDES
13	National Institute for Geophysics and Volcanology	**INGV**	Italy	not represented
14	Institute for Coastal Research	**HZG**	Germany	Wilhelm PETERSEN
15	Management Unit of the North Sea Mathematical Models	**MUMM**	Belgium	Frederic FRANCKEN
16	The Secretary of State for Environment, Food & Rural Affairs	**CEFAS**	UK	Jo FODEN
17	Swedish Meteorological and Hydrological Institute (EuroGOOS)	**SMHI**	Sweden	Iréne LAKE
18	Consejo Superior de Investigaciones Cientificas	**CSIC**	Spain (Balearic)	Joaquim TINTORE
19	Royal Netherlands Institute for Sea Research	**NIOZ**	Netherlands	not represented
20	Marine Institute	**MI**	Ireland	Glenn NOLAN
21	Blue Lobster I.T.	**BL**	UK	Simon KEEBLE
22	AZTI - Tecnalia	**AZTI**	Spain	Julien MADER
23	Institut National des Sciences de l'Univers (CNRS)	**INSU / CNRS**	France	Pascal MORIN
24	Instituto Hidrográfico	**IH**	Portugal	Sara ALMEIDA
25	Institute of Oceanology - Bulgarian Academy of Sciences	**IO-BAS**	Bulgaria	Atanas PALAZOV
26	Puertos del Estado	**PUERTO**	Spain	not represented
27	Euro-Mediterranean Center for Climate Change	**CMCC**	Italy	Srdjan DOBRICIC

5.2. Minutes of General Assembly meeting

5.2.1. Coordination and reporting, WP11 activities by P. Farcy (Ifremer)

Slides are presented in the next pages.

The main achievements of the Work packages are:

1. *WP1: Roadmap for WPs (D1.2); FCT activities well launched (D1.3), the first workshop will start next week*
2. *WP2: Inventories of GOOS is still in process*
3. *WP3 & 4 : 3 common workshops : fixed platforms, ferryboxes and gliders+ 3 surveys*
4. *WP5: Data management handbook, first version is done (D5.1 & D5.2)*
5. *WP6: Launching of OceanBoard and JERICO website*
6. *WP7: Will start month 19*
7. *WP8: First call for TNA done and 6 proposals are already accepted and 3 are under evaluation*
8. *WP9: a workshop on OSE and OSSE initiated the WP9 activities.*
9. *WP10: workshop on VOS in June 2011. WP10 kick off in March 2012.*
10. *WP11:. Consortium Agreement finally signed by all, sent to the EC in Dec*

Some key points were discussed:

- The upcoming FCT workshop of next week is presented; the FCT is a real opportunity to have fruitful exchanges between Jerico community and SME's or industrial companies. Unfortunately, only a few of European companies will come, probably due to travel coast or the smallest ones.
- Attendance to the General Assembly: some partners are not represented at the GA, in some cases they did not answer at all, it is not suitable. Each partner has to take his own responsibility in the JERICO project. If a partner is not able to perform his part of the activities we have to take some decisions and find a solution.
- Status of deliverables: some are still undelivered despite our requests: particularly D2.1 and 2.2.

  A FIRST VERSION OF DELIVERABLE D2.1 AND D2.2 WILL BE DELIVERED TO THE NEF DATABASE AT THE END OF OCTOBER.

  A V2 version will be ready before Christmas
- Some reminders from Steering committee meeting #1 (see slides), some deliverables are postponed (D3.2, D6.3, D1.4, D2.3, D11.4).

D11.4 is postponed of 2 months – the legal delivery of the M18 report is month 20 D1.4: the preliminary definition of JERICO label is reported to month 24 D2.3, initially planned M18 is postponed to month 21 (January 2013) D3.2, initially planned month 15, is now planned on month 24. This is due to the late starting of the glider activities which are now correlated with the Groom FP7 project D6.3: the first summer school has been delayed of one year. The new delivery date is M28

- Deliverables for the second period

One of the deliverables, D6.5, which is the second summer school, will be also 1 year postponed. **6 new**

deliverables must be ready for M24: D1.6, D1.7, D2.4, D5.3, D6.4, D9.4. Due to the mid term review, this deadline has to be strictly respected..

- Overview of WP focused points to improve:

WP1: FCT management, needs more involvement of task leader MI and partners
WP2: D2.1 & D2.2 are too late and what about D2.3?
WP3. Waiting for the "Glider best practices workshop" report.
WP4: It is difficult to get answers to questionnaire on operating costs
WP5: WP5 coordination and exchanges between WP5 players – 3 months delay.
WP6: Needs contribution from partners to feed the JERICO OceanBoard (see website)
WP7: Delayed due to WP5 delay and delay to answer questions on TOP and SA.
WP8: Selection process longer than expected
WP9: Need to send more reporting information to the partners
WP10: Starting too slow and difficulties to get coordination from IMI.

- Interim report:

At the kick off meeting, we decided to create an internal interim report. We started the exercise in February but only finished it in late June. It was really a necessary preparation for the first period report which will start next month. We need to be ready at least at the end of December 2012.
The coordinator asked all the partners to be very responsive to the coordinator and work package leaders' questions and requested work, in order to be in time for the first report.

- M18 report for EC: process

AT THE END OF OCTOBER THE MANAGEMENT TEAM WILL SEND THE INSTRUCTIONS TO APPLY.

TECHNICAL REPORTING DEADLINE:	***END OF NOVEMBER***
FINANCIAL REPORTING AND DRAFT FORM C:	***END OF NOVEMBER***
ACKNOLEDGE OF THE MANAGEMENT:	***MID DECEMBER***
ALL SIGNED FORM C RETURNED TO IFREMER BEFORE	***END OF DECEMBER***
CONSOLIDATION OF THE REPORT	***1st WEEK OF JANUARY***

An amendment to the JERICO grant Agreement is in preparation for: - Art10: to add 3 CNRS/Universities laboratories and to modify unit costs for glider infrastructure of CNRS

- NERC: modifications of SA/TNA infrastructure (eg ferrybox)

-TNA travel costs: travel costs for users whom are from a partner institute will be charged to the partner. We'll transfer the costs from the coordinator to the partner's WP8 other costs.

GENERAL ASSEMBLY

INFORMATION
COMMUNICATION, JERICO website
MANAGEMENT, COORDINATION (WP11)
TECHNICAL AND FINANCIAL REPORTS
FINANCIAL MANAGEMENT

WP ACTIVITIES (coordination, tasks, workshops, deliverables, milestones, ...)
APPROVALS & CONCLUSIONS

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INFORMATION

May 2011 : Kick off meeting - Paris
August 2011 : 1st Ferrybox best practices workshop – HZG
November 2011 : Kick-off GROOM - Paris
January 2012 : Workshop on calibration – SYKE
February/march : Workshop on fixed platforms best practices – CNR Rome
May : Workshop on Glider best practices – CSIC Majorca – Common WS with GROOM
October : General Assembly n°1 - Heraklion

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INFORMATION

STEERING COMMITTEE

W. PETERSEN – HZG
S. KAITALA – SYKE
D. HYDES – NERC (TBC)
D. MILLS – CEFAS
D. DURAND – NIVA
G. NOLAN - MI
A. GREMARE – CNRS
S. SPARNOCCHIA – CNR
K. NITTIS – HCMR
J. TINTORE – CSIC
P. FARCY – IFREMER

TBC = To Be Changed   because he retires next year (lucky guy?)

Richard Lampitt is proposed to stand in for David in April 2013

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INFORMATION

TNA selection panel

Dr. Janet Newton, biological oceanographer, P.I. at the University of Washington and the Executive Director for the Northwest Association of Networked Ocean Observing Systems (NANOOS)
Dr George Zodiatis, Physical Oceanographer, University of Cyprus.
Dr. Richard Dewey, Physical Oceanographer, University of Victoria, Canada.
Dr Hans Dalhin, Director of EUROGOOS
Dr Roger Proctor, Program Leader, IMOS, University of Tasmania, Australia
Dr Franciscus Colijn, University of Kiel
Dr Laurent Mortier, GROOM coordinator, UPMC/LOCEAN laboratory
Dr Alicia Lavin IEO, Spain

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INFORMATION

First STEERING COMMITTEE meeting in January *(Roissy en france)*

17 actions decided and especially:
- *WP1: Deliverable D1.2 will be an upgrade of the DoW. : D1.2 is now available*
- *WP4: Proposal to dedicate the 1st FCT to O2 sensors and inter-calibration of T, S,O2: FCT and calibration experiments next week in Brest*
- *WP11: Coordinator: officially postpones deliverables D3.2 (current status on glider) and D6.3 (First summer school) to the middle of next year.*
- *WP7: "JERICO Data" definition to be discussed in October 2012: unfortunately, we are not ready. A dedicated meeting will be organised (OGS and Ifremer).*
- *WP1: Start to work on the future strategy for coastal observatories : Wednesday workshop*

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INFORMATION

NEXT OFFICIAL MEETINGS

Steering committee n°3: TDB, May/june 2013

Mid term review : Brussels (tbc), May/june 2013
One representative per partner, EC representatives

SC n°4 & GA 2: Norway, April/May 2014
Partners, associated partners

Steering committee n°5: TDB, Jan/Feb 2015

Final GA: France, April 2015 → All

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COMMUNICATION - JERICO WEBSITE

Paper in International Innovation

Editorial article of 3 pages to include colour graphics,

- *All partners & project receive full copyright use of the PDF of article upon publication*
- *All partners receive physical copies of the report*
- *Complimentary distribution of the publication to 50 contacts supplied by project.*
- *Coordinator receives 100 physical copies of the report for events and other workshops*

COMMUNICATION - JERICO WEBSITE

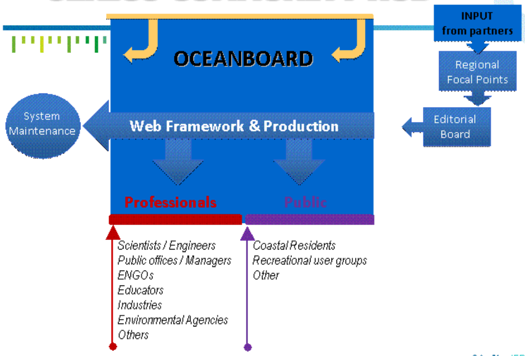
www.jerico-fp7.eu

A practical link with the partners:

- *General information: next events (FCT), project news*
- *Access to deliverable*
- *Information on TNA and Data*
- *Data tool provided by WP6*
- *OCEANBOARD*

OCEANBOARD : a well adapt tool to touch the professional or non professional public.
JERICOPROF and JERICOPUB

JERICO COMMUNITY HUB



WP11-Coordination & Management

P. Farcy, Ifremer, with D. Gueguen & I. Puillat

Jerico@ifremer.fr

Reminder: JERICO General Objectives during M1-M18

1. Structuring of each community related to the 3 observation systems: Glider, Ferryboxes and fixed platforms, AND cross- integration between these communities
2. Launching of WPs activities and cross WP activities

HOW?

by

1. Making signed the Consortium Agreement by all partners
2. Preparing TNA procedures for the entire project duration
3. Organising first meetings and workshops

Main achievements of the Project

1. *WP1: Roadmap for WPs (D1.2); FCT activities well launched (D1.3), the first workshop will start next week*
2. *WP2: Inventories of GOOS is still in process*
3. *WP3 & 4 : 3 common workshops : fixed platforms, ferryboxes and gliders+ 3 surveys*
4. *WP5: Data management handbook, first version is done (D5.1 & D5.2)*
5. *WP6: Launching of OceanBoard and JERICO website*
6. *WP7: Starting month 19*
7. *WP8 : First call for TNA done and 6 + 3 proposals accepted*
8. *WP9: a workshop on OSE and OSSE initiated the WP9 activities*
9. *WP10: workshop on VOS in June 2011. WP10 kick off in March 2012*
10. *WP11. Consortium Agreement finally signed by all, sent to the EC in Dec.*

WP 11 - Management

Task 1: day to day management
Task 2: financial follow-up
Task 3: Technical reporting, M18, 36, 48
Task 4: Quality assurance plan (with HCMR)
Identity set (with NIVA)
Task 5: Consortium animation
Task 6: Other management related issues
Exchanges with Australia and USA
Associated partners

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WP11 - MANAGEMENT

Quality assurance plan V2 – available, on the website (deliverables). Up to date, V3 available (ask me).

A new one (V4) will be available next month and will integer the new deliverable and milestone timetables

Identity set : the description is on the website. To have the # items (ppt, logo, etc…) please ask to Ingrid or me.

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WP11 - MANAGEMENT

Grant Agreement Amendment in preparation :

CNRS : Article 10 for three CNRS/University labs
Unit cost for glider infrastructure
NERC : Waiting information for SA/TNA infrastructure
Others : CNR – some Unit costs to modify
???

PLEASE send me an official letter … Amendments needs SC approval and will no be ready before 6 months.

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DELIVERABLES 1st PERIOD

Del. n°	Deliverable name	Dow Delivery date	Deliverable responsible	Delivery status
D11.1	Signed consortium agreement	2	Ifremer	Done
D11.2	Quality assurance plan	3	HCMR	Done
D6.1	Design and launching of JERICO OceanBoard V0	6	CEFAS	Done
D11.3.	Identity Set	6	Ifremer	Done
D5.1	DM data management handook V1	8	Ifremer	Done
D5.2	RT data management handook V1	8	Ifremer	Done
D1.1	First call for TNA proposals	8	CNR	Done
D1.2	Rationale and definitions for a common strategy	9	INSU	Submited
D1.3	Terms of reference of the FCT	9	MI	Done
D3.1	Report on current status of ferrybox	9	HZG	Done
D2.1	Report on existing observation	12	IMR	Not submited
D2.2	Report on recommendations	12	IMR	Not submited

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DELIVERABLES 1st PERIOD

Del. n°	Deliverable name	Dow delivery date	Deliverable responsible	Delivery status
D6.2	Jerico Communauty Hub	12	CEFAS	Done
D9.1	First scientific report	12	CMCC	Done
D3.2	Report on current status of gliders observatories within Europe	15	CSIC	Postponed to M24
D6.3	Summer school 1	15	DELTARES	Postponed to M28/29
D1.4	JERICO label definition	18	HCMR	Postponed to M28/29
D2.3	Integrated Pan European Atlas/first report	18	IMR	? ?
D4.1	Report on calibration existing facilities	18	HZG	18 ?
D9.2	First report on OSE	18	HCMR	18 ?
D9.3	First report on OSSE	18	DMI	18 ?
D11.4	First periodic report	18	Ifremer	20

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MILESTONES 1st PERIOD

MiL n°	Milestone name	Dow Milestone date	Deliverable responsible	Milestone status
MS1	Kick off meeting	1	Ifremer	Done
MS16	First JERICO management Handbook	8	OGS	Done
MS5	First steering committee outputs	9	INSU/CNRS	Done
MS6	Infrastructure available for users (TNA)	11	INSU/CNRS	Done
MS22	JERICO workshop on sensors for vessels of opportunity and fish vessels probes (linked to other JERICO	12	MI	Done
MS20	Summer School 1	16	CEFAS	Posponed M28/29
MS2	First intermediate GA	18	Ifremer	Done
MS7	First forum for coastal technology	18	INSU/CNRS	Done (next week)
MS8	Second steering committee outputs	18	INSU/CNRS	To be done this month
MS17	Launch of service access	18	OGS	Postponed M21

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DELIVERABLES 2nd PERIOD

Del. n°	Deliverable name	Dow Delivery date	Deliverable responsible	Delivery status
D1.5	Second call for TNA proposals	M20	CNR	M21
D1.6	First report of the FCT activity	M24	MI	M24
D1.7	First report of the access activity	M24	CNR	M25
D1.8	Second report of the FCT activity	M36	IFREMER	M36
D1.9	Proposed strategy for biodiversity	M36	NIOZ	M36
D2.4	Demonstration of the feasibility of Joint trans-regional production	M24	SMHI	M24
D3.3	Review of current marine fixed instrumentation	M21	HZG/CEFAS	M21
D3.4	Report on new sensor developments	M36	HZG	M36
D4.2	Report on calibration best practices	M36	HZG	M36
D4.3	Report on biofouling prevention methods	M36	CNR	M36

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DELIVERABLES 2nd PERIOD

Del. n°	Deliverable name	Dow Delivery date	Deliverable responsible	Delivery status
D5.3	First data management report	M24	OGS	M24
D5.4	Guidelines for uncertainty	M30	OGS	M30
D6.4	Development and implementation of suite of web-based interactive tools	M24	Cefas	M24
D6.5	Summer school 2	M27	DELTARES	M39
D6.6	Final version of Jerico OceanBoard	M30	Cefas (+UoM)	M30
D9.4	Second scientific report	M24	CMCC	M24
D9.5	Second report on OSE	M36	HCMR	M36
D9.6	Second report on OSSE	M36	DMI	M36
D10.1	Report on trials and deployments	M36	MI	M36
D11.5	Second periodic report	M36	IFREMER	M36

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MILESTONES 2nd PERIOD

Mil. n°	Milestone name	Dow Milestone date	Deliverable responsible	Milestone status
MS3	GA2 meeting	36	Ifremer	
MS9	Steering committee outputs	27	INSU/CNRS	
MS10	Second Forum for coastal technology	30	INSU/CNRS	
MS11	Steering committee outputs	36	INSU/CNRS	
MS15	Constitution on a permanent JERICO WG for calibration activities	30	HCMR	
MS20	Summer School 1	16	CEFAS	28/29
MS21	Summer School 2	28	CEFAS	Postponed 40/41
MS23	Software and manuals for image analysis techniques (Task 10.1)	24	INSU/CNRS	
MS24	Recommendation report for autonomous carbon measurements	26	MI	
MS25	Data report on temperature and salinity measurements from XBT and ferrybox	26	MI	
MS26	Report on joint workshop on best practices for coastal observatories and moored and floating profilers (???)	30	MI	

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WP focused points to improve

WP1: FCT management, need more involvement of task leader IMI and partners

WP2: D2.1 & D2.2 are too late and what about D2.3 ?

WP3. Waiting for Glider best practices workshop.

WP4: It seems to be difficult to get answer to questionnaire on operating costs?

WP5: WP5 coordination and exchanges between WP5 players – 3 months delay.

WP6: Needs contribution from partners to feed Oceanboard

WP7: Delayed due to WP5 delay and late to answer questions on TOP and SA.

WP8: Selection process longer than expected

WP9: Need to send more reporting to the partners

WP10: Starting too slow and difficulties to get coordination from IMI.

WP11: SOS: too many EMAILs received ! Need a better organisation.

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INTERIM REPORT M9

Started in February but finished in July.

Technical WP report : 1st one in February, last one in June

Financial report ready end of June

2 partners have no costs even they receive the advance

Around 400 emails …. But

A necessary exercise for the 1st period reporting M18

GA n°1 - JERICO - 34

M18 1st PERIOD REPORTING

THE MANAGEMENT WILL SEND THE INSTRUCTIONS TO USE BY THE END OF OCTOBER

TECHNICAL REPORTING DEAD LINE : END OF NOVEMBER

FINANCIAL REPORTING AND DRAFT FORM C : END OF NOVEMBER

ACKNOLEDGE OF THE MANAGEMENT : MID DECEMBER

ALL SIGNED FORM C RETURNED TO IFREMER BEFORE END OF DECEMBER

CONSOLIDATION OF THE REPORT 1st WEEK OF JANUARY

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5.2.2. *Administrative and Financial management, WP11, by D. Gueguen (Ifremer)*

Slides are presented in the next pages regarding the following sections

Milestones: We are now at the end of period 1 and we need to provide the first period reporting,

Overview budget (see slides)

Pre-financing distribution:

Pre financing is 55% of the total EC grant transferred to the partners except for WP7 and 8

WP8 will be transferred for infrastructures selected by the TNA selection panel. WP8 will be transferred when the data will be available.

M9 interim report:

The total eligible costs for the first 9 months of the project is 12, 44% of the full budget.

Two partners have no cost at all: IBWPAN and INGV.

M18 report preparation:

For the financial reporting, each partner has to fill the two templates (like those filled for the interim report) + the Form C. A copy of the form C must be sent to the coordinator at least the 1st of December.

Reminder of eligible costs and indirect costs (see slides)

Some key-points and discussions:

- The slide dealing with costs per WP shows important cost for WP10 activities compared with the expected requested contribution to EC (grant)
- Presented Excel templates for financial reporting are official templates from the EC
- Discussion on TNA budget:
  - the budget can vary from one to another partner, inside the total allocated grant that will not change,
  - we need to focus on reporting of TNA cost: how to improve it? How to adjust to real costs? The explanations from EC documents are not clear. Need to understand better. Considering the morning meeting of WP8 and panel meeting held just before the GA meeting it is agreed that the coordinator should provide a clearer guideline document to help reporting TNA costs.

CNR Stefania Spanochia: problems were met during M9 report but they are solved now.

Simon Ruiz/ Answer by Dominique Guéguen: During the project an unique estimated cost is considered for the access to infrastructures. But at the end of the project the real costs will be considered.

Joaquin Tintore: Guidelines will be helpful. Stefania has done good work for TNA.

Dominique Durand: are the templates internal or transmitted to EU? Some WP are funded at 100% (-7%) other like WP9 and WP10 at 75%.

Tables of content

1. Milestones

Contract period :

- *01/05/2011 ⇨ 30/04/2015 (48 months)*

Reporting periods :

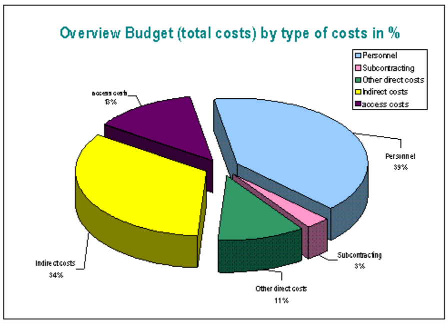
- *P1 : 01/05/2011 ⇨ 31/10/2012 (18 months)*
- *P2 : 01/11/2012 ⇨ 30/04/2014 (18 months)*
- *P3 : 01/05/2014 ⇨ 30/04/2015 (12 months)*

Intermediate reports :

- *One internal report 9 months after the beginning of the contract (31/01/2012),*
- *One report at mid-term stage of the project (30/04/2013),*

with scientific and financial review to follow the progress of the WP and Tasks.

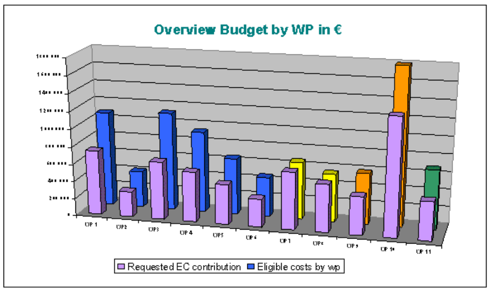
2. Overview budget (1)



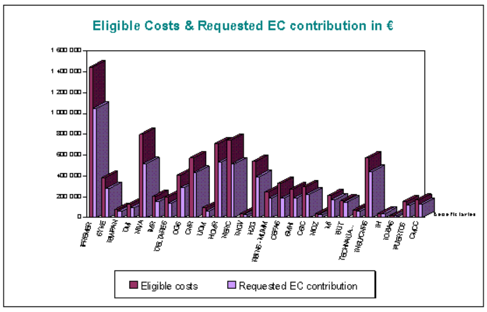
Budget allocated = 8 931 707 euros

UE maximum contribution = 6 500 000 euros

2. Overview budget (2)



2. Overview budget (3)



Milestones

Overview budget

Pre-financing distribution

M9 Interim report

M18 Report preparation

Reminder of eligible costs and indirect costs

3. Pre-financing distribution (1)

Pre-financing payment :

55 % of the total EC contribution to the project have been transferred to the coordinator.

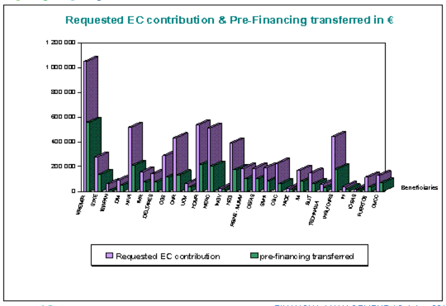
Amount received by Ifremer = 3 575 000 euros

Corresponding to pre-financing of 3 900 000 euros and deduction of 5% of the EC grant transferred directly by EC to the guarantee fund and kept aside up to the end of the project.

The Pre-financing has been transferred to all beneficiaries after signature of the Form A of the ECGA and the consortium agreement.

Considering the start of the support activities is planned in 2012, Ifremer has postponed the payment of the part of the EC contribution for the costs of the support activity (access costs WP7 & WP8), for the beneficiaries contributing to this activity.

3. Pre-financing distribution (2)



Milestones

Overview budget

Pre-financing distribution

M9 Interim report

M18 Report preparation

Reminder of eligible costs and indirect costs

4. M9 Interim report (1)

The M9 interim report covers the period from May 1st 2011 to January 31st 2012 and the objectives are double :

- to check out the project progress, both in terms of tasks done on each work package and on the status of expenses incurred by each partner for the project,
- to be fully operational at the official interim reporting M18 in november.

The financial statement has been done with two templates to fill in by each beneficiary (same as presented in part 5 of this presentation).

The total eligible costs presented by the 27 beneficiaries for the 9 first months represent ***1,110,793 euros*** *and correspond to 12,44% of the budget planned for the whole project.*

4. M9 Interim report (2)

Main remarks :

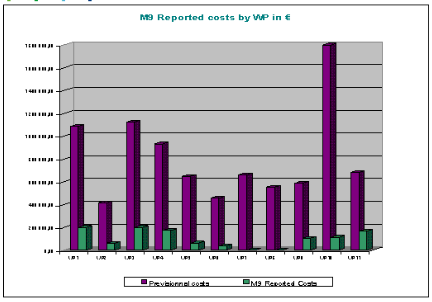
1- The Templates have been filled in by all the partners apart two beneficiaries (IBWPAN and INGV) without any time or costs involved during the first nine months,

2- No costs presented for Trans National Activity (WP7 and WP8) as no internal calls was set up during the period.

3- Many messages and confusions about the indirect costs for the coordination activity : ***you must declare your proper actual Indirect Costs*** *(with your method of calculation) without taking account the threshold of 7% reimbursement by the EC.*

When you will fill in your actual indirect costs in the FORM C via the participant portal, the calculation of the part of EC reimbursement will be automatic.

4. M9 Interim report (3)



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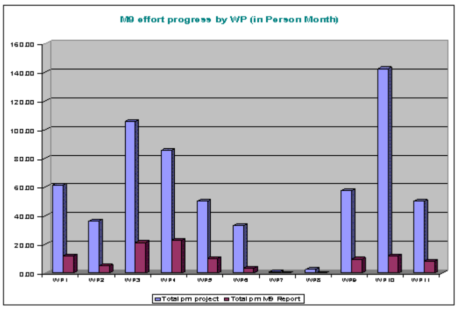
4. M9 Interim report (4)



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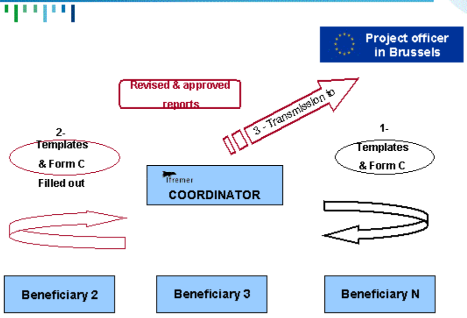
5. M18 report preparation (1)



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5. M18 report preparation (2)

Activity/financial reporting is a main contractual duty for all FP7

Reports include :

- *Periodic reports delivered to the EC 60 days after the end of each reporting period ,*
- *One final report at the end of the project, and on request,*
- *short progress reports within the main reporting periods.*

*A Certificate on Financial Statements (CFS) is mandatory for every claim (interim or final) in the form of reimbursement of costs, when the accumulated amount of requested funding is equal or superior to **375 000 €**.*

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5. M18 report preparation (3)

Reporting : who does what ?

Front page	by Coordinator	
Declaration project coordinator	by Coordinator	
1. Publishable summary	by Coordinator + WP leaders	
Scientific work progress		
2. Project objectives of the period	by Coordinator + WP leaders	
3. Work progress, during period (WP)	by Coordinator + WP leaders	
4. WPs deliverables & milestones tables	by Coordinator + WP leader	
Management & financial issues		
5. Project management	by Coordinator + Partners	
6. Explanation of the use of the ressources	by each partner	
7. Financial statements (Forms C) Summary financial report table	by each partner by Coordinator	Using UE internet Participant Portal
8. Certificates on Financial statement List of certificates	by each partner by Coordinator	

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5. M18 report preparation (4)

Reporting : which documents ?

- *FORM C for combination of Collaborative Project & Coordination and Support Action (CP & CSA) declined the costs by activity (RTD, coordination, support, management).*
- *Two templates from the coordinator to comply with EC requirements about reporting, based on tables presented on the project reporting EC guide :*
  - *one for explanation of use of resources by each beneficiary for the period with work package reference,*
  - *one for the details costs per beneficiary and per WP.*

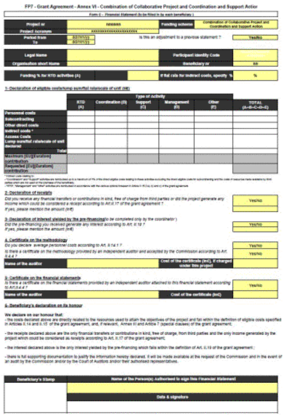
Two useful Guidelines in Cordis website :

Financial issues : *ftp://ftp.cordis.europa.eu/pub/fp7/docs/financialguide_en.pdf*

Project reporting : *ftp://ftp.cordis.europa.eu/pub/fp7/docs/project_reporting_en.pdf*

5. M18 report preparatio

FORM C Template to fill in by each beneficiary through the Participant portal website :


FP7 - Grant Agreement - Annex VI - Combination of Collaborative Project and Coordination and Support Action

	Type of Activity					
	RTD (A)	Coordination (B)	Support (C)	Management (D)	Other (E)	TOTAL (A+B+C+D+E)
Personnel costs						
Subcontracting						
Other direct costs						
Indirect costs *						
Access Costs						
Lump sum/flat rate/scale of unit declared						
Total						

5. M18 report preparation (6) Template 1 « explanation of the use of the ressources »

JERICO Project 262584 - TEMPLATE 1 : "Explanation of the use of the re	
Number and dates of the Period :	Interim Period Nr 1 (From 01/05/2011 - To 31/10/2012)
BENEFICIARY (short name) :	

NB : Please provide an explanation of personnel costs, subcontracting and any major direct costs incurr travel costs, large consumable items, linking them to work packages.

There is no standard definition of "major direct cost items". Beneficiaries may specificy these, according your total budget, or as regards the individual of the item.

Work Package nr	Item description	Amount
	Personnel direct costs	
	Subcontracting	
	Equipment cost : Major item X	
	Equipment cost : Major item Y, ...	
	Access costs	
	Transnational Access costs	
	Remaining direct costs	

5. M18 report preparation (7) Template 2 for details costs :

JERICO Project 262584 - TEMPLATE 2 : "Costs per WP and beneficiary during t Nr of reporting per

Beneficiary (short name) :

Indirect Cost Method : Indirect Cost rate :

Items		DETAILED COS														
		RTD						CO								
		WP9			WP10			WP1			WP2			WP3		
Personnel costs																
Manpower	Hour rate	hrs	pm	Cost	hrs	pm	Cost	hrs	pm	Cost	hrs	pm	Cost	hrs	pm	Cost
Cost for the period			0			0			0			0			0	
TOTAL Personnel costs				0			0			0			0			0
Subcontracting																
Name of subcontractant	subject			Cost			Cost			Cost			Cost			Cost
TOTAL Subcontracting				0.00			0.00			0.00			0.00			0.00
Durable equipment																
Type of equipment				Cost			Cost			Cost			Cost			Cost
Equipment 1																
Equipment 2																
Equipment 3																
TOTAL Durable equipment				0.00			0.00			0.00			0.00			0.00
Travel and subsistance																
cost for the period																
TOTAL Travel and subsistance				0.00			0.00			0.00			0.00			0.00
TOTAL Consumables, supplies and other direct costs				0.00			0.00			0.00			0.00			0.00
TOTAL Direct costs excluding TA and Third Parties				0.00			0.00			0.00			0.00			0.00
Indirect costs (based on the IC method and rate)				0.00			0.00			0.00			0.00			0.00
Transnational Access (TA) costs				0.00			0.00			0.00			0.00			0.00
Third Parties costs				0.00			0.00			0.00			0.00			0.00
TOTAL COSTS				0.00			0.00			0.00			0.00			0.00
TOTAL COSTS PER ACTIVITY		0,00														

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Reminder of eligible costs and indirect costs

6. Reminder of eligible costs and indirect costs

Eligible costs :

- *Actual costs : they must be real, not estimated and incurred during the duration of the project,*
- *They have to be presented in euros on Form C,*
- *Durable equipement : only portion of the equipment used on the project may be charged, they must be purchased for the purpose of the contract and depreciated (with each partner's usual accounting practice) in each relevant periodic report.*
- *Access costs : for the infrastructure selected by the selection panel. A unit cost is estimated and specified in Annex 1 (DOW) and declaration is based on the total quantity of access to the infrastructure and this estimated unit cost for the life-time of the project. The cost will be adjusted with a real unit cost at the end of the project (final reporting).*

Indirect costs :

- *They are calculated in accordance with the method chosen by each partner,*
- *For RTD: calculated in accordance with the method chosen by each partner,*
- *For Coordination : the reimbursement is limited to a maximum of 7% of the direct eligible costs, excepted subcontracting, but you have to declare your proper actual indirect costs,*
- *For Support : they are included in the unit cost as described in the DOW (where there are limited to 7%).*
- *For management : calculated in accordance with the method chosen by each partner.*

5.2.3. WP1: A common strategy, by P.Morin (CNRS/INSU)

Slides are presented in the next pages.

The first step for a common strategy is to have a common vision:

- to promote coastal observatories and increase knowledge and understanding of marine systems,
- to propose easier access to data and information to improve the predictions of climate change impacts and how to combat them,
- to support developments of new tools and technologies.

And to have a main goal:

Developing a common strategy for a pan European network of operational coastal observatories to address the challenge of observing the complexity and high variability of coastal areas.

With 5 major actions in that WP which are to:

- set up a European research infrastructure,
- create a “JERICO Label”,
- organise the Forum for Coastal Technologies,
- promote open access to JERICO network (Through TNA et SA),
- **suggest a roadmap for the future** (this is the aim of the strategy workshop).

WP1 has just finalised the deliverable D1.2: **Rationale and definition for a common strategy.** This handbook focuses on the main objectives of JERICO what are the links between the work packages and their interfaces in terms of contribution.

The objectives are:

• Present key-environmental parameters measured (to be provided by WP2 and WP3)

• Emerging key-environmental parameters to be measured (to be provided by WP1 and WP10)

• Sampling requirements in space and time to address efficiently the needs of the EC Directives and GMES marine services (to be provided by WP2 and WP9)

• Elements of costs and efficiency of observing systems (to be provided by WP4 and WP10)

• Standardization, Quality standards (to be provided jointly by WP3, 4 and 5)

• Data dissemination (technology, channel, time constraint…). (To be provided by WP 5, 6 and 7)

• Promoting the use of JERICO infrastructure (WP1 and WP8)

The expected contributions for the other work packages are:

<u>Expected contribution from WP2</u>

• The inventory of existing systems in operational use at the regional levels for the different types of platforms.

• The inventory of available data on servers for the different types of platforms.

• The Identification of the main gaps between accessible observations and data needs for the different types of platforms.

• To propose recommendations on how to fill the gaps at regional levels (link with WP9 and WP1).

Expected contribution from WP3

• To review the existing systems in operation: types of sensors used, types of data transmission, quality control, and data archiving (link with WP5) for the different types of platforms.

• To define best practices for designing systems for the different types of platforms according to specific scientific objectives and geographical specificities (link with WP2).

• To develop qualified and robust systems (from sensors to data transmission) Consensual view on key aspects to focus upon, and elements of best practices (link with WP4).

• To establish the existing and future needs to develop plug-and-play technology that could ease integration of new sensors and upgrade for future needs (link with FCT)

• To establish the needed improvements on existing technologies (link with WP10 and FCT).

Expected contribution from WP4

• Inventory of procedures and calibration methods for the different types of sensors and platforms.

• Inventory of existing methods against bio-fouling.

• To propose solutions to develop qualified and robust systems (from the definition of the constituting elements of the considered platform to sensors and data transmission) and more specifically to propose criteria to focus on (link with WP3).

• Best practices in all phases of the setup of sensors (choice of sensor type, calibration,...) to enable an end to end quality assurance of data (link with WP5).

• What are the needed improvements on existing or future technologies for bio-fouling prevention? (link with WP10 and FCT).

• To define the best practices in terms of calibration of sensors and qualification of systems. The latter item should be a major input to the JERICO label.

Expected contribution from WP6

• JERICO datatool for easy data access in different formats (output from WP5).

• Jerico user display for Ferrybox.

• JERICO OceanBoard for diffusion of on-line informative and educational resources to professionals and general public.

• JERICO Summer Schools.

• JERICO Community Hub (link to WP1).

Expected contribution from WP9

• The definition of the sampling requirements in space and time to address efficiently the needs of both the implementation of the EC Directives and the operational need of in-situ data from the GMES marine services.

• Optimisation of observational systems with Observing System Simulation Experiments (link with WP2).

• Optimisation of a 3-D grid of observing systems at European level.

• Improvements of future observing networks based on new platforms (profilers, fishing ships, link with WP10).

• Identification of gaps in sampling systems (Link to WP2 and WP1)

Expected contribution from WP10

WP 10 intends to give major inputs to the Common Strategy in terms of emerging technologies and sensors that will contribute to future OCO.

• The identification of the technological bottlenecks for integrating of new "hot" sensors (ex: climate change parameters, pollution assessment, litter at sea, etc…) into the different considered platforms systems. Emphasis is set on contaminant measurements using passive samplers, algal pigments and carbonate system (pH, pCO2 and alkalinity).

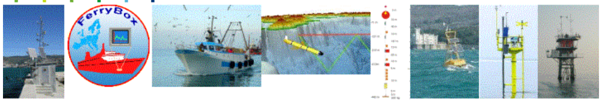
• Identification of new tools (in situ and laboratory video systems) for monitoring of key biological compartments.

• Identification of emerging technology (profiling systems, fishing vessels, link with WP9).

Some key points and discussions:

- It is underlined that the JERICO Label would be difficult to define; it should be a several stages process. It is proposed to firstly define what items/topics should to be dealt with in the label document, reach a consensus on that issue and then we will work on describing the procedures and criteria to be applied for each items/topics.
- G. Petihakis explained that referring to ESONET label it is not an easy task: ESONET consortium went into details and we have 3 kinds of platforms to deal with.
- **It is proposed to have a dedicated meeting, with users and infrastructure coordinators close to the end of the project to have a finalised label definition. Anyhow, we need to work on a pre-definition of this label in the deliverable D1.4.**

WP1: A common strategy - objectives, results, next events



JERICO

A
Joint
European
Research
Infrastructure network
for Coastal
Observatories

Coordinator: Patrick Farcy (Ifremer)

Project Management Team:
- Ingrid Puillat – IFREMER (F)
- Pascal Morin - CNRS/INSU (F)
- Dominique Durand – NIVA (N)

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WP1: A common strategy - objectives, results, next events

Why JERICO ?

- To address the challenge of observing the complexity and high variability of coastal areas at Pan-european level
  - New requirements arising from WFD and MSFD
  - Operational marine services (GMES)
- Often driven through short-term research projects, marine observing systems mostly answer local/regional monitoring. **Sustainability is not guaranteed**

One of the main challenges for the European research community is now to **increase the consistency** and **the sustainability** of these dispersed infrastructures by addressing their future within a **shared pan-European framework.**

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WP1: A common strategy - objectives, results, next events

The JERICO vision is to make a significant contribution to the harmonisation of existing European coastal observatories and to support future strategic developments.

JERICO will promote easier access to the infrastructures and data.

JERICO will:

- increase knowledge and understanding of marine systems, strengthen the evidence base for environmental assessments,

- provide data and information required to improve predictions of future human and climate-driven environmental change and the strategies to combat them.

- support developments of new tools and technologies for the monitoring of key oceanographic parameters in coastal systems.

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WP1 Reporting: A common strategy - objectives, results, next events

Objective: ***Developing a common strategy for a pan European network of operational coastal observatories to address the challenge of observing the complexity and high variability of coastal areas***

4 major actions:

1 - Set up an European Research Infrastructure for coastal observations based on existing systems in European coastal and shelf seas.

(initial state of existing networks, gaps, running costs, policies WFD and MSFD, technological developments, gouvernance)

2 - Creating a JERICO Label: To support **standardization** of operations and activities for the **benefit of data quality and availability** and **cost efficiency.**

(harmonization operation and maintenance methods, compability and interoperability to reduce costs, set of parameters, frequency, sampling scheme, data quality, best practices,…)

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WP1: A common strategy - objectives, results, next events

Objective: ***Developing a common strategy for a pan European network of operational coastal observatories to address the challenge of observing the complexity and high variability of coastal areas***

4 major actions:

3 - Organizing a Forum for Coastal Technology: To stimulate the development of new automated systems for the operational monitoring of the coastal marine environment, with the focus on the biochemical compartment. (JRA)

4 - Promote access open access to JERICO network: to **external users** for their own experiments and testing **(TNA)** and access to data and services **(SA)**

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WP1: A common strategy - objectives, results, next events

Common Strategy: Key elements and definition

Key environmental challenges and knowledge gaps for OCOs:

- Assessment of environmental status (eutrophication and primary production, ocean acidification)

- Better understanding of functioning of coastal ecosystems (trophic chain)

- Trans-boundary pollution transport (concentration of persistent pollutants)

- Control and validation of operational models (hydrodynamic, biogeochemical, transport models (sediment, contaminants, radionucleids)

To address efficiently these challenges, JERICO needs a common consensual strategy coveri

- Integration of existing observing systems into an harmonized pan-European framework

- Set a framework for future systems for the operational monitoring of the coastal environment, thanks to common progress initiated on sensors and platforms

- Optimal designing of future networks

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WP1: A common strategy - objectives, results, next events

Common Strategy

- Define the rules for a better coordination at European level
- Launching a European strategic view on OCO
- Creating a JERICO label
- Promote open access to JERICO network
- Provide cross-regional integration and demonstration
- Coordinating networking actions for optimal integration of knowledge and consensus
- Suggest a roadmap for a deployment strategy

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WP1: A common strategy - objectives, results, next events

Towards a Common strategy:

- Present key-environmental parameters measured (to be provided by **WP2 and WP3**)
- **Emerging key-environmental parameters** to be measured (to be provided by **WP1 and WP10**)
- **Sampling requirements** in space and time to address efficiently the needs of the EC Directives and GMES marine services (to be provided by **WP2 and WP9**)
- Elements of **costs and efficiency** of observing systems (to be provided by **WP4 and WP10**)
- Standardization, Quality standards (to be provided jointly by **WP3, 4 and 5**)
- Data dissemination (technology, channel, time constraint, ...). (To be provided by **WP 5, 6 and 7**)
- Promoting the use of JERICO infrastructure (**WP1 and WP8**)

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WP1: A common strategy - objectives, results, next events

6 Tasks :

- *Task 1.1: Set up the scene and implementation plan (INSU, all)*
- *Task 1.2: Jerico Label (HCMR, PUERTO, HZG, CEFAS)*
- *Task 1.3: Forum for Coastal Technology (MI, Ifremer)*
- *Task 1.4: Definition strategy and interfaces with the monitoring of marine biodiversity (NIOZ, all)*
- *Task 1.5: Roadmap for the future (INSU, all)*
- *Task 1.6: User access for the Trans National Activities (CNR, all WP8 partners)*

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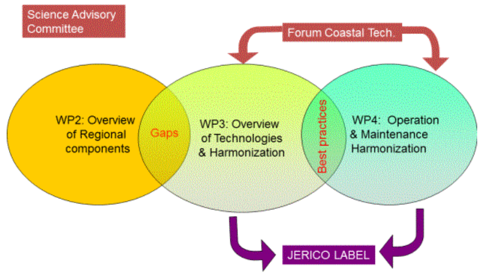
WP1: A common strategy - objectives, results, next events
Coordination between NAS Workpackages



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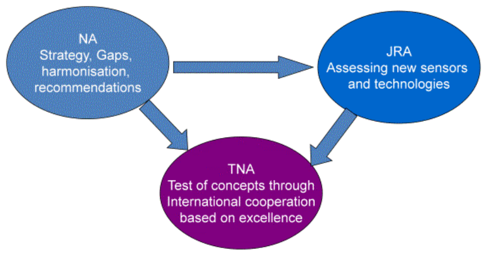
WP1: A common strategy - objectives, results, next events
Interactions and feedbacks between project activities



Existing synergies between NA, JRA and TNA : speed up implementation of new technologies and generate adding values within the project and towards industry

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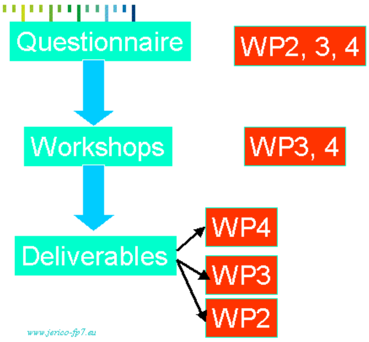
WP1: A common strategy - objectives, results, next events
Implementation plan: Expected contribution from WP2,3,4



WORKSHOPS:

- Crucial tool for reaching consensus and delivering inputs to the common strategy
- 3 Joint workshops WP3 – WP4 (ferrybox: 30-31. aug. 2011, fixed platforms: 29feb.1mar 2012, gliders: may 2012)

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WP1: A common strategy - objectives, results, next events
Implementation plan: Expected contribution from WP2

Common contributions and specific contributions related to types of platforms.

The synthetic contributions from WP2 are expected to be:

- The inventory of existing systems in operational use at the regional levels for the different types of platforms
- The inventory of available data on servers for the different types of platforms
- The Identification of the main gaps between accessible observations and data needs for the different types of platforms
- **To propose recommendations on how to fill the gaps at regional levels (link with WP9 and WP1)**

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WP1: A common strategy - objectives, results, next events
Implementation plan: Expected contribution from WP3

- To review the existing systems in operation: types of sensors used, types of data transmission, quality control, and **data archiving (link with WP5)** for the different types of platforms.
- **To define best practices for designing systems for the different types of platforms according to specific scientific objectives and geographical specificities (link with WP2).**
- **To develop qualified and robust systems (from sensors to data transmission) Consensual view on key aspects to focus upon, and elements of best practices (link with WP4).**
- **To establish the existing and future needs to develop plug-and-play technology that could ease integration of new sensors and upgrade for future needs (link with FCT)**
- **To establish the needed improvements on existing technologies (link with WP10 and FCT).**

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WP1: A common strategy - objectives, results, next events
Implementation plan: Expected contribution from WP4

The synthetic outputs from WP4 are expected to be:

- Inventory of procedures and calibration methods for the different types of platforms
- Inventory of existing methods against bio-fouling
- **To propose solutions to develop qualified and robust systems (from the definition of the constituting elements of the considered platform to sensors and data transmission) and more specifically to propose criteria to focus on (link with WP3)**
- **Best practices in all phases of the setup of sensors (choice of sensor type, calibration,...) to enable an end to end quality assurance of data (link with WP5).**
- **What are the needed improvements on existing or future technologies for bio-fouling prevention? (link with WP10 and FCT).**
- To define the best practices in terms of calibration of sensors and qualification of systems. The latter item should be a **major input to the JERICO label.**

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WP1: A common strategy - objectives, results, next events
Implementation plan: Expected contribution from WP5

Contribution will be common for all platforms, and expected to be:

- Harmonized procedure to manage the data flow from the sensor to the user
- To produce a data management handbook for real-time and delayed mode data
- To propose Harmonized QA/QC procedures, whatever the platforms data sources
- **To define procedures for ascribing uncertainties to measurements (precision and accuracy of sensors, instrument drift, …) (link with WP3 and WP4)**
- To harmonise vocabularies for real-time and delayed mode data formats and meta-databases
- To harmonise real-time and delayed mode data handling practices
- **Standard tools for online data access and visualization (link to WP6 and WP7)**

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WP1: A common strategy - objectives, results, next events
Implementation plan: Expected contribution from WP6

Contributions from WP6 are expected to be:

- **JERICO data tool for easy data access in different formats (output from WP5)**
- Common Ferrybox screens passenger display
- JERICO Oceanboard for diffusion of on-line informative and educational resources to professionals and general public
- JERICO Summer Schools
- **JERICO Community Hub (link to WP1)**
- **Web-based Yellow pages (link to WP1)**

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WP1: A common strategy - objectives, results, next events
Implementation plan: Expected contribution from WP9

The synthetic outputs from WP9 are expected to be:

- The definition of the sampling requirements in space and time to address efficiently the needs of both the implementation of the EC Directives and the operational need of in-situ data from the GMES marine services.
- **Optimisation of observational systems with Observing System Simulation Experiments (link with WP2)**
- Optimisation of a 3-D grid of observing systems at European level
- **Improvements of future observing networks based on new platforms (profilers, fishing ships, link with WP10)**
- **Identification of gaps in sampling systems (Link to WP2 and WP1)**

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WP1: A common strategy - objectives, results, next events
Implementation plan: Expected contribution from WP10

WP 10 intends to give **major inputs to the Common Strategy in terms of emerging technologies and sensors** that will contribute to future OCO.

The synthetic outputs from WP10 are expected to be:

- The identification of the technological bottlenecks for integrating of new "hot" sensors (ex: climate change parameters, pollution assessment, litter at sea, etc…) into the different considered platforms systems. Emphasis is set on contaminant measurements using passive samplers, algal pigments and carbonate system (pH, pCO_2 and alkalinity).
- Identification of new tools (in situ and laboratory video systems) for monitoring of key biological compartments
- **Identification of emerging technology (profiling systems, fishing vessels, link with WP9)**

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WP1: A common strategy - objectives, results, next events
List of Deliverables from WP1

Delivered:

- D1.1 First Call for TNA proposals (13 proposals)
- D1.2 Rationale and definition for a common strategy (v3)
- D1.3 Terms of reference for the FCT (v1)

To be delivered:

- D1.4 JERICO label definition (M18 postponed to M28/29)
- D1.5 Second Call for TNA proposals (M20)
- D1.6 First report of the FCT activity (M24)
- D1.7 First report of the access activity (M24)
- D1.8 Second assessment of the FCT activity (M36)
- D1.9 Proposed strategy for biodiversity (M36)

TITLE - JERICO - 21

WP1: A common strategy - objectives, results, next events
Next Events

- First Forum for Coastal Technology (Brest, 10 oct. 2012)
- Second Call for TNA proposals (jan. 2013)

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5.2.4. WP2: Strengthening regional activities by H. Wehde (IMR)

Co-led by P. Gorringe (Eurogoos)

Slides are presented in the next pages.

WP2 has two tasks: one for regional activities of the six ROOS and the second for cross-regional integration.

For task 1, the three objectives are to:

- Make an inventory of existing coastal observing systems,
- identify data to be used for demonstration, for inter-calibration (WP4) and data collection in servers (WP5),
- identify main gaps between accessible observations and data needs and address how to fill these gaps at the regional level.

For task 2, the two objectives are to:

- make a demonstration of the pan-European transport products through the sea boundaries,
- evaluate a European model for hydrological prediction.

The Deliverables D2.1 and D2.2 are still on going but with six month delay.

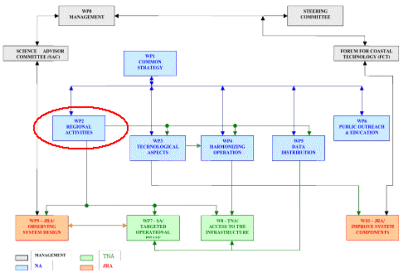
The calendar of the WP2 for this year is:

- Delivery of the preliminary version of D2.1 and D2.2 at the end of October (26/10).
- Delivery of a second version of these two deliverables before Christmas (20/12).
- Delivery of the third deliverable, D2.3 before the end of December (30/12)

Some key points and discussions:

- Hans Dahlin: How much will WP2 influence other WPs and other communities?
- H. Wehde: It will influence on the future strategy and so it collaborates with WP1. There are some links with ICES community and with EUROGOOS.
- Patrick Farcy: Strong links are necessary with the ICES community, with EUROGOOS and with open ocean observations. Jerico could extract from other projects information which will be important for coastal observatories.
- The coordinator also underlined the importance of this WP to make the interface between coastal oceanography and Eurogoos community which is not only coastal. We need to have some common meetings or workshops with Eurogoos to show what we are going to do, more specifically for TNA.
- Regarding deliverable the coordinator highlighted the important incurred delays: at earlier stage deliverables D2.1 & D2.2 were expected to be delivered before summer holidays but we did not get them yet. It is urgently requested to send them, at least in draft status ASAP. WP2 leader insure that Deliverables D2.3 should be delivered before Christmas as well D2.1 and D2.2
- Lars Stemmann would like to participate to the establishment of the state of the art for zooplankton in this WP.

JERICO WP2 STRENGTHENING REGIONAL AND TRANS-REGIONAL ACTIVITIES



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WP 2 REGIONAL ACTIVITIES PARTNERS IN WP2

Co leaded by Patrick Gorringe, EuroGOOS

• Arctic ROOS	IMR
• BOOS	SMHI
• NOOS	Deltares and IMR
• IBI ROOS	IH and AZTI
• MONGOOS	INGV
• Black Sea	IO-BAS

WP 2 STRUCTURE

7 partners, 2 tasks, 5 deliverables

Task 2.1: State of the Art in Coastal observing systems

Henning Wehde – __IMR__, SMHI, Deltares ,IH, AZTI, INGV, IO-BAS

Task 2.2 Cross regional integration and demonstration

Chantal Donnelly - __SMHI__, IMR, Deltares ,IH, AZTI, INGV, IO-BAS

WP 2 REGIONAL ACTIVITIES OBJECTIVES

Make an inventory of existing coastal observing systems

To identify data to be used for demonstration, for inter-calibration (WP4) and data collection in servers (WP5)

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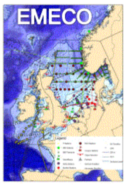
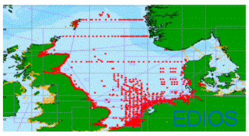
COASTAL OBSERVING SYSTEMS

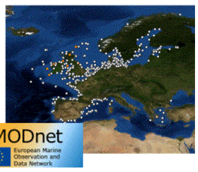


GISC
GMES in-situ coordination

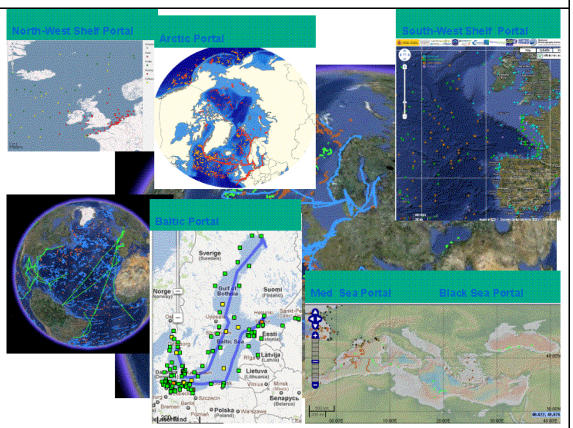
Review of ongoing and planned programmes and projects collecting in situ data and identification of Gaps

Establishment of an inventory of existing observing systems, with special focus on up till now not sufficiently considered biochemical parameters, terms for data accessibility, administrative and legal barriers





EMODnet
European Marine Observation and Data Network



WP 2 REGIONAL ACTIVITIES OBJECTIVES

- *To identify main gaps between accessible observations and data needs and address how to fill these gaps at the regional level.*

WP 2 REGIONAL ACTIVITIES OBJECTIVES

- *Definition of the specific needs for the regions*
- *Form a basis for future monitoring program*
- *Identify time series/stations for monitoring environmental variability with the possibilty to monitor:*
- *climate changes*
- *impacts on ecosystem*
- *Assess how the timeseries can improve*
- *Propose physical chemical monitoring parameters and frequencies*

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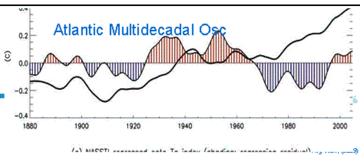
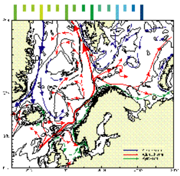
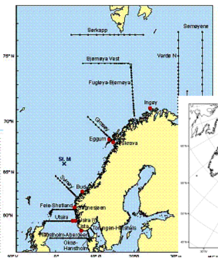
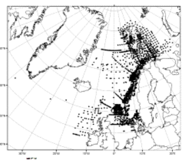
NEEDS: HERE THE NORWEGIAN WATERS AS AN EXAMPLE

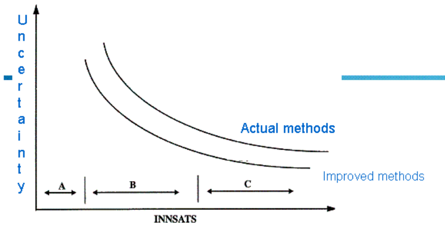






Established 1930´s





Reducing uncertainty

A : too scarcely evolved efforts

B : more frequently measurements lead to improvement

C : New methodology needed for improvement

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CENTRAL CHALLENGES

North Sea	Norwegian Sea	Barents Sea	Coast
Climate Change	Climate Change	Climate Change	Climate Change
	Water masses distribution	Water masses distribution	Water masses distribution
Water transport			
Water exchange			
Mixed Layer	Mixed Layer	Mixed Layer	Mixed Layer
Acidification	Acidification	Acidification	
Modellvalidation	Modellvalidation	Modellvalidation	Modellvalidation
Production basis	Production basis	Production basis	Production basis
Biodiversity	Biodiversity	Biodiversity	Biodiversity
Climate effects	Climate effects	Climate effects	Climate effects
Eutrophication			Eutrophication
Harmful algae			Harmful algae
Alien species	Alien species	Alien species	Alien species
Management plan	Management plan	Management plan	
MSFD	MSFD	MSFD	WFD

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PERIODS IMPORTANT FOR PROCESSES

North Sea/Skagerrak	J	F	M	A	M	J	J	A	S	O	N	D
Nutrients												
Production basis (abiotic)	x	x	x	x	x			x	x			
Eutrophication	x	x			x	x	x	x				
Longtransport vs. lokal impact			(x)	x	x	x	x					
Oxygen(bottom water)	x	x					x	x	x	x		
Management plan	x	x		x	x	x	x	x				
Nutrient dynamic	x	x	x	x	x	x		x	x	x		
Acidification (DIC)	x			x				x		x		
Physical oceanography												
Transport		x	x	x	x	x	x	x	x	x	(x)	
Ventilation		x	x	x	(x)			x	x	x	(x)	
Mixed layer/ stability		(x)	x	x	x	(x)	(x)	(x)	x	x	x	
Climate effects		x	x	x	x	x	x	x	x	x	x	
Modell validation	x	x	x	x	x	x	x	x	x	x	x	X
Phytoplankton												
Production basis/ Primary Production		x	x	x	x	x	x	x	x	x		
Biodiversity		(x)	x	x	x	x	x	x	x	(x)		
Climate effects			(x)	x	x	x	x	x	x	x	x	
Eutrophication/environmental status		x	x	x	x	x	x	x	x	x		
Harmful algae/ blooms			x	x	x	x	x	x	x	(x)		
Alien Species			x	x	x	x	x	x	x	x	x	
Management plan		x	x	x	x	x		x	x	x		
Zooplankton												
Production basis/Primary production	x		x	x	x	x	x	x	x	(x)		
Biodiversity			x	x	x	x	x	x	x			
Climate effects			x	x	x	x	x	x	x			
Alien Species							(x)	x	x	x	(x)	
Management plan			x	x	x	x	x	x	x			

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PROPOSED MONITORING OF ENVIRONMENT AND BIOLOGICAL PARAMETERS

Location	Frequency	T	S	N	Chl a	Php	Zpl	O	pH	CO_2	Fish
Svinøy-NV	5 x	+	+	+	+	+	+	New	New	-	-
Gimsøy-NV	4 x	+	+	+	+	+	+	New	New	-	-
Bjørnøya-V	4 x	+	+	+	+	+	+	New	New	-	-
Fugløya-Bjørnøya	6 x	+	+	+	+	+	+	New	New	-	-
Vardø-N	4 x	+	+	+	+	+	+	New	New	-	-
Polar Ocean	1 x	New	New	New	New	New	New	New	New	-	-
St. M	4 x	+	+	+	+	+	+	New	New	-	-
St. M (buoy)	Pr. time	+	+	-	+	-	-	+	-	+	-
Regional covering Norwegian Sea	1 x	+	+	+	+	+	+	New	-	-	+Re
Regional covering Barents Sea	2 x	+	+	+	+	+	+	New	-	-	+Re
Argo	~50 x per bøye	+	+	New	+	-	-	+	-	-	-
Ferrybox Tromsø-Longyearbyen	52 x	+	+	+	+	-	-	-	-	-	-
Ice	365 x	-	-	-	-	-	-	-	-	-	-
Satellite	52 x	New	-	-	New	-	-	-	-	-	-

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TASK 2.2 CROSS REGIONAL INTEGRATION AND DEMONSTRATION

Subtask 2.2.1 Demonstration of pan-European transport product

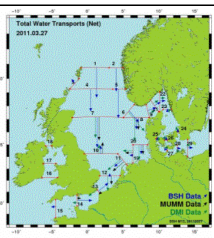
Exploring/inventory of observations on fluxes in the different areas

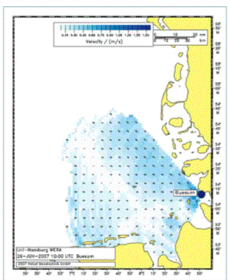
Define operational products based on this and connect to operational users

Subtask 2.2.2 E-HYPE European Hydrological Predictions for the Environment

Access to water discharge and nutrient transport from main rivers and diffuse outlets on a daily timescale and at a high spatial resolution.

TASK 2.2.1 CROSS REGIONAL INTEGRATION AND DEMONSTRATION





Transport

Model products existing

observations for an observational based product existing

Users that are foreseen:

science related to ecosystem approach

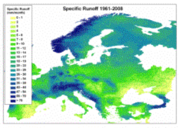
OSPAR; MSFD

National requirements and authorities

WORKING ON FOR USERS RELEVANT INDICATORS

- Position of fronts
- Upwelling indexes
- Currents, temperature, salinity and turbulence
- Fluxes of nutrients (though given sections)
- Timing (of peak spring bloom) and strength of primary prod.
- Contaminant exposure on plankton and benthic ecosystems
- Overlap between species (prey and predators)

TASK 2.2.2 CROSS REGIONAL INTEGRATION AND DEMONSTRATION



E-HYPE

- ***New, daily output, hydrological model based on widely accepted hydrological concepts (SMHI/HBV)***
- ***Integrated modules for nutrient and conservative tracers***
- ***Wide range of parameters modelled (runoff, soilmoisture, snowdepth, groundwaterlevel, N, P, O18)***
- ***Model used at local, regional and pan-European scale for research purposes***
- ***Updated version in November***

DELIVERABLES:

D2.1 (12) Report on existing observation network from all ROOSs

➔ Before Christmas so in time for being sent with the intermediate report

D2.2 (12) Report on recommendations for future research and developments for filling gaps in all ROOSs

➔ Before Christmas so in time for being sent with the intermediate report

D2.3 (18) Integrated Pan European Atlas/first report on Coastal Observing systems

D2.4 (24) Demonstration of the feasibility of joint trans-regional product production Transports; E-HYPE

D2.5 (48) update at the end of the project

5.2.5. WP3: Harmonizing Technological aspects, by W. Petersen (HZG)

Slides are presented in the next pages.

WP3 and WP4 has organised common workshops on the 3 types of platforms: Ferrybox, glider and fixed platforms.

For the Ferrybox task, the status is:

a) 1st JERICO FerryBox workshop (30-31 August 2011 at HZG).

Review current status FerryBox (T 3.1.1):
- 1st Version of questionnaire circulated in August 2011
- 2nd Version (with extra columns regarding WP4) circulated in January 2012

b) Report of 1st JERICO FerryBox workshop (distributed Nov. 2011).

c) Best practice of FB systems: already discussed in 1st workshop, will be continued in Best Practices workshop in Crete for all three platforms (Oct 2012)

The deliverable D 3.1 on "Report on current status of FerryBox" is now available.

For the glider task, the status is:

a) the first workshop on gliders has been organised together with EU project GROOM* and EGO** in May 2012, in order to define the best technical practices (T 3.2.2).

b) a common questionnaire has been prepared by the task leader (CSIC). The answers are on going and will be evaluated soon. The results will be integrated in the next deliverable.

The deliverable D 3.2 "Report on current status of gliders observatories within Europe" initially planned M15 (Jul 2012) is postponed to M24 because of the late dates of the workshop (to be in phase with the GROOM project). The task leader assumes that it will be ready before. A first draft will be available in November 2012.

For the fixed platforms task, the status is:

a) Review of the current status of all existing fixed observing sites (T 3.3.1) questionnaire about used platform within JERICO (started by HZG with input from EDIOS database) and circulated to all partners will be continued by CEFAS (taskleader) by integration of all information available in EMODnet.

b) Fixed Platforms (FP) workshop (T 3.3.2)
(29th February – 2nd March 2012 in Rome - CNR).

c) Harmonization and merging quality assessed data from fixed platform (T 3.3.3). The objective is to harmonise the outputs of fixed platforms with other systems such as FerryBox. The test sites for this will be the North Sea (Cefas, HZG, Ifremer) and Adriatic (CNR). These activities will start in the next year (2013).

d) Comparison of new sensors and assessment for FPs (T3.3.4) in conjunction with WP 10: Has been touched at first short WS of WP10 March 2012 in Rome and new experiences will be discussed at next WS of WP10 in 2013.

e) Best practices of Fixed Platform: already discussed in 1st workshop in Rome, will be continued in Best Practices workshop in Crete for all three platforms (Oct 2012)

The deliverable D 3.3 on "Report on current marine fixed instrumentation" will be available M21.

Some key points and discussions:

- D3.2 "*Report on current status of gliders observatories within Europe*" is postponed to month 24.
- Presented Google earth maps from fixed platforms are fed by the Excel questionnaires where columns are extracted and creating GoogleEarth files.
- P. Farcy asked if it is possible to use this tool for glider routes. P Testor answered we are all converging to the utilisation of Google tool but it is difficult to have a 3D view of glider transect with it.
- Discussion on line with data systems:
    - H. Dahling: we have to fill other tools, how much of data are available to fill other systems? How data are accessible?
    - W. Petersen: data are feeding MyOcean and for fixed plate-forms it feeds the ROOSes. Data are also accessible from FTPservers.
    - H. Dahling: legacy of MyOcean must be taken, Emodnet data portals, responsibility on the ROOSes
    - The coordinator concluded a MoU is needed between Myocean, SeaDataNet and JERICO
- Are other meetings or workshops planed during next period? The FerryBox workshop in next April is a good possibility to organise an aside meeting for WP3, but firstly it would be good to have a meeting of a small working group to elaborate recommendations.
- P. Testor: you said that for gliders we have common work with GROOM project, how to separate the work on deliverables, as there are clear overlaps?
- W Petersen: the work is different, but we need to clarify this.
- P Farcy agreed on the overlaps existence but he underlined that JERICO deliverables are public so will be available for GROOM. For the EC we cannot give the same deliverables for both projects but we can have some little overlaps, we need to adapt the deliverable to each project. We have to work on that.

WP3: HARMONIZING TECHNOLOGICAL ASPECTS

General Objectives:

- *To provide a common base for the operational use of FerryBoxes, gliders, fixed platforms along European coasts*
- *To review the current status of existing systems in operational use in European seas*
- *To define the best technical practices for compatible, robust and cost-effective systems*
- *To define procedures for harmonizing and merging quality assessed FerryBox and Fixed Platform data at regional (ROOS) level*
- *To define procedures and technological solutions for integration and testing of new sensors on these systems*

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GA, Crete Oct 2012, WP3 Status - 2

TASK LEADERS:

Task 3.1 FerryBox:	*NERC (David) & NIVA & SYKE (Dominique & Seppo)*
Task 3.2 Glider:	*CSIC (Simon)*
Task 3.3. Fixed Platform:	*CEFAS (Rodney) & CNR (Stefania)*
Task 3.x.3 test & application of new sensors:	*HZG (Willi)*

GA, Crete Oct 2012, WP3 Status - 3

WP3: CONTRIBUTIONS OF PARTNERS

Overview WP3 contributions

		IFREMER (FR)	SYKE (FI)	IBWPAN (PL)	NIVA (NO)	OGS (IT)	CNR (IT)	HCMR (GR)	NERC (UK)	HZG (DE)	MUMM (BE)	CEFAS (UK)	SMHI (SE)	CSIC (ES)	NIOZ (NL)	MI (IE)	AZTI (ES)	INSU (FR)	PUERTOS (ES)	Number of partners involved
P.-No.		1	2	3	5	8	9	11	12	14	15	16	17	18	19	20	22	23	26	17
PM		2	4	6	5	4	7	8	13	16	3	8	4	5.5	0	2	3.7	7	6.5	104.7
WP 3.1	Ferry Box	0	X	–	X	–	–	X	X	X	X	X	X	–	X	–	–	–	–	9
WP 3.2	Glider	X	–	–	–	–	–	–	X	X	–	0	–	X	–	X	–	–	–	6
WP 3.3.	Fixed Platf	X	–	X	–	X	X	X	X	X	0	X	X	–	–	X	X	?	X	13

partners in total: 17
budget: ~550 T€
total personal month: 105

GA, Crete Oct 2012, WP3 Status - 4

WP 3.1 FERRYBOXES TASKS:

3.1.1: *Review current status of existing FB systems (flow-through systems, sensors, quality control, data handling)*

3.1.2: *Best practice of FB systems (flow-through system, sensors, operation procedures, antifouling, control mechanisms, data handling)*

3.1.3: *Harmonization and merging quality assessed data from FB systems in ROOS regions*

3.1.4: *Test and integration of new sensors and best practices (tightly linked to WP10).*

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GA, Crete Oct 2012, WP3 Status

WP 3:

STATUS TASK 3.1 FERRYBOX (FB) (responsible David Hydes):

Task 3.1 FerryBox:

- 1st JERICO FerryBox workshop (30-31 August 2011 at HZG)
- Review current status FerryBox (T 3.1.1):
  - 1st Version of questionnaire circulated in August 2011
  - 2nd Version (with extra columns regarding WP4) circulated in January 2012
- Report of 1st JERICO FerryBox workshop (distributed Nov. 2011)
- Best practice of FB systems (T 3.1.2): already discussed in 1st workshop, will be continued in best practice WS in Crete (Oct 2012)

- ***Deliverable:***
- ***D 3.1. Report on current status of FerryBox***

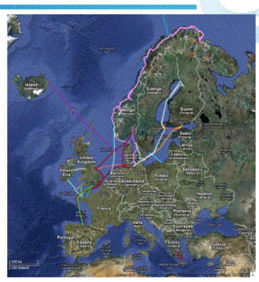
GA, Crete Oct 2012, WP3 Status - 6

WP3: Harmonizing technological aspects

Task 3.1. Ferryboxes

Joint European Research Infrastructure network for Coastal Observatories

Report on current status of Ferrybox
D 3.1



www.ferrybox.org

GA, Crete Oct 2012, WP3 Status - 7

D 3.1 Report on current status of FerryBoxes
Content:

Institution	Destination harbours	Name of platform	Observed parameters	Ship type	Shipping Company & website		public awareness website
BCCR, UiB	**Amsterdam - Bergen**	M/S Trans Carrier	pCO2, T, S, Trb, Chl-a, pH	cargo ship	Sea Cargo	http://www.sea-cargo.no	
HCMR	**Piraeus-Heraklion**	Olympic Champion	T, S, Trb, Chl-a, DO, pH	car/passenger ferry	Anek Lines		www.poseidon.hcmr.g
HZG	**Cuxhaven - Harwich**	Duchess of Scandinavia	T, S, DO, Chl-a, pH, Trb, nutrients	car/passenger ferry	DFDS A/S	http://www.dfdsseaways	www.cosyna.de
HZG	**Cuxhaven - Immingham**	TorDania	T, S, DO, Chl-a, pH, Trb, nutrients	Ro/Ro-ship	DFDS TorLine	http://www.dfdstorline.c	www.cosyna.de
HZG	**Moss-Cuxhaven-Hamburg-Chatham-Bilbao-Immingham**	LysBris	T, S, DO, Chl-a, pH, Trb, nutrients	cargo ship	DFDS Lys Line	http://www.lysline.com	www.cosyna.de
HZG	**Büsum - Helgoland**	MS Funny Girl	T, S, DO, Chl-a, pH, Trb	passenger ship	Reederei Cassen Eils	http://www.Helgolandrei	www.cosyna.de
HZG	**Cuxhaven- Helgoland**	MS FunnyGirl	T, S, DO, Chl-a, pH, Trb	passenger ship	Reederei Cassen Eils	http://www.Helgolandrei	www.cosyna.de
Ifremer	**Portsmouth-Santander-Plymouth-Roscoff-Cork**	Pont-Aven	T, S, DO, chl-a, Trb, CDOM	car/passenger ferry	Brittany Ferries	http://www.brittany-ferries.co.uk	
IMGW	**Gdynia – Karlskrona**	Stena Baltica	T, S, Trb, Chl-a, DO	car/passenger ferry	Stena Line	http://www.stenaline.se	
IMR	**Bergen-Kirkenes**	MS Vesterålen	T,S, Chl-a fluorescence	car/passenger ferry	Hurtigruten Group	http://www.hurtigruten.c	
IMR	**Norwegian West Coast (Bergen)**	KV TOR	T,S, Oxygen	Coast Watch ship	Coast Watch Norway	http://mil.no/Pages/default.aspx#2	

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QUESTIONNAIRE FB EQUIPMENT I

Operator:	HZG	HZG	HZG	HZG						
Ships	Tor Dania (TD)	LysBris (LB)	FunnyGirl (FG)	FunnyGirl (FG)						
Company										
Routes	Cuxhaven - Immingham	Norway, Germany, England, Spain	Helgoland-Büsum	Helgoland-Cuxhaven						
Frequency	5 per week	fortnightly	daily (summer)	daily (winter)						
Parameter	Measurement principle	Sensor	Manufacturer	Unit	Detection range	Accuracy	Resolution	Typical obs. Range (min. - max.)	Maintenance procedure	Maintenance interval
Water temperature	PT100	EXCELL TSG PT100	FSI (USA)	°C		0.1	0.01	2 – 25	cleaning, calibration check	yearly
conductivity	inductively	EXCELL TSG	FSI (USA)	ms/cm	0 – 50 psu	0.02	0.001	10 – 36 psu	cleaning, calibration check	6-monthly
Turbidity	light scattering (red)	CUS31-W2A	Endress & Hauser (Germany)	FTU	0 – 999	10%	0.001		cleaning, calibration check	monthly
Turbidity	light scattering (blue)	Scufa II	Turner design (USA)	NTU	0 – 50	tba	0.05	-	cleaning, calibration check	monthly
dissolved oxygen	Clark electrode	COS4-2	Endress & Hauser (Germany)	mg/l	0 – 20	0.2% F.S.	0.2 % F.S.	8 – 15	cleaning,calibration check	monthly
dissolved oxygen	dynamic luminescence quenching	Oxygen Optode 3830	Aanderaa	micro-Moles/l	0 - 500	<8uM or 5%	<1% or 0.4 %	200-400	cleaning,calibration check	monthly
pCO2	membran system, NDIR detection	HydroC CO2	Contros	ppm	0-1000			100-1000	recalibration	6-monthly
pH	pH-electrode (gel)	CPS11	Endress & Hauser (Germany)		0-12	0.05	0.01	7.5 – 9.0	cleaning, calibration check	monthly
pH	pH-electrode (gel)	EGA140 SMEK	Meinsberg (Germany)		0-12	0.05	0.01	7.5 – 9.0	cleaning,calibration check	monthly
chlorophyll-a	fluorescence	Scufa II	Turner design (USA)	µg/l	0 – 200	tba	0.5	0.5 – 35	cleaning, calibration check	monthly
algae groups (chlorophyll-a)	fluorescence (excitation at different wavelengths)	Algal-Online-Analyser(AOA)r	bbe-moldaenke (Germany)		1 – 200	0.1	0.5	depends on algae group	cleaning, calibration check	yearly
CDOM	fluorometric	Cyclops 7	Turner design (USA)	ppb QS	0.4-2500		0.1	0-3	cleaning	monthly

CEFAS | CNRS_INSU | HCMR | HZG | IMR_1 | IMR_2 | NIVA | NOCS GB_ES | SMHI SE_Fi_De | SYKE Fi_De

WP 3.2 GLIDER TASKS:

3.2.1: *Review current status of glider operation in Europe*

3.2.2: *Define the best technical practices for operation a fleet of glider*

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WP 3:

STATUS TASK 3.2 GLIDERS (GL) (responsible Simon Ruiz):

- *Workshop on gliders (together with EU project GROOM* and EGO** (Ma 2012) define the best technical practices (T 3.2.2)*

Deliverable:

D 3.2. Report on current status of gliders observatories within Europe (M15 Jul 2012 postponed to M24?)
first draft mid of October 2012

* GROOM: Gliders for Research, Ocean Observation and Management, Start Oct 2011, Duration 36 months

** EGO: Everyone's Glider Observatories

Minutes of Joint GROOM-JERICO meeting
22-23 May 2012, Palma de Mallorca

Session 1. Review of present/future needs for gliders in Europe Chair Elena Mauri, Reiner Onken.
1.1 Scientific challenges: key hot topics, long term monitoring
1.2 Environmental challenges: MSFD/ GES, emergency response
1.3 Gliders as a new component of a European Ocean Observing System

Session 2: Review of existing glider facilities and technology Chair Alberto Alvarez and Lucas Merckelbach
2.1 Gliders: existing platforms and sensors
2.2 Workshops: ballasting, repairing, pressure testing
2.3 Ground segments: computer infrastructures (glider communications, data processing)
2.4 Calibration facilities
2.5 Coastal Ships

Session 3. Review best practices in glider operations (one glider/fleet) Chair: Laurent Beguery, Carlos Barrera
3.1 Glider platforms and sensors in the laboratory - *Lucas Merckelbach*
3.2 Glider Mission – Alberto Alvarez
3.3 Glider Data Management - Sylvia Pouliquen

Session 4. Recommendations for glider contributions to a European Coastal Observatories
4.1 Science: key topics to be addressed using gliders (Matthew Palmer)
4.2 Technology: future directions, operations, sensors, platforms and support (Pierre Testor)
4.3 Society: contributions to: European Marine Policy, emergency response, etc.
4.4 Coordination: glider contribution to a European Coastal Observatory Strategy

WP 3.3 FIXED PLATFORM (FP) TASKS:

***3.3.1:** Review of the current status of all existing fixed observing sites*

***3.3.2:** Workshop to identify elements of fixed platform technology which clearly represent best practice*

***3.3.3:** Harmonization and merging quality assessed data from fixed platform systems in ROOSes*

***3.3.4:** Comparison of new sensors and assessment of their applicability for fixed stations <-> WP 10*

Deliverable:

D 3.3: Review of current marine fixed instrumentation (M21 = Jan 2013)

WP 3:
STATUS TASK 3.3
FIXED PLATFORMS (FP) (responsible Rodney Forster (CEFAS):

- *Review of the current status of all existing fixed observing sites (T 3.3.1)*
  questionnaire about used platform within JERICO (started by HZG with input from EDIOS database)
- *Fixed Platforms (FP) workshop (T 3.3.2)*
  (29th February – 2nd March 2012 in Rome organized by Stefania (CNR))
- *Harmonization and merging quality assessed data from fixed platform (T 3.3.3)*
  harmonise the outputs of fixed platforms with other systems such as FerryBox.
  The test sites for this will be the North Sea (Cefas, HZG, Ifremer) and Adriatic (CNR).
- *Comparison of new sensors and assessment for FPs (T 3.3.4)*
  in conjunction with WP 10 (first short WS Marche 2012 in Rome organized by Glenn)

Task 3.2 Overview Fixed Platforms in Europe

waves

phys. & biol.

sealevel

Actions within WP3 (outcome from FP Meeting in Rome):

- Fixed platforms questionnaire:
  add more details (e.g. system downtime, platform manufacturers, sensor manufactures, hidden costs, impact of the platform on data quality)
- Deliverable 3.3.1
  description of platforms used, review of running experiences, gathering information on equipment and onboard sensors

WP 3:

FURTHER DELIVERABLES

- D 3.4. Report on new sensor developments (M36 = May 2014)
- D 3.5. Conclusion report (M42 = Oct 2014)

PARIS – Maison de la recherche - 24 & 25 May 2011

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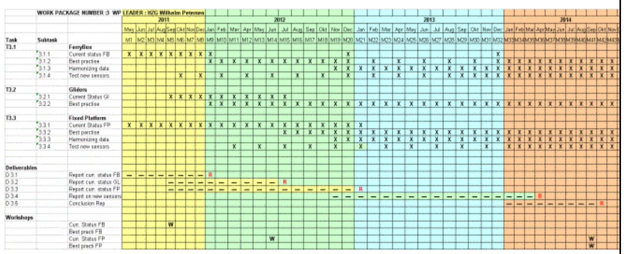
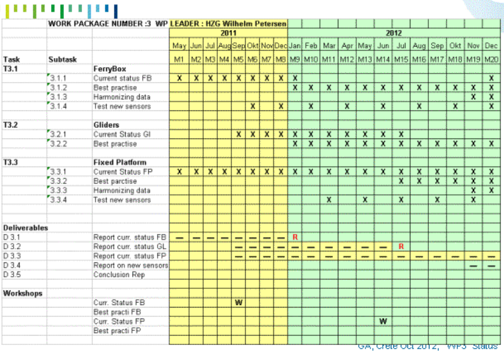
WP3: TIME TABLE FOR THE ENTIRE PROJECT



GA, Crete Oct 2012, WP3 Status

WP3: TIME TABLE UNTIL 2012



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Summary

- Tasks:
  - All tasks are more or less in schedule:
  - FP: questionaire has to be updated and completed with a questionaire about instrumentation
    - Rodney: The information of all slides of best practice of the partners will be combined with the Cefas task of collating all existing knowledge of the locations and designs of fixed platforms into one single report. We will have a draft version of this report ready by the middle of November to be circulated to all the relevant partners.
  - GL: report of WS + questionaire ➔ Deliverable D.3.2 Report on status of gliders observatories within Europe
- Deliverables:
  - D 3.1 (FerryBox) completed
  - D 3.2 (glider) in preparation (postponed to M24 = May2013)
- T

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WP3: NEXT STEPS:

- Completion of the reports on currents status of the FP and GL including the two outstanding deliverables
- after the surveys about the current status of the different platforms focus will be on:
  - elaboration of best practise for different platforms
  - elaboration of clear recommendations for best practise
  - common agreements about QA and data handling including flagging (←→ WP4)
- Testing and reporting the application of new sensors on different platforms

Recent next step:

- ➔ „Best practise" WS on Thursday and Friday

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WP3: PERSONAL MONTH PER PARTNER

Person-Months per Participant

Participant number [10]	Participant short name [11]	Person-months per participant
1	IFREMER	2.00
2	SYKE	4.00
3	IBWPAN	6.00
5	NIVA	5.00
8	OGS	4.00
9	CNR	7.00
11	HCMR	8.00
12	NERC	13.00
14	HZG	16.00
15	MUMM	3.00
16	CEFAS	8.00
17	SMHI	4.00
18	CSIC	5.50
20	MI	2.00
22	TECNALIA-AZTI	3.70
23	INSU/CNRS	7.00
26	PUERTOS	6.50
	Total	104.70

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5.2.6. WP4: Harmonizing operation and maintenance methods, by G. Petihakis (HCMR)

Slides are presented in the next pages.

Aims of the calibration objectives:

a) Enlarge the community of in-house calibration facilities

b) Promote the adoption of accreditation for the calibration, and in general work more on the Quality Standards issues.

c) Homogenize calibration approaches as much as possible.

d) Sharing of facilities and common training of technical staff – JERICO WS & TNA's.

e) Calibration workshop, including DO Optode sensors. – SeaTech Week.

f) Set up a permanent calibration working group. Identify key nodes as reference for calibrating specific type of sensors. This will help in reducing costs. – Milestone.

✓ A common workshop in SYKE was organised on the 9th of February for optical sensors.

✓ A second workshop is organised in IFREMER during SeaTech week

Aims of the bio-fouling objectives:

a) Describe the methods across the network (through a questionnaire).

b) Share best practices and methodologies through a "Biofouling Monitoring Programme" BMP.

c) Evaluate new methods.

Aims of E2E QA objectives:

a) To describe best practices in all phases of the system (pre-deployment test, maintenance, calibration etc).

b) To adopt common methodologies and protocols.

c) To move towards the harmonisation of equipment, which will help in reducing maintenance and calibration costs. For this inter calibration tests and in-situ validation will be organised.

d) Running Costs.

The next deliverable D4.1 "Report on existing facilities", with the capacity to handle pressure, temperature, salinity and dissolved oxygen calibrations amongst the active coastal observing networks HZG (M18), will be postponed to the end of December. The report will be based on results collected from questionnaires such as HZG has done for the ferrybox report on existing facilities.

Some key points and discussions:

- G. Nolan: How many reference calibrations facilities are available?
    - G.Petihakis: We have some reference labs within the network: for instance IFREMER and OGS operate reference calibration labs on particular parameters and could calibrate the reference sensors of other partners. We need to identify partners which can be reference calibrating facilities.

- We have to examine the possibility to organize a calibration workshop to train staff with a sharing of facilities and common training of technical staff by partners such as SYKE for optical sensors or Ifremer for dissolved oxygen.
- To set up a permanent Calibration Working Group within JERICO partners.

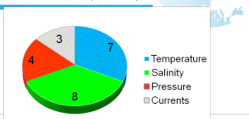
- L. Delauney concerning the BMB (Biofouling Monitoring Programme) experiments who is managing?
  - M. Faimali (CNR) will organise it and the thought is to ask partners if they are interested to participate. Once experimental sites (fixed platforms) are identified he will prepare and send the material (documents and slates) explaining the whole procedure. Partners will have to place the slate and photograph it at their installation at both beginning and end of the experiment. Then they will conserve it and send it to M. Faimali for analysis.
  - Following this discussion, the partners were asked how many of them are interested and 8 expressed their interest.
- It is requested to continue to feed the best practices documents after the workshops on the project website. This is very important since it will act as a reference material to partners.
- It is requested to develop links with Emodnet for physical parameters (biogeochemical parameters are archived).
- It is requested to establish links with the wider glider community and Groom. Pierre Testor's email will be added in the WP4 mail list so all the information within the WP4 community will be shared.
- It is requested that the presentations of the gliders WS in Palma in May will be uploaded in the website under WP4 tab.
- Calibration experiments are done through manufacturers or calibration facilities?
  - OGS and Ifremer can calibrate reference sensors. We need to identify partners, which can be reference calibrating facilities.
- Coordinator would require deliverable to be ready at the end of October but a lot of information and material have to be integrated. **It is agreed that it will be delivered at the latest before Christmas.**

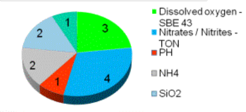
TASK 4.1 CALIBRATION – OBJECTIVES (HZG)

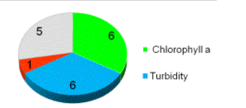
1. Harmonization of calibration practices through documentation and assessment of existing calibration methodologies

✓Questionnaire to collect all information available within JERICO, → assessment → Report on Existing Facilities (M18 – HZG).

- ✓ Only 6 out of 15 partners operate a dedicated calibration facility.
- ✓ Some of the rest perform calibration experiments for some parameters.
- ✓ A large amount of money is spent to have sensors calibrated by the manufacturer.







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Physical sensors calibrated by manufacturer

	MI	CNR (total)	OGS	IH	AZTI	Cefas	CSIC	PUERTOS	NOCS	SYKE	SMHI	HZG
Temperature	✓	✓			✓		✓	✓	✓	✓	✓	✓
Conductivity (Salinity)	✓	✓			✓		✓	✓	✓	✓	✓	✓
Dissolved Oxygen	✓	✓	✓	✓			✓		✓		✓	✓
Water Currents	✓		✓	✓	✓	✓		✓			✓	
Pressure	✓	✓	✓		✓	✓	✓		✓			

Optical sensors calibrated by manufacturer

	MI	CNR (total)	OGS	IH	CSIC	IFREMER	NOCS	SMHI	HZG
Chlorophyll a	✓		✓	✓	✓			✓	
Turbidity	✓	✓	✓	✓	✓		✓	✓	
PAR	✓			✓		✓		✓	
Dissolved Oxygen	✓	✓	✓	✓	✓		✓	✓	✓

Chemical sensors calibrated by manufacturer.
There are only a few: Conrtos CO2, Analyzers, SBE 43 and PH sensors with no regular calibration intervals.

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RESULTS - OVERVIEW

Organization and responsibility:
- ◆ *40% of them possess a well-defined organizational framework with dedicated staff*
- ◆ *60% declare a transparent chain of responsibility for management, technical / scientific and operational decisions.*

Funding:
- ◆ *73% have both internal funding (Institute/Center) and external funding (projects).*
- ◆ *40% without a constant funding*
- ◆ *47% of answers declare to have a separate budget for upgrading or acquiring new instrumentation.*

Quality standards:
- ◆ *46% adopts Quality Management Standards and Good Laboratory Practices*
- ◆ *67% doesn't possess any kind of accreditation of the calibration and doesn't endorse a policy of continual **training of personnel** involved.*

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RESULTS – OVERVIEW (CONT..)

Documentation:
- ◆ *40% maintain a documented in-house Quality Assurance Program & control charts*
- ◆ *87% maintain a formal quality manual,*
- ◆ *67% assure an effective traceability chain to primary standards or to conventionally accepted reference material.*

Accuracy:
- ◆ *53% do not furnish uncertainty estimations for their calibration systems*
- ◆ *60% don't have links with the National Metrology Institutes*

Calibration practices:
- ◆ *Most of partners send their sensors to manufacturer for calibration. This is an expensive practice, since most of the manufactures are in the USA.*

Budget (for calibration activity):
- ◆ *Wide variability from few thousands to some tens of thousands.*

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AIMS / TARGETS / FUTURE ACTIONS

- ✓ *Enlarge the community of in-house calibration facilities*
- ✓ *Promote the adoption of accreditation for the calibration, and in general work more on the Quality Standards issues*
- ✓ *Homogenize calibration approaches as much as possible*
  - ✓ *Sharing of facilities and common training of technical staff – JERICO WS & TNA's*
  - ✓ *Calibration workshop, including DO Optode sensors. – SeaTech Week*
  - ✓ *On the JERICO web-site / WP4 tab people can upload/download manuals.*
  - ✓ *All the completed questionnaires and the attached manuals are available on the JERICO web-site*
- ✓ *Set up a permanent calibration working group. Identify key nodes as reference for calibrating specific type of sensors. This will help in reducing costs. – **Milestone***

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TASK 4.1 CALIBRATION – OBJECTIVES (CONT..)

2. Sharing of calibration facilities

✓A common workshop in SYKE was organised on the 9th of February for optical sensors.

✓A second workshop is organised in IFREMER during SeaTech week

✓TNA

✓More???

3. Best practices, dissemination of know-how

✓Questionnaire

✓Meetings in the framework of the three platform WS's (Hamburg, Rome and Palma)

✓Drafting a calibration best practice report is on going having identified key persons during the Rome workshop.

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TASK 4.2 BIOFOULING – OBJECTIVES (CNR)

1. To describe all different methods used across the network with reference to the cost (implementation, maintenance) and adaptability (different sensors and areas)

✓Questionnaire to collect all information available within JERICO, **(Marco Faimali and Ilva Trentin - ISMAR-CNR)**

→ which are the most reliable sensors

→ to describe and evaluate different methods

The answers to the biofouling questionnaire, the first general (Part A) and the second specific for each type of sensor used by the partners (Part B), were collected and integrated into several summary charts.

CNR will produce a report for the critical analysis of the responses by the end of January 2013.

Some of the evidence emerging in a preliminary analysis of the responses are summarized in the following slides.

PRELIMINARY RESULTS

- 100% of the partners use physical sensors ..... almost 60% using optical sensors and <30% use chemical sensors.
- 100% of the partners think that biofouling is a serious problem
- 60% of the partners use only **passive** anti-biofouling systems (mechanical device and uncontrolled biocide generation systems).
- 60% of partners have a minimum maintenance-free duty cycles furnished with an anti-biofouling system less than 6 months.
- 70% of partners said they did not detect any differences in the extensions/distribution of the different types of biofouling (biofilm/slime, hard-fouling, soft-fouling) in relation to the depths at which sensors are placed.
- 70% of partners are able to detect differences in relation to the season of the year (spring and summer seem to be the most problematic).

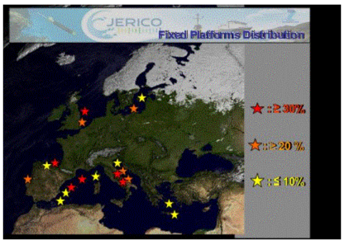
PRELIMINARY RESULTS (CONT..)

The percentage of total costs associated with the biofouling of all partners is:

✓50 % percent of the partners does not exceed 10 percent of total costs

✓40% percent shows values greater than or equal to 20 percent

✓11% percent has costs which exceed 30% percent that in some cases can reach the 50% percent



PRELIMINARY RESULTS (CONT..)

- ✓ but the answers most interesting are those which concern the description of biofouling oganisms… ..in general partners almost always do not know in detail the phenomenon of biofouling and its organisms.
- ✓ 100% of the partners to the question "*are there any types of organisms that, while not directly involved in the kind of biofouling you have indicated as the major problem for the sensing element/window/area of your sensor(s) or sensor system(s), can contribute significantly to the overall deterioration in instrument performances?*" reported only "**biofouling organisms**"!!!
- ✓ 63% of the partners did not give annual costs requested in question n° 16 ***This is unusual, and we think that will be necessary to repeat the question!***

TASK 4.2 BIOFOULING - OBJECTIVES

2. To share best practices and methodologies

-Platform workshops and Questionnaires will contribute to define Best Practices

-Especially during the Rome workshop biofouling was extensively discussed and couple of actions were taken:

- We have identify the key persons within the consortium
- To setup a common biofouling experiment.

BIOFOULING MONITORING PROGRAM - BMP

(MARCO FAIMALI – CNR)

1. Proposal for a protocol for a shared biofouling monitoring experiment:
2. selection of partners and monitoring sites along a geographical gradient (max 6)
3. for each selected site define two sampling stations (open water and coastal water)
4. ISMAR-CNR prepare and send a special sampling system (Biofouling Monitoring Box - BMB) for each partner and for each site by January 2013. The BMB is a specifically monitoring device designed to provide substrates with spatial and structural heterogeneity can simulate the complexity of the sensors and housing/container
5. each selected partner will immerse the system (BMB) close to the sensors of reference for this study

BMP (CONT…)

6. each partner at least every 2 months will photograph the different parts of the BMB and simultaneously the different part of sensor (CNR will produce a document of instructions dedicated to the methodology for taking the photographs before January 2013).

7. after 12 months each partner will ship the two BMBs to ISMAR laboratory after appropriate conservation treatment.

8. ISMAR-CNR will analyze all seasonal images and final BMB using appropriate techniques for the characterization of biofouling (see the last slide)

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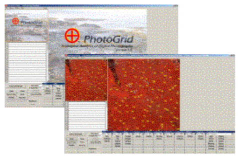
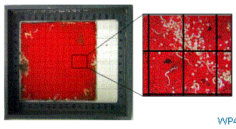
BMP (CONT…)

Biofouling Characterization (by a degree thesis)

Periodic photographic digital images analysis with the software Photogrid



Stereomicroscope analysis with Dethier method of different part of BMB



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TASK 4.2 BIOFOULING - OBJECTIVES

3. To evaluate new methods used by the community external to JERICO

✓This will be done mainly during Platform workshops and the upcoming Forum for Coastal Technology (FCT).

✓Update on Review of biofouling methods vs sensors (literature, BRIMOM project), focus on new methods (Marco Faimali - CNR and Laurent Dealuney – IFREMER).

- ✓ The literature review is continuing and soon we will start the process of integration of the collected information and share a strategy for analyzing the results.

- ✓ The access to BRIMOM project documentation is restricted and only a report on in situ test can be used (BRIMOM WP4, Leader L. Delauney). The related information will be integrated with the literature review after specific acceptation by L. Delauney.

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UPDATE ON REVIEW OF BIOFOULING METHODS VS SENSORS (LITERATURE, BRIMOM PROJECT), FOCUS ON NEW METHODS (*MARCO FAIMALI - CNR AND LAURENT DEALUNEY – IFREMER*) (CONT…)

✓Related information will be integrated with the literature review Results from the survey on Dissolved Oxygen sensors vs biofouling will be presented at the Best Practices Workshop on October 4th by Carolina Cantoni.

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TASK 4.3 E2E QA - OBJECTIVES

1. To describe best practices in all phases of the system (pre-deployment test, maintenance, calibration etc)

-Best practices are discussed during the workshops. If necessary a questionnaire will also be prepared for FB and FP – Glider questionnaire includes best practice issues. As mentioned on the preparatory meeting on Monday, during the workshop we will try to define a team for each platform with a key person which will undertake the job of collecting info and start drafting the document.

2. To adopt common methodologies and protocols

- These are discussed during the workshops and they will result from 1.

3. To move towards the harmonisation of equipment which will help in reducing maintenance and calibration costs. For this inter calibration tests and in-situ validation will be organised

-Partners have to discuss about this during this WS but again this is a future issue which will be accomplished towards the end of the project

4. Running Costs

- A spreadsheet/questionnaire has been prepared and distributed to the partners

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DELIVERABLES & MILESTONE

D4.1 Report on existing facilities with the capacity to handle pressure, temperature, salinity and dissolved oxygen calibrations amongst the active coastal observing networks **HZG** (M18)

D4.2 Report on calibration best practices for the different Sensors **HZG** (M36)

D4.3 Report on biofouling prevention methods **CNR** (M36)

D4.4 Report on best practice in conducting operations and maintaining of different systems **HCMR** (M42)

D4.5 Report on running costs of observing systems **CEFAS** (M42)

***MS15** Constitution of a permanent Working Group within JERICO for Calibration Activities **HCMR** (M30)*

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5.2.7. *WP5: Data management and distribution; by C. Fanara (OGS)*

Slides are presented in the next pages.

WP5 has provided a Data Management handbook. The document aims to be the key tool for harmonizing real time and delayed mode data management for in situ data collection and for providing practical advice to JERICO community in data delivery. It is structured as follows:

CONTENT

DOCUMENT DESCRIPTION

SUMMARY AND INTRODUCTION

MAIN REPORT

3.1 Common Standards

3.2 JERICO Real Time Data Management Procedures

3.3 JERICO Delayed Mode Data Management Procedures

CONCLUSIONS

This document was split into 2 handbooks, one for RT (Real Time) mode, the other for DM (Delayed Mode), in order to deliver the 2 planned deliverables D5.1 and D5.2.

The documentation describing the state of art for uncertainties in measurements is completed for temperature and is going on for the other parameters.

The data management tools available are:

- MIKADO is the software tool used for generating CDI entries (XML files) for SDN catalogues :

EDIOS – Permanent Ocean Observing System

EDMERP - Marine Environmental Research Projects

EDMED - Marine Environmental Data sets

CSR - Cruise Summary Reports

CDI - Common Data Index

- NEMO is a reformative software used to convert ASCII text file of vertical profiles, time-series or trajectories to the ASCII common format (MEDATLAS or ODV) which are defined as SeaDataNet formats for data exchange.

<u>Some key points and discussions</u>:

-H. Wehde: why do we need to be a MyOcean user to get JERICO Data, it is not normal, we have the GOOS, ROOS data portal?

-C. Fanara : we do use the ROOS portal.

WP5 DATA MANAGEMENT & DISTRIBUTION: MAIN GOAL

- ✓ The main goal is to design the JERICO Data Flow and Management infrastructure based on the implementation of an end-to-end 'open and free' conduit from data to users and upon the guidelines proposed in the GOOS Report 148 (2005).
- ✓ The implementation will be consistent and complementary with the major European initiatives for the establishment and coordination of infrastructures for the management and distribution of data and products in Europe which can use JERICO data (SeaDataNet, EuroGOOS Regional Centres, MyOcean).

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WP5 DATA MANAGEMENT & DISTRIBUTION: STRUCTURE

JERICO will need to ensure that the flow of real-time and delayed mode data will be **reliable**, **accessible** and **easy to distribute**.

Structure: three tasks that will focus on:

1. *Creating value for measured data: from raw data issued from the sensors to validated data stored and marked.*
2. *Facilitating data and meta-data flow to existing data repository infrastructures (SeaDataNet).*
3. *Helping in delivering real-time JERICO data to ROOSes and My Ocean systems.*

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WP5 DATA MANAGEMENT & DISTRIBUTION: *what is important…*

Integration of existing and new data sets using the structure already available:

- ✓ SDN for delayed mode
- ✓ GMES / MYOCEAN for near real time

NO NEED TO DEVELOP A SPECIFIC DATA MANAGEMENT STRUCTURE FOR JERICO !!!

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TASK 5.1 QUALITY ASSURANCE: CREATE VALUE FOR MEASURED DATA

- Task responsible: OGS
- Partners: HCMR
- Duration M1-M42
- The aim of this task is to develop common procedures for assigning uncertainties to measured parameters and add value to observations within JERICO.
- By definition, the "expected" accuracy associated with an observation is an attribute of the measurement chain that produces it.

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TASK 5.1 QUALITY ASSURANCE: OBJECTIVES

This is accomplished by:

- ✓ Collecting pre-existing knowledge regarding the key identified sensors and critically revising the state-of-art literature on in lab and in situ performances of the most popular sensors (in conjunction with WP4).
- ✓ Defining procedures for ascribing a total uncertainty to measurements that will account for the actual circumstances and conditions under which the measurements were taken.
- ✓ Testing and verifying uncertainty computational procedures.

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TASK 5.1 QUALITY ASSURANCE: METHODOLOGY

- ✓ All the relevant assessments carried out in WP4 will be included as basic information for the combined uncertainty estimation.
- ✓ The variables temperature, salinity and fluorescence/chlorophyll will be considered at first.
- ✓ WP4.1 will provide an updated summary of these achievements to WP5.1, no later than the dates set down in the WP4 D4.2 delivery schedule (M14)
- ✓ A novel model of a-priori uncertainty will be proposed as a sum of fixed and time-dependent sources of error and uncertainty (precision and accuracy, drifts, experimental uncertainties, the representativity error, etc.)

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TASK 5.1 QUALITY ASSURANCE: ADVANCEMENTS

- A documentation regarding the state-of-the-art uncertainty measurement methodology was completed for temperature and is ongoing for the other variables.
- The definition of procedures for ascribing a total uncertainty to measurements started and is still in progress.
- The WP4.1 is about to provide an updated input on the sensor uncertainties relevant to WP5.

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TASK 5.2 HARMONIZATION OF DELAYED MODE DATA MANAGEMENT PROCEDURES WITH SEADATANET

- Task leader: IFREMER,
- Partners: HCMR, MUMM, OGS
- Duration: M1-M42
- This task will define, establish and oversee the data management infrastructure for dealing with delayed-mode data in JERICO.
- The goal is to provide JERICO users with relevant information for seamless data integration with the EU SEADATANET initiative.

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TASK 5.2 METADATA IMPLEMENTATION

Discovery metadata:

- *To let all know what have been deployed during the project* *(where, what, how, who…)*
- *To help to retrieve data related to Observatories*
- *To be compliant with European directives (INSPIRE)*

Enabling technology:

- *Use of SeaDataNet EDIOS directory to describe Observatories*
- *Typing / Generation of metadata using SeaDataNet procedures and tools*

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TASK 5.3 HARMONIZATION OF REAL-TIME DATA MANAGEMENT PROCEDURES WITH MYOCEAN/EUROGOOS

+ Task leader: IFREMER,
+ Partners: CNR, NIVA, IMR, CMR,PUERTO, SMHI
+ Duration: M1-M42
+ This task will define, establish and oversee the data management infrastructure for dealing with real-time data in JERICO.
+ The goal is to provide for seamless data integration with the EuroGOOS and EU Marine Core Service's MyOcean component and in order to render JERICO real-time data accessible for use in generating downstream services and products.

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TASK 5.3 IMPLEMENTATION

- ✓ Real-Time Quality check based on EuroGOOS/MyOcean procedure that would need to be extended to new parameters whenever possible
- ✓ Uniform file format (based on OceanSites NetCDF, compatibility with CF convention)
- ✓ FTP file server (with an index file) per Region
- ✓ Oceanotron (OpenDap protocol) for direct access by remote software

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WP5 DELIVERABLES & MILESTONES

Deliverable Number [61]	Deliverable Title	Lead beneficiary number	Estimated indicative person-months	Nature [62]	Dissemination level [63]	Delivery date [64]
D5.1	DM data management handbook V1	1	6.00	R	PU	8
D5.2	RT data management handbook V1	1	6.00	R	PU	8
D5.3	First data management report	8	6.00	R	PU	24
D5.4	Guidelines for uncertainty	8	6.00	R	PU	30
D5.5	Report on uncertainty	8	6.10	R	PU	42
D5.6	DM data management handbook V2	8	6.00	R	PU	48
D5.7	Second data management report	8	10.00	R	PU	48
D5.8	RT data management handbook RT V2	8	6.00	R	PU	48

Milestone number [59]	Milestone name	Lead beneficiary number	Delivery date from Annex I [60]	Comments
MS16	First JERICO management Handbook	8	8	Handbook
MS17	Launch of service access	8	18	Call
MS18	Report on activities	8	46	Final report
MS19	Final JERICO management Handbook	8	48	Handbook

JERICO

WP5 OVERVIEW OF THE DATA MANAGEMENT HANDBOOK

The document aims to be the key tool for harmonizing real time and delayed mode data management for in situ data collection and for providing practical advice to JERICO community in data delivery.

CONTENT

1. DOCUMENT DESCRIPTION

2. SUMMARY AND INTRODUCTION

3. MAIN REPORT

3.1 Common Standards

3.2 JERICO Real Time Data Management Procedures

3.3 JERICO Delayed Mode Data Management Procedures

4. CONCLUSIONS

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WP5 DATA MANAGEMENT HANDBOOK: COMMON STANDARDS

Common vocabularies and meta-databases

The Metadata management in JERICO will rely on the metadata directories at European level developed in the framework of SeaDataNet EU-FP7 infrastructure project.

These metadata directories will be used to describe:

- **JERICO project (EDMERP)**
- **Research organization involved in JERICO (EDMO)**
- **JERICO marine environmental data sets (EDMED)**
- **Cruises conducted for JERICO deployments (CSR)** *(if relevant)*
- **JERICO platforms (EDIOS)**

Populating Metadata directories will be done using the Mikado tool software

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WP5 DATA MANAGEMENT HANDBOOK: COMMON STANDARDS

JERICO data will be distributed using the EUROGOOS recommended formats: ODV and OceanSites NetCDF.

Common data formats adopted in JERICO are described in line with data formats adopted within SeaDataNet and MyOcean projects. Data may be provided using alternatively:

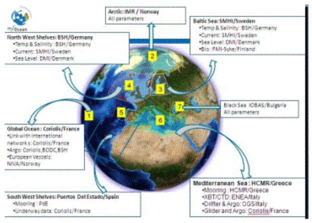
- **Ocean Data View spread sheet format (ASCII flat file)**
- **NetCDF format using CF convention**
- **Medatlas format** *(optionally, but deprecated)*

WP5 DATA MANAGEMENT HANDBOOK: REAL TIME DATA MANAGEMENT PROCEDURES

JERICO data providers can provide real time data to JERICO data management system through MyOcean using the Global Centre (Coriolis) or the 6 EUROGOOS regional in-situ centres.

A new data provider has to contact the ROOS portal manager and provide access to his data via an FTP server. The ROOS portal managers will either handle the management of the JERICO data in their institute or inform the in-situ TAC partners to perform it.

The conversion to common NetCDF format is taken on board by the MyOcean in-situ TAC partners as well as data integration on the portal.



WP5 DATA MANAGEMENT HANDBOOK: REAL TIME DATA MANAGEMENT PROCEDURES

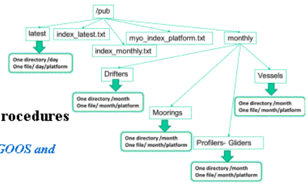
List of ROOS portal managers

Contact	Email	Region
Coriolis data Center Loic Petit de la Villeon Thierry Carval	codac@ifremer.fr loic.petit.de.la.villeon@ifremer.fr thierry.carval@ifremer.fr	*Global and European*
Pierre Jaccard	Pierre.Jaccard@niva.no	*EU Ferrybox*
Leonidas Perivoliotis Dimitris Kassis	lperiv@ath.hcmr.gr dkassis@ath.hcmr.gr	*Mediterranean Sea*
Henning Wehde Sjur Ringheim Lid	Henning.Wehde@imr.no Sjur.Ringheim.Lid@imr.no	*Arctic*
Kai Soetje Tobias Gies	kai.soetje@bsh.de tobias.gies@bsh.de	*NOOS*
Veselka Marinova Asen Stefanov	marinova@io-bas.bg a.stefanov@io-bas.bg	*Black Sea*
Marta de Alfonso	mar@puertos.es	*IBI-ROOS*
Thomas Hammarklint Anders Hartman	thomas.hammarklint@smhi.se anders.hartman@smhi.se	*BOOS*

WP5 DATA MANAGEMENT HANDBOOK: REAL TIME DATA MANAGEMENT PROCEDURES

Common data formats and Real-Time Data portal architecture

There is no requirement on data providers to transform their data into OceanSites NetCDF format as this activity is done by the MyOcean in-situ TAC partners.



Near Real Time Data quality procedures

Documentation available at the EUROGOOS and CORIOLIS Project web sites.

Tools for data access and visualisation

MyOcean web portal: " Products & Services". See the Catalogue for a detailed description of products.

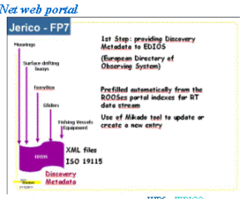
WP5 DATA MANAGEMENT HANDBOOK: DELAYED MODE DATA MANAGEMENT PROCEDURES

JERICO data providers have two possibilities for providing delayed mode data to JERICO data management system

a) By asking the National Oceanographic Data Centre (NODC) of the provider's country for managing, archiving and making access of data acquired during JERICO project. (For the list of Contact Points see http://www.seadatanet.org/Overview/Partners)

b) By interfacing data provider's repository with the SeaDataNet web portal

- *Installation of SeaDataNet download manager*
- *Adoption of JERICO common data formats*
- *Generation of CDI entries*



Data quality control for delayed-mode data

Guideline (V1 and a more recent version V2) of recommended QC procedures, compiled in discussion with IOC, ICES and JCOMM

WP5 DATA MANAGEMENT HANDBOOK: DELAYED MODE DATA MANAGEMENT PROCEDURES

Tools for data access and visualisation

- ***Based upon the Common Data Index service***
- ***Two interfaces available: CDI V2 (meta)data access service QUICK and EXTENDED search***
- ***Registration required***

http://www.seadatanet.org/Data-Access

WP5 DATA MANAGEMENT HANDBOOK: TOOLS

MIKADO is the software tool used for generating CDI entries (XML files) for SDN catalogues

EDIOS – Permanent Ocean Observing System
EDMERP - Marine Environmental Research Projects
EDMED - Marine Environmental Data sets
CSR - Cruise Summary Reports
CDI - Common Data Index

MIKADO software is freely available at:
http://www.seadatanet.org/standards_software/software/mikado

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WP5 DATA MANAGEMENT HANDBOOK: TOOLS

NEMO is a reformatting software used to convert ASCII text file of vertical profiles, time-series or trajectories to the ASCII common format (MEDATLAS or ODV) which are defined as SeaDataNet formats for data exchange.

While converting, NEMO also generates a SeaDataNet CDI Summary (a text file containing the minimum mandatory information needed in the CDI ISO-19115 description).
This file can be converted to an Excel file that can be read by MIKADO to generate the XML CDI files.

NEMO software is freely available at:
http://www.seadatanet.org/standards_software/software/nemo

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WP5 FUTURE ACTIONS

- To formalize collaborations with SDN and EuroGOOS-MyO to permit sharing and exchange of information and ensure more visibility to JERICO Project
- To populate EDMERP by the Coordinator
- To populate EDMO for each Partner *(to be done by NODC upon request)*
- To populate EDIOS and EDMED for each Data Originator

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WP5 SUGGESTED ROADMAP *(FOR WP7)*: REAL-TIME FIRST!

TOP PERIOD: 1 JANUARY 2013

- 15 Oct 2012: definition of the technical requirements by in-situ TAC/CORIOLIS and preliminary agreement
- 1 Nov 2012: first data set download test
- 20 Nov 2012: data set upload on each own provider server with automatic procedures
- 1 Dec 2012: final download test
- 1 Jan 2013: all operational !

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WP5 SUGGESTED ROADMAP *(FOR WP7)*: DELAYED MODE LATER!

TOP PERIOD: 1 JANUARY 2013

- 1 Jan – 31 Dec 2013: first data collection period
- 2013 uptade of catalogues in SDN2, metadata collection
- 30 Jun 2014: first 12 months delivery of SDN data and CDI
- 1 Jan – 31 Dec 2014: second data collection period
- 30 Jun 2015: second 12 months delivery of SDN data and CDI

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5.2.8. *WP7: Service and data access, by L. Petit de la Villéon (Ifremer)*

Slides are presented in the next pages.

The list of infrastructure involved in WP7 is:

Infrastructure n°1 : MOLIT & Mesurho buoys

Infrastructure n°2 : RECOPESCA

Infrastructure n°3 : Alg@line

Infrastructure n°4 : CRS

Infrastructure n°5 : NorFerry

Infrastructure n°6 : Color Fantasy

Infrastructure n°7 : IMR

Infrastructure n°8 : OGS-NACObs

Infrastructure n°9 : OGS-NACObs (MAMBO)

Infrastructure n°10 : CNR - NAMS

Infrastructure n°11 : CNR - FOS

Infrastructures n°12 et n°13 : POSEIDON Observatory

Infrastructure n°14 : NERC/NOCL (COBS)

Infrastructure n°15 : COSYNA

Infrastructure n°16 : SMHI - MOS

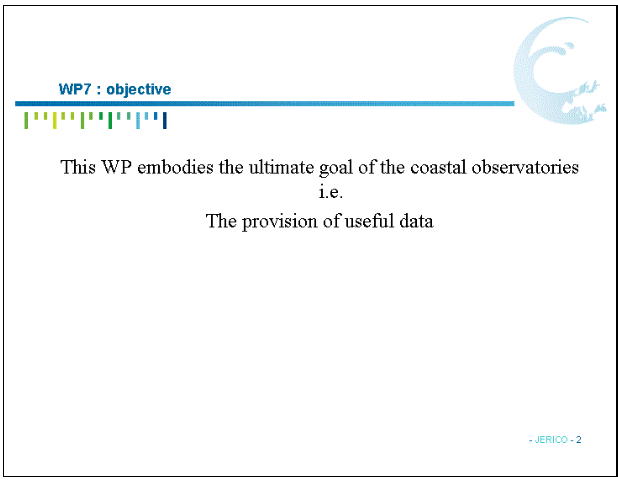
Infrastructure n°17 : SMHI - Laesoe

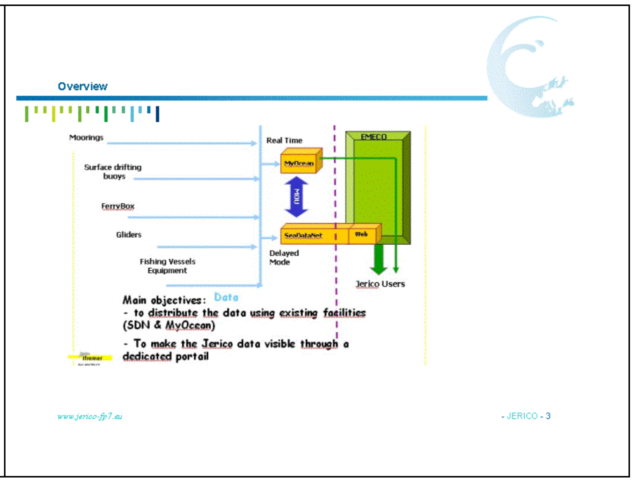
Infrastructure n°18 : SmartBay Galway

Infrastructure n°20 : PdE - DWN

For all these infrastructures we need to have 1 point of contact;

SO PLEASE CONFIRM TO LOÏC WHO IS THIS CONTACT





Many data are yet integrated in MyOcean. For those which are not, please send a dataset to Loïc Petit de la Villéon. In order to know if your data are yet provided or not, please have a look to the next slides.

It is asked to answer to the questions in red and to send a contact name or a dataset.

Data Inventory: 1. Molit & Mesurho buoys

Name of the Infrastructure: MOLIT & Mesurho buoys
Name of Installation: MOLIT & Mesurho buoys
Legal name of organisation: IFREMER
Location of organisation : Brest France

Mesurho
Status of the NRT data flow: in place
1st / last data 01/01/2009 → 06/09/2012
→ OK. Running in NRT

MOLIT
Status of the NRT data flow: in place
03/04/20008 → 06/09/2012
→ OK. Running in NRT

- JERICO - 5

Data Inventory: 2. RECOPESCA

Name of the Infrastructure: RECOPESCA
Name of Installation: RECOPESCA Probes
Short name of Installation: RECOPESCA
Organisation: Ifremer
Location of organisation : Brest France

5 probes
Status of the NRT data flow: in place
1st / last data : 18/12/2007 → 02/09/12

→ OK. Running in NRT

- JERICO - 6

Data Inventory: 3 ALG@LINE

Name of the Infrastructure: ALG@LINE
Name of Installation: ALG@LINE
Short name of Installation: ALG@LINE
Location of organisation : BALTIC
Legal Name of the organisation : SYKE
Localisation of the organisation : Helsinki, Finland

Ferrybox and research vessel

"FINMAID" 10/03/2011→ 06/09/2012 SST & SSS → running in NRT
"SILJA SERENADE" → no data. Contact taken with NIVA
"KRISTINA BRAHE"→ no data. Contact taken with NIVA
"TRANSPAPER" → 25/032010→ 30/08/2012 → running in NRT
"R/V ARANDA" → Historical data only . Need a contact

- JERICO - 7

Data Inventory: 4 CRS Coastal Research Station

Name of the Infrastructure: Coastal Research Station
Name of Installation: CRS
Short name of Installation: CRS
Location of organisation : Lubiatowo, Poland, South Baltic Sea

Parameters :
- hydrodynamic data (wave records)
- temperature
- water quality

Need a contact

- JERICO - 8

Data Inventory: 5 & 6 NorFerry

Name of the Infrastructure: Norwegian FerryBox Network
Name of Installation: NorFerry (1 & 2 & 3)
Location of the installation: Barent Sea, Norwegian Sea, Norh Sea
Short name of Installation: NIVA
Location of organisation : Oslo

M/S NORTBJORN
14/02/2011→ 16/04/2012 T, S, 02 Data Flow : in place
→ OK. Running in NRT

M/S TROLLFJORD
13/02/2011→ 06/09/2012 T, S, 02 Data Flow : in place
→ OK. Running in NRT

M/S BERGENSFJORD
13/02/2011→ 08/01/2012 T, S Data Flow : in place
→ OK. Running in NRT

M/S Color Fantasy
13/02/2011 → 05/09/2012 T, S, 02 Data Flow : in place
→ OK. Running in NRT

- JERICO - 9

Data Inventory: 7 IMR Coast observatories

Name of the Infrastructure: IMR coast observatories
Location of the installation: Norway coast

8 stations
- Ingoy
- Eggum
- Skrova
- Bud
- Sognesjoen
- Ytre Utsira
- Indre Utsria
- Lista

→ Need a contact to set up the data flow

- JERICO - 10

Data Inventory: 8 & 9 OGS-NACOBs

Name of the Infrastructure: OGS-North Adriatic Coastal Observatory (OGS-NACOBs)

Name of the installation: Friuli-Venezia Giulia Regional Costal Marine Monitoring System
Short name of intallations: FVG-MMS
Location: Adriatic Sea

Name of the installation:MAMBO buoy
Short name of intallations: MAMBO buoy
Location: Adriatic Sea

Contact has been taken with A. Crise
Possible contacts Rajesh Nair or Caterina Fanara

→ Need to set up the data flow

Data Inventory: 10: CNR-NAMS

Name of the Infrastructure: CNR-Marine Platforms and Laboratories (CNR-MPL)

Name of the installation: Friuli-Venezia Giulia Regional Costal Marine Monitoring System
Short name of intallations: CNR NAMS Northern Adriatic Monitoring System
Location: Adriatic Sea

- 11 fixed installations
  - Meteo Marine Shore station (Gulf of Trieste)
  - Tide gauge station (Trieste)
  - Paloma dynbamic pylon (Trieste)
  - S1 station (PO Delta)
  - E1 Station (Torre Predera, Rimini)
  - TeleSenigallia pylon (Ancona)

→ Need a contact to set up the data flow

Data Inventory: 11: CNR-FOS

Name of the Infrastructure: CNR-Marine Platforms and Laboratories (CNR-MPL)

Name of the installation: CNR-FISHERY OBSERVING SYSTEM
Short name of intallations: CNR FOS
Location: Northern and central Adriatic Sea

- 8 fishing vessels

→ Need a contact to set up the data flow

Data Inventory: 12 & 13 POSEIDON Observatory

Name of the Infrastructure: POSEIDON Observatory
Name of Organisation: HCMR
Name of the installation: POSEIDON BUOY NETWORK
Short name of intallations: POSEIDON BUOYS
Location: Eastern Mediterranean Sea

- 8 stations
  - T, S, Current Atm pressure, Wind, T atm and more meteo parameters
  - Data flow in place
  - Spring 2010 → September 2012 OK : running in NRT

- FerryBox system
- Athens → Heraklion
- Ferry "Kriti II" ANEK Lines
- Need a contact to set up the data flow

Data Inventory: 14 POL (COBS)

Name of the Infrastructure: POL Costal Observations (COBS)
Name of Organisation: Natural Environment Research Council NERC(POL)
Name of the installation: POL Costal Observations (COBS)
Short name of intallations: COBS (1 & 2)
Location: Irish Sea

- Installation 1
  - 9 tide gauges
    - 8 are reporting data
    - No data for Port Ericn (Isle of Man)
    - …. → september 2012

- Installation 3 : Ferry Birkenhead → Dublin
  - *Need a contact to set up the data flow*

- Installation 4 : Glider
  - SG117. One day of data (23-25/09/2010)
  - Need a contact

Data Inventory: 15 COSYNA 1 & 2

Name of the Infrastructure: Coastal Observation System for Northern and Artic Seas (COSYNA)
Name of Organisation: HZG Research Centre

- Installation 1
  - 3 ferrybox lines
    - FUNNY GIRL (DFPZ) Reporting data 26/07/2012 → 09/2012 OK running in NRT
    - LYSBRIS (LJLN3). Reporting data 08/11/2011 →09/2012 OK running in NRT
    - TOR DANIA (MSTY3) 13/10/2011→ 08/04/2012 → OK running in NRT

- Installation 2
  - 3 shallow-water wadden sea piles
  - *Need a contact to set up the data flow*

Data Inventory: 16 SMHI MOS

Name of the Infrastructure: SMHI Marine Observation System
Name of Organisation: SMHI
Short name of installation MOS (1 & 2)
Location: Kattegat

- Installation 1
  - 1 ferrybox line (Baltic Sea)
  - *Need a contact to set up the data flow*
- Installation 2
  - Kattegat buoy
  - *Need a contact to set up the data flow*
  - *Contact taken with Bengt Karlson (answer 1/10/2012)*

- JERICO - 17

Data Inventory: 17 SMHI -Laesoe

Name of the Infrastructure: SMHI Marine Observation System
Name of Organisation: SMHI
Short name of installation Laesoe Oceanographic buoy
Location: Kattegat

- Installation 3
  - 1 Oceanographic buoy
  - Historical data only (2006-2007)
  - *Need a contact to set up the data flow*

- JERICO - 18

Data Inventory: 18 SmartBay Buoy

Name of the Infrastructure: SmartBay Galway
Name of Organisation: Marine Institute
Short name of installation SmartBay Buoy
Location: Galway Bay, West coast of Ireland

- 6 buoys
  - 5 are presently reporting data (september 2012)→ OK running in NRT
  - 62090: no data since February 2008
- 13 fixed stations
  - 13 are reporting data (march 2010→ September 2012) → OK running in NRT

- JERICO - 19

Data Inventory: 20 PdE DWN

Name of the Infrastructure: Puerto Del Estado Deep WaterNetwork
Name of Organisation: Puertos de Estado (PUERTOS)
Short name of installation PdE DWN
Location:

- 15 buoys are presently reporting data (… → september 2012) → running in NRT
- Oceano parameters + Meteo

- JERICO - 20

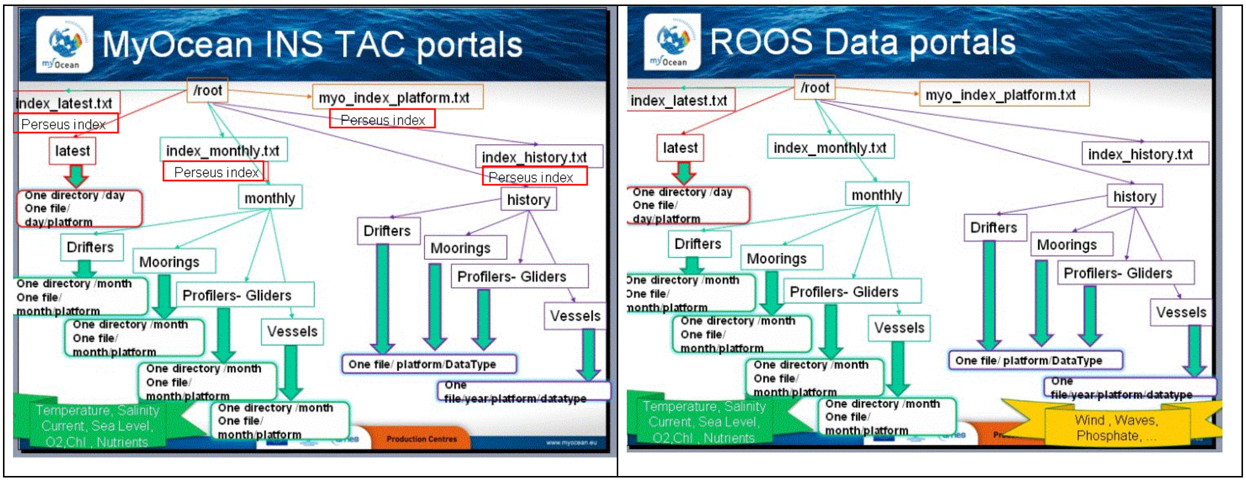
How to identify the Jerico data among wide and various data sets?

The MyOcean in situ data distribution is based on a ftp server with:

- indexes
- data

Screening the indexes, allows to identify the data you need access to and then to download them from the data directories

MyOcean indexes have been adapted to identify projects to data (ie Jerico, Perseus, Moose)



Next steps

Continue the integration work in the MyOcean Distribution Unit

Link with SeadataNet as described by Catarina

<u>Some key points and discussions</u>:

- MyOcean has adapted Indexes to identify datasets and data providers
- HCMR: do we have to collect data at regional level and then we transmit them to Coriolis ?
- L. Petit de la Villeon: Yes, it is rare that we directly get the data from the data provider.
- P. Farcy: it is asked to prepare a meeting with WP5 and WP7 to explain to data provider partners how to provide data.

5.2.9. *WP6: Outreach, by Jo Foden (CEFAS)*

Slides are presented in the next pages.

Three tasks were presented :

1) Development of end-user products and services (please see slides)

The JERICO Community Hub has been developed and launched. The JERICO Datatools (based on EMECO Datatools) have been developed and are awaiting data. The user display for Ferrybox data has been developed and is undergoing testing.

2) Jerico OceanBoard (see slides)

It is composed of JERICO PROF- and the JERICO PUB-OceanBoard.

THE OCEANBOARD NEEDS YOUR INPUT TO PROVIDE ARTICLES

Send comments, questions, articles to:

oceanboard@jerico-fp7.eu

3) Jerico summer schools (see slides)

Two summer schools are planned in Jerico. These summer schools are postponed by one year from the DoW planning, because there was too little time to organise the first one for 2012.

The first one will be on “Marine Observations in the 21st Century”

The theme of the second one is to be confirmed (decision to be taken by the steering committee) and choice is between “data assimilation” and “the 4th paradigm”.

Some key points and discussions:

- Regarding the JERICO website, please register to the web site: you will get update regarding the website, and more especially if you are WP leader

- Ocean board: material is needed to write article: just send material: technical documents, photos etc…

- Everybody registered will get the 2-monthly news letter
- Summer school 1: marine observations in the 21st century, will be one week duration, focused on dealing with the full operational chain of collecting data to supply services and meet end user demands. 15-20 participants (the application form will be available in early 2013)

OceanBoard is an important communication tool that we should use.

TASKS

6.1 Develop end-user products and services
6.2 Jerico OceanBoard
6.3 Jerico summer schools

TITLE - JERICO - 2

6.1 DEVELOP END USER PRODUCTS & SERVICES

Objectives

- Jerico Community Hub (JCH)
- Jerico Datatools
- FerryBox data on public display

TITLE - JERICO - 3

UB

Please register yourself

& request project user access

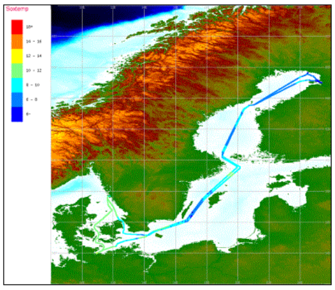
TITLE - JERICO - 4

JERICO DATATOOLS

The JERICO Datatool, based on the EMECO Engine, has been developed and is awaiting data, before being fully integrated into the JERICO Community Hub.

TITLE - JERICO - 5

FERRYBOX DATA PUBLIC DISPLAY



Jerico User Display for FerryBox

Figure 1. Track plot of the Transpaper ferry overlaid on a Gebco bathymetric image

TITLE - JERICO - 6

FERRYBOX DATA PUBLIC DISPLAY

Jerico User Display for FerryBox

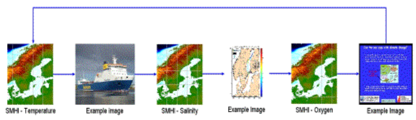


Figure 2. An example of a Sequence of pages displayed by the JUD

TITLE - JERICO - 7

FERRYBOX DATA PUBLIC DISPLAY

Jerico User Display for FerryBox

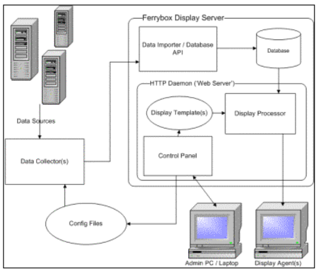


Figure 3: An example of a sequence of pages displayed by the JUD

TITLE - JERICO - 8

6.2 JERICO OCEANBOARD

Objectives

- Jerico PROF-Oceanboard
- Jerico PUB-Oceanboard

TITLE - JERICO - 9

The Oceanboard Status and Way Forward

Prof Aldo Drago
Ms Angele Giuliano

IOI Malta – University of Malta

TITLE - JERICO - 10

MAIN TARGETS OF OCEANBOARD

Gaining society's support the marine environment

Raising awareness on the benefits of coastal observations

Disseminating experience, examples and best practices

Supporting students / young scientists with high level articles

Target Groups:

- Public – including young generation, policy makers, stakeholders
- Professional – academia, students, professionals

TITLE - JERICO - 11

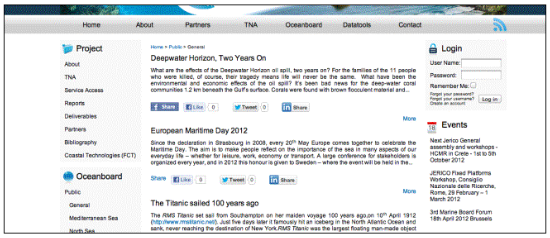
WHERE TO FIND IT?

TITLE - JERICO - 12

ARTICLES SORTED IN REGIONS – NOTICE THE EMPTINESS!

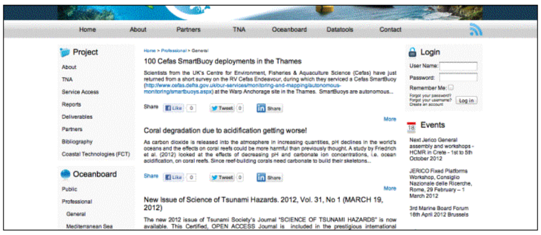
TITLE - JERICO - 13

ARTICLES IN PUBLIC



TITLE - JERICO - 14

ARTICLES IN PROFESSIONAL



TITLE - JERICO - 15

THE OCEANBOARD NEEDS YOUR INPUT!

All Jerico partners but especially there is a regional focal points

- International – Cefas
- Mediterranean Sea –University of Malta
- North Sea – DELTARES
- Baltic Sea – SYKE
- Iberian Area & Black Sea – IFREMER

Email oceanboard@jerico-fp7.eu

- Send short 200 word articles + image + web-link for further info
- The editorial team will do the rest

TITLE - JERICO - 16

POTENTIAL JERICO NEWSLETTER?

- Proposal to have a monthly 'newsletter' email
- Take input from existing articles in Oceanboard
- To be issued once every 6 months or annually?

Send comments, questions, articles to:

oceanboard@jerico-fp7.eu

TITLE - JERICO - 17

6.3 JERICO SUMMER SCHOOLS

Objectives

- Use project outputs for 2 summer school, aimed at:
  - Scientific and technical staff
  - Environmental managers and policy makers

TITLE - JERICO - 18

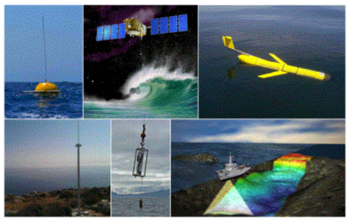
JERICO MALTA SUMMER SCHOOL 2013

Marine Sensors Technology in the 21st Century

11th to 15th June 2013
to be confirmed

Coordinated by
the **University of Malta**

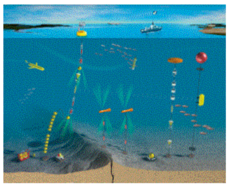
Prof. Aldo Drago
Mr. Adam Gauci



TITLE - JERICO - 19

OVERVIEW

- Main focus is on state-of-the-art **sensor technology** and usage for coastal and ocean observing systems
- One week
- At the University of Malta
- International tutors with extensive experience
- Hands-on training and site visits



PARTICIPANTS

- Between 15-20 participants (depending on funds available)
- Application forms available early 2013
- Registration
  - Application form
  - Curriculum Vitae (CV)
  - Endorsement letter
- Both full and co-sponsorships are available
- Participants accepted also from non-project partners

TITLE - JERICO - 21

NEED OF A COURSE COMMITTEE

- Course preparation and selection of candidates: JERICO Steering Committee or by a dedicated WP6 Course Committee?
- A WP6 Course Committee could support the organisers to:
  - Select the Scientific Coordinator of the course
  - Prepare the course programme
  - Select the lecturers
  - Select the course participants

TITLE - JERICO - 22

POTENTIAL LECTURERS

- Suggestions welcome
- Volunteers?
- Email: aldo.drago@um.edu.mt
- Or: adam.gauci@um.edu.mt

TITLE - JERICO - 23

DRAFT COURSE PROGRAMME

Draft programme:

Day 1 – overview
(purpose of observing, methods, types of sensors)

Day 2 – in-water and *in situ* observing
(e.g. Ferrybox, fixed platform, ROVs)

Day 3 – Other sensors (e.g. echo sounders, HF radars, sonar)

Day 4 – Calibration and data assimilation

Day 5 – Site visit (HR Radar CALYPSO)

TITLE - JERICO - 24

JERICO DELTARES SUMMER SCHOOL 2014

2nd summer school suggestion for JERICO:
Data assimilation **or** 4th paradigm workflows

Gerben de Boer
Ghada El Serafy
Martin Verlaan
Nicky Villars

TITLE - JERICO - 25

DELTARES SUMMER SCHOOL 2014

- Deltares have two proposals for review by the JERICO board

1. Data Assimilation techniques and Applications (SSDA 2014)
2. 4th paradigm workflow communities or community workflows

1. DATA ASSIMILATION

Goal of the Summer School and Target Group

Bring experts in the field of data assimilation together to make use of their knowledge in using data for the purpose of improving model skills.

Suggested Topics: data use, data combination, data control and management

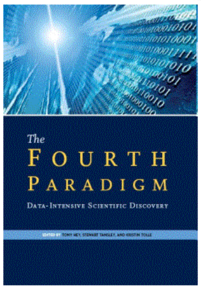
OpenDA, the data assimilation generic toolbox for Data Model integration.

The participants: graduate students, young and senior researchers from Jerico consortium and outside.

2. FOURTH PARADIGM

4 phases in science (Jim Gray)
1. Empirical knowledge
2. Mathematical modeling
3. Computational physics
4. Modern sensor technologies

Mankind nowadays faces
- Dealing with the data deluge
- And combining data and models



2. FOURTH PARADIGM

- Deltares propose the participants experience one workflow a day
- Turn data into information, with hands-on exercise on 1 dataset
- Each workflow will highlight one special dataset

2. FOURTH PARADIGM

1. **OpenDA** (www.openda.org)
   open source data assimilation toolbox (Java)
   special dataset: wave buoy spectrum time series
2. **OpenEarth** (www.OpenEarth.eu)
   open source data processing toolbox (Matlab, Python , R)
   special dataset: coastal Lidar data
3. **EMECO** (www.emecodata.net)
   open source workflow (language?)
   special dataset: FerryBox scalar time series tracks (?)

2. FOURTH PARADIGM

4. **DINEOF/DIVA**
   (modb.oce.ulg.ac.be/mediawiki/index.php/DINEOF)
   open source emperical orthogonal function toolbox (Fortran)
   special dataset: remote sensing data
5. **DCHART** (www.epic.noaa.gov/epic/software/dchart/)
   open source: netCDF4, OPeNDAP, AJAX
   special datasest: Argo floats
6. **OceanDataView** (odv.awi.de/)
   alas, not open source
   special dataset: T/S samples

Just Brainstorming

non-JERICO Partners could be invited

5.2.9. WP8: TNA to coastal observatories, by S. Sparnoccia (CNR)

Slides are presented in the next pages.

The objective of TNA is to enable Trans National and free-of-charge access (*) to original coastal infrastructures among those operated by the JERICO project beneficiaries.

(*) Access includes logistical, technical and scientific support by the access provider and any special training that a user group may require to use an assigned infrastructure.

The first call was launched on January 12th, 2012. The deadline was in early April.

We received 13 proposals. These proposals were evaluated by the TNA selection panel composed by:

1. Stefania Sparnocchia, JERICO WP8 leader
2. Patrick Farcy, JERICO coordinator
3. Pascal Morin, JERICO WP1 coordination team
4. Dominique Durand, JERICO WP1 coordination team
5. Ingrid Puillat, JERICO WP1 coordination team
6. Janet Newton, SAC, University of Washington, USA
7. George Zodiatis, SAC, University of Cyprus, Cyprus
8. Richard Dewey, SAC, University of Victoria, Canada
9. Hans Dalhin, SAC, Director of EUROGOOS
10. Roger Proctor, SAC, University of Tasmania, Australia
11. Franciscus Colijn, FCT, Helmholtz Zentrum Geesthacht, Germany
12. Laurent Mortier, FCT, ENSTA-LOCEAN, France
13. Alicia Lavin, FCT, Instituto Español de Oceanografía, Spain

Two proposals were rejected because under the threshold of the notation to be approved.

Six proposals were approved and three proposals are still under revision.

One proposal is not eligible and one was withdrawn by the P.I. because of the non adequacy of the infrastructure to the project.

IN CONCLUSION, 9 PROJECTS WILL BE SELECTED AND HAVE STARTED OR WILL START SOON

THE NEXT CALL IS PLANNED FOR JANUARY 14th, 2013. AN EXTRA CALL WILL BE OPEN IN NOVEMBER 2013 FOR SHORT PROJECTS.

Some key points and discussions:

- Next call for TNA: 14 Jan 2013
- Question about costs: What are the budget of the approved proposals and corresponding proportions in the total TNA budget?
- Not calculated for the operators. Estimated as 70 000€ for the users.
- To be done for the 6 approved and 3 under revision

WP8 OBJECTIVE

To enable Trans National and free-of-charge access (*) to original coastal infrastructures among those operated by the JERICO project beneficiaries.

(*) Access includes logistical, technical and scientific support by the access provider and any special training that a user group may require to use an assigned infrastructure.

WP8 OBJECTIVE

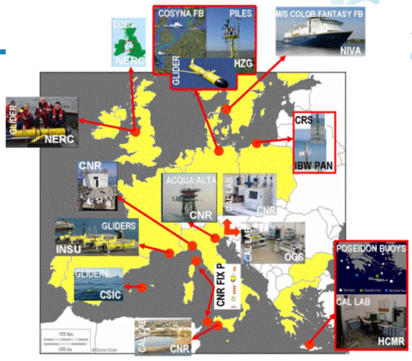
To enable Trans National and free-of-charge access (*) to original coastal infrastructures among those operated by the JERICO project beneficiaries.

(*) Access includes logistical, technical and scientific support by the access provider and any special training that a user group may require to use an assigned infrastructure.

www.jerico-fp7.eu WP8 TNA - JERICO - 2

Accessible facilities

FP - Fixed Platforms
FB - Ferryboxes
GL - Gliders
CAL - Calibration Laboratories



http://www.jerico-fp7.eu/tna/accessible-facilities

WP1 T1.6 : User modality Access for the Trans National Activities

SubTask 1.6.1: Preparation of the call – peer review

- Setting the "Selection Panel"
- Drafting the call
- Drafting the guidelines for evaluation.
- Meetings of the Panel

SubTask 1.6.2 : Information and reporting activities

- Drafting the specifications of the TNA webpages (accessible facilities, calls, rules and procedures, results), managing its construction and implementation
- *1st* Managing the calls (call opening, proposals reception and transmission to the targeted providers for pre-screening technical review)
- Access reporting and information

TNA WEBPAGES WWW.JERICO-FP7.EU/TNA

Developed by Blue Lobster IT Ltd.

Selection Panel

1. Stefania Sparnocchia, JERICO WP8 leader
2. Patrick Farcy, JERICO coordinator
3. Pascal Morin, JERICO WP1 coordination team
4. Dominique Durand, JERICO WP1 coordination team
5. Ingrid Puillat, JERICO WP1 coordination team
6. Janet Newton, SAC, University of Washington, USA
7. George Zodiatis, SAC, University of Cyprus, Cyprus
8. Richard Dewey, SAC, University of Victoria, Canada
9. Hans Dalhin, SAC, Director of EUROGOOS
10. Roger Proctor, SAC, University of Tasmania, Australia
11. Franciscus Colijn, FCT, Helmholtz Zentrum Geesthacht, Germany
12. Laurent Mortier, FCT, ENSTA-LOCEAN, France
13. Alicia Lavin, FCT, Instituto Español de Oceanografía, Spain

Proposal evaluators

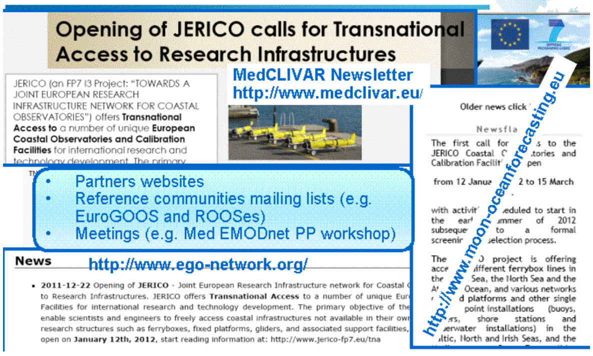
http://www.jerico-fp7.eu/tna/calls-and-selection

PROMOTING T.N. ACCESS OPPORTUNITY

www.jerico-fp7.eu

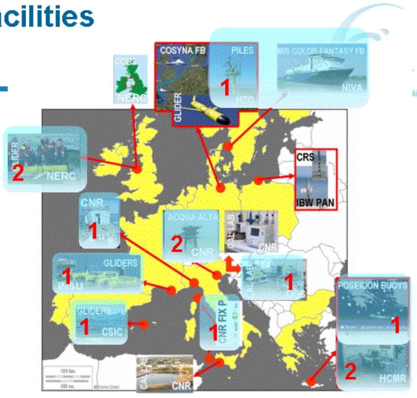
WP8 TNA - JERICO - 8

PROMOTING T.N. ACCESS OPPORTUNITY



Targeted facilities First call

FP - Fixed Platforms
FB - Ferryboxes
GL - Gliders
CAL - Calibration Laboratories



http://www.jerico-fp7.eu/tna/accessible-facilities

WP8 TNA - JERICO - 10

EVALUATION PROCEDURE

Three steps:

1. Evaluation by the Selection Panel (SP) based on **scientific excellence, innovation and impacts on the state-of-the-art**.
   Each proposal was evaluated by 3 members of the SP.
2. Validation of each proposal by the manager of the targeted facility.
3. Final assessments by the SP.

Six evaluation criteria:

1. Fundamental, scientific and technical value - max 30
2. Quality of the work program - max 25
3. Feasibility - max 20
4. Potential for seeding links with industry - max 10
5. Quality of users groups - max 10
6. European representativity - max 5

Threshold score > 60

11

REVISED EVALUATION PROCEDURE

(AFTER WP8 & TNA SELECTION PANEL MEETINGS OF OCT. 1[ST])

Three steps:

1. Validation of each proposal by the manager of the targeted facility (feasibility).
2. Evaluation by the Selection Panel (SP) based on **scientific excellence, innovation and impacts on the state-of-the-art**
3. Final assessments by the SP.

Six evaluation criteria:

1. Fundamental, scientific and technical value - max 30
2. Quality of the work program - max 25
3. Evaluation of risk and payoff - max 15
4. Potential for seeding links with industry - max 10
5. Quality of users groups - max 10
6. European relevance - max 10

Threshold score > 60

12

EVALUATION RESULTS

SCORE	REF. No	TYPE	OPERATOR	PROPONENT	STATUS
87.1	CALL_1_13	GL	NERK - UK	Allan - NO	REVISION
86.8	CALL_1_10	GL	NERK - UK	Wahlin - SE	WITHDRAWN
82.1	CALL_1_9	FP	CNR - IT	Coppola - FR	APPROVED
76.6	CALL_1_2	FP	CNR - IT	Zibordi - IT	NOT ELIGIBLE
76.5	CALL_1_5	CAL	OGS - IT	Pethiakis - GR	APPROVED
75.6	CALL_1_11	CAL	HCMR - GR	Bozzano - IT	APPROVED
74.3	CALL_1_4	FB FP	NIVA - NO HZG - DE	Jones - UK	REVISION
72.7	CALL_1_1	FP & CAL	HCMR - GR	Gonzales Davila - ES	APPROVED
72.0	CALL_1_8	GL	CSIC - ES	Ribotti - IT	APPROVED
70.1	CALL_1_6	FP	CNR - IT	Cano Diaz - ES	APPROVED
68.0	CALL_1_7	GL	CNRS - FR	Caballero Reyes - ES	REVISION
59.3	CALL_1_12	FP	CNR - IT	Deudero - ES	REJECTED
59.0	CALL_1_3	CAL	HCMR - GR	Nair - IT	REJECTED

WP8 TNA - JERICO - 13

FIRST TNA CALL
APPROVED/REVISED PROPOSALS
MAIN OBJECTIVES

REF. No	FACILITY	PROPONENT	Objectives
_1	FP&CAL, HCMR – GR	Gonzales Davila - ES	Testing a novel pH sensor in peculiar environment; studying pH variability in coastal waters.
_4	FB, NIVA - NO FP, HZG – DE	Jones - UK	Testing a novel passive water sampler on ferrybox and fixed platform.
_5	CAL, OGS – IT	Pethiakis - GR	Sharing experience in high precision calibration methodology for Temperature sensors.
_6	FP, CNR – IT	Cano Diaz - ES	Testing innovative protective treatments for material exposed to aggressive agents in an urban-marine environment.
_7	GL, CNRS – FR	Caballero Reyes - ES	Scientific study of a mesoscale feature in the Bay of Biscay using CNRS glider plus data from other platforms (residing buoys, HF radar array and remote sensing) and model simulations.

continues ....

NEXT STEPS

Six Approved Proposals:
- *Signing of the TNA Agreement between USER and OPERATOR*
- *Start of the Project*

Three Proposals under revision:
- *Approval by the Operator*
- *Approval by the Panel*
- *Signing of the TNA Agreement*
- *Start of the Project*

NEXT STEPS

Six Approved Proposals:
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Three Proposals under revision:
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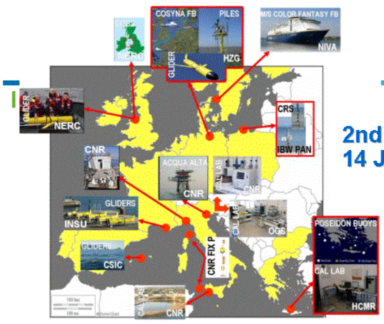
- *Approval by the Panel*
- *Signing of the TNA Agreement*
- *Start of the Project*

TNA: next phase

2012		2013	
12 Jan	D1.4 1st Call opening	14 Jan	**D1.5 2nd Call opening** *Call_1_5 Start*
Feb		Feb	
Mar	MS6 – [illegible] ready	**18 Mar**	**2nd Call closing**
3 Apr 24 Apr	1st Call deadline extended Evaluation start	8 Apr **end of Apr**	Scientific evaluation start **D1.7 1st Reports of Access Activity**
May		15 May end of May	Evaluation end Results to proponents and operators
6 Jun 13 Jun	Scientific evaluation end Technical evaluation end	Jun	
10 Jul	Results communicated to proponents and operators	Jul	Revision of critical projects
31 Aug	Deadline for revision	Aug	
30 Sep	Revision deadline extended	Sep	
15 Oct	*Call_1_8 Start*	Oct	
mid-Nov	*Call_1_9 (or next May)* *Call_1_11 Start*	Nov	**Extra Call for short projects to finish within the end of 2014**
mid-Dec	*Call_1_1 & Call_1_6 Start*	Dec	



2nd TNA Call:
14 Jan – 18 Mar, 2013

Please help promotion to make it successful!

Thank you!!!

5.2.10. WP9: New methods to assess the impact of coastal observing systems, by S. Dobricic (CMCC)

WP9 should apply mathematically sophisticated methods based on the statistical measure of the impact of coastal observations in order to provide the information on how to optimize investments and extract the most of the data from European coastal observing systems.

Recently the estimation of the impact of observations had some important developments in meteorology. There are three main groups of methods:

- Observation exclusion (traditional)
- Backward adjoin integration (very efficient in operational systems)
- Ensemble estimate (efficient if EnKF is used for the assimilation)

A Workshop has been organized on 4th October 2011 dedicated to an overview on methods and applications, writing the report, writing a common science paper, to prepare an evaluation matrix and to elaborate the first recommendations.

The preliminary results of the 3 tasks (Scientific coordination, impact of existing observational platforms, Impact of future observational platforms) are presented in the following slides.

Results from some experiments have been presented for three areas:

- North Sea OSE impact on existing infrastructures

- Bay of Biscay: impact of RECOPESCA and gliders sections

- Aegean Sea.

Two deliverables are expected at M18:

- D9.2 Report on OSE experiments

- D9.3 Report on OSSE experiments

Collaboration are possible with WP8 (TNA) to take benefit of the planned experiments.

Some key points and discussions

Glenn Nolan: Do you plan specific collaboration with WP10?

- Collaborations with WP2 and WP10 should be enhanced to take into account new sensors for instance. Including assimilation for biological systems is not evident.

Hans Dahlin: Is there a link planned with Auton project in the North Sea?

- The idea to link this activity with Auton project in the North Sea is discussed. It’s not exactly the same project but at least it will be possible to compare both project and check the possible links

WORK PLAN

Task 9.2: Impact of existing observational platforms on estimates of coastal processes by the use of high resolution coastal models: OSE experiments. (D9.2 and D9.5 - Mon.18 and 36)

-surface currents measurements from a HF radar installation in the Aegean Sea

- in situ observations of temperature and salinity profiles by existing coastal platforms in the Adriatic Sea and the Mediterranean Sea

- coastal platforms observing temperature, salinity and water level in the Baltic and North Sea

- coastal platform measuring the sea level in the North Sea and the North-Eastern Atlantic Shelf

- in situ temperature and salinity data in the North Sea

- Hf radar measurements in the German Bight impacting currents and water level

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WORK PLAN

Task 9.3: Impact of future coastal observing platforms on the estimates of coastal processes by the use of high resolution coastal models: OSSE experiemnts (D9.3 and D9.6 - Mon.18 and 36)

- *positions of surface drifters and temperature observations from instruments implemented on fishing nets in the Adriatic Sea*
- *glider observations in the Baltic Sea*
- *moving platforms in the southern part of the North Sea*
- *FerryBox SST and SSS data in the German Bight.*
- *ARVOR-C platforms, gliders and observations on fishing boats in the Bay of Biscay*

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WORKSHOP (M03)

On 4 October 2011 a workshop was organized in Bologna to present the status of development of each system and discuss the collaboration in the project and the expected outcomes and issues.

- *Methods and applications*
- *Writing the reports*
- *Common scientific paper*
- *Evaluation matrix*
- *Recommendations*

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FIRST SCIENTIFIC REPORT (M12)

The first scientific report describes the existing data assimilation systems in the WP9 and briefly discusses the future methodology for the collaboration on writing the reports describing the OSE and OSSE experiments.

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NORTH SEA OSE

- September 2001
- Ensemble Kalman filter (square root algorithm)
- Assimilation of synthetic temperature profiles at 8 stations representing 4 observational networks:
  - Existing network
  - Optimally designed network
  - Existing network + 1 station
  - Optimally designed, move 3 stations
- Comparison of the networks:
  - RMS errors between model with assimilation and assimilated data
  - Reduction of the ensemble spread

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NORTH SEA OSE

- September 2001
- Ensemble Kalman filter (square root algorithm)
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  - Existing network
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- Ensemble Kalman filter (square root algorithm)
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  - RMS errors between model with assimilation and assimilated data
  - Reduction of the ensemble spread

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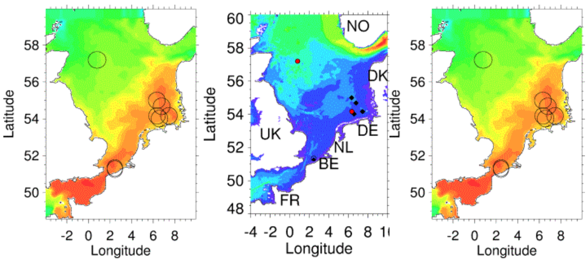
NORTH SEA OSE



Surface temperature without (left), with (right) assimilation, location of the profiles (middle)

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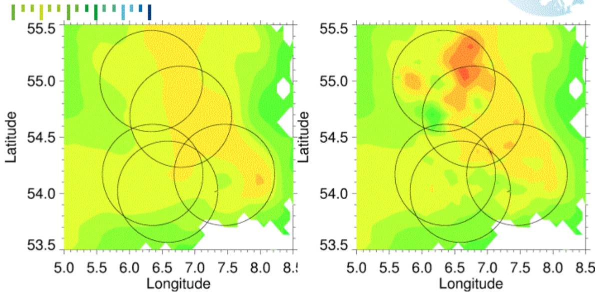
NORTH SEA OSE



German Bight: Surface temperature without (left), with (right) assimilation

TITLE - JERICO - 14

BAY OF BISCAY

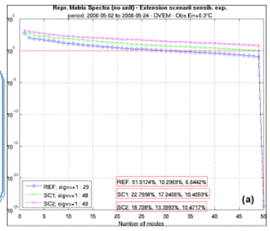
Based on:

- **Observations** (vertical T/S profilers on ships of opportunity – RECOPESCA program on fishing boats)
- **Model** ensemble simulations (MARS3D – 4Km – 50 members)

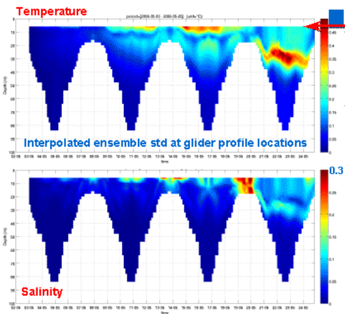
Using a representer-based method: **ARM (ARray Modes)** (Le Hénaff et al., 2008; de Mey, 2010)

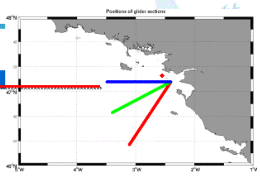
Estimation, using ARM method, of the ability of observations networks to constrain model uncertainties.
Three scenarii:
- **REF: observed profiles in 2008**
- **SC1: observed profiles in 2010**
- **SC2: whole RECOPESCA dataset from 2006 to 2011**

In conclusion, SC2 most efficient than SC1 and REF. Spatial distribution most important than number of profiles.



BAY OF BISCAY





Next step: same model ensemble and method but based on:

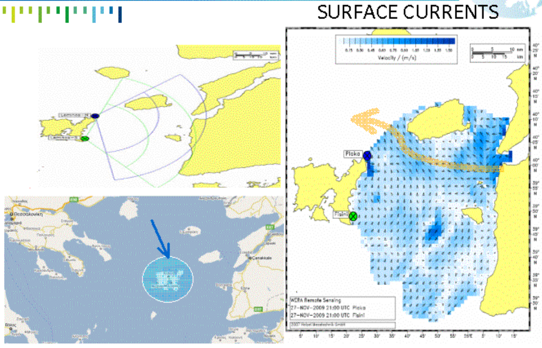
- **New observations from glider and mooring ( ) in Temperature and Salinity**

Preliminary results: Weak sensitivity of the results to the glider direction (if it remains cross-shore from the river mouth). Most of error modes "seen" by the glider.

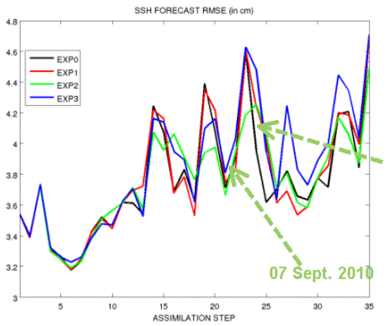
TITLE - JERICO - 16

AEGEAN SEA

SURFACE CURRENTS



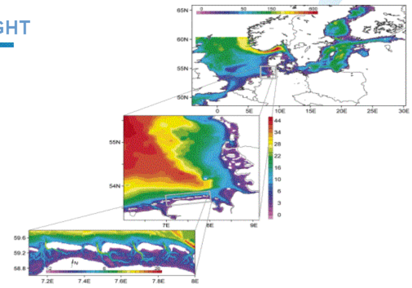
AEGEAN SEA



Assimilation of observed surface zonal velocity improves SSH forecast RMS error

TITLE - JERICO - 18

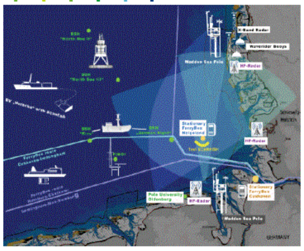
GERMAN BIGHT

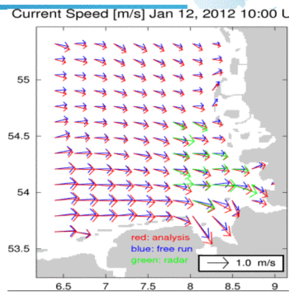


Topography of the North Sea-Baltic Sea model (top); the German Bight (centre) and the Wadden Sea (bottom).

TITLE - JERICO - 19

GERMAN BIGHT





(left) COSYNA observing system, (right) Example of surface current analysis using GETM data and HF radar measurements as input.

TITLE - JERICO - 20

NEXT DELIVERABLES AND PLANS

Two deliverables are expected at M18:

- *D9.2 Report on OSE experiments*
- *D9.3 Report on OSSE experiments*

We should enhance the collaboration with WP2 and WP10.

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TITLE - JERICO - 21

5.2.11. WP10: Improved existing and emerging technologies, by G. Nolan (IMI) and WP10 partners

Slides are presented in the next pages.

Objective: *To examine the extent to which existing technologies can be improved and/or adapted to the benefit of coastal operational oceanography and to document and test emerging technologies that will underpin future operational oceanographic systems in Europe's coastal seas.*

THE WP 10 LEADER WILL PROVIDE A REPORT OF THE INTERMEDIATE RESULTS OF THE WP. IT IS PROPOSED TO HAVE A SCIENTIFIC MEETING TO PRESENT THE RESULTS TO THE SCIENTIFIC COMMUNITY IN SEPTEMBER/OCTOBER NEXT YEAR.

The tasks reports are presented by:

Biological compartments – Alicia Romero-Ramirez and Lars Stemman

Developments of physico-chemical sensors – Kaï Sorensen, Jukka Seppala, Wilhelm Petersen, Laurent Coppola.

Emerging technologies – Laurent Coppola, Caterina Fanara

Fishing vessel – VOS – Stefania Sparnocchia, Laurent Delauney

Quality control on ferrybox – Wilhelm Petersen

Sediment measurements – Fritz Francken

Next steps

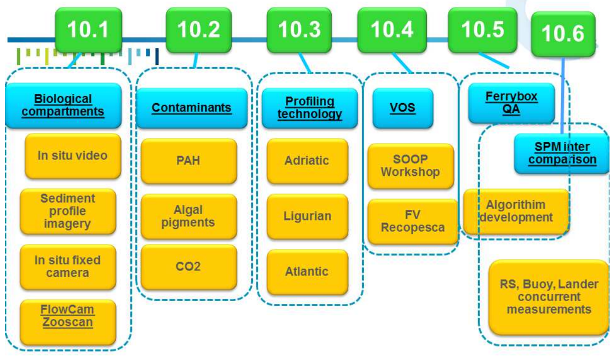
Some experiments conducted leading into winter 2012/2013

Test Operational Period on Fishing Vessels (linked to WP7) mid 2013

Progress meeting (2 days) in Jan-March 2013

Task 10.5: Automated QC of data will be presented at the next during the next Helsinki FerryBox meeting (April 24th/25th 2013) and discussed the possibility to extend to the entire FerryBox community if useful.

WP10 Overview 2012



OVERVIEW OF TASKS AND SUB-TASKS

Task	Description	Sub-task	Description	INSU	NIVA	NERC	SYKE	SMHI	HZG	OGS	IFREMER	CSIC	CNR	CEFAS	MI	MUMM
10.1	Biological Compartments															
10.2	Physical/Chemical sensors	10.2.1	Contaminants													
		10.2.2	Algal pigments													
		10.2.3	Carbonate System													
10.3	Emerging technol															
10.4	Fishing vessel/VOS															
10.5	Ferrybox															
10.6	Sediment meas.															

KEY PERSONNEL

INSU	Antoine	**OGS**	Rajesh
NIVA	Dominique	**IFEMER**	Patrick
NERC	David	**CSIC**	Joaquin
SYKE	Jukka	**CNR**	Stefania
SMHI	Bengt	**CEFAS**	Dave
HZG	Willi	**MI**	Glenn

3/12/2013

		Year 1	Year 2	Year 3	Year 4
MS22	JERICO workshop on sensors for vessels of opportunity and fishing vessel probes	12			
MS23	Software and manuals for new image analysis techniques (including zooscan)		24		
MS24	Recommendations Report for autonomous carbon measurements			26	
MS25	Data report on Temperature and salinity measurements from XBT and Ferrybox (including methodology)			26	
MS26	Report of joint workshop on best practices for coastal observatories and floating profiles			30	
D10.1	Report on trials and deployments			36	
D10.2	Set of software (analysis of SPI, Flowscan and Zooscan images)				42
D10.3	Report on data analysis (moored profile comparison, 3D T/S structure)				42
D10.4	Report on potential new sensors (fishing vessels and VOS)				42
Internal reporting		**9**	**24**	**27**	**48**
Project reporting		18	36		
Field activity					

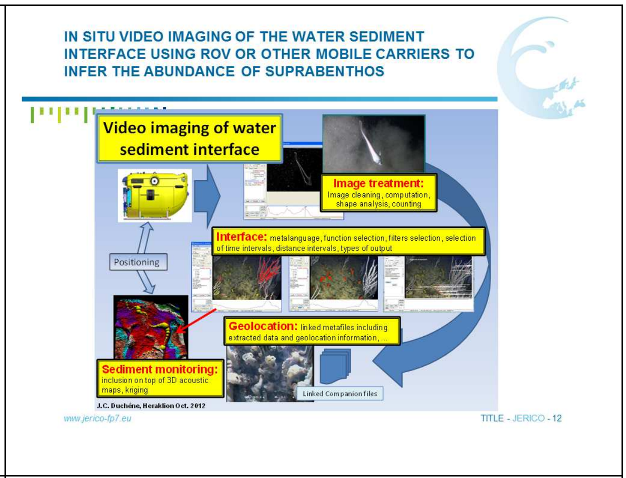
DELIVERABLES: WP10

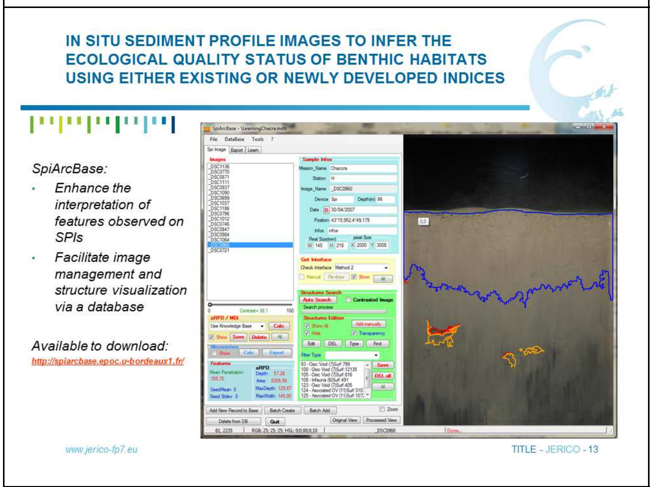
Deliverable Number	Deliverable title	Lead Beneficiary	Estimated indicative person months	Nature	Dissemination level	Delivery date
D10.1	Report on trials and deployment	20	20	R	PU	36
D10.2	Set of software	23	60	R	PU	42
D10.3	Report on data analysis	14	32.5	R	PU	42
D10.4	Report on potential new sensors	1	30	D	PU	42
Total			*142.5*			

MILESTONES

Milestone Number	Milestone name	Lead Beneficiary	Delivery date	Comments
MS22	JERICO workshop on sensors for vessels of opportunity and fishing vessel probes	20	12	Workshop report
MS23	Software and manuals for new image analysis techniques	21	24	Software
MS24	Recommendations report for autonomous carbon measurements	20	26	Recommendation report
MS25	Data report on temperature and salinity measurements from XBT and Ferrybox (including methodology)	20	26	Recommendation report
MS26	Report of joint workshop of best practices for coastal observatories and moored and floating profilers	20	30	Report

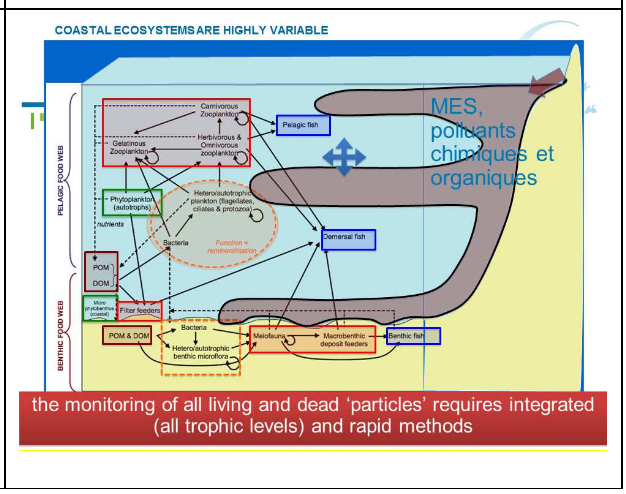

JERICO
JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES
MONITORING OF KEY BIOLOGICAL COMPARTMENTS AND PROCESSES
J.C Duchene A. Gremare, A. Romero-Ramirez
Speaker I Organism I adresse mail
www.jerico-fp7.eu
Jerico GA & BPW I Heraklion I Crete – Greece

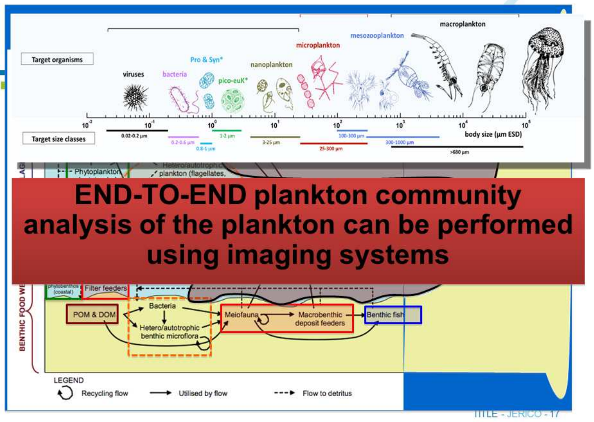

IN SITU VIDEO IMAGING OF THE WATER SEDIMENT INTERFACE USING ROV OR OTHER MOBILE CARRIERS TO INFER THE ABUNDANCE OF SUPRABENTHOS
Video imaging of water sediment interface
Image treatment: Image cleaning, computation, shape analysis, counting
Positioning
Interface: metalanguage, function selection, filters selection, selection of time intervals, distance intervals, types of output
Geolocation: linked metafiles including extracted data and geolocation information, ...
Sediment monitoring: inclusion on top of 3D acoustic maps, kriging
Linked Companion files
J.C. Duchêne, Heraklion Oct. 2012
www.jerico-fp7.eu
TITLE - JERICO - 12


IN SITU SEDIMENT PROFILE IMAGES TO INFER THE ECOLOGICAL QUALITY STATUS OF BENTHIC HABITATS USING EITHER EXISTING OR NEWLY DEVELOPED INDICES
SpiArcBase:
Enhance the interpretation of features observed on SPIs
Facilitate image management and structure visualization via a database
Available to download:
http://spiarcbase.epoc.u-bordeaux1.fr/
www.jerico-fp7.eu
TITLE - JERICO - 13


IN SITU RECORDED VIDEOS BY FIXED CAMERAS TO ASSESS THE ACTIVITY AND GROWTH OF BENTHIC ORGANISMS
Video imaging by fixed cameras
3D imaging: survey of recruitment, surface bioturbation, activities
Recruitment analysis: shape analysis on juveniles, early competition, substrate coverage
Growth analysis: survey of juvenile growth, fouling communities extension
Fouling analysis: control of anti-fouling efficiency
J.C. Duchêne, Heraklion Oct. 2012
www.jerico-fp7.eu
TITLE - JERICO - 14


JERICO
JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES
JERICO PROJECT WP10.1
L. Stemmann, M. Picheral, Jean Baptiste, Romagnan , F. Prejger, G. Obolensky
OOV CNRS-UPMC (October 2012)
Speaker I Organism I adresse mail
www.jerico-fp7.eu


COASTAL ECOSYSTEMS ARE HIGHLY VARIABLE
PELAGIC FOOD WEB
BENTHIC FOOD WEB
Carnivorous Zooplankton
Pelagic fish
Gelatinous Zooplankton
Herbivorous & Omnivorous zooplankton
Phytoplankton (autotrophs)
Hetero/autotrophic plankton (flagellates, ciliates & protozoa)
nutrients
Bacteria
Function = remineralisation
Demersal fish
POM
DOM
Filter feeders
POM & DOM
Bacteria
Hetero/autotrophic benthic microflora
Meiofauna
Macrobenthic deposit feeders
Benthic fish
MES, polluants chimiques et organiques
the monitoring of all living and dead 'particles' requires integrated (all trophic levels) and rapid methods



Imaging systems, GREAT PERSPECTIVES

Provide Indicators of ecosystem status (abundance, biomass, taxa, size spectra)

Can be obtained using lab and in situ instruments, they provide high frequency data

Data type and format can be harmonised

Data can be archived on servers and distributed easely

These indicators can be used to develop mathematical models for systems where size is important

Speaker I Organism I adresse mail

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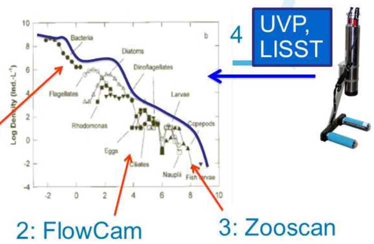
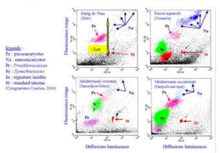
Pelagic ecosystem « end to end » monitoring using semi automated imaging systems

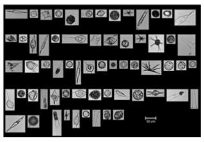
DELIVERABLE:
Common software for image analysis and data management for Flowcam, Zooscan.

We try to take into account other instruments (for other size ranges)



1: Flowcytometer





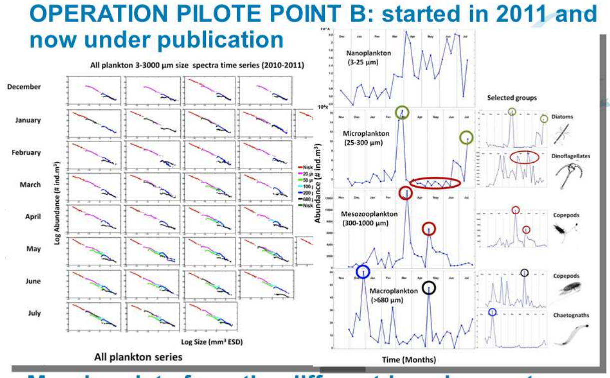
Working progress in 2011 and 2012:

1 develop an integrated suite of softwares:
This work has started and is ongoing for the analysis of the current softwares and the needs for the future development. A first step in the software development for different instruments was achieved by releasing a first version zooproces 7.09 (in February 2012). The software is still in development and release zooprocess 7.12 has been displayed on the ZOOSCAN web page (http://www.obs-vlfr.fr/LOV/ZooPart/ZooScan/).

2 test different protocoles for sampling:
This work has started in summer 2011 and stopped in december 2011. Samples have been collected weekly with Niskin bottles and different nets (50, 100, 200 and 680 µm meh size) to collect protozoa and metazoa. The samples have been analysed using the FlowCam and Zooscan. The full analysis has been completed in summer 2012 and a consistent data set will be available and made available for step 1 and 3. A publication is in preparation and one is published in Marine Methods.

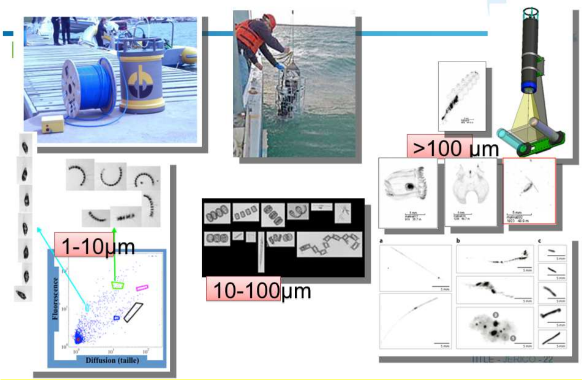
3test different software's setting for optimization of the (semi-)automatic recognition of plankton groups. :
This work has just started.

OPERATION PILOTE POINT B: started in 2011 and now under publication



Merging data from the different imaging systems works but requires adaptation for the software (in progress, should be finished early 2013) TITLE - JERICO - 21

We try to take into account future development of future, *in situ* systems (cytometer, flowcam and UVP)



JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

JERICO WP10: JRA EMERGING TECHNOLOGIES (IMPROVE SYSTEM COMPONENTS)

Kai Sørensen, NIVA

Speaker I Organism I adresse mail

www.jerico-fp7.eu

Date I City I Land

TASK 10.2:

DEVELOPMENTS OF PHYSICO-CHEMICAL SENSORS AND IMPLEMENTATION ON NEW PLATFORMS

- Subtask 10.2.1. Contaminants
- Subtask 10.2.2. Algal pigments
- Subtask 10.2.3. Carbonate system

TITLE - JERICO - 24

TASK 10.2.1 CONTAMINANTS - NIVA ACTIVITY PER SEPT 2012

Installation of the passive samples Chem. Mariner system was done in August, and first test with the SPMD was performed in September.

The Chem. Mariner has been patented for a year.

A labview Software has been developed and implemented

The TriOS EnviroFlu-HC UV sensor for Poly-Aromatic Hydrocarbon has been lab calibrated and will be deployed on the ship again in October.

Both systems will be run for a longer tests from October.

TITLE - JERICO - 25

TASK 10.2.1 CONTAMINANTS - NIVA

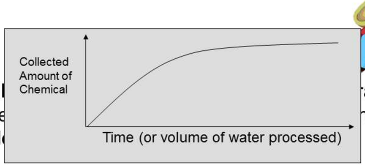
Chemical extrator

6 units exposed in different areas using GPS coordinates to expose 5 of the units. One unit used as Reference.

Installation in April 2012 Preliminary tests in the Chem. Mariner project until august

TITLE - JERICO - 26

Passive approach!



- Use of l ... ranes
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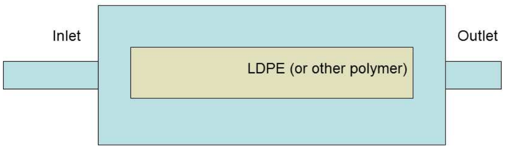


TASK 10.2.1 CONTAMINANTS - NIVA ACTIVITY

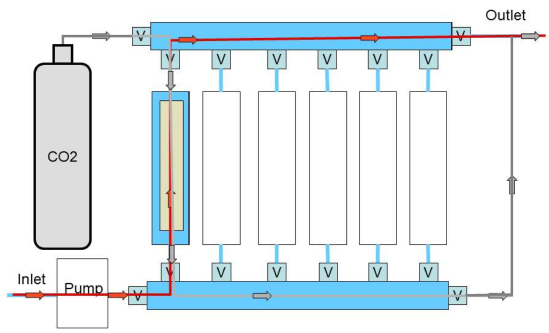
Using polyetylene sheets to extract contaminatns

The compounds are extracted with solvents in the lab (apolar solvents (e.g. hexane) for hydrophobic contaminants or methanol for the polar emerging contaminants

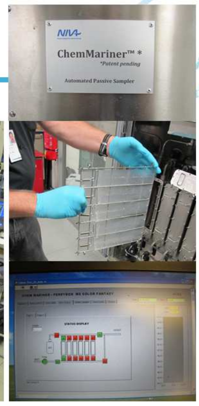
We will do PAHs, PCBs, and some pesticides.

TITLE - JERICO - 28

Technical scheme



TEST OF PASSIVE SAMPLER/EXTRACTOR



THE ENVIRO-FLU HC SENSOR FOR PAH

SUBTASK 10.2.2 ALGAL PIGMENTS

TriOS solid standards for Chl-a_fluorescence, CDOM_Fluorecence and phycocyanin fluorescence has been purchased

Lab test of the standards are ongoing

Will start to be used on the ship from October 2012

SUBTASK 10.2.3. PCO2 AND PH SYSTEM

Franatech pCO2 system has been mechanically tested and compared with calculated pCO2 from pH and Alkalinity/TIC .

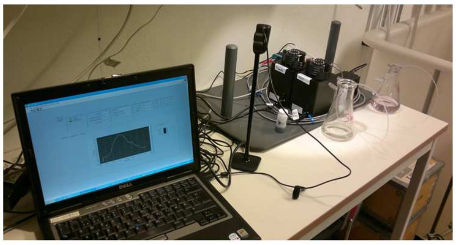
The systems has been compared with a GO system from GeoMAR

Test is ongoing concerning calibration and respons tests.

A prototype spectrophotometric pH system has been build and tested in lab.

PCO2 TEST ON COLOR FANTASY

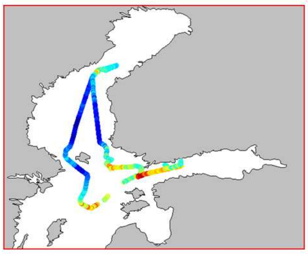
SPECTROPHOTOMETRIC PH PROTOTYPE – LAB.TESTING

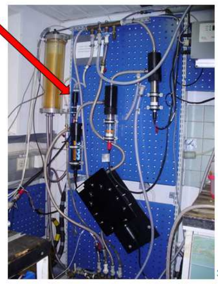


TITLE - JERICO - 35

WP 10, Task 10.2.2: DEVELOPMENT AND IMPLEMENTATION OF SENSORS FOR THE ALGAL PIGMENTS ON SHIPS
Activities by SYKE

Testing fluorometers for phycoerythrin (PE) detection:
- Chelsea Instruments PE Unilux in flow-through system during summer cruise





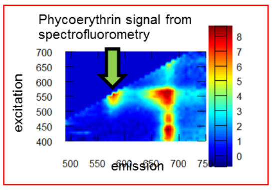
36

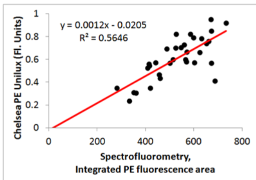
WP 10, Task 10.2.2: DEVELOPMENT AND IMPLEMENTATION OF SENSORS FOR THE ALGAL PIGMENTS ON SHIPS
Activities by SYKE

Testing fluorometers for phycoerythrin (PE) detection:
- Chelsea Instruments PE Unilux in flow-through system during summer cruise
Additional data collected:

spectral fluorescence from discrete samples, good correspondence between methods

spectral absorption and reflectance data collected (with PE signal)





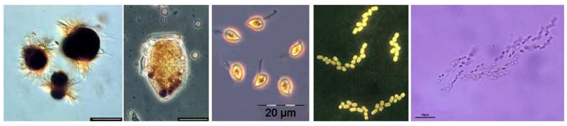
37

WP 10, Task 10.2.2: DEVELOPMENT AND IMPLEMENTATION OF SENSORS FOR THE ALGAL PIGMENTS ON SHIPS
Activities by SYKE

Testing fluorometers for phycoerythrin (PE) detection:
- Chelsea Instruments PE Unilux in flow-through system during summer cruise
Additional data collected:

FlowCAM to identify and count PE containing larger cells (>5 µm)
PE containing species: *Mesodinium rubrum*, *Dinophysis norvegica*, Cryptomonads, colonial cyanobacteria

Picocyanobacteria counts (microscopy, flow cytometry)



Photos: Baltic Sea Portal; nordicmicroalgae.org

TITLE - JERICO - 38

WP 10, Task 10.2.2: DEVELOPMENT AND IMPLEMENTATION OF SENSORS FOR THE ALGAL PIGMENTS ON SHIPS
Activities by SYKE

Instruments for variable Chla fluorescence:
Recalibration of old Chelsea FRRF to meet requirements of new Oxborough et al. algorithm, during a workshop in the Netherlands

LIMNOLOGY and OCEANOGRAPHY: METHODS

Limnol. Oceanogr.: Methods 10, 2012, 142–154
© 2012, by the American Society of Limnology and Oceanography, Inc.

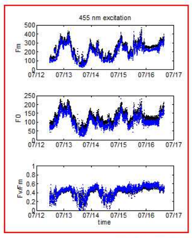
Direct estimation of functional PSII reaction center concentration and PSII electron flux on a volume basis: a new approach to the analysis of Fast Repetition Rate fluorometry (FRRf) data

Kevin Oxborough[1], C. Mark Moore[2], David J. Suggett[3], Tracy Lawson[3], Hoi Ga Chan[1], and Richard J. Geider[3]*

TITLE - JERICO - 39

WP 10, Task 10.2.2: DEVELOPMENT AND IMPLEMENTATION OF SENSORS FOR THE ALGAL PIGMENTS ON SHIPS
Activities by SYKE

Instruments for variable Chla fluorescence:
Testing two flow-through instruments from Photon Systems Instruments (CZ) in flow-through system during summer cruise
AOM 2800 & FFL-40

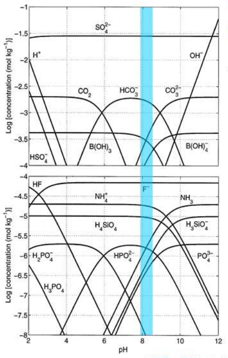


TITLE - JERICO - 40

e System:

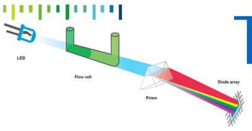
41

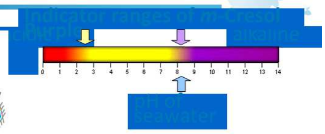
- pH gives information about the position of the equilibriums
- A_T gives information about the amount of the acid-base species
- **Combination** gives possibility to characterize the entire CO_2 system
- **DIC and pCO_2** are the other two measurable parameters



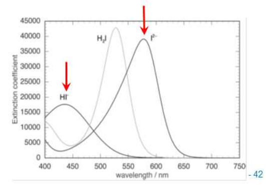
TITLE - JERICO - 41

MEASUREMENT PRINCIPLE FOR PH





$$pH = pK_a + \lg \frac{[I^{2-}]}{[HI^-]}$$



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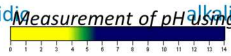
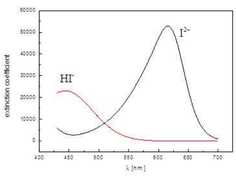
TITLE - JERICO - 42

MEASUREMENT PRINCIPLE FOR A_T

- *Acidic titration to pH ≈ 4.5 and degassing of CO_2*
- *Measurement of pH using Bromocresol green*





Calculation of pH

$$pH = pK_a + \lg \frac{[I^{2-}]}{[HI^-]}$$

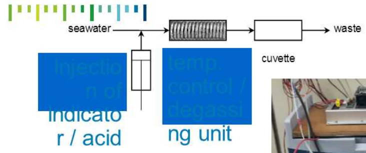
Calculation of A_T

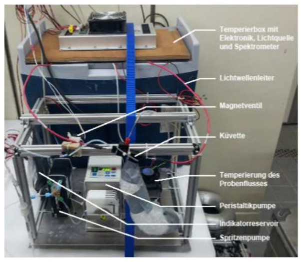
$$A_T M_{SW} = N_A M_A - [H^+]_{ASW} M_{ASW}$$

43

TITLE - JERICO - 43

SETUP PH & ALKALINITY





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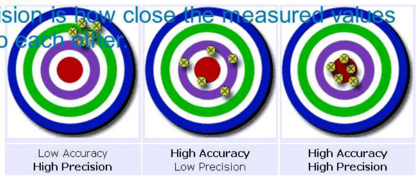
ACCURACY AND PRECISION

Accuracy

Accuracy is how close a measured value is to the actual (true) value.

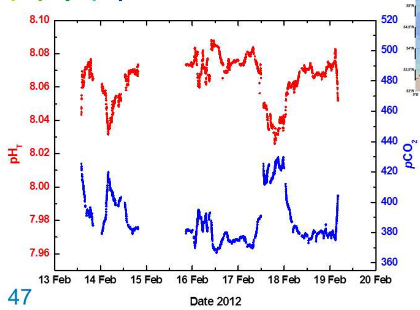
Precision

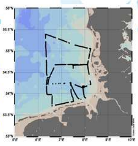
Precision is how close the measured values are to each other.



TITLE - JERICO - 46

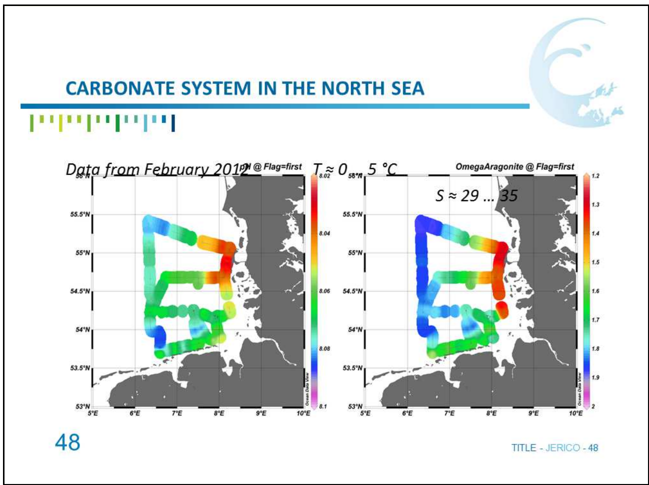
FIELD MEASUREMENTS IN THE NORTH SEA

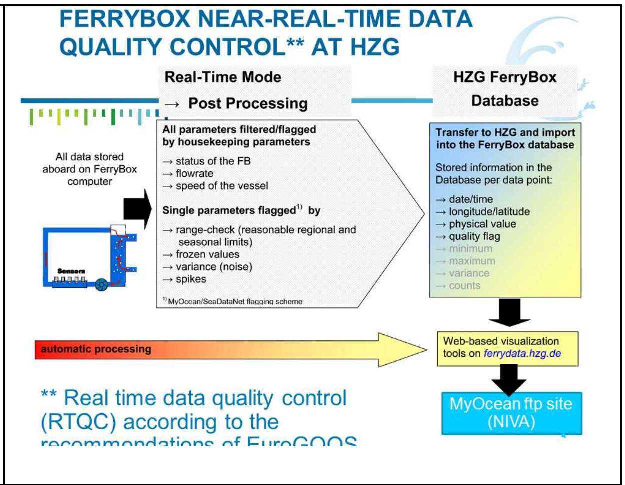


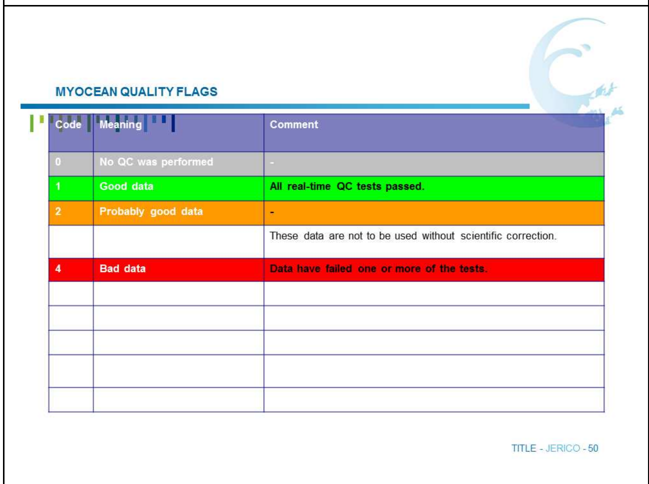


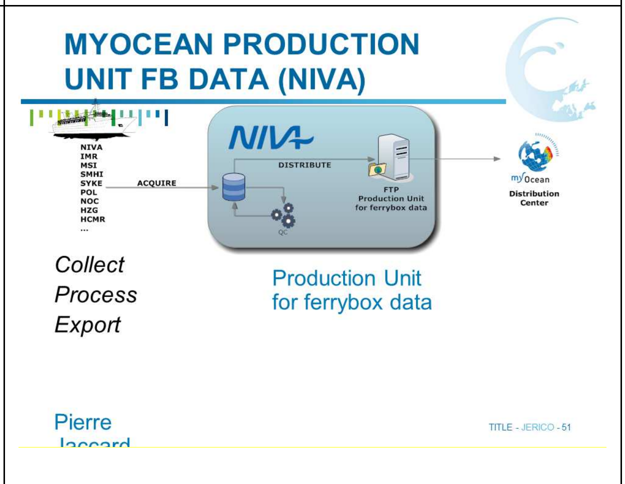
47

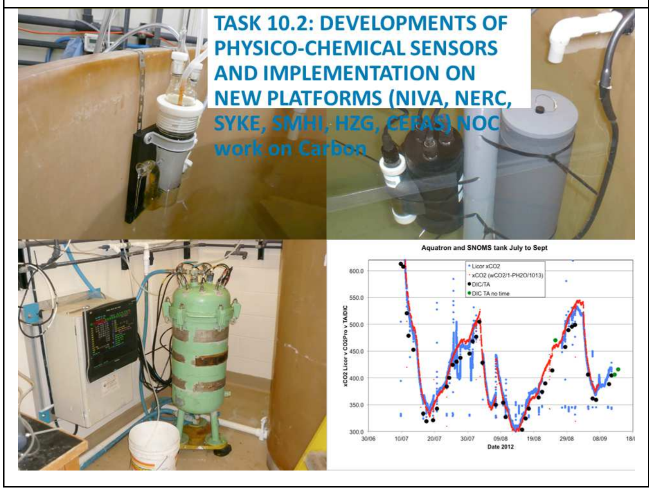
TITLE - JERICO - 47

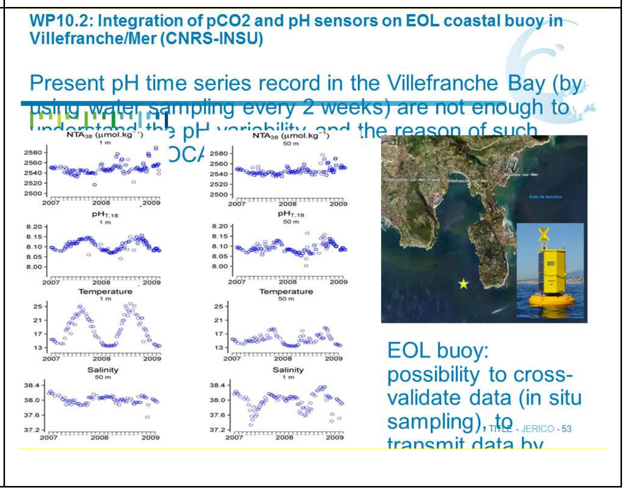

CARBONATE SYSTEM IN THE NORTH SEA
Data from February 2012
T ≈ 0 … 5 °C
S ≈ 29 … 35
OmegaAragonite @ Flag=first
48
TITLE - JERICO - 48

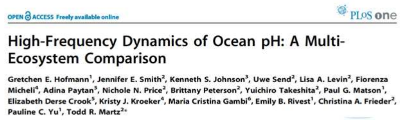

FERRYBOX NEAR-REAL-TIME DATA QUALITY CONTROL** AT HZG
Real-Time Mode
→ Post Processing
HZG FerryBox Database
All data stored aboard on FerryBox computer
All parameters filtered/flagged by housekeeping parameters
→ status of the FB
→ flowrate
→ speed of the vessel
Single parameters flagged by
→ range-check (reasonable regional and seasonal limits)
→ frozen values
→ variance (noise)
→ spikes
MyOcean/SeaDataNet flagging scheme
Transfer to HZG and import into the FerryBox database
Stored information in the Database per data point:
→ date/time
→ longitude/latitude
→ physical value
→ quality flag
→ minimum
→ maximum
→ variance
→ counts
automatic processing
Web-based visualization tools on ferrydata.hzg.de
MyOcean ftp site (NIVA)
** Real time data quality control (RTQC) according to the recommendations of EuroGOOS


MYOCEAN QUALITY FLAGS
Code | Meaning | Comment
0 | No QC was performed | -
1 | Good data | All real-time QC tests passed.
2 | Probably good data | -
These data are not to be used without scientific correction.
4 | Bad data | Data have failed one or more of the tests.
TITLE - JERICO - 50


MYOCEAN PRODUCTION UNIT FB DATA (NIVA)
NIVA
IMR
MSI
SMHI
SYKE
POL
NOC
HZG
HCMR
…
ACQUIRE
DISTRIBUTE
FTP
Production Unit for ferrybox data
QC
Distribution Center
Collect
Process
Export
Production Unit for ferrybox data
Pierre Jaccard
TITLE - JERICO - 51


TASK 10.2: DEVELOPMENTS OF PHYSICO-CHEMICAL SENSORS AND IMPLEMENTATION ON NEW PLATFORMS (NIVA, NERC, SYKE, SMHI, HZG, CEFAS) NOC work on Carbon
Aquatron and SNOMS tank July to Sept
Date 2012


WP10.2: Integration of pCO2 and pH sensors on EOL coastal buoy in Villefranche/Mer (CNRS-INSU)
Present pH time series record in the Villefranche Bay (by using water sampling every 2 weeks) are not enough to understand the pH variability and the reason of such
Temperature
Salinity
EOL buoy: possibility to cross-validate data (in situ sampling), to transmit data by
TITLE - JERICO - 53


OPEN ACCESS Freely available online
PLoS one

High-Frequency Dynamics of Ocean pH: A Multi-Ecosystem Comparison

Gretchen E. Hofmann[1], Jennifer E. Smith[2], Kenneth S. Johnson[3], Uwe Send[2], Lisa A. Levin[2], Fiorenza Micheli[4], Adina Paytan[5], Nichole N. Price[2], Brittany Peterson[2], Yuichiro Takeshita[2], Paul G. Matson[1], Elizabeth Derse Crook[5], Kristy J. Kroeker[4], Maria Cristina Gambi[6], Emily B. Rivest[1], Christina A. Frieder[2], Pauline C. Yu[1], Todd R. Martz[2*]

Since 2009, the Martz lab (SIO) has constructed 52 **SeaFET pH** sensors for 13 different collaborators (see http://martzlab.ucsd.edu) working in a broad range of s... $)

Delivering a CONTROS pCO2 sensor in July 2012.
Will be tested and installed in December 2012 under the EOL buoy (2m depth)

Range: 0-2000ppm
Resolution < 1ppm
Accuracy: +/- 1%

TITLE - JERICO - 54

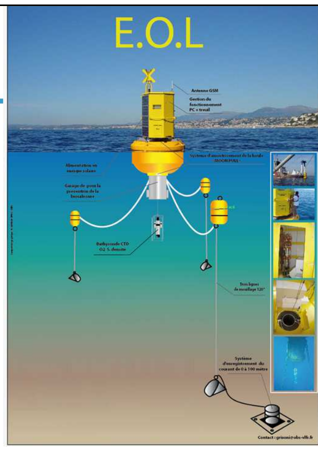
EOL: profiler coastal buoy existing since 2004 in Villefranche/Mer

Two version: 2004-2008 and 2009-2011

Third version of the buoy still under construction

EOL version 3 progress:

- Partnership signatures in July 28th between CNRS, University and Mobilis company
- Top structure finished in June 2011
- Float has to be bigger (14m3)
- Installation planned in November 2012



WP10 - TASK 10.3:
EMERGING TECHNOLOGY - PROFILING TECHNOLOGY, INTERCOMPARISON WITH MATURE TECHNOLOGY
(OGS, IFREMER, CSIC, MI, INSU, NIVA, NERC)

Aim of the task:
To compare profile measurements from a moored buoy with similar profiles from profiling floats, standard ship-based CTD measurements and surface data from FerryBox systems

One case of study:
Intercomparisons between a profiling buoy of the MAMBO series and a 'moored' ARVOR C buoy deployed in proximity of the MAMBO buoy in the Northern Adriatic Sea.

TITLE - JERICO - 57

THE EXPERIMENT: MOTIVATION AND DESIGN

The basic idea is to test and inter-compare the results of different autonomous profiling systems in shallow areas.

The essential ocean variables considered here are T and S.

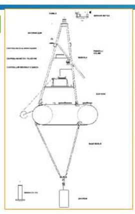
The two systems will be active for one month with a profiling rate of 3 hours.

Beside the deployment and the recovery of the instrumentation, one or two additional cruises (depending on the weather conditions) will be carried out collecting CTD samples all around the area.

TITLE - JERICO - 58

CHARACTERISTICS OF THE SYSTEMS

MAMBO BUOY



Meteo-oceanographic profiling buoy called MAMBO

Battery-powered system recharged by solar panels

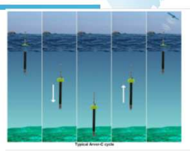
Mechanical winch driving a profiling multiparametric probe (P, T, S, Diss. Oxy, Chl, pH, turb.)

Meteorological sensors, installed on the tripod (air temperature and humidity, barometric pressure, wind speed and direction).

Data acquired and transferred via mobile phone to the OGS land station

OGS home-made controller operating also an *Acoustic Doppler Current Profiler*

ARVOR C FLOAT



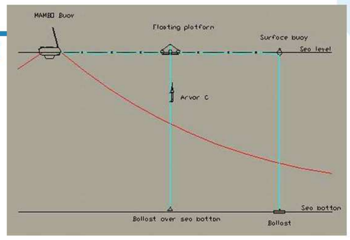
Easy to set up / ready to be deployed

Autonomously operating at sea optimised time of ascent and descent through the water column

Short time of transmission at the surface

Iridium satellite bi-directional link remote control

TITLE - JERICO - 59



The ARVOR C will be clamped on a ballasted cable floating below a stainless-steel triangular pyramid-shaped surface buoy through two ball bearing sheaves connected to the ARVOR hull via a Delrin harness.

The triangular buoy will be moored between the MAMBO hull and an ad hoc small mooring system to keep the ARVOR mooring always far from the mooring lines and the buoy profiling system.

TITLE - JERICO - 60

THE STATE OF THE ART

- Permits: obtained, last arrangements to be made.
- Instrumentation:
  - AVOR-C (IFREMER): to be delivered at OGS premises within mid October
  - MAMBO buoy (OGS): fully operational at sea
- Mooring structure (OGS): nearly completed
- Schedule:
  - deployment within the end of October;
  - recovery at the end of November.

TITLE - JERICO - 61

TASK 10.4 – CNR ACTIVITIES

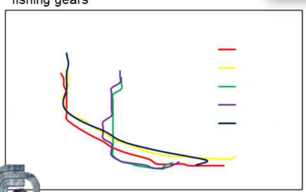
Michela Martinelli - Andrea Belardinelli - Pierluigi Penna

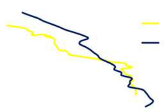
Development of tools to be installed on fishing vessels and upgrade of the already existent observation systems:

- CNR is working with NKE to upgrade their probes and software for integration in its own system;
- CNR is developing a new radio tool for data transmission from various sensors installed on the fishing gears

TASK 10.4 – CNR ACTIVITIES

- Evaluation of sensors (typology, precision, accuracy, size, suitability for the purpose…): comparison of the various probes already in use and those to be experimented
- Demonstration surveys: simultaneous use of CTD and probes + trials on the sensors mounted on fishing gears





JERICO

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

10.4 VOS ACTIVITY

Laurent Delaunay

Speaker | Organism | adresse mail

www.jerico-fp7.eu — Jerico GA & BPW / Heraklion / Crete – Greece

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NEW OBSERVING SYSTEMS FOR SHIPS OF OPPORTUNITY

Ifremer – June 2012 – Workshop on Autonomous Surface vehicles

⇨ ***Water sampling for the surface of the ocean and on first meter of the water column.***

⇨ ***Technological concept validated, need optimization : energy, communication, motorisation, sensors on board…***

⇨ ***Sensors** : temperature, salinity, pH, fluorescence, oxygen, turbidity and in the future, nutriement and PCO2.*

www.jerico-fp7.eu — TITLE - JERICO - 66

NEW OBSERVING SYSTEMS FOR SHIPS OF OPPORTUNITY

Ifremer – June 2012 – Workshop on Autonomous Surface vehicles

- ⇨ ***Various USVs (Mobesens, Vaimos, …) – Loic Dussud Ifremer***
- ⇨ ***Robotics algorythmic – Benoit Clement ENSTA,***
- ⇨ ***IBOAT – Yves Briere ISAE,***
- ⇨ ***ASAROME – Clement Petres ISIR,***
- ⇨ ***Payload and operational difficulties for USV – V. Rigaud CETSM,***
- ⇨ ***Gliders in situ results – Fabien Durand LEGOS***
- ⇨ ***FerryBox systems – P. Morin CNRS***
- ⇨ ***OCARINA – D. Bourras***
- ⇨ ***Biochemical measurement on USV – Thmas Gorgues***
- ⇨ ***Surface Salinity – F. Gaillard LPO***

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NEW OBSERVING SYSTEMS FOR SHIPS OF OPPORTUNITY

Ifremer – June 2012 – Workshop on Autonomous Surface vehicles

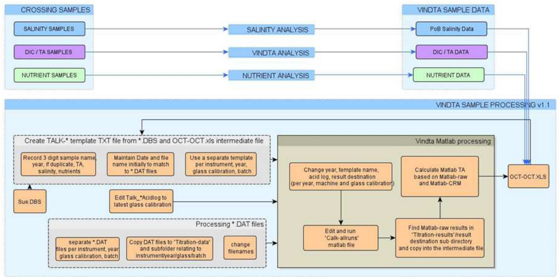
TITLE - JERICO - 68

TASK 10.5: FERRYBOX DATA QUALITY CONTROL ALGORITHM (M6-M42) (NERC, NIVA, HZG SMHI SYKE)

Notes from KOM, Rome

A new quality control scheme will be considered based on the collective Ferrybox experience within the JERICO community.

In early 2013 existing Ferrybox quality control schemes will be evaluated and discussed with a view to developing new algorithms in the September 2013-2015 period



TITLE - JERICO - 69

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

TASK 10.6: EMERGING TECHNOLOGY – REMOTE SENSING OF SUSPENDED PARTICULATE MATTER CONCENTRATION, INTER-COMPARISON WITH SMART BUOY AND BENTHIC LANDER (MUMM)

Speaker I Organism I adresse mail

www.jerico-fp7.eu

TRIPOD DATA (OBS AT 0.2 AND 2 M ABOVE BED)

MOW1

8 deployments 2003-2006 (138 days)

Since 09/2009: continuous data

Kwintebank

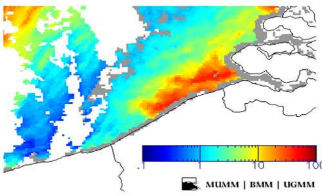
1 deployment 2004: 8 days

TITLE - JERICO - 71

SATELLITE DATA

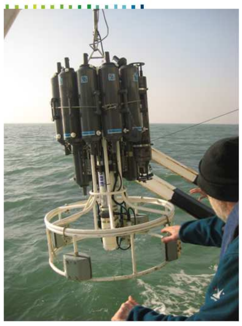
MODIS Level 1A data (raw detector counts) processed by the SeaDAS software:

MOW1: 460 data (2003-2008)
Kwintebank: 502 data (2003-2008)



TITLE - JERICO - 72

TIDAL CYCLE MEASUREMENTS FROM R/V BELGICA



MOW1

16 cycles 2001-2008: 198 vertical profiles

Kwintebank

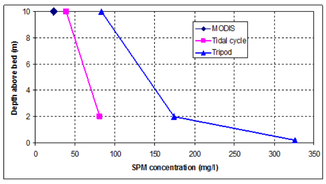
8 tidal cycles 200-2008: 108 vertical profiles

1. Rosette is kept at 3 m above bottom
2. Every hour a vertical profile : 3 mab – surface
3. Profile is fitted using logarithmic function
4. Fitted profile is used for further analysis and to extrapolate tripod data towards surface

TITLE - JERICO - 73

COMPARISON BETWEEN MODIS, TIDAL CYCLE & TRIPOD SPM CONCENTRATION POPULATION AT MOW1

Sampling	Depth	D50 SPM Conc. (mg/l)	Extrapolated surface SPM conc (mg/l)
MODIS	surface	23	-
Tidal cycle	surface	39	-
Tidal cycle	2 mab	81 (extrapolated)	-
Tripod	2 mab	174	83
Tripod	0.2 mab	326	



CONCLUSIONS

Significant differences between tidal cycle, satellite and tripod SPM conc. in high turbidity areas

Differences can only partially be explained by measurement uncertainties (OBS, atmospheric correction) and sampling schemes

Long-term measurements cannot be replaced by satellites or low-frequency measurements in high turbidity areas → Necessity of surface buoy !

TASK 1: SMART BUOY

Market study to find suitable smart buoy
- *CEFAS SmartBuoy*
  - *Around 100,000£ each, would need a least two*
  - *Yearly maintenance cost around 100,000£*
- *Other options investigated:*
  - *a.o. TechWorks Marine BB series, …*
- *→ Out of budgetary scope*
- *Other options are being investigated*
  - *SBE19 SeaCat + OBS3+*
  - *OBS5+*
  - *AIS Data transfer*

On existing/new buoy

NEXT STEPS

- *Some experiments conducted leading into winter 2012*
- *Test Operational Period on Fishing Vessels (linked to WP7) early 2013*
- *Progress meeting (2 days) in Jan-March 2013*
  - *Link to other JERICO activity?*
- *Task 10.5 meeting (Ferrybox QA) during Helsinki FB meeting (April 24th/25th 2013)*

5.2.12. Conclusions from GA, by P. Farcy (Ifremer)

JERICO

NEED TO BE READY FOR THE 1st PERIOD REPORTING

START SIGNAL END OF OCTOBER

WP TECHNICAL REPORTING END OF NOVEMBER

FINANCIAL TEMPLATES 1 & 2 AND DRAFT FORMC END OF NOVEMBER

AMMENDMENT TO THE GRANT AGREEMENT

PARTNERS WHO HAVE TO AMEND THEIR PART TO SEND ME AN OFFICIAL LETTER (BEFORE END OCT)

GA n°1 - JERICO - 2

JERICO

***WP1: PROPOSE A MULTI-STAGE METHODOLOGY** FOR THE DEFINITION OF THE JERICO LABEL TO BE CONCLUDED BY A WORKSHOP BEFORE END OF JERICO (THE DELIVERABLE IS THE FIRST STAGE)*

***WP2: STRENGTHEN THE INTERFACE BETWEEN** JERICO AND THE EUROGOOS COMMUNITY.*

MAY BE PLAN A WP2 WS WITH PARTNERS BEFORE ANNUAL EUROGOOG MEETING

WP2: TO SEND DRAFT OF THE DELIVERABLES ASAP

GA n°1 - JERICO - 3

JERICO

WP3: TO CLARIFY THE USE OF GOOGLE TOOLS

- WITH WP6

- CLARIFICATION WITH MyOcean (MOU)

WP3: TO PROVIDE A MEETING/WS AGENDA FOR 2013

WP4: DRAFT OF D4.1 ASAP – DELIVERABLE XMAST

WP4: TO PROVIDE A MEETING/WS AGENDA FOR 2013

WP4: JERICO WG ON CALIBRATION TO BE ORGANISED AND MAY BE A SCIENTIFIC WORKSHOP NEXT PERIOD

GA n°1 - JERICO - 4

JERICO

***WP5/7: NEED TO HAVE A DEDICATED WORKSHOP** WITH PARTNERS INVOLVED IN WP5 AND WP7 (MAY BE A "HOTLINE" WILL BE NECESSARY)*

PARTNERS TO PROPOSE OR VALIDATE THE CONTACT PERSONS FOR THE # INFRATSRUCTURES

WP7: TO PROPOSE A "KICK-OFF" FOR TOP IN 2013

WP6: PROMOTION OF OCEANBOARD

CONFIRMATION OF THE PROGRAM AND AGENDA OF THE FIRST SUMMER SCHOOL

PROPOSITION OF THE THEME OF 2nd SCHOOL

GA n°1 - JERICO - 5

JERICO

***WP8: TO FINISH THE 1st CALL EVALUATION PROCESSUS** BEFORE END OF OCTOBER (AND COST EVALUATION)*

TO PREPARE THE DRAFT OF THE NEXT CALL ASAP

***WP9: ENHANCE COLLABORATION WITH WP2 AND WP10** + PROMOTION OF THE TNA INFRASTRUCTURES*

WP10: EXCHANGE BETWEEN CNRS/CNR ON BIOFOULING

READY TO HAVE THE RESEARCH COMMUNITY FEEDBACK

A WP10 INTERMEDIATE REPORT FOR PARTNERS AND +

GA n°1 - JERICO - 6

6. Best practices Workshop

6.1. Objectives of the workshop

- Review the best practices and the available technologies for protection against fouling.
- Review the Best practices in calibration of oceanographic sensors.
- Overview of the available DO sensors and operating issues.
- End-to-End Quality Assurance (Best Practices on Sensors, Housings, Pre & Post deployment procedures, Data processing) for Fixed Platforms.
- End-to-End Quality Assurance (Best Practices on Sensors, Housings, Pre & Post deployment procedures, Data processing) for FerryBoxes.

6.2. Workshop Agenda

Thursday October the 4th

9.00-13.00 Best Practices Workshop – session 1

- **Bio-fouling Best Practices (9.00-10.00)**
    - Physical Sensors (Temp. & Cond.) - Optical Sensors (Chl, Turb. &Oxyg) (Laurent Delauney - IFREMER) (25mins)
    - Discussion (15mins)
- **Calibration Best Practices (10.00-13.00)**
    - Chlorophyll and turbidity (Jukka Seppala – SYKE) (15mins)
    - Temperature and conductivity (Florence Salvetat – IFREMER) (15mins)
    - Chemical sensors calibration issues (nutrients) (Wilhelm Petersen – HZG) (15mins)
    - Chemical sensors calibration issues (pCO2) (David Hydes - NOCS) (15mins)
    - Dissolved Oxygen (Florence Salvetat – IFREMER) (15mins)
    - review on commercial and prototype Oxygen sensors and their performance with respect to biofouling (Carolina Cantoni CNR) (15mins)
    - Experiences with different types of oxygen sensors on fixed platforms (Detlev Machoczek - BSH) (15min))
    - Future Activities: White paper for Oxygen measurements to be discussed in the Forum for Coastal Technology (Laurent Coppola – CNRS / Stefania Sparnocchia - CNR)

- Trans-network nodes (performing standard calibrations for the partners) (David Hydes-NOCS / George Petihakis - HCMR) (15mins).
- Discussion (30mins)

13.00-14.00 Light Lunch

14.00-18.30 Best Practices Workshop – session 2

– **End-to-End Quality Assurance (14.00-18.30)**

(Best Practices on Sensors, Housings, Pre & Post deployment procedures, Data processing)

Considering that during the 3 previous workshops each partner has presented his infrastructure (current status WP3) the aim here is to present their practices on maintenance, pre and post deployment procedures (cleaning etc), maintenance, storage, transport, data transfer, data post-process, etc. The idea is by the end to be able to describe the COMMON BEST PRACTICE for each platform. Towards this small working groups elaborating the main issues and recommendations concerning End-to-End best practice for each platform will be formed.

- **Fixed Platforms (FP)**
  - ❖ Summary of Fixed Platform workshop (Stefania Sparnocchia - CNR)(15mins)
  - ❖ Single contributions about best practise by different partners (IFREMER, IBWPAN, CNR, HCMR, BSH, CEFAS, SMHI, AZTI) (15mins each)
    - HCMR: Manolis Ntoumas
    - CNR: Stefano Miserocchi
    - BSH: Detlev Machoczek
    - SMHI: Malin Mohlin
    - CEFAS: Dave Sivyer
    - AZTI: Carlos Hernandez
    - IFREMER: Yannick Aoustin
    - IBWPAN: Piotr Szmytklewicz
  - ❖ FP discussion (30mins)

Friday October the 5th

9.00-13.00 Best Practices Workshop – session 3

- **End-to-End Quality Assurance (9.00-11.45) (cont):**
  - **FerryBoxes (FB):**
    - Summary of FB workshop (David Hydes – NOCS) (15mins)
    - Single contributions about best practise by different partners (SYKE, NIVA, CNRS, HCMR, NERC, HZG, SMHI) (15 mins each)
      - CNRS: Pascal Morin
      - NIVA: Kai Sörensen
      - NERC: Mark Hartman
      - HZG: Wilhelm Petersen
      - SYKE: Seppo Kaitala
      - HCMR: Manolis Ntoumas
      - SMHI: Malin Mohlin
  - **FerryBoxes (cont):**
      - HZG: Wilhelm Petersen: FB data handling and real-time quality assessment (15 min)
      - FB discussion (30mins)

11.45-13.00 Best Practices Workshop – session 4

- **End-to-End Quality Assurance (11.45-13.00) (cont):**
  - **Gliders (GL):**
    - Summary of Glider workshop (Simon Ruiz - CSIC) (15 mins)
    - Single contributions about best practise by different partners (15mins each) (IFREMER, HZG, CSIC)
      - CISC: Simon Ruiz
      - HZG: Pre-operational glider operation in the North Sea (Wilhelm Petersen)
      - LOCEAN-IPSL: Pierre Testor
    - Gliders discussion GL (15mins)

13.00-14.00 Light Lunch

14.00-15.00 Workshop Conclusions

6.3. List of participants

Ingrid Puillat	IFREMER
Patrick Farcy	IFREMER
Wilhelm Petersen	HZG
Jo Foden	CEFAS
George Petihakis	HCMR
Stefania Sparnocchia	CNR
Dominique Durand	NIVA
Simon Keeble	BL
Laurent Coppola	CNRS
François Bourrin	CNRS
Srdjan Dobricic	CMCC
Ntoumas Manolis	HCMR
David Hydes	NERC
Piotr Szmytkiewicz	IBW PAN
Jan Schonhofer	IBW PAN
Michael Haller	HZG
Carolina Cantoni	CNR
Seppo Kaitala	SYKE
Jukka Seppälä	SYKE
Guillaume Charria	IFREMER
Glenn Nolan	MI
Stefano Miserocchi	ISMAR CNR
Simón Ruiz	CSIC
Joaquín Tintore	CSIC
Dominique Guéguen	IFREMER
Ananda Pascual	CSIC
Hans Dahlin	Eurogoos
Dave Sivyer	CEFAS
Atanas Palazov	IO-BAS
Malin Mohlin	SMHI
Frederic Francken	MUMM
Yannick Aoustin	IFREMER
Pascal Morin	INSU/CNRS
Kai Sørensen	NIVA

Dimitris Podaras	HCMR
Fotis Pantazoglou	HCMR
Loic Petit de la Villéon	IFREMER
Kathryn Keeble	BL
Sara Almeida	IH
Stemmann	CNRS
Leonidas Perivoliotis	HCMR
Delauney Laurent	IFREMER
Carlos Hernández	AZTI
Julien Mader	AZTI
Mark Hartman	NERC
Adam Gauci	UoM
Iréne Lake	SMHI
Henning Wehde	IMR
Janet Newton	University of Washington
Alicia Romero	CNRS
Caterina Fanara	OGS

6.4. Bio-fouling and Calibration Best Practices

6.4.1. *Bio-fouling protection for oceanographic sensors*

Laurent Delauney (IFREMER) focused on accessibility and energy consumption parameters that characterize all types of observing platforms. These parameters are influencing the fouling protection choices and the maintenance intervals, that vary for each platform (e.g. Underwater cabled observatories vs. Near shore buoy). Ifremer chose 3-month maintenance intervals for all their systems. Methods for protecting sensors by biofouling were reviewed. Several examples of biofouling action on a variety of sensors and after different deployment intervals were shown. Materials and shape should be chosen very carefully in order to reduce fouling. The objectives for fouling protection are listed hereafter.

- The protection system must delay the biofouling effect on the response of the measuring system for at least 1 month in severe conditions and for 3 months in average condition.
- For specific applications like deep-sea observatories, biofouling protection effect should last for at least 6 months.
- The protection system must not affect the measurements produced.
- The protection system must be adaptable quite easily on existing instrumentation.
- The protection system should be compatible with autonomous energy supplying (batteries).

The strategy should be to work as close as possible to the transduction interface. An example of fouling protection affecting the sensor measurement was presented. Finally a review of the anti-fouling methods was presented in terms of:

- Economical aspect:
- Availability on the market.
- Price.
- Metrological aspect:
- Adverse effect to the measured parameter.
- Can system be turned on and off?
- Hardware matter:
- Robustness (depth of use/ operating depth??)
- Mechanical complexity
- Ease of adaptation to the existing instrument
- Level of integration
-

Questions and Discussions

Details about how chlorination works as an antifouling method were asked. L. Delauney informed the partners this technique is under development and the partners will be informed as soon as it is available. This system was not approved by Argo team because it was considered energy consuming.

6.4.2. *Calibration Best Practices*

6.4.2.1. *Jukka Seppala (SYKE)* : Best practices in chlorophyll and turbidity calibration.

This presentation relates to JERICO Subtask 4.1.2: Optical sensors Chl-a, Turbidity, PAR

Designation of best practices for the use of optical sensors:

This includes recommendations on sampling frequency , calibration procedures, anti-fouling measures and procedures to combine different data to produce high quality products.

Primary instrument calibration:

- Fluorescence intensity is given in arbitrary units (bits, V), calibration with other physical units is not practical (spectral issues, geometry of optics)
- Aim of calibration is to provide a solid reference point
- Typically primary calibration is carried out using material with constant quantum yield

Conversion from optical signal to concentration:

- Provide relationship between fluorescence intensity and Chla concentration (which is NOT constant)
- Without primary calibration, the variability in the above mentioned relationship cannot be understood or modelled

Reasons that the primary calibration is needed:

- To get stable response from the instrument, allowing comparison
  1. between cruises/deployments
  2. between years
  3. between instruments (with the same optical setup) in different platforms

Then he focused in the calibration procedures and standards used by sensor manufacturers and end-users, evaluating the advantages and disadvantages of each method/solution.

	simple	Stable fluorescence	spectral match	compatible	transferable	cost	traceability	flexible
Factory	-	+	+	+	+	-	?	-
Culture	-	-	+	+	+	+	-	-
Chla in solvent	+(-)	+	+	-/+	+	+	+	+/-
Fluorescein	+(-)	?/-	-	+	+	+	+	+/-
Chla in water	?	?	+	+	+	?	?	?
Solid	+	+(?)	+	+	-	+	?	+

Finally, the following actions were concluded to support best practices:

1. Review of calibration questionnaire, individual methodological descriptions → possible further questions
2. Questionnaire to manufacturers
   - Method of calibration
   - Traceability
   - Availability of secondary standard, material, durability
   - Recommendations

3. Testing artificial Chla dissolved in water, as proposed by Rajesh Nair

- Stability, traceability, spectral match etc. to be studied

Questions and Discussions

It was suggested to implement a workshop to test the reference solutions and standards. Regarding the artificial chl_a it was mentioned that is not so stable to be used as a standard. For turbidity sensors there is a European norm so it was discussed if a similar method could be applied to the chl_a sensors.

6.4.2.2. Florence Salvetat (Ifremer) and Rajesh Nair (OGS): Temperature and Conductivity calibration

Oceanographic temperature & conductivity sensors require regular, often frequent, calibrations because their performances tend to vary over time and can be affected by the specific conditions of usage.

The main aims of calibrating:

- Ensure continuing conformity of instrument/sensor performance to required/declared specifications in a way compatible with accepted international regulations and practice;
- Provide documented evidence attesting to the proper functioning of an instrument/sensor over time.

An overview of the equipment and the methodology for temperature and conductivity/salinity calibration were presented followed by the effects of fouling in T-C sensors. Regarding the best practices in operating, it was mentioned that proper field maintenance is the key to successful calibrations. Poorly maintained instruments often need to be subjected to long and complicated procedures in order to restore them to a condition that would permit a proper calibration to be performed.

In conclusion some guidelines for best practices were mentioned:

- Remember, you cannot calibrate temperature and conductivity sensors in the field!
  - (But you can monitor performance…)
- It would be wise to have your temperature sensor calibrations verified at least once a year!
- You need to have your conductivity sensor calibrations verified at least once a year!
  - (Once every six months would be even better…)
- Wherever possible, calibrate the sensor together with the mother instrument!
- Perform an “As Received” evaluation of your sensor prior to a calibration.
- Calibrating temperature & conductivity sensors/instruments properly requires expertise, specialized equipment and procedures, dedicated staff and most of all experience. If

you lack these resources in-house, don't improvise!

- Every once in a while, use a calibration service provider different from the one you habitually use (if you perform your own calibrations, have your sensors calibrated by someone else); over time, this practice will provide you with information useful for QA.
- Keep your calibration records up-to-date; calibration histories of sensors can often help to pre-empt potential problems with them in time.

The results of a calibration may or may not be accredited but they must always be accompanied by the following:

- a declaration of the uncertainty associated with the calibration process.
- information evidencing traceability to reference material (certified or otherwise): ITS-90 fixed points for temperature and IAPSO Standard Seawater for conductivity.

Questions and Discussions

It was mentioned that it is very useful to have calibrations made by different labs in order to avoid systematic mistakes, and especially for T-C: the techniques and the standards are well known for years. Salinometers, although they are based on older technology, are considered as being the reference instrument for salinity, but modern sensors (SBE 37) are very stable too.

6.4.2.3. *Wilhelm Petersen (HZG)* : Overview of Operation and Calibration of Nutrient Sensors used in HZG

The advantages and disadvantages of each sensor / analyser were presented. Especially for nitrate measurements he talked about some special problems:

- *NO3 has to be chemically reduced to NO2 either by*
  - *A Cadmium reduction (column of activated Cd) or*
  - *UV radiation*
- *Issue:*
  - *Reduction yield has to be stable and reproducible (ideally ~100%)*
  - *Reduction has to be stopped at NO2 (problem of UV radiation) NO3 → NO2 → NH3 → N2*

The calibration of the chemicals sensor is performed against samples collected in the field and analysed in the lab:

- Automatically sampling by a cooled water sampler
  - position control (FerryBox)
  - time control (Fixed Platform)
- Filtration of the samples in the lab
- Storage at -20°C
- Analysis with an Autoanalyser (SEAL AutoAnalyzer 3, segmented flow analysis)

•

Some preliminary conclusions regarding best practices for chemical sensors were presented :

- Operation of chemical nutrient analysers requires well trained and experienced operators (not a plug & play instrument)
- Re-calibration in the field is time consuming and results in higher errors
- Recalibration from bottle samples (lab analysis) is recommended
- Commercially available instruments suffer on long-term stability when unattended
- There is still a demand on more robust and reliable instruments with high sensitivity.

Questions and Discussions

The NAS analysers (in-situ Nutrient Analyser produced by Envirotech http://www.envirotechinstruments.com/nas3x.html) are operated using an on board standard. Maybe this method could be used in other analysers used for FB systems, but there are a lot of limitations.

6.4.2.4. *David Hydes (NOCS):* CO2 measurement systems

The talk was introduced by mentioning that more information and shared experiences regarding the CO2 systems are needed in JERICO but other groups should be contacted too (deep sea community). The main issues regarding CO2 measurement systems are:

- Design – ship - buoy
- System
- Possible methods
- Experience
- Hidden problems

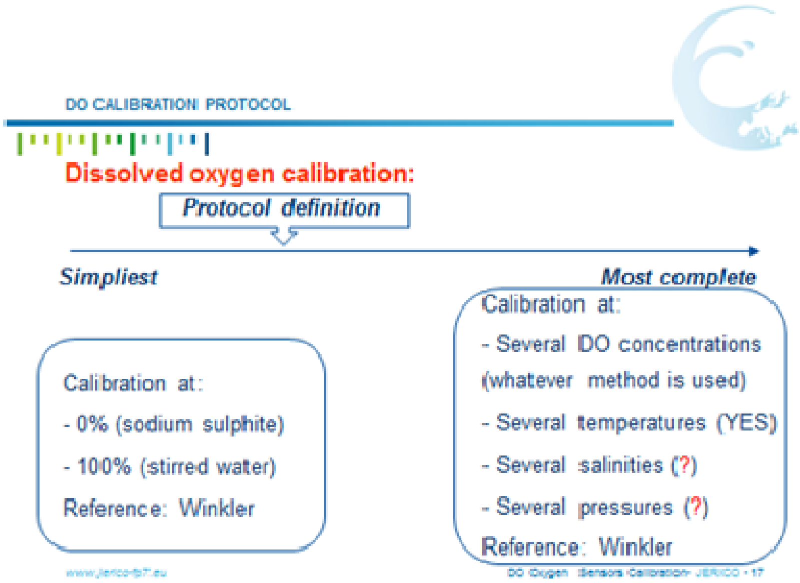
The technology behind the available CO2 measurement systems is described giving details for their proper use and potential problems. He suggested having a large tank to test systems in JERICO community. He referred to test they performed to their FB CO2 system in the Aquatron test facility presenting and commenting the data from the experiment. He suggested moving forward by gathering the information from the partners with questionnaires and reviewing the info in the next FB meeting.

Questions and Discussions

There was a short discussion about the data form Aquatron test facility. It was mentioned that the majority of partners sent their Contros pCO2 back to the company for calibration so it will be a good idea to organise an experiment between the partners.

6.4.2.5. *Florence Salvetat (Ifremer):* Ifremer protocol for oxygen calibration.

The protocols used in Ifremer and the methodology for DO samples analysis and calibration was presented, with the supporting literature and examples for several sensors. A schematic of the DO calibration protocols follows



The presentation concluded with some best practices advices for a reference/calibration device and operating DO sensors.

Reference device to perform stable steps: whatever instrument is used to perform stable DO concentrations, you must check that the medium is STABLE and HOMOGENEOUS for:

- DO
- Temperature
- Other parameters (pressure, salinity ?, …)

- Always keep foil wet (to avoid 1 to 2 days drift when immersed) and dark.
- If possible, when deploying (and regularly if possible), perform comparisons with *in situ* Winkler.
- At sea, try to prevent bio-fouling.
- In lab, calibrate (or check) before and after cleaning.

Questions and Discussions

It was suggested to have a discussion after all presentations regarding DO sensors/measurements.

6.4.3. *Dissolved Oxygen Sensors Best Practices*

6.4.3.1. *Michael Haller (HZG):* Quality assurance methodology developed for dissolved oxygen measurements.

It is based on :

- Continuous measurements of dissolved oxygen

  on ships of opportunity (TorDania until 04/2012, LysBris, FunnyGirl)

  at Cuxhaven port measurement site
- Oxygen samples during maintenance in harbour

  Analysis in lab by Winkler-titration
- Calibration tests in lab

The samples are collected :

- TorDania: Route between Germany and England

  Ferrybox maintenance in Cuxhaven
- LysBris: Route between Germany, England, Spain, Norway

  Ferrybox maintenance in Hamburg
- Campaign data of R/V Heincke

  Optode measurements + Winkler-titration on board

The presentation continued with some data examples focusing in the comparison between the sensor measurements against collected samples analysed with Winkler titration.

The conclusions contained some points for the Aanderaa optodes behaviour :

- 2-year period of quality assurance
- Underestimation of Optode measurements (≈ 10-15%)
- Drifting Optode measurements on LysBris
- Calibration over wide range helpful
- Individual Optode calibration is beneficial

Calibrating before and after optode change in Ferrybox is needed on regular basis

And the actions to follow :

- Continue quality assurance for 2012
- Determine correction functions
- Installation of Ferrybox on Ro-Ro Ship ”HafniaSeaways” as a replacement for TorDania

6.4.3.2. *Carolina Cantoni (CNR)*: Preliminary results after review on commercial Oxygen sensors for oceanographic applications and their performance with respect to biofouling.

The introduction included the presentation of the operational principal for both electrochemical sensors and optodes and the effect of the environment in the measurements. In total 17 papers were reviewed to collect the information.

Effect of environmental conditions on DO sensors :

- Temperature

Changes in temperature modify molecular activity in the water media, with consequences on the diffusion of DO through the membrane of an electrochemical probe or on the sensing element of an optical probe. The temperature affects both electrochemical and optical DO sensors and its effects have to be corrected through calibration or algorithms that use the temperature readings from the probe's thermistor.

- Salinity

The presence of permeable diffusion membranes protects polarographic and optical sensors by the contact with water and salt. However, increases of salinity decrease the solubility of DO in seawater. Thus, salinity must be derived by the conductivity sensors and factored into the instrument's algorithms for the calculation of DO concentration.

- Pressure

An increase of the pressure decreases the permeability of membranes, reducing the current outputs of polarographic sensors, while the response of micro-hole sensors is slightly increased. The response of optodes also decreases with an increasing pressure (≈ -4% for +100 bar), but the effect is fully reversible and predictable without remaining effects of hysteresis.

- DO concentration

Optodes have a greater precision at lower oxygen concentrations (hypoxic conditions) that at higher levels (300-500 µM).

- Chemical contamination

Contamination by hydrogen sulphide (H_2S) is reported for electrochemical sensors that used silver as the cathode element. Sensors that use noble metals (gold) as the cathode and silver as the anode, are not affected by sulphur contamination. Optodes are insensitive to H_2S poisoning, but a cross-sensitivity with gaseous sulphur dioxide (SO_2) and chlorine (Cl_2) has been observed.

Four biofouling examples from the international scientific literature were presented.

Summarizing the effect of Biofouling:

Optodes are less affected by fouling than polarographic sensors.

In polarographic sensors, fouling alters the characteristics of the membranes and they need accurate cleaning and recalibration.

Optodes are tolerant of fouling as long as some part of the window remains clear

However ….

The anti-fouling technique used by Sea-Bird is effective also under severe fouling conditions.

Care is needed in the choice of fouling protection for optodes. If it reduces water circulation at the membrane surface, the effect could be detrimental.

Finally to summarize the comparison between electrochemical and optode sensors for measuring dissolved oxygen.

	ELECTROCHEMICAL SENSORS	OPTODES
Reliability	Proven technology	Not always approved for environmental monitoring
Calibration and maintenance	More frequent	Less frequent
Power	Higher consumption (pumping system is needed)	Lower consumption
Response time	Faster measurements	Slower measurements (not always suitable for CTD cast applications)
DO consumption in the samples	Yes (not suitable for micro-environments and for not stirred samples)	No
Costs	Lower initial costs	Higher initial costs
Biofouling	More sensitive, but good antifouling systems available	Less sensitive
Chemical contamination	Recent sensors are scarcely affected	Scarcely affected
Winkler calibration	Always necessary for high precision DO determinations	Always necessary for high precision DO determinations

6.4.3.3. *Detlev Machoczek (BSH):* Experience on oxygen sensors and measurements on the field.

The advantages and disadvantages of the available sensors in the market and the Winkler analysis were described in details using data examples.

Winkler Titration:

Advantages:

- Standard measuring method
- High accuracy
- High resolution

Disadvantages:

- not usable for continuous measurements
- laboratory equipment is needed

Clark-cell sensor:

Advantages:

- automatic measuring system
- generating continuous data
- acceptable resolution/accuracy

Disadvantages:

- extensive calibration/maintenance work before installation necessary
- long-term stability is limited to the reaction of the electrolytical liquid
- susceptible to bio-fouling

Züllig Sensor:

Advantages:

- automatic measuring system
- generating continuous data
- acceptable resolution/accuracy
- not susceptible to bio-fouling
- little calibration/maintenance work before installation necessary
- high long-term stability due to open system without electrolytical liquid

Disadvantages:

- whetstone has to be working continuously
- relatively high energy consumption
- mechanical instability
- small changes in the surface geometry of the electrode create major changes in the oxygen values
- in-situ calibration necessary

Optode:

Advantages:

- no movable parts
- easy to handle
- stable measurements up to one year
- comparatively low energy consumption

Disadvantages:

- foil cannot be treated by mechanical cleaning
- relative long response time, not suitable for profiling systems

At the end he referred to the new Rinco optode sensor for DO measurements that preliminary results indicates that is stable with no time drift.

6.4.3.4. *Laurent Coppola (CNRS):* DO sensors accuracy and scientific needs after Argo community results.

He referred to each available sensor in terms of operational and calibration advantages and disadvantages with data examples.

Problems with SB43:

- Sources of drift: changes in membrane tension, depletion of electrolyte, impairment of the silver anode, plating of anode metal on the cathode, and the presence of chemical contaminants in the sensor's plastic body.
- Dynamic errors leading to apparent hysteresis are caused by response- time mismatch of the compensation temperature sensor.
- Membrane fouling: altering the oxygen diffusion rate through the membrane, thus reducing sensitivity. Biofouling can be particularly troublesome because the living organisms either consume or create oxygen.
- Mostly adapted for CTD profiler (very fast time response).

Aanderaa (AADI) calibration procedure:

- Each batch of foils are characterized with respect to temperature and oxygen concentration (PreSens).
- Individual 2 point calibration made by AADI for correction of foil and sensor to sensor variations.
- In addition each optode is temperature calibrated by AADI but…
  - Bad initial calibration (we need 64 point calibration!).
  - Self heating (should be >10s).
  - Influence of the storage conditions on the data quality (light, dry air).
  - Need to modify calibration equation.

Furthermore the results and the question raised from the calibrations experiments with Aanderaa optodes on Argo floats at the IFREMER pool were presented.

Conclusions and future actions :

- Recent results far from the accuracy of 1 umol/kg required by the scientific community
- Necessary to re-calibrate optode in lab. Expecting better calibration procedures from Aanderaa.
- What about others sensors ? RINKO ? SBE ?
- ARGO: Measurements every 10s. Need to improve the NRT O2 calibration procedure:

climatology comparison not always robust. Better to use O2 saturation in the air (H.Kortzinger)

- A third ARGO test has been performed in the IFREMER pool with 10 PROVOR□DO and 5 PROVOR□DOI in Sept 2012 with free optode, Winkler titration, salinity measurements (mixing). These results are still under treatment…

Laurent Coppola – CNRS / Stefania Sparnocchia – CNR: Prospectived on DO best practices

Future Activities: White paper for Oxygen measurements to be discussed in the Forum for Coastal Technology

The partners agreed that there should be a white paper for DO to be discussed with sensor manufacturers/represents in the FCT in Brest. It was suggested to start writing down bullets to be the guidelines for the writers.

- State of art-Scientific needs
- Sensors accuracy, precision etc
- Existing sensors in different platforms (priority JERICO platforms and rest to follow)
- Experiments – Tests performed by partners
- Missing data-data gaps
- Recommendations about DO sensors
- Lab, field calibration
- Deployment issues
- Data corrections issues-methods
- Fouling

It was mentioned that JERICO will plan two summer schools and one will be dedicated to oceanographic measurements so DO measurements can be included.

Slides presented with regards to biofouling Best Practices are inserted hereafter in the following pages.

JERICO BEST PRACTICE WORKSHOP WP4
CRETE 4 OCT 2012

Chemical Sensors Calibration Issues CO2

WP4 and WP10.2

KIEL SYSTEM ATLANTIC COMPANION

Issues

Design – ship - buoy

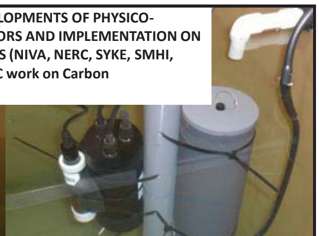
System

Possible methods

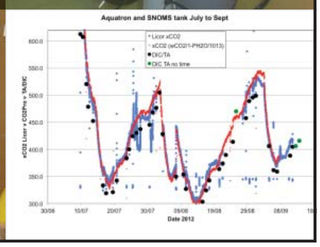
Experience

Hidden problems

PCO2 TEST ON COLOR FANTASY



TASK 10.2: DEVELOPMENTS OF PHYSICO-CHEMICAL SENSORS AND IMPLEMENTATION ON NEW PLATFORMS (NIVA, NERC, SYKE, SMHI, HZG, CEFAS) NOC work on Carbon



Plan for work in in WP10
Gathering new info

S Y K E

Jerico Best Practices Workhop

Heraklion, Crete 4.-5. October 2012

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

CALIBRATION BEST PRACTICES
CHLOROPHYLL AND TURBIDITY

JUKKA SEPPÄLÄ

FINNISH ENVIRONMENT INSTITUTE, SYKE

www.jerico-fp7.eu

Calibration Best Practices: Chlorophyll and turbidity

TASK 4.1: CALIBRATION

SubTask 4.1.2: Optical sensors Chl-a, Turbity, PAR

3) Designation of best practices for the use of optical sensors. This includes recommendations on time of day and frequency for sampling, calibration procedures, anti fouling measures and procedures to combine different data to produce high quality products.

1. Primary instrument calibration
2. Conversion from optical signal to concentration

Calibration Best Practices: Chlorophyll and turbidity

1. Primary instrument calibration

- Fluorescence intensity is given in arbitrary units (bits, V), calibration with other physical units is not practical (spectral issues, geometry of optics)
- Aim of calibration is to provide a solid reference point
- Typically primary calibration is carried out using material with constant quantum yield

2. Conversion from optical signal to concentration

- Provide relationship between fluorescence intensity and Chl*a* concentration (which is NOT constant)
- Without primary calibration, the variability in the above mentioned relationship cannot be understood or modeled

---

Calibration Best Practices: Chlorophyll and turbidity

1. Primary instrument calibration

Why:
To get stable response from the instrument, allowing comparison
- between cruises/deployments
- between years
- between instruments (with the same optical setup) in different platforms

How:
- Factory calibration
- Algae cultures
- Chemical standards in water/solvents
- Solid standards

Calibration Best Practices: Chlorophyll and turbidity

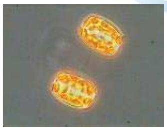
1. Primary instrument calibration

Factory calibration

+ professional check
+ certificate
+ technical inspection & repair

- expensive
- time consuming
- inflexible

? Calibration material
? Traceability

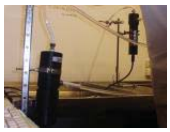


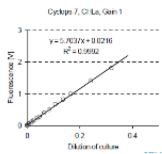
Calibration Best Practices: Chlorophyll and turbidity

1. Primary instrument calibration

Algae cultures

+ may be used directly in Chla concentration estimation
- requires specific infrastructure
- variable fluorescence to [Chla] ratio (taxonomy, physiology)
- no traceability
- not applicable for calibration check in platforms





1

Calibration Best Practices: Chlorophyll and turbidity
1. Primary instrument calibration

In vivo Chla fluorescence ≠ Chla concentration

F = [Chla] · R

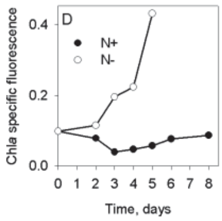
R varies 2-4 fold for single species,
and up to 50-fold between different species.

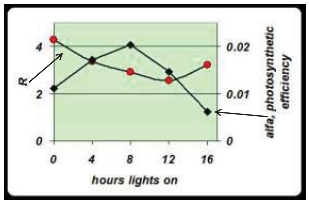
$$F(\lambda_{ex/em}) = \underbrace{[Chla]}_{\text{Biomass}} \cdot \underbrace{E_{ex}}_{\text{Instrument}} \cdot \underbrace{\bar{a}_{PSII}}_{\text{Species}} * \cdot \underbrace{Q_a{}^*(\lambda_{em})}_{\text{Pigmentation}} \cdot \underbrace{\phi_F}_{\text{Physiology}}$$

Calibration Best Practices: Chlorophyll and turbidity
1. Primary instrument calibration

Algae cultures

- variable fluorescence to [Chla] ratio (taxonomy, physiology)





Calibration Best Practices: Chlorophyll and turbidity
1. Primary instrument calibration

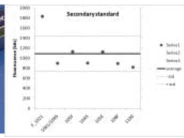
Chemical standards in water/solvents

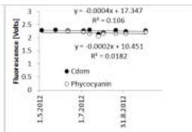
+ principally a good solution, but no agreement on substance/solvent
+/- Chla in acetone (or other solvent) may be solution for some instruments but may not be compatible with other
- Other chemicals (like fluorescein) are not stable or do not match the wavelengths of Chla to yield a good calibration

Calibration Best Practices: Chlorophyll and turbidity
1. Primary instrument calibration

Solid secondary standards

+(/-) stable and traceable signal, thus instrument performance can be tracked
- secondary standard does not allow direct instrument-instrument comparisons





Calibration Best Practices: Chlorophyll and turbidity
1. Primary instrument calibrationc

The perfect chromophore-based fluorescence standard should

- be simple to use,
- be sufficiently stable in solution or as a solid
- absorb and emit in the same general regions as the compounds under study,
- have a constant fluorescence quantum yield
- reveal a negligible small temperature dependence of its fluorometric properties,
- be easy to purify/manufacture
- dissolve in solvent compatible with field fluorometers
- inexpensive
- flexible
- traceable

Modified from
Resch-Genger & DeRose 2010 Pure Appl. Chem.

Calibration Best Practices: Chlorophyll and turbidity
1. Primary instrument calibration

	simple	Stable fluorescence	spectral match	compatible	transferable	cost	traceability	flexible
Factory	-	+	+	+	+	-	?	-
Culture	-	-	+	+	+	+	-	-
Chla in solvent	+(-)	+	+	-/+	+	+	+	+/-
Fluorescein	+(-)	?/-	-	+	+	+	+	+/-
Chla in water	?	?	+	+	+	?	?	?
Solid	+	+(?)	+	+	-	+	?	+

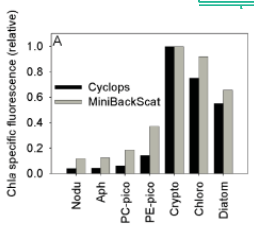
Calibration Best Practices: Chlorophyll and turbidity

1. Primary instrument calibration

Comparison of instruments with different optics may be a mess...

$$F(\lambda_{ex/em}) = [Chla] \cdot \boxed{E_{ex} \cdot \bar{a}_{PSII}{}^{*} \cdot Q_a{}^{*}(\lambda_{em})} \cdot \phi_F$$

Spectral variability between calibration and field samples



Calibration Best Practices: Chlorophyll and turbidity

1. Primary instrument calibration

to support best practises:

1. Review of calibration questionnaire, individual methodological descriptions → possible further questions
2. Questionnaire to manufacturers
   - Method of calibration
   - Traceability
   - Availability of secondary standard, material, durability
   - Recommendations
3. Testing artificial Chl*a* dissolved in water, as proposed by Rajesh Nair
   - Stability, traceability, spectral match etc. to be studied


JERICO
JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES
□ISSO□□E□ O□□□EN SENSORS
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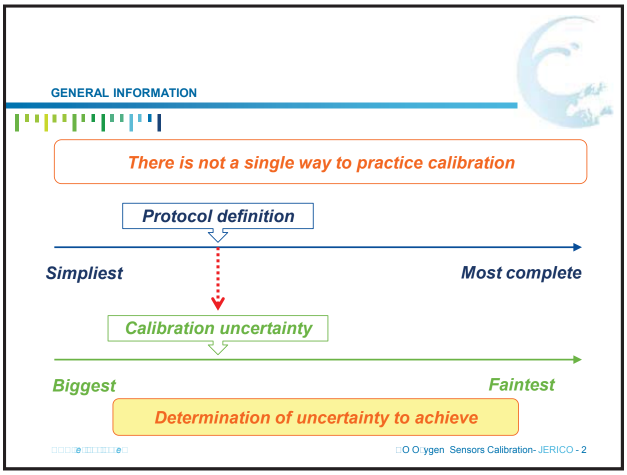
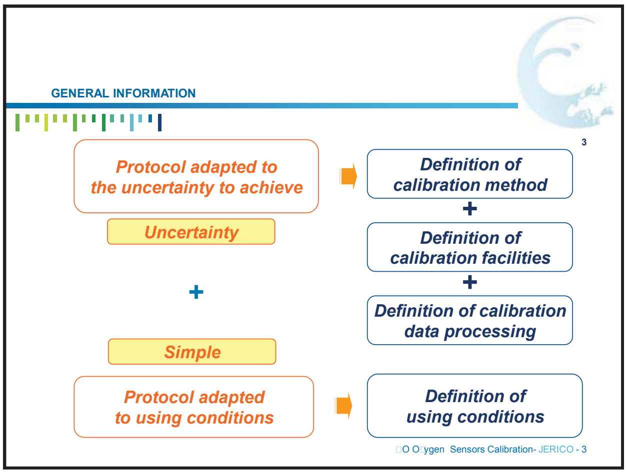
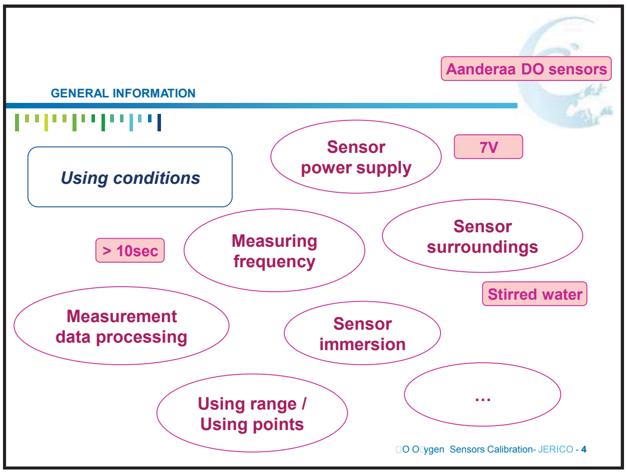
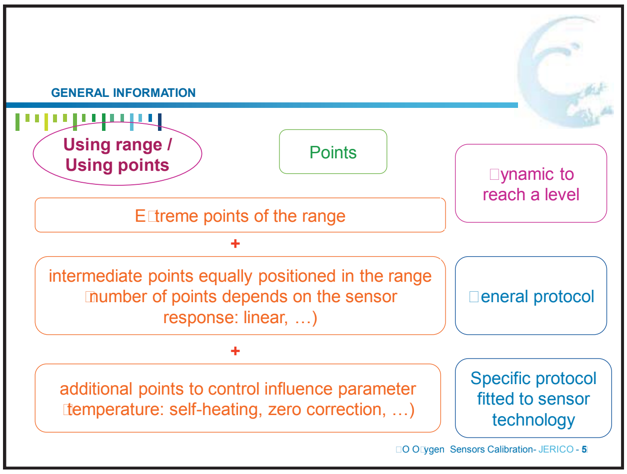
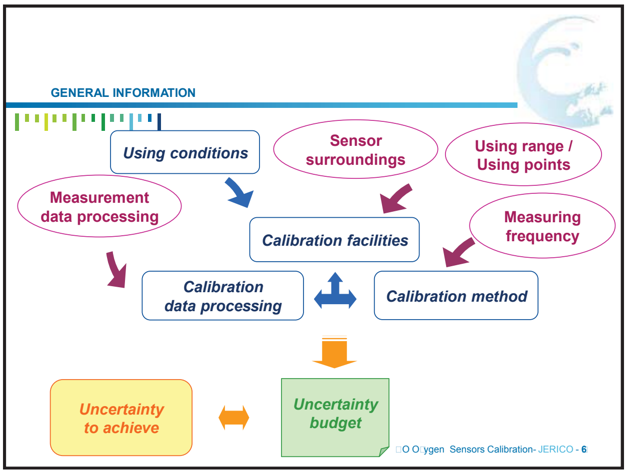

GENERAL INFORMATION
There is not a single way to practice calibration
Protocol definition
Simpliest
Most complete
Calibration uncertainty
Biggest
Faintest
Determination of uncertainty to achieve
□O O□ygen Sensors Calibration- JERICO - 2


GENERAL INFORMATION
Protocol adapted to the uncertainty to achieve
Uncertainty
+
Simple
Protocol adapted to using conditions
Definition of calibration method
+
Definition of calibration facilities
+
Definition of calibration data processing
Definition of using conditions
□O O□ygen Sensors Calibration- JERICO - 3


GENERAL INFORMATION
Aanderaa DO sensors
Using conditions
Sensor power supply
7V
> 10sec
Measuring frequency
Sensor surroundings
Stirred water
Measurement data processing
Sensor immersion
Using range / Using points
...
□O O□ygen Sensors Calibration- JERICO - 4


GENERAL INFORMATION
Using range / Using points
Points
□ynamic to reach a level
E□treme points of the range
+
intermediate points equally positioned in the range □number of points depends on the sensor response: linear, …)
□eneral protocol
+
additional points to control influence parameter □temperature: self-heating, zero correction, …)
Specific protocol fitted to sensor technology
□O O□ygen Sensors Calibration- JERICO - 5


GENERAL INFORMATION
Using conditions
Sensor surroundings
Using range / Using points
Measurement data processing
Calibration facilities
Measuring frequency
Calibration data processing
Calibration method
Uncertainty to achieve
Uncertainty budget
□O O□ygen Sensors Calibration- JERICO - 6

Dissolved oxygen calibration:

Protocol definition

Simpliest → ***Most complete***

Calibration at:
- 0% (sodium sulphite)
- 100% (stirred water)

Reference: Winkler

Calibration at:
- Several DO concentrations (whatever method is used)
- Several temperatures (?)
- Several salinities (?)
- Several pressures (?)

Reference: Winkler

Winkler literrature:

Standard:

- NF EN 25813 / ISO 5813 Standard

Sampling description

Oceanographic recognized references:

- World Ocean Circulation Experiment recommendations (1990-1998)
- French reference literature: "Hydrologie des écosystèmes marin. Paramètres et analyses" - Editions Ifremer

Winkler description:

- KIO_3 solution: $Na_2S_2O_3$ calibration
- $Na_2S_2O_3$ solution: I_2 titration

- Reagent 1: $MnCl_2$
- Reagent 2: NaOH / NaI
- Reagent 3: H_2SO_4

Winkler: main issues

- Winkler analysis: Waiting and storage… … Still many practices
  - Waiting time: 2 to 4 hours before analysis
  - Storage:
    - condition: distilled water around the stopper
    - time: analysis within one day
- Substance matrix: seawater

(Winkler's method overestimates dissolved oxygen in seawater: Iodate interference and its oceanographic implication. George T.F. Wong and Kuo-Yuan Li, Marine Chemistry, 2009, vol.115, n°1-2, pp.86,91)

Surface and deep open ocean, overestimation = 0.52 ± 0.15 and 0.63±0.05 µmol kg^{-1} respectively.

Winkler: results

Acquisition du thiosulfate	
Etalonnage du thio ml	
1	5.089
2	5.088
3	5.092
4	5.089
5	5.094
Moyenne	5.0905

Acquisition du thio échantillonnage		Acquisition temp, salinité	
N° Flacon	Vthio echant. (ml)	T°	Sal
13	11.477	10.0	0
14	11.324	10.0	0
15	11.311	10.0	0
19	11.168	10.0	0
11	8.381	15.0	0
12	8.233	15.0	0

Résultats thio échantillonnage				Résultats de t et S		Résultats complémentaires			
Flacon	O2 µmol/l	O2mg/l	O2 ml/l	température °C	Salinité	O2 Sat µmol/l	O2 Sat mg/l	O2 Sat ml/l	% sat
flacon 13	353.40	11.31	7.91	10.0	0.0	352.80	11.29	7.90	100.2
flacon 14	353.82	11.32	7.92	10.0	0.0	352.80	11.29	7.90	100.3
flacon 15	354.20	11.33	7.93	10.0	0.0	352.80	11.29	7.90	100.4
flacon 19	353.96	11.33	7.93	10.0	0.0	352.80	11.29	7.90	100.3
flacon 11	258.32	8.27	5.78	15.0	0.0	315.04	10.08	7.05	82.0
flacon 12	257.69	8.25	5.77	15.0	0.0	315.04	10.08	7.05	81.8

Winkler: uncertainties

U = +/- 2 µmol/L

Dissolved oxygen calibration:

Protocol definition

Simpliest → ***Most complete***

Calibration at:
- 0% (sodium sulphite)
- 100% (stirred water)

Reference: Winkler

Calibration at:
- Several DO concentrations (whatever method is used)
- Several temperatures (?)
- Several salinities (?)
- Several pressures (?)

Reference: Winkler

DO CALIBRATION PROTOCOL

Dissolved oxygen calibration:

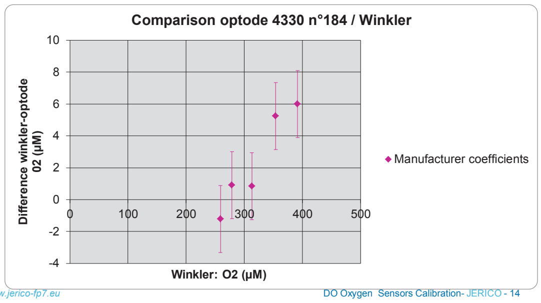
Several temperatures and pressure :

Uchida H., T. Kawano, I. Kaneko and M. Fukasawa, 2008: In situ calibration of optode-based oxygen sensors, J. Atm. Ocean. Tech., 2271-2281, doi: 10.1175/2008JTECHO549.1

www.jerico-fp7.eu — DO Oxygen Sensors Calibration- JERICO - 13

DO CALIBRATION PROTOCOL

Calibration in bath at different temperatures and air equilibrium:



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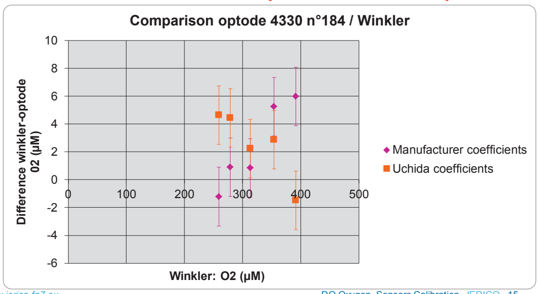
DO CALIBRATION PROTOCOL

Calibration in bath at different temperatures and air equilibrium:



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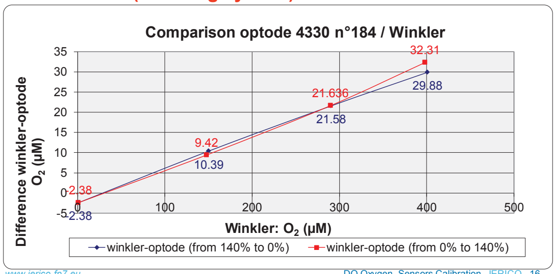
DO CALIBRATION PROTOCOL

Calibration in bath at different temperatures and concentrations (bubbling system):



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DO CALIBRATION PROTOCOL

Dissolved oxygen calibration:

Protocol definition

Simpliest → ***Most complete***

Calibration at:
- 0% (sodium sulphite)
- 100% (stirred water)

Reference: Winkler

Calibration at:
- Several DO concentrations (whatever method is used)
- Several temperatures (YES)
- Several salinities (?)
- Several pressures (?)

Reference: Winkler

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REFERENCE DEVICE TO PERFORM STABLE STAGES

Reference device to perform stable stages

Whatever instrument is used to perform stable DO concentrations, you must check that it is STABLE and HOMOGENEOUS in

- DO

But also:

- Temperature
- All influence parameters (pressure, salinity ?, …)

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DO OTHER RECOMMENDATIONS

Storage:

□lways keep foil wet (to avoid 1 to 2 days drift when immersed) and dark.

***"In sit□* calibration":**

If possible, when deploying (and regularly if possible), perform comparisons with *in situ* winkler.

Fouling:

□t sea, try to prevent from bio-fouling.
In lab, calibrate (or check) before and after cleaning.

THANKS FOR YOR ATTENTION

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

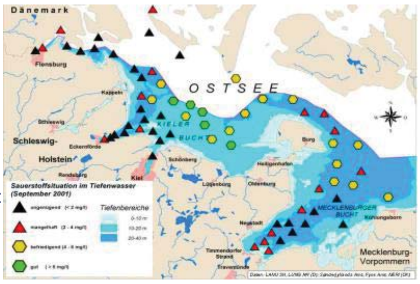
Towards reliable in-situ real-time oxygen measurements

Oxygen measurements

Oxygen measurements:

• deliver information about the biological status of the sea area
• deliver information about water exchange
• help to evaluate the environmental conditions for marine life
• indicate biological production/extinction

Oxygen measurements



Insufficient:
□oor:
Fair:
□ood:

Oxygen distribution in the Western □altic Sea, Sep. 2001

Oxygen measurements

Ways of measuring oxygen:

• Winkler □itration
• Clark-cell Sensor (electrochemical, closed system)
• Züllig Sensor (galvanic, open system)
• Optode (chemo-optical system)

Oxygen measurements

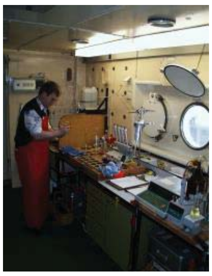
Winkler Titration:

Advantages:

• Standard measuring method
• High accuracy
• High resolution

Disadvantages:

• not usable for continuous measurements
• laboratory e□uipment is needed



Oxygen measurements

Clark-cell Sensor:

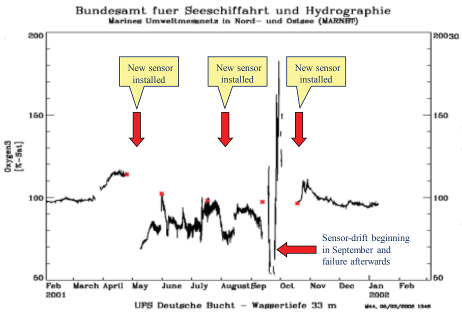
Advantages:

• automatic measuring system
• generating continously data
• acceptable resolution/accuracy

Disadvantages:

• extensive calibration/maintenance work before installation neccessary
• long-term stability is limited to the reaction of the electrolytical li□uid
• susceptible to bio-fouling

Oxygen measurements



Oxygen saturation in 30 m depth at MARNET - station German Bight in 2001 (Clark-cell)

Oxygen measurements

Züllig Sensor:

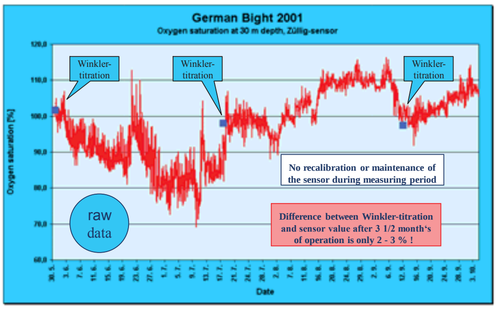
Advantages:

- automatic measuring system
- generating continously data
- acceptable resolution/accuracy
- not susceptible to bio-fouling
- little calibration/maintenance work before installation neccessary
- high long-term stability due to open system without electrolytical liquid

Disadvantages:

- whetstone has to be working continuously
- relatively high energy consumption
- mechanical instability
- small changes in the surface geometry of the electode create major changes in the oxygen values
- in-situ calibration necessary

Oxygen measurements



Oxygen measurements

Optode:

Advantages:

- no movable parts
- easy to handle
- stable measurements up to one year
- comparatively low energy consumption

Disadvantages:

- foil cannot be treated by mechanical cleaning
- relative long response time, not suitable for profiling systems

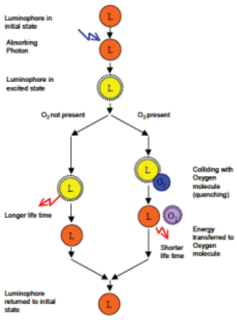
Oxygen measurements

Dynamic Luminescence Quenching:

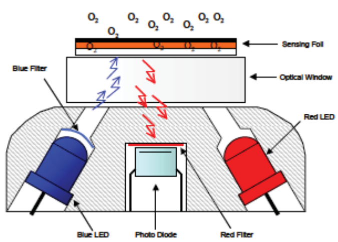
The Oxygen Optode is based on a principle called dynamic luminescence quenching.

This phenomenon is the ability of certain molecules to influence the fluorescence of other molecules. Fluorescence is the ability of a molecule to absorb light of a certain energy and later emit light with lower energy (longer wave length). Such a molecule, called a luminophore, will after absorbing a photon with high enough energy, enter an exited state.

After a while the luminophore will emit a photon of lower energy and return to its initial state. Some types of luminophores might also return to the initial state when colliding with certain other molecules.

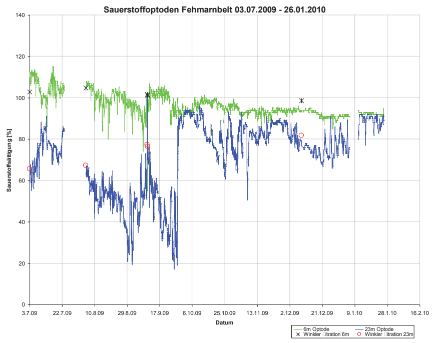


Oxygen measurements



The optical design

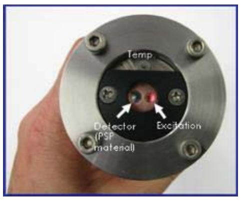
Oxygen measurements



Oxygen measurements

Oxygen measurements

Fast response oxygen sensor:



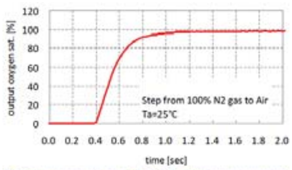
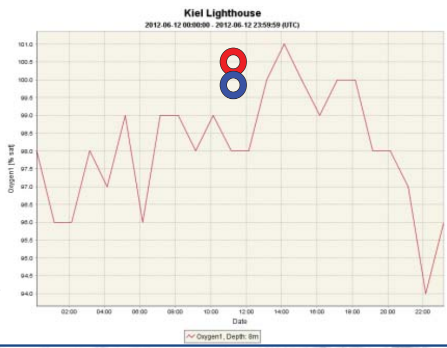


Fig.5 The response time of RENKO. This figure shows that the response time which reaches to 90% value of oxygen in air is within 1second.

Oxygen measurements

C□D

Winkler



Oxygen measurements

Fast response oxygen sensor:

First results:

Calibration measurement 12. 06. 2012: C□D – Winkler-□it.: 0.6 %

Calibration measurement 27. 09. 2012: C□D – Winkler-□it.: 0.4 %

No calibration of the C□D – oxygen sensor between the two measurements□

Quality assurance of dissolved oxygen measurements

Michael Haller, Wilhelm □etersen, M. □ehrung, S. Reinke, H. Rust, □ □ieplow, H. □homas I
H□□ I
michael.haller□ h□g.de

□□□erico fp□e□   □ct □□□ □er□ lion □□rete

Quality assurance procedure

- *Continous measurements of dissolved oxygen*
  on ships of opportunity (Tor□ania until 0□2012, Lys□ris, FunnyGirl)
  at Cuxhaven port measurement site
- *□xygen samples during maintenance in har□our*
  □nalysis in la□ □y Win□ler-titration
- *Cali□ration tests in la□*

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HZG Optode Quality assurance platforms

- □orDania: Route between □ermany and England
  - Ferrybox maintenance in Cuxhaven
- Lys□ris: Route between □ermany, England, Spain, Norway
  - Ferrybox maintenance in Hamburg
- Campaign data of R/□ Heincke
  - Optode measurements + Winkler-titration on board

R/□ Heincke

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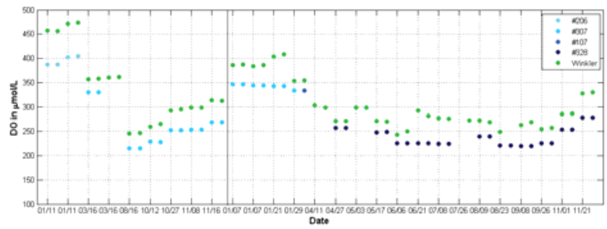
Tor Dania 2010-2011 time series



□orDania: Dissolved Oxygen time series 2010-2011
In two years four different optodes

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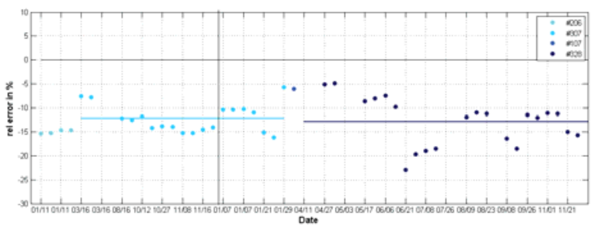
Tor Dania 2010-2011 relative error



Relative error and mean values for each optode

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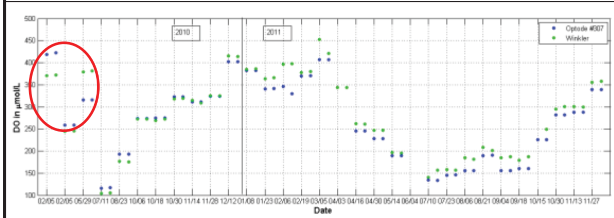
LysBris DO time series



□wo year time series of comparison between Optode and Winkler for one Optode
Measurements taken in Hamburg harbour → low DO values in summer□

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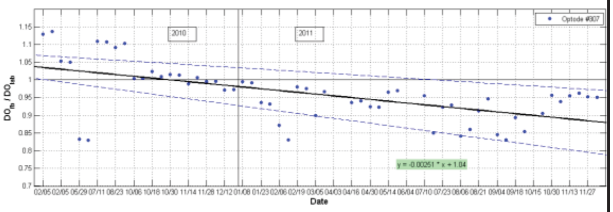
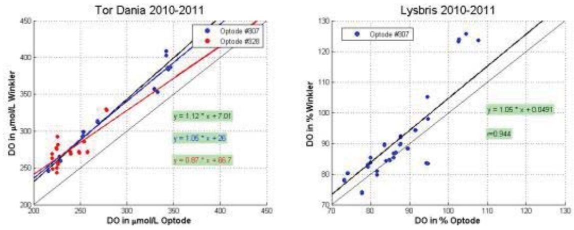
LysBris 2010-2011 DO ratio Ferrybox / Lab



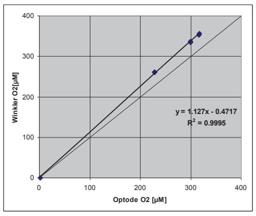
Ratio DO F□/Lab: Drifting optode, starting with overestimation

Tor Dania and LysBris DO Scatterplots

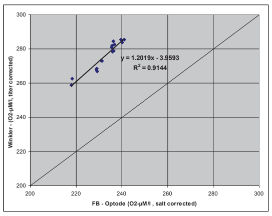


Systematic underestimation of optode measurements
Oxygen data over wide range helpful

Pre-campaign lab calibration comparison



Lab calibration Optode □205 and Winkler
9-11/06/2011
□emperature ≈ 23°C, Salinity: 0 psu
Mean ratio = **0.89**



Comparison on ship cruise R/V Heinke
Optode #205 and Winkler
17-21/06/2011
Temperature ≈ 12-15°C, Salinity: 32.3-34.8 psu
Mean ratio = **0.84**

Conclusions

- *2-year period of quality assurance*
- *Underestimation of Optode measurements (≈ 10-15%)*
- *Drifting Optode measurements on LysBris*
- *Calibration over wide range helpful*
- *Individual Optode calibration is beneficial*
  Calibrating before and after optode change in Ferrybox is needed on regular basis

To-Do List

- *Continue quality assurance for 2012*
- *Determine correction functions*
- *Installation of Ferrybox on Ro-Ro Ship „HafniaSeaways“ as a replacement for TorDania*

HafniaSeaways

REVIEW O□ O□□□E□ SE□SORS □OR OCE□□O□R□□HIC □□□□IC□TIO□S □□□ THEIR □ER□ORM□□CE WITH RES□ECT TO □IO□O□□I□□. □RE□IMI□□R□ RES□□TS

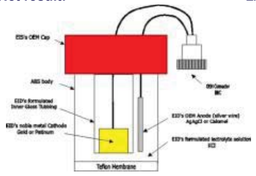
Carolina Cantoni□□tefano Co□□i□□tefania □parnocchia

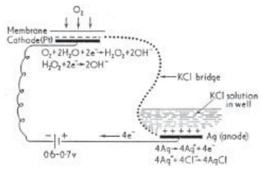
Carolina Cantoni | C□R-ISM□R | carolina.cantoni□ ts.ismar.cnr.it

Electrochemical (polarographic) DO sensors - 1

□rinciple: □ased on an amperometric cell (*dr. Leland Clar□□1□5□*□polarised at ≈ -0.8 V. In conditions of a complete polarisation □O_2□ = 0 on cathode surface□, the current is proportional to the diffusion (i.e. partial pressure□ of □O in the li□uid media. Oxygen is consumed, need of a constant water flux.

Anode □□g□gCl with electrolyte □Cl□ 2□g □2 Cl$^-$ → 2□gCl □2e$^-$
Cathode □□atinum, gold, palladium□ 2e$^-$ + ½ O_2 □$H_2$0 → 2 OH$^-$
Net result: 2Ag + ½ O_2 □$H_2$0 □2Cl$^-$ → 2 □gCl □2OH$^-$





Electrochemical (polarographic) DO sensors - 2

Main types:

- Steady-state sensors with permea□le mem□ranes (e.g. teflon or polyethylene□and electrolyte □□Cl or □□r solutions□□e.g. **SBE 43**□
- Rapid-pulse sensors with mem□rane and electrolyte (three electrodes, pulse voltage to avoid the depletion of □O at the surface of the mem□rane□□
- Micro-hole potentiostatic sensors (three electrodes: cathode, anode, reference□without mem□rane and electrolyte, they are □ased on the direct diffusion of □O□

Others:
□teady-state electrochemical (galvanic) sensors□ with mem□rane and electrolyte. They measure a current proportional to □O partial pressure in □Cl solution in a galvanic cell (cathode: silver / anode: □inc□, without the application of an external constant voltage (i.e. similar to a □attery□

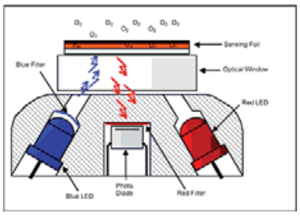
Optical DO sensors - 1

□rinciple: (since the 2000s□□ased on a sensing foil containing a chemical dye in contact with seawater that is excited □y a monochromatic □□lue□light. Oxygen dissolved in the water □uenches (oth decay time and intensity of the □re□□luminescence emitted □y the foil (i.e. emission of photons at a lower energy than those a□sor□ed□. The sensor also emits a red light that is reflected □y the dye layer. The reading of this reflected light is used as reference.

Stern-Volmer equation:

$$[O_2] = \frac{1}{K_{sv}} \cdot \left(\frac{T_0}{T} - 1\right)$$

relationship □etween [O_2□and luminescence lifetime/intensity:
T = lifetime/intensity, T_0 = lifetime/intensity in the a□sence of oxygen, □SV = Stern-Volmer constant (the □uenching efficiency for the selected dye□
□ifetime measure more used: less affected □y dye degradation



Optical DO sensors - 2

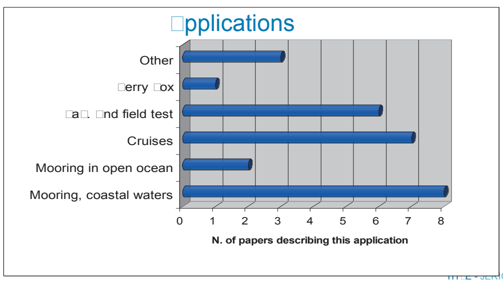
Oxygen is not consumed during the measure. □o need of water flux.

Main types of sensing dyes:
- □olymer layer with fluorophores (polycyclic aromatic hydrocar□ons (e.g. pyrene and fluoranthene□, metal (e.g. platinum□ porphyrins, longwave a□sor□ing dyes, transition-metal (e.g. ruthenium□organic complexes.

Structure:
- Optodes or micro-optodes□
- □lanar foils or porous plastic supports□
- □resence/a□sence of an oxygen permea□le diffusion cover to protect the foils (e.g. silicon mem□rane□

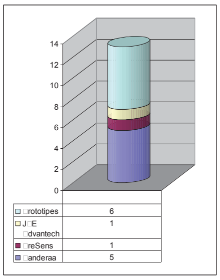
Literature review: applications

17 Peer-reviewed papers from 1995, independent authors
4 Performance Verification Statement – ACT 2004

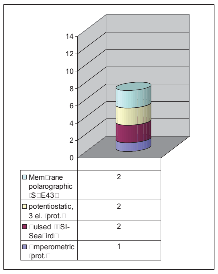


Literature review: kind of sensors

O□TO□ES



E□ECTROCHEMIC□□S



Effect of environmental conditions on DO sensors

Temperature
Changes in temperature modify molecular activity in the water media, with conse□uences on the diffusion of □O through the mem□rane of an electrochemical pro□e or on the sensing element of an optical pro□e The temperature affects □oth electrochemical and optical □O sensors and its effects have to □e corrected through cali□ration or algorithms that use the temperature readings from the probe's thermistor.

Salinity
The presence of permea□le diffusion mem□ranes protect polarographic and optical sensors □y the contact with water and salt. However, increases of salinity decrease the solu□ility of □O in seawater. Thus, salinity must □e derived □y the conductivity sensors and factored into the instrument's algorithms for the calculation of □O concentration.

Pressure
□n increase of the pressure decreases the permea□ility of mem□ranes, reducing the current outputs of polarographic sensors, while the response of micro-hole sensors is slightly increased. The response of optodes also decreases with an increasing pressure □≈ -4□ for □100 □ar□, □ut the effect is fully reversi□le and predicta□le without remaining effects of hysteresis.

Effect of environmental conditions on DO sensors

DO concentration
Optodes have a greater precision at lower oxygen concentrations □hypoxic conditions□that at higher levels □300-500 μM).

Chemical contamination
Contamination □y hydrogen sulfide □H_2S□is reported for electrochemical sensors that used silver as the cathode element. Sensor that use no□le metals □gold□as the cathode and silver as the anode, are not affected □y sulfur contamination. Optodes are insensitive to H_2S poisoning, □ut a cross-sensitivity with gaseous sulfur dioxide □SO_2□and chlorine □Cl_2□has □een o□served.
.

Effect of biofouling on DO sensors

From a theoretical point of view

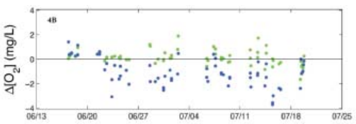
- □iofouling alters the mem□rane permea□ility to □O diffusion, □oth for electrochemical and optical sensors
- □iofouling creates a microenvironment □production/respiration□that is not representative of the surrounding seawater

From: Alliance for Coastal technologies. Performance verification Statement for Aanderaa Instruments Inc. Dissolved Oxygen Optode 3830/3930/3838 - 2004

□nprotected □rotected


□elleville □ake, Michigan.
4 weeks deployment.
2 Optodes □ Winkler measures

- □nprotected
- □rotected



□ifference with respect to Winkler data

Sensor with the □iofouling prevention system drifted more than the unprotected

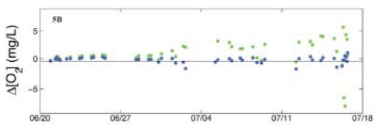
➢The □est: unprotected

From: Alliance for Coastal technologies. Performance verification Statement for Aanderaa Instruments Inc. Dissolved Oxygen Optode 3830/3930/3838 - 2004

□nprotected □rotected


□aneohe □ay Reef, Hawaii.
4 weeks deployment.
2 Optodes □ Winkler measures

- □nprotected
- □rotected

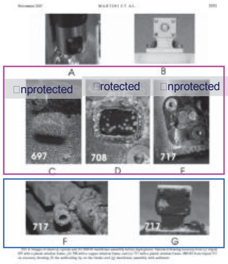


□ifference with respect to Winkler data

Sensor with the □iofouling prevention system drifted less than the unprotected

➢The □est: protected

From: □. □artini and □. □utman. □. Of Atm. And Ocean □ech.
Long-term performance of Aanderaa Optodes and Sea-□ird S□E-43 DO sensors □ottom □ounted at 32m in □assachusetts □ay. - 200□



Massachusetts □ay, 32m.
7 months deployment with 1-2 months of measures with two sensors.
Optode □□and.3830□, □olarographic □S□E43□,
Winkler measures

6□7 Sensing foil window completely covered □y a □ryo□oan colony. □ot working anymore

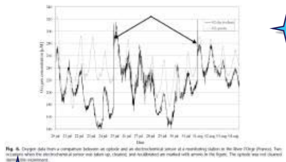
708 Copper frame, new design. □ess fouled, good □O data

717 severe fouling conditions, sensing window nearly □locked. However only small drift in □O values□

Sea-□ird S□E43 □lushing and tri□utyl-tin leaching tips.

□o fouling. Mem□rane covered □y sediments □ut still good data – 112 days.

From: □engberg et al.□Limnol. Ocean. □ethods.
Evaluation of a lifetime-based optode to measure oxygen in a□uatic systems - 200□



- Monitoring station in River l'Orge □□rance□
  Heavy fouling environment, □acterial □iofilm.
  20 days deployment.
  Optode □□a3830□, Electrochemical sensor.

  Electrochemical sensor affected □y fouling after 2 days□ optode without protection no influence of fouling within 20 days
- Waste water treatment plants
  14 days unprotected and not cleaned optodes
  □0 days unprotected and cleaned with tap water spry to remove the organic material accumulated near the foil.
- Shallow coastal waters
  □se of a □erillyum-copper alloy net □for domestic cleaning□ wrapped around the sensor.
  Service interval prolonged from 7-10 days to 40-60 days.

Effect of biofouling on DO sensors

Summarizing the effect of Biofouling

Optodes are less affected by fouling than polarographic sensors.

- In polarographic sensors, fouling alters the characteristics of the membranes and they need accurate cleaning and recalibration.
- Optodes are tolerant of fouling as long as some part of the window remains clear

However ....

- The anti-fouling technique used by Sea-Bird is proved to be effective also under severe fouling conditions.
- Care is needed in the choice of fouling protection for optodes. If it reduces water circulation at the membrane surface, the effect could be opposite.

Conclusions

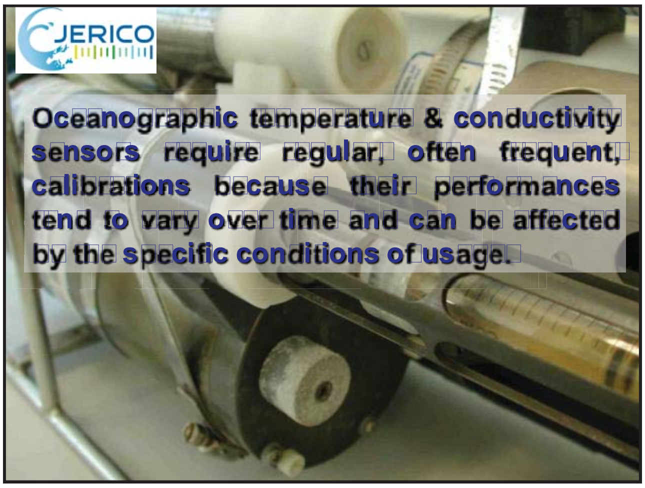
	ELECTROCHEMICAL SENSORS	*OPTODES*
Reliability	*Proven technology*	*Not always approved for environmental monitoring*
Calibration and maintenance	*More frequent*	*Less frequent*
Power	*Higher consumption (pumping system is needed)*	*Lower consumption*
Response time	*Faster measurements*	*Slower measurements (not always suitable for CTD cast applications)*
DO consumption in the samples	*Yes (not suitable for micro-environments and for not stirred samples)*	*No*
Costs	*Lower initial costs*	*Higher initial costs*
Biofouling	*More sensitive, but good antifouling systems available*	*Less sensitive*
Chemical contamination	*Recent sensors are scarcely affected*	*Scarcely affected*
Winkler calibration	*Always necessary for high precision DO determinations*	*Always necessary for high precision DO determinations*

Calibration Best [illegible]ractice

Temperature [illegible] Conductivity

[illegible]

www.[illegible]erico-fp[illegible]eu

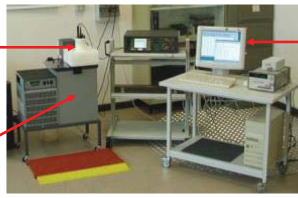


[illegible]

- [illegible]
- [illegible]

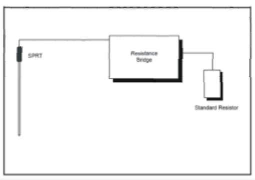
[illegible] calibration

[illegible] temperature calibration is performed by comparing the temperature readings of the instrument being tested with those of a Reference System in a thermostatic bath.

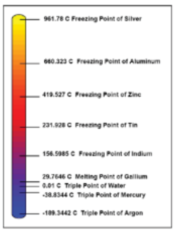


[illegible]

Constituted by a high-precision [illegible]igital Thermometer [illegible]Resistance Bridge[illegible], a Standard [illegible]latinum Resistance Thermometer [illegible]S[illegible]RT[illegible] and a Standard Resistor.



The principal fixed points of the International Temperature Scale of 1990 (ITS-90) used in Oceanography



[illegible] °C

[illegible] °C

□ □□□□i□□ o□ con□uc□i□i□□c□li□□□□ion

□ conductivity calibration is performed in a thermostatic bath□the conductivity readings of the instrument being tested are compared with those obtained from the salinity analysis of appropriately collected discrete water samples using a recogni□ed Reference System.

Reference Conductivity

Reference values for conductivity are calculated from measured sample salinities and reference bath temperatures using the standard **al□o□i□□□s □o□ co□□u□□ion o□ □un□□□ □n□l □o□□□i□s o□ s□□□ □□□** □UNESCO *Technical papers in marine science, no. 44, 1983*□

□□□ s□lini□□ □n□l□sis

The salinities of bath water samples are measured using a Laboratory Salinometer, standardi□ed using □□□□ □□n□□□□ □□□□ □□□□ as Reference □aterial

Best □ractice□Operations

Fouling can alter the performance of a temperature sensor, depending on thickness, extension and characteristics.

Fouling and hydrocarbons are a dangerous combination for a conductivity sensor. They can form thin gelatinous coatings on the measuring electrodes of the sensor which can dry out in air if not removed completely, thereby providing a base for new layers of Fouling on successive deployments.

Best Practice: Operations

□□o□□□i□l□ □ □in□n□nc□is □□□ □□□ □□□ □o succ□ss□ul c□li□□□□ions□

Poorly maintained instruments often need to be subjected to long and complicated procedures in order to restore them to a condition that would permit a proper calibration to be performed.

Best Practice: Calibration

Remember, you <u>cannot</u> calibrate temperature and conductivity sensors in the field!
(But you can monitor performance…)

It would be wise to have your temperature sensor calibrations verified at least once a year!

You <u>need</u> to have your conductivity sensor calibrations verified at least once a year!
(Once every six months would be even better…)

Wherever possible, calibrate the sensor together with the mother instrument!

Pretend an “As Received” evaluation of your sensor prior to a calibration.

Best Practice: Calibration

Calibrating temperature & conductivity sensors/instruments properly requires expertise, specialized equipment and procedures, dedicated staff and most of all experience. If you lack these resources in-house, don't improvise!

Every once in a while, use a calibration service provider different from the one you habitually use (if you perform your own calibrations, have your sensors calibrated by someone else); over time, this practice will provide you with information useful for QA.

Keep your calibration records up-to-date; calibration histories of sensors can often help to pre-empt potential problems with them in time.

Best Practice: Calibration

The results of a calibration may or may not be accredited but they must always be accompanied by the following:

- a declaration of the uncertainty associated with the calibration process.
- information evidencing traceability to reference material (certified or otherwise): ITS-90 fixed points for temperature and IAPSO Standard Seawater for conductivity.

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

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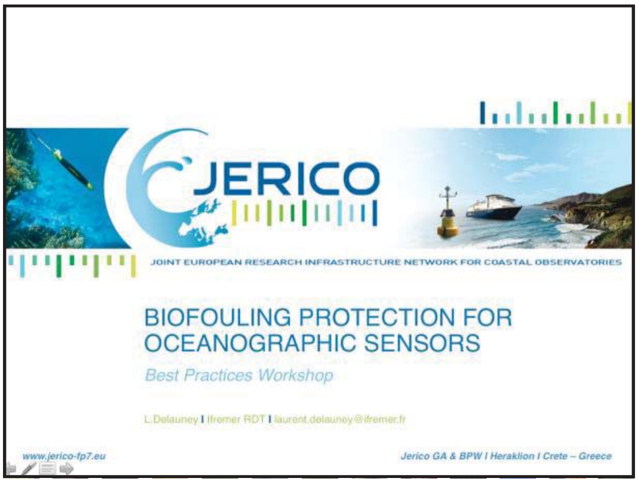
JERICO Best Practices Workshop, Heraklion, Greece, 04-05 October 2012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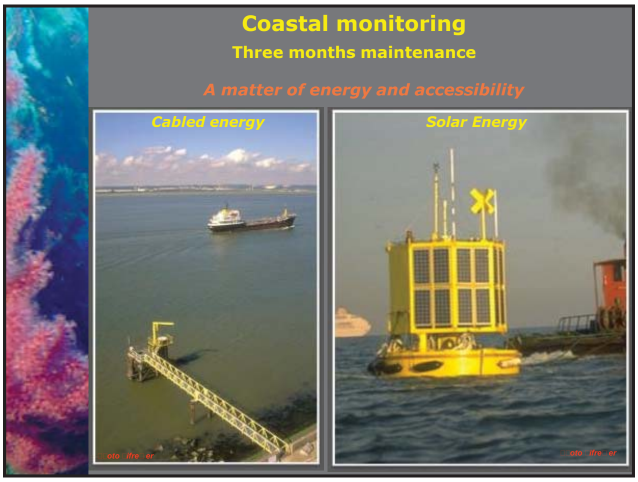
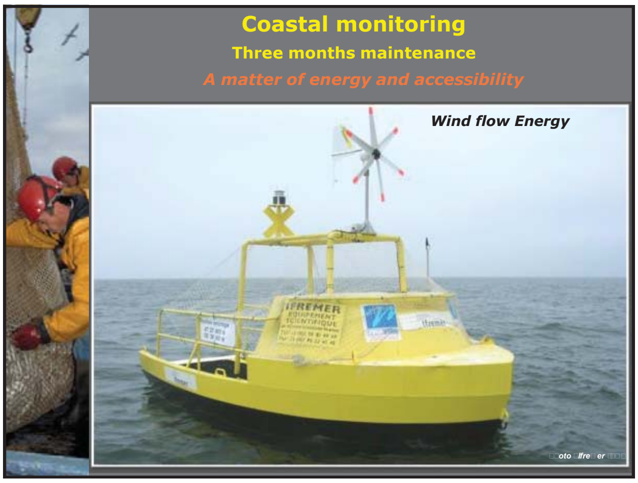
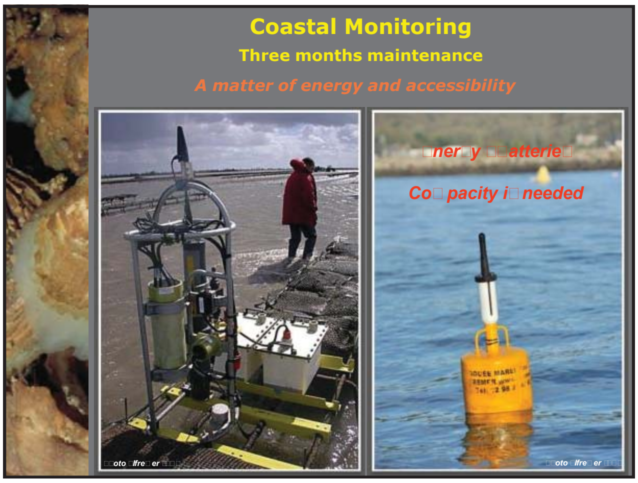
BIOFOULING PROTECTION FOR OCEANOGRAPHIC SENSORS
Best Practices Workshop
L.Delauney I Ifremer RDT I laurent.delauney@ifremer.fr
www.jerico-fp7.eu
Jerico GA & BPW I Heraklion I Crete – Greece

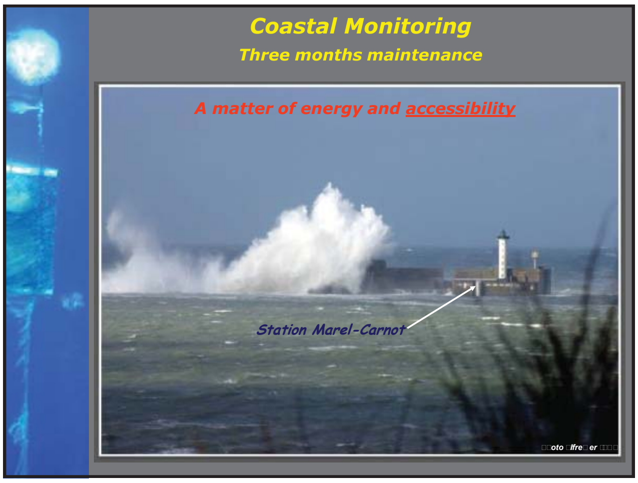

We are playing in an
In Situ marine
context !


A tough medium… isn't it ?
Photo : Ifremer/FFV L. Delauney

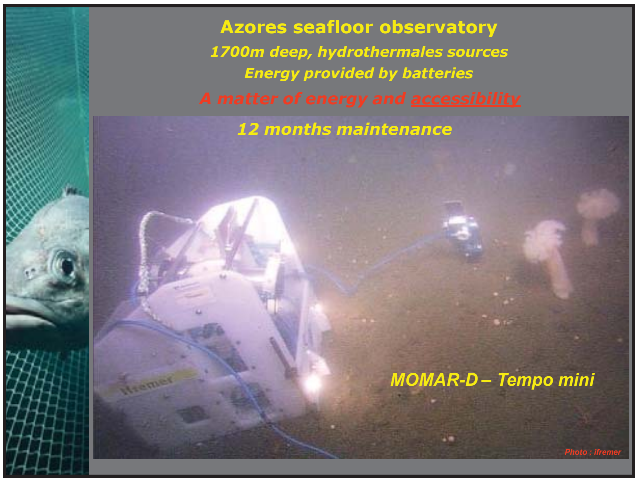

Coastal monitoring
Three months maintenance
A matter of energy and accessibility
Cabled energy
Solar Energy

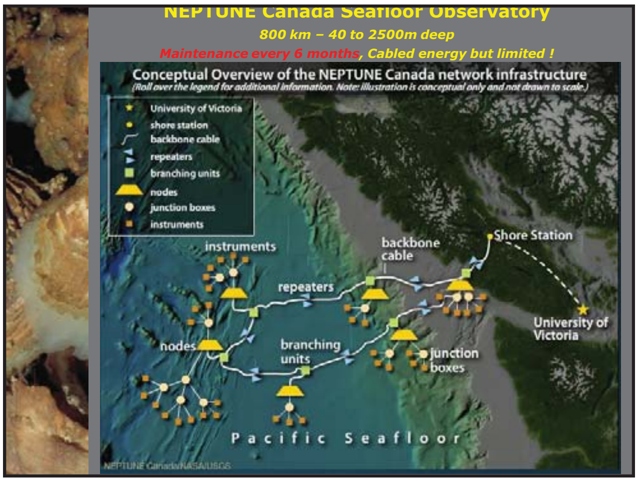

Coastal monitoring
Three months maintenance
A matter of energy and accessibility
Wind flow Energy

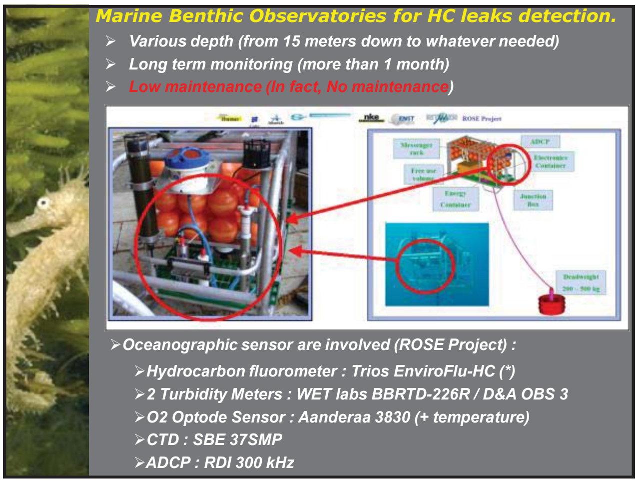

Coastal Monitoring
Three months maintenance
A matter of energy and accessibility

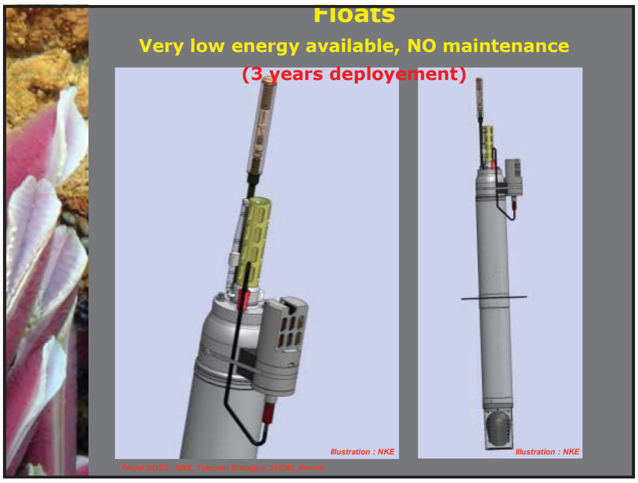

Coastal Monitoring
Three months maintenance
A matter of energy and accessibility
Station Marel-Carnot


Seafloor observatories in Europe
Arctic
Norwegian Margin
Nordic Sea
Porcupine Abyssal Plain
Azores Islands
Iberian Margin
Ligurian Sea
Western Ionian Sea
Hellenic Arc
Black Sea
Marmara Sea


Azores seafloor observatory
1700m deep, hydrothermales sources
Energy provided by batteries
A matter of energy and accessibility
12 months maintenance
MOMAR-D – Tempo mini
Photo : Ifremer


NEPTUNE Canada Seafloor Observatory
800 km – 40 to 2500m deep
Maintenance every 6 months, Cabled energy but limited !
Conceptual Overview of the NEPTUNE Canada network infrastructure
University of Victoria
shore station
backbone cable
repeaters
branching units
nodes
junction boxes
instruments
backbone cable
Shore Station
repeaters
University of Victoria
nodes
branching units
junction boxes
Pacific Seafloor


Marine Benthic Observatories for HC leaks detection.
Various depth (from 15 meters down to whatever needed)
Long term monitoring (more than 1 month)
Low maintenance (In fact, No maintenance)
ROSE Project
ADCP
Oceanographic sensor are involved (ROSE Project) :
Hydrocarbon fluorometer : Trios EnviroFlu-HC (*)
2 Turbidity Meters : WET labs BBRTD-226R / D&A OBS 3
O2 Optode Sensor : Aanderaa 3830 (+ temperature)
CTD : SBE 37SMP
ADCP : RDI 300 kHz


Floats
Very low energy available, NO maintenance
(3 years deployment)
Illustration : NKE
Illustration : NKE

Gliders

Very low energy, no maintenance
Few days deployment (usually)

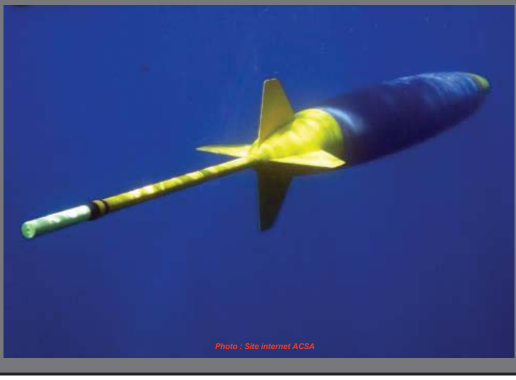


Photo : Site internet ACSA

Scientific drones – USV Mobesens

Low Energy, No maintenance
One day deployment

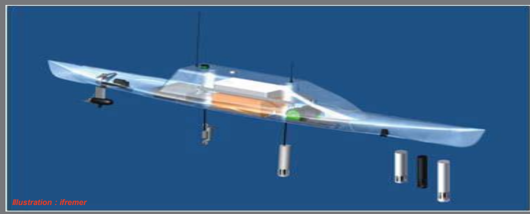


Illustration : Ifremer

Sensors and biofouling

Marine Benthic Observatories.

Photos : Ifremer (FR)

Biofilm development must be taken into acount

Biofouling example

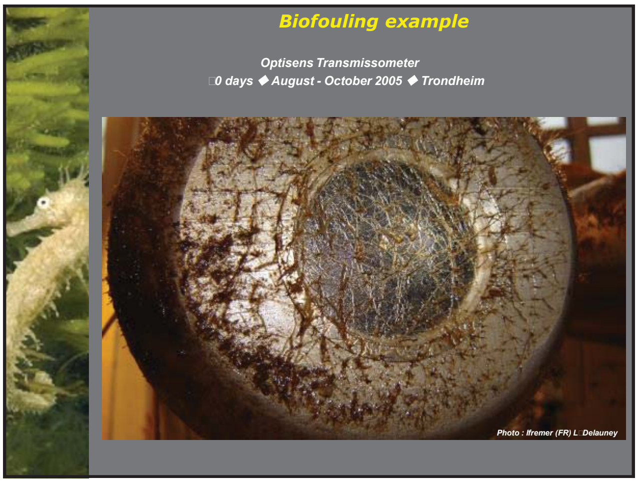
SI 6600 EDS (E tended Deployment System) - Clean SweepTM
150 days ◆ April - Sept 2005 ◆ St Anne Portzic Brest

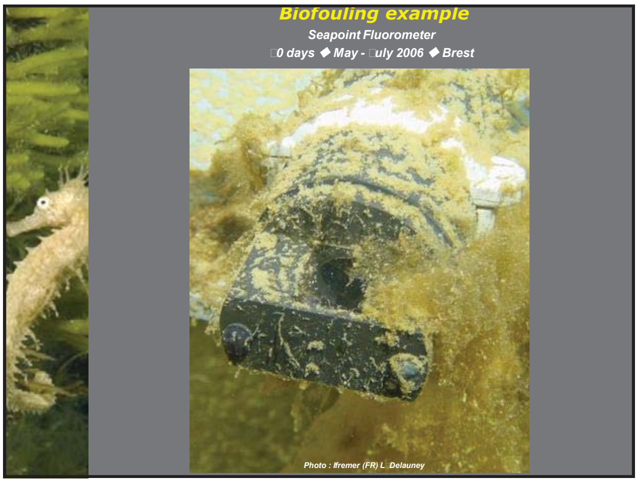
Photo : Ifremer (FR) L. Delauney

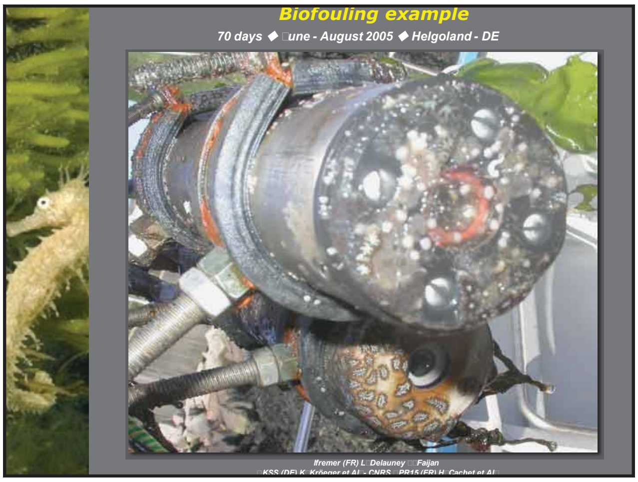
Biofouling example

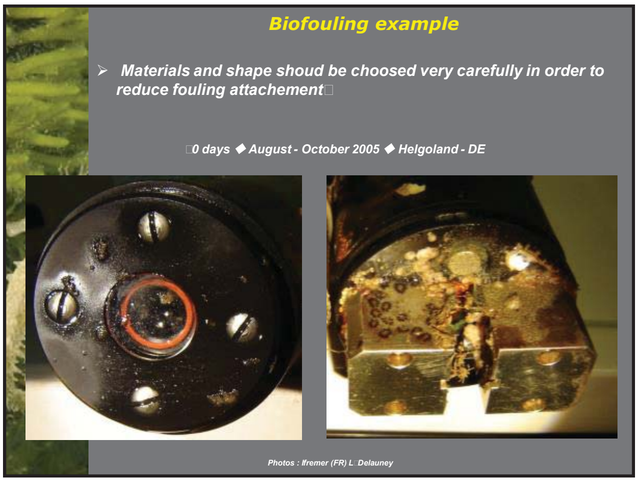
SI 6600 EDS (E tended Deployment System) - Clean SweepTM
150 days ◆ April - Sept 2005 ◆ St Anne Portzic Brest

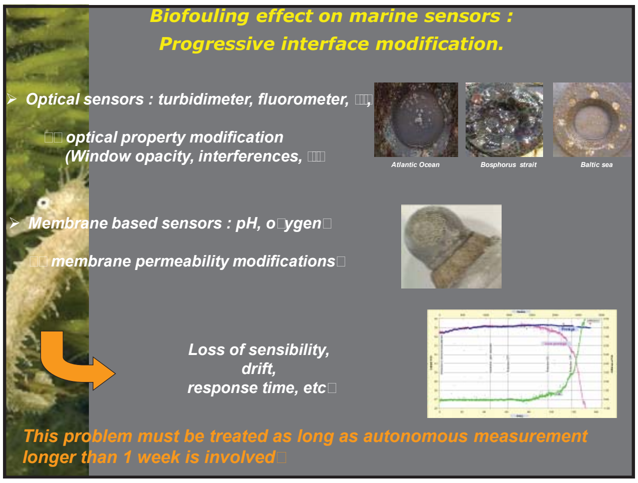
Photo : Ifremer (FR) L. Delauney

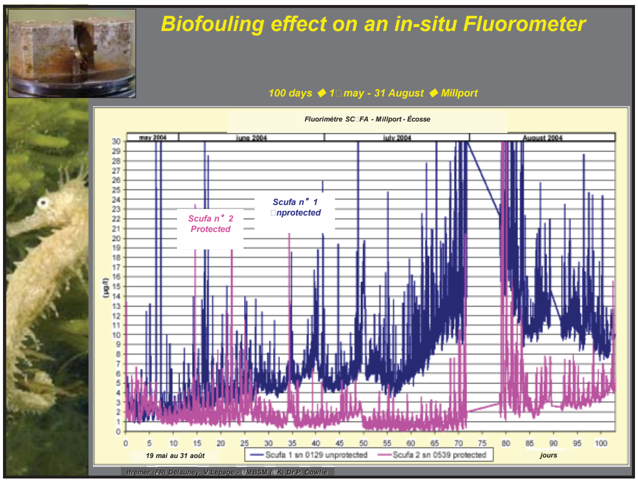

Biofouling example
Optisens Transmissometer
0 days ◆ August - October 2005 ◆ Trondheim
Photo : Ifremer (FR) L. Delauney


Biofouling example
Seapoint Fluorometer
0 days ◆ May - uly 2006 ◆ Brest
Photo : Ifremer (FR) L. Delauney


Biofouling example
70 days ◆ une - August 2005 ◆ Helgoland - DE
Ifremer (FR) L. Delauney Faijan

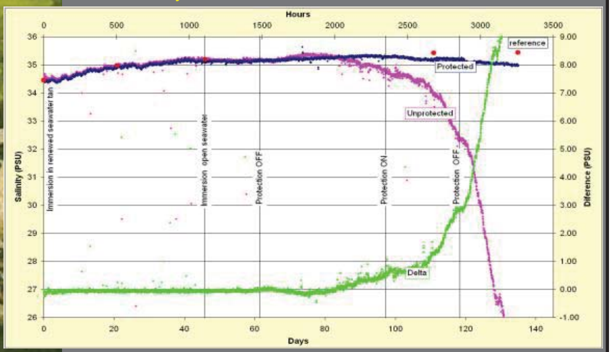

Biofouling example
Materials and shape shoud be choosed very carefully in order to reduce fouling attachement
0 days ◆ August - October 2005 ◆ Helgoland - DE
Photos : Ifremer (FR) L. Delauney


Biofouling effect on marine sensors :
Progressive interface modification.
Optical sensors : turbidimeter, fluorometer,
optical property modification
(Window opacity, interferences,
Atlantic Ocean
Bosphorus strait
Baltic sea
Membrane based sensors : pH, o ygen
membrane permeability modifications
Loss of sensibility,
drift,
response time, etc
This problem must be treated as long as autonomous measurement longer than 1 week is involved


Biofouling effect on an in-situ Fluorometer
100 days ◆ 1 may - 31 August ◆ Millport
may 2004
june 2004
july 2004
August 2004
Scufa n° 2
Protected
Scufa n° 1
nprotected
19 mai au 31 août
Scufa 1 sn 0129 unprotected
Scufa 2 sn 0539 protected
jours

Sensor deviation e□ample : conductivity

133 days ◆ 03 □une - 16 October 2003 ◆ St Anne Portzic Brest



Conductivity Measurement - TPS35 Micrel Instrument

Objectifs

- *The protection system must delay the biofouling effect on the response of the measuring system for at least 1 month in severe conditions and for 3 months in average condition□*

  For specific applications like deep sea observatories, biofouling protection effect should last for at least 6 months□

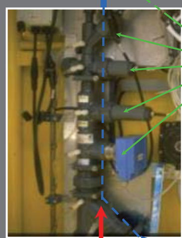
- *The protection system should be compatible with autonomous energy supplying (batteries)□*
- *The protection system must be adaptable □uite easily on e□isting instrumentation□*
- *The protection system must not affect the measurements produced□*

Protection strategy

To be closer as possible to the transduction interface

Global Protection

- *Pumping is needed*



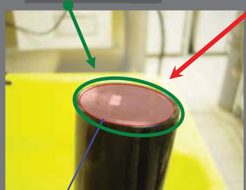
Photos : Ifremer (FR)

MAREL - Ifremer
Mesures Automatisées pour l'environnement littoral
(Autonomous Measurement for Coastal Environment)

Local Protection

Sensor Head

Biocide zone



- *Pumping system not needed*
- *Biocide is produced as close as possible of the sensing element of the instrument□*

Turbidimeter TBD 35 - NKE

Coated window Protection

Interface Modification

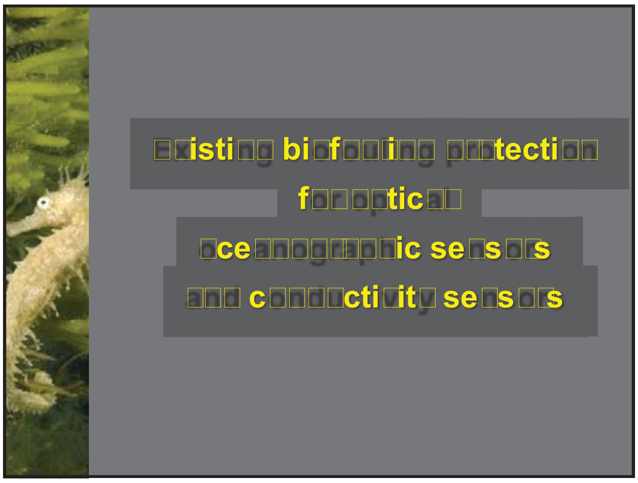
□lass window coated with a specific material in order to generate biocide on the surface (Work in progress)

Sensor transducing interface

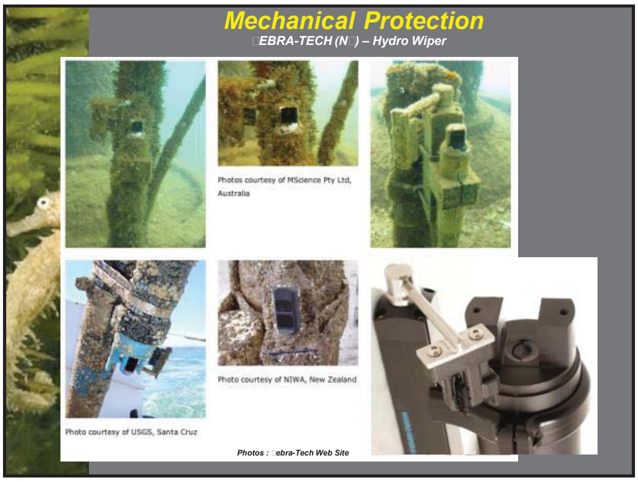
Biocide zone

TriOS microFlu-chl

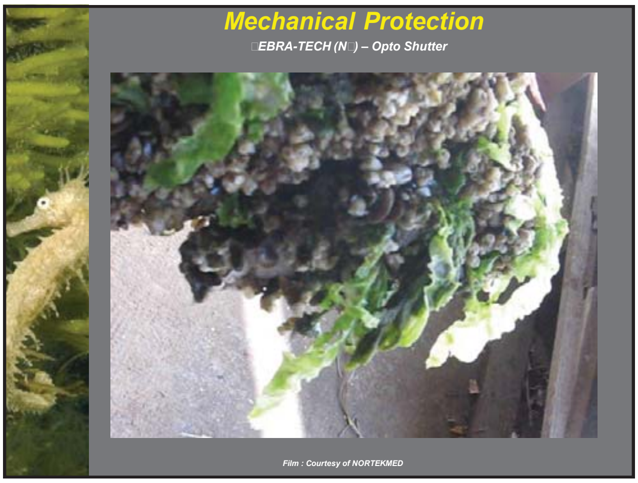
- *Optical sensor, camera, lights, □□*
- *Biocide generation is situated on the window surface□*
- *Biocide □uantity needed is very low□*


Existing biofouling protection for optical oceanographic sensors and conductivity sensors


Mechanical Protection
YSI 6600 EDS (Extended Deployment System) - Clean SweepTM

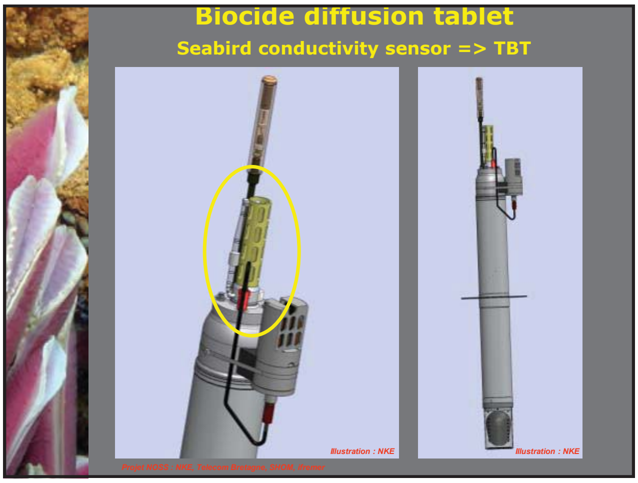

Mechanical Protection
ZEBRA-TECH (NZ) – Hydro Wiper
Photos courtesy of MScience Pty Ltd, Australia
Photo courtesy of NIWA, New Zealand
Photo courtesy of USGS, Santa Cruz
Photos : Zebra-Tech Web Site


Mechanical Protection
ZEBRA-TECH (NZ) – Opto Shutter
D-Opto dissolved oxygen sensor with Shutter fitted
Shutter closed
Shutter open
D-Opto optical window
D-Opto Shutter
Shutter open
Photos : Zebra-Tech Web Site


Mechanical Protection
ZEBRA-TECH (NZ) – Opto Shutter
Film : Courtesy of NORTEKMED

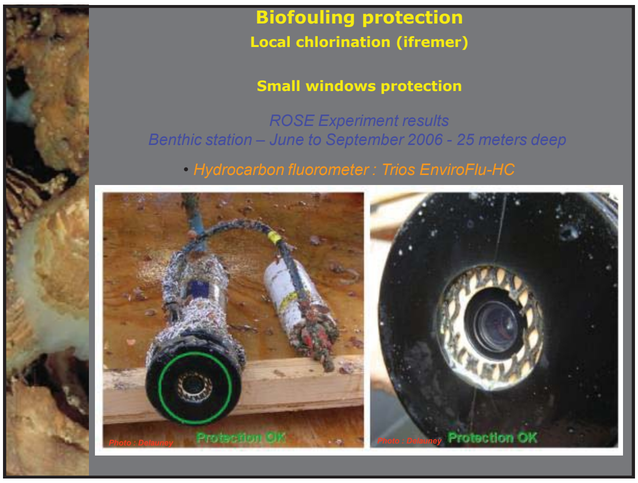

Copper Biofouling protection
Fluorimeter Seapoint + Hobilabs Hydroshutter
Ifremer (FR) L. Delauney
Ifremer (FR) L. Delauney
• The instrument must be customised in order to build a Copper cell.
• The Hydroshutter must be controlled by an external unit in order to open and to close it.

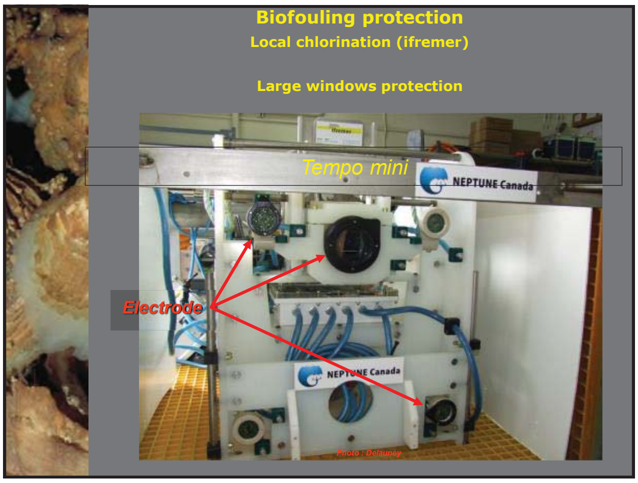

Copper Biofouling protection
Fluorimeter Seapoint + Hobilabs Hydroshutter
Ifremer (FR) L. Delauney


Biocide diffusion tablet
Seabird conductivity sensor => TBT
Illustration : NKE
Illustration : NKE


Coated window Protection
Trios – Nano coating on windows
- high sensitivity
- wide operation range
- nano coated windows against fouling
- fast acquisition
- electronic daylight compensation
- miniaturized design
- low power consumption
- low cost
- easy to handle
- RS232 interface
- fully RS232 controllable
- 0..5V analog output
- Windows software for PC access
- controllable with handheld or TriBox2
TriOS
microFlu-blue


Nano Coating spray
YSI - Anti-fouling C-Spray Protective Probe Solution
C-Spray


Biofouling protection
Local chlorination (ifremer)
Small windows protection
ROSE Experiment results
Benthic station – June to September 2006 - 25 meters deep
• Hydrocarbon fluorometer : Trios EnviroFlu-HC
Protection OK
Protection OK


Biofouling protection
Local chlorination (ifremer)
Large windows protection
Tempo mini
NEPTUNE Canada
Electrode
NEPTUNE Canada

Electro chlorination by Coated window Protection

□0 days ◆ August - October 2005 ◆ Helgoland - DE

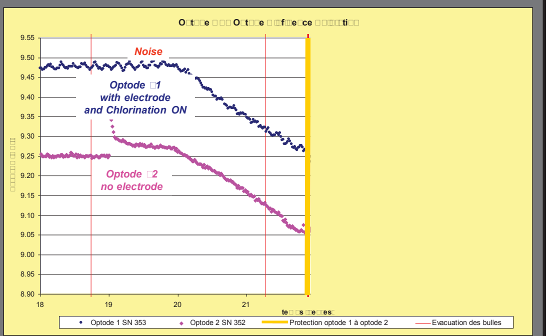
Ifremer (FR) L□Delauney □□Faijan
□KSS (DE) K□Kröeger et Al□- CNRS □PR15 (FR) H□Cachet et Al□

Adverse effect on sensor measurement

One example

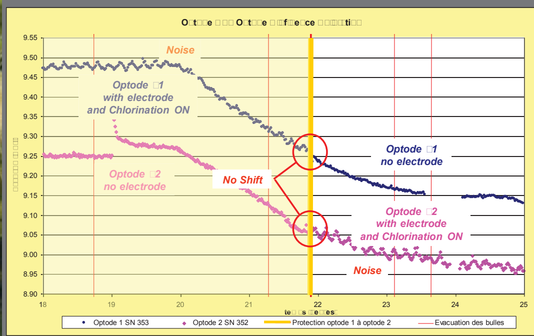
Local Chlorination
Adverse effect, laboratory check

O□ygen Measurement – Optode Aanderaa instrument



Local Chlorination
Adverse effect, laboratory check

O□ygen Measurement – Optode Aanderaa instrument



Conclusion

- Main techniques available to protect sensors:
  - Wipers
  - Copper and copper shutter
  - Bleach (biocide injection)
  - Local chlorination
- The choice can be driven by different aspects :
  - Hardware matter :
    - Robustness (depth of use)
    - Mechanical comple□ity
    - Easiness of adaptation to the e□isting instrument
    - Level of integration
  - Metrological aspect :
    - Adverse effect to the measured parameter□
    - Is system can be turned on and off□
  - Economical aspect :
    - Availability on the market□
    - Price□

Conclusion

- Main techniques available to protect sensors:
  - Wipers 3/5 (endurance problem of the wiper material)
- The choice can be driven by different aspects :
  - Hardware matter :
    - Robustness (depth of use) : 2/5
    - Mechanical comple□ity : 2/5
    - Easiness of adaptation to the e□isting instrument : 2/5
    - Level of integration : 2/5
  - Metrological aspect :
    - Adverse effect to the measured parameter : 5/5
    - Is system can be turned on and off : □ES
  - Economical aspect :
    - Availability on the market : □ES (adaptable as well)
    - Price : 3/5
- Suitable for Optical sensors.
- Pay attention on the soft material used for the wiper.

Conclusion

• Main techniques available to protect sensors:

- Copper : 3/5

• The choice can be driven by different aspects :

Hardware matter :
- Robustness (depth of use) : 5/5
- Mechanical complexity : 4/5
- Easiness of adaptation to the existing instrument : 3/5
- Level of integration : 5/5

Metrological aspect :
- Adverse effect to the measured parameter : 3/5
- Is system can be turned on and off : NO

Economical aspect :
- Availability on the market : YES
- Price : 3/5

• Suitable for Optical and conductivity sensors
• Adverse effect for oxygen sensor

Conclusion

• Main techniques available to protect sensors:

- Copper shutter : 3/5

• The choice can be driven by different aspects :

Hardware matter :
- Robustness (depth of use) : 2/5
- Mechanical complexity : 2/5
- Easiness of adaptation to the existing instrument : 2/5
- Level of integration : 1/5

Metrological aspect :
- Adverse effect to the measured parameter : 3/5
- Is system can be turned on and off : NO

Economical aspect :
- Availability on the market : YES
- Price : 2/5

• Suitable for Optical sensors
• Adverse effect for oxygen sensor

Conclusion

• Main techniques available to protect sensors:

- Bleach (biocide injection) : 4/5

• The choice can be driven by different aspects :

Hardware matter :
- Robustness (depth of use) : 2/5
- Mechanical complexity : 2/5
- Easiness of adaptation to the existing instrument : 2/5
- Level of integration : 1/5

Metrological aspect :
- Adverse effect to the measured parameter : 3/5
- Is system can be turned on and off : YES

Economical aspect :
- Availability on the market : YES (but not as a kit)
- Price : 2/5

• Suitable for every sensors
• Adverse effect for sensor if badly flushed

Conclusion

• Main techniques available to protect sensors:

- Local chlorination : 4/5

• The choice can be driven by different aspects :

Hardware matter :
- Robustness (depth of use) : 5/5
- Mechanical complexity : 3/5
- Easiness of adaptation to the existing instrument : 4/5
- Level of integration : 3/5

Metrological aspect :
- Adverse effect to the measured parameter : 4/5
- Is system can be turned on and off : YES

Economical aspect :
- Availability on the market : YES
- Price : 3/5

• Suitable for every sensors
• Adverse effect on oxygen, can be turned OFF.

Conclusion

• Main techniques available to protect sensors:

- Local chlorination on coated windows : 4/5

• The choice can be driven by different aspects :

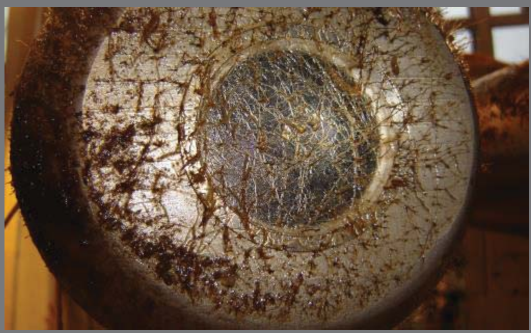
Hardware matter :
- Robustness (depth of use) : 5/5
- Mechanical complexity : 4/5
- Easiness of adaptation to the existing instrument : 2/5
- Level of integration : 5/5

Metrological aspect :
- Adverse effect to the measured parameter : 3/5
- Is system can be turned on and off : YES

Economical aspect :
- Availability on the market : NO (still in developpement)
- Price : -

• Suitable for optical sensors
• No Adverse effect, can be turned OFF.

Thank you for your attention



Operation and Calibration of Nutrient Sensors

W. Petersen, Helmholtz-Zentrum Geesthacht
Email: wilhelm.petersen@hzg.de

www.jerico-fp7.eu

μMAC

AutoLAB

EcoLAB

MicroLAB

ACT Code	Document Name	File Size
Nutrient	Detailed Testing Protocols used for evaluating the performance of in situ nutrient analyzers are available for download	588k
ACT TD08-01	Performance Demonstration Statement for the American Ecotech NUT 1000	1.1mb
ACT TD08-02	Performance Demonstration Statement for the Satlantic ISUS V3 Nitrate Sensor	2.3mb
ACT TD08-03	Performance Demonstration Statement for the WET Labs Cycle-P Nutrient Analyzer	1.8mb
ACT TD08-04	Performance Demonstration Statement for the YSI 9600 Nitrate Monitor	1.4mb
Needs & Use	Customer Needs and Use Assessments (CNUA) of In Situ Nutrient Sensors 2005	7.3mb
Needs & Use	Customer Needs and Use Assessments (CNUA) of In Situ Nutrient 2 Sensors 2009	3.7mb

Nutrient Analyzer Technical Advisory Committee
Patrick Anderson, University of Wisconsin-Milwaukee; Earle Buckley, North Carolina State University; Lou Codispoti, University of Maryland Center for Environmental Science; Chris D'Elia, University of South Florida; Jan Newton, University of Washington

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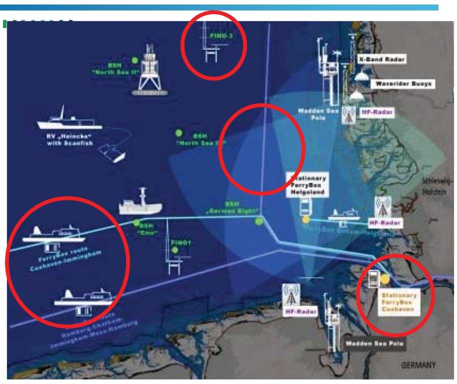
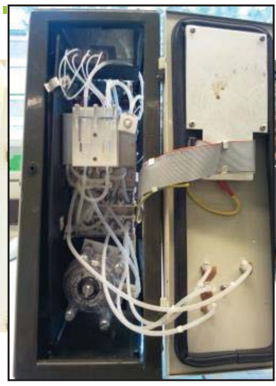


6

(SYSTEA™)

ADVANTAGES VS. DISADVANTAGES

ADVANTAGES VS. DISADVANTAGES



DATA STATION (STATIONARY FB) CUXHAVEN JANUARY 2012

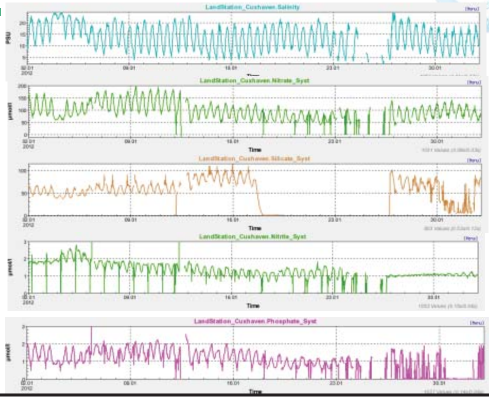
Sal

NO3

Si

NO2

PO4



CALIBRATION OF SYSTEA ANALYSERS

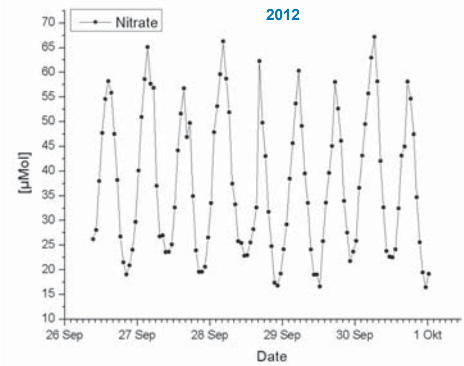
1-point calibration either in the lab or at the station

SPECIAL PROBLEMS FOR NITRATE

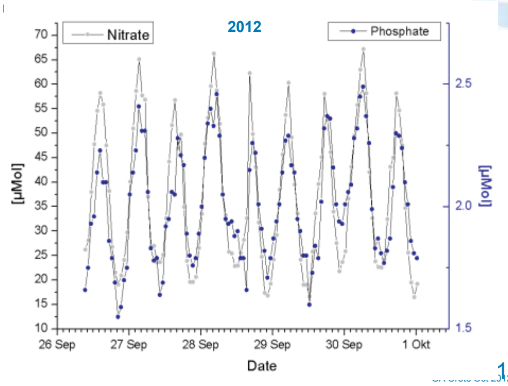
- *NO3 has to be chemically reduced to NO2 either by*
  - *A Cadmium reductor (column of activated Cd granulate material) or*
  - *UV radiation*
- *Issue:*
  - *Reduction yield has to be stable and reproducible (ideally ~100%)*
  - *Reduction has to be stopped at NO2 (problem of UV radiation)*

    NO3 → NO2 → NH3 → N2

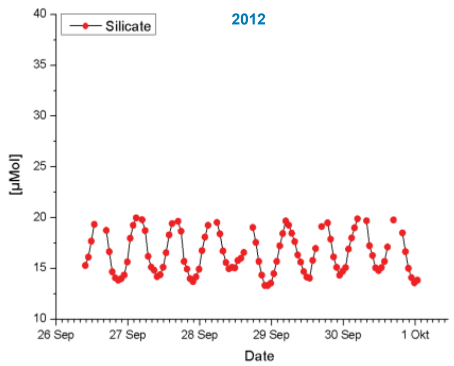
RECENT DATA FROM CUXHAVEN STATION



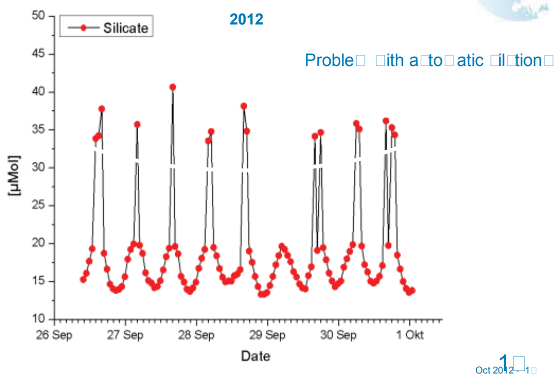
RECENT DATA FROM CUXHAVEN STATION



RECENT DATA FROM CUXHAVEN STATION



RECENT DATA FROM CUXHAVEN STATION

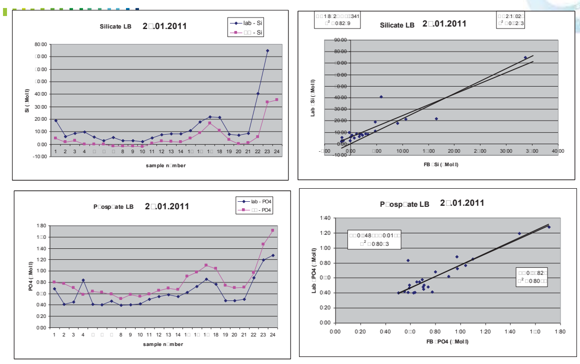


REFERENCE ANALYSIS OF BOTTLE SAMPLES (LAB)

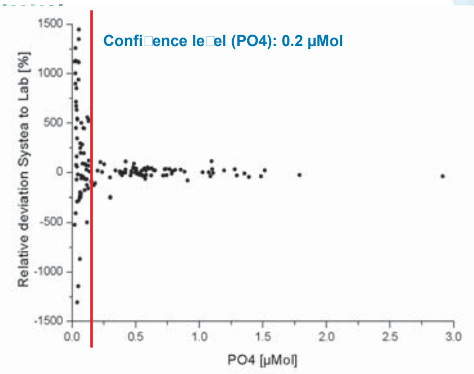
- A□to□aticall□sa□plin□b□a coole□ □ater sa□pler
  - position control □□err□□o□□
  - ti□e control □□i□e□ Plat□or□ □
- □iltration o□the sa□ples in the lab
- Stora□e at -20°C
- Anal□sis □ith an A□toanal□ser

□S□A□A□toAnal□er 3□se□□ ente□ □lo□ anal□sis□

LAB CHEC□ FERYBOX



RESULTS OF LAB CHEC□



Concl□sion (prelimanary)

-Operation o□che□ical n□trient anal□sers re□□ires □ell traine□ an□ e□perience□ operators (not a pl□□□pla□ instr□□ent□

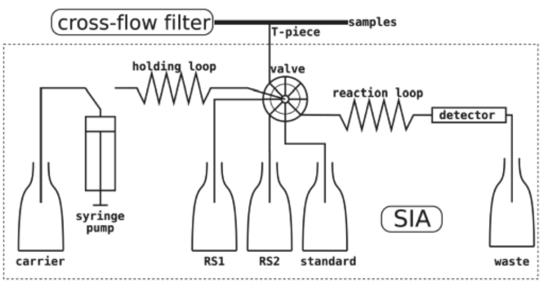
- re-calibration in the □iel□ are ti□e cons□□in□ an□ res□lts in hi□her errrors

  -□ecalibration □ro□ bottle sa□ples (lab anal□sis□are reco□□en□e□

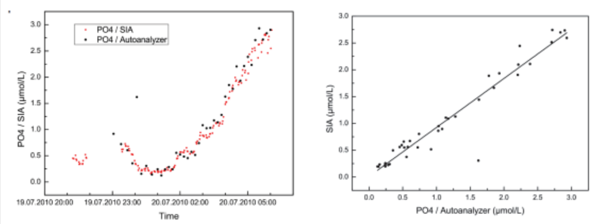
-Co□□erciall□ a□ailable instr□□ents s□□ers on lon□-ter□ stabilit□ □or □natten□e□ operation

- there is still a □e□an□ on □ore rob□st an□ reliable instr□□ents □ith hi□h sensiti□it□

NE□ NUTRIENT ANALYSER BY SE□UENTIAL INJECTION ANALYSIS (SIA) DEVELOPMENT AT H□G



TEST SIA ANALYSER FOR PO4 IN GERMAN BIGHT (RV HEINC□E)



Thanks for your attention!

Oxygen measurements: sensors accuracy and scientific needs

L.Coppola (LOV), V.Thierry (LPO), D.Lefevre (MIO) and others partners involved in the O2 measurements

JERICO General Assembly, October 2012

INSU
Institut national des sciences de l'Univers

- Due to the relatively rapid ongoing changes in the world's oceans, biogeochemical parameters are urgently needed across all temporal and spatial scales
- Must enhance our ability to monitor ocean acidification, changes in biogeochemical cycling in response to climate variability, and ocean deoxygenation at scales not currently possible.
- **We need integrated observing systems (satellite, in situ platforms, floats, moorings), sensors and models that allow us to observe biogeochemical change**

Global phytoplankton decline over the past century

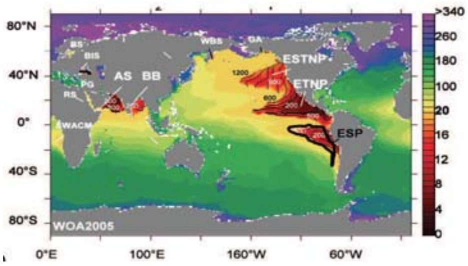
Daniel G. Boyce[1], Marlon R. Lewis[2] & Boris Worm[1]

In the oceans, ubiquitous microscopic phototrophs (phytoplankton) account for approximately half the production of organic matter on Earth. Analyses of satellite-derived phytoplankton concentration (available since 1979) have suggested decadal-scale fluctuations linked to climate forcing, but the length of this record is insufficient to resolve longer-term trends. Here we combine available ocean transparency measurements and *in situ* chlorophyll observations to estimate the time dependence of phytoplankton biomass at local, regional and global scales since 1899. We observe declines in eight out of ten ocean regions, and estimate a global rate of decline of ~1% of the global median per year. Our analyses further reveal interannual to decadal phytoplankton fluctuations superimposed on long-term trends. These fluctuations are strongly correlated with basin-scale climate indices, whereas long-term declining trends are related to increasing sea surface temperatures. We conclude that global phytoplankton concentration has declined over the past century; this decline will need to be considered in future studies of marine ecosystems, geochemical cycling, ocean circulation and fisheries.

Why are we measuring oxygen ?

- Physical interests: water mass circulation, new formed deep waters, mixing depth, ventilation age, atmosphere-ocean exchange
- Biogeochemical interests: primary production estimates, remineralisation flux (consumption/production through bacteria and zooplankton)

- The ocean deoxygenation (due to global warming and human activities) is one of the most important topic (OMZ studies)
- Oxygen is one of the first measured oceanographic parameters but with a large spatio-temporal scales range : OMZs are poorly documented…

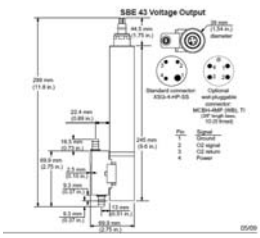


A summary of the manufacturer's stated specifications of present O2 sensors suitable for use on profiling floats

Sensor	Response Time	Accuracy	Precision	Stability
SBE 43-IDO	< 1 sec	2% of sat.	1 µmol/kg	2%/1000 hr
Optode 3830	< 25 sec	<8 µmol/kg	< 1µmol/kg	Good
Optode 4330	8-25 sec	<8 µmol/kg	< 1µmol/kg	Good
Rinko	1 sec	2%	0.1%	??
SBE 63-IDO	< 10 sec ?	1 µmol/kg ?	??	Good?

We need accuracy around 1 umol/kg to do some science !

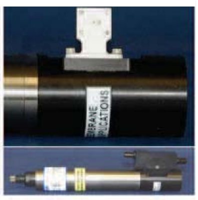
SBE 43 Dissolved Oxygen Sensor



Principle of Operation:

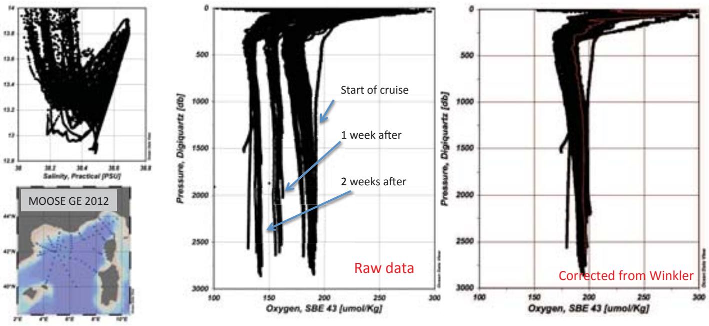
Oxygen gas diffuses across a membrane, is converted to OH^- at the cathode (Au), 4 electrons are required, and the resulting current is converted to a voltage proportional to the number of molecules.

Specifications
Measurement range: 120% of surface saturation in all natural waters, fresh and salt
Initial accuracy: 2% of saturation
Typical stability: 0.5% per 1000 hours (clean membrane)



Problems with SB43:

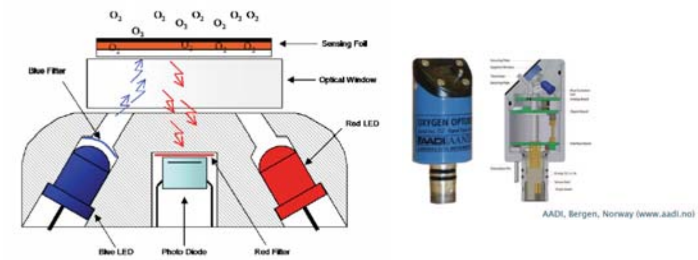
- Sources of drift: changes in membrane tension, depletion of electrolyte, impairment of the silver anode, plating of anode metal on the cathode, and the presence of chemical contaminants in the sensor's plastic body.
- Dynamic errors leading to apparent hysteresis are caused by response-time mismatch of the compensation temperature sensor
- Membrane fouling: altering the oxygen diffusion rate through the membrane, thus reducing sensitivity. Biofouling can be particularly troublesome because the living organisms either consume or create oxygen.
- Mostly adapted for CTD profiler (very fast time response)



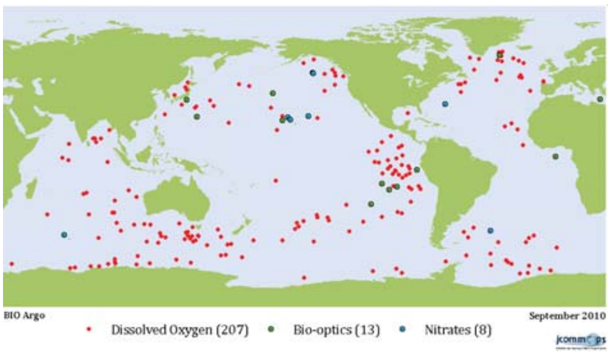
- MOOSE-GE 2012: summer cruise with 90 CTD-O2 profiles in the NW Mediterranean Sea
- Large drift from SBE43 raw data during 17 days cruise (around 50 umol/kg !!) despite the application of the SBE cleaning procedure (Triton and bleach flushing)
- Able to correct data from O2 Winkler measurements (1 profile per day)

Optical sensor: Aanderaa optode

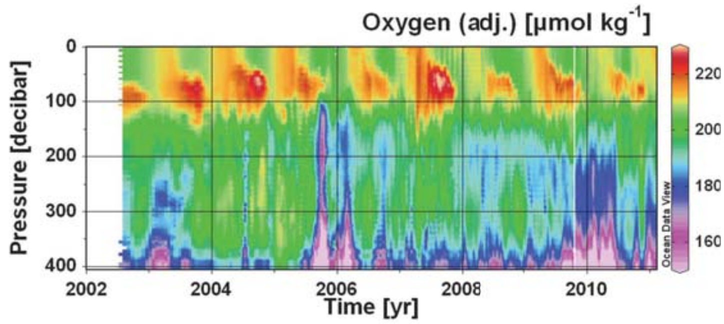
- The sensor is based on the dynamic luminescence quenching of an oxygen-sensitive fluorochrome embedded in the tip
- Long time stability, no pressure hysteresis, fast response, compact, better accuracy (accuracy <8µmol/kg, precision <1µmol/kg)
- Adapted for Argo floats, gliders, ferry boxes, moorings, plankton incubators (eg. IODA, RESPIRE,…)



Oxygen sensors have been deployed on ~ 300 Argo floats: today 200 floats are currently operating



Optode on Argo floats



9 years of float-based O2 data from the HOT site show a consistent seasonal cycle, demonstrating the utility of float-based O2 optode measurements (from K. Johnson).

Sensor Comparison to gridded data in WOA 09 for 119 floats

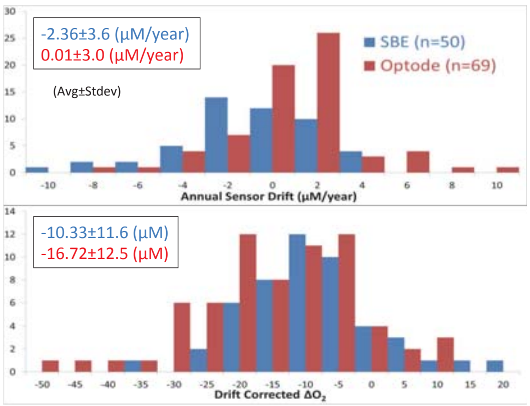
Metadata for 298 floats that include O_2 - ~21 obviously bad, ~25 record<1 yr, ~15<1000m, ~71 have only NaN in O_2 field, ~40 don't list type of O_2 sensor in metadata = 119 floats for analysis.

Drift

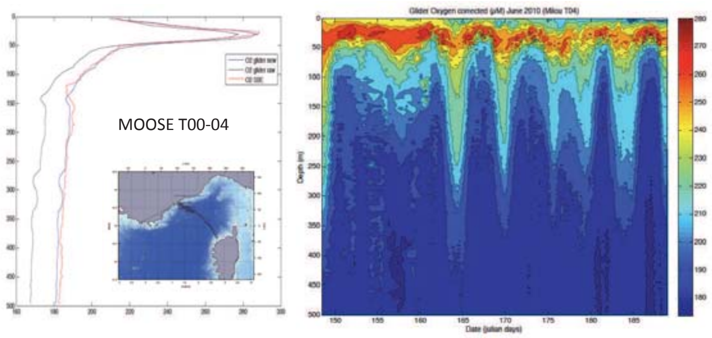
No drift in Optodes. Some for SBE.

Accuracy

Clear calibration offsets.



Slides from Yui Takeshita & Todd Martz, SIO

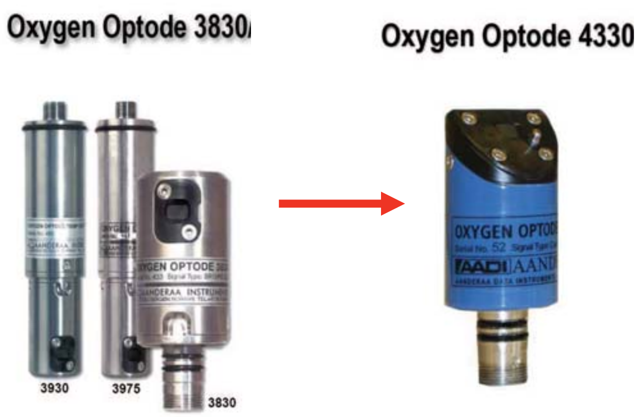


- Glider O2 measurements with optode 3835 in Ligurian Sea (July 2010)
- Drift from O2 raw data and O2 SBE_corrected @ Dyfamed = 20 umol/kg
- Possibility to correct coefficients calibrations using a polynomial fit model (Sensor Dynamics of Autonomous Underwater Gliders, Bishop, 2008) using T from CTD and after S and P correction:

  $[O2] = C0Coef + C1Coef . P + C2Coef . P^2 + C3Coef . P^3 + C4Coef . P^4$

  $CxCoef = CxCoef0 + CxCoef1 . T + CxCoef2 . T^2 + CxCoef3 . T^3$

New optode 4330 with better temperature compensation, faster time response (8-25s) but Aanderaa specifications are poor…



Aanderaa (AADI) calibration procedure

- Each batch of foils are characterized with respect to temperature and oxygen concentration (PreSens)
- Individual 2 point calibration made by AADI for correction of foil and sensor to sensor variations
- In addition each optode is temperature calibrated by AADI

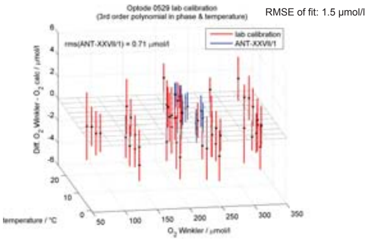
but…

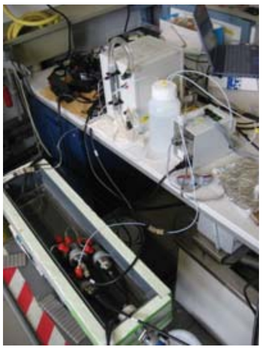
- **Bad initial calibration (we need 64 point calibration !)**
- **Self heating (should be >10s)**
- **Influence of the storage conditions on the data quality (light, dry air)**
- **Need to modify calibration equation**

Optode Calibration

Henry Bittig, Arne Körtzinger
IFM-GEOMAR, Kiel (and CSIRO)

- electrochemical O_2 Generator
- regulated current, flow and temp.
- triplicate Winkler samples
- several optodes in sequence
- polynomial fit in phase and temp.





Henry Bittig, IFM-GEOMAR

Argo O2 meeting conclusion

- Recommendations for the QC of O2 data:
- Calibrate sensors before deployment
- Collect concomitant oxygen sample at deployment (Winkler)
- Compare O2 data to climatological data to estimate sensor bias or drift

- Recommendation for the data management

Transmit raw data and not onboard calculated O2 concentrations

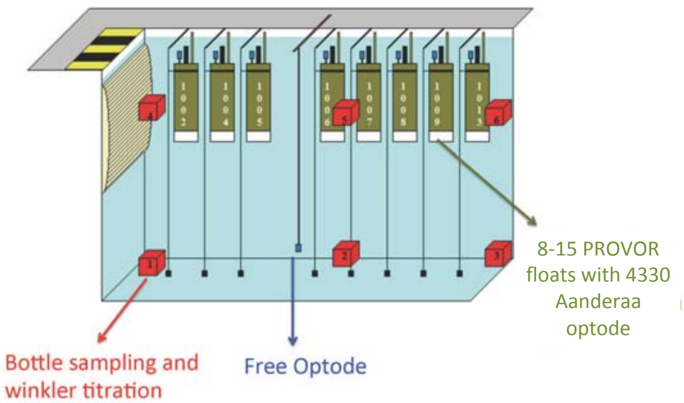
Before float deployment

Control of the float behavior in Ifremer pool :
- 1 day cycle at 20 dbar (float at the bottom during “drift phase”)
- Check sensors, Argos transmission, buoyancy control, etc
- Intercomparison between floats
- Salinity and oxygen sampling for comparison
- Free optode in between the floats (in Feb 2011 only)

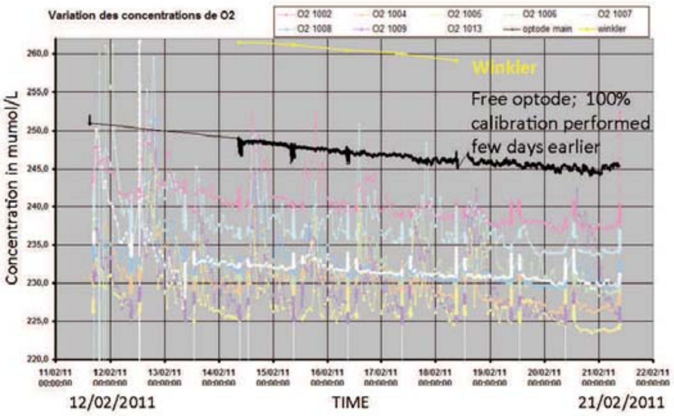
- **Our initial objective was to use results from those inter-comparisons to evaluate oxygen sensors and to help correct oxygen data from floats after deployment.**
- **The experiments brought more questions than solutions !**

Can we use them anyway ?

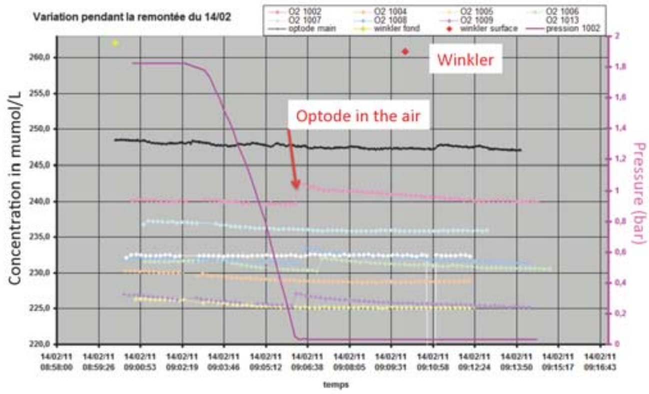
Two experiments in 2011 and 2012 at the IFREMER pool



O2 concentration over 10 days at Ifremer pool : 8 floats, 1 optode, winkler titrations (2011)



Argo profiles (float ascent from 18 dbar to surface) vs winkler titration



Main results

- Experiment done in winter when the pool was very homogeneous, both vertically and horizontally
- All optodes revealed the same temporal trend as the one shown by the Winkler titration over the duration of the experiment
- All optodes underestimated oxygen concentration;
- Anomalous fluctuations for the free optode : self-heating of the optode
- Large unexplained fluctuations during « drift » at parking depth for the floats , many checks, no clear explanation

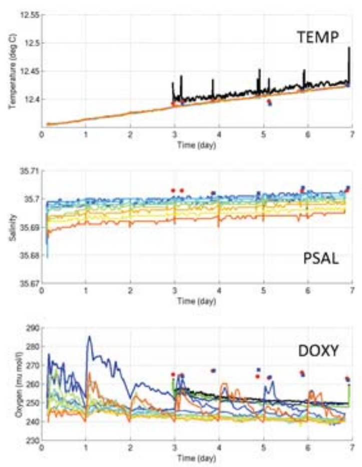
➔ **Results presented at the Argo-02 meeting**

10-day experiment in March 12 at the Ifremer pool with calibrated optode

- 13 PROVOR-DO equipped with calibrated optodes and one free calibrated optodes were tested in Ifremer pool
- Calibration done in fall 2011 at CSIRO
- Calibration based on the Stern-Volmer equation (Uchida 2008)

$$[O2] = \frac{\frac{c4 + c5.T}{c6 + c7.TCPhase} - 1}{c1 + c2.T + c3.T^2}$$

✓ Use 7 calibration coefficients instead of 20
✓ Optode raw parameters to transmit: C1, C2 and TCPhase = C2-C1
✓ Use T from CTD sensor (SBE)



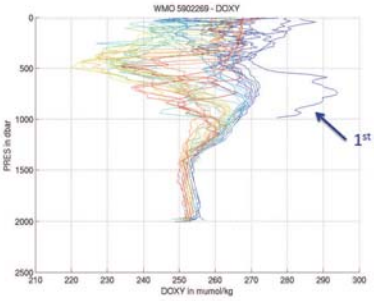
Main results

- Small vertical temperature/salinity gradient in the pool
- Despite the calibration, all optodes underestimated oxygen concentration (between 11 and 24 mumol/L)
- Large (>20 mumol/L) unexplained fluctuations during « drift » at parking depth for the floats , still no clear explanation

Unresolved questions

- Why the mean difference between the **calibrated** optodes and the Winkler titration varies between 11.7 and 23.6 mumol/L in Ifremer pool
  - Storage in dry air ?
  - Calibration in fresh water ?
  - Chlorine effect on the optode measurement and/or Winkler titration (although the chlorine was also titrated and taken into account)
  - Problem with the Winkler titration ? Solubilty of O2 in Niskin bottle ?
- Why optodes on the floats (and not the free optode) do measure large unexplained fluctuations during the drifting phase
  - Air bubbles trapped in the float ?
  - Outgassing of the some float materials (plastic) ?
  - No flow in front of the foil ?

Response of the foil after storage in dry condition

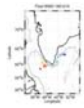


1^{st} descending profile

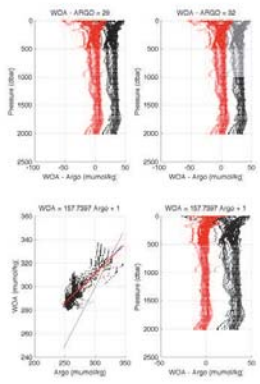
- Float 5900269 deployed in the North-Atlantic in June 2010 (3830 optode)

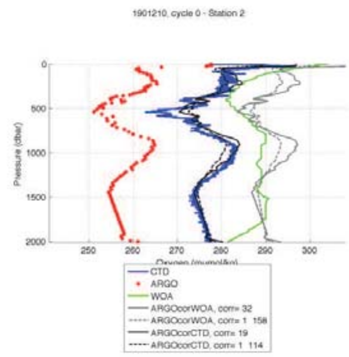
- Impact of the storage condition on the calibration ? Should we keep the optode wet ?

Post deployment correction



Comparison to WOA





➔ Reduce difference from 20 to <10 umol/kg

Response of the foil after storage in dry condition

Aanderaa's answer to a question regarding this issue:

"We recommend to store the sensor wet, or you will experience a drift the first 24 hours. This drift is exponential and will decrease after a couple of hours, but you will still see the drift after 1 day if you run with a high resolution."

- What is amplitude and sign of this drift ?
- Can this lead to a significant bias when a 0-100% calibration is done while the foil is not stabilized?
- Does it depend on the duration of the storage in dry conditions ?
- Does the foil return to its initial calibration after being stored in dry air ?

Conclusions and future strategy

- Recent results far from the accuracy of 1 umol/kg required by the scientific community
- Necessary to re-calibrate optode in lab. Excepting better calibration procedures from Aanderaa.
- What about others sensors ? RINKO ? SBE ?
- ARGO: Measurements every 10s. Need to improve the NRT O2 calibration procedure: climatology comparison not always robust. Better to use O2 saturation in the air (H.Kortzinger)
- A third ARGO test has been performed in the IFREMER pool with 10 PROVOR-DO and 5 PROVOR-DOI in Sept 2012 with free optode, Winkler titration, salinity measurements (mixing). These results are still under treatment…

6.5. End-to-End Quality Assurance for Fixed Platforms

Considering that during the 3 previous workshops each partner has presented his infrastructure (current status WP3) the aim here is to present their practices on maintenance, pre and post deployment procedures (cleaning etc), maintenance, storage, transport, data transfer, data post-process, etc.

6.5.1. Debriefing after the first Fixed Platforms (FP) Workshop (Rome, 29 Feb. -1 Mar. 2012)

Stefania Sparnocchia (CNR) presented the summary of Fixed Platform workshop. The Rome workshop was organized in three sessions covering the below topics.

- Session 1: Fixed platforms: current status and improvement (WP3 T3.3), 29 February 2012
- Session 2: Maintenance methods: calibration (WP4 T4.1), 1 March 2012
- Session 3: Maintenance methods: biofouling and prevention methods (WP4 T4.2), 1ST March 2012

The actions decided were:

Session 1:

- D 3.3. report on status of fixed platforms (M21=Jan 2013)
- Description of types of platforms in use (Bengt Karlson)
- Review of experiences. Find a regional coordinator to collect info and synthesize.
- Description of equipment and sensors on board.

Session 2:

- Organize a calibration workshop, including DO Optode sensors.
- White paper on Oxygen measurements to be discussed in the Forum for Coastal Technology.
- D4.1 Report on existing calibration facilities (M18 = Oct 2012)
- D4.2 Report on calibration Best Practice (M36 = Apr 2014)
- Key persons were identified for each parameter that will coordinate the drafting of the documents:
    - Jukka Seppala (SYKE): Chlorophyll and turbidity sensors
    - Rajesh Nair (OGS): Temp. and Cond. sensors
    - Wilhelm Petersen (HZG): Chemical sensors
    - Florence Salvetat (Ifremer): DO sensors
- describe the best practices for the sensor calibration of each parameter or group of

parameter

- recommend methodologies and issue protocols
- distribute the information/draft to full and associated partners

Session 3:

- Improve the questionnaire to collect more information and better specify “not clear/difficult-to-answer questions”, diffuse to partners and associated.
- Review of biofouling methods vs. sensors (literature, BRIMOM project), focus on new methods
- Testing the effect of biofouling on Dissolved Oxygen sensor (focus on “immunity”)
- literature and manufacturers documentation review
- comparison of sensors measurements with Winkler data
- Plan of a biofouling experiment to discuss at the meeting in Crete, Oct. 2012)
- D4.3 Report on biofouling prevention methods (M36 = Apr 2014)
- Key persons to work on this task with CNR: Laurent Delauney, Wilhelm Petersen and someone from the gliders community.

6.5.2. *Experience and Best Practices from already deployed Fixed Platforms (FP)*

In this session each partner was given the opportunity to give a 15-minute presentation regarding the best practices used in FP.

6.5.2.1. *Manolis Ntoumas (HCMR):* HCRM best practices and experiences from the Poseidon buoy network operating.

He talked about the pre/post deployment operations, lab sensor maintenance, data quality checks and the monthly sampling in the M3A station. He presented the calibration procedure that HCMR uses

Calibration procedure:

- First define the acceptable residual thresholds in order to change calibration coefficients and then perform the calibration as described to the calibration manuals.
- Generally we try to use the same sets of sensors in each spot and calibrate them according to the spot climatology.

Validation before next deployment.

- On the lab, in one of the tanks with fresh sea water and 2-3 calibration steps.
- On the field, CTD casting and water sampling

- Final product: Calibration report containing
  - serial number and date
  - previous cal coefficients
  - new coefficients
  - table with measurement of calibration steps
  - graph and table with previous and new residuals
  - graph and table with validation test with new residuals

Finally he showed some slides with the fouling effect on sensors/ data and some bad experiences with equipment failures.

6.5.2.2. *Carlos Hernandez (AZTI):* Best practices from the AZTI buoy network.

He talked about the limitations they face and the operation bases that AZTI buoy is operating,

Limitations:

forced to work with opportunity vessels: 3 boats/5 years

Operation bases:

- no room for improvisation: training and preparation
- stable staff: roles in the manoeuvre, nobody's a bottleneck!!
- replicability & traceability
- as much tasks as possible on land
- replacement sensors, materials, comm sys,...: tested on the spare buoy before deployment

He also presented in detail the pre/post deployment procedures and actions they are performing in order to secure the system operational capabilities. He emphasized the use of video recording on deck during the mooring procedures as a very useful tool to analyse and improve the operation. He concluded with the important role plaid in the whole procedure by involved people.

6.5.2.3. *Stefano Miserocchi (CNR) : Technical details, data, open problems and "Best practices" for the S1 and E1 meteo oceanographic buoys.*

An overview of the whole system was given in detail. Data transmission and quality control procedures were presented. The following anti fouling solutions were suggested :

- Using a mix of Duct tape and stretchable food-grade plastic films wrapped all around instrumentation and connectors: a good solution to protect sensors body and connectors from biofouling deposits.
- Sensors intubation in a single closed hydraulic circuit, served by the same pump, with a TBTO pill in the entrance tube: a good solution in the short and medium term.
- Bio-wiper system (mechanical brush) and copper face plate. A new system: after 45

days of its application the device seems to work properly

But so far, the most effective anti-biofouling system is a periodical (each 2-3 months) manual cleaning of the sensors and an annual cleaning of the system.

Furthermore some mooring challenges they are facing in their buoys were presented. Finally an overview of the new sensors deployed in the S1 buoy was given, emphasizing in the DO data.,

6.5.2.4. *Detlev Machoczek (BSH)* : Improving of MARNET network measurements.

He started with the temperature measurements giving an example of how a custom A/D converter home-built improved radically the PT-100 sensor accuracy. Continuing, the challenges regarding conductivity and salinity measurements and the solutions they chose to cover the extended range of their seas were mentioned, . For current measurements he talked about the experiences they have with older current meters and ADCPs. For chemical analyzers he emphasized that although they have worked on ferrybox systems their experience in fixed platforms shows that their data doesn't deserve the effort/cost behind it. Finally he talked about their experience with water samplers in the field.

Questions and Discussions

It was mentioned that sometimes even though the equipment is in theory technically appropriate for the desired application, the maintenance is so demanding that in reality cannot be used.

6.5.2.5. *Dave Sivyer (CEFAS):* Best practices developed over eleven years of high frequency in situ measurements with the CEFAS Smartbuoy network.

An overview of the buoys configuration and the management system (below) was given.

- Cefas QA system (Project management, HSE PAG etc)
- Risk assessments (RA and COSHH)
- Standard Operating Procedures (SOP) for all tasks.
- SOP are bench tested and reviewed every two years.
- Checklists

Then the Best Practices for SmartBuoys were referred in each of the here-below sectors giving details about the procedures used in CEFAS.

- Maintenance
- Storage
- Transport
- Data transfer
- Data post process

In conclusion some additional notes for best practices were given.

6.5.2.6. *Piotr Szmytklewicz (IBWPAN): the two kinds of IBW PAN Fixed Platforms*

IBWPAN manages 2 types of fixed platforms:

- Hard Fixed Platforms

- Mobile Fixed Platforms

operated in the coastal zone of the South Baltic.

- mild slope of 1.5% on average,
- 3 – 5 bars,
- medium grain diameter of about d50 = 0.22mm,
- emerged part of the beach is 20 – 50m wide,
- Hmax = 7,52 m (at 15 m depth), Vmax = 1,5 m/s (longshore current - at c.a. 1 m depth),
- area of our interest: from dune to c.a. 20 m depth.

An overview of the hard platform network history and of the planned upgrade was given. The mobile platforms procedures and some examples of how the harsh weather conditions of the Baltic affect the equipment were presented.

To conclude here after are the IBW PAN recommendations:

Hard Fixed Platforms

- Should be built on the dissipative Baltic coastal zone on depths from 5 up to 10 m (on large depths it's recommend to use buoy).
- Platform should be designed as a solid structure.
- The platform is being designed for 30 years of the use.
- All steel elements will be additionally corrosion protected.
- During winter, depending on wave conditions, "karcher" should be used to remove ice phenomena on the platform.

Mobile Fixed Platforms

- Should be built for depth: from shoreline to the 5 metres deep.
- The platform can be used in the period of ca. 12 months.

If the structure is sticking out beyond the water level it is recommended not to use it during winter.

- On account of the biological conditions it is not recommended to carry out measurements in summer.
- Visual inspection and cleaning are held after every extreme event.
- It's a relatively cheap method to measure parameters of hydro- and lithodynamic processes occurring in the shallow water coastal zone.
- Sometimes, it's the luck of the draw - you have to spend more than you planned for!

6.5.2.7. *Yannick Aoustin (Ifremer)*: End-to-End Quality Assurance experience at Ifremer.

He referred to the many types of fixed or moving platforms

- Focus only on key parameters on estuary & coastal water
- Continuous Measurement (high frequency)
- From surface to sea bottom
- Quasi real time automatic, and remote control
- Robust system, quality assurance, maintenance
- Fifteen years of high frequency data collection
- Large panel of locations

Coastal environment

- Harsh environment (very demanding)
- High level of energy (wave, current)
- Biofouling & mineral deposit
- Many hazards (fishing, anchoring, vandalism, ..)
- Fatigue on instruments and structures

Quality and durability guarantee by technology:

- Flow through measuring systems (most)
- Pumping and chlorination
- Protection against harsh environment
- Active bio fouling protection
- Objective to reach a 3 month period maintenance
- Energy: huge concern for autonomous systems

Furthermore the Operational organisation for management of the whole monitoring system was presented:

- Operational team (mandatory)
- Network supervision
- In situ preventive operation
- Sensors calibration under quality assurance
- On site and workshop maintenance
- Traceability of spare sensors and devices

- Strong partnership with suppliers

And he concluded his presentation covering the subjects of data quality assurance and diffusion to the end user.

6.5.3. *Discussions and decisions with regards to Fixed plateforms*

Decision #1: For Best Practices it was decided to form a small group to start working with the material collected. This material/info will be uploaded to the JERICO webpage in order to be accessible by all partners in the JERICO restricted area.

The people for this group are:

- ***Carlos Hernandez (AZTI) - coordinator***
- ***Detlev Machoczek (BSH)***
- ***Yannick Aoustin (IFREMER)***
- ***Dave Sivyer (CEFAS)***

Decision # 2: Regarding calibration it was proposed to have a workshop coupled with one of the following scheduled JERICO meetings.

Decision # 3: With regards to the biofouling proposal led by Marco Faimalis (after Rome workshop) it was proposed to set up a biofouling experiment with plates installed in different sites across Europe and sent back to Marco for lab analysis. The partners agreed and an email will be sent to the JERICO network to find out who will be participating.

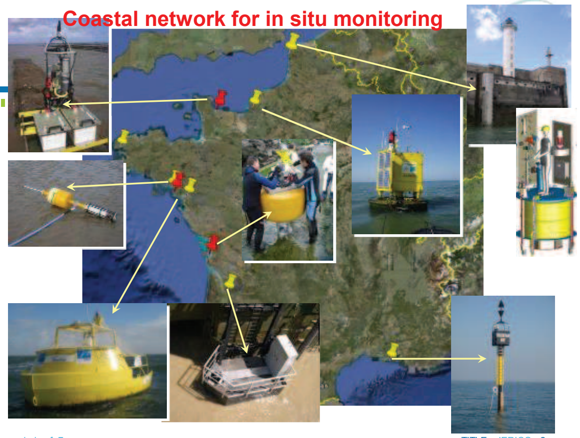
Slides presented with regards to End to End quality assurance for Fixed Platforms are inserted hereafter in the following pages.

Best Practices Worshop

End-to-End Quality Assurance
Experience at Ifremer

Yannick Aoustin I Ifremer I yannick.aoustin@ifremer.fr

Coastal network for in situ monitoring



Many types of fixed or moving platforms
Focus only on key parameters on estuary &coastal water

Continuous Measurement (high frequency)
From surface to sea bottom
Quasi real time automatic, and remote control
Robust system, quality assurance, maintenance

Fifteen years of high frequency data collection
Large panel of locations

Coastal environment

Harsh environment (very demanding)
High level of energy (wave, current)
Biofouling & mineral deposit
Many hazards (fishing, anchoring, vandalism, ..)
Fatigue on instruments and structures

Quality and durability guaranty by technolo

flow through measuring systems (most)
Pumping and chlorination
Protection against harsh environment
Active bio fouling protection
Objective to reach a 3 months period mainten

Energy: huge concern for autonomous system

PHYSICO-CHIMICAL PARAMETERS		
Parameters	Range	Accuracy
Water temperature	-5 to +30°C	0,1 °C
Conductivity	0 to 70 mS/cm	0,3 mS/cm
Dissolved Oxygen	0 to 20 mg/l	0,2 mg/l
pH	6,5 to 8,5 upH	0,2 upH
Turbidity	0 to 4000 NTU	10 %
Chlorophyll	0 to 50 FFU	10 %

ADDITIONAL PARAMETERS		
Parameters	Range	Accuracy
Nitrates	0,1 to 100 µ mol/l	5 %
Silicates	0,1 to 100 µ mol/l	5 %
Ammonium	0,1 to 100 µ mol/l	5 %
p CO2	200 to 1000 µ atm	1 atm

METEOROLOGICAL PARAMETERS		
Parameters	Range	Accuracy
Air temperature	-20 to + 30°C	0,1 °C
Air pressure	900 to 1100 Hpa	0,3 Hpa
P.A.R.	0 to 3000 µ mol/s/m²	10 µ mol/s/m²
Hygrometry	0 to 100%	2%
Wind Speed	0 to 40 m/s	1 m/s
Wind Direction	0 to 360°	10 °

Operational organisation

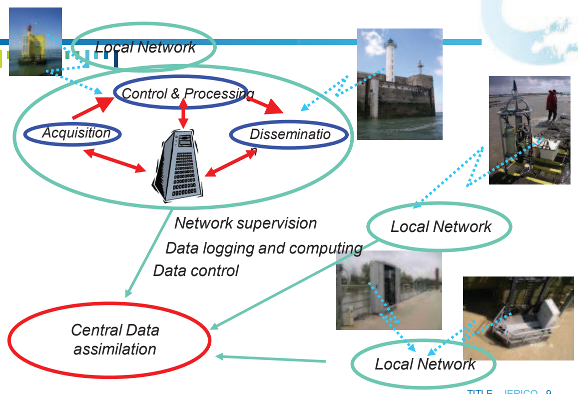
Operational team (mandatory)
Network supervision
In situ preventive operation
Sensors calibration under quality assurance
On site and workshop maintenance
Traceability of spare sensors and devices

Strong partnership with suppliers

Data quality assurance

4 levels of data checking
- *raw data, automatic checking, visual checking, qualification after calibration (3 months delay)*

6 levels of data quality (international scale)
- *not qualified (raw data), good, out of stat, unreliable, false, missing*



Data quality control software

data diffusion on the web

Various user profiles: public, scientist, technician, owner
Data visualisation
Data downloading
Metrology report
Raw data access
Maintenance log book and management

Maintenance and accessibility
Systems at sea: limited accessibility:
- ✓*weather, boat (very high price), crews…*

Floating support must adapted to maintenance
- ✓*design, size, cost… Size of unit of maintenance*
- ✓*No technical work at sea (just connection)*

Limitation of travel at sea (every 3 months),
Tele-maintenance

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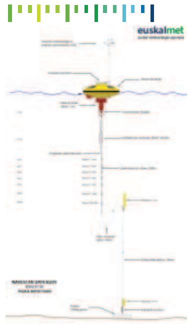
A□TI-T□CNALIA

Carlos Hernández | □□TI-T□□□□□ | □□□□□□□□□□ □□□□□

BEST PRACTICES ON FIXED PLATFORMS



The maintenance of the buoys is based on:

- *□ moored buoys and one **SPARE BUOY** on land*
- *Maintenance work is made **ON LAND***
- *□□□□□□ □□□□ □□□□ **SIX MONTHS***

BEST PRACTICES ON FIXED PLATFORMS

OPERATION BASES:

- □O ROO□ □OR I□ □RO□I□□TIO□□TR□I□I□□ □□□ □RE□□R□TIO□
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LIMITATIONS:

- *FORC□D TO □ OR□ □ IT□ OPPORT□NIT□ V□SS□LS: 3 □OATS□□ □□ARS*

BEST PRACTICES ON FIXED PLATFORMS: AVAILABLE OPPORTUNITY VESSELS

BEST PRACTICES ON FIXED PLATFORMS: DEPLOYMENTS

Mooring #		BUOY WAVESCAN WS66		
Buoy	Total	Mooring period	Position	Coordinates
1	3	Junio 2007 Abril 2008	Matxitxako	43º 38.196' N 002º 43.096' W
2	6	Febrero 2009 Marzo 2010	Donostia	43º 33,507' N 002º 01.482' W
3	9	Marzo 2010 Noviembre 2010	Donostia	43º 33.673 'N 002º 01.474' W
4	12	Mayo 2011 Septiembre 2011	Matxitxako	43º 37.475' N 002º 43.469' W
5	13	Noviembre 2011 -	Matxitxako	43º 37.463' N 002º 41.960' W

Mooring #		BUOY WAVESCAN WS67		
Buoy	Total	Mooring period	Position	Coordinates
1	1	Enero 2007 Junio 2007	Matxitxako	43º 37.980' N 002º 41.550' W
2	4	Junio 2007 Noviembre 2007	Donostia	43º 33.996' N 002º 01.668' W
3	6	Abril 2008 Junio 2009	Matxixtako	43º 38.148' N 002º 41.634' W
4	11	Marzo 2011 Noviembre 2011	Donostia	43º 33.859' N 002º 01.395' W

Mooring #		BUOY WAVESCAN WS68		
Buoy	Total	Mooring period	Position	Coordinates
1	2	Enero 2007 Junio 2007	Donostia	43º 33.765' N 02º 01.433' W
2	5	Diciembre 2007 Febrero 2009	Donostia	43º 34.200' N 002º 01.440' W
3	7	Junio 2009 Junio 2009	Matxitxako	43º 37.6444' N 002º 41.130' W
4	8	Agosto 2009 Marzo 2010	Matxitxako	43º 37.446' N 002º 41.332' W
5	10	Mayo 2010 Mayo 2011	Matxitxako	43º 37.445' N 002º 41.340' W

BEST PRACTICES ON FIXED PLATFORMS: POST-RECOVERY:ON BOARD

- *Visual inspection*
- *Pictures*
- *Switch off the buoy*
- *First cleaning: mussels, barnacles,…hard fouling.*
- *Disassemble of the elements of the system*
- *Get the buoy ready for unloading on port*

BEST PRACTICES ON FIXED PLATFORMS:
BUOY RECEPTION ON BOARD

- FOULING CLEANING
- PREPARE THE BUOY FOR TRANSPORTATION

BEST PRACTICES ON FIXED PLATFORMS:
POST- DEPLOYMENT:ON LAND

- [illegible]
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- [illegible]

- STATE OF THE BUOY REPORT

LI□T O□ ELE□E□T□ TO □E RE□L□CE□ → □□RC□□□E / □TOC□

BEST PRACTICES ON FIXED PLATFORMS:
LAND FRAME

BEST PRACTICES ON FIXED PLATFORMS:
POST- DEPLOYMENT:ON LAND

[illegible]

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BEST PRACTICES ON FIXED PLATFORMS:
PRE- DEPLOYMENT:ON LAND

[illegible]

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BEST PRACTICES ON FIXED PLATFORMS:
ROPES

REPLACED AFTER EVERY MOOORING!!

BEST PRACTICES ON FIXED PLATFORMS:
PRE- DEPLOYMENT:ON BOARD

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O [illegible] T [illegible]

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BEST PRACTICES ON FIXED PLATFORMS:
DIFFERENT VESSELS: SAME □AY OF □OR□ING □

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BEST PRACTICES ON FIXED PLATFORMS:
DIFFERENT VESSELS: SAME □AY OF □OR□ING □

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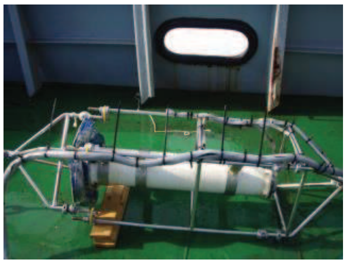
BEST PRACTICES ON FIXED PLATFORMS:
CABLING PROTECTION

- CABLING
- □EA□EST PART OF THE SYSTEM
- PROTECTED □ITH HOSEPIPE
- MAIN "HOLE PRODUCER" IN REAL TIME SERIES



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BEST PRACTICES ON FIXED PLATFORMS:
ADCP HEIGHT

OB□ECTIVE:
TO RE□□CE T□E □□□TE□ TOT□L □EI□□T□□□E TO T□E CR□□E LI□IT□TIO□

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BEST PRACTICES ON FIXED PLATFORMS:
TO HELP THE MEMORY

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BEST PRACTICES ON FIXED PLATFORMS:
RECORDING THE MOORING OPERATIONS

- □□□□□□□□□□□□□□ □□□□□□□□□ □□□□□□□□ □□ □□□□□□ □□□□
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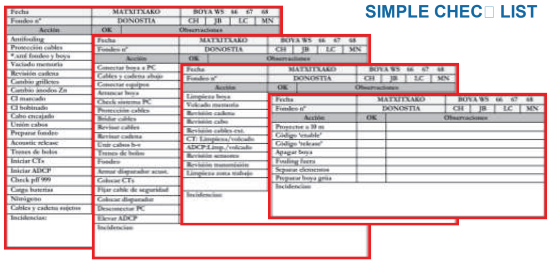
BEST PRACTICES ON FIXED PLATFORMS:
MAINTENANCE OPERATIONS TRACEABILITY



SIMPLE CHEC□ LIST

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BEST PRACTICES ON FIXED PLATFORMS:
ELEMENTS TRACEABILITY

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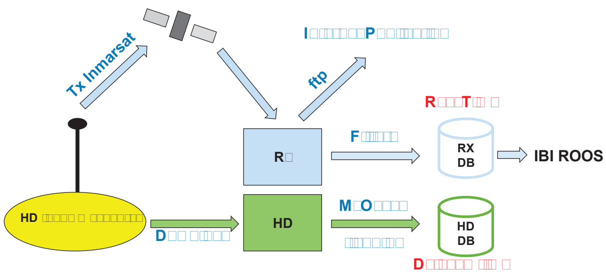
BEST PRACTICES ON FIXED PLATFORMS:
DATA HANDLING



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BEST PRACTICES ON FIXED PLATFORMS

ONCE EVERYTHING IS READY□
REST AS MUCH AS YOU CAN!!

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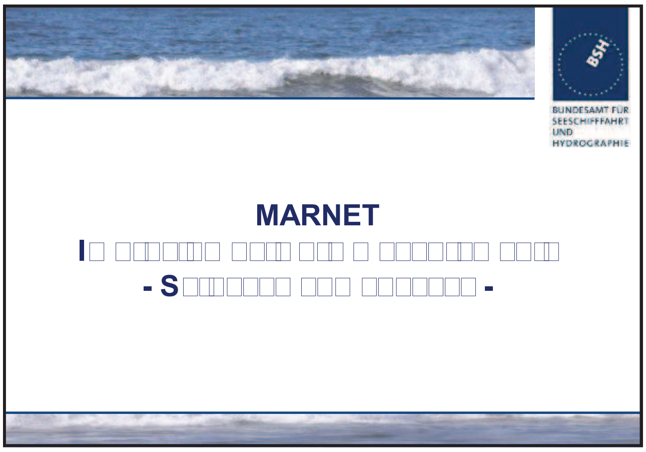
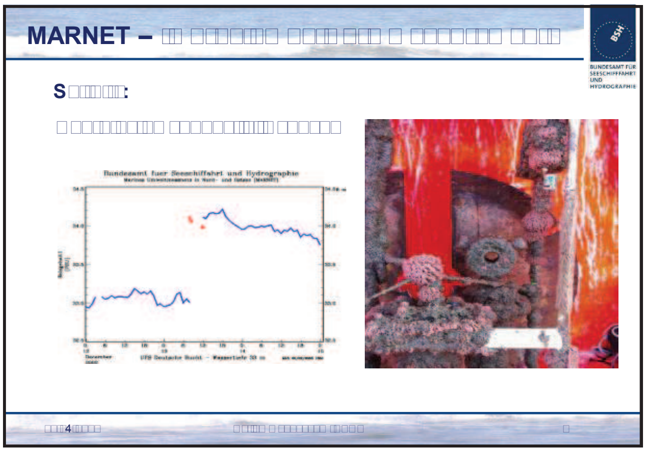
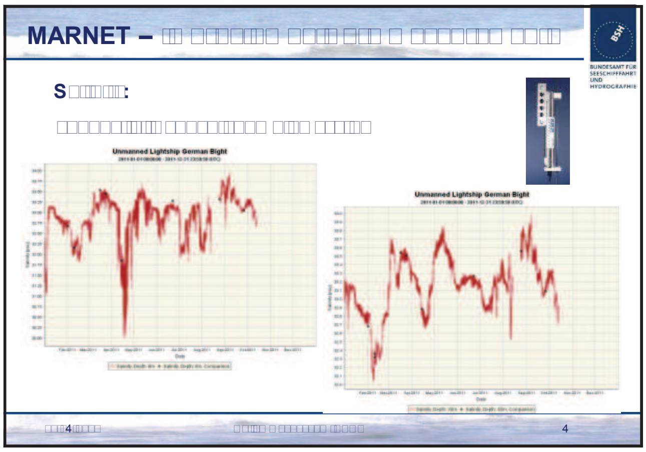
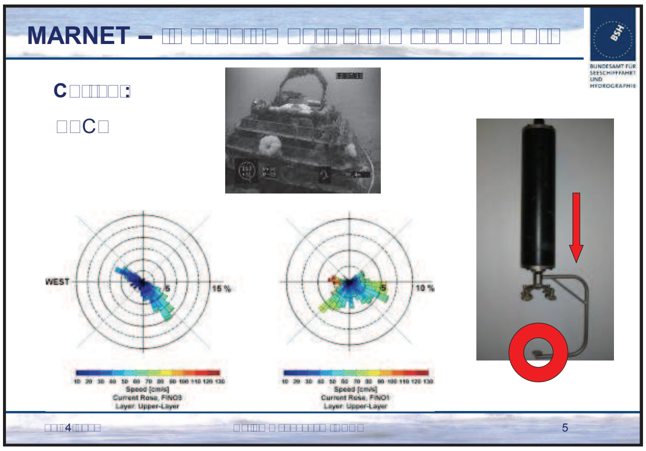
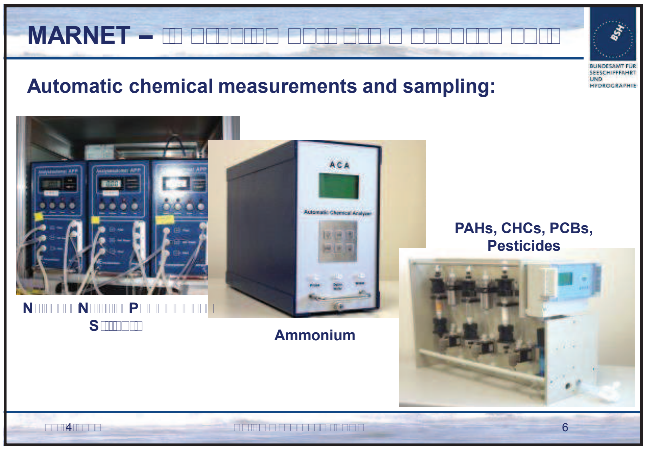

BSH
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE
MARNET


MARNET –
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

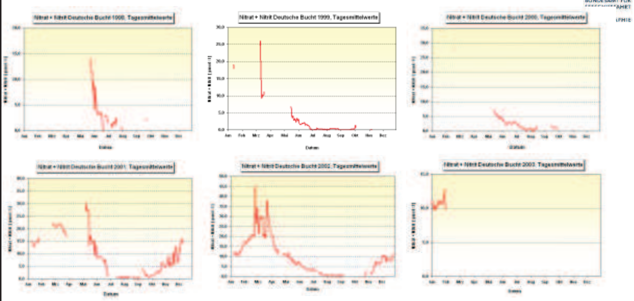

MARNET –
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE
Bundesamt fuer Seeschiffahrt und Hydrographie


MARNET –
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE
Unmanned Lightship German Bight
Unmanned Lightship German Bight
4


MARNET –
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE
WEST
15 %
Speed [cm/s]
Current Rose, FINO3
Layer: Upper-Layer
10 %
Speed [cm/s]
Current Rose, FINO1
Layer: Upper-Layer
5

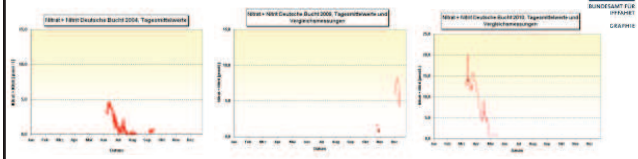

MARNET –
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE
Automatic chemical measurements and sampling:
ACA
Ammonium
PAHs, CHCs, PCBs, Pesticides
6

□A□□□□ – impro□ing net□or□ measurements



Nitrate/Nitrite [µmol/l], 1998, 1999, 2000, 2001, 2002, 2003, daily mean values

□A□□□□ – impro□ing net□or□ measurements



Nitrate/Nitrite [µmol/l], 2004, 2009, 2010, daily mean values

□A□□□□ – impro□ing net□or□ measurements

Automatic □ater sampler:

Automatic Water Sampling device

JERICO

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

Rome, 29 February – 1 March, 2012

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4-5 October 2012 I Heraklion I Greece

B C

To review the current distribution of Fixed Platforms in European coastal observing efforts and to ***advance the development of harmonized Fixed Platforms operations*** within the JERICO network.

Contribution to the preparation of deliverables of WP3 and WP4:

D3.3. report on status of fixed platforms (M21=Jan 2013)

D4.1 Report on existing calibration facilities (M18 = Oct 2012)

D4.2 Report on calibration Best Practice (M36 = Apr 2014)

D4.3 Report on biofouling prevention methods (M36 = Apr 2014)

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ession : aintenance methods: io ouling and pre ention methods P , arch

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PA C PA

rgani ation	ame and surname
IFREMER	Patrick Farcy, Ingrid Puillat, Laurent Delauney, Florence Salvetat
IBWPAN	Rafal Ostrowski, Piotr Szmytkiewicz
OGS	Rajesh Nair, Stefano Kuchler
CNR	Stefania Sparnocchia, Marco Faimali, Mauro Bastianini, Carolina Cantoni, Francesco Riminucci
HCMR	George Petihakis, Thanasis Chondronasios, Manolis Ntoumas
NERC	Michael J. Howarth
HZG	Wilhelm Petersen
BSH	Detlev Machoczek
Flemish Hydrography	Stephanie Vandevreken
CEFAS	Naomi Greenwood, Dave Sivyer
SMHI	Bengt Karlson, Olle Petersson
MI	Sheena Fennell
AZTI	Carlos Hernández
CNRS/INSU	Laurent Coppola, François Bourrin, Pascal Morin
IH	Sara Almeida
SYKE	Jukka Seppala
CSIC/IMEDEA	Benjamín Casas Pérez
SOCIB	Carlos Castilla
UOM	Adam Gauci
CMCC	Srdjan Dobricic
ENEA/ EMODNET PP	Giuseppe Manzella

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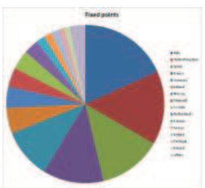
JERICO survey on fixed platforms (T3.3.1 - Fixed Platforms Questionnaire) – Dave Sivyer (CEFAS) & Wilhelm Petersen (HZG)

Actions to take



Overview of fixed platforms information collected at the date of the workshop

- inal report ith stations list and gaps according to geographic regions, or measurement parameter

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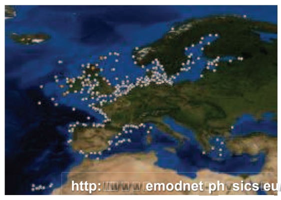
A A P

Overview of fixed platforms by Giuseppe Manzella (ENEA & EMODNET PP)

Overview by JERICO partners



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□e□ sensors and techni□ues □or in situ measurements at □i□ed points

- ***pH and pCO_2 measurements***
  Lab measurements and image analysis for monitoring the ecosystem status (abundance, biomass, taxa, size spectra)
  L.Coppola, L. Stemmann, M. Picheral, F. Prejger, G. Obolensky
  Observatoire Océanologique de Villefranche-sur-Mer
- ***New sensors tested at HZG: Nutrients, PSICam, pCO2***
  W. Petersen, Helmholtz-Zentrum Geesthacht
- □eeds o□□i□ed o□ser□ing sites □or estimating□modelling processes in the coastal □one □in colla□oration □ith □ P□□
  Srdjan Dobricic (CMCC)

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3.3.1 "Review of the current marine fixed instrumentation"

□□□ hat is the e□perience □ith di□erent □ind o□plat□orms□ □ hat □ind o□purposes do need □ig or small plat□orms, □i□ed plat□orms or □uo□s, etc□

□□□ hat is the e□perience □ith pro□iling de□ices□

□□□ hat t□pe o□plat□orms should □e mention in the deli□era□le□

□□□ hat is the accessi□ilit□o□the plat□orms□ □ hat are the ad□antages and disad□antages o□di□erent options□

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□ C□□C□□□□□□

□e□t Action

□ra□ting the report

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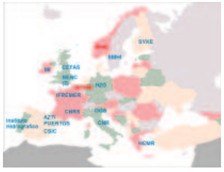
□– CA□B□A□□□

Calibration Questionnaire – George Pethiakis (HCMR)



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□– CA□B□A□□□

Calibration Practices

- ***Calibration of optical sensors: outcomes from the Helsinki workshop of February 2nd, 2012***
  Jukka Seppala (SYKE)
- ***Metrology for Oceanography: main issues and IFREMER's actions***
  Florence Salvetat (IFREMER)

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□– CA□B□A□□□

Points to work out:

2

– CA B A

Follow up actions:

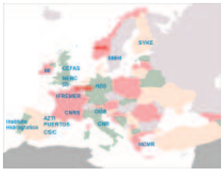
– CA B A

e t Actions

ra ting the report

– B

Biofouling Questionnaire – Marco Faimali (CNR)



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– B

Biofouling impact and protection methods

- **Bio ouling protection or marine sensors – e ie**
  Laurent Delauney (IFREMER)
- ***An example biofouling impact after long-term deployment***
  Carlos Hernàndez (AZTI)
- ***Antifouling device at EOL buoy***
  Laurent Coppola (Obs.Oc. CNRS)
- ***Biofouling – Techniques to fight the plague***
  Detlev Machoczek (BSH)

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ollo up actions

- specify “not clear/difficult answer questions”, diffuse to partners and
- issol ed gen sensor
  “immunity”)
  → hite paper
- ra ting the report
  eport on io ouling pre ention methods Apr

P A H P
B A

!!! EFKARISTOS !!!

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3

Best practice developed over eleven years of high frequency in situ measurements

Cefas

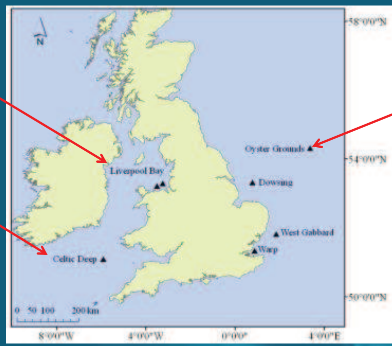
SmartBuoy Locations

7 routine monitoring sites

Cefas/AFBI /POL

Cefas/AFBI

Cefas/DNZ



Cefas

SmartBuoy Configuration

Max. weight ca. 500kg

Variable	Sample frequency
Salinity Temperature Chlorophyll fluorescence Turbidity PAR irradiance Dissolved oxygen	1Hz in 2 x 10 min burst/hr Data acquisition and control via ESM-2
TOxN (total oxidisable nitrogen	Up to every two hours
Dissolved silicate	Up to daily
Phytoplankton counts and composition	Every 4 days

Cefas

Cefas

in situ nutrient analyser (NAS-3X)

TOxN

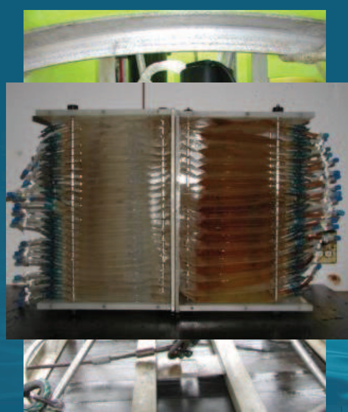
accuracy ±10.6%
precision 5%

Cefas

Water sampler (WMS-2)

TOxN, Si, PO_4

accuracy ±4.0%
precision 4%



Cefas

Overview of our "System"

- Cefas QA system (Project management, HSE PAG etc)
- Risk assessments (RA and COSHH)
- Standard Operating Procedures (SOP) for all tasks.
- SOP are bench tested and reviewed every two years.
- Checklists

Cefas

Best Practice for SmartBuoys

- Maintenance
- Storage
- Transport
- Data transfer
- Data post process
- Other stuff..

Cefas

Maintenance

- SmartBuoy Workshop – most preparation of instruments.
- 2 staff full time + 2 others to help
- Electronics Workshop – in-house instruments (ESM2, Mooring Locator, Water Sampler) .
- Less than 1 man year – from 3 staff

Cefas

Storage

- Mainly at Cefas laboratory
- Hardware is nearby on a site with 5 industrial units and a big yard area. (all the stainless steel is kept indoors to prevent theft).
- Hardware is maintained by P&O Maritime Services who also look after the RV Cefas Endeavour.

Cefas

Transport

- Locally all sensors and instrumentation are moved by the SmartBuoy team – rental vans.
- Pallet Line to Holland and Belfast (monthly)
- Hardware is moved by POMS
- Each survey has a (long) pre-requisite list of forms the SIC completes.

Cefas

Data transfer

- Most of the SmartBuoys send back data every two hours (every 8th burst) via Orbcomm.
- Once the buoy is serviced the logger is downloaded and data uploaded to the database.

Cefas

Pre deployment

- Logger set up on database – checks on service history of sensors, looks at deployment length battery life etc
- Serviced instruments ready to deploy (i.e. two complete sets per site)
- Use the same sensors on rotation – helps a lot with calibration
- Build before you set sail (check telemetry)

Cefas

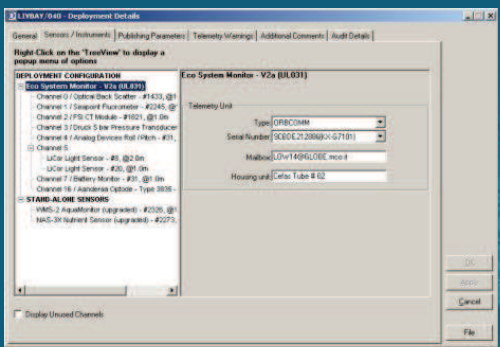
Post deployment

- Photograph all sensors – helps when assessing fouling.
- Jet wash
- Dismantle and wash and clean everything in fresh water, pack into transit cases.

- Upload data to database overnight
- Service all instruments

Cefas

SmartBuoy Data Management System – 1 Sensor and deployment configuration

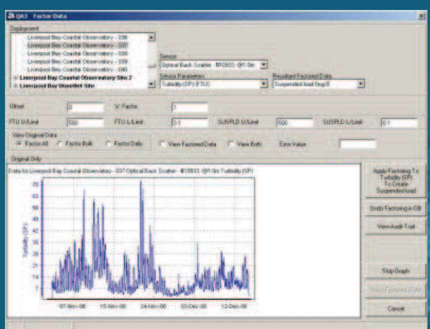


Cefas

SmartBuoy Data Management System – 2 QA Level 2 (manual QA by expert user)

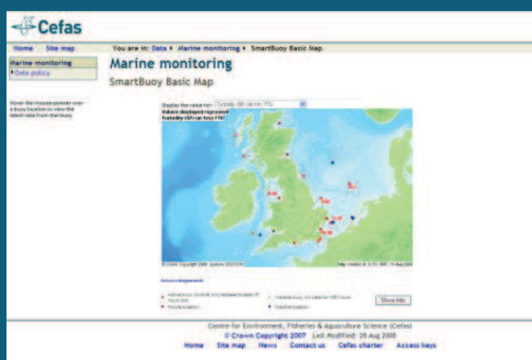
Cefas

SmartBuoy Data Management System – 3 QA Level 3 (applying field calibrations)



Cefas

Web access to data



Website: **www.cefas.co.uk/monitoring**

Cefas

Other Stuff

- Housings – If Cefas built then generally locally hand-made pressure housings (rated 200 and 450m).
- All wet pluggable connectors – mainly SubCon micro but occasionally Impulse.
- Mooring locator uses Iridium (costs around $25 per month)

Cefas

More Other Stuff

- SmartBuoy database is SQL 2008
- SmartBuoy QA software is currently being re-written in .NET (from VB6) - due March 13?
- SmartBuoy logger is being re-developed – due 2014
- FerryBox database and QA system now operational

Cefas

Yet More Other Stuff

- Anti-fouling measures using Zebratech wipers – OBS, Seapoint Flu and Licor PAR
- Due to trial AAI optode wiper next month
- Full SB trial for 3 months Oct to Feb

Cefas

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

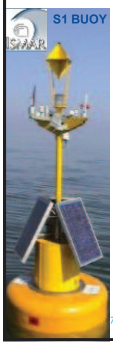
E1 AND S1 METEO-OCEANOGRAPHIC BUOYS
(NORTH ADRIATIC SEA)

Technical details, data, open problems and "Best practices"

M. Ravaioli, G. Bortoluzzi, F. Riminucci, and S. Miserocchi
ISMAR-CNR Bologna
stefano.miserocchi@ismar.cnr.it

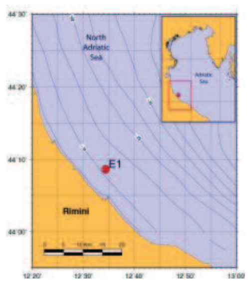
Best Practices Workshop
4 Oct 2012 Heraklion, Crete

S1 and E1 METEO-OCEANOGRAPHIC BUOY
COORDINATED BY CNR-ISMAR DI BOLOGNA



LOCATION: North Adriatic
(south of the Po River Delta)
Operative since April 2004
Max Depth: **22.5 m**
Distance from the coast: 6 km

LOCATION: North Adriatic
(North of Rimini coast)
Operative since August 2006
Max Depth: **9.5 m**
Distance from the coast: 6 km



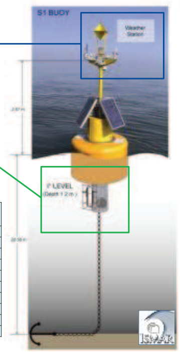
S1 BUOY SENSORS: TECHNICAL DETAILS

Meteorological sensors and measured parameters :

➢Aanderaa 2740 Wind Speed and Gust	Wind Speed & Gust
➢Aanderaa 3590 Wind Direction	Wind Direction
➢Aanderaa 3455 Air Temperature	Air Temperature
➢Aanderaa 2810 Atmospheric Pressure	Air Pressure
➢Aanderaa 3445 Relative Humidity	Relative Humidity
➢Aanderaa 2770 Solar Radiation	Net Solar Radiation

I° LEVEL Sensors and measured parameters (1.2 m. below the sea level):

➢CTD SBE 37	Water temperature and Salinity
➢SBE 43	Dissolved Oxygen
➢Aanderaa DCS 3900	Current speed and direction



Between March 2004 and August 2012 the following data were also acquired:

Sensor	Parameter	Depth of measurements (m)	Sampling frequency	Operation start	Operation end
CTD SBE 37	Sea Temperature	21.5	1h	July 2006	October 2008
CTD SBE 37	Sea Water Salinity	21.5	1h	July 2006	October 2008
SBE 27	Sea Water pH	1.2, 21.5	1h	March 2004	December 2009
SBE 43	Dissolved Oxigen	21.5	1h	March 2006	October 2008
D&A OBS-3+	Sea Water Turbidity	1.2	1h	March 2004	November 2007
Turner Designs SCUFA II	Sea Water Fluorescence	1.2	1h	March 2004	May 2008
ADCP RDI (Monitor)	Wave period	21.5	1h	May 2007	July 2008
ADCP RDI (Monitor)	Period wave peak	21.5	1h	May 2007	July 2008
ADCP RDI (Monitor)	Peak direction	21.5	1h	May 2007	July 2008
ADCP RDI (Monitor)	Wave maximum high	21.5	1h	May 2007	July 2008

E1 BUOY SENSORS: TECHNICAL DETAILS

Surface meteorological Sensors and measured Parameters :

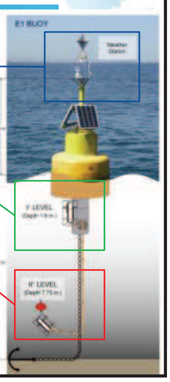
➢WS MetPak Pro, Gill	Wind speed and direction; Air temperature; relative humidity; barometric pressure and dew point
➢LP02, Hukseflux	Solar radiation

I° LEVEL Sensors and measured Parameters (1.3 m. below s.l.):

➢CTD SBE 37	Water temperature and Salinity
➢SBE 43	Dissolved Oxygen
➢SBE 63	Dissolved Oxygen
➢OBS 3+	Turbidity
➢WetLabs Triplet	Chlorophyll, CDOM, Scattering (Proambiente Probe)
➢Aanderaa DCS 4100	Current speed and direction

II° LEVEL Sensors and measured Parameters (7.75 m. below s.l.):

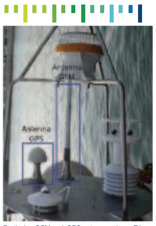
➢CTD SBE 37	Water Temperature and Salinity
➢SBE 43	Dissolved Oxygen



Between 2007and 2008 were also acquired the following parameters:

Sensor	Parameter	Depth of measurements (m)	Sampling frequency	Operation start	Operation end
Aanderaa 3900 DCS	Current Speed & Direction	8.8	1h	May 2007	July 2008

E1 AND S1 BUOY: COMMUNICATION SYSTEM

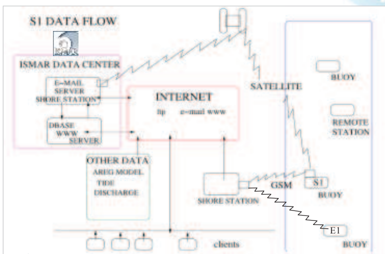


Particular GSM and GPS antennas, buoy E1

Distance from the coast: 6 km

Communication data: Bi-directional communication system via GSM, G2 or G3 (this depends on the available coverage network)

Frequency of transmission: every hour (occasionally every two hours)



Data flow and handing

The **data acquired by sensors are stored on the internal buoy data logger and are transmitted ashore** at programmable rates (10 min to 2-3 hours, depending on battery status and available data links). **At shore station a terminal encode the data in an e-mail message**, that is sent to authorized addresses (mail box S1 and E1)

DATA STORAGE AND DATA CONTROL

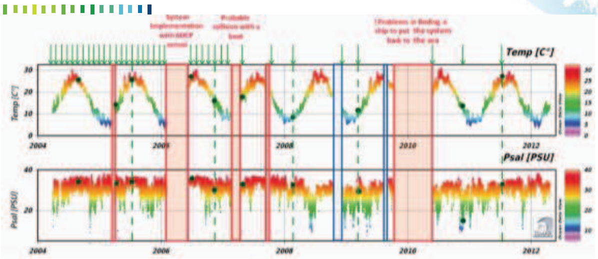
When the data arrive in the authorized mail box, an automatic procedure (implemented using Shell and Perl scripts) filters the data and inserts them in a relational database (MYSQL) on the ISMAR server. Once in the database, data may be retrieved, processed and plotted.

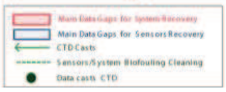
Steps of the automatic procedure in ISMAR server :
1) checks the presence of coded data on the remote mailbox
2) decodes data if coded (header and data) messages are found
3) copies and renames messages and data on both servers (first stage backup)
4) processes buoy data, inserting them in the RDBMS with unique buoy ID's
5) updates user downloadable data files and 'custom' data for authorized access by www, ftp, e-mail or other Internet services
6) updates the daily, weekly and monthly maps and publishes them on the INTERNET
7) logs and sends messages to system administrators and to the project responsible.

When there is data requests from external users, we can be provided three formats:

➢**Raw data**: therefore unfiltered;
➢**Filtered data**: where we apply (manually or automatic) low pass filter and add *SeaDataNet* flags
➢**Calibrated and filtered data**, where we apply a data correction comparing the records with contemporary CTD casts acquired near the system

S1 BUOY: TIME-SERIES, MAIN GAPS, CALIBRATIONS





Temperature and Salinity Data series (2004-2012)

System Buoy: S1
Probe: CTD SBE 37
Depth: 1.2 m above s.l.
Time: April 2004 – April 2012
SBE CTD37 Manufacturers Calibration Frequency : 2-3 Years
Results: Good correlation with CTD cast data

CNR buoys in the North Adriatic Sea

E1 AND S1 BUOY: Sensor and Data Quality

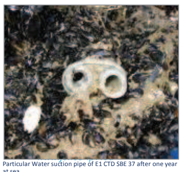
DATA	Sensor	Data validation	Data quality reached	Next step	Technical solutions
Meteo	Aanderaa sensors	Every 6 months with vessel meteo sensors	Good	-	New Metereological Station Gill MetPack Pro with sonic anemometer sensor
Sea water Temperature	CTD SBE 37	Every 6 months with CTD casts	Good	-	CTD intubated with TBTO pill
Sea water Salinity	CTD SBE 37	Every 6 mounths with CTD casts	Good	-	CTD intubated with TBTO pill
Dissolved Oxygen	SBE 43	Every 6 months with calibrated DOX sensor	Good for the first two months following the sensor cleaning by biofouling	•Calibration with Winkler analysis • Greater cleaning frequency by biofouling (2 months)	New optical oxygen sensor (SBE63) intubated with TBTO pill
Sea Water Fluorescence	Scufa II	Every 6 months with calibrate Fluorescence sensor	Good for the first two months following the sensor cleaning by biofouling	•Calibration with Winkler analysis • Greater cleaning frequency by biofouling (2 months)	New fluorescence optical sensor with Bio-wiper system and copper face plate
Sea Water Turbidity	OBS3+	Every 6 months with calibrate Fluorescence sensor	Good for the first two months following the sensor cleaning by biofouling	Greater cleaning frequency by biofouling (2 months)	New turbidity optical sensor with Bio-wiper system and copper face plate
Current Speed & Direction	ADCP RDI DCS Aanderaa 3900	Every 6 mounths with vessel ADCP	Good for the 2-3 mouths after the sensor cleaning by biofouling	Greater cleaning frequency by biofouling (2 months)	-
Sea Water pH	SBE 27	Every 6 months with calibrated Ph sensor	Problematic	Sensor removed	-

OPEN PROBLEM: Biofouling

Both buoys are located in high productivity areas, and biofouling causes many problems to the stations:

- Alter the buoyancy of the system;
- Alter the quality of the acquired data;
- Creates problems for connectors and cables.

S1 Buoy after one year at sea



Particular Water suction pipe of E1 CTD SBE 37 after one year at sea

E1 Buoy I° Level after one year at sea

S1 Buoy: ADCP Sensor after one year on the sea bottom

Technical solutions adopted against the biofouling

- Using a mix of Duct tape and stretchable food-grade plastic films wrapped all around instrumentation and connectors (Figure 1).
<u>Good solution to protect sensors body and connectors from biofouling deposits.</u>

- Sensors intubation in a single closed hydraulic circuit, served by the same pump, with a TBTO pill in the entrance tube (Figure 2).
<u>Good solution in the short and medium term.</u>

- Bio-wiper system (mechanical brush) and copper face plate (commercial system, Figure 3).
New system. <u>After 45 days of its application the device seems to work properly</u>

<u>But so far, the most effective anti-biofouling system is a periodical (each 2-3 months) manual cleaning of the sensors and an annual cleaning of the system</u> (Figure 4).

Fig. 1

Fig. 3

Fig. 2

Fig. 4

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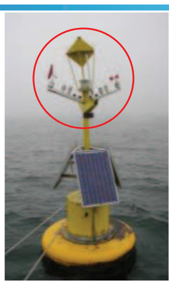
OPEN PROBLEM: System vulnerability

Buoys are placed in areas subjected to intense fishing and anthropic activities.
The traffic of boats near the stations, may occasionally produce collisions with the structures causing multiple damages such as:

- Loss of the anchor;
- Breaking of connecting cables of sensors near the bottom;
- Damages of the structure (e.g. solar panels, Meteorological mast, body buoy, etc.);
- Damages of the sensors.

S1 Buoy: Damage to the meteorological mast



E1 Buoy: Damage to the meteorological mast

E1 Buoy: Problems to solar pannels (breakage or theft)

Further problems are caused by private boats, which anchor near the buoys or hook up directly to the buoy. The buoys are not protected by guardian buoys, however they are moored in prohibited area controlled by Coast Guard and their presence is marked on nautical charts.

CNR buoys in the North Adriatic Sea 11

POSSIBLE SOLUTION: Transition to Elastic Beacon

The system transition from buoy to floating elastic beacon could solve many of the problems occurred at stations E1 and S1 between 2004 and 2012

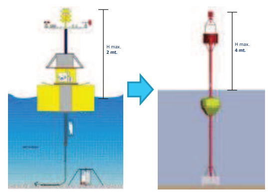
Elastic beacon installation advantages:

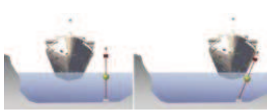
- More protection and stability on bottom level instrumentation;
- Reduced vulnerability of the anchorage and greater protection of submerged data transmission cables;
- Less vulnerability to collisions with boats;
- Greater stability of the installation -> Facilitation in the sensors maintenance procedures;
- Increased visibility of the installation (H max on s.l. 4 mt.)
- Reduced vulnerability of weather sensors ;
- Limited possibility of sensors and instrumentation flooding

The transition to the elastic beacon will impose alternative solutions for the surface oceanographic sensors: sensors basket under wave motion level (3-4 m.) and tides level (1.5 m.).

Current installation

Transition to Elastic beacon





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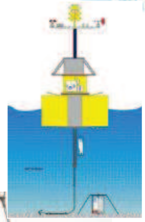
OPEN PROBLEM: Bottom Sensors Vulnerability

In the years we've been trying some technical solutions in order to install a sensors basket on (or near) the sea bottom of buoy E1 and buoy S1 (e.g. Tripod near the anchor, Sensors on the chain, etc.).
These attempts produced, however, various problems over the years, including:

- Partial burial of the sensors placed on the tripod anchor;
- Breaking of the cables communicating with the surface;
- Difficulty in recovering the buoy bottom sensors (which requires fully equipped vessels and sub team);
- Bottom sensors collision with the buoy anchoring chain.



S1 Buoy: ADCP Tripod installation

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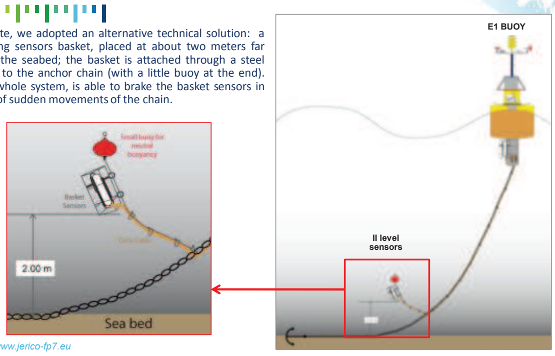
SOLUTION *(in progress)*: Floating basket sensors

To date, we adopted an alternative technical solution: a floating sensors basket, placed at about two meters far from the seabed; the basket is attached through a steel cable to the anchor chain (with a little buoy at the end). This whole system, is able to brake the basket sensors in case of sudden movements of the chain.



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S1 BUOY: SHORT TERM SYSTEM DEVELOPMENTS

In the next two months, the station S1 will be recovered and brought back to the laboratories of the ISMAR-CNR (Bologna) for the routine sensors calibration, the system reset and the implementation of the sensor package.

By the end of **November**, the installation S1 will be equipped with the new sensors (see below) in addition to those already in use.

New Ultrasonic Anemometers will replace the two old wind sensors:

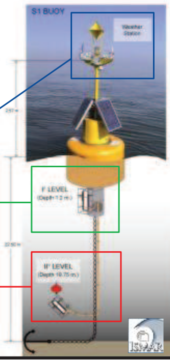
- Wind sonic 2-axis, Gill — Wind Speed and Direction

I° LEVEL implementation (1.2 m. below the sea level):

- SBE 63 (D.O. Optical) — Dissolved Oxygen
- WetLabs Eco-Triplet — Chlorophyll, CDOM and Scattering

NEW II° LEVEL Basket Sensors (19.75 m. below the sea level):

- CTD SBE 37 — Water Temperature and Salinity
- SBE 43 — Dissolved Oxygen



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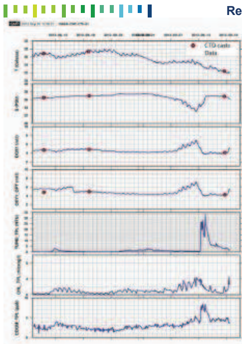
E1 BUOY: EXAMPLE OF DATA ACQUIRED

Recent data acquired after implementing the new system

Data between 08/08/2012 and 20/09/2012



- **Temperature** 1.3 m below sea level (Probe CTD SBE 37)
- **Salinity** 1.3 m below sea level (Probe CTD SBE 37)
- **Dissoved oxygen** 1.3 m below sea level (SBE 43, Membrane sensor)
- **Dissoved oxygen** 1.3 m below sea level (SBE 63, Optical sensor)
- **Turbidity** 1.3 m below the sea level (ECO-Triplet Optical sensor, *Tecnopolo-Proambiente ,ISAC*)
- **Chlorophyll** 1.3 m below the sea level (ECO-Triplet Optical sensor, *Tecnopolo-Proambiente,ISAC)*
- **CDOM** 1.3 m below the sea level (ECO-Triplet Optical sensor, *Tecnopolo-Proambiente, ISAC*)

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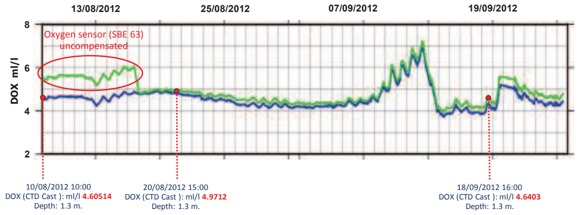
E1 BUOY: OPTICAL VS MEMBRANE OXYGEN SENSOR

Comparison data between **Membrane oxygen SBE 43**, **Optical oxygen sensor SBE 63** (Depth 1.3 above sl) and **Membrane oxygen SBE 43 on CTD casts**



After 40 days:
- the data acquired by the SBE 43 Oxygen sensor display a shift of -0.3 ml/l when compared to the CTD data
-the data acquired by the SBE 63 Oxygen sensor are in agreement with the CTD data

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E1 AND S1 BUOY: Sensors and System Maintenance

Sensors regular maintenance:

Sensors/Probes	Buoy	Real Frequency	Optimal Frequency	Activity	Facilities Required
Meteo Sensors	S1	12 months	12 months	Oil wind sensors and data test	Motor boat
	S1	12 months	12 months		
CTD SBE 37	E1	8/12 months	6/8 months	Sensors cleaning to biofouling, change TBTO pill and data test	Vessel or scuba team
	S1	6/12 months	6 months		
Optical Sensors (OBS3+, Scufa II)	E1	8/12 months	2/3 months	Sensors cleaning to biofouling, and data test	Vessel or scuba team
	S1	6/12 months	2 months		
Chemical sensor (SBE43)	E1	8/12 months	1-2 months	Sensors cleaning to biofouling and data test	Vessel or scuba team
	S1	6/12 months	1-2 months		
Current meters (ADCP and DCS)	E1	8/12 months	2-3 months	Sensors cleaning to biofouling and data test	Vessel or scuba team
	S1	6/12 months	2-3 months		

Usually the biofouling cleaning operation are performed lifting the buoy on CNR vessel (R/V Urania or R/V Dallaporta). This process usually takes 1-2 days of work, during this period other research activities are done.

System recovery:

Buoy	Real Frequency	Optimal Frequency	Activity	Facilities Required
E1	2-3 years	1-2 years	Sensors substitution or calibration; system update and check	Vessel
S1	2 years	1-2 years	sensors substitution/calibration; system update and check	Vessel

The need for fully equipped ships and the lack of funding are the main problems, especially in case of un expected events (e.g. system damages). Organizing a recovery without a CNR ship might be very expensive.

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JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

HCMR FIXED PLATFORMS

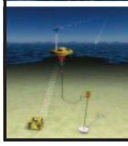
Best practices

www.jerico-fp7.eu *04 /10/2012 I Heraklion I Greece*

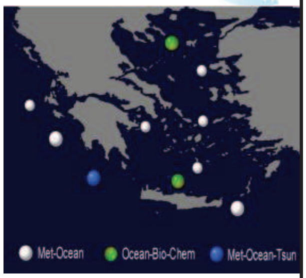
FIXED PLATFORM NETWORK – POSEIDON BUOYS

SeaWatch buoys
Limited number of parameters

Wavescan buoys
Supporting deep sea monitoring including ecosystem variables



Deep Sea platform
Tsunami detection with acoustic link to surface buoy



www.poseidon.gr

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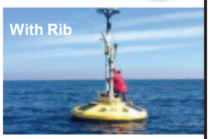
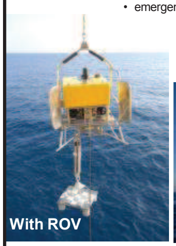
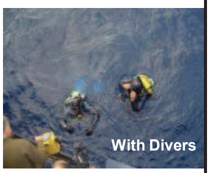
NETWORK OPERATION - SUPPORT MEANS

- buoy replacement
- sensor replacement
- sensor maintenance and field validation
- emergency visits with inflatable

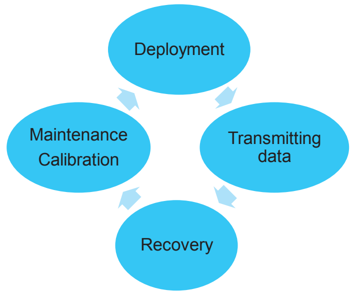






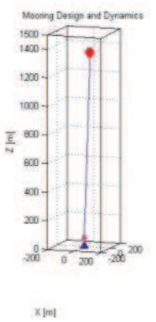
www.jerico-fp7.eu TITLE - JERICO - 3

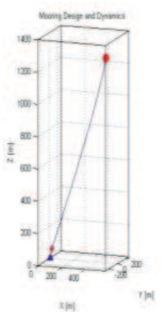
FIXED PLATFORM (BUOY) OPERATIONAL CYCLE



www.jerico-fp7.eu TITLE - JERICO - 4

MOORING DESIGN USING MOORING DYNAMICS (MATLAB)





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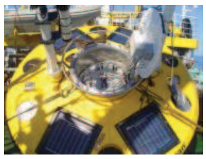
DEPLOYMENT PROCEDURE



Check and test everything (buoy, sensors, mooring line components, releaser) just before deployment.

A successful data transmission ON BOARD the R/V is required.

www.jerico-fp7.eu TITLE - JERICO - 6

DEPLOYMENT ISSUES – SOME ECONOMICS

Mooring anchor

- Weld steel plates: (density 7600 kg/m³)
- Reinforced concrete: (density 2300 kg/m³)

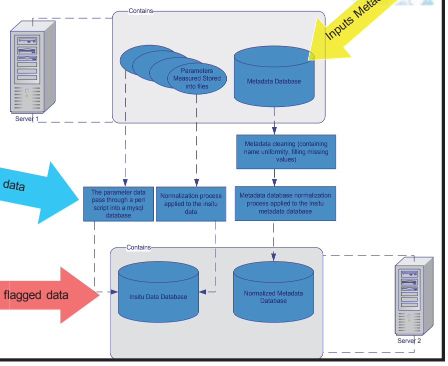
Although the steel is the most convenient solution (less volume on board) the cost is very high.

- 1000 kg of welded steel ≈ 1000 euros
- 2300 kg of reinforced concrete ≈ 60 euros

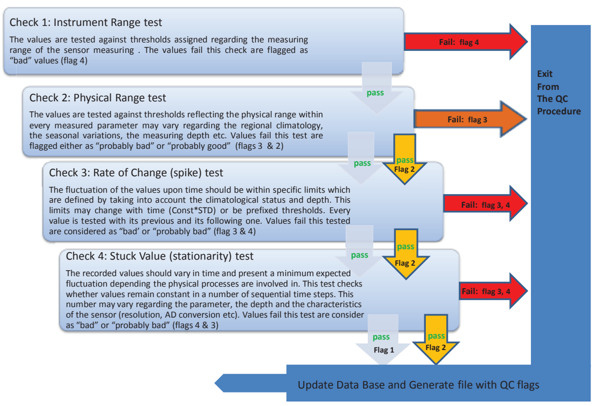
DATA TRANSMISSION

Data are transmitted to the Operational Center of POSEIDON using 3 telecommunications systems:

- **-INMARSAT-C satellite**
- **- GPRS**
- **- Irridium**



Quality control procedures



FIELD SURVEY - M3A EXAMPLE

M3A monthly sampling

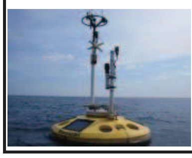
- CTD casting
- Water sampling
- Zooplankton sampling

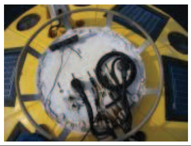
Advantages

- Monitoring sensor behavior on the field
- Performing data corrections

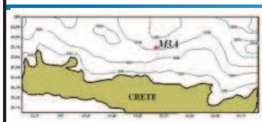
And emergency visits in case of malfunction

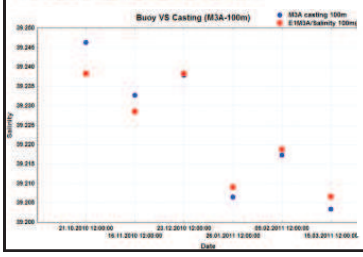
M3A buoy

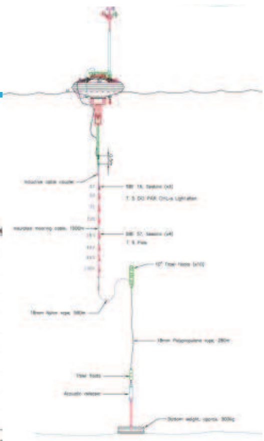




FIELD SURVEY - M3A EXAMPLE







SENSORS RECOVERY

On board maintenance

- Cleaning all the equipment with fresh water.
- Download data
- Conductivity cells and optical sensors immersed in deionized water
- Seabird electrochemical sensors sealed with tubes.

SENSORS □A□□ □□A□C□

Lab maintenance

- Deep cleaning of the conductivity cells and the rest of the sensors.
- □atteries and spare parts replacement
- □unctionality test

□sually the sensor manual cover all this procedure. Some companies provide even more – SEA□IRD video tutorials at S□E webpage.





SENSORS CALI□RA□ION

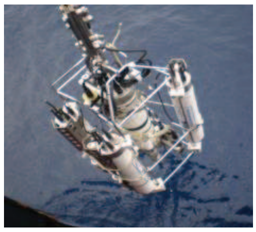
Calibration procedure

- □irst define the acceptable residual thresholds in order to change calibration coefficients and then perform the calibration as described to the calibration manuals. □□□□□□JERICO webpage hosts some calibration manuals□we □EED even more.
- □enerally we try to use the same sets of sensors in each spot and calibrate them according to the spot climatology .

□alidation before ne□t deployment.

- On the lab□in one of the tanks with fresh sea water and 2-□ calibration steps.
- On the field□CTD casting and water sampling

□inal product□Calibration report containing
- serial number and date
- previous cal coefficients
- new coefficients
- table with measurement of calibration steps
- graph and table with previous and new residuals
- graph and table with validation test with new residuals



SENSORS RECOVERY - □IOFOULIN□

Main body o□ the buoy□ □ouling doesn't a□ect the data□

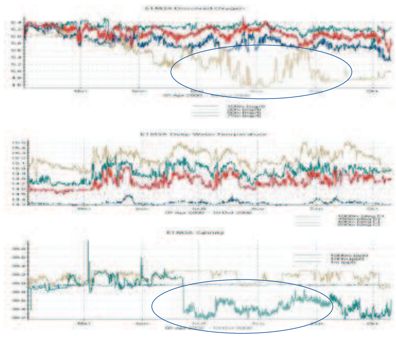
Current Meter

Conducti□ity sensor

Sensor □ouling – data a□ected

DO sensor

□IOFOULIN□ AFFEC□ □O DA□A

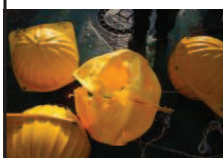


SENSORS RECOVERY - SOME □AD EXPERIENCES…….

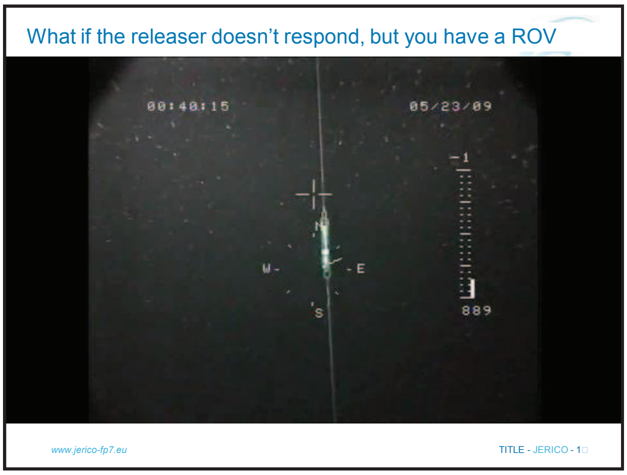
Inducti□e cable destroyed

Seabird C□D □□plus as reco□ered

RECOVERY - SOME □AD EXPERIENCES…….



□uoyancy sphere e□plode at □□□□meters


What if the releaser doesn't respond, but you have a ROV
00:40:15
05/23/09
W -
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S
889
www.jerico-fp7.eu
TITLE - JERICO - 1

FIXED PLA□FORM □ES□ PRAC□ICES POLIS□ CASE S□UDY

Piotr Szmytkiewicz | IBWPAN | p.szmytkiewicz@ibwpan.gda.pl

OVERVIE□

CRS at Lubiatowo – South Baltic coastal zone

Two kinds of IBW PAN Fixed Platforms

- Hard Fixed Platforms

- Mobile Fixed Platforms

Threats/Problems/Bad luck?

IBW PAN recommendation

MUL□I□AR DISSIPA□IVE COAS□AL □ONE

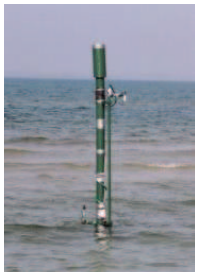
- mild slope of 1.□□ on average□
- □– □bars□
- medium grain diameter of about d□ □0.22mm□
- emerged part of the beach is 20 – □0m wide□
- □ma□ □ □□2 m □at 1□m depth□□ □ma□ □ 1□□m□s □longshore current - at c.a. 1 m depth□□
- area of our interest□from dune to c.a. 20 m depth.

I□□ PAN Fi□ed Plat□orms destination□
-string wave gauges□
- electromagnetic current meters□
- ADCP□
-laser Doppler particle size analyser LISST-100□
-salinity□temperature □pressure sensors.

□□ O □YPES OF FIXED PLA□FORMS

□ard Plat□orms

Mobile Plat□orms



□ARD FIXED PLA□FORMS – □IS□ORY

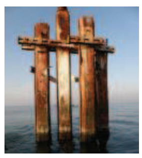
A row of □steel towers was constructed in 1□□0
They stretched from the shoreline □00 m offshore to the depth of □-□m and covered the entire zone of coastal bars.

□ARD FIXED PLA□FORMS

System of towers was linked with the cables for power supply and data transmission.

The cables were suspended on a steel rope mounted at the towers tops.

The rope was stretched between a offshore structure and the tower at the shoreline.



The structure was built with the relatively poor quality steel.

After □0 years steel looks like „paper".

The platforms were thoroughly renovated in 200□.

HARD FIXED PLATFORMS – THREATS

Platform has been designed as a flexible structure.

Most of the measuring towers were destroyed due to storm impacts and ice phenomena.

HARD FIXED PLATFORMS – FUTURE

New platform is being planned.

Platform will be sponsored by Ministry of Science and Higher Education.

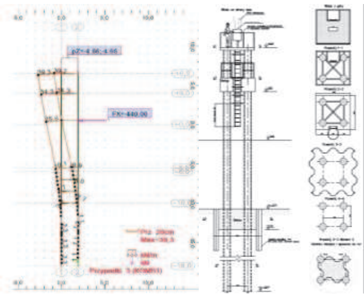
Platform has been designed as a solid structure.

Increased corrosion resistance steel will be used. All steel elements will

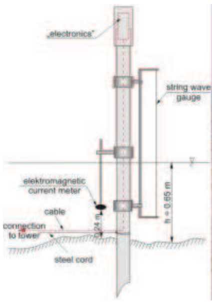
be additionally corrosion protected (anticorrosion coating).

Cost: c.a. □□0 000 Euros.

Autumn 201□ - fully operational



MOBILE FIXED PLATFORMS



MOBILE FIXED PLATFORMS

MOBILE FIXED PLATFORMS

MOBILE FIXED PLATFORMS

2

MO□ILE FIXED PLA□FORMS

MO□ILE FIXED PLA□FORMS

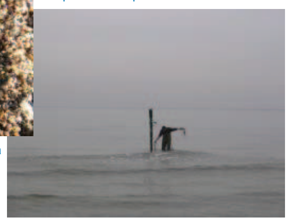
MO□ILE FIXED PLA□FORMS – CONNEC□ION

The mobile fi□ed platform was linked with the cable □for power supply and data transmission□or with □SM system.

MO□ILE FIXED PLA□FORMS –□IOFOULIN□

Depending on□

- communication system□
- seasons□
- importances of performed measurements.



□isual inspection and cleaning are held once a week or once a month or after every e□treme events.

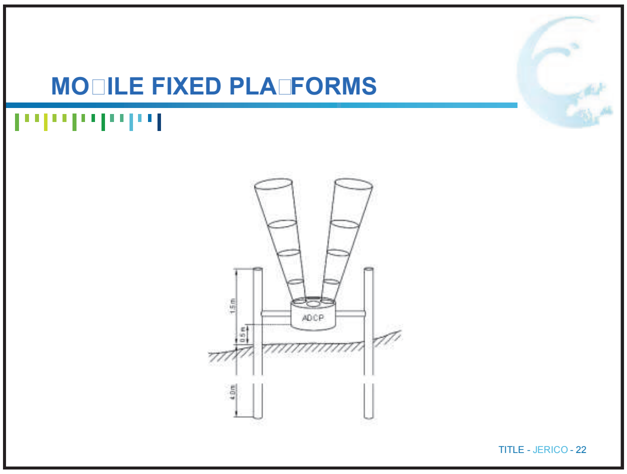
MO□ILE FIXED PLA□FORMS

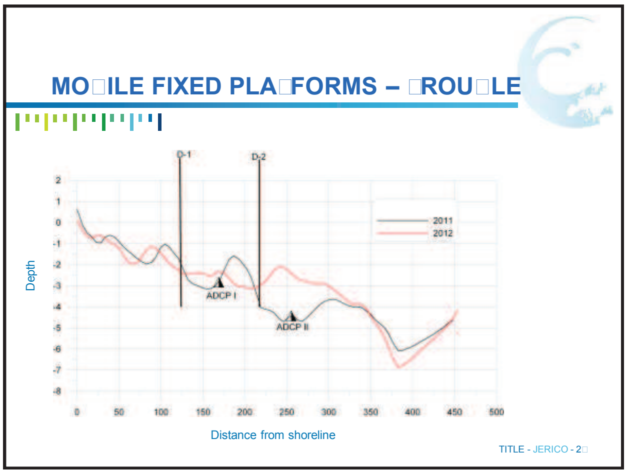
MO□ILE FIXED PLA□FORMS


MO□ILE FIXED PLA□FORMS
TITLE - JERICO - 1□


MO□ILE FIXED PLA□FORMS
TITLE - JERICO - 20

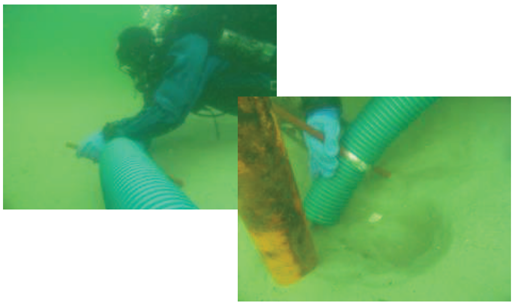

MO□ILE FIXED PLA□FORMS
TITLE - JERICO - 21


MO□ILE FIXED PLA□FORMS
ADCP
TITLE - JERICO - 22


MO□ILE FIXED PLA□FORMS – □ROU□LE
D-1
D-2
2011
2012
ADCP I
ADCP II
Depth
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
0
50
100
150
200
250
300
350
400
450
500
Distance from shoreline
TITLE - JERICO - 2□

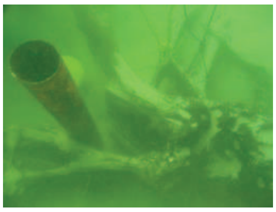

MO□ILE FIXED PLA□FORMS – □ROU□LE
TITLE - JERICO - 2□

MO□ILE FIXED PLA□FORMS – □ROU□LE



TITLE - JERICO - 2□

MO□ILE FIXED PLA□FORMS – □AD LUC□



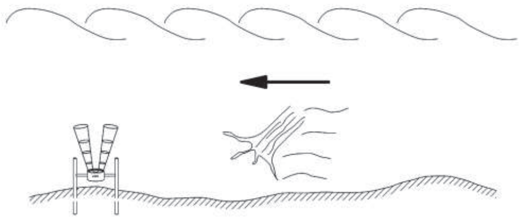
TITLE - JERICO - 2□

MO□ILE FIXED PLA□FORMS – □AD LUC□

TITLE - JERICO - 2□

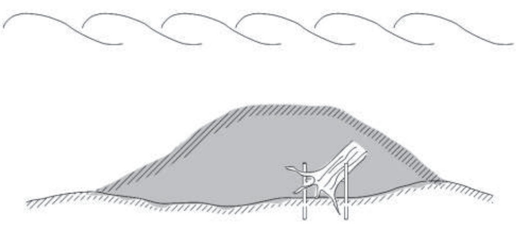
MO□ILE FIXED PLA□FORMS – □AD LUC□

What happened□



TITLE - JERICO - 2□

MO□ILE FIXED PLA□FORMS – □AD LUC□



TITLE - JERICO - 2□

I□□ PAN RECOMMENDA□ION □

□ard Fi□ed Plat□orms

1. Should be built on the dissipative □altic coastal zone on depths from □ up to 10 m □on large depths it's recommend to use buoy□
2. Platform should be designed as a solid structure.
□. The platform is being designed for □0 years of the use.
□. All steel elements will be additionally corrosion protected.
□. During winter□depending on wave conditions□karcher□should be used to remove ice phenomena on the platform.

TITLE - JERICO - □0

I□□ PAN RECOMMENDA□ION □

Mobile Fi□ed Plat□orms

1. Should be built for depth□from shoreline to the □metres deep.
2. The platform can be used in the period of ca. 12 months.
□. If the structure is sticking out beyond the water level it is recommended not to use it during winter.
□. On account of the biological conditions it is not recommended to carry out measurements in summer.
□. □isual inspection and cleaning are held after every e□treme event.
□. It□s relatively cheap method to measure parameters of hydro- and lithodynamic processes occurring in the shallow water coastal zone.
□. Sometimes□it□s the luck of the draw - you have to spend more than you planned for□

TITLE - JERICO - □1

□□AN□ YOU

6.6. End-to-End Quality Assurance for Gliders and Ferryboxes

6.6.1. *Gliders (GL)*

Simon Ruiz (CSIC) started his presentation with the IMEDEA-CSIC Task 3.2

OBJECTIVES:

-To review the current status of the existing glider fleet in operational use in European Seas.

-To define the best technical practices for operation of a fleet of gliders

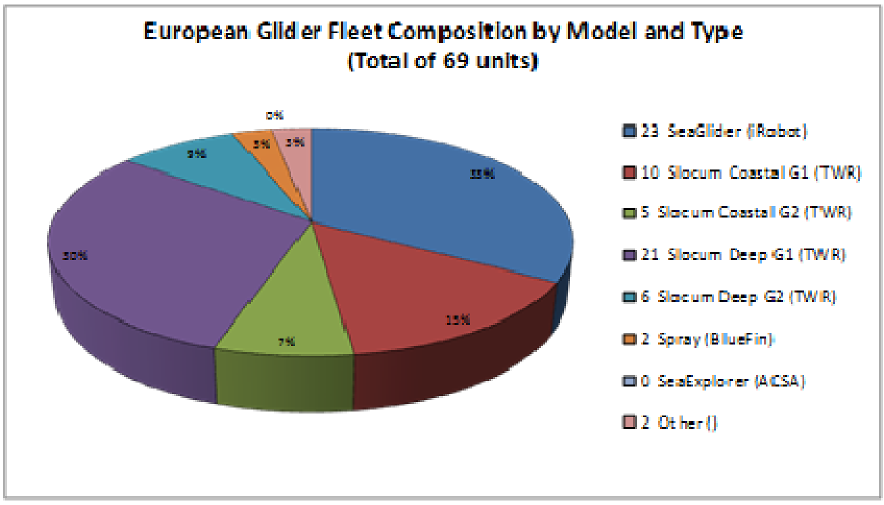
DELIVERABLES:

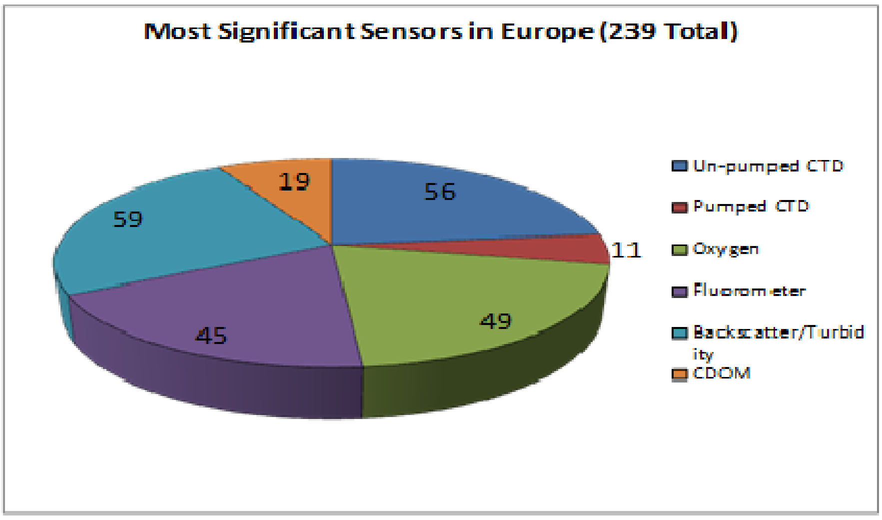
-D3.2: Report on current status of gliders observatories within Europe: Task 3.2 – Report on the first workshops of gliders observatories within Europe

He continued by highlighting the results of the Glider Workshop as follows:

- The added value of using gliders in specific areas of coastal and open ocean and for routine monitoring at key control points was shown and discussed.
- The technological complexity still provokes that a small proportion of European gliders (around 60) have been in the water at any one time
- The glider community has an opportunity to propose a coordinated network of glider observations in the same way the profiling float community setup the ARGO program
- Establishment of a Working Group on Data Management to study the Organization, Formats, QC procedures.
- The EGO website is a good platform for sharing information and making visible the activities of European partners. It was suggested that all participants record their gliders deployments on the website even if the RT or DM data are not yet available.

Some results from the Glider questionnaire were presented mentioning that the data have not been analysed in total.





The information of the GL questionnaires will be contained in the Report on current status of gliders observatories within Europe by the end of 2012.

6.6.2. *Ferry Boxes (FB) Hamburg Workshop*

David Hydes (NOC) presented the summary of FerryBox workshop and the results from the FB questionnaire that was cycled between partners that operate FBs. The issues arising are :

- FB questionnaires
- Quality Assessment
  - Status on quality control and data handling (in connection with WP5)
  - Overview of quality assessment procedures in the community
  - Quality criteria appropriate for FerryBox
  - Quality flags (according to SeaDataNet)
- Best practise:
  - Data vocabularies consistent with SeaDataNet for use by EMODNET

- Goals of QC development in JERICO
- Status data transfer, communication
- Real time data processing incl. QC/QA - community needs
- Post processing incl QC/QA - community needs
- Data storage and access for internal and external use (via pick user pick up from a ftp site?) and data flow to other communities (MyOcean, JERICO, EMODNET)

- Calibration
  - Common procedures

After presenting the actions that have already performed for the above issues he concluding by mentioning some questions for interoperability requirements.

Discussions considered:

- Public access and visibility of FB data.
- How can we get all FB data for a certain date in a defined area ?
- HZG can offer their database for other users. HZG database has interactive visualization and download tools via an internet browser.
- In WP7 data go to MyOcean – data will be labelled JERICO data. NO data tools are offered.
- What do we need from the JERICO data tools?
- A Data Management handbook was in preparation. This will define the approaches that need to be taken for automation of QC of the data.

6.6.3. *Ferry Boxes (FB)*

In this session each partner was given the opportunity to give a 15-minute presentation regarding the best practices used in Ferry Boxes.

6.6.3.1. *Pascal Morin (CNRS)*: CNRS Fixed platforms and Ferry Boxes

- Description of CNRS Fixed Platforms and CNRS - Ifremer FerryBox
- Pre- and Post-deployment procedures, maintenance, fouling
- Calibration procedures
- Comparison of Fixed Platform and Ferry Box data
- Data Processing (data transmission, archiving, quality codes)

Apart from the systems overview, regarding maintenance and the fouling effect the procedures used was presented.

Fixed Platform Maintenance:

- Cleaning every 2-3 months depending on the season (more frequent during the productive season)
- Antifouling: TBTO pills from Seabird

Ferry Box Maintenance:

- Automatic cleaning at each arrival in port (10% HCl solution)
- Regular cleaning of the debubbler,
- Entire circuit every year

The CNRS calibration procedures involve sampling and lab analysis against the data of both FB and FPs. The procedures are :

Fixed Platform:

- CTD sensors calibration every year at SHOM calibration facility (Brest)
- Fluorometer: calibration with chlorophyll extracted from algal cultures
- Samples (bimonthly frequency) for salinity, dissolved oxygen, chlorophyll

Ferry Box:

- CTD sensors calibration every year at SHOM calibration facility (Brest)
- Fluorometer: calibration with solid secondary standard, chlorophyll extracted from algal cultures
- Samples (bimonthly frequency) for salinity, dissolved oxygen, chlorophyll, pCO_2 (DIC and alkalinity measurements)

Examples of data for each parameter measured were demonstrated and the end the data collecting procedures and how data are treated were presented.

6.6.3.2. *Kai Sörensen (NIVA):* Large experience and the best practices in operating FB systems.

He focused on the following topics :

- Installation of a new Ferrybox system (D3.1)
- Data transmission and communication
- Maintenance of the systems
- Calibration and QA-controls of the systems
- Calibration of Chl-a fluorescence

giving details for best practices in each one of them. The installation guides will be included in the deliverable D 3.1 Report on the current status of Ferrybox.

For data transmission and communication some guidelines were mentioned

- Internally on ship:
  - RS232 Port server between sensor and computer
  - IP communication from deck sensor to Ferrybox computer
  - Access to the ship GPS , Gyro, wind sensor.
  - Send data from the Ferrybox to the bridge (display)
  - (W)LAN (internal internet on deck)
- Externally to database at NIVA
  - GPRS must be used on ship in the Barents Sea
  - Prefer to use ships internet communication
- Software
  - LabView
  - PC-anywhere
  - TeamViewer can be operated from iPad and iPhone

Regarding maintenance of the FB the procedures and the intervals were presented and for the calibration of the sensors involved there was a detailed presentation.

- Salinity/temperature
  - Certified digital term./Control samples minimum 2-4x/year
  - Factory calibration when needed (every 2 years)
- Oxygen
  - Winkler (in harbour/at sea) 4-6x/year
- Turbidity
  - Formazin turbidity standards 1x/year
  - Formazin prepared in house and calibrated according to ISO-EN 7027
- Irradiance/radiance sensor
  - FieldCal lamp 3-4x/year, Yearly control at NIVA - NIST reference lamp
  - Factory or external calibration when needed
- Chlorophyll-a fluorescence
  - Algal culture yearly (Skeletonema costatum, exponential growth)
  - «Field calibration» Chl-a (hplc) water samples monthly/weekly
  - Seasonal calibration
  - Sensor drift control with solid standard introduced from October-12

Followed by chla data examples, their variation in time and the dependency with PAR measurements.

The conclusion was a summary of guidelines.

- A good planned technical installation and choose of system are important for the operation, maintenance costs and data quality
- Internet communication are a preferable for the operation to be able to access the system
- Maintenance depends much of the system in operation and the access to the installation
- Sensors calibration and controls are of high importance and must follow the agreed protocols
- Chl-a fluorescence as a proxy for Chl-a can be improved using seasonal calibration of the Chl-a_fl/Chl-a ratio.

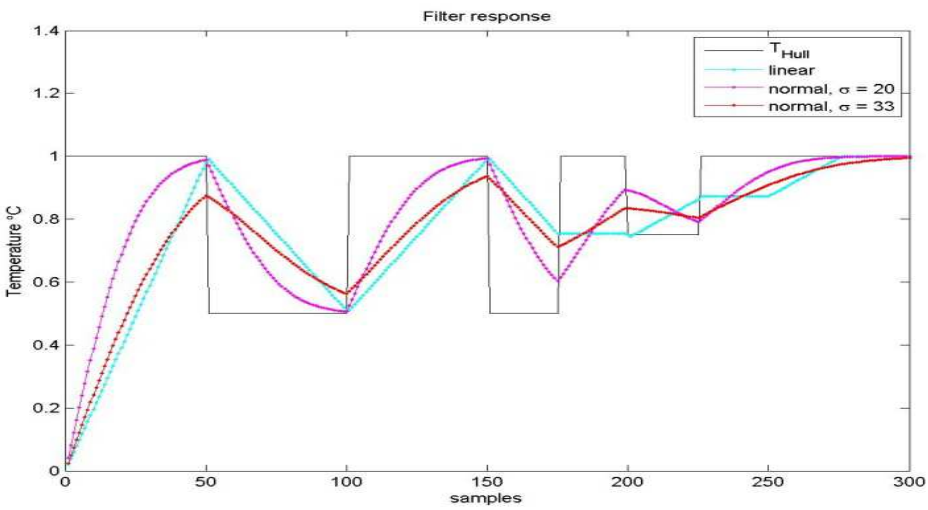
Questions and Discussions

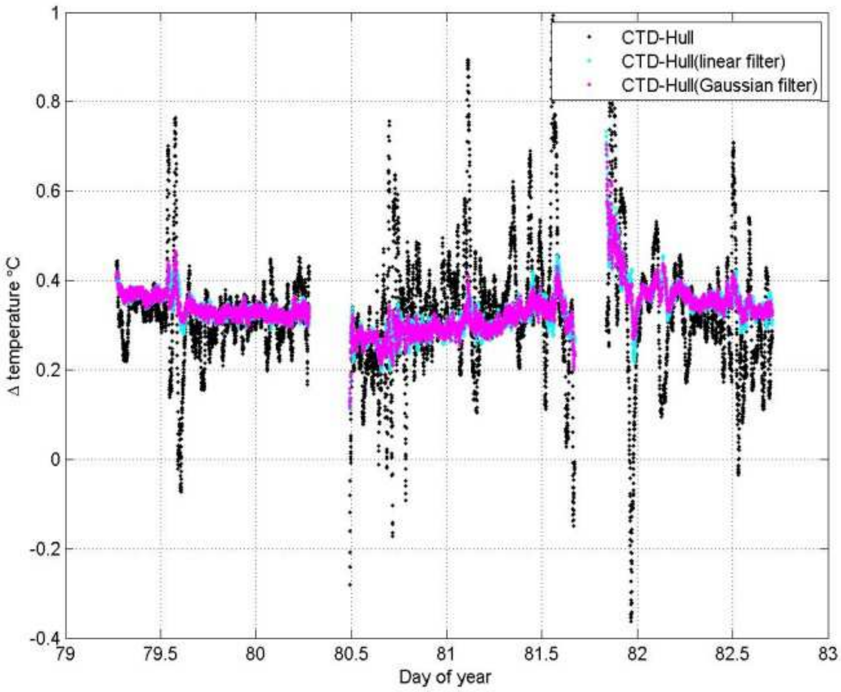
It was asked if the deliverable can include information and guidelines of how to install a new FB system.

6.6.3.3. *Mark Hartman (NERC):* Processing methods of NERC FB data acquired on two ships of opportunity.

The pride of Bilbao ferry crossings enabled the comparison of two independent temperature datasets.

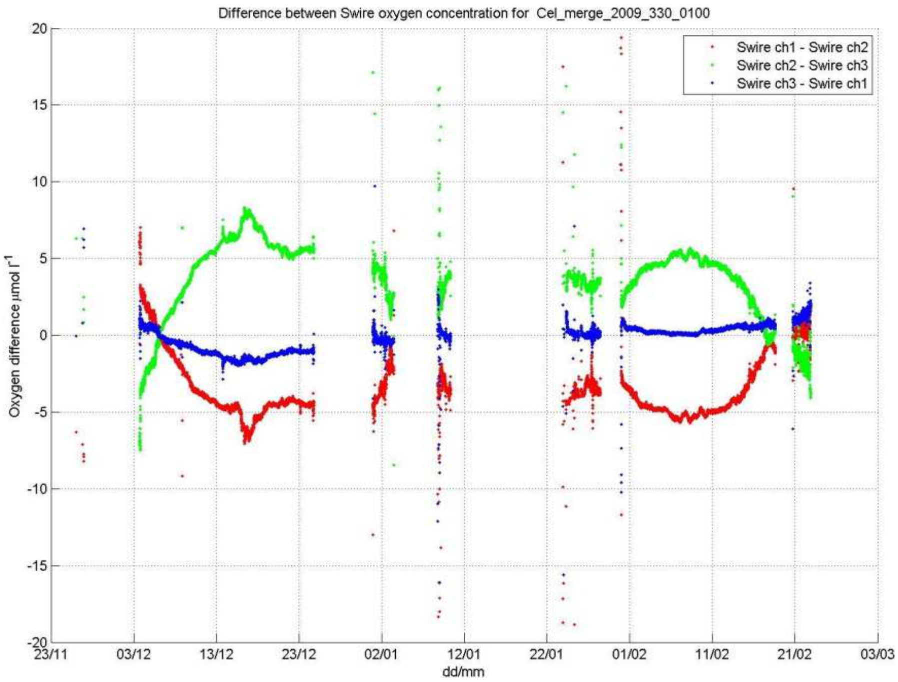
The first; measured within a flow through system and the second; a Hull temperature sensor that gave our best in situ temperature measurement which is a **key parameter needed in other measurements**. The comparison gave a model of the two relative temperatures and allows calculation of the delay in the flow-through system.





1. the relative response of 2 types of filter, a linear filter and a Gaussian filter with two window lengths
2. temperature differences with time before and after filter application

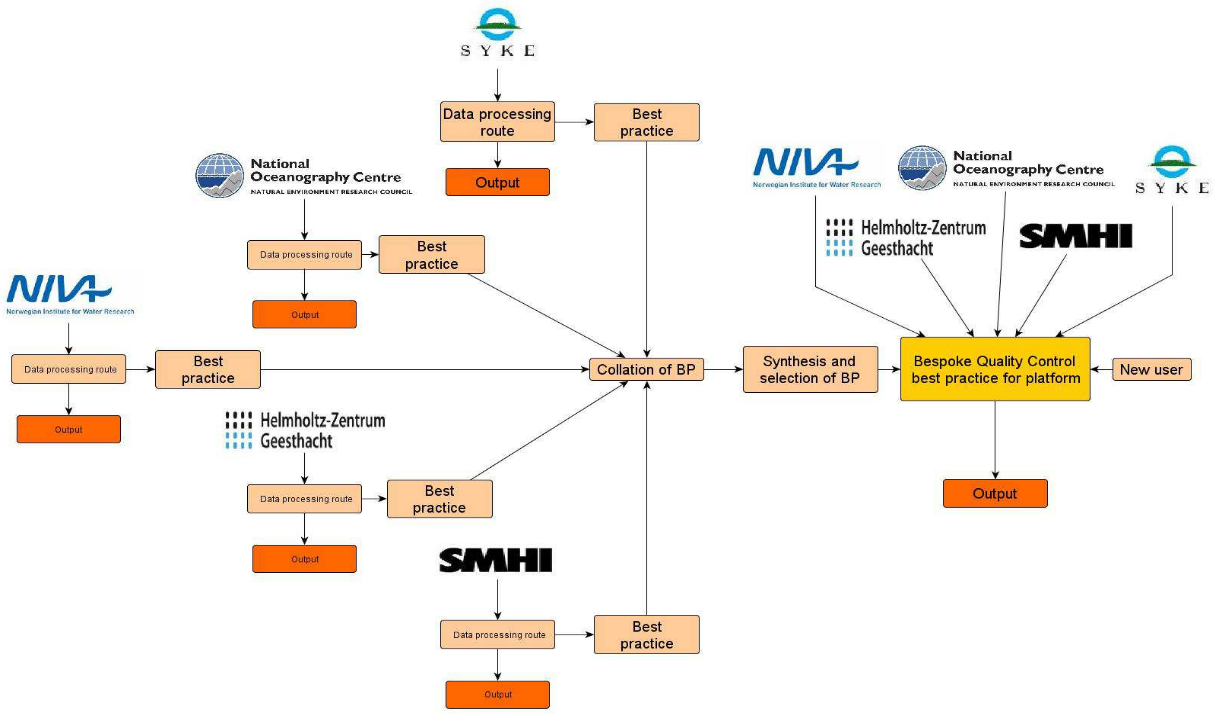
Following he presented some flow charts of the data process covering information that leaves the ship through to archival at data centres. He continued presenting data and results from the comparison of a set of Aanderaa triplicate sensors (T, C, DO) installed in an flow through housing used on a FB system.



Regarding the best practice in operating FB M. Hartmann suggested.

- Pre-deployment sensor calibration
- Training of ship's crew in sample taking
- Limited duration sensor deployment – 3 months
- Regular Monitoring of real-time data – daily if possible
- Shutdown of flow-through system and cleaning in port
- Sample logistics
- Sample analysis

Finally an example schematic of how we move forward in collecting/ integrating best practices was introduced.



Questions and Discussions

Further information was provided about the JUD software technical specs. It was mentioned that FBs are good for testing new sensors because they caver a large range of the measured parameters.

6.6.3.4. Frederic Francken (MUMM): Overview of the MUMM Ferrybox installed on the RV Belgica.

The FB is fully equipped with commercial system and some special features for the specific system were presented.

- Anti-flooding system with leak detection and alarm unit,
- Programmable periodic cleaning cycle,

- Auto shutdown system including full cleaning cycle (harbour approach),
- Position controlled seawater sampling (16 1l bottles),

Followed by operational issues:

- Problems with water inlet
  - Insufficient flow into the AUMS
- Problems with cleaning cycle
  - Biological growth despite the cleaning cycle
- Problems with drainage system
  - Insufficient removal of water from the drainage tank resulting in shutdowns
- Problems with excessive amounts of suspended solids
  - Filter system for the Systeas becomes rapidly overloaded
- Problems with the Systeas
  - Differences between lab measurements and underway measurements
  - Insufficient rinsing of tubing during shutdowns

Finally the MUMM best practices that have been chosen were presented with a table with responsibilities for actions.

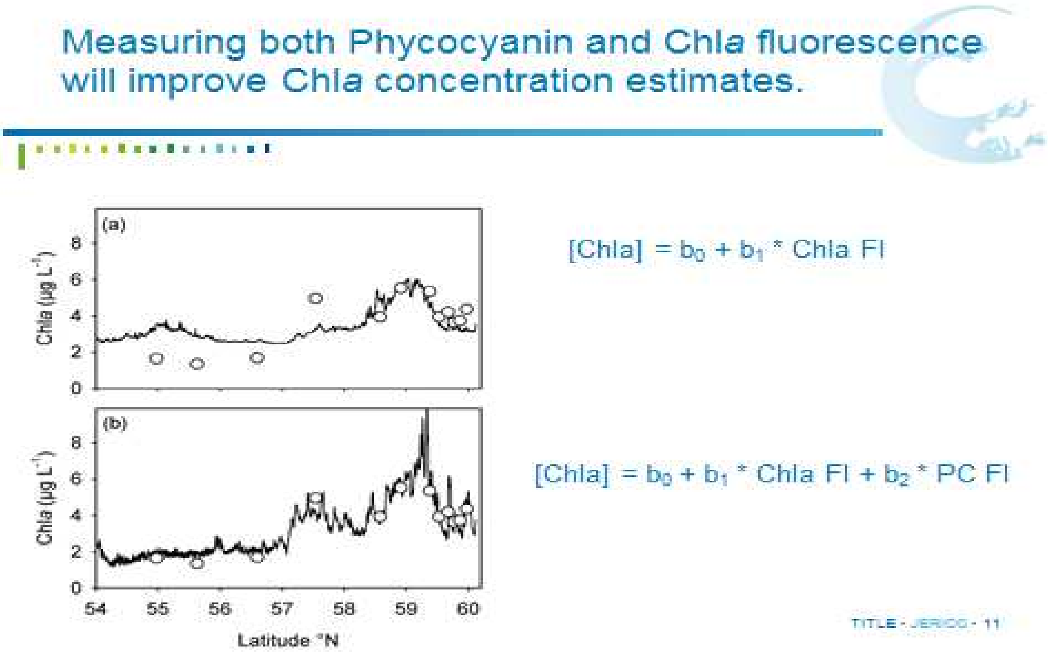
- Frequent (± weekly), checks of the system by MUMM personnel recorded in log
- Frequent, (± weekly) calibration of the Systeas and the pH electrode recorded in log
- Planned monthly QA-QC checks by independent sampling and analysis (Chl a, salinity, O2, nutrients, pH)
  - E.g. comparison of Chla data with the results of HPLC analysis
- Currently validation of the Systeas
  - Analysis of reference samples with the Systeas under lab conditions
  - Stability test of the Systeas under lab conditions

Questions and Discussions

More information was provided about the cleaning system of MUMM ferrybox.

6.6.3.5. Seppo Kaitala (SYKE): Overview of the FB routes, operation and data management involved in the Alg@line project.

He talked about the importance of real time FB data from commercial vessels and for the technical characteristics of the "in house" FB system they develop in SYKE. Furthermore he presented a few slides regarding the data management and quality control. Especially for chl_a measurements he gave some data examples, explanations of the plots and described how the data is corrected.



At the end the presentation included the measurements of the coastal Smartbuoys network and the relationship with FB data, and the voluntary observations collected by citizens participating through mobile phones in the Algal watch programme.

6.6.3.6. *Manolis Ntoumas (HCMR):* New HCMR FB system recently installed in a HighSpeed Ferry

The ferry is covering the route between Piraeus – Heraklion every night.

He presented the challenges they faced during the installation.

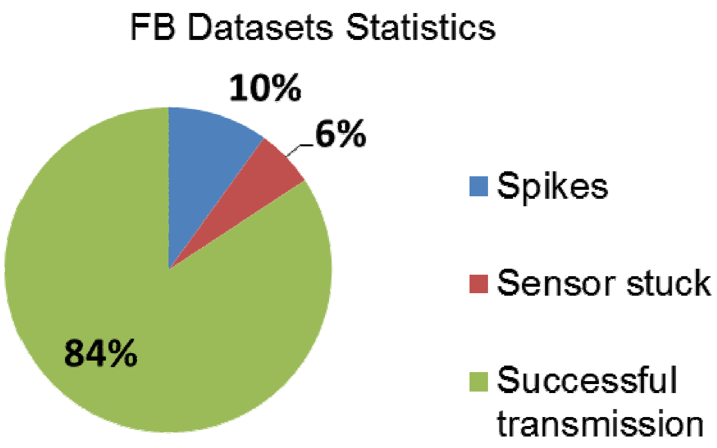
Problems faced before installation and chosen solutions:

- Corrosion: Previous experiences show that there are corrosion issues due to moisture.
- Vibration: Heavy vibrations due to bow thrusters operation and sea waves while cruising.

Limitations: For safety reasons we can NOT drill on the ship, only WELDING is allowed.

Communication and coordination with the FB manufacturer was essential.

Furthermore a rough evaluation of the data transmission was presented and data sets of each measured parameter. At the end there were some slides regarding the maintenance procedure, some leakages treatment, and the fouling protection.



Questions and Discussions

It was suggested by partners the use of a secondary temperature sensor mounted in the ship hull to improve the temperature measurements.

6.6.3.7. *Malin Mohlin (SMHI):* Overview of the SMHI FB real time system

Flow through system

- Temperature (SeaBird + near water inlet)
- Conductivity (SeaBird)
- Salinity (calculated)
- Chlorophyll fluorescence (WetLabs ECOFLNTUS)
- Phycocyanin fluorescence (TriOS)
- CDOM fluorescence (TriOS)
- Turbidity
- Oxygen (Anderaa Oxygen Optode 3835)
- CO_2 (General Oceanics 8050 being evaluated)
- pH (fluorescence based own development being evaluated)

In air measurements

- Air temperature
- Air pressure
- Irradiation (PAR, Photosynthetic Active Radiation, Biospherical Instruments)
- CO_2 (being evaluated)
- Position and time stamp (GPS)

And the data are collected at Swedish National Oceanographic Data Centre. She mentioned the common effort with NOCS to develop a user display of the FB data.

In order to avoid biofouling some practices were mentioned :

- Automated washing system fills sensors with freshwater and detergent every time the ship is in harbour (10 times in 2 weeks)

- Service every two weeks
  - Water inlet filters are cleaned
  - Manual cleaning of fluorometers and O_2-sensors and flow chambers
  - CO_2-system filter cleaned
- Less frequent
  - SeaBird conductivity sensor anti fouling device replaced (TBT)
  - Replacement of tubes with CO_2 reference gases
  - Replacement of tubing

And regarding the water sampling some results were demonstrated

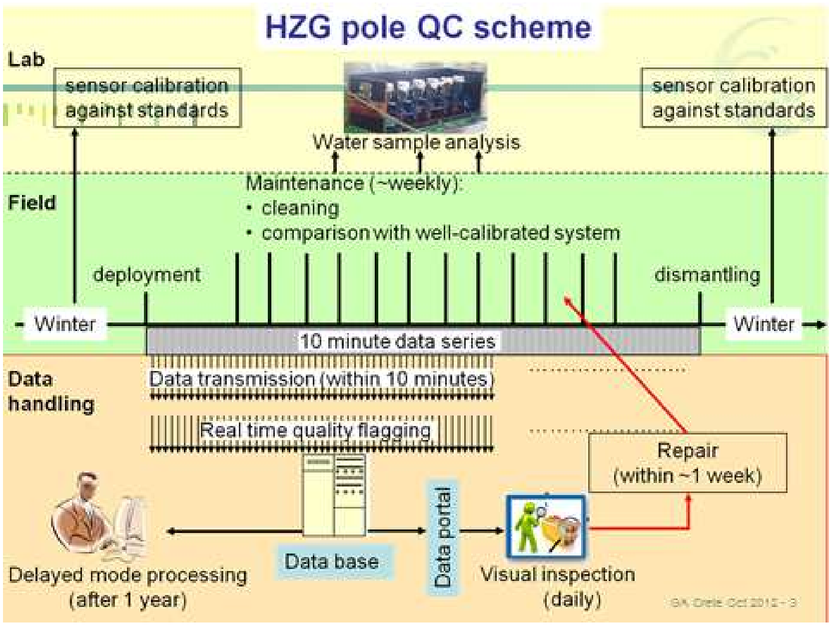
- Alkalinity - testing if storage affects quality of results – four days is OK
- Salinity – SeaBird works fine!
- Chlorophyll a- good correlation with chl. a fluorescence
- CDOM – not yet evaluated
- Phycocyanin samples still in -80 freezer
- Phytoplankton samples to be analysed for cyanobacteria

Questions and Discussions

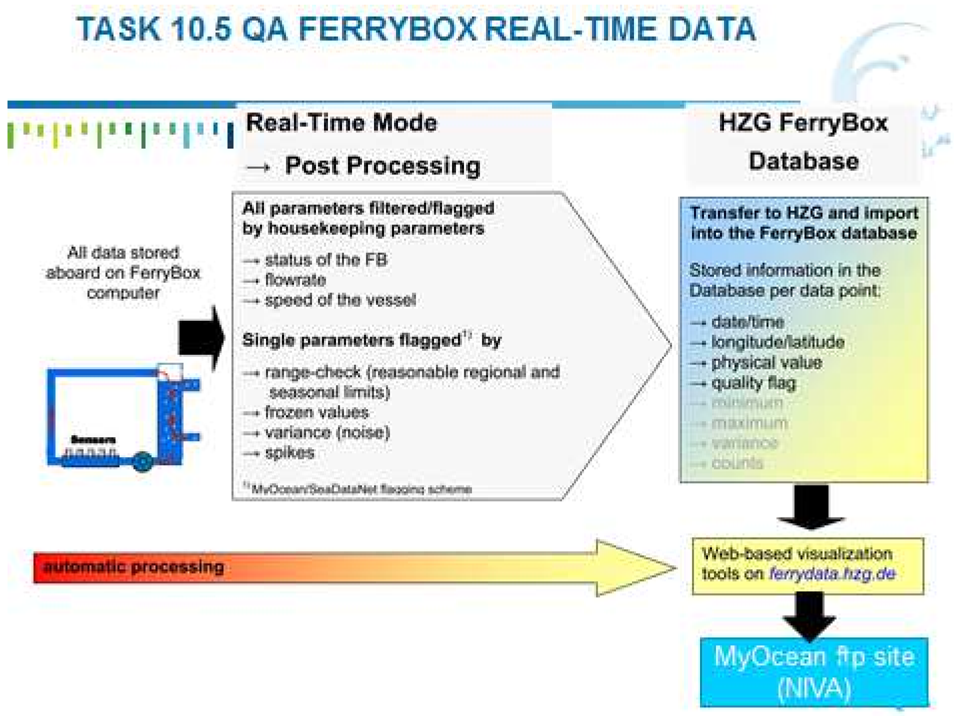
Further information was provided about the samples stability and storage.

6.6.3.8. *Wilhelm Petersen (HZG)*: FerryBox Data Handling and QA at HZG.

He started by mentioning the FP –pole they also operate in North Sea and their data are treated the same way as FB data in the quality assessment. The schematics is :



The FB data are transmitted in real time and they are treated it as below :



In delayed mode apart from the automatic control and quality flagging visual control and comparison with samples analysed in the lab can be performed too. The presentation continued with a demonstration of the HZG FB database and tools available followed by an example with combination of chlorophyll a data from 2 FB and MERIS satellite image. The presentation was completed with conclusions for the FB data management:

- Storage of data on relational database gives high flexibility regarding further evaluation of data
- Interactive web access allows:
  - visualisation with different kinds of presentation of the data (transects, pooled data (scatter plots), maps, time series at certain position..)
  - data control and data correction including quality flagging

HZG can offer database FB data storage of external user (with own login and rights for editing).

Questions and Discussions

Questions were asked and discussed regarding the possibilities of the FB data base and how data can be imported.

6.6.4. *Discussions and decisions*

Decision:

As in the FP and for the FB there will be a group dealing with best practices. The participants are:

- ***Kai Sörensen (NIVA)-coordinator***
- ***Wilhelm Petersen (HZG)***
- ***Mark Hartman (NERC)***
- ***David Hydes (NOC)***
- ***Pascal Morin (CNRS)***
- ***Manolis Ntoumas (HCMR)***
- ***Seppo Kaitala (SYKE)***
- ***Malin Mohlin (SMHI)***

Furthermore the possibility to introduce shipping companies to the FB concept was discussed.

Decision:

It was decided to produce a flyer with information about FB activities that will be sent to shipping companies and others outside JERICO community. JUD FB data display software can contribute to public awareness by providing real time data to the passengers of the ferries/ships that host a FB.HZG data base and data management tools can be shared in order for each user / partner to visualize and check his data.

Slides presented with regards to End to End quality assurance for Gliders and Ferryboxes are inserted hereafter in the following pages.

AUMS project
RV Belgica

Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM
MUMM-RBINS
museum
JERICO FerryBox-Workshop 30th to 31st of August 2011

MUMM has installed a autonomous underway measurement system or "Ferrybox" on board the RV Belgica

Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM
MUMM-RBINS
museum
JERICO FerryBox-Workshop 30th to 31st of August 2011

Ship Track in 2010

Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM
MUMM-RBINS
museum
JERICO FerryBox-Workshop 30th to 31st of August 2011

Aquisition

- Call for tenders 2010
- SubCtech GmbH obtained the contract
- Installation February 2011
- HAT and SAT February-June 2011
- Declared operational en of June 2011

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MUMM-RBINS
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MUMM-RBINS
museum
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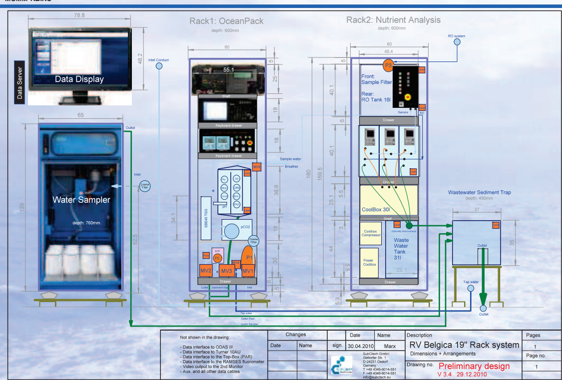


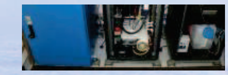
Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM
MUMM-RBINS
JERICO FerryBox-Workshop 30th to 31st of August 2011

Parameter	Brand	Model	Range	Time interval
Turbidity	Endress + Hauser	2 * CUS 41	0 – 2000 FTU 0 – 10000 FTU	1 s 1 s
Turbidity	Campbell	OBS3+	0 – 4000 FTU	1 s
Oxygen	Aanderaa	3835 optode	0 – 30 mg/l	2 s
pH	Meinsberg	AGA 140	0 – 12 pH	1 s
Chlorophyll	Trios	MicroFlu-chl	0 – 100 µg/l	1 s
Blue Algae	Trios	MicroFlu-blue	0 – 100 µg/l	1 s
CDOM	Trios	MicroFlu-CDOM	0 – 200 µg/l	1 s
Salinity	Sea-Bird	SBE45	0 – 40 PSU	1 s
pCO2	SubCtech	MK2	0 – 20000 µAtm	1 s
Fluorescence	Turner Designs	10AU	0 - 500	1 s
PAR	Li-Cor	LI-190	0 – 2000 Watt/m2	1 s
Hyperspectral irradiance	Trios	ACC-VIS	320 – 950 nm	8 s
NO3, NH3, PO4, SiO2, NO2	Systea	3 * MicroMac1000	0 – 500 ppb 0 – 8000 ppb 0 – 150 ppb	20 min. *

Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM
MUMM-RBINS
JERICO FerryBox-Workshop 30th to 31st of August 2011

Some special features of the AUMS:

- Anti-flooding system with leak detection and alarm unit,
- Programmable periodic cleaning cycle,
- Auto shutdown system including full cleaning cycle (harbour approach),
- Position controlled seawater sampling (16 1l bottles),


Management Unit of the North Sea Mathematical Models
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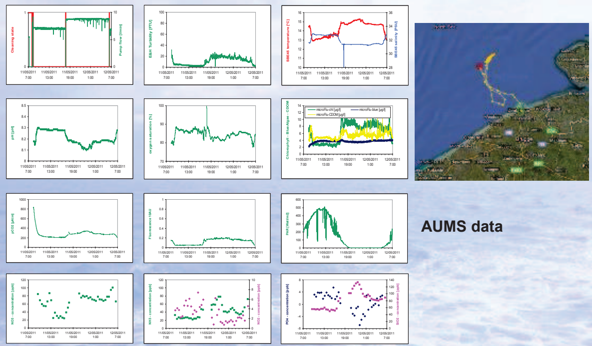
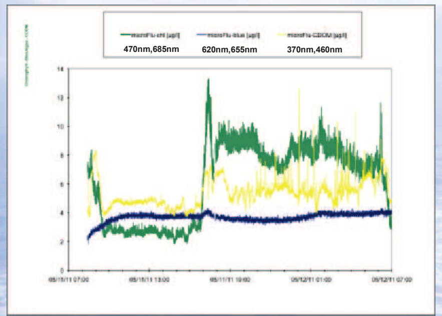
MUMM-RBINS
JERICO FerryBox-Workshop 30th to 31st of August 2011



AUMS data

Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM
MUMM-RBINS
JERICO FerryBox-Workshop 30th to 31st of August 2011

Fluoresence data



Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM
MUMM-RBINS
JERICO FerryBox-Workshop 30th to 31st of August 2011

Operational issues

- Problems with water inlet
  - Insufficient flow into the AUMS
- Problems with cleaning cycle
  - Biological growth despite the cleaning cycle
- Problems with drainage system
  - Insufficient removal of water from the drainage tank resulting in shutdowns
- Problems with excessive amounts of suspended solids
  - Filter system for the Systeas becomes rapidly overloaded
- Problems with the Systeas
  - Differences between lab measurements and underway measurents
  - Insufficient rinsing of tubing during shutdowns

Management Unit of the North Sea Mathematical Models
MUMM | BMM | UGMM
MUMM-RBINS
JERICO FerryBox-Workshop 30th to 31st of August 2011

Best practices-QA

- Frequent (± weekly), checks of the system by MUMM personnel recorded in log
- Frequent, (± weekly) calibration of the Systeas and the pH electrode recorded in log
- Planned monthly QA-QC checks by independent sampling and analysis (Chl a, salinity, O2, nutrients, pH)
  - E.g. comparison of Chla data with the results of HPLC analysis
- Currently validation of the Systeas
  - Analysis of reference samples with the Systeas under lab conditions
  - Stability test of the Systeas under lab conditions

Best practices-QA

Object	Interval	Responsible
Clean turner fluorometer	½ Year	Meetdienst
Clean OBS3+ sensor	½ Year	Meetdienst
Calibrate + service pCO2 analyzer	Yearly	SubCtech
Empty CO2 analyzer CF card	½ Year	Meetdienst
Calibrate + service SBE45 probe	Yearly	Meetdienst
Service Systea analyzer	Yearly	Elscolab
Check top-box	½ year	Meetdienst
Cleanup Dataserver harddisk	½ Year	Meetdienst
Check all connectors outside	Yearly	Meetdienst
Empty reagent tank	Weekly	Marchem
Empty and clean watersampler	Weekly	Marchem
Check rack damper and holder	Weekly	All
Check sensor holder	Monthly	Meetdienst
Check all manual valves	Weekly	Meetdienst
Clean Systea automatic filter	Weekly	Marchem
Check Systea air cleaning	Weekly	Marchem
Clean Systea sample tank	Weekly	Marchem
Exchange sample + RO tubes	Monthly	Marchem
Clean outlet tank	Weekly	Belgica

Best practices-QA

Object	Interval	Responsible
Check coarse filter	Weekly, Friday	Belgica
Check fittings for leaks	Weekly	Belgica
Test level switches	Monthly	Marchem/Meetdienst
Test Systea sample pump tube	Weekly	Marchem
Check acid pump head	Weelky	*Under evaluation*
Replace acid pump head	½ Year	*Under evaluation*
Test motor driven valves	½ Year	Meetdienst
Check RO tank	Weekly, Monday	Marchem
Test RO pump	½ Year	Marchem
Test refrigerator	Weekly	Marchem
Test Water sampler function	½ Year	Marchem
Test Leak sensors	½ Year	Meetdienst
Clean debubbler	½ Year	Meetdienst
Replace old tubes	Yearly	ALL
Empty datalogger CF card	Monthly	Meetdienst
Empty DL system CF card	½ Year	Meetdienst
Calibrate pH probe	Weekly	Marchem
Clean oxygen sensor	½ Year	Meetdienst
Clean E&H turbidity sensors	½ Year	Meetdienst

CNRS – Ifremer Ferry Box Best Practices in the Western Channel

Comparison between calibration of different types of sensors on Fixed Platforms and Ferry Box

Pascal Morin, Yannick Aoustin, Eric Macé, Paul Jégou, François Bourrin
Speaker I Organism I adresse mail

Outline:

Description of CNRS Fixed Platforms and CNRS - Ifremer FerryBox

Pre- and Post deployment procedures, maintenance, fouling

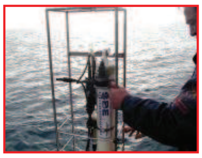
Calibration procedures

Comparison of Fixed Platform and Ferry Box data

Data Processing (data transmission, archiving, quality codes)

Time Series in the Western Channel: Platform types and types of measurements

Low Frequency



- 16 physico-chemical and biological parameters

Ferry Box

High Frequency

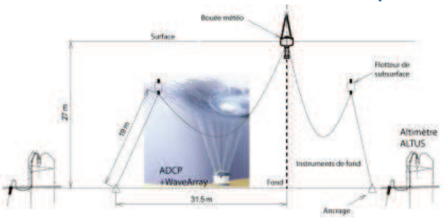
Fixed Platform

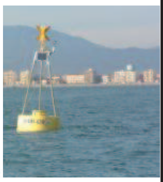
CNRS coastal buoys network

5 Fixed platforms:
- Somlit ASTAN
- SOLA Banyuls
-POEM Perpignan
- Eole Villefranche
- Somlit/Smatch/ Marseille

CNRS coastal buoys network

POEM Buoy / Perpignan
Flood and storm impact survey





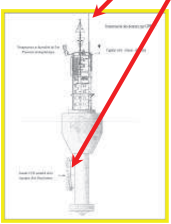
- Meteorological measurements
- Sub-surface oceanographic measurements (CTD + Turbi + Fluo)
- Near-bottom instrumentation

http://cefrem.univ-perp.fr/

ASTAN Buoy of opportunity

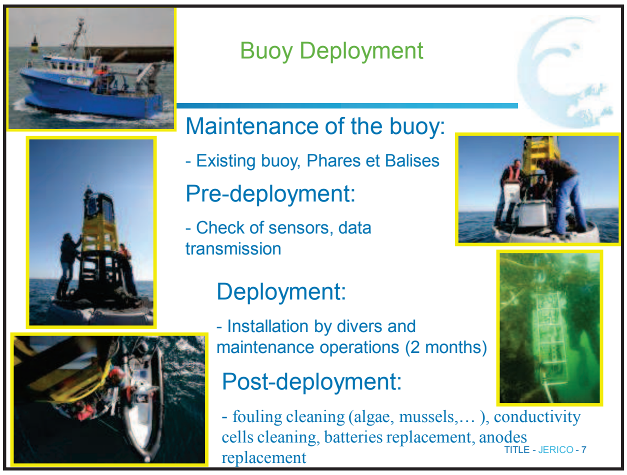
Atmospheric (T, Patm, Wind) and oceanographic sensors (T, S, chl fluorescence, Dissolved Oxygen)

Sensors: SBE 16+, Turner C7, SBE43

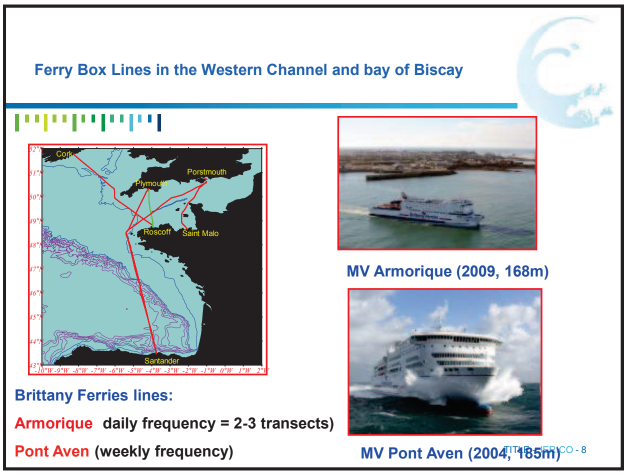


2 milles off the north Brittany coast (Western Channel)

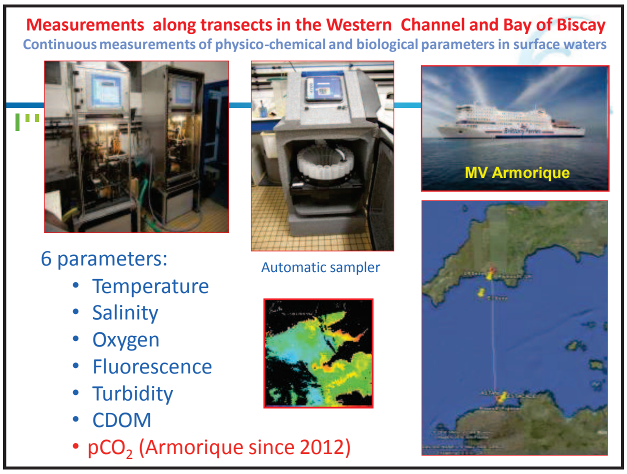
Depth > 40m



Buoy Deployment
Maintenance of the buoy:
- Existing buoy, Phares et Balises
Pre-deployment:
- Check of sensors, data transmission
Deployment:
- Installation by divers and maintenance operations (2 months)
Post-deployment:
- fouling cleaning (algae, mussels,…), conductivity cells cleaning, batteries replacement, anodes replacement
TITLE - JERICO - 7

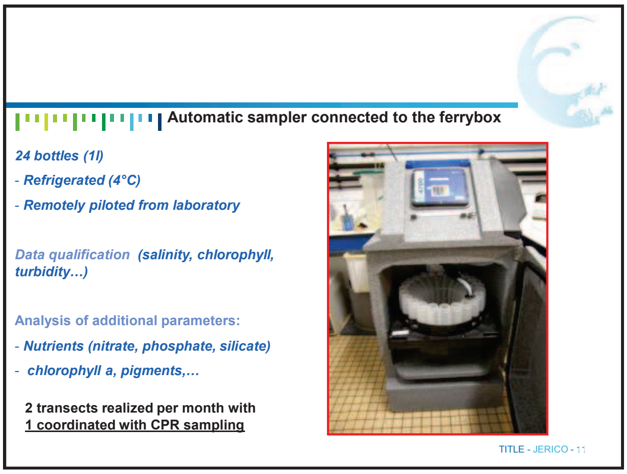


Ferry Box Lines in the Western Channel and bay of Biscay
Cork
Porstmouth
Plymouth
Roscoff
Saint Malo
Santander
MV Armorique (2009, 168m)
Brittany Ferries lines:
Armorique daily frequency = 2-3 transects)
Pont Aven (weekly frequency)
MV Pont Aven (2004, 185m)
TITLE - JERICO - 8



Measurements along transects in the Western Channel and Bay of Biscay
Continuous measurements of physico-chemical and biological parameters in surface waters
MV Armorique
Automatic sampler
6 parameters:
• Temperature
• Salinity
• Oxygen
• Fluorescence
• Turbidity
• CDOM
• pCO_2 (Armorique since 2012)

Ferry Box Sensors:
SBE 45
Thermosalinograph
Anderaa
3835 Optode
Turner Designs C3
Fluorometer
Same sensors onboard MV Armorique and Pont Aven + 1 additional set
TITLE - JERICO - 10



Automatic sampler connected to the ferrybox
24 bottles (1l)
- Refrigerated (4°C)
- Remotely piloted from laboratory
Data qualification (salinity, chlorophyll, turbidity…)
Analysis of additional parameters:
- Nutrients (nitrate, phosphate, silicate)
- chlorophyll a, pigments,…
2 transects realized per month with
1 coordinated with CPR sampling
TITLE - JERICO - 11

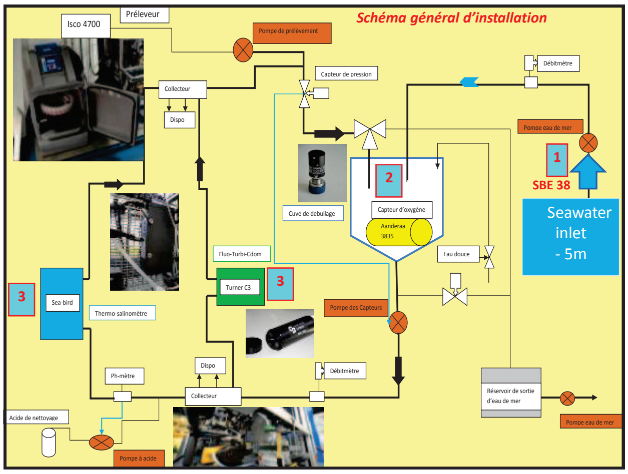


Schéma général d'installation
Préleveur
Isco 4700
Pompe de prélèvement
Collecteur
Dispo
Capteur de pression
Débitmètre
Pompe eau de mer
1
SBE 38
Seawater inlet - 5m
2
Cuve de debullage
Capteur d'oxygène
Aanderaa 3835
Eau douce
Fluo-Turbi-Cdom
Turner C3
3
Sea-bird
Thermo-salinomètre
Pompe des Capteurs
Ph-mètre
Dispo
Collecteur
Débitmètre
Réservoir de sortie d'eau de mer
Pompe eau de mer
Acide de nettoyage
Pompe à acide

Fouling

Fixed Platform Maintenance:

- Cleaning every 2-3 months depending on the season (more frequent during the productive season)
- Antifouling: TBTO pills from Seabird

Ferry Box Maintenance:

- Automatic cleaning at each arrival in port (10% HCl solution)
- Regular cleaning of the debubbler,
- Entire circuit every year

TITLE - JERICO - 13

Calibration procedures

Fixed Platform:

- CTD sensors calibration every year at SHOM calibration facility (Brest)
- Fluorometer: calibration with chlorophyll extracted from algal cultures
- Samples (bimensual frequency) for salinity, dissolved oxygen, chlorophyll

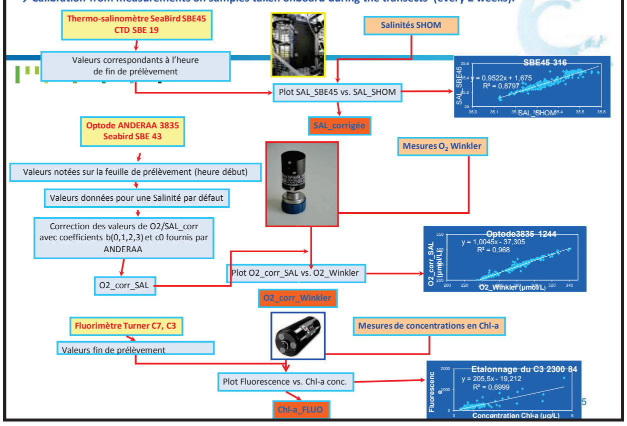
Ferry Box:

- CTD sensors calibration every year at SHOM calibration facility (Brest)
- Fluorometer: calibration with solid secondary standard, chlorophyll extracted from algal cultures
- Samples (bimensual frequency) for salinity, dissolved oxygen, chlorophyll, pCO_2 (DIC and alkalinity measurements)

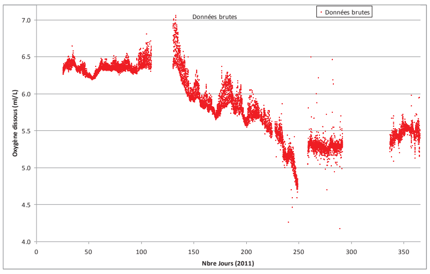
TITLE - JERICO - 14

Buoy and Ferrybox sensors calibration procedures

→ Calibration from measurements on samples taken onboard during the transects (every 2 weeks).



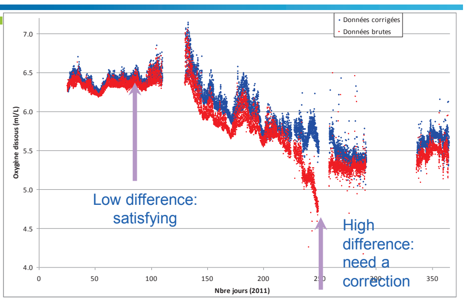
Buoy: Dissolved Oxygen Calibration



Evolution of dissolved oxygen concentrations against time (data with the initial manufacturer calibration)

TITLE - JERICO - 18

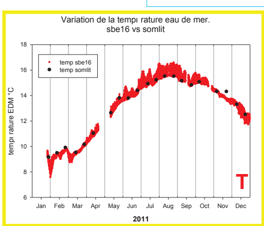
Buoy: Dissolved Oxygen Calibration

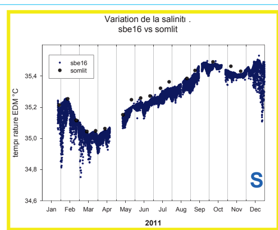


Raw and corrected data from SBE43 sensor (Astan Buoy)

TITLE - JERICO - 19

Comparison between samples and buoy data





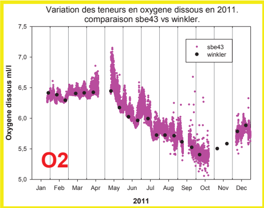
Data return 2011 = 83%

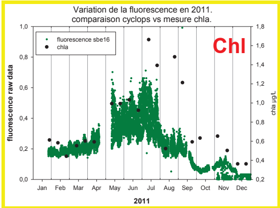
Data return 2010 = 94%

TITLE - JERICO - 22

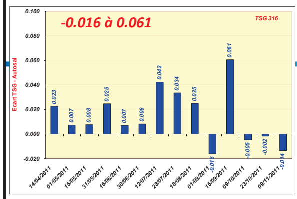
3

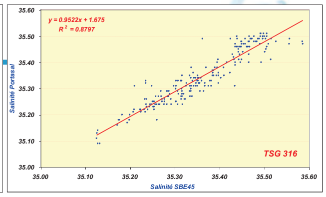
Comparison between samples and buoy data

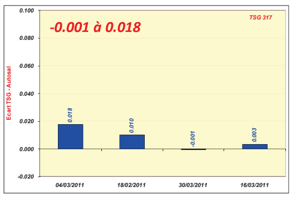


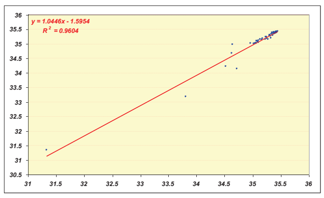


FerryBox : Salinity calibration (TSG vs salinometer measurements):



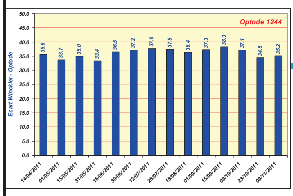


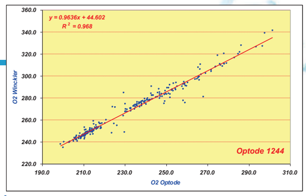




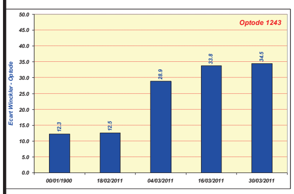
Good precision of TSG measurements (better than 0.05 PSU)

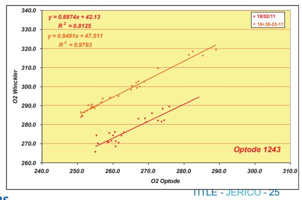
Dissolved Oxygen calibration (Optode vs Winckler measurements):



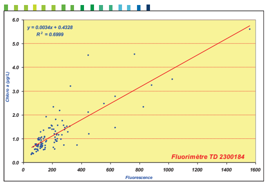


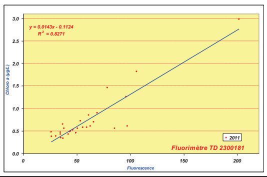
Optode 1244 : Constant offset of 35 µmole/L = 1 correction





Optode 1243 : Variable offset = 2 corrections



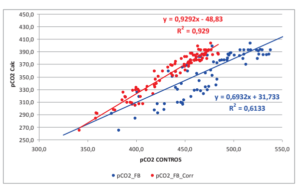


Fluorescence Chlorophyll calibration (Turner C3 vs fluorimetric Turner Designs measurements):

Relatively good correlations between in situ fluorescence and chlorophyll a measuremetns:

R^2 > 0.70

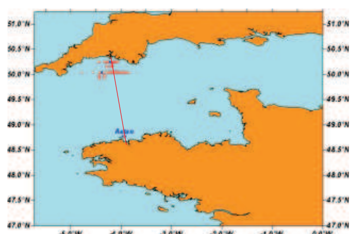
pCO2 calibration (Contros sensor vs calcultated pCO2 (DIC + alkalinity)

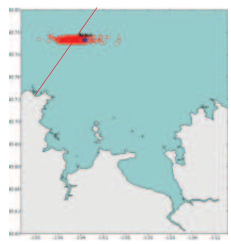


Water Sampling: Existence of an offset plus and increasing trend.

When corrections made, better correlation between sensor values and calculated pCO2.

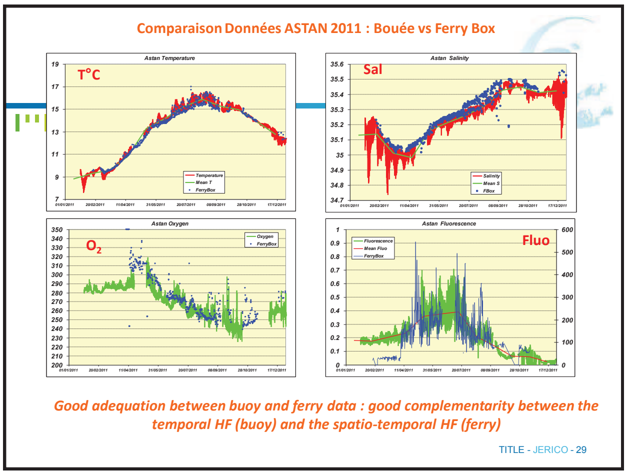
Comparison Data from 2011 : Buoy vs Ferry Box

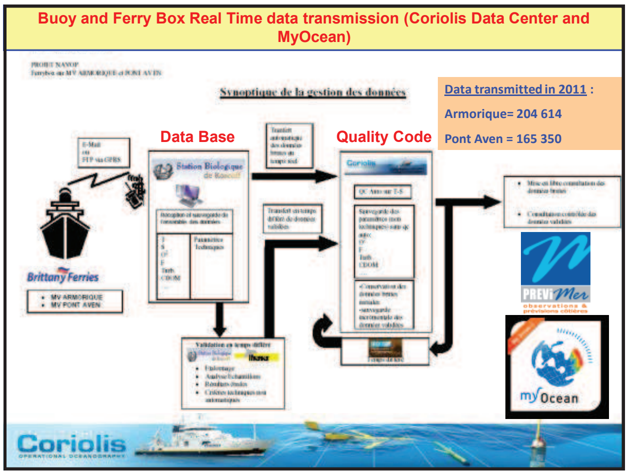


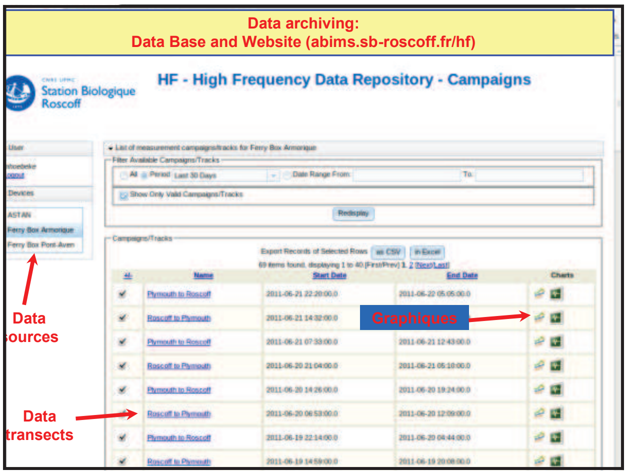


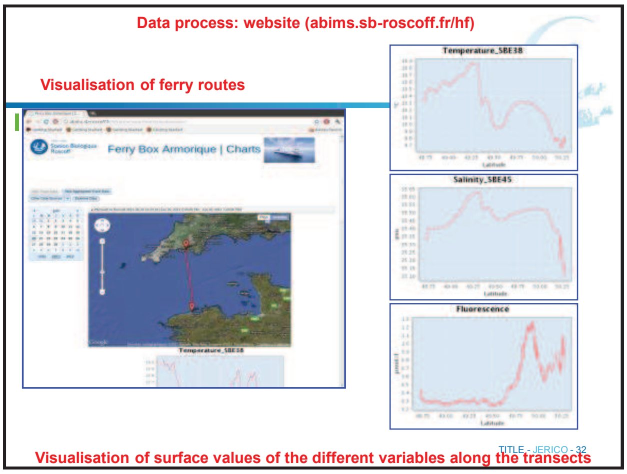
Passage of Ferry Armorique near Astan buoy (2-3 times/day)

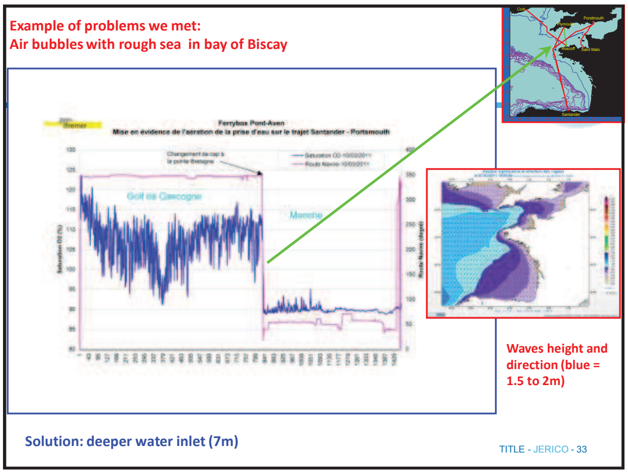
Comparison of data acquisition by the two platform types


Comparaison Données ASTAN 2011 : Bouée vs Ferry Box
Astan Temperature
T°C
Astan Salinity
Sal
Astan Oxygen
O2
Astan Fluorescence
Fluo
Good adequation between buoy and ferry data : good complementarity between the temporal HF (buoy) and the spatio-temporal HF (ferry)
TITLE - JERICO - 29


Buoy and Ferry Box Real Time data transmission (Coriolis Data Center and MyOcean)
Synoptique de la gestion des données
Data Base
Quality Code
Data transmitted in 2011 :
Armorique= 204 614
Pont Aven = 165 350
Brittany Ferries
MV ARMORIQUE
MV PONT AVEN
PREVIMer
myOcean
Coriolis


Data archiving:
Data Base and Website (abims.sb-roscoff.fr/hf)
Station Biologique Roscoff
HF - High Frequency Data Repository - Campaigns
Data sources
Graphiques
Data transects


Data process: website (abims.sb-roscoff.fr/hf)
Visualisation of ferry routes
Ferry Box Armorique | Charts
Temperature_SBE38
Salinity_SBE45
Fluorescence
Visualisation of surface values of the different variables along the transects
TITLE - JERICO - 32


Example of problems we met:
Air bubbles with rough sea in bay of Biscay
Ferrybox Pont-Aven
Golfe de Gascogne
Waves height and direction (blue = 1.5 to 2m)
Solution: deeper water inlet (7m)
TITLE - JERICO - 33


TITLE - JERICO - 34

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

JERICO WP3+4: BEST PRACTICE-FERRYBOX

Kai Sørensen, NIVA, kai.sorensen@niva.no

Speaker I Organism I adresse mail

BACKGROUND

- 11 years of operation of the Norwegian Network
- 9 different ship installations over 11 year
- 5 different ship companies over the periode
- Norwegian Network operates from 54.5 to 79.5 North
- 2 Ferrybox systems in operation with the NIVA standard system
  - Temp, T-Inlet, Sal,O2, Chl-a_Fl, Turbidity, water sampler (24 *1 L)
- 1 Ferrybox with standard systems + experimental systems
  - CDOM, Phycocyanin, Enviro-Flu(PAH), pCO2, passive sampler air pressure and pH (soon)
- All 3 have TriOS Ramses radiance sensors for satellite validation
- 2 Minor Ferrybox systems with only Temp, Sal, Chl-a_Fl

CONTENT

- Installation of a new Ferrybox system (D3.1)
- Data transmission and communication
- Maintenance of the systems
- Calibration and QA-controls of the systems
- Calibration of Chl-a fluorescence

DELIVERABLE D3.1

Report on current status of Ferrybox
D 3.1

Grant Agreement n° 262584
Project Acronym: JERICO
Project Title: Towards a Joint European Research Infrastructure network for Coastal Observatories
Coordination: P. Farcy, IFREMER,
jerico@ifremer.fr, www.jerico-fp7.eu:
Authors: David Hydes, Wilhelm Petersen, Kai Sorensen, Pierre Jaccard, Mark Hartman
Involved Institutions: NOCS, HZG, NIVA
Version and Date:1.6 06.08.2012

INSTALLATION

- Ship company/owners
  - Good relation with all involved – technical inspector/director
  - Good information, benefit for the company
    - «Green profile»
    - Web display to passenger
    - Data can be helpful for the ship (temp, density, alkalinity)
  - You should consider if possible the «stabilty of the company»
- Ship type
  - Normally not many to choose since you want a certain area/transect
  - Ferries or cargo ships? Whats most stable concerning the operation
  - Cargo ship more rolling than ferries. (Optical measurements from deck)
  - Cargo more variations in water depth on intake and air in ship chest

INSTALLATION

- Route
  - Long routes give less access and service
  - Long port calls is not cost effective and can give more biofouling
  - Short port calls less possibility for service
- Regulations
  - Depends of the ship type and must be considered
  - Some area on the ship can have stronger regulation (IP-class, air gas under pressure e.g.)
- Place for installation/working space
  - Air temperture, air pollution/oil in the atmosphere
  - Space for specific experiments
  - Distance to the water inlet

INSTALLATION

- Water inlet/outlet
  - Water from ship chest or separate inlet (docking needed)
  - Water from the internal water cooling (biofouling chemicals-problem?)
  - Possibilities to clean the inlet and outlet
    - Use ball valves – easy to clean
  - Place for separate inlet temp and oksygen (before the debubbler)
  - Regulation depending on ship and operation area
  - Water supply lines - regulations
- Pump(s)
  - Choose depend on the Ferrybox systems and what you are measuring
  - Biological samples (phytoplankton countings, flow cytometry) need maybe a slow moving peristaltic pump
  - Use pressure- and vakuum controller to stop pump if blocking

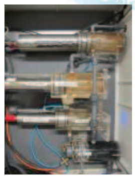
INSTALLATION

- Choice of the Ferrybox system
  - Commercial available Ferrybox systems and institute developed systems
  - Some arguments to consider:
    - Risk of leaks and flooding.
    - Open system water outlet (need to pump out).
    - Is the range of sensors and their accuracy what you need?
    - Can a third party system fit in the allocated place?
    - Can one split in smaller parts and remounted in the ship?
    - Can extra sensors be added in the future?
    - How "open" is the system hardware and software?
    - Data from the ship's system to be included (GPS, Wind, Gyro)?
    - Is it possible to modify settings and software using an external communications link to the ship from shore?

DATA TRANSMISSION AND COMMUNICATION

- Internally on ship:
  - RS232 Port server between sensor and computer
  - IP communication from deck sensor to Ferrybox computer
  - Access to the ship GPS , Gyro, wind sensor.
  - Send data from the Ferrybox to the bridge (display)
  - (W)LAN (internal internet on deck)
- Externally to database at NIVA
  - GPRS must be used on ship in the Barents Sea
  - Prefere to use ships internet communication
- Software
  - LabView
  - PC-anywhere
  - TeamViewer can be operated from iPad and iPhone

MAINTENANCE

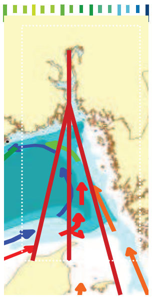


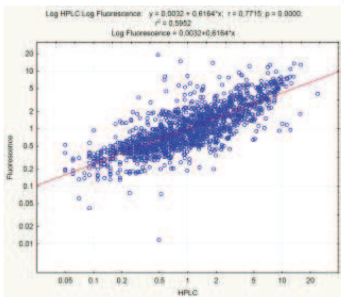
- High pressure air cleaning in every port visit
  - From 2 to 35 port stops for one trip
  - From 4-6 hours to max 48 hours
- Manual cleaning in start and end harbour
  - Weekly to monthly frequence
  - Acid cleaning when needed
  - Inlet and outlet valves 2-3x year
- Optical deck sensor
  - 3-4x/year inspection and cleaning

CALIBRATION AND CONTROLS

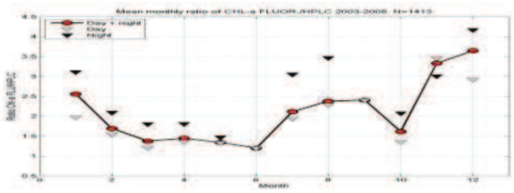
- Salinity/temperature
  - Certified digital term./Control samples minimum 2-4x/year
  - Factory calibration when needed (every 2 years)
- Oxygen
  - Winkler (in harbour/at sea) 4-6x/year
- Turbidity
  - Formazin turbidity standards 1x/year
  - Formazin prepared in house and calibrated according to ISO-EN 7027
- Irradiance/radiance sensor
  - FieldCal lamp 3-4x/year, Yearly control at NIVA - NIST reference lamp
  - Factory or external calibration when needed
- Chlorophyll-a fluorescence
  - Algal culture yearly (Skeletonema Costatum, exponential growth)
  - «Field calibration» Chl-a (hplc) water samples monthly/weekly
  - Seasonal calibration
  - Sensor drift control with solid standard introduced from October-12

CHL-A_FL VS CHL-A_HPLC FOR 6 YEARS OF DATA IN THE SKAGERRAK





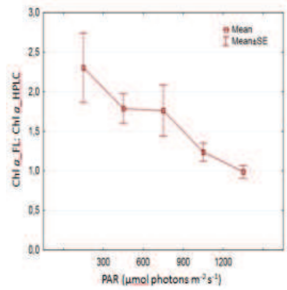
FerryBox seasonal and night and day variation



Yearly calibration of the Chl-a fluorescense using all the Chl-a_hplc water samples

- *Most months show the same trend:*
  - *High ratio at night*
  - *Lower ratio at daytime*

CHL-A_FL / CHL-A (HPLC) VS PAR MEASURED AT DECK



- *Dependency of the downwelling irradiance*
- *Recommendation to start measure PAR*
- *Modelling of the Chla□a□fl/Chl-a□conc ratio on seasonal basis*
- *Goal: To improve the Chl-a□fluorescence as a proxy for Chl-a*

SUMMARY

- *A good planned technical installation and choose of system are important for the operation, maintenance costs and data quality*
- *Internet communication are a preferable for the operation to be able to access the system*
- *Maintenance depends much of the system in operation and the access to the installation*
- *Sensorcalibration and controls are of high importance and must follow the agreed protocols*
- *Chl-a fluorescence as a proxy for Chl-a can be improved using seasonal calibration of the Chl-a□fl/Chl-a ratio.*

K. Sørensen, M. Norli and A. Folkestad

Presented at JERICO General assembly/WP3-WP4 workshop 1-5 October 2012

SMHI

SMHI FerryBox activities in JERICO

□resented by □alin □ohlin

Bengt □arlson□Fredri□ □lbertsson□ □ristin □ndreasson□Chantal □onelly□□ron □a□onen□Filip □vitloc□□□arie Johansen□ Irene La□e Johan □ronsell□□□alin □ohliin□□enri□Lindh □□er Olsson□Olle □ettersson□Fredri□□ aldh□□nna □ illstrand-□ ranne

□wedish □eteorological and □ydrological Institute□
□ven Källfelts gata 5□4□□ □1 Västra Frölunda, Sweden
Folkborgsvägen 1, 601 76, Norrköping

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bengt.karlson@smhi.se
irene.lake@smhi.se
malin.mohlin@smhi.se

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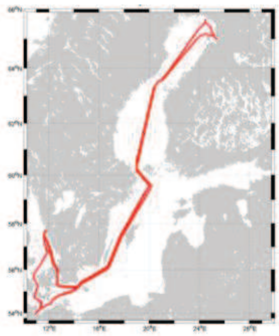
Route for ship TransPaper with FerryBox



Schedule

Day 1 Arrive to Gothenburg 9 pm

Service and sample collection for 4 hours

Day 11 Sampling start (in Kemi Finland) 24 stations are sampled from Kemi to Gothenburg to validate the sensors

Day 15 Arrive to Gothenburg…

And so on…

Sensors and water samplers

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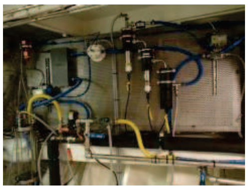

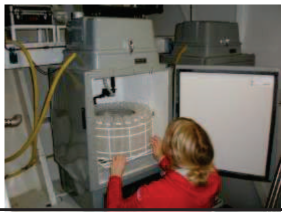

3

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Real time data

Flow through system

- Temperature (SeaBird + near water inlet)
- Conductivity (SeaBird)
- Salinity (calculated)
- Chlorophyll fluorescence (WetLabs ECOFLNTUS)
- Phycocyanin fluorescence (TriOS)
- CDOM fluorescence (TriOS)
- Turbidity
- Oxygen (Anderaa Oxygen Optode 3835)
- CO_2 (General Oceanics 8050 being evaluated)
- pH (fluoroscence based own development being evaluated)

In air measurements

- Air temperature
- Air pressure
- Irradiation (PAR, Photosynthetic Active Radiation, Biospherical Instruments
-)
- CO_2 (being evaluated)
- Position and time stamp (GPS)

4

Dataflow TransPaper - Swedish National Oceanographic Data Centre

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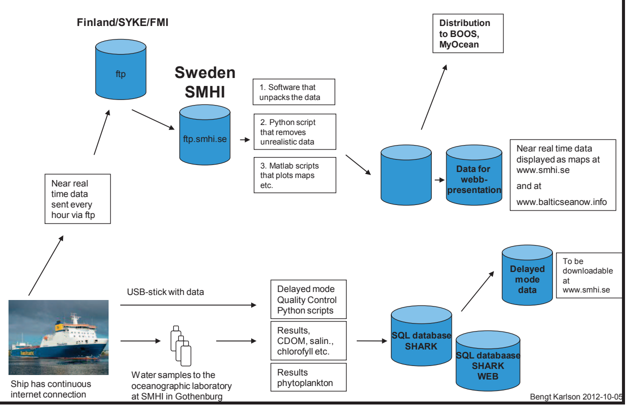

Bengt Karlson 2012-10-05

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JERICO User Display – Cooperation SMHI-NOCS

Presentation system for the public developed by NOCS
Specification defined by NOCS and SMHI in cooperation
Large computer monitors to be displaying FerryBox data
A prototype has been shown to the shipping company TransAtlantic

6

Practices for avoiding biofouling etc.

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- Automated washing system fills sensors with freshwater and detergent every time the ship is in harbour (10 times in 2 weeks)
- Service every two weeks
  - Water inlet filters are cleaned
  - Manual cleaning of fluorometers and O_2-sensors and flow chambers
  - CO_2-system filter cleaned
- Less fre□uent
  - SeaBird conductivity sensor anti fouling device replaced (TBT)
  - Repalcement of tubes with CO_2 reference gases
  - Replacement of tubing

7

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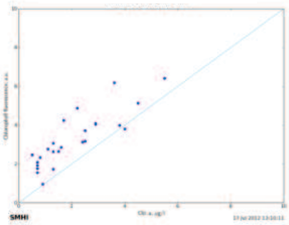
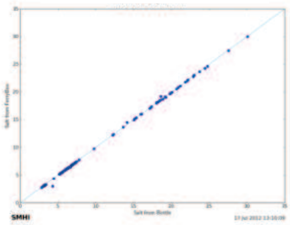
Comparison reference water sampling vs automated measurements 2011

Chl. fluorescence vs chl. a
Kattegat and Belt Sea 2011



Salinity (SeaBird) vs salinity
Gulf of Bothnia, Baltic Sea,
Kattegat and Belt Sea 2011



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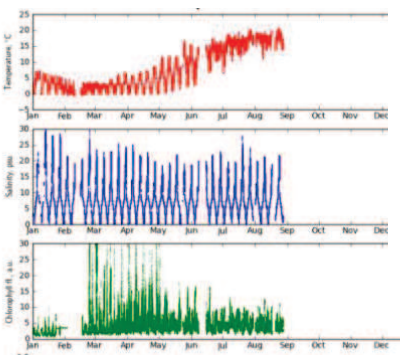
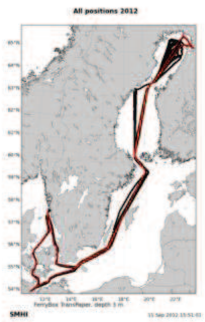
Some preliminary data from 2012





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More data from 2012

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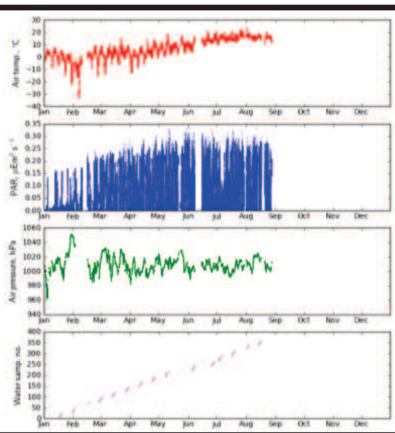

Unit of irradiance incorrect

10

Kattegat comparison
FerryBox vs research vessel sampling

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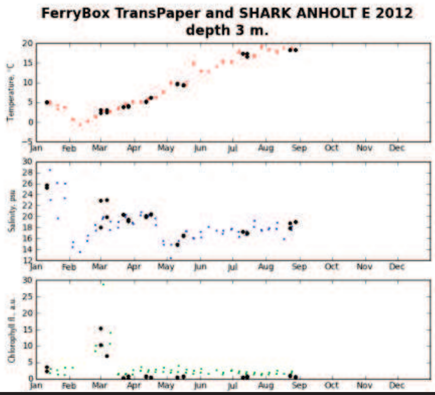

Black dots:
Water samples
0 and 5 m depth
from cruises

11

Spring bloom in the Kattegatt in February 2012

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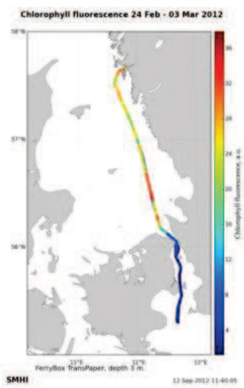

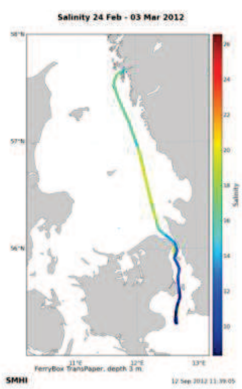

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SMHI personell on ship TransPaper in June 2012 verify the quality of data from FerryBox sensors etc.

Water samples collected for:

Alkalinity - testing if storage affects □uality of results – four days is OK
Salinity – SeaBird works fine□
Chlorophyll a- good correlation with chl. a fluorescence
CDOM – not yet evaluated
Phycocyanin samples still in -80 free□er
Phytoplankton samples to be analysed for cyanobacteria

13

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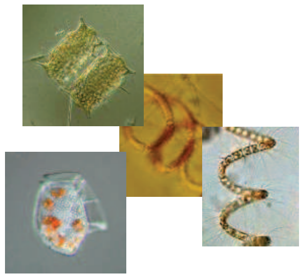
Phytoplankton monitoring using FerryBox

- Automated water sampling for microscope analysis of phytoplankton
- Chlorophyll a fluorescence – a proxy for phytoplankton biomass
- Phycocyanin fluorescence – a proxy for cyanobactieria biomass



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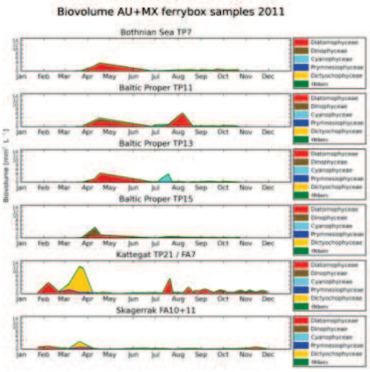
Biovolume of phytoplankton groups



15

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Extra slides after this one to be used if needed

17

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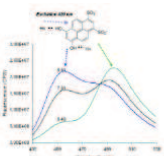
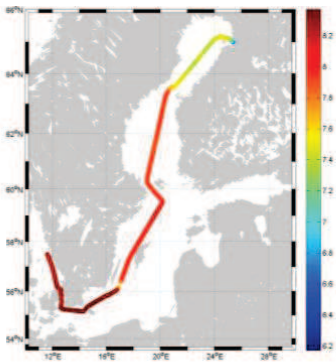
pH – new method still pre-operational

DHPDS fluorescence





More info: aron.hakonen@smhi.se

18

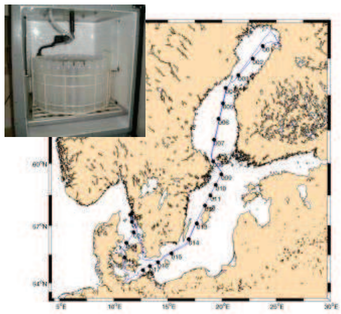
SMHI

FerryBox systems in the Skagerrak – Kattegat and in the Baltic Sea

No. on map	Ship	Route	Institute
1	Baltic Princess	Tallinn-Helsinki	EMI
2	Color Fantasy	Oslo-Kiel	NIVA
3	Finnmaid	Helsinki-Lübeck-Gdynia-Helsinki	SYKE
4	MS Bergensfjord	Bergen-Hirtshals	NIVA
5	Lysbris	Hamburg-Immingham-Halden	NIVA and HZG
6	Silja Serenade	Helsinki-Mariehamn-Stockholm	SYKE
7	Stena Spirit	Gdynia-Karlskrona	IMGW-PIB
8	TransPaper	Gothenburg-Oulu-Kemi-Lübeck-Gothenburg	SMHI
9	Victoria	Tallinn-Mariehamn-Stockholm	MSI

SMHI

TransPaper sampling locations



Sampling frequency
- Every two weeks

Parameters
12 locations
- Salinity
- CDOM/humic substances
- Alkalinity

6 locations in the Kattegat-Öresund
- Chlorophyll a

5 locations
- Phytoplankton

20

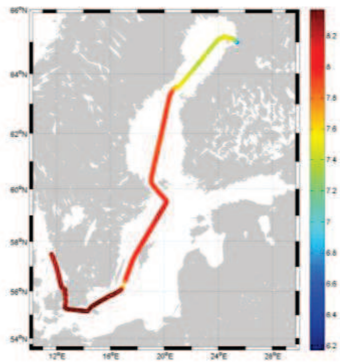
SMHI

Water samples

21

SMHI

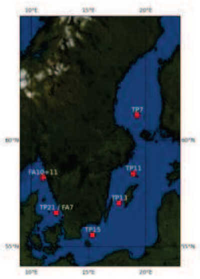
pH – new method now pre-operational

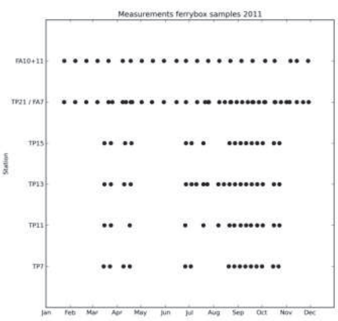


22

SMHI

Sampling frequency 2011

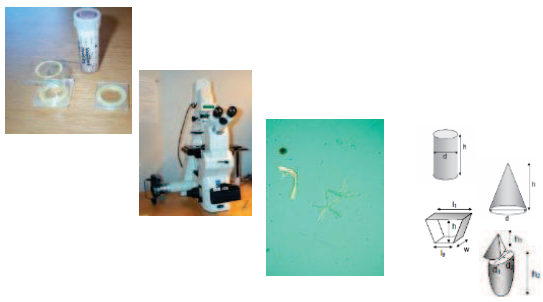




23

SMHI

Phytoplankton analysis method - Utermöhl



24

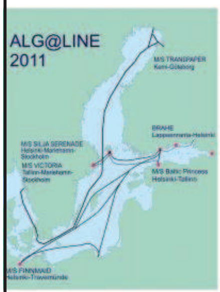
BEST PRACTICES IN FERRYBOX MONITORING BY SYKE

Seppo Kaitala, SYKE, seppo.kaitala@ymparisto.fi

Speaker I Organism I adresse mail

www.jerico-fp7.eu *Jerico GA & BPW I Heraklion I Crete – Greece*

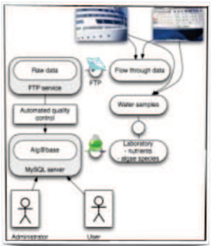
Current Alg@line routes



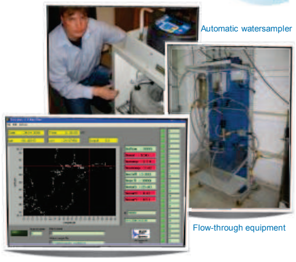
- •Ferry Finnlines cruises between Helsinki and Travemünde, occasionally via Gdansk, SYKE
- •Ferry Transpaper from Gothenburg to Kemi in cooperation between SYKE and SMHI
- •Ferry Silja Serenade ferry travelling between Helsinki and Stockholm, Uusimaa ELY Centre, SYKE
- • MS Brahe along the Finnish coast of the Gulf of Finland during summer months. KAS ELY, Helsinki Environment Centre, SYKE
- •The ferry Baltic Prinsess is cruising daily between Tallinn and Helsinki and maintained by Marine Systems Institute (MSI), Tallinn.
- •The ferry Victoria is cruising from Tallinn to Stockholm and maintained by Estonian Marine Institute (EMI).

TITLE - JERICO - 2

MANAGEMENT



Alg@line dataflow



Automatic watersampler

Flow-through equipment

Ferrybox-software

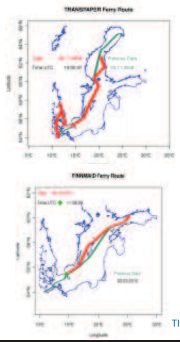
Ferrybox-software controls operations of automatic flow-through and watersampling equipment onboard

TITLE - JERICO - 3

Near real time observations on commercial ferries

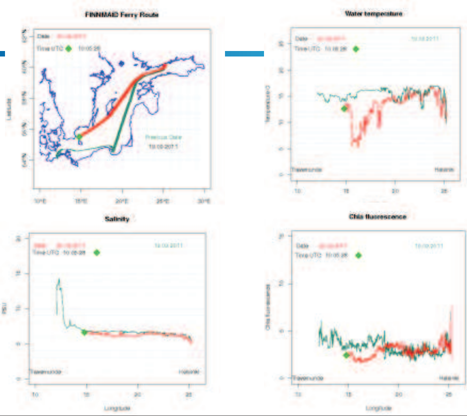
http://www.itameriportaali.fi/en/tietoa/algaline_seuranta/en_GB/algaline_seuranta/

- Time, location, from GPS
- Salinity, Temperature
- Chlorophyll
- Phycocyanin
- Turbidity
- Water samples for nurient analysis
- Automatic washing in the harbor



TITLE - JERICO - 4

Real time monitoring



ITLE - JERICO - 5

FLUOROMETERS AND WASHING SYSTEM

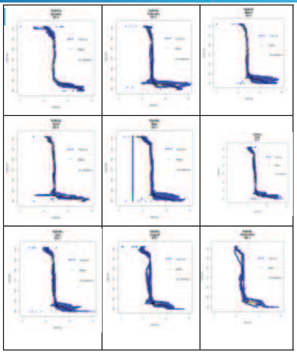
- Pneumatic valve
- Fluorometer
- Termosalinograph
- Triton-X 0.1 % for washing, 1 h in Harbour
- Air debubler outside the box

www.jerico-fp7.eu TITLE - JERICO - 6

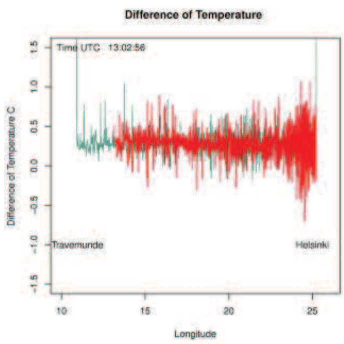
Finnmaid □iary 2010

Week Date Who	Mit- files G=good, U=usefull,but fixed B=bad, leaved to original_files folder If corcections, how Parameters ja georecords original_files	device	Samplin gyes/no maintenance comments
4 27.1.2010 PeMa	FM100121 G FM100123 G FM100124 G FM100126 G	SEABIRD TSG 45 Calibration of conductivity13.1.2010	
7 16.2.2010 PeMa	FM100127 G FM100129 G FM100130 G FM100201 G FM100203 G FM100205 G FM100206 G FM100208 G FM100210 G FM100212 G FM100213 G FM100215 G	SEABIRD TSG 45	Samples ok FM100215 G salinity comparison

SALINITY VARIATION FROM JANUARY TO SEPTEMBER 2011



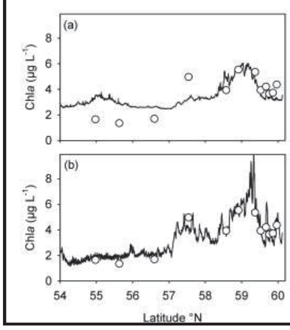
The difference of temperature from termometer by the water inlet and the termosalinograph is used for perliminary quality checking



Real Time Quality Control of biogeochemical measurements , MyOcean flags

□a□le □□ □uality fla□ scale. □o□es marke□ i□ re□ are ma□□atory followi□□ t□e □□□□ proce□ure **Code**	**Meaning**
0	No □C was performed
1	Good data
2	Probably good data
3	Bad data that are potentially correctable
4	Bad data
5	□alue changed
6	Below detection limit
□	In excess of quoted value
□	Interpolated value
□	Missing value
A	Incomplete information

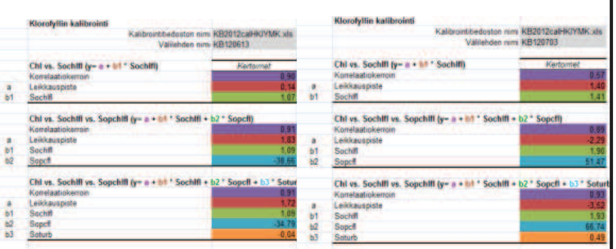
Measuring both Phycocyanin and Chl*a* fluorescence will improve Chl*a* concentration estimates.



□Chla□□ b_0 □ b_1 □Chla Fl

□Chla□□ b_0 □ b_1 □Chla Fl □ b_2 □PC Fl

MS BRAHE VALIDATION OF CHLOROPHYLL EARLY SUMMER 2012



No cyanobacteria

Cynaobacteria present in July

2

MS BRAHE VALIDATION OF CHLOROPHYLL LATE SUMMER 2012

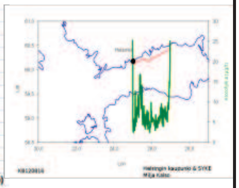
Klorofyllin kalibrointi

Kalibrointitiedoston nimi KB2012calHKIYMK.xls
Välilehden nimi KB120816

	Chl vs. Sochlfl (y= a + b1 * Sochlfl)	Kertoimet
	Korrelaatiokerroin	0,25
a	Leikkauspiste	18,25
b1	Sochlfl	-3,99

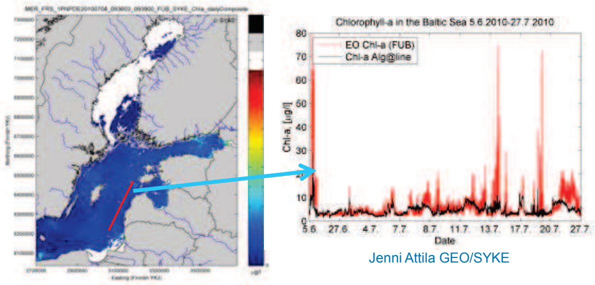
	Chl vs. Sochlfl vs. Sopchlfl (y= a + b1 * Sochlfl + b2 * Sopcfl)	
	Korrelaatiokerroin	0,25
a	Leikkauspiste	18,24
b1	Sochlfl	-3,99
b2	Sopcfl	0,53

	Chl vs. Sochlfl vs. Sopchlfl (y= a + b1 * Sochlfl + b2 * Sopcfl + b3 * Soturb)	
	Korrelaatiokerroin	0,89
a	Leikkauspiste	-36,94
b1	Sochlfl	-0,80
b2	Sopcfl	879,61
b3	Soturb	61,31



TITLE - JERICO - 13

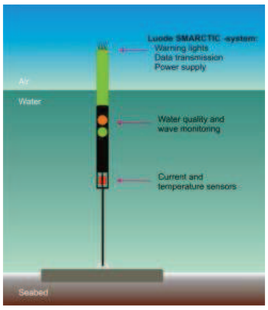
Alg@line Ferrybox □ata vs. EO □ata Chlorophyll-a



Jenni Attila GEO/SYKE

TITLE - JERICO - 14

Measurement water quality observations with navigation buoys



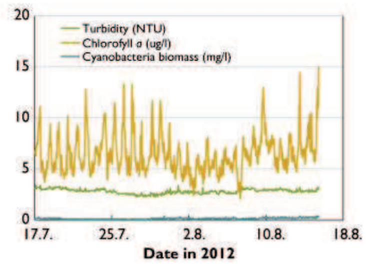
BUOY STRUCTURE

□esign of water quality system □Smarctic□buoy system: Luode Consulting Oy

Buoys manufactured by MeriTaito Ltd

TITLE - JERICO - 15

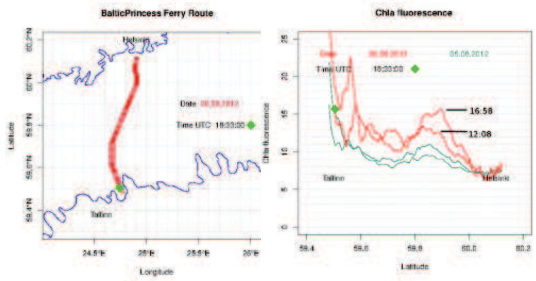
RECORDS FROM OF PYHTÄÄ BUOY



www.luodedata.fi/rauto

TITLE - JERICO - 16

Baltic Princess ferrybox NRT observations Marine Systems Institute, Tallinn, Estonia



TITLE - JERICO - 17

Need for voluntary observations: Algal watch

□l□al watc□ ca□ □e □ow□loa□e□ to your mo□ile
- □okia Sym□ia□□a□a applicatio□ □ttp□□k□owle□□e.□tt.fi□le□a□a□ti
- i□□o□e from □pple Store
- □□□roi□ p□o□e from □oo□le □lay searc□i□□ Levävahti

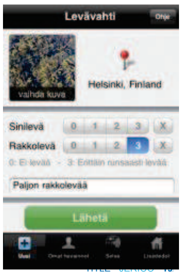
□utomatic □eo-refere□ce

TITLE - JERICO - 18

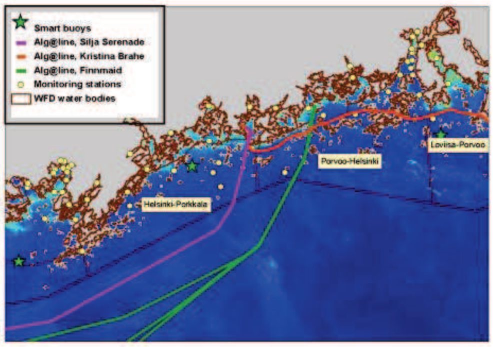
ALGAL WATCH

Experience from year 2011:
- Software was easy to use (99 %)
- Heart about it from Järviwiki (30 %)
- Software hard to find from www
- Not interactive software

Expert versus citizen:
Observation was correct 70 % (0,1,2,3)
Algae yes/no, correctly 93 %



Real-time water quality monitoring with multi-source data



New Alg@line route St. Petersburg-Helsinki-Bilbao

HCMR FERRYBOX SYSTEM

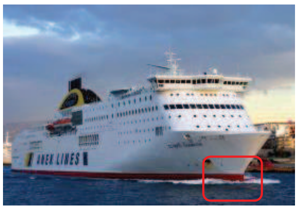
□est □ractices

FERRYBOX ROUTE

Route: Pireaus-Heraklio

Ship: High-Speed Ferry "Olympic Champion" covering the distance every night in 7 hours (speed > 20 knots).

INSTALLATION



Installed on the Bow thruster department 2 meters below the waterline. This spot is as close as it gets to the seawater input of the ship (5 meters pipe with a filter, 0.5 cm mesh size).

FERRY BOX SYSTEM

HCMR's FerryBox System

Ferry Box System I (-4H- JENA engineering GmbH) originally installed on "Kriti II" in the framework of MFSPP and MFSTEP projects

Sensors

- Temperature-Conductivity (Thermo-Salinometer FSI)
- Fluorescence-Turbidity (Scufa II Turner Design)

Plus

- Dissolved Oxygen (Aanderaa optode)
- pH (Meinsberg pH probe)

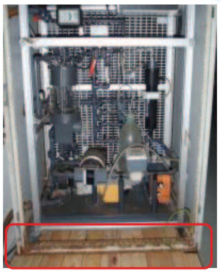
INSTALLATION

Problems to face before installation

- Corrosion: Previous experience show that there are corrosion issues due to moisture.
- Vibration: Heavy vibrations due to bow thrusters operation and sea waves while cruising.

Limitations: For safety reasons we can NOT drill on the ship, only WELDING is allowed.

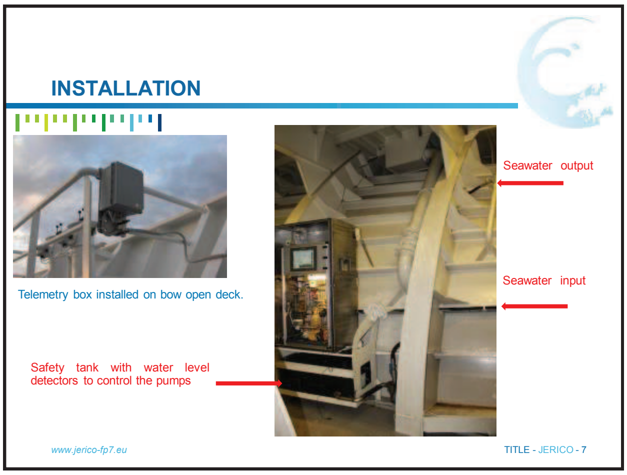
Communication and coordination with the FB manufacturer was essential.

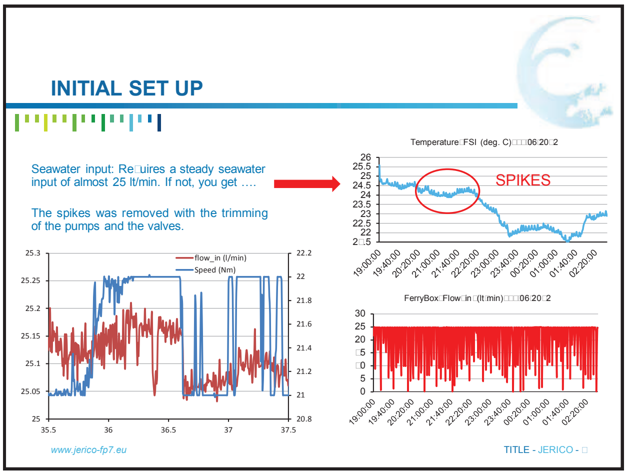


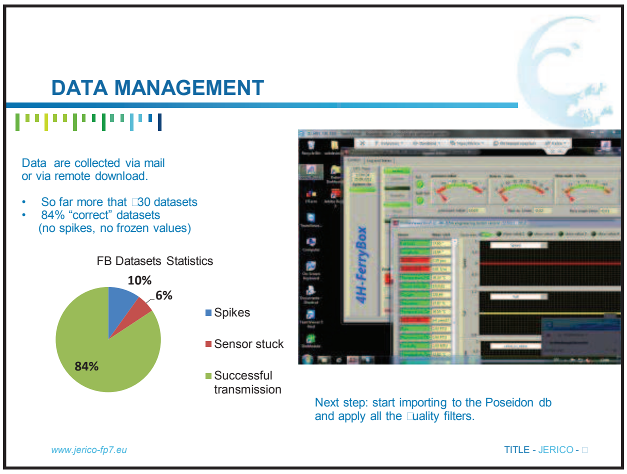
INSTALLATION

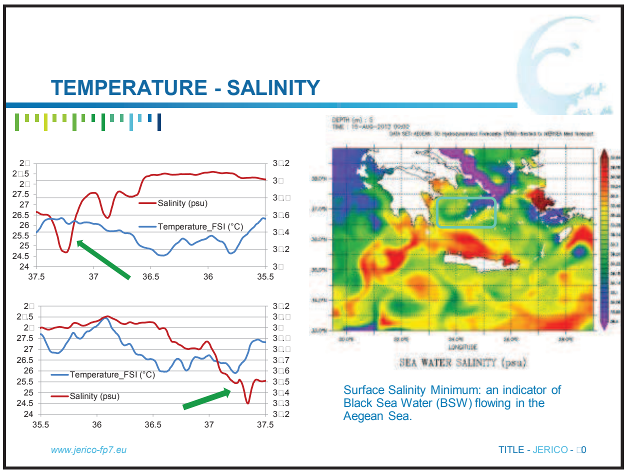
Design and manufacture "in –house" a new INOX rack with anti vibrating base and connectors.

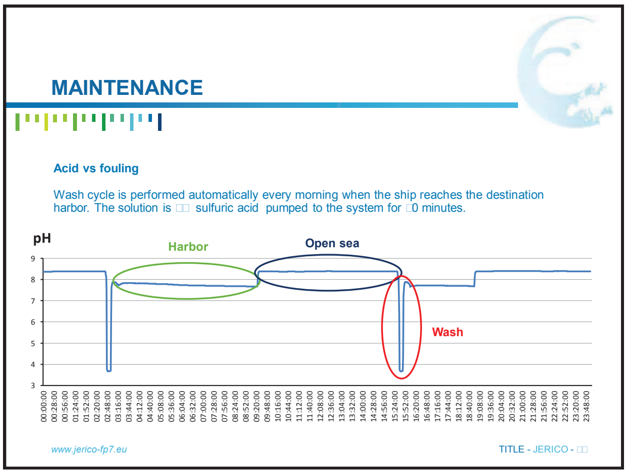
Use only inox connectors and high pressure pipes for safety reasons.

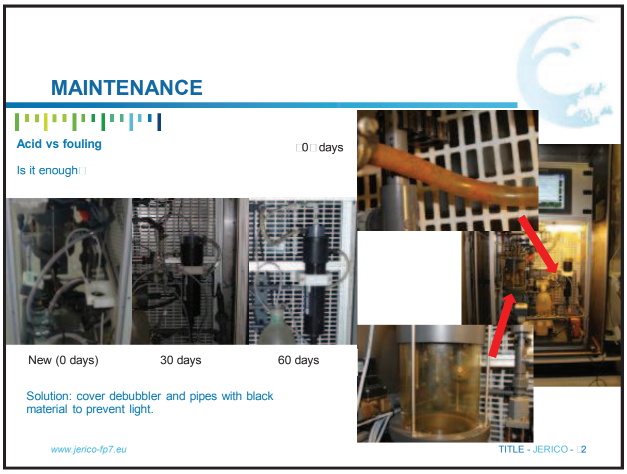

INSTALLATION
Seawater output
Seawater input
Telemetry box installed on bow open deck.
Safety tank with water level detectors to control the pumps
www.jerico-fp7.eu
TITLE - JERICO - 7


INITIAL SET UP
If not, you get ….
The spikes was removed with the trimming of the pumps and the valves.
SPIKES
flow_in (l/min)
Speed (Nm)
www.jerico-fp7.eu


DATA MANAGEMENT
Data are collected via mail or via remote download.
84% "correct" datasets (no spikes, no frozen values)
FB Datasets Statistics
10%
6%
84%
Spikes
Sensor stuck
Successful transmission
4H-FerryBox
Next step: start importing to the Poseidon db
www.jerico-fp7.eu


TEMPERATURE - SALINITY
Salinity (psu)
Temperature_FSI (°C)
SEA WATER SALINITY (psu)
Surface Salinity Minimum: an indicator of Black Sea Water (BSW) flowing in the Aegean Sea.
www.jerico-fp7.eu

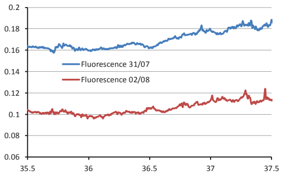

MAINTENANCE
Acid vs fouling
Wash cycle is performed automatically every morning when the ship reaches the destination harbor.
pH
Harbor
Open sea
Wash
www.jerico-fp7.eu

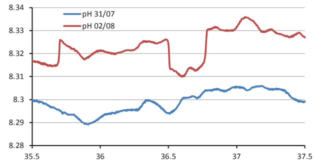

MAINTENANCE
Acid vs fouling
days
New (0 days)
30 days
60 days
Solution: cover debubbler and pipes with black material to prevent light.
www.jerico-fp7.eu

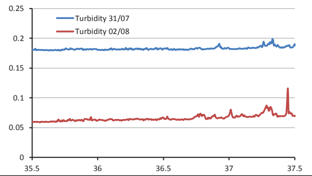
MAINTENANCE

Acid cleaning influence on data

0□0□20□2: replace the acid solution with a stronger one.



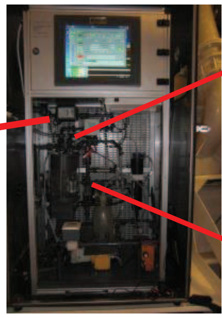


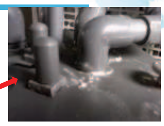


MAINTENANCE

Leakages

Major: needed replacement, spare part provided by manufacturer.





Minor: fixed with PVC glue

MAINTENANCE

Leakages: deal with ASAP or collect the salt …………

Solution: Frequently visits to the ship.

Thank you for the attention

JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES

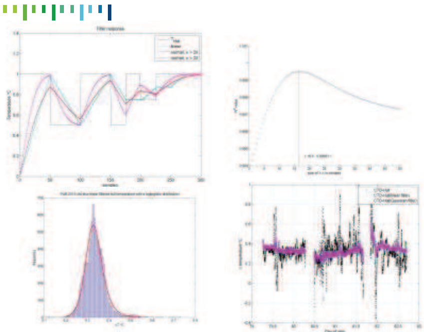
BEST PRACTICES – SOME LESSONS LEARNT FROM 2 SHIPS OF OPPORTUNIT□.

□□ □ere roo□ for proce□ur□□i□ pro□e□ e□□

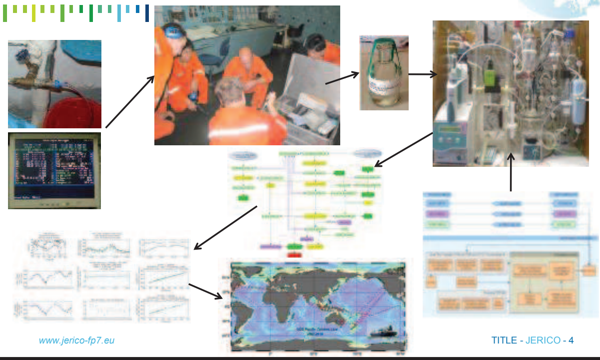
Mark Hartman □NOC □mch□ noc.ac.uk

BULK FREIGHT CARRIER - MV PACIFIC CELEBES 2007 - 2012
INTERNATIONAL FERRY - PRIDE OF BILBAO 2002 - 2010

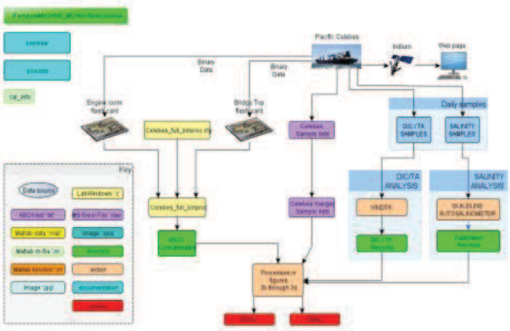
PRIDE OF BILBAO TEMPERATURE COMPARISONS BETWEEN A FLOW THROUGH AND THE HULL MOUNTED TEMPERATURE SENSOR



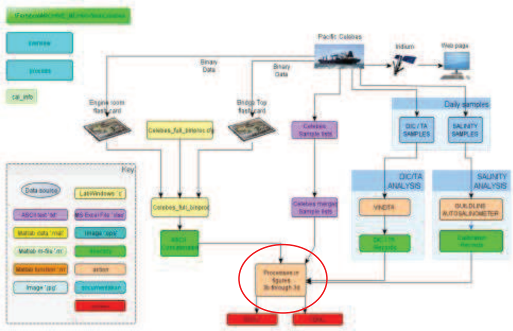
SCHEMATIC OF END TO END PROCESSING PROCEDURE



DATA AND SAMPLES TRANSFERRED FROM M.V. PACIFIC CELEBES TO NOC. FLOWCHART A



DATA AND SAMPLES TRANSFERRED FROM M.V. PACIFIC CELEBES TO NOC. FLOWCHART A



UNDERWAY DATA
PROCESSING
FLOWCHART B

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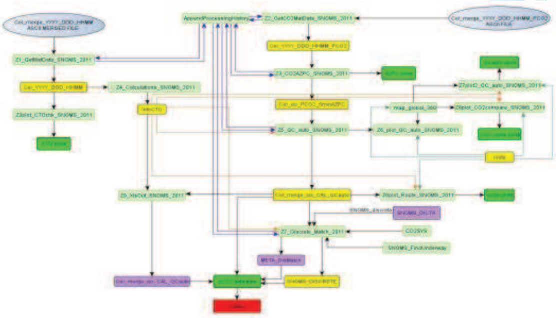
TITLE - JERICO - 7

UNDERWAY DATA
PROCESSING
FLOWCHART B

www.jerico-fp7.eu

TITLE - JERICO - □

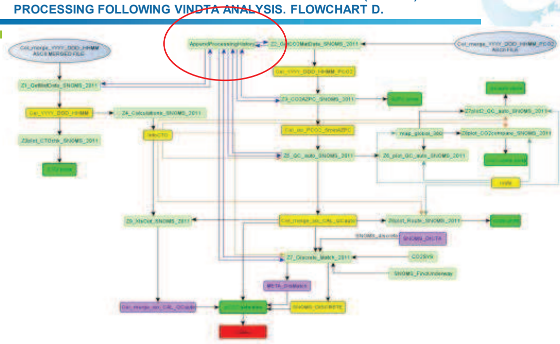
DISSOLVED INORGANIC CARBON AND TOTAL ALKALINITY (DIC / TA)
PROCESSING FOLLOWING VINDTA ANALYSIS. FLOWCHART D.



www.jerico-fp7.eu

TITLE - JERICO - □

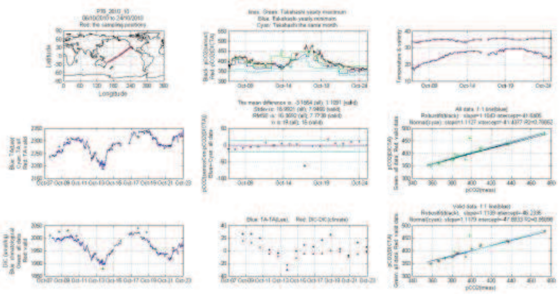
DISSOLVED INORGANIC CARBON AND TOTAL ALKALINITY (DIC / TA)
PROCESSING FOLLOWING VINDTA ANALYSIS. FLOWCHART D.



www.jerico-fp7.eu

TITLE - JERICO - □0

ALKALINITY, DIC, $_pCO_2$ QUALITY CONTROL
BY COMPARISON TO CLIMATOLOGICAL DATA



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AANDERAA TRIPLICATE SENSORS
3 TEMPERATURE
3 CONDUCTIVITY
3 OXYGEN

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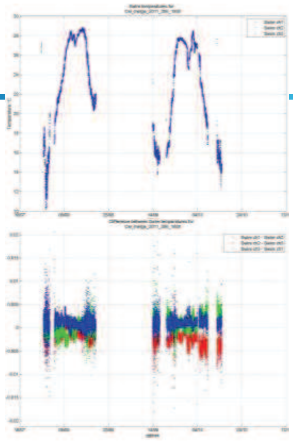
TITLE - JERICO - □2

PACIFIC TRIPLICATE TEMPERATURE DATA



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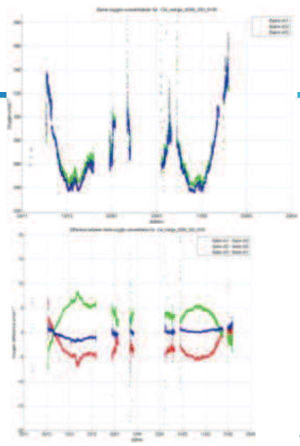
TITLE - JERICO - □3

PACIFIC TRIPLICATE OXYGEN DATA



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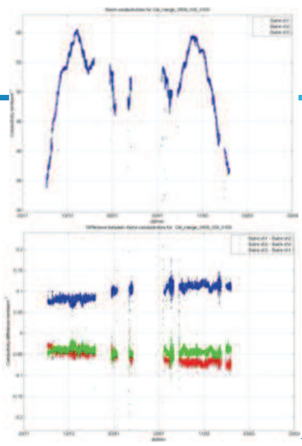
PACIFIC TRIPLICATE CONDUCTIVITY DATA



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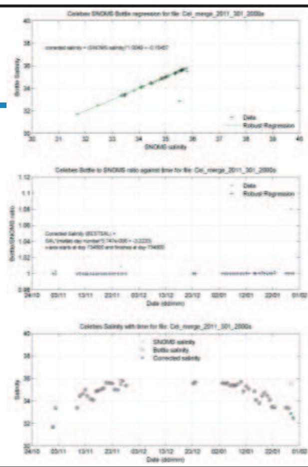
DAILY SAMPLE COMPARISON



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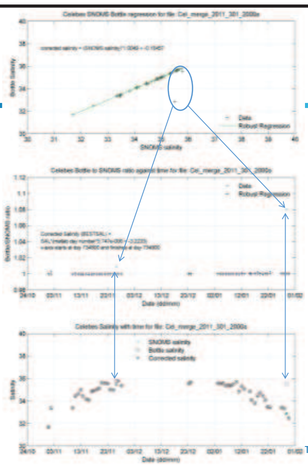
SALINITY CORRECTION



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BEST PRACTICE - OPERATIONAL

- □re-□ep□o□□ e□□□e□□or c□□i□r□□io□
- Training of ship’s crew in sample taking
- □i□ i□e□ □ur□□io□ □e□□or □ep□o□□ e□□– □ □ o□□□□
- □e□u□□r □o□i□ori□□ of re□□-i□ e □□□□ – □□i□□if po□□i□□e
- □□u□□ow□ of f□ow-□□rou□□ □□□□e□ □□□ c□e□□i□□i□ por□
- □□□ p□e □o□i□□ic□
- □□□ p□e □□□□□□i□

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ALGORITHM DEVELOPMENT – A SIMPLE LIST

- Co-location of sample data with underway data
- Combination of discrete sample analysis results with underway measurements
- Decision on which sensor output to use.
- Regression of sample data with underway data
- Processing leading to CO_2 data
- Processing leading to salinity data
- Correction of underway data

USEFUL ASPECTS AND DRAWBACKS

- [illegible] *Data processing procedures for SNOMS project 2007 to 2012 M. C. Hartman, D. J. Hydes, J. M. Campbell, Z. P. Jiang, S. E. Hartman*
- [illegible]
- [illegible]

SOME QUESTIONS

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible] problems, we don't expect a likely answer to these in Crete. However, we aim to [illegible] criterion for each measurement type. However…
- [illegible]

A POSSIBLE APPROACH

- [illegible]
- [illegible]
- Would a 'Markov chain' style approach be useful in the following case?

[illegible]

[illegible]

7. [illegible]

[illegible]

14. ……….and so on.

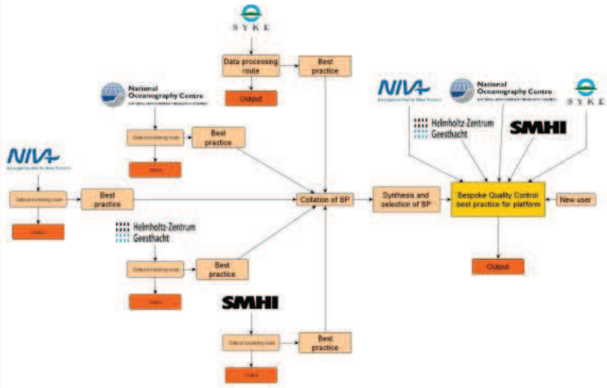
WP10.5 TASK

[illegible]

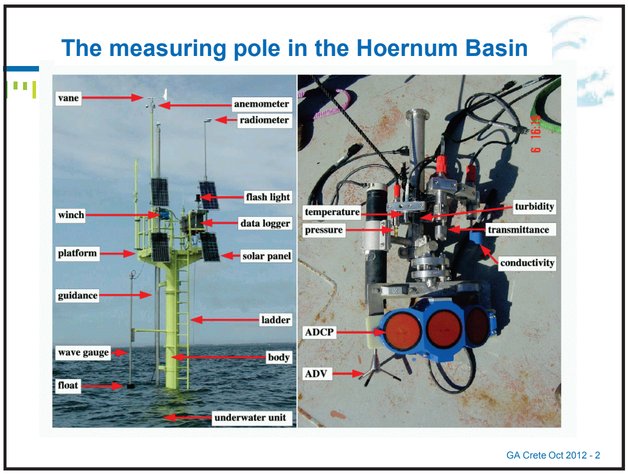
4

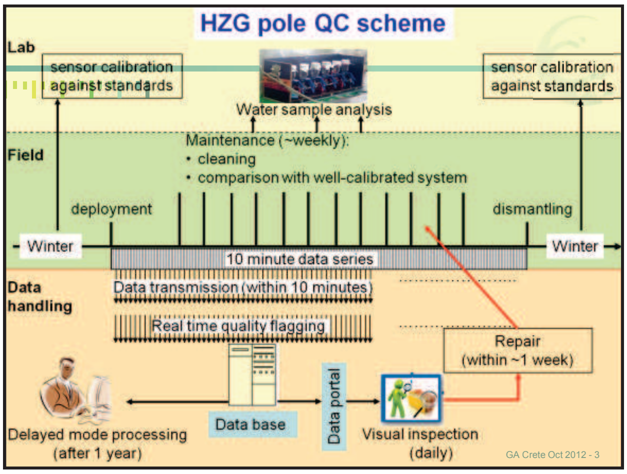
UNIFICATION OF THE DATA PROCESSING ROUTE FOR A SMALL GROUP OF INSTITUTIONS. ARE THERE COMMONALITIES?

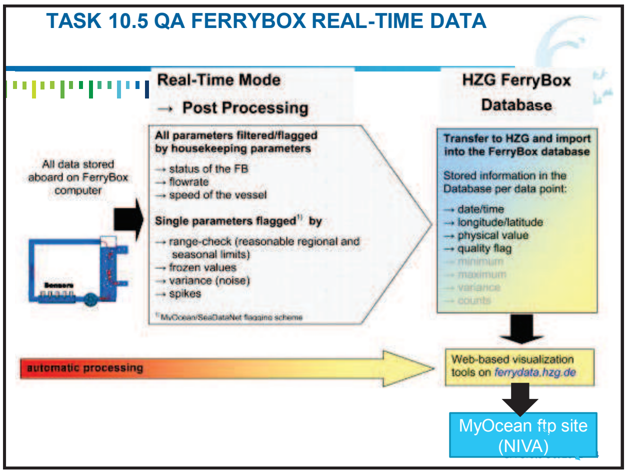
A WAY FORWARD?

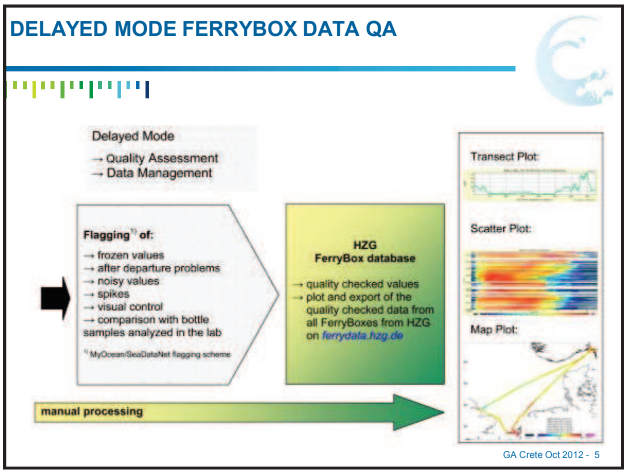


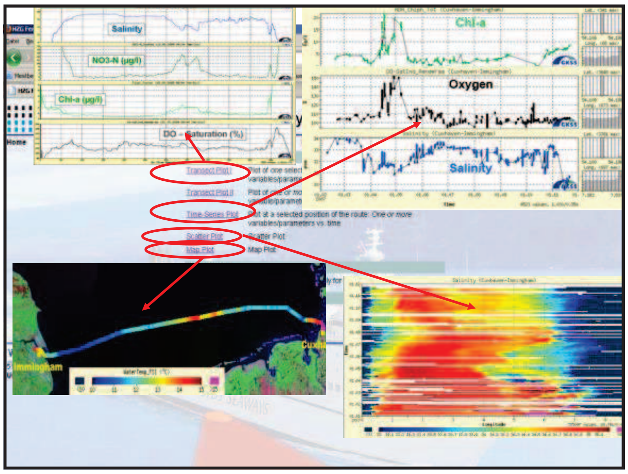

JERICO
JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES
FerryBox
Data Handling and QA at HZG
W. Petersen,
Helmholtz-Zentrum Geesthacht
Email: wilhelm.petersen@hzg.de
www.jerico-fp7.eu


The measuring pole in the Hoernum Basin
vane
anemometer
radiometer
flash light
winch
data logger
platform
solar panel
guidance
ladder
wave gauge
body
float
underwater unit
temperature
pressure
turbidity
transmittance
conductivity
ADCP
ADV
GA Crete Oct 2012 - 2


HZG pole QC scheme
Lab
sensor calibration against standards
Water sample analysis
sensor calibration against standards
Field
Maintenance (~weekly):
• cleaning
• comparison with well-calibrated system
deployment
dismantling
Winter
10 minute data series
Winter
Data handling
Data transmission (within 10 minutes)
Real time quality flagging
Repair (within ~1 week)
Data portal
Delayed mode processing (after 1 year)
Data base
Visual inspection (daily)
GA Crete Oct 2012 - 3

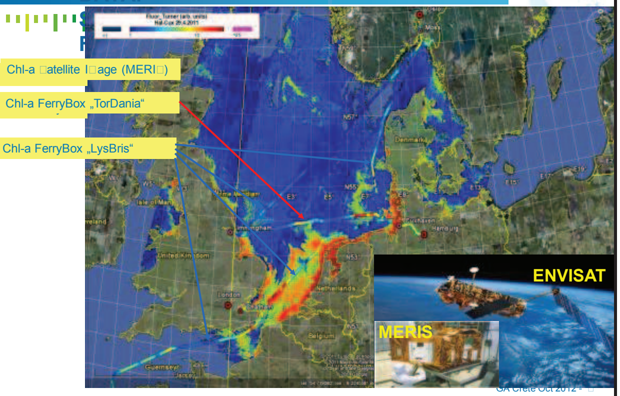

TASK 10.5 QA FERRYBOX REAL-TIME DATA
Real-Time Mode
→ Post Processing
HZG FerryBox Database
All data stored aboard on FerryBox computer
All parameters filtered/flagged by housekeeping parameters
→ status of the FB
→ flowrate
→ speed of the vessel
Single parameters flagged by
→ range-check (reasonable regional and seasonal limits)
→ frozen values
→ variance (noise)
→ spikes
MyOcean/SeaDataNet flagging scheme
Transfer to HZG and import into the FerryBox database
Stored information in the Database per data point:
→ date/time
→ longitude/latitude
→ physical value
→ quality flag
→ minimum
→ maximum
→ variance
→ counts
automatic processing
Web-based visualization tools on ferrydata.hzg.de
MyOcean ftp site (NIVA)


DELAYED MODE FERRYBOX DATA QA
Delayed Mode
→ Quality Assessment
→ Data Management
Flagging of:
→ frozen values
→ after departure problems
→ noisy values
→ spikes
→ visual control
→ comparison with bottle samples analyzed in the lab
MyOcean/SeaDataNet flagging scheme
HZG FerryBox database
→ quality checked values
→ plot and export of the quality checked data from all FerryBoxes from HZG on ferrydata.hzg.de
Transect Plot:
Scatter Plot:
Map Plot:
manual processing
GA Crete Oct 2012 - 5


Salinity
NO3-N (µg/l)
Chl-a (µg/l)
DO - saturation (%)
Chl-a
Oxygen
Salinity
Immingham

1

COMBINATION OF CHLOROPHYLL-A DATA:



CONCLUSIONS

-□torage of data on relational data□ase gi□es high flexi□ility regarding further e□aluation of data

-Interacti□e □e□ access allo□s□

- □isualisation □ith different kinds of presentation of the data (transects, pooled data (scatter plots), □aps, ti□e series at certain position..)
- data control and data correction including □uality flaggin

-HZG can offer data□ase FB data storage of external user (□ith o□n login and rights for editing)

Thanks for your attention!

Pole real-time filter

- Missing data
- □yste□ □oltage
- Maintenance period
- Min□Max range
- □pike
- □tuck □alues
- Flagging□Missing□□ad□pro□a□ly good

IMEDEA-C□IC G□IDER □A□□□□

WORKPACKAGE 3□□□r□ o□izi□□ □ec□□o o□ic□□□pec□□
WORKPACKAGE 4□ *Harmonizing □perations and □aintenance*

□□ E□E□ Glider team □□□

J. Tintoré, E. Heslop, □. □artinez-□edesma, □. □uiz, □. Pascual, □. □asas, G. □izoso

□□with colla□oration o□□□□□□ engineers□□. □orner, □. □usi, □P. Beltrán, □. □astilla □ Lizarán and □. □o□ue

www.jerico-fp7.eu 1-5 Oct. 2012 / Crete

SUMMARY OF IMEDEA-CSIC TASK 3.2

WP3: Harmonizing technological aspects (DOW)
WP leader: Wilhelm Petersen □G□□□□
□as□□.□ Gliders leader: □□□

OBJECTIVES:
-□o re□iew the current status o□the e□isting glider □leet in operational use in European □eas.
-□o de□ine the □est technical practices □or operation o□a □leet o□gliders

DELIVERABLES:
-□□.□: □eport on current status o□gliders o□ser□atories within Europe: □as□□.□ – □eport on the □irst wor□shops o□gliders o□ser□atories within Europe

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SUMMARY OF IMEDEA-CSIC TASK 3.2

Tasks carried Out:

- *Wor□shop Gliders □a□ □□□□*
- *Glider □uestionnaire*
- *□uestionnaire anal□sis □ongoing□*
- *□eport on current status o□glider o□ser□atories within Europe □ongoing□*

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WORKSHOP GLIDERS MAY 2012

TITLE: GLIDER OPERATIONS IN EUROPE, SCIENTIFIC, TECHNICAL AND OPERATIONAL CHALLENGES. JERICO/GROOM - EGO Glider Workshop 22nd – 23rd May 2012, Mallorca Spain

□□ecti□es:
□□□o re□iew the current status o□the e□isting glider □leet and glider □acilities in operational use in European seas
□□□o identi□□□est technical practices □or operation o□a □leet o□gliders
□□□o identi□□the needs □or a □oastal European glider o□ser□ing s□stem
□□□o coordinate European glider acti□ities □mainl□□E□□□ and G□□□□ pro□ects, within the □ramewor□o□EG□ acti□ities, E□□□□□□□□□ action□

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WORKSHOP GLIDERS MAY 2012

- *□□international researchers attended*
- *□□essions:*
  - *□. □e□iew o□present□uture needs □or gliders in Europe*
  - *□: □e□iew o□e□isting glider □acilities and technolog□*
  - *□. □e□iew □est practices in glider operations □one glider□leet□*
    - *□.□ Glider plat□orms in the la□*
    - *□.□ Glider □ission*
    - *□.□ Glider □ata □anagement*
  - *□. □ecommendations □or glider contri□utions to an European □oastal □□ser□atories □trateg□*

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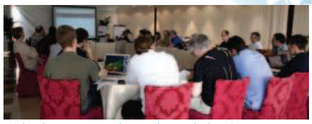
WORKSHOP GLIDERS MAY 2012

HIGHLIGHT OF MAJOR RESULTS:



□he added □alue o□using gliders in speci□ic areas o□coastal and open ocean and □or routine monitoring at □e□ control points was shown and discussed.

□he technological comple□it□still pro□o□es that a small proportion o□European gliders □around □□ha□e □een in the water at an□one time

□he glider comunit□has an opportunit□to propose a coordinated networ□o□glider o□ser□ations in the same wa□the pro□iling □loat communit□setup the □□G□ program

Esta□lishment o□a Wor□ing Group on □ata □anagement to stud□the □rganization, □ormats, □□ procedures.

□he EG□ we□site is a good plat□orm □or sharing in□ormation and ma□ing □isi□le the acti□ities o□European partners. □t was suggested that all participants record their gliders deplo□ments on the we□site e□en i□the □□ or □□ data are not □et a□aila□le.

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GLIDERS QUESTIONNAIRE

JERICO/GROOM GLIDER QUESTIONNAIRE

□o pro□ide in□ormation □or:

□□□E□□□ Glider deli□ea□le WP□.□-

□□Wor□ □eing underta□en in other glider related initiati□es within □E□□□, G□□□□ and EG□ □□□□ □ction

GLIDERS QUESTIONNAIRE

HIGHLIGHT OF MAJOR RESULTS:

□ompleted □□ □□ institution operating gliders □partners □rom □E□□□ and G□□□□ pro□ects□

Country	Institute	Completed	Comments
France	CNR□	yes	
	IFREMER	yes	
	EN□□A	yes	
	IRD	no	Not co□ered under another sur□ey, 1 glider
GERMANY	GEOMAR	yes	
	AWI	yes	
	HZG	yes	
	W□D □1	yes	
GREECE	HCMR	yes	
ITALY	OG□	yes	
	N□RC□CMRE	yes	
NORWAY	NACO	yes	
POLAND	IOPA□	no	□hey don' t ha□e already any glider
SPAIN	IMEDEA	yes	
	P□OCAN	yes	
UK	MAR□ (NOC-PO□)	yes	
	□AM□	yes	
	□EA	no	
CYPRUS	OG-□C□	yes	
BELGIUM	VI□O	yes	

GLIDERS QUESTIONNAIRE

53 questions ….

July-□epte□ □er 2012

- ***PART 1: Review of existing glider operations***
- ***PART 2: Review of glider facilities and technology***
- ***PART 3: Review of best practices for mission preparation of gliders***
- ***PART 4: Review of best practices for glider data management and global costs of operations***
- ***PART 5: Review of best practices for future glider operations and technology***

GLIDERS QUESTIONNAIRE

53 questions ….

July-□epte□ □er 2012

- ***PART 1: Review of existing glider operations***

- Nu□ □er of □issions□year and duration (in days) of □issions still □ery □aria□le due to high di□ersity of experiences.
- Main □orking areas□North Atlantic, Mediterranean, Cape Vert, etc
- Open ocean and coastal areas (not only coastal)
- Most operations □ith 1 glider until 2011, and later □ulti-platfor□ integrated studies (□oorings, drifters, satellite, etc.)
- □cientific challenges and long ter□ □onitoring focus

GLIDERS QUESTIONNAIRE, *PART 2: Review of glider facilities and technology*

53 questions ….

July-□epte□ □er 2012

- ***PART 1: Review of existing glider operations***
- ***PART 2: Review of glider facilities and technology***
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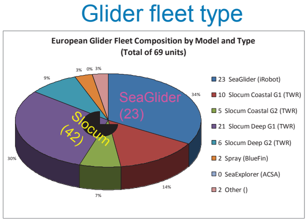
- ***PART 5: Review of best practices for future glider operations and technology***

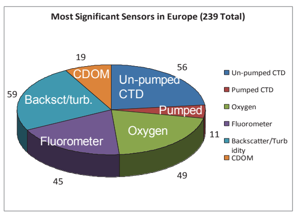
GLIDERS QUESTIONNAIRE, *PART 2: Review of glider facilities and technology*

HIGHLIGHT OF MAJOR RESULTS:

Glider fleet type



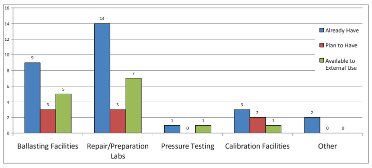
Sensors



GLIDERS QUESTIONNAIRE, *PART 2: Review of glider facilities and technology*

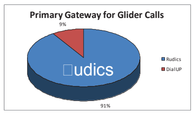
HIGHLIGHT OF MAJOR RESULTS:

□aboratories and Facilities



Ballasting facilities□ laboratories　repair/preparation　Pressure testing　Calibration facilities　Control room

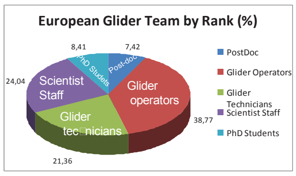
□T Facilities



GLIDERS QUESTIONNAIRE, *PART 2: Review of glider facilities and technology*

HIGHLIGHT OF MAJOR RESULTS:

Glider Teams



GLIDERS QUESTIONNAIRE

53 questions ….
□uly-September 2□□2

- ***PART 1: Review of existing glider operations***
- ***PART 2: Review of glider facilities and technology***
- ***PART 3: Review of best practices for mission preparation of gliders***
- ***PART 4: Review of best practices for glider data management and global costs of operations***
- ***PART 5: Review of best practices for future glider operations and technology***

GLIDERS QUESTIONNAIRE, *PART 3: Review of best practices for mission preparation of gliders*

- Glider missions c□ecklist and protocols used only by □□□ of users
- Pre-mission preparation of □ days
- Pre-mission team in lab□2 people
- Ma□or bottlenecks□ballasting and batteries refurbis□ment
- Sensor calibration mostly by manufacturers (e□ery □2 mont□s)
- Mission definition by P□□mission planning and operations by Glider team leader
- Most c□allenging operation□s□ip reco□ery
- □o pat□ planning tools yet
- Different problems obser□ed by users for Slocum or Seagliders
- Bio-fouling □as s□o□n to be a problem by 3□□ users. Topic starting…

GLIDERS QUESTIONNAIRE

53 questions ….
□uly-September 2□□2

- ***PART 1: Review of existing glider operations***
- ***PART 2: Review of glider facilities and technology***
- ***PART 3: Review of best practices for mission preparation of gliders***
- ***PART 4: Review of best practices for glider data management and global costs of operations***
- ***PART 5: Review of best practices for future glider operations and technology***

- **GLIDERS QUESTIONNAIRE, *PART 4: Review of best practices for glider data management and global costs of operations***

- □C and □alidation still need to be implemented for □T. □round □□□ of groups apply □C and □ procedures for DM. → Data management G□OOM meeting (next □eek□□□-□2 October□Paris)
- □n-situ □C□mostly s□ip-borne CTD casts□nearby platforms (i.e. moorings).
- Most common procedures are□remo□al of anomalous □alues□pressure filtering and salinity correction. □ll of t□em in DM.
- □etCDF is t□e most extended data format alt□oug□ot□ers are used suc□ as manufacturer proprietary format□plots only and/or □SC□□ Still fe□ □T contributions to Coriolis and □GO.
- Groups begin to rely t□eir public outreac□ and communication to □o□n □ □ □ site□alt□oug□t□ere is a lot yet to be done

- **GLIDERS QUESTIONNAIRE,** ***PART 4: Review of best practices for glider data management and global costs of operations***

- □Ocean state c□aracteri□ation and □ariability□is t□e top routinely usage of gliders. Occasional assimilation into forecasting models and no contribution to marine products for leisure and commercial applications □a□e been also remarked
- □ery fe□ groups □a□e pro□ided information about t□eir budgets and running costs. T□ere are not enoug□ samples to extract conclusions yet.

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GLIDERS QUESTIONNAIRE

53 questions ….

□uly-September 2□□2

- ***PART 1: Review of existing glider operations***
- ***PART 2: Review of glider facilities and technology***
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- ***PART 4: Review of best practices for glider data management and global costs of operations***
- ***PART 5: Review of best practices for future glider operations and technology***

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- **GLIDERS QUESTIONNAIRE,** ***PART 5: Review of best practices for future glider operations and technology***

- □ig□er reliability of performance and reduction on costs are t□e preferred impro□ements to see applied in future glider □ersions.
- Groups seem to be □illing to ac□uire □ig□er tec□nical skills to be more autonomous in glider maintenance and refurbis□ment. □uropean support centers □ould also be □ery □elcomed.
- T□e ser□ices more often needed to support national/□uropean glider operations are□ (□) Scientific/Tec□nological Forum and Data Management Centers by □uropean □nfrastructure and (2) Tec□nical Ser□ices (i.e. calibration) and Glider Pool by □ational □nfrastructure
- □o□er importance and/or priority is gi□en to □inks □it□ Manufacturers□ Multi-platform □nterface for Piloting and □d□ise on Safety □ssues.

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- **GLIDERS QUESTIONNAIRE,** ***PART 5: Review of best practices for future glider operations and technology***

- Desired specific tec□nological ad□ances for t□e next □ years are related to (□) more capable and faster sensors/Payload□ (2) a better battery tec□nology□ e□en rec□argeable□ and (3) adaptability to □ars□ en□ironments (ice□ strong currents□ density stratification□..)
- □ey topics gliders □ill □elp address in t□e next □ years □a□e been □ig□lig□ted□ Pollution and Biological Monitoring (Coastal □ aters)□ Modelling/Forecasting and Seasonal □ariability (Open Ocean) and t□e □nteractions□ Transports and □elated Dynamics bet□een (Bot□)
- □ey contributions to t□e Coastal Obser□atories o□er t□e next □ years□
  - increase and complete data sets (□ong Monitoring)
  - feed models
  - tools for mesoscale and sub-mesoscale studies□ eddy-mean flo□ interactions and deep □ater formation□ amongst ot□ers

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- **GLIDERS QUESTIONNAIRE,** ***PART 5: Review of best practices for future glider operations and technology***

- □uropean future funding s□ould be in□ested□ according to t□e groups□ in t□e creation of centrali□ed glider centers for renting□ maintaining□ piloting and calibrating a□ailable to any suitable user□ all ser□ing under a general protocol frame□ork.
  □□D is also a selected preference□ specially on po□er cells and de□eloping □uropean glider tec□nology

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2□Review current status of glider observatories in Europe

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3□Review current status of glider operations in Europe

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- Glider Data Archiving
- Data Processing and Quality Control

6. Glider Data Dissemination and Outreach

7. Training Materials, Courses and more Information

8. Glider Cost Analysis

BEST PRACTICE WORKSHOP
FERRYBOX INTRODUCTION

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Best practice
What is it?
How can we develop it?
How can we share?

Crete is second meeting following meeting at HZG September 2011.
Meeting minutes and Deliverable 3.1
Report on current status

1. FB questionnaires
2. Quality Assessment
    1. Status on quality control and data handling (in connection with WP5)
    2. Overview of quality assessment procedures in the community
    3. Quality criteria appropriate fro FerryBox
    4. Quality flags (according to SeaDataNet)
3. Best practise:
    1. Data vocabularies consistent with SeaDataNet for use by EMODNET
    2. Goals of QC development in JERICO
    3. Status data transfer, communication
    4. Real time data processing incl. QC/QA - community needs
    5. Post processing incl QC/QA - community needs
    6. Data storage and access for internal and external use (via pick user pick up from a ftp site?) and data flow to other communities (MyOcean, JERICO, EMODNET)
4. Calibration
    1. Common procedures

Key Points

Context - MyOcean - SeaDataNet

Common procedures

Data QC and reporting - Meta-data & Flagging

Operations ie what will be produced for WP7?

Interoperability requirements:
Discussions considered

1. Public access and visibility of FB data.
2. How can we get all FB data for a certain date in a defined area ?
3. HZG can offer their database for other users. HZG database has interactive visualization and download tools via an internet browser.
4. In WP7 data go to MyOcean – data will be labelled JERICO data. NO data tools are offered.
5. What do we need from the JERICO data tools?
6. A Data Management handbook was in preparation. This will define the approaches that need to be taken for automation of QC of the data.