

JERICO : A JOINT EUROPEAN RESEARCH INFRASTRUCTURE NETWORK FOR COASTAL OBSERVATORIES SUPPORTING MARINE RESEARCH IN THE MEDITERRANEAN SEA

I. Puillat ^{1*}, S. Sparnocchia ², P. Farcy ¹, R. Bozzano ², M. Borghini ², L. Coppola ³, S. Cusi ⁴, N. Medeot ⁵, R. Nair ⁵, M. Ntoumas ⁶, A. Olita ², S. Pensieri ², G. Petihakis ⁶, A. Ribotti ², S. Ruiz ⁴, K. Schroeder ² and J. Tintore ⁴

¹ Ifremer Centre de Brest, FR, jerico@ifremer.fr - ingrid.puillat@ifremer.fr

² CNR ISMAR, IAMC and ISSIA, La Spezia, Genoa, Oristano, Trieste and Venice, IT, stefania.sparnocchia@ts.ismar.cnr.it

³ CNRS Observatoire Océanographique de Villefranche, FR

⁴ CSIC-UIB/IMEDEA and SOCIB, Mallorca, SP

⁵ OGS, Trieste, IT

⁶ HCMR, Heraklion, GR

Abstract

Existing coastal observatories in European waters are composed of platforms such as moored buoys, piles, profiling systems, gliders, 'ferryboxes' and automated systems on board ships of opportunity. JERICO project strives to integrate existing infrastructures and provides a platform for the identification and dissemination of best practices for the design, implementation, operation and maintenance of observing systems and the dissemination of data. In order to reach these objectives several kinds of actions are undertaken, amongst which the offer of Trans-National Access (TNA) to a number of coastal observatories and calibration facilities for international research and technology development. This presentation will give a short overview of the selected Mediterranean TNA proposals and a focus will be drawn on some of the TNA results.

Keywords: Instruments and techniques, Coastal engineering, Ligurian Sea, South-Western Mediterranean, North-Western Mediterranean

Coastal observatories dotted along Europe's coastlines deliver a wealth of information on the state of its seas. These observatories are composed of moored buoys, piles, profiling systems, gliders, shore-based HF radars, 'ferryboxes' and automated systems on board ships of opportunity (e.g. fishing boats). JERICO strives to integrate these observatories at the European level, and provides a platform for the identification and dissemination of best practices from the design to the operation and maintenance of observing systems and the dissemination of data. It aids in the optimization of the use of existing infrastructures and in the promotion of interoperability. It has also initiated research to advance the state of the art, and has invited the international scientific community to access key infrastructures. In order to reach these objectives several kinds of actions are undertaken, amongst which the offer of Trans-National Access (TNA) to a selection of coastal observatories and calibration facilities operated by the JERICO Consortium for international research and technology development. A primary objective is to mobilize scientists and engineers across Europe, encouraging firstly those who haven't such facilities at their disposal in their countries. The access offered by JERICO includes ferryboxes, fixed platforms, gliders, and associated support calibration laboratories and a dozen of them are located in the Mediterranean Sea. This presentation will give a short overview of four Mediterranean TNA experiments selected after the first TNA call in 2012 and will focus on a selection of scientific results introduced hereafter. Two of them address calibration and the other two explore scientific themes of interest for the Mediterranean community.

Calibrating sensors regularly is the prime requirement for getting reliable data from coastal observatories and ensuring their long-term relevance as viable providers of information on the marine environment. The OGS-Oceanographic Calibration Centre in Trieste and the calibration facilities at the HCMR Thalassocosmos complex in Crete hosted users for calibration experiments. The first one was accessed by a HCMR team that wished to improve their experience in calibrating high-quality oceanographic temperature sensors using primary ITS-90 reference standards. The experiment involved full calibrations of two SBE 35 thermometers from Sea-Bird Electronics, Inc. owned by the HCMR that will be used as reference sensors for temperature measurements in their calibration laboratory in Crete (Greece). The second one was accessed by a team from CNR-ISSIA with the purpose of enhance the accuracy of dissolved oxygen, chlorophyll-a and turbidity probes used for *in-situ* observations on a long term basis in the W1-M3A off-shore observing system in the Ligurian basin. The performed experiment allowed obtaining an extremely accurate laboratory calibration and a test at sea for oxygen and fluorescence sensors.

Gliders make oceanographic measurements traditionally collected by research vessels or moored instruments, but at a fraction of the costs. The CSIC/IMEDEA gliders infrastructure was accessed by a team from

CNR/IAMC Oristano to study the central part of the Algero-Provencal sub-basin, representing a buffer area between the northern Provencal sub-basin and the southern Algerian one, characterized by the presence and action of the Balearic front. The experiment is midway, and a first mission was just concluded, with the deployment of a Seaglider which flew from the surface to about 1000 m following a route between the Balearic Islands and Sardinia. A second mission is planned in early Autumn 2013. This transect is also annually monitored by CNR with CTD and LADCP during oceanographic cruises. The data collected during the glider missions and oceanographic cruises will help to assess the inter-annual variability of physical and biochemical properties of water masses and to understand the exchanges of salt and heat through the sub-basins in the western Mediterranean.

Fixed platforms allow long term -sensor testing and -measurements. The presented experiment is led by CNRS/OBS-VLFR and consists in the implementation of automatic Dissolved Oxygen (DO) measurements in the mooring operated by CNR/ISMAR in the Corsica Channel (Ligurian Sea). The deployment began in November 2012 and is planned to last for twelve months under the aegis of JERICO TNA, then it will continue for at least other six months as a collaboration of CNR/ISMAR, CNRS/OBS-VLFR and the Mediterranean Institute of Oceanography. The final purpose of the research is to integrate the DO concentration in the long term time series data in the Ligurian basin to track and evaluate the water mass variability and to estimate the time lag between the eastern and the western part of the Ligurian Sea. Further observations regularly acquired by sensors installed on the mooring and data collected during the periodic maintenance cruises, will be available for completing the study.

The development of high-quality and comprehensive coastal observing systems has only recently moved forward, principally at national and regional level. In this overall context, the JERICO project aims at creating a solid and transparent organization towards an operational service for the continuous and sustainable delivery of high quality environmental data and information products related to the marine environment in European coastal and shelf seas. It promotes joint research initiatives and standardisation as illustrated by TNA experiments.

References

- 1 - Farcy P. and Puillat I., 2013. JERICO Interim Periodic Activity Report, 80p.http://www.jerico-fp7.eu/attachments/article/176/D11.4_Periodic-activity-report-M1_18.pdf.
- 2 - Sparnocchia S., 2012. First call for TNA. JERICO deliverable D1.1. http://www.jerico-fp7.eu/attachments/article/142/D1.1_first%20TNA%20call.pdf