

FIXO3 NETWORK PROJECT: INTEGRATION, HARMONIZATION AND INNOVATION

Richard Lampitt ¹, Vanessa Rossana Cardin ^{2*} and FixO3 Consortium ¹

¹ National Oceanography Centre, Southampton, United Kingdom

² OGS Borgo Grotta Gigante 42/c - vcardin@inogs.it

Abstract

The Fixed point Open Ocean Observatory Network (FixO3, <http://www.fixo3.eu/>) project is an European project coordinated by the National Oceanography Centre (NOC), which objective is to integrate 23 in situ platforms operated by European organizations and to improve access to data and services they provide for the broad ocean community. Started in September 2013, FixO3 has produced several outputs useful for scientists, industry and policy-makers beyond the project partners.

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FixO3 is an international project that involves 29 partners from academia, industry and research institutions from 12 European countries. The programme is structured in 12 work packages (WPs) that carry out three different types of activities:

1. Coordination activities (COORD) to integrate and harmonise the current procedures and processes
2. Support actions (SUPP) to offer free access to observatory infrastructures and open data services and products
3. Joint research activities (RTD) to innovate and enhance the current capability for multidisciplinary in situ ocean observation.



Fig. 1. FixO3 observatories distribution

One of the main aims of FixO3 is to harmonize technologies and procedures. A major achievement in this direction has been a detailed review and complete synthesis of the current operational status of all observatories included in the network. Each observatory has a dedicated page with details on the study area,

the platform status and maintenance, information on data provided, hardware and software, and a list of all sensors mounted on the platform.

An inventory of new sensor developments and their applicability has also been carried out within the technological harmonization and is available to project partners. The inventory includes sensors for pH, pCO₂ & pH/pCO₂, ADCP, CTD, tide recorders, hydrophones, current meters and underwater technologies (mass spectrometer, HD camera, acoustic modem). This inventory constitutes an update of the ESONET Yellow Pages, a public database of all available sensors along with their specifications.

The available documentation related to the observatory is collected in a library of instrument-specific preparation, deployment & calibration techniques, a catalogue for all the data managers and instrument developers and technicians who need to access quickly the reports and manuals related to an observatory in the network.

A handbook of best practices for observatory operations has been compiled to gather all common methodologies and protocols on pre-deployment, deployment and recovery and post-deployment within the network and to provide recommendations on sampling, calibration, the latest anti-fouling measures, Q/C methods for high quality products.

Open access to data & visualization of available parameters from all the observatories is made available through EarthVO (Earth Virtual Observatory), a powerful and versatile tool that enables users to easily view and compare parameters and observatories on a variety of fixed and mobile devices.

Two more essential tools have been made publicly available to facilitate data and metadata availability: a standards & services registry complying with GEO to enable effective interoperability among FixO3 data archives and a searchable metadata catalogue that collects and indexes the metadata of data hosted within the several data archives used by the FixO3 community.

A cost-benefit analysis has been carried out to justify Eulerian observations. The report summarises the rationale behind sustained open ocean observatories, provides an estimate of the costs to operate a typical fixed-point observatory and assesses the type of data and services provided and their value for society.

Service Activities (SA) give access to fully-process multidisciplinary data services and products from 18 fixed-point multidisciplinary open ocean observatories included in the FixO3 network. They demonstrate direct applications, such as maps of ecosystem indicators over European seas, or model validations with respect to in-situ data. In addition, FixO3 provides highly derived information products such as regional trends in ecosystem function and diversity.

Through a targeted action for transnational access to infrastructures (TNA), FixO3 supported external users by providing fully coordinated logistical and financial support to 13 of the 23 observatories included in the network.

An inter-comparison experiment has been carried out at a test site in a coastal environment to evaluate the performance of pCO₂ sensors and compare 10 instruments.

The FixO3 project is due to end in August 2017 and more data and tools will be available for the scientific community to use and apply in other contexts and projects.

References

- 1 - Cristini L. et al. (submitted): Costs and benefits of multidisciplinary fixed-point ocean observatories. JMPO_2016_48