7th IBI-ROOS meeting

Iberia Biscay Ireland Regional Operational Oceanographic System 2006–2010

2nd – 4th February 2010

Instituto Hidrográfico Lisbon (Portugal)

The 7th IBI-ROOS meeting was held at the Instituto Hidrográfico in Lisbon (Portugal). 22 persons attended the meeting from the 5 countries involved in IBI-ROOS (see list in annex2). The meeting started at 10h00 on the 2nd February and finished on the 4th at 12h00. Carlos Venture Soares welcomed the participants and Jose Onofre Mesquita provided the logistical information for the three day meeting.

1 General Overview of IBI-ROOS activities for 2009

1.1 News from the MOU and the DEA(Data Exchange Agreement)

S. Pouliquen reported on the coordination of the IBI-ROOS. 16 institutes have signed the MoU, 4 are considering it. We are very pleased to welcome Boris Kelly-Gerreyn for NOC/UK who signed the MoU this year.

Signed	Potential members
1. AZTI/Spain 2. MeteoGAlicia / Spain 3. Euskalmet-Basque Météorological Agency / Spain 4. I.E.O / Spain 5. Ifremer /France 6. Instituto Hidrografico /Portugal 7. INTECMAR/ Spain 8. IPIMAR / Portugal 9. Irish Marine Institute/ Ireland 10. IST / Portugal 11. Mercator-Ocean/France 12. SHOM/ France 13. Météo-France/ France 14. CNRS France 15. Puertos Del Estado/Spain 16. NERC / UK	1. Centre for Environment, Fisheries & Aquaculture Science (CEFAS)/UK 2. MetOffice / UK 3. Instituto de Meteorologia, Portugal 4. Universidade dos Açores, Portugal

Among the institutes who signed the MoU 10 have signed the Data exchange agreement, 4 in 2010. The list of the observation and model product provided by these institutes is attached in annexe 5

Signed	Potential members
1. Ifremer /France 2. MeteoGalicia / Spain 3. Instituto Hidrografico /Portugal 4. INTECMAR/ Spain 5. SHOM/ France 6. Puertos Del Estado/Spain 7. Mercator-Ocean 8. Euskalmet-Basque Météorological Agency / Spain 9. AZTI 10. Irish Marine Institute/ Ireland	1. I.E.O / Spain 2. IPIMAR / Portugal 3. IST / Portugal 4. Météo-France/ France 5. CNRS / France 6. NERC / UK 7. Centre for Environment, Fisheries & Aquaculture Science (CEFAS)/UK 8. MetOffice / UK 9. Universidade dos Açores, Portugal

Several institutes mentioned that they were working on having DEA signed by their institutes.

1.2 Ongoing projects and calls in relation with IBI

S. Pouliquen presented the status of the EU projects in which the IBI members are involved:

- Euro-Argo: the purpose is to consolidate the European contribution to Argo and help new countries to join Argo. All IBI countries are represented. It started January 1st 2008 and will end in December 2010. A legal entity (ERIC) will be set up this year that that aims at coordinating the European contribution to the Argo Network It should be co-funded by member states and European Commission.
- ECOOP: attempts to organize coastal operational oceanography in Europe. This 3 year project (Feb 2007-Jan 2010) is finished. It developed useful prototypes of tools and methods and we have to discuss what is important to sustain in the future
- EasyCo: aims at building a Polycentric Infrastructure for Operational Ocean Modeling in the whole Atlantic Space joining capacities from all the 5 countries. It aims at forecasting hydrodynamics and biogeochemistry at the regional scale using grid sizes of a few km. It's a 3 year project (Feb 2009-Jan 2011).Interoperability with MyOcean should be studied to improve efficacy of the tools to downscale from regional to local. Feedback to the IBI community on inter-comparison exercises should be provided
- Asimuth: This proposal wants to build a Gmes downstream service on HAB in the IBI area.It didn't passed in 2009 but will be resubmitted in 2010.
- MyOcean: aims at providing an operational core service in Europe providing observation and forecast products for the global ocean and regional seas. A specific session has been dedicated to the link between MyOcean and IBI community
- Jerico: A proposal has been submitted to the 2009 I3 call. It aims at setting up a European Research Infrastructure for coastal observation as needed in research and Operational Oceanography activities in the framework of GMES (Marine Core Service) MyOcean and downstream Coastal Services. If accepted it should start in 2011.

1.3 How to improve communication within IBI-ROOS

S. Pouliquen reminded members that a WWW site has been set up for the IBI community and that it was really a pity to get so little material to make the IBI portal a real advertising tool for our activities.

- The data centre and observing system inventories have been put on the IBI web and will be updated on an early basis at the annual meetings. A GoogleEarth file is available showing the shared data in the IBI area and the link to the IBI portal will be advertised
- The map of the present observing system has been inserted. A vision of the Observing system needed for IBI-ROOS will be made inserted when available
- A product catalogue has been developed but there is a need for members to describe the products they agreed to share with the IBI community

- It was agreed that each partner would provide a summary of its operational oceanography activities in the IBI area for the WWW that shall be a gateway to their institutional sites (see Euro-Argo as an example of what could be done (example : http://www.euro-argo.eu/about_euro_argo/partners/france)
- The section on meeting will provide access to the meeting talks in pdf format unless the speaker denies it.
- IBI Members will provide material to feed the news section

In 2008 it was decided to form a steering team whose mandate is :

- Follow progress within the working groups
- Inform on cross-cutting activities between the projects
- Inform EuroGoos on activities carried out in the IBI area
- Prepare contribution to projects in more coordinated way

It is composed of the following members and meets at the annual EuroGOOS meeting to assess progress of the working group between two annual meetings.

- France: Sylvie Pouliquen / Jérome Chanut
- Spain: Alicia Lavín / Marta de Alfonso
- Ireland: Glenn Nolan / Marcel Curé
- Portugal: José Onofre
- U.K: Rosa Barciela.

In order to facilitate the job of the of the steering team and of the WG leaders it was agreed that we will make sure to identify clear actions related to the different topics adressed during the meeting

1.4 Actions

- Schedule a Steering team meeting at EuroGoos annual meeting and eventually a phone conference if needed
- Members to feed the Product catalogue with the product description of the model products agreed in DEA according to procedure provided by Sylvie
- Members to provide to Sylvie material for WWW site in terms of News, one page summary of Operational oceanography activities related to IBI.

2 MyOcean and IBI

The purpose of this topic was to inform the IBI community on the progress of the MyOcean project, on the next steps foreseen to sustain the GMES Marine Core Service, on the services that MyOcean is and will provide to the IBI community. This topic also aims at defining how the IBI community, who are key intermediate users for the IBI MyOcean products, could provide feedback on /assess the IBI products and influence their evolution.

2.1 MyOcean project status

S Pouliquen presented, on behalf of P Bahurel the MyOcean project coordinator, the status of the MyOcean project. Started on the 1st April 2009, the project is presently on track and the reviews were passed successfully. Next annual meeting will be in Exeter end April 2010. The entire components are active and providing a V0 service on the best effort schema and preparing the V1 of the service that should be turned to operation in December 2010. In V1, the products mentioned in the MyOcean catalogue will be provided to users with an engagement of service through Service Level Agreement (SLA) signed between MyOcean and the registered users. Data policy is free and open access to registered users. In The IBI area MyOcean is providing in-situ, ocean colour, SST and model products.

P Bahurel pointed out that it was important the IBI members are registered as MyOcean users, that they sign SLA and test and provide feedback on the MyOcean products . The IBI community has to be predominant to strengthen the marine community at the European level, and to be the real drivers of the European Marine Core Service evolutions. Pierre also indicated the User commissioning forum that will be held before the end 2010 where IBI members will have the opportunity to really influence the services provided by MyOcean.

There was an agreement for IBI members to register as MyOcean users and be proactive in collaborating with MyOcean to improve the service in the IBI area. They also support the present initiative from MyOcean project to discuss with EC, together with the GMES Atmospheric service, for MyOceanII (2012-2014) on the consolidation of the current Marine Core Service (MyOcean system and service : a pan-European service to member states) and the consolidation of the link with European community of Member States marine centers prepared in MyOcean. IBI members asked P Bahurel to provide them with a common text that they could use with their delegates to lobby for a consolidation of the MyOcean System as an integrated coordinated project for bridge phase.

2.2 In-Situ TAC (Thematic Assembly Center)status

S Pouliquen presented the In-SITU TAC which is a distributed architecture setting up global and regional portals to provide real time and delayed mode coherent in situ products for a limited number of parameters (Temperature Salinity and Sea Level in the IBI area). Within MyOcean In-Situ TAC the following activities are carried out in a common manner:

- Define common distribution means: vocabularies, formats, organization, monitoring tools,…
- Develop a reliable distributed architecture for in-situ data delivery to MFCs and MyOcean users
- Converge on common quality control procedures and flag conventions
    - Enhance the T&S basin scale consistency methods for global ocean and adapt them to regional scales, if possible

- Develop methods for Quality Control of biogeochemical data both in real time and delayed mode and provide recommendations for acquisition of biogeochemical data from various platforms
- Turn to operations enhanced calibration/validation methods

Presently the activity has been focused on acquiring observation data from the regional partners (mainly EuroGOOS ROOSes members) in real time and setting regional portals that provide an integrated access to in-situ data using the same format and portal organization. The second activity is to agree on real-time (i.e. automated) QC procedures that would be applied by all regional centres. This work is done in collaboration with SeaDatanet and other International projects (see §3.2 hereafter). A MoU has been signed between MyOcean and SeaDatanet to collaborate on common standards, elaboration of delayed mode products and sharing of products.

Within the IBI area this activity is carried out by Ifremer and PdE with the aim to extend this service to other parameters and platforms within the IBI-ROOS framework (see . §3.1 hereafter). It's really important to set up good partnership with the IBI institutes operating the observing systems as they are the data providers to the IBI in situ TAC.

2.3 IBI MFC(Monitoring and Forecasting Center) status

Enrique Alvarez and Jérôme Chanut presented the development of the IBI MFC (operational service scheduled in April 2010). It will be operated by Puertos Del Estado, Mercator Océan acting as a backup of PdE.

2.3.1 R&D activities

Development of the NEMO ocean model for IBI MFC (with particular focus on model improvement over the shelf) has been pursued by Mercator Océan, in collaboration with the MetOffice and LOCEAN. IBI system upgrades, grouped by numerical and physical improvements are listed below:

Numerical improvements:

- A two equation turbulence model (Generalized Length Scale model, *Umlauf, L., H. Burchard, 2003: A generic length-scale equation for geophysical turbulence models, J. Marine Res., 61, 235-265.)* has been implemented.
- An improved version of the barotropic mode time stepping scheme has been coded and validated. The resulting scheme is twice as more efficient in term of computing time as the previous one, resulting in a gain of about 15% of the overall model computation time. This also solves issues related with tracers' conservation, and model stability in high amplitude tidal areas.
- A higher order horizontal advection scheme: the PPM scheme (Piecewise Parabolic Method) has been coded. This should limit the level of numerical diffusion in the case of the strong gradients that occur in shelf regions.

Physical processes add-ons:

- Climatological, monthly, spatially varying ocean colour effects on solar radiation penetration have been implemented. This replaces the inaccurate "clear water type" assumption, in particular on the continental shelf, where biological species and sediments strongly limit available light below surface layers.
- Atmospheric pressure effects have been activated which adds surge modelling capability to the system.
- High frequency atmospheric forcing (3h) has been implemented. This enables proper representation of the diurnal cycle.

Work on data assimilation implementation into a moderate resolution (1/12°) version of the IBI system has been initiated. The data assimilation system is based on the sequential Kalman filter methodology used in Mercator Océan global operational system and assimilates along track sea level anomalies, Temperature/Salinity profiles and low resolution Sea Surface Temperature (SST). Data assimilation analyses are performed weekly but data assimilation increments are applied smoothly thanks to an Incremental Analysis Update (IAU), thus avoiding periodic initialization shocks. As a start, possible issues related to the use of new numerical scheme in NEMO (split-explicit free surface vs filtered free surface), high frequency forcing (3h, including diurnal cycle) have been studied, tidal forcing being not yet activated. A full year hindcast has been produced showing an overall improvement of the results over the IBI area compared to basin scale and global operational models currently run in Mercator Océan. Future developments will focus on the activation of tidal forcing, assimilation of high resolution SST and the use of improved products from sea level TAC (higher resolution along track SLA, improved Mean Dynamic Topography).

2.3.2 Progress on IBI nominal production unit implementation (PdE)

During the first year of MyOcean project the activity of PdE has been mainly focussed on defining, planning and implementing some of the functions, software and hardware architecture on which the future IBI V1 MFC operational production will be performed.

PdE has been working in a deep re-engineering of most of the subsystems to ensure the transition from IBI MFC V0 (ESEOAT) to the IBI V1 (this transition implies a change of machine environment, model, inputs, forcing files and generation and service of final products).

As a first step, a collaboration agreement was signed by PdE and the *Centro de Supercomputación de Galicia* (CESGA) in order to dedicate some supercomputing resources from the *Finisterrae* machine for the IBI MFC implementation and operational production. In that sense, adaptation of the NEMO IBI-36 model Application to the new Finisterrae supercomputer environment has been started and it is currently on-going. Preliminary benchmarking tests have shown a very good scalability of the NEMO model in the new supercomputer environment and it is seemed that committed IBI operational products will be provided on time.

Good progress has been done in the implementation of the future PdE IBI-MFC operational suite (prior objective: launch of the operational IBI V1 at April 2011).
At this stage, a set of operational procedures has been implemented to:

- retrieve/acquire and pre-processing the required IBI forcing fields (from GLOBAL MFC and ECMWF)
- execute the daily NEMO forecast cycle run
- Post-process outputs and generation of user-dedicated IBI products

Additionally, PdE has planned (currently under development) the transition required to upgrade the user service interface (currently based only on ftp servers) in order to provide IBI products through the new service interfaces specified in MyO (IBI products will be provided to end-users through THREDDS/OpenDap and through a direct web portal access (MIS Gateway will allow to download files, make subset of them, as well as display or mapping them through a WMS services). Furthermore, it has been planned to improve the current existing PdE operational suite, particularly in terms of documentation, robustness and production control in order to fulfil the operational service requirements (in agreement with the MyOcean Service Desk).

It is worth to mention that PdE is having an active participation in the discussion/definition and assessment of the cal/val metrics to be used for the quality control of the IBI MFC products. This definition is being doing in strong coordination with the other WP8 PU/DU

(Mercator-Ocean) and scientific partners (CNRS) involved in MyO scientific R&D cal/val activities. Main conclusions of this IBI cal/val definition process will be soon (early June) detailed in the MyO Scientific Calibration Plan Report (SCPR) and the Scientific Validation Plan Report (SVPR). Finally, Mercator and PdE have started working on comparing outputs from the ESEOAT system (IBI V0) and the preliminary IBI NEMO runs (used for scientific calibration of the future IBI V1) in order to quantify differences between both systems and to ensure no regression with the new IBI MFC System.

It was agreed that the IBI members should assess this new product in a coordinated way and Julien Mader agreed to work with the IBI modelers, downscaling from the IBI MFC product, to organize it and if necessary eventually find some funds.

2.4 Link with User WP

Within WP18 the IBI community is represented by Ifremer (YH de Roeck) , IST(R Neves) and Météo-France (P Daniel). The first work of this WP is to define User Requirement Document (URD) in the 4 areas that have been identified by MyOcean as targeted intermediate users. The second step is to assess the MyOcean product (User Assessment Documents) . It's important that as IBI members we work with the people representing us in these group to contribute to these documents that will be used for the evolutions of the MyOcean services (V2 of MyOcean and future steps of Marine Core Services). Yann-Hervé pointed out that one main input for the "Marine Ressources" URD was the work of the WGOOFE working group where a stronger representation of the IBI community should be beneficial (next meeting in Brest in June 2010). An important deadline is the 1st User Commissioning Forum that will be held before the end of this year.

2.5 Summary of 2010 Actions on interaction with MyOcean

- IBI partners to register as MyOcean users by signing the SLA so that the user community in the IBI area is visible and recognized
- P Bahurel to provide to IBI partners with a common text that they could use with their delegates to lobby for a consolidation of the MyOcean System as an integrated coordinated project for bridge phase.
- IBI partners in WP18 to inform and interact with IBI community to provide their user requirements and also contribute to the users feedback (User Commissioning Forum in October 2010)
- Organize the Validation of MyOcean IBI V1 model product to provide feedback in a coordinated manner
- Jerome to provide when available documentation of metrics (MyO Scientific Calibration and Validation reports) that are planned to be implemented within MyOcean for the IBI model in order to help a user assessment.

3 Data exchange working group

3.1 Action status

At last IBI-ROOS annual meeting the following actions were decided. Since then, some have been completed, some just started, really started and one delayed:

1. DEA to be filled in (Annexes A and B) by members who are willing to sign;
2. Each observation provider to update the Data Centre Inventory with the FTP site for PdE and Coriolis to integrate the agreed data into the IBI portal;
3. PdE and Coriolis to continue the work on setting up the IBI Portals;
4. Product catalogue to be filled in by IBI members;
5. IBI Members to study possibilities of acquiring data from their research vessels;
6. Identify the key parameters and a strategy to set up a dataset for reanalysis purposes.

The Status on DEA has been provided in previous section

3.2 Toward an IBI-ROOS portal

Both Ifremer and Puertos Del Estado have been working on integrating more data in the IBI portal. For details, see the "Data Management working group" report in annex 4.

The IBI-portal (focus on in-situ data) was set up according to last IBI meeting agreement: (NetCDF OceanSites V1.1 format, FTP site organization . Data collection and integration was done by Puertos Del Estado for mooring data and Coriolis for underway and profile data. The parameters T&S, sea level (committed for MyOcean), currents from drifters and currents, biochemical data, wind and waves from moorings. S Pouliquen , as MyOcean In-SITU tac leader and as EuroGOOS DataMEQ working group , has worked with European partners to make this organization both endorsed by MyOcean and EuroGOOS.

A first version of the IBI catalogue has been derived from the ECOOP and is available at http://www.ibi-roos.eu/ibiroos/Access-to-data/Catalogue/IBI-ROOS-partner-products For each product, it provides its description: standard parameter naming, time and space coverage, update frequency, links to the documentation and to the delivery services at the producer (or at the IBI portal when settled) . To describe or update a product description, a web form has been set up at http://www.ifremer.fr/camiif-forms/IBI-ROOS/

For 2010, it would be good if more research vessels could transmit data when they cruise or transit over the IBI area. French experience has proven that interesting data could be gathered on these ideally equipped platforms supported by skilled technicians (T and S profiles, SSS,…). Data are transmitted daily by email to Coriolis. Coriolis is willing to offer similar processing facilities to the IBI members to help starting the process. The data ca n be transmitted by email at co_no_xbt@ifremer.fr . It eases Coriolis data center job if you put in the subject *"data from "your vessel name" ".* Please contact Coriolis at codac@ifremer.fr for more explanation

Finally Sylvie Pouliquen mentioned that we have to work on integrating data for reanalysis purposes over the past 20 years. This work has to be carried out in collaboration with SeaDatanet project and the WGOOFE-ICES working group. We need to identify the key parameters and a strategy to set up this dataset.

3.3 Toward common QC procedures

S Pouliquen presented the work on real time automated QC that is carried out within MyOcean. It's based on SeaDataNet, Mersea, Coriolis and International network (Argo, GOSUD) documents and it aims at defining a common se of automated tests and QC flaggs that will be applied by all the MyOcean In-Situ Tac regional centres . These RT QC procedures are documented and the documents will be shared with SeaDataNet and the EuroGOOS DataMEQ working group in order to be endorsed by a wider community. These documents will be made available to the IBI community when finalised.

3.4 Summary of 2010 Actions on Data Exchange activities

1. Finalize setting up of the IBI portal and synchronization between PdE and Coriolis servers.
2. Implement RT QC procedure as recommended by MyO for T&S and sea Level
3. Extend work within DataMEQ WG and involve other IBI partners especially for BIO product
4. Identify what is needed in term of long time series , identify potential provider , study eventual data policy issue…

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4 Observing System working group

4.1 Update of the existing and funded observing system for IBI-ROOS

Following a template provided by G Charria/YH De Roeck prior to the meeting, each country updated the 2009 status and provided their view of what could be achievable in 2012.

4.1.1 France

Ifremer presented the study made at French level by multi-institutes working group collaborating on operational oceanography in the IBI area. The goal was

- → to make an inventory of the *in situ* observation system used for coastal operational oceanography
- → to design a common base for the future permanent and real-time observation network in the coastal zone

The result can be summarized in the following figures showing the observing system at the end of 2009 (on the left) and the desired one by 2012

Based on an *in situ* and operational network,, the plan is designed to extend the real time database and combine tested (i.e. CTD) and recent (i.e. ARCOR-C, gliders) sensors and platforms

4.1.2 Ireland : IMI Observing System summary

IMI presented a summary of the current ocean observing system in Irish waters to fulfil a variety of requirements and drivers including the Water and Marine Strategy Framework Directives, Global Climate Observing System and national programmes on maritime safety, environment and fisheries. The current Irish ocean observing system consists of the following elements:

- 18 coastal tide gauges (reporting in real time)
- 5 offshore weather buoys (1 of which is a deep ocean sentinel (M6))
- 2 Inshore buoys measuring biogeochemical variables (Galway Bay)
- Standard oceanographic CTD stations in deep water (winter) and Irish shelf (summer)
- 4 ARGO floats deployed annually

Future planned activity includes:

- Establishment of a Ferrybox route in the Irish Sea (Dublin to Holyhead)
- Establishment of a repeat Glider line (Scotland-Ireland??)
- Support of the Western Shelf Biogeochemical Observatory (with CEFAS)

- Continued deployment of Argo floats to support the global array
- Wave Energy Test site off NW coast of Ireland (Environmental monitoring and device testing)
- Possible expansion of Tide gauge network to 30-40 gauges.

IMI will work with the observing systems working group of IBIROOS to produce an integrated map of the current and future observing systems in the IBI region and to complete the Observing Systems template produced by Julien Mader of AZTI.

4.1.3 Spain

A summary of the current ocean observing system develop by the different institutions on the Spanish waters of IBIROOS was presented to fulfil a variety of requirements and drivers including Global Climate Observing System and national programmes on maritime safety, environment and fisheries. The current Spanish ocean observing system consists of the following elements:

- 18 coastal tide gauges (reporting in real time) from Puertos del Estado and 7 from IEO reporting in quasy real time and 6 from Euskalmet-AZTI.
- 10 offshore ocean-meteorological buoys over the shelf-break (8 from Puertos and 2 from Euskalmet) and 1 from IEO in deep oceanic waters, the later including chemic-biological parameters.
- 11 coastal buoys from Puertos del Estado y 3 from the Xunta of Galicia.
- Radar HF between Finisterre and Cape Silleiro. Puertos del Estado and other institutions. Radar HF in the Basque country operated by Euskalmet. Radar HF in the Ria de Vigo operated by the University of Vigo.
- Ship of Opportunity FerryBox line on the Pride of Bilbao Postmouth-Bilbao operated by NOCS.
- Repeat hydrographic cruises. Standard oceanographic CTD stations in deep water and shelf, covering the seasonal cycle by IEO and AZTI..
- Ongoing TSG measurements form oceanographic vessels sending daily data to Coriolis Center by IEO.
- Mooring current meters equipped with T/S sondes. Two from IEO covering until 1800m depth (and two from Puertos del Estado until 300m). Bottom pressure recording systems BPR.
- ARGO floats deployed annually.
- Satellite images, AZTI, IEO

Future planned activity includes:

- Establishment of three new offshore ocean-meteorological buoys over the Galician shelf by the RAIA project equipped with biogeochemical Observations. . Also two more buoys will be added one in Aurosa and other in Ribadeo Rias by Xunta de Galicia.
- Establishment of a new Ferrybox route in the Bay of Biscay and other between Portugal and the Canaries.
- Establishment of a repeat Glider lines in some Standard hydrographical sections on the N/NW of the Iberian Peninsula.
- Improve the atmospheric and oceanographic sensors, including Biogeochemical and water column observation in the buoys.
- Continued deployment of Argo floats to support the global array
- Try to implant a system of sampling in fishing fleets following RECOPESCA.
- Possible improve on the quality of the Tide gauge networks.
- Improve the lines of current meters to cover the main selected areas.

- Improve the knowledge of the shelf with automatic profilers as well as anti-trawling moorings on the shelf.
- Improve the IR measurements for the Bay of Biscay southeastern corner. Collaborate and improve the system installed by France.
- Deep-sea observatories. PLOCAN large infrastructure in Canaries.

The Spanish IBIROOS groups will work with the observing systems working group of IBIROOS to produce an integrated map of the current and future observing systems in the IBI region and to complete the Observing Systems template produced by Julien Mader of AZTI.

4.1.4 Portugal

IH presented a summary of the current ocean observing system in Portuguese waters, including Azores and Madeira to fulfil a variety of requirements and drivers including the Water and Marine Strategy Framework Directives, Global Climate Observing System and national programmes on maritime safety, environment and fisheries. The current Portuguese observing system consists of the following elements:

- 14 coastal tide gauges (2 reporting in real time)
- 3 multiparameter buoys
- 8 buoys measuring wave height (WAVERIDER)
- 3 permanent moorings in the Nazaré Canyon on the framework of the European project HERMIONE

Future planned activity includes:

- Study for the establishment of a Ferrybox/Glider route between Azores and Portuguese mainland.
- Study for the establishment of a Ferrybox/Glider route between Madeira and Portuguese mainland.
- Study for the establishment of a Ferrybox/Glider route between Canary Islands and Portuguese mainland.
- Radar HF system to be deployed in Sines during 2010.
- Instalation of a new multiparameter buoy.

4.1.5 UK

The current UK ocean observing system consists of the following elements (not a exhaustive list but captures many of the operations that are both panned and ongoing):

Who	**Where**	**What - current**		**What - future**
		Platform	***Variables inc depth and frequency***	
AFBI	1. E-W Irish sea into L/Bay 2. Transect - Irish Sea to shelf edge 3. Malin shelf	RV	8 times per year EW, 4 times to Shelf Edge Vertical profiles: CTD, nutrient, chl, phyto, zoo, O2 Underway mapping nutrients, chlorophyll, TS,	Joint buoy deployment with Cefas Sea bed mapping Biological oceanography on Malin shelf
	North western Irish Sea	Buoy	CTD, nutrients, phytoplankton, multiple depths	ADCP sea bed with POL
	Lough Foyle	Buoy	CTD, fluorescence, surface	

Cefas	Celtic Seas	Buoy	Surface: CT, nutrients, phytoplankton, oxygen	Additional depths,
		Wavenet	Surface waves – height, period, direction, Temp	
		RV	Groundfish and Mackerel surveys Underway measurement FB, underway acoustics	
		Model	GETM-BFM	Future intention to implement fully coupled model in this region
POL	Eastern Irish Sea	Model	POLCOMS-ERSEM , nested model 12km to 200m in LBay	NEMO, unstructured grids
		Survey	9x per year LBay grid: CTD, Nuts, chl, O2, SPM, PAR, LISST Underway sampling on RV Prince Madog	Glider ?
		FB	Liverpool-Dublin : CT, chl, turbidity	Nutrients Liverpool Bay to Belfast
		Moorings	SmartBuoy x 2 –near surface measurements	
		Seabed lander	2x ADCP, CTD, Oxygen, turbidity	
		HF radar	Surface currents and waves	
		X band radar	Coastal bathymetry and waves	
		Wavenet		
		Fixed point	National tide guage network A class (CMF coastal moniotoring and forecast)	
SAHFOS	8 Routes	SOOP	Monthly, plankton distribution and abundance, 500+ entities identified, results within 9 months Pride of Bilbao route instrumented	Addition of water samplers for quantitative sampling of phytoplankton CTD, others sensors e.g O2
NOC	Portsmouth to Bilbao	FerryBox	Frequency 3-4 days transit time, Surface (5m?) CT, Oxygen, Fluorescence……. Accompanied cruise 1 per month – nutrients, chlorophyll, other pigments (HPLC), coccoliths (microscopy), total alkalinity and DIC,	
	Portsmouth to Caribean	FB	Benguela Stream –every calendar month, with UEA, CO2, TS, O2, Crew collect samples for nutrients, salinity	
		FB	Sea surface radiometer on PoB	

PML	Western Channel Observatory	Buoys	E1, L4; CT, Radiometer,	ADCP
		RV	E1, L4, weekly vertical profiles, HPLC, phyto, zoo etc	
		AMT	Annual/autumn	

4.2 Designing the future IBI-ROOS Observing system

For each of the countries we are missing a cost/analysis for each of the systems. This should be carried out within Jerico project if funded.

In order to progress in 2010 Julien Mader proposed a structured approach that relates the observing systems to the drivers and also to the capability of the different technologies: Then he proposed to establish priorities between the different drivers, the best suited technologies in each case , the funding capabilities and the capabilities in term of collaboration.

Julien proposed to perform this exercise through an Excel sheet that will be improved before the end of March. Then each member of the working group will fill this sheet for his country coordinating contribution from different institutes in the country. The goal is to be able to present a first consolidated draft at the annual EuroGoos conference.

H Dalhin mentioned that it was really important to pursue this activity as we , Eurogoos, are periodically solicited to provide to the European Commission, the EEA , Member States , … with a consolidated study on the observing system needed for operational oceanography both for GMES and downstream services .

The following drafting team volunteered to perform this exercise before summer 2010: Julien Mader, Jose Onofre, Guillaume Charria, Alicia Lavin, Enrique Alvarez, Glenn Nolan, Boris Kelly-Gerreyn, Ramiro Nevez.

4.3 Summary of the actions for 2010

- Draw a map of the 2009 and foreseen 2012 Observing system needed for IBI activities
- Work toward a consolidated roadmap preparing more complete cost analysis that could be funded within Jerico project *
    - Template: finalize before end of March
    - Fist version filled by institute/nation in June and first synthesis for September
    - Target to make a presentation at the EuroGoos annual meeting

5 Model Downscaling

5.1 Progress made in 2009

A lot of on going development have been carried out at national level in various domains. A complete report is provided in annexe 4

- Wave modelling at IMI and Previmer (World 6min resolution model and NORGAS 2 minute resolution model from 43°N to 58°N with local model with a resolution up to 150m)
- Improvement in forcing fields for wind and water shade (MeteoGalicia, Previmer)
- Improvement of regional model carried out by Mercator and Puertos Del Estado within MyOcean (see MyOcean section)
- Improvement of coastal models (AZTI, IEO, SHOM, Previmer, IMI, MeteoGalicia): Most of them are using boundary conditions from Mercator. Enhanced bathymetry has been tested in some models as well as improvements in forcing
- Downscaling to local scale has been presented for AZTI
- First promising results from ENSURF in the IBI area within ECOOP project: Ensurf allow ensemble prediction of storm surges that provide a better estimation that the individual models alone. It was agreed that it would be good to continue these developments and take into account other models. Previmer has launched a 2 year study to improve its storm surge model. This 5.6 km resolution model covers the North East Atlantic area (see website)
- Reanalysis: 1971-2007 long time run of coupled hydrodynamic-ecosystem model has been performed by Ifremer. Long Time series hindcast forced by different atmospheric models is also planned at Puertos Del Estado in collaboration with Météo-France is planned in the coming two years.
- Easyco: the project acts as an intermediate user between Core service and final user: It's important to show that studying coastal area is needed not only to better understand anthropogenic impact but also the exchange with deep ocean. Therefore downscaling from regional to coastal to local scale is a necessary step forward. We have overlapping model outputs and we can't provide the users all these models without explaining the differences

5.2 Summary of the actions for 2010

- Study how to start an inter-comparison between the different models in the Bay of Biscay to better understand eventual differences and have material to justify this variety in terms of targeted applications. Link with Easyco project.
- Continue the storm surge activity developed in ECOOP with involvement of other IBI partners.
- Request to MF to continue to provide to IBI partners storm surge data needed for storm surge inter-comparison after the end of ECOOP (Data Exchange Agreement…)
- Rosa to provide the ECOOP document to describe Model and targeted application to see if we can use it as starting point in the IBI area to better describe our models
- Study how to converge on a common bathymetry that could be shared between all the modelers (action Enrique and Jerome)

6 Towards applications

6.1 HAB Detection

Rosa Barciela presented the AlgaRisk project funded by the UK Environment Agency Algae08. It's a pre-operational system using satellite (Ocean Color + SST) and model (physic and ecosystem) information for harmful bloom warning service along south UK beaches. This is a willingness to extend it to fish a farming and aquaculture warning system. A similar talk could have been made by Yann-Hervé on Ifremer activities, Glenn on Irish one or Ramiro within EasyCo in the continuity of what was presented last year.

The group was originally chaired by P. Gentien and B. Reguera. The HAB group involves Ireland, France, Spain and UK. Since Dublin meeting two years ago, none of the chairs of this activity came at the IBI meeting. While there are fruitful collaboration at scientific level and it seems difficult presently to turn into operations developments made and involve this community within the IBI activities. Probably we have to wait for the Azimuth EU proposal to be funded to progress on the operational side of this activity within IBI. The Azimut proposal aims at developing with SMEs a GMES downstream service for HAB detection, forecast and alert to shellfish farmers in Spain, France, Portugal, Ireland and UK. It is lead by DOMMS (Daithi O'Murchu Marine Research Station), an Irish SME..

6.2 Toward Marine Safety Search & Rescue common activities

At 2009 IBI meeting we agreed that it was important to first assess what was available for "Marine safety, search and rescue activities" within the IBI area and identify the gaps that needed to be addressed. P Daniel agreed to coordinate the assessment work and present it at the IBI meeting in 2010.

The following working group was formed to work on this issue: P Daniel, Julien Mader, Pedro Montero, Rodrigo Fernandes , Marcel Curé , Yann-Hervé De Roeck, Jose Onofre .

Pierre provided a questionnaire to the members of the working group and only received Météo-France and Previmer answers. IST provided its input at the meeting and AZTI,IH and IMI apologized for not having answered and agreed to provide their input in the coming days. Enrique agreed that to provide a contact point at PdE as they are carrying such activities in Spain.

It was agreed to continue this assessment in 2010, that members of the working group should, if necessary, make the link with other institutes involved in Marine safety, search and rescue activities" in their country . It was also agreed to coordinate with NOOS who is doing similar work.

6.3 Summary of the actions for 2010

- Ecosystem, HAB : better define the objective of the WG and collaboration activities that could be carried out within the IBI framework.
- Continue the assessment work of the existing capabilities for "marine pollution and Search & rescue services" within the IBI area and in collaboration with the NOOS community

7 River Discharge

At last meeting it was agree to help Julien Mader updating the inventory made within the ECOOP project for the IBI area. We admitted that not much collaborative work has been done on this issue in 2009 .

Following the interaction with the French institute in charge of Flooding monitoring and forecast (SHAPPI) an automatic river data collection and integration within the IBI portal is under development and should be finalized before summer. Ireland has the policy to provide free access to the Irish river data and similar work should be feasible in Ireland too. Jose presented the Portuguese portal (http://snirh.pt/snirh.php?main_id=1&item=4.4&objlink=&objrede) that should allow IH to provide similar data provision for Portugal too. Accessing to similar data in Spain seems less trivial but last year it was mentioned that river data collection will be done within RAIA and shared with IBI. B Hackett did a complete inventory for the NOOS area and Rosa will try to get it for IBI and there are overlapping regions.

We agreed that we want to share the river outflow at the river mouths. It will be the duty of each local partner to integrate the different upstream flows to provide the relevant information at the mouth. We agreed to first focus on major rivers for which outflow have impact over the regional level.

Ifremer mentioned that Previmer will get access from Météo-France to 10 day river runoff forecast. Discussion with Met agencies should be initiated to share such forecasts with the IBI partners.

H Dalhin mentioned the E-HYPE model developed by SMHI that seems to work well in the NOOS area. Partners should keep the IBI members informed if there are E-HYPE progresses in the IBI area.

7.1 Summary of the actions for 2010

- Update the river runoff inventory with priority on major rivers for which outflow have impact over the regional level. IBI modelers could easily contribute to this inventory by sharing their input river data files (mostly climatological) A few explanations about the data processing and sources (GRDC, local database, etc…) would be useful. IBI Action on Julien
- Study possibility of getting watershed model forecast from meteo institutes that could be shared with IBI partners.
- Keep partners informed in E-Hype progress in the IBI area if any.

8 Link with Ospar and ICES

Yann-Hervé De Roeck pointed out that the Marine Strategy Framework Directive that was signed in June 2008 will rely on regional conventions such as OSPAR for the IBI area..The MSFD has the following timetable

- 2012: describe and assess of current environmental Status, define good status, establish environmental target et indicators
- 2014: monitoring status
- 2020 : reach good assessment

Even it's a national duty and commitment we will need to a regional approach (ecological objective, operational objective, indicators) where operational oceanography will have a role to play. We agreed to organize a meeting in Brest after Isobay 12 meeting (May 7th) to discuss on possible common IBI initiative focused on Operational Oceanography on MSFD

8.1 Summary of the actions for 2010

- Organize a meeting in Brest after Isobay meeting (May 7th) do discuss on possible common IBI initiative focused on Operational Oceanography on MSFD

9 Wrap session Workplan/actions for 2009

The action plan for 2010 has been discussed during each WG sessions and was summarized in 24 agreed actions recorded in annex 3.

UK offered to host next meeting in Exeter at the UK in February 2011.

The meeting was closed around 12:00 after thanking the local organizer Jose Onofre, Rita Esteves and the Instituto Hidrográfico for the support during the meeting.

Annex1 Agenda

Objectives of the meeting

- Review the actions and progress made towards the implementation of the Strategic plan
- Assess progress in data exchange and IBI-ROOS portal and identify weaknesses
- Define the Observing system needed for OO in IBI-ROOS area and priorities
- Assess progress toward an integrated system from regional to coastal to local in the IBI-ROOS area and identify improvement needed
- Define actions to develop downstream activities
    - o HAB : review progress
    - o Oil spill: review progress
    - o Link with convention (Ospar) and EU agencies (EEA, EMSA)

Tuesday February 2nd

Welcome from local host and logistic information.

General Issues

- → Report from the chairs on IBI- ROOS activities (MoU, WWW, Involvement in EU projects)
- → Feedback on MyOcean (S Pouliquen , Jerome Chanut, Yann-Hervé de Roeck)

Data exchange working group – Chair Sylvie Pouliquen & Marta Alfonso

- → Progress on data exchange within IBI-ROOS, (DEA, setting up the insitu Portal): Marta de Alfonso
- → Towards common QC procedures, feedback from MyOcean: Sylvie Pouliquen
- → Discussion on future Plan on Data Exchange

Observing System working group – Chair Julien Mader & Glenn Nolan

- → Update of the existing and funded observing system for IBI-ROOS and 2 year plan: Alicia Lavin, Glenn Nolan,Yann-Hervé de Roeck, José Onofre
- → The Jerico proposal: Yann-Hervé De Roeck
- → Define the future IBI-ROOS Observing system and the priorities
    - o Example of French proposal on observing system needed for Coastal Operational Oceanography: Guillaume Charria

Wednesday February 3rd

Observing System working group – The way forwards at the IBI level: Julien Mader

Model Downscaling - Chair Enrique Alvarez & Jérome Chanut

- → Progress made in 2009: Enrique & Jérome

Applications – Chair ??

Progress on HAB Detection in UK: Rosa Barciella

Progress on Oil spill: Pierre Daniel

- o Assessment on existing system and Needs: Pierre Daniel
- o Discussion on the way forwards

Thursday February 4th

Progress on River Discharge - Chairs Glenn Nolan & Julien Mader

Link with Ospar /WGOOFE/EEA - Chair Yann-Hervé De Roeck

Wrap session, Workplan/actions for 2010

Annex 2 Attendees

Name	Institute	Country
HANS Dalhin	EuroGOOS	
DANIEL Pierre	Météo-France	France
DE ROECK Yann-Hervé	IFREMER	France
POULIQUEN Sylvie	IFREMER	France
CHANUT Jérôme	Mercator Océan	France
LOUAZEL Stéphanie	SHOM	France
NOLAN Glenn	Marine Institute, Ireland	Ireland
ONOFRE José	Instituto Hidrográfico	Portugal
NEVES Ramiro	IST-MARETEC	Portugal
FERNANDES Rodrigo	IST-MARETEC	Portugal
AGOSTINHO Pedro	Qualitas Instruments	Portugal
MARTINHO António	Instituto Hidrográfico	Portugal
ALMEIDA Sara	Instituto Hidrográfico	Portugal
VITORINO João	Instituto Hidrográfico	Portugal
MADER Julien	AZTI-Tecnalia	Spain
LAVIN Alicia	Instituto Español de Oceanografia	Spain
RUIZ VILLARREAL Manuel	Instituto Español de Oceanografia	Spain
ALVAREZ Enrique	Puertos del Estado	Spain
DE ALFONSO Marta	Puertos del Estado	Spain
ALONSO MARTIRENA Andrés	Qualitas Instruments	Spain
BARCIELA Rosa	Met Office	United Kingdom
KELLY-GERREYN Boris	NOC	United Kingdom

Annex3 Action List

Over all consortium Coordination

1. Schedule a Steering team meeting at EuroGoos annual meeting and eventually a phone conference if needed
2. Partners to feed the Product catalogue with the product description of the model products agreed in DEA according to procedure provided by Sylvie
3. Partners to provide to Sylvie material for WWW site in terms of News, one page summary of Operational oceanography activities related to IBI.

Collaboration with MyOcean

4. IBI partners to register as MyOcean users by signing the SLA so that the user community in the IBI area is visible and recognized
5. P Bahurel to provide to IBI partners with a common text that they could use with their delegates to lobby for a consolidation of the MyOcean System as an integrated coordinated project for bridge phase.
6. IBI partners in WP18 to inform and interact with IBI community to provide their user requirements and also contribute to the users feedback (User Commissioning Forum in October 2010)
7. Organize the Validation of MyOcean IBI V1 model product to provide feedback in a coordinated manner
8. Jerome to provide when available documentation of metrics that are planned to be implemented within MyOcean for the IBI model in order to help a user assessment (cf. action 7).

Data Exchange

9. Finalize setting up of the IBI portal and synchronization between PdE and Coriolis servers.
10. Implement RT QC procedure as recommended by MyO for T&S and sea Level
11. Extend work within DataMEQ WG and involve other IBI partners especially for BIO product
12. Identify what is needed in term of long time series , identify potential provider , study eventual data policy issue…

Observing System

13. Draw a map of the 2009 and foreseen 2012 Observing system needed for IBI activities
14. Work toward a consolidated roadmap preparing more complete cost analysis that could be funded within Jerico project *
    - Template: finalize before end of March
    - Fist version filled by institute/nation in June and first synthesis for September
    - Target to make a presentation at the EuroGoos annual meeting

Modeling activities

15. Study how to start an inter-comparison between the different models in the Bay of Biscay to better understand eventual differences and have material to justify this variety in terms of targeted applications. Link with Easyco project.
16. Continue the storm surge activity developed in ECOOP with involvement of other IBI partners.
17. Request to MF to continue to provide to IBI partners with the storm surge data needed for storm surge activity after the end of ECOOP (Data Exchange Agreement…)
18. Rosa to provide the ECOOP document to describe Model and targeted application to see if we can use it as starting point in the IBI area to better describe our models

Towards Applications

19. Ecosystem , HAB : better define the objective of the WG and collaboration activities that could be carried out within the IBI framework.
20. Continue the assessment work of the existing capabilities for "marine pollution and Search & rescue services" within the IBI area and in collaboration with the NOOS community

River runoffs

21. Update the river runoff inventory with priority on major rivers for which outflow have impact over the regional level.
22. Study possibility of getting watershed model forecast from meteo institutes that could be shared with IBI partners.
23. Keep partners informed in E-Hype progress in the IBI area if any.

MSFD and OSPAR

24. Organize a meeting in Brest after Isobay meeting (May 7th) do discuss on possible common IBI initiative focused on Operational Oceanography on MSFD.

Annex 4- Working groups Reports

9.1 IBI-ROOS Data Management working group

At last IBI-ROOS annual meeting the following actions were decided. Since then some have been completed, some just started, really started and one delayed:

Action Status

1. DEA to be filled in (Annexes A and B) by members who are willing to sign;
2. Each observation provider to update the Data Centre Inventory with the FTP site for PdE and Coriolis to integrate the agreed data into the IBI portal;
3. PdE and Coriolis to continue the work on setting up the IBI Portals;
4. Product catalogue to be filled in by IBI members;
5. IBI Members to study possibilities of acquiring data from their research vessels;
6. Identify the key parameters and a strategy to set up a dataset for reanalysis purposes.

Most of the activities have been done in encouraging institute to sign the Data Exchange Agreement (action 1) and in setting up the IBI-ROOS Data Portal (Action 3)

For action 4 the tools are in place but presently only the IBI product registered for ECOOP are described. It's up to the partners to describe their product if they want to make them visible

For action 5, Coriolis need a will from partners to progress

For action 6 we plan t o start with Temperature and Salinity as these are the parameters we have commitment within MyOcean We may extend to other parameters if other institutes contribute

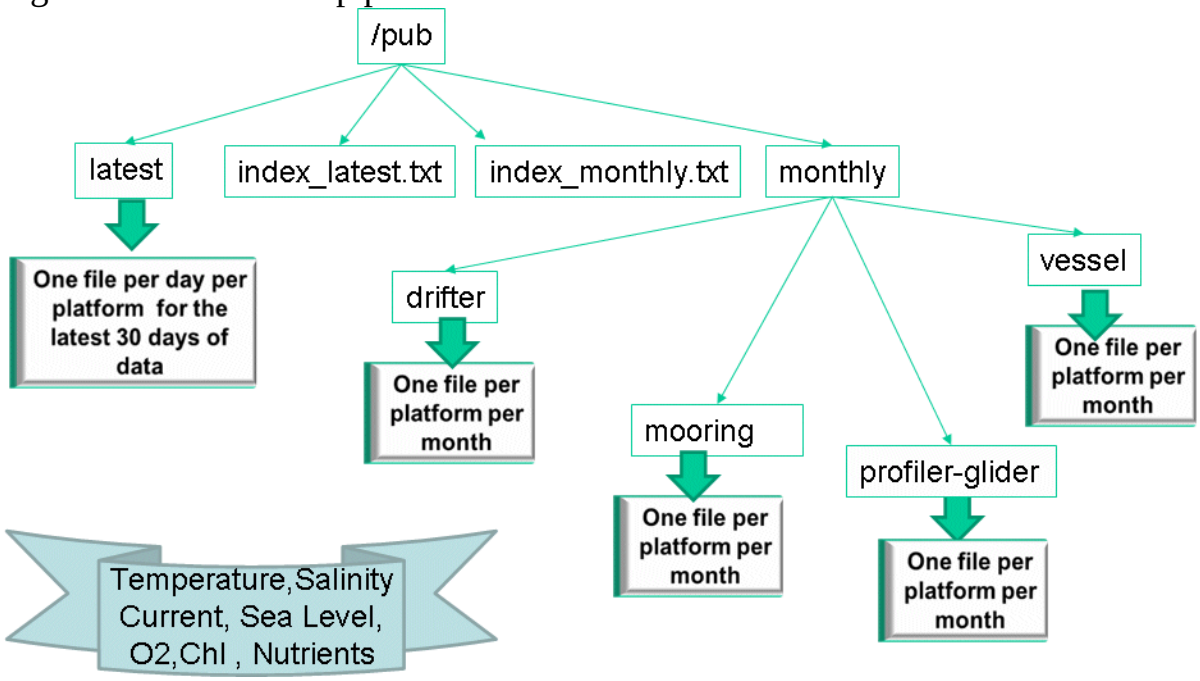
Concerning action 1, at the date of the report the following institutes signed the agreement:

1. Ifremer /France
2. MeteoGalicia / Spain
3. Instituto Hidrografico /Portugal
4. INTECMAR/ Spain
5. SHOM/ France
6. Puertos Del Estado/Spain
7. Mercator-Ocean
8. Euskalmet-Basque Meteorological Agency / Spain
9. AZTI
10. Marine Institutes

Concerning Action 2, the setting up the IBI-ROOS portal , the focus has been made on in-situ data . This work has been developed in the frame of MyOcean in situ TAC (Thematic Assemble Center) in order to develop with the other EuroGOOS Rooses a European ^portal for operational in-situ activities sustaining that way the exchanges started within the FP6 SEPRISE project coordinated by EuroGOOS

The in-situ portal has been set up according to the agreement made at last IBI-ROOS meeting. All the data have been converted in the NetCDF OceanSites V1.1 format by Puertos Del Estado for mooring data and Coriolis for underway and profile data

Following MyOcean In-situ TAC specification (v 1.3), the directory organization of each ftp portal is described below:



IBI-ROOS in-situ data portal progress
Coriolis - February 2010

It was decided last year, during 2008-2009 IBI-ROOS meetings at Dublin and Toulouse, to plan data exchange activities based on the following principles:

- Data producers must clarify which institutes will provide real time lagragian and underway data to IBI community.
- Coriolis will collect real time data from the data producers.
- Data will be integrated into the IBI in-situ data base at Coriolis and Temperature and Salinity data will be qualified according to QC procedure described in Coriolis user manual..
- A first version of the IBI Portal will be set up as an ftp site protected with a password.
- In the frame of MyOcean, and with the project resources, Coriolis, together with Puertos del Estado will upgrade the portal. The portal will have some key characteristics to be robust: mirror disks, massive storage, backup, OPeNDAP server...

In 2009 Coriolis has continued to integrate the data provided by the members and set up the Coriolis portal for IBI. Coriolis team have been working at EuroGOOS DataMEQ and MyOcean level to ensure that the architecture chosen for MyOcean was fulfilling IBI-ROOS needs, that it could be extended to fulfil additional IBI-ROOS requirements especially handle additional variables. It also worked with SeaDataNet to clarify the interfaces between the operational communities and the SeaDataNet network

Coriolis as work at French level to integrate in the IBI Portal the in-situ data collected by Previmer (Recopesca, Marel, Pagode) as well as some Previmer partners data such as SHOM tide gages and Schapi rivers

.

Despite the recommendations made at last IBI meeting no additional lagragian and underway data stream have been identified by the IBI-ROOS members. …This probably needs to be revisited!

Proposal for 2010 (the same as 2009)

Coriolis would like to foster the Data acquisition from research vessels (TSG, XBT, CTD) by offering to process the data that the institute are willing to send daily be email to the Coriolis center. This process is presently operational from Ifremer , IPEV and SHOM vessels, and VOS network coordinated by IRD and also have been tested on long periods from Cornide de Saavedra / Spain .

Coriolis would also like to work with IBI members integrate ferrybox data. In collaboration with Niva at European level within MyOcean.

Coriolis propose processing facilities for Recopesca if some countries would like to start to deploy such instruments. In the continuation of similar activities in the Med Sea, Coriolis is willing to integrate glider data if some are deployed in the area and access given to IBI…

IBI-ROOS in-situ data portal progress
Puertos del Estado - February 2010

During last two IBI-ROOS meetings, we stated a plan based in 5 actions to set up the in-situ data portal. Here we comment, one by one, the status of every action and the plan for next year:

1. Data producers must clarify which fixed stations will provide real time data to IBI community and they will permit access to the data.

- Complete for:
    - Ireland: Marine Institute buoys and tide gauges.
    - UK/France: Buoys managed by UKMO/MeteoFrance and POL and SHOM tide gauges.
    - Spain: Buoys and platforms managed by IEO, MeteoGalicia/Intecmar/XG and buoys and tide gauges from Puertos del Estado.
    - Portugal: IH buoy (MONICAN).

- In progress: Euskalmet stations.

2. Puertos del Estado will collect real time data from the data producers.

3. Data will be integrated into the IBI in-situ data base at Puertos del Estado.

- Done. Data is being collected and integrated into the IBI data base at PdE.

4. At National level, Spanish data (if desired) will be first distributed through Puertos del Estado to the GTS, Coriolis and SEPRISE and through the IBI portal when it is set up.

- Done. Spanish data from IEO, MG, PdE is being distributed.

5. In the frame of MyOcean, and with the project resources, Puertos del Estado will set up the IBI portal with a specific machine dedicated to it. The portal will have some key characteristics to be robust: mirror disks, massive storage, backup, OPeNDAP server...

- MyOcean machine delivery was delayed, so, PdE set up the portal in a shared machine and start to storage and distribute IBI data.
- At the end of 2009, PdE acquired a new machine, specifically dedicated to IBI portal.
- PdE is currently designing a new IBI database and is migrating all the procedures to this new machine.
- In one month (beginning of march) everything up and running.

To do in 2010:

- Finish setting up the IBI portal.
- Try to identify new providers and integrate their data.
- In the frame of MyOcean, facilitate data access with OPeNDAP server and graphical interface.
- Complete synchronization with Ifremer part of IBI portal.

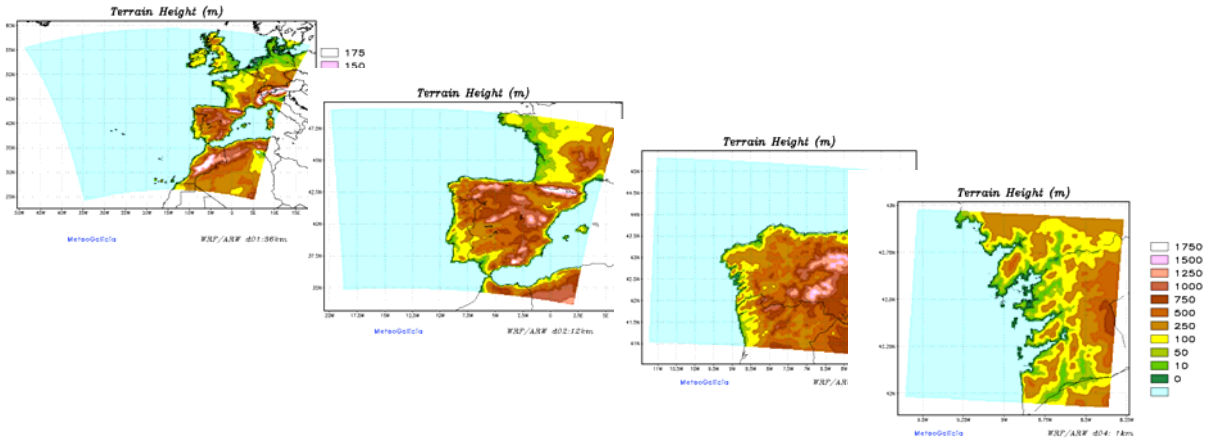
9.2 IBI-ROOS Model working group

This annex has the following parts, reflecting advances in several areas:

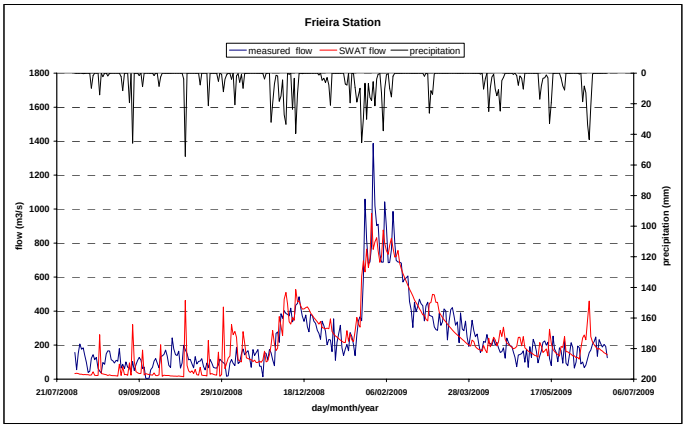
9.2.1 - Improvement in operational forcings
9.2.2 - Wave modeling
9.2.3 - Modeling circulation at coastal scale
9.2.4 - Modeling circulation at the local scale
9.2.5 - Ensemble work (sea level)
9.2.6 - Climate modeling

9.2.1 - Improvement in operational forcings

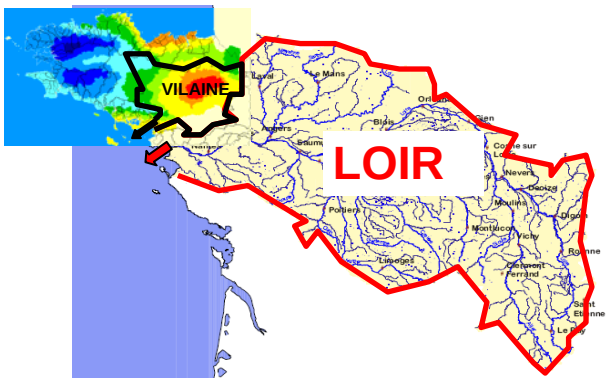
MeteoGalicia develop two WRF 1km resolution grids cover Galician coast in order to usr the data as forcing. Some tests with these grids were made and some improvements in parameterization schemes were made EASYCO project. Improvements were achieved in wind velocity inside the Rias and the expected changes in wind direction were obtained.



SWAT (Soil Water Assessment Tool) model was implemented by **Meteogalicia**. A study comparison against river flow gauge was carried out.



Ifremer has implemented a similar tool to deal with Loire and Vilaine watershed and performed a 3-year long run. The model provides 3x365 daily tracer concentrations in every mesh.

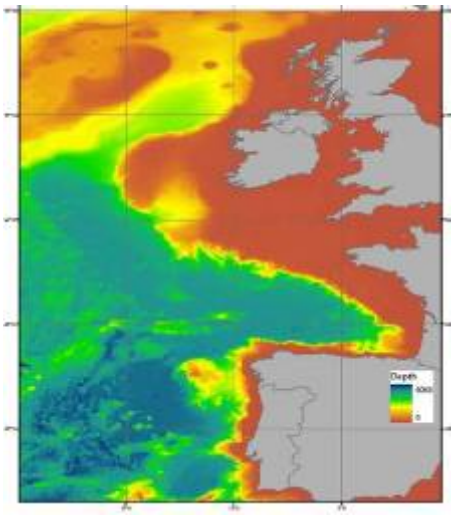


9.2.2 - Wave modeling

IMI has increased the simulation domain of its operational suite, having now the following characteristics:

- SWAN model
- 0.025 deg. Resolution
- GEBCO 2008 and MI bathymetry
- Daily run with 7 day hindcast-6 day forecast
- Forecast published on MI website

Model domain of the IMI operational suite:



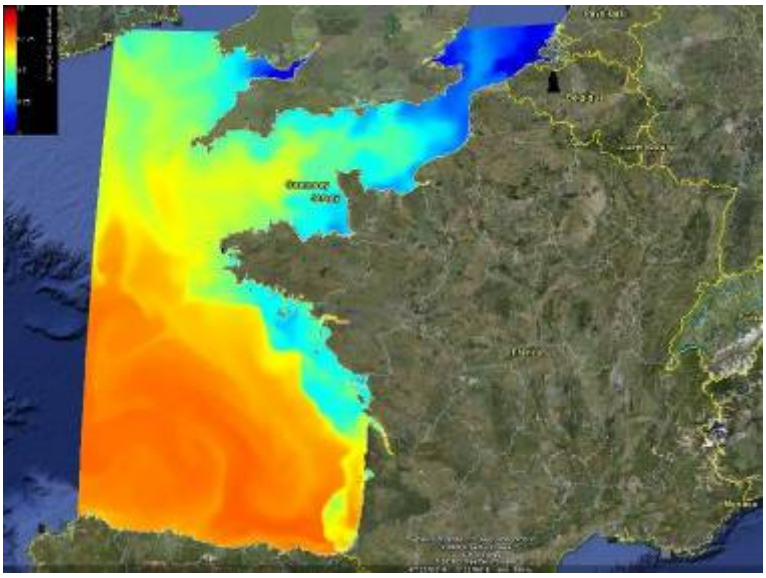
9.2.3 - Modeling circulation at coastal scale

Ifremer has been working on a Evolution of the Manga model. The model have been inproved 2009 by:

- Boundary conditions by MERCATOR (PSY2V3R1) in forecast mode
- Performance assessment of the model in the Bay of Biscay

Additionally, Several improvements were made in numerical model code (MARS V8.10):

- Parameterizations (heat fluxes, turbulence)
- Numerics (Generalized sigma coordinate system, new temporal scheme…)



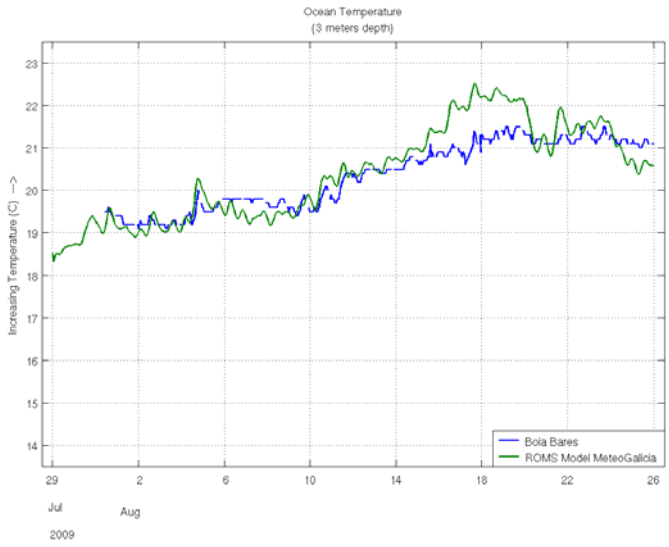
For 2010, the following advances are expected:

- Coastal surge with wave set-up, MARS2D-MANGA2500 (2.5 km) with Météo-France AROME HR forcing and BRGM wave-circulation coupling
- Non-othogonal curvilinear mesh for sediment transport and turbidity (mouth of Loire)
- ICHTYOP Lagrangian module for particle tracking: V3, parallel mode

MeteoGalicia has improved the operational application by means of implementing ROMS in the first level of nesting:

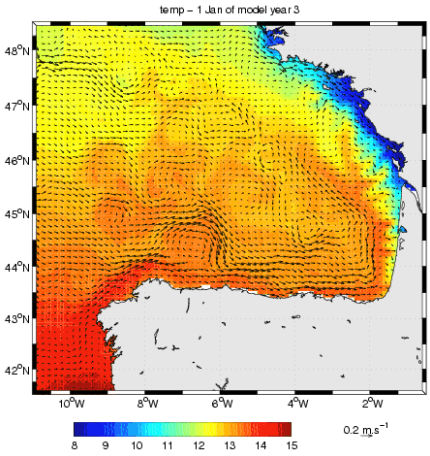
- ROMS model is been developed in order to force local MOHID domains
- Patterns defined by MERCATOR Model preserved, showing some differences in coastal values, forecasting more realistic temperatures.

Validation of the model with data from Puertos del Estado buoy:



AZTI has been working on the validation of the existing model in the bay of Biscay:

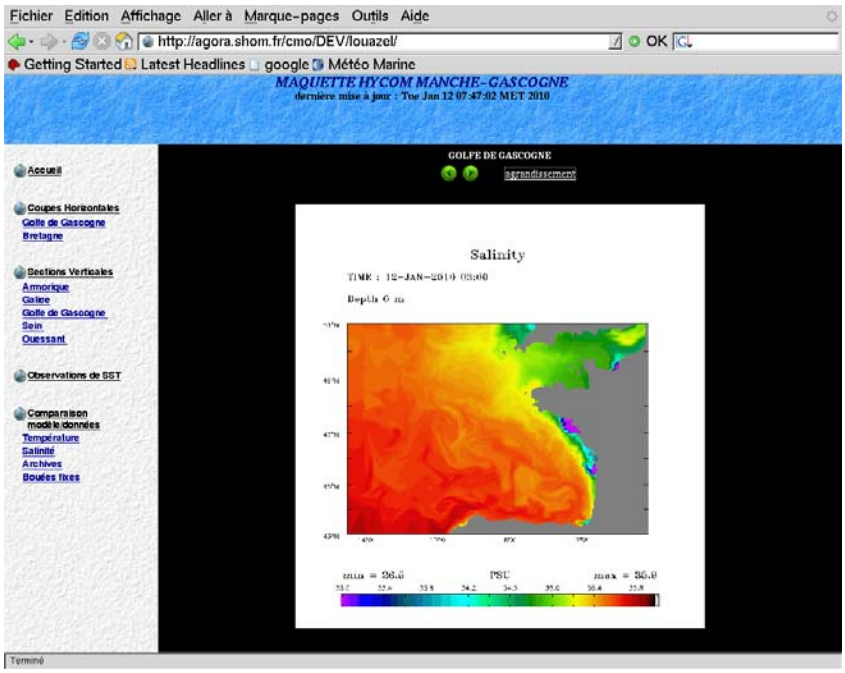
- Meso and large scales using remote data: SST / altimetry (future work)
- Shelf/slope circulation and HF frequency processes using in-situ data:
  - Good fit between atmospheric forcing and data offshore, worse at the coastal zone
  - Less satisfactory results for surface ocean currents (in progress)



SHOM is developing a system to include the bay of Biscay model in PREVIMER by 2010-2011 with the following characteristics:

- Mo data assimilation
- HYCOM model
- Met forcing : ECMWF or METEOFRANCE
- Tide
- Boundary conditions : Mercator
- Real time rivers outflows

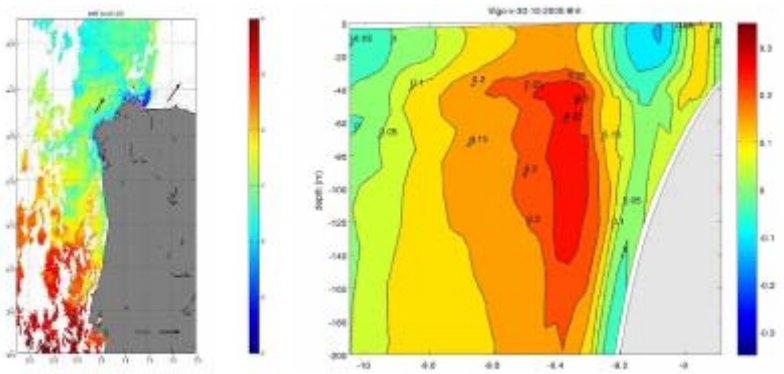
Model output;



IEO has operated the model in the North coast of Spain fro the following main applications:

- Fisheries: providing info on environmental conditions. Work on diagnosing the info "fisheries" scientists would need. Hindcast simulations in 2007-2009
- HABs: modelling shelf flows. Hindcasts for autumn 2005-2007

Hindcast of year 2005 showing alongshelf flows transporting HAB populations:

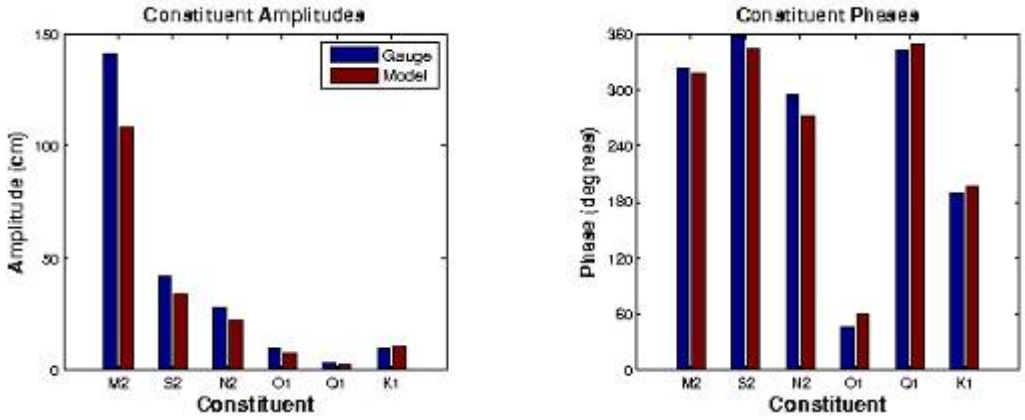


Additionally, a development of python based tools for "maintaining" coastal forecasts has been carried out

Future work for 2010 includes:

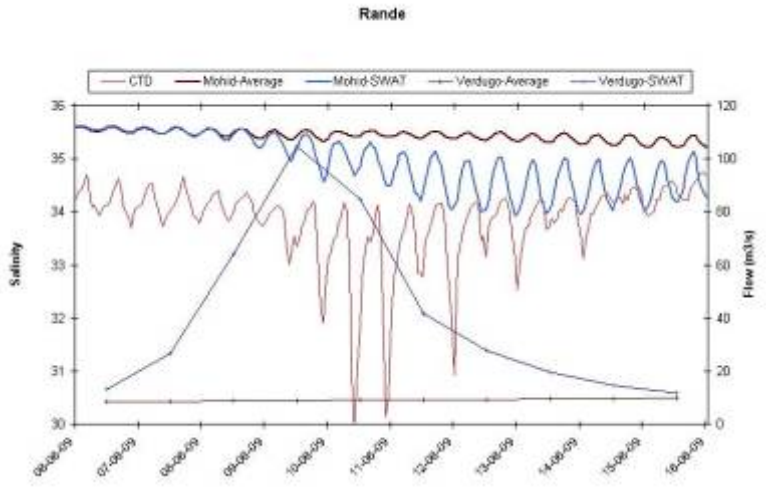
- Routine forecasts for RAIA from spring on.
- Setting up a biogeochemical model in order to provide information for higher trophic level models (REPRODUCE project together with Ifremer, Ipimar, AZTI, HCMR, Rutgers University...)

IMI has improved the bathymetry of its model. As a result, the model output has improved. The following example show the impact of the change in the tidal solution:



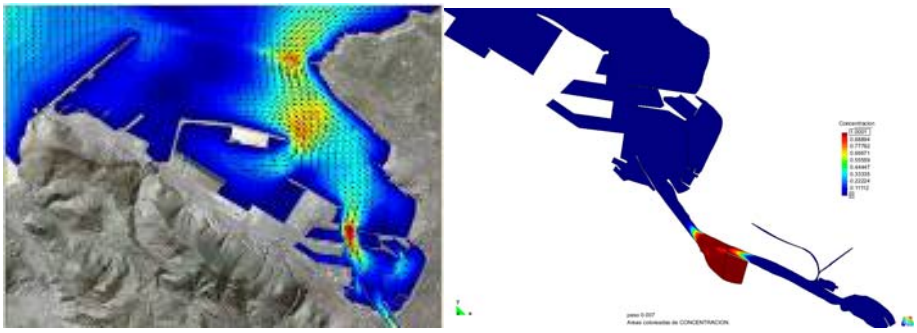
9.2.4 - Modeling circulation at the local scale

MeteoGalicia has tested SWAT at the coastal scale MOHID application for the Rias. Preliminary results show improvement at Verdugo Station when SWAT is included:



AZTI has been working with the basis of the operational application of the models for Bilbao and Pasajes:

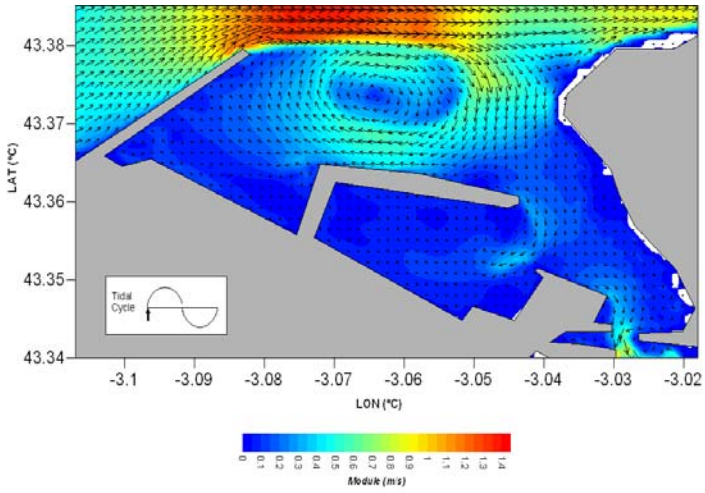
- Estimation of water renovation parameters for environmental quality management within harbors (MODELTOX and AMPLIRED projects)
- Improvement of pollution dispersion algorithms for local fields



The work for the incoming future includes application and validation of local models in Saturraran and Zarautz beaches for bathing waters quality prediction, using the MOHID modelling system (INTERREG IVa LOREA project)

Puertos del Estado has developed with LIM/UPC an operational model for the Bilbao Harbour with the following characteristics:

- Downscaling scheme: 2 different nesting levels domains
  - Coastal domain (CST_BIL; 200m horizontal resolution) covers the harbour adjacent waters
  - Harbour domain (PRT_BIL; 50m horizontal resolution) covers only inner harbour waters
- ROMS model used in all nesting grids.
- Atmospheric forcing: AEMET HNR (4Km res, 1h freq)



9.2.5 - Ensemble work (sea level)

Puertos del Estado has finished the ENSURF ensemble application, showing the benefit of applying BMA over each individual model:

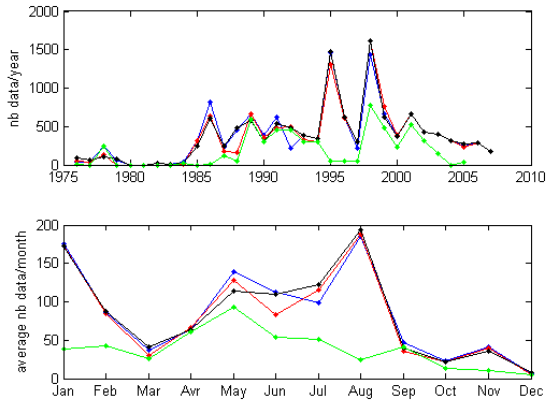
Modelo	RMSE
Nivmar	0.047
Eseoat	0.064
Mf-aladin	0.063
Mf-arpege	0.062
Mf-ecmwf	0.061
BMA	**0.042**

The ENSURF can be found at http://ensurfibi.puertos.es or at http://195.53.243.65/puertos.html

9.2.6 - Climate modeling

Ifremer has developed a long-time free run (1971-2007) using Mars3D coupled with ECOMARS and forced by ERA40 + Arpege, daily runoff of 4 rivers and OBC form Drakkar

Validation has been carried out with in-situ data



Puertos del Estado has launched a project with the Spanish Agency of Meteorology in collaboration with Puertos del Estado and MeteoFrance. The objective is to generate, through numerical modeling, regional ocean hindcasts and scenarios of waves, sea level residuals, circulation and total sea level with special focus in assess atmospheric forcing uncertainties. The Spatial domain will cover the whole Iberian Peninsula (25ºN – 50ºN / 21ºW – 40ºE)

Annex 5 List of the observations and model product provided by the institutes Who signed the DEA

IFREMER PREVIMER-F1-MARS3D-MANGA (96h forecast over English Channel and Bay of Bisquay) available throught FTP and OpenDAP

Data (name and code)	Technical Specification	Frequency of Release
XE (Sea Surface heigth m) (no tide , no atmospheric pressure)	2D Field 4km regular grid 1-hour results Bay of Biscay	Once a day
SAL Salinity (psu)	3D Field 4km regular grid 1 hour results 30 sigma level Bay of Biscay	Once a day
TEMP Potential Temperature (°C)	3D Field 4km regular grid 1 hour results 30 sigma level Bay of Biscay	Once a day
UZ zonal velocity (m/s)	3D Field 4km regular grid 1 hour results 30 sigma level Bay of Biscay	Once a day
VZ meridian velocity (m/s)	3D Field 4km regular grid 1 hourlresults 30 sigma level Bay of Biscay	Once a day

An updated version has been launched: PREVIMER-F1-MARS3D-MANGA4000 which use Mercator-Ocean PSY2V3 as boundary conditions and integrated MARS 8 latest code version.

IFREMER Coriolis

Data (name and code)	Technical Specification	Frequency of release
Coriolis IN-Situ T&S	Temperature/Salinity/Currents qualified In Situ data delivery for the whole IBI area	Once a day

METEOGALICIA WRF-Model

Data (name and code)	Technical Specification	Frequency of Release
Wind velocity and direction (u, v), 2m-temperature (temp), Sea surface temperature (sst), 2m-relative humidity (rh), Mean sea level pressure (mslp), Cloud cover fraction (cft), Precipitation (prec), surface downwelling longwave flux (lwflx), surface downwelling shortwave flux (swflx), Surface downward sensible heat flux (shflx), Surface downward latent heat flux (lhflx), land/water mask (lwm)	2D Field 4km grid around Galicia 12km grid around Iberian Peninsula 36km grid around SW-Europe 1-hourly results	Twice a day. 96h forecast

METEOGALICIA WW3-Model

Data (name and code)	Technical Specification	Frequency of Release
Significant Wave Heigth (hs), swell associated significant wave height (hswell), wind associated significant wave height (hswind), mean wave direction (dirm), peak wave direction (dirp), mean absolute wave period (tm-10), relative peak period (rtp)	2D Field 2.5' grid around Galicia 15' grid around Iberian Peninsula 0.5º grid around North Atlantic 1-hourly results	Twice a day. 96h forecast

METEOGALICIA SWAN-Model

Data (name and code)	Technical Specification	Frequency of Release
Significant Wave Heigth (hs), swell associated significant wave height (hswell), wind associated significant wave height (hswind), mean wave direction (dirm), peak wave direction (dirp), mean absolute wave period (tm01), relative peak period (rtp)	2D Field Two grids in Galician Coast with 250m and 500m resolution 1-hourly results	Once a day. 72h forecast

METEOGALICIA MOHID-Model

Data (name and code)	Technical Specification	Frequency of Release
Sea water temperature (temperature), Sea water salinity (salinity), Current Velocity and Direction (u, v), Sea Water Level (ssh)	2D Field 0.02º grid around Galicia 500m grid in Ria de Vigo 1-hourly results	Once a day. 72h forecast

METEOGALICIA Real Meteorological Data

Data (name and code)	Technical Specification	Frequency of Release
Wind, pressure, temperature, humidity and precipitation	71 Meteorological Stations.	10 minutes

INTERCMAR/METEOGALICIA Real Oceanographic Data

Data (name and code)	Technical Specification	Frequency of Release
Wind, pressure, temperature Currents, SST, SSS	2 buoys in Ria de Vigo, 1 buoy in Ria of Arousa	10 minutes

PUERTOS DEL ESTADO Real time met-ocean data in deep water

Data (name and code)	Technical Specification	Frequency of Release
Puertos del Estado Deep Water Buoy Network	8 SeaWatch buoys moored in deep water providing wind, air pressure, air temperature, Currents, SST, SSS, wave height, period and direction	Every hour

PUERTOS DEL ESTADO Real time coastal wave data

Data (name and code)	Technical Specification	Frequency of Release
Puertos del Estado Coastal Buoy Network	7 DWR coastal buoys (wave height, period and direction) and 3 Triaxys buoys (wave height, period and direction and SST).	Every hour

PUERTOS DEL ESTADO Real time sea level data

Data (name and code)	Technical Specification	Frequency of Release
Puertos del Estado Tide Gauges Network	30 Tide Gauges providing sea level.	Every hour

PUERTOS DEL ESTADO Ocean predictions from the ESEOO Ocean Forecasting System (Atlantic Regional Component: ESEOAT)

Data (name and code)	Technical Specification	Frequency of Release
PdE ESEOAT data Daily averages of 3D temperature, salinity, currents (U & V components) and sea surface height (data at every level on the vertical from the 34 S-levels).	3D Field 1/20º ~ 4 km (both in lon and lat) 34 S-level POLCOMS 3D baroclinic Model ESEOAT domain: 15.0W – 0.5W 32.0N – 48.0N	Daily data. 72h forecast horizon Daily updated forecasts

Data (name and code)	Technical Specification	Frequency of Release
PdE ESEOAT data Hourly averages of surface parameters (2D): temperature, salinity, currents and sea level.	2D Field 1/20º ~ 4 km (both in lon and lat) POLCOMS 3D baroclinic Model ESEOAT domain: 15.0W – 0.5W 32.0N – 48.0N	Hourly data. 72h forecast horizon Daily updated forecasts

PUERTOS DEL ESTADO Ocean predictions from the ESEOO Ocean Forecasting System (Canary Islands Component: ESEOCAN)

Data (name and code)	Technical Specification	Frequency of Release
PdE ESEOCAN data Daily averages of 3D temperature, salinity, currents (U & V components) and sea surface height (data at every level on the vertical from the 34 S-levels).	3D Field 1/20º ~ 4 km (both in lon and lat) 34 S-level POLCOMS 3D baroclinic Model ESEOCAN domain: 20.0W – 10.0W 24.0N – 33.0N	Daily data. 72h forecast horizon Daily updated forecasts

Data (name and code)	Technical Specification	Frequency of Release
PdE ESEOCAN data Hourly averages of surface parameters (2D): temperature, salinity, currents and sea level.	2D Field 1/20º ~ 4 km (both in lon and lat) POLCOMS 3D baroclinic Model ESEOCAN domain: 20.0W – 10.0W 24.0N – 33.0N	Hourly data. 72h forecast horizon Daily updated forecasts

PUERTOS DEL ESTADO Wave predictions from the PE/AEMET wave forecast system.

Data (name and code)	Technical Specification	Frequency of Release
Significant wave heigth , swell associated significant wave height, wind sea associated significant wave height, mean wave direction, mean wave period, peak period, wind speed and wind direction.	WAM Model 2D Field North Atlantic: Variable grid resolution from 1 to 0.25 degrees Cantabric coast: 2.5' grid Canary Islands and Gulf of Cadiz: 5' grid	Twice a day 72h of forecast Three hourly data

INSTITUTO HIDROGRAFICO WW3-Model

Data (name and code)	Technical Specification	Frequency of Release
Significant Wave Heigth (hs), swell associated significant wave height (hswell), mean wave direction (dirm), peak wave direction (dirp), mean absolute wave period (tm-10), relative peak period (rtp)	2D Field 1º grid in the North Atlantic 6 hourly results	Once a day, 144h forecast

INSTITUTO HIDROGRAFICO SWAN-Model

Data (name and code)	Technical Specification	Frequency of Release
Significant Wave Heigth (hs), swell associated significant wave height (hswell), mean wave direction (dirm), peak wave direction (dirp), mean absolute wave period (tm-10), relative peak period (rtp)	2D Field 0.1º grid around Portugal 6-hourly results	Once a day. 72h forecast

INSTITUTO HIDROGRAFICO MONICAN Project data

Data (name and code)	Technical Specification	Frequency of Release
Wind, pressure, air temperature, relative humidity Currents, wave, SST, salinity (conductivity), termistor chain, oxygen, and oil spill sensor	2 multiparameter oceanographic buoy (coastal and off-shore)	2 hours

INSTITUTO HIDROGRAFICO Tide gauge network

Data (name and code)	Technical Specification	Frequency of Release
Sea level	5 tide gauges: Viana do Castelo, Leixões, Nazaré, Peniche and Sesimbra.	2 hours

INSTITUTO HIDROGRAFICO Wave buoy network

Data (name and code)	Technical Specification	Frequency of Release
Wave height, direction and period	3 Datawell buoys in Leixões, Sines and Faro	2 hours

SHOM, FRANCE Tide gauge network

Data (name and code)	Technical Specification	Frequency of Release
Sea level	RONIM network - tide gauges – realtime stations in IBI-ROOS area	5 minutes

Meteorology and Climatology Directorate – Basque Met Service- Euskalmet
Real-time Oceanographic data

Data (name and code)	Technical Specification	Frequency of Release
Wind , pressure, temperature, currents, waves, SST, SSS	2 deep sea buoys in Matxitxako and Donostia (10 miles away from coastline) 6 Ocean-meteorological coastal platforms in Bilbao, Bermeo, Ondarroa, Getaria, Pasaia and Hondarribia harbours	Buoys data hourly Coastal platforms data every 10 minutes

MERCATOR OCEAN, FRANCE: PSY2V3 IBI standard grid products

Data (name and code)	Technical Specification	Frequency of Release
PSY2V3 IBI standard grid products. Daily averages of 3D temperature, salinity, currents, sea surface height, diffusivity, mixed layer depth and atmospheric forcing.	3D field Domain: 20°W-10°E; 26°N-64°N Data provided has been interpolated from ORCA 1/12° curvilinear grid onto a regular lon/lat grid at 1/12° horizontal resolution. Daily outputs.	Weekly 1 year (sliding window) analysis + 14 days forecast

AZTI, ROMS MODEL (BASQUE COUNTRY nested into a BAY OF BISCAY configuration)

Data (name and code)	Technical Specification	Frequency of Release
SSH (Sea Surface heigth m) (with tide , no atmospheric pressure)	2D Field 2.2 km Mercator grid 3-hourly results Basque Country Netcdf output	Once a day, 96-hour forecasts
SALT Salinity (psu)	3D Field 2.2 km Mercator grid 3-hourly results 32 sigma level Basque Country Netcdf output	Once a day, 96-hour forecasts
TEMP Potential Temperature (°C)	3D Field 2.2 km Mercator grid 3-hourly results 32 sigma level Basque Country Netcdf output	Once a day, 96-hour forecasts
U zonal velocity (m/s)	3D Field 2.2 km Mercator grid 3-hourly results 32 sigma level Basque Country Netcdf output	Once a day, 96-hour forecasts
V meridian velocity (m/s)	3D Field 2.2 km Mercator grid 3-hourly results 32 sigma level Basque Country Netcdf output	Once a day, 96-hour forecasts
Ubar (m/s)	2D Field 2.2 km Mercator grid 3-hourly results 32 sigma level Basque Country Netcdf output	Once a day, 96-hour forecasts
Vbar (m/s)	2D Field 2.2 km Mercator grid 3-hourly results 32 sigma level Basque Country Netcdf output	Once a day, 96-hour forecasts

AZTI, TRIMODENA MODEL (BILBAO and PASAIA harbours)

Data (name and code)	Technical Specification	Frequency of Release
U zonal velocity (m/s)	3D Field Irregular grid 3-hourly results Binary output	Once a day, 96-hour forecasts
V meridian velocity (m/s)	3D Field Irregular grid 3-hourly results Binary output	Once a day, 96-hour forecasts

MARINE INSTITUTE Real time met-ocean data (Irish shelf and adjacent Atlantic)

Data (name and code)	Technical Specification	Frequency of Release
Irish National Weather Buoy Network (INWBN)	5 ODAS/Fugro buoys moored on the Irish shelf and west of Porcupine Bank providing wind, air pressure, air temperature, SST, SSS, wave height, period and direction (Fugro systems only).	Every hour

MARINE INSTITUTE Real time physical and biological buoys (Ireland: West coast)

Data (name and code)	Technical Specification	Frequency of Release
Mobilis Coastal biogeochemical buoys	2 buoys moored in and around Galway Bay providing wind, air pressure, air temperature, SST, SSS, wave height, period and direction, pCO_2, fluorescence and Dissolved Oxygen	Every hour

MARINE INSTITUTE Real time coastal wave data

Data (name and code)	Technical Specification	Frequency of Release
Marine Institute coastal wave rider buoys	3 DWR coastal buoys (wave height, period and direction) in Galway Bay and Belmullet, Co. Mayo	Every hour

MARINE INSTITUTE Real time sea level data

Data (name and code)	Technical Specification	Frequency of Release
Irish National Tide Gauge Network	20 Tide Gauges providing sea level data	Every hour

MARINE INSTITUTE Ocean predictions from the IMI ROMS Regional model of the Irish region

Data (name and code)	Technical Specification	Frequency of Release
ROMS Regional model fields Daily averages of 3D temperature, salinity, currents (U & V components) and sea surface height (data at each S-level).	3D Field 1/25º ~ 2.5 km (both in lon and lat) 40 S-level ROMS 3D baroclinic Model Irish Regional Domain 20.0W – 0.5W 32.0N – 48.0N	Daily data. 72h forecast horizon Daily updated forecasts

MARINE INSTITUTE Wave predictions from the Irish region wave forecast system.

Data (name and code)	Technical Specification	Frequency of Release
Significant wave height , swell associated significant wave height, wind sea associated significant wave height, mean wave direction, mean wave period, peak period, wind speed and wind direction.	SWAN Model 2D Field NE Atlantic: 0-20W, 37.5-60N at 3km horizontal resolution	72h forecast produced each week day. Three hourly data.