Atlantic Stakeholder Platform Conference - 20 January 2015, Porto

Atlantic Coastal Operational Oceanographic Observatory

Abstract

Coordination between existing operational coastal observatories will improve the implementation and maintenance of oceanographic observing and forecasting systems, data quality control and dissemination procedures and adoption of common best practices.

Organiser: Vicente Pérez Muñuzuri (MeteoGalicia, Xunta de Galicia, Spain)

[Please insert here the names of your speakers and panellists of your workshop]

1. Glenn Nolan. Marine Institute. Ireland.
2. Antonio Jorge da Silva. Instituto Hidrográfico. Portugal.
3. Maria Luisa Bastos. CIIMAR Porto. Portugal.
4. Julien Mader. Fundación AZTI. Spain.

1. Key messages

[Please write here what are the three key messages from your workshop?]

1. Need to develop a network of operational coastal observatories addressing all scales associated with relevant phenomena in the continental margin – slope, shelf and littoral areas – covering the whole Atlantic Arc.
2. The network must include a set of forecasting systems (including risk assessments and early warning capabilities) that builds on the Copernicus marine service and maintain a sustainable integrated programme for surveying the coasts, the seabed and the water column, making use of in-situ as well as satellite-based observations.
3. High importance should be assigned to the development of innovative technological solutions to be implemented within the network while its worldwide dissemination should be promoted.

2. Summary

[Please provide here a short summary (200 words max) of each presentation given during your workshop.]

Title: Building EOOS and the Copernicus marine service

Speaker: Glenn Nolan. Marine Institute, Ireland

Europe has begun to put the building blocks of the European Ocean Observing System (EOOS) concept together. In the Galway Statement on Atlantic Ocean Cooperation the EU, US and Canada agreed a framework to better understand the Atlantic Ocean and to promote the sustainable management of its resources. The OceanObs 2009 conference also agreed on a Framework for Ocean observing based on user requirements, observations and data products. The AtlantOS project, recently funded under Horizon 2020 aims to further the objectives of both the OceanObs Framework and EOOS. AtlantOS will help define the observing system requirements, enhance ship-based and autonomous observing networks, examine cross-cutting issues between the coastal and open ocean and demonstrate the societal benefits of the existing and future planned observing system in the Atlantic basin. Any observing system will be dependent on the existing systems under the auspices of EuroGOOS, primarily the Regional Operational Oceanographic Systems (ROOSes) of which there are six in Europe at present. Considerable effort has also mobilised in setting up the Copernicus Marine Environmental Monitoring Service (previously MyOcean) whereby observations,

including satellite-based systems and ocean forecast models are combined to produce a seamless one stop shop service to a variety of applications and users including maritime safety, marine environment, weather and forecasting and marine resource exploitation. There are almost 5,000 users of this service at present. A major focus is now required on the production of downstream services at the national/local level. This includes the design and implementation of services that can be deployed on web-enabled devices to assist decision making in marine industries.

Title: When the ocean reaches the continental margin …IT IS ALL ABOUT BOUNDARIES!

Speaker: António Jorge da Silva, Instituto Hidrográfico, Lisbon (PT)

The modifications undergone by the ocean dynamics must be taken into account at all times when one aims to monitor a costal ocean area. Dynamic structures tend to be trapped by the boundaries. Scales of entrapment must be resolved by the in situ observational networks and adequate models must be employed when deriving products of interest to end users.

Most of the interaction between the continent and the ocean occurs at the continental shelf. Coastal upwelling is an ocean response to wind forcing taking place first at the inner shelf. So is the development of coastal currents induced by the joint effect of river runoff and winds blowing onto the shore. High velocities may occur under such conditions. But interaction between different domains of the coastal ocean must be taken into account when developing any product or service for one specific domain. Details of the cross-margin features, like submarine canyons or upwelling filaments are often crucial in export of material from the continent to the deep-sea.

In the littoral area, when the coastline is approached, surface waves are the forcing agent. They undergo major changes in direction and height, feel the bottom and break, giving rise to very strong though very short scale currents. The joint effect of these agents is responsible for longshore sediment transport while inducing major changes in the coastline.

The RAIA coastal observatory in the Euroregion Galicia – North of Portugal is a good example of a coastal operational observatory within the Atlantic Arc. The different scales of phenomena enumerated above are being tackled in RAIA when establishing the network of observational platforms, choosing the system of models and designing products for end users.

Title: Monitoring the Coastal Ocean

Speaker: Luísa Bastos, CIIMAR, Universidade do Porto (PT)

Coastal Observatories play a key role for the understanding of the ocean/land interactions, both at local and regional levels, and the implementation of reliable ocean forecasting models.

The methods used for the open ocean have spatial and temporal resolutions that are no suited to study small scale processes which are tightly coupled with local conditions. A denser spatial coverage is needed to characterize local phenomena. More efficient monitoring techniques and methodologies need to be implemented profiting the benefits of integrating different observation platforms (marine, space, aerial and terrestrial) and combining continuous in-situ data with periodic measurements, using mobile platforms, to extend the coverage and guarantee the long term monitoring needed to understand ocean variability, land/ocean interactions as well as anthropogenic impacts and human vulnerability.

Drivers for the implementation of coastal observatories should be to improve monitoring cost-effectiveness, developing easy to deploy and maintain low-cost, low-power consumption systems and sensors (including new biochemical sensors), supported by innovative power supply and data transmission solutions that guarantee the collection of multi-scale/multi-temporal data. Use of autonomous vehicles (gliders, AUVs, UAS, etc.) in a networked vehicle approach can augment efficiency in collecting and transmitting oceanographic data.

Atlantic coastal observatories networks can provide the frame for the establishment of common observation strategies and seamless data access and management to guarantee interoperability and maximize the efficiency

of these infrastructures in support to the scientific community and the industry and to answer major societal needs.

Title: Coastal scale: LOREA, cross-border synergy in south-eastern Bay of Biscay

Speaker: Julien MADER, AZTI

The project LOREA (INTERREG IVa 2008-2011) was developed as a result of a joint commitment between Aquitaine (FR) and Euskadi (SP). It aimed to provide tools and information to advise stakeholders on an active management of the coast. LOREA was designed to provide solutions for social, economic and environmental common challenges of the littoral area, from an Operational Oceanography point of view. Different tools have been developed for safety, drift prediction of pollutants and water quality monitoring. In 2014, a cross-border governance framework was created, which joined local administrations, research institutes, technological research centres and private companies. The group tries to address the future challenges in a coordinated way, together with other regions along the Atlantic coast. Main technical issues are promoted, like; the integrated implementation of innovative monitoring technologies; the link with the European Core services; the process oriented validation of forecasting tools; and the harmonization of data exchange protocols. Moreover, the different coastal observatories are envisaged to find synergies to provide new solutions in key development areas along the Atlantic coast, like coastal risk assessment for extreme events and climate change consequences, and promotion of the blue economy (renewable energy, aquaculture, coastal tourism, sustainable fisheries, etc.).

Title: Coastal scale: RAIA, oceanic observatory of the Iberian margin and littoral.

Speaker: Vicente Pérez-Muñuzuri, MeteoGalicia (Spain)

RAIA Observatory for the Euroregion North of Portugal – Galicia is formed by 13 partners covering operational, research and technological oceanographical fields. The Observatory, funded by POCTEP Interreg projects since 2009, has developed a network of coastal observations based on buoys and near-shore platforms. As well, different oceanographical, wave and meteorological models have been made operational and available for public use. Observational and model data are made available through WMS clients and Thredds services. Data exchange protocols between partners have been harmonized and are OGC compliant. Another important point of the Observatory is the vicinity of the end users so specific end user applications where the operational oceanography has an added value, have been provided and sustained operationally. Among others, some examples are a tool for barnacle fishers indicating when and where they may go to the sea safely, a table with weather and oceanographical forecasts sent to harbours and fishers on a daily basis, an App for smartphones to know the state of the beaches, a tool to know the best beach for surfing, etc. RAIA data contribute to IBI-ROOS and Emodnet platforms.

3. Questions and answers

[What main questions were raised by participants? What answers were provided?]

At the coastal observatories, which is the most used: real data or model forecasts?

Both have contributed to the users requests, although their demands are basically for robust forecasts that result from model predictions that are informed by observations, whether through data assimilation or validation of model results.

Where must be focused the technological efforts at the coastal level?

Novel products and devices that are simultaneously ingenious and low-cost should be top priority, as is the development of solutions to instrument “platforms of opportunity” operated by end users.

Deployment of cost-effective platforms/sensors that allow densification of the observation networks.

Development of new sensors to monitor biogeochemical processes.

Development of new power supply solutions that augment the autonomy of the sensors/platforms, and efficient low-cost communications that guarantee transmission of growing data volumes.

How to incorporate the end users to the operational oceanography?

They should be aware of the capabilities and limitations of the operational networks as well as stimulated to contribute to definition of products and services. On the other hand, the service providers and product developers must listen to the end users. One way to do it is through the organization of workshop for specific groups of end users. The RAIA Oceanic Observatory of the Iberian Margin and Littoral has organized such workshops and obtained an interesting return.

Involve end users in the data collection process through the promotion of citizens' ocean observatories.

4. Follow up

[What follow -up actions have been identified in your workshop? To be taken up by whom and by when?]

Identification of the main partners in the Atlantic Arc that may contribute to the establishment of a network of coastal observatories and design of joint proposals to be considered for financing in the next Interreg Atlantic Programme. The MyCOAST project proposal, which was already submitted last year (and was nearly approved) will be the basis for this new proposal.

5. Next Atlantic Stakeholder Platform Conference

[Would you be interested in reporting back on the progress made since Porto at the next Atlantic Stakeholder Conference, which is to take place towards the end of 2015 (date and place TBC)?]

Yes