

# ID21-RADAR ON RAIA: HIGH FREQUENCY RADARS IN THE RAIA OBSERVATORY

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## Abstract

The RADAR ON RAIA project aims to update and extend beyond the Galician border the High Frequency (HF) radar network that has been operating since 2011 in the framework of the RAIA Observatory. The Project is allowing the establishment of a cross-border collaboration beyond the physical infrastructure itself, developing a sharing strategy of maintenance procedures, validation and data processing on both sides of the border, as well as an easy and public access to all the information.

In addition, new products are being developed to exploit the potential of the HF radar technology.

## Keywords

HF radar, validation, data management, currents, waves, wind direction, products and services, RAIA Observatory

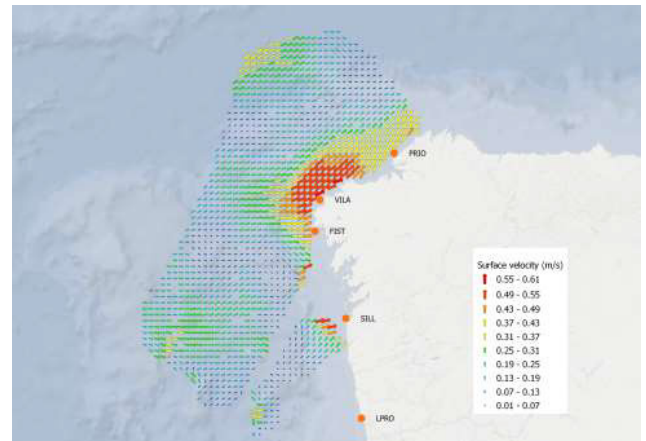
## INTRODUCTION

The RADAR ON RAIA project (<http://radaronraia.eu/en/>) aims to update and extend beyond the Galician border the HF radar network in the RAIA Observatory throughout the Consolidation of a cross-border HF radar network; fostering and sharing new methodologies of Data validation and management; the implementation of a common Spatial Data Infrastructure and finally the development of Products for end users. RAIA Observatory is a cross-border ocean observing and forecasting system at the coast and shelf of the NW of the Iberian Peninsula (Galicia-Spain and N of Portugal). RAIA relies on three basic pillars: (1) an observing infrastructure, (2) modeling capabilities, and (3) the provision of services through the portal [www.marnaraia.org](http://www.marnaraia.org). This observatory was initiated in 2009 and is in constant evolution and facing new challenges. Support received through projects such as RAIA, RAIACO, RAIATEC, MarRISK and more recently RADAR ON RAIA (all financed by the European Regional Development fund (ERDF) through the INTERREG V-A Spain-Portugal program-POCTEP) have enabled the RAIA Observatory to develop and increase its capabilities to support coastal communities.

## PRELIMINARY RESULTS

Consolidation of a cross-border HF radar network

Currently, the extension and consolidation of the HF radar network through the integration with other pre-existing ocean observation infrastructures has been achieved thanks to the installation of Leça de Palmeira antenna. A new HF radar station (13.5MHz) for Leça da Palmeira has been installed and integrated (Figure 1) in the HF radar Galician Observation System. At the same time the adjustment of the Cabo Fisterra antenna and the start-up of Ría de Vigo network is taken place to get a greater coverage area in the Galicia and North Portugal region. Besides, it is expected to develop a common management strategy at both sides of the border and a traceability study of the radial and total current data of all HF radar sites (5MHz, 13.5MHz and 42.6MHz).



## Data validation and management:

The proper operation of all equipment is ensured thanks to the homogenization of maintenance procedures, standardization of data formats and their accessibility as well as data quality monitoring in near real-time.

Complementarily, the assessment of the accuracy of surface current velocities and waves measured by HF radar systems from a geophysical point of view is tackled by Eulerian and Lagrangian validations. A number of drifters with different drogues have been built and released during lagrangian experiments conducted in the framework of the project, some of which are still ongoing.

## Spatial Data Infrastructure:

In order to assuring data accessibility through the development of a spatial data infrastructure, compatible with the RAIA Observatory, some partners are working on: a) the standardization of radial, total and interpolated current data in a single format with a unified list of metadata; b) the consolidation and start-up of the catalogue, display and download services based on the standards for their exploitation. This spatial data infrastructure will be the basis for the development of a training course, which will contribute not only spreading the use of HF data but also fostering ocean literacy initiatives.

## Products for end users:

Finally, the development of products and services to support an efficient management of the marine environment based on the HF radar network of the RAlA Observatory is one of the ultimate and promising goals of the project. A wide range of products are being obtained involving all the variables derived from HF radar technology. The design of a web portal, composed of discovery, viewer and downloader services, based on Open Geospatial Consortium (OGC) emerging norms and following INSPIRE directive, will help to distribute not only general products but also specific stakeholders' applications.

At a starting point, we are working on implementing three specific products: 1) upwelling index derived from HF radar-derived surface currents [1] along with other indices such as those calculated by the Spanish Institute of Oceanography; 2) operational observation of waves from HF radar stations [2]; 3) combined product consisting of daily averages calculated from HF Radar and buoy winds, and daily satellite data (SST and Chl a Level 4 products) served by Copernicus. Other products developed in the project include surface currents in a homogenous spatial grid, wind fields from HF radar spectra and Lagrangian Coherent Structures (LCS) from HF radar data.

### CONCLUSIONS

The RADAR ON RAlA project aims to update and extend beyond the Galician

border the HF radar network that has been operating since 2011 in the framework of the RAlA Observatory. The cross-border infrastructure allows to give support to decision makers in key maritime sectors like Safety and Security at the sea, Marine Renewable Energy or Spatial Planning which will contribute to the development of a sustainable Blue Economy.

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