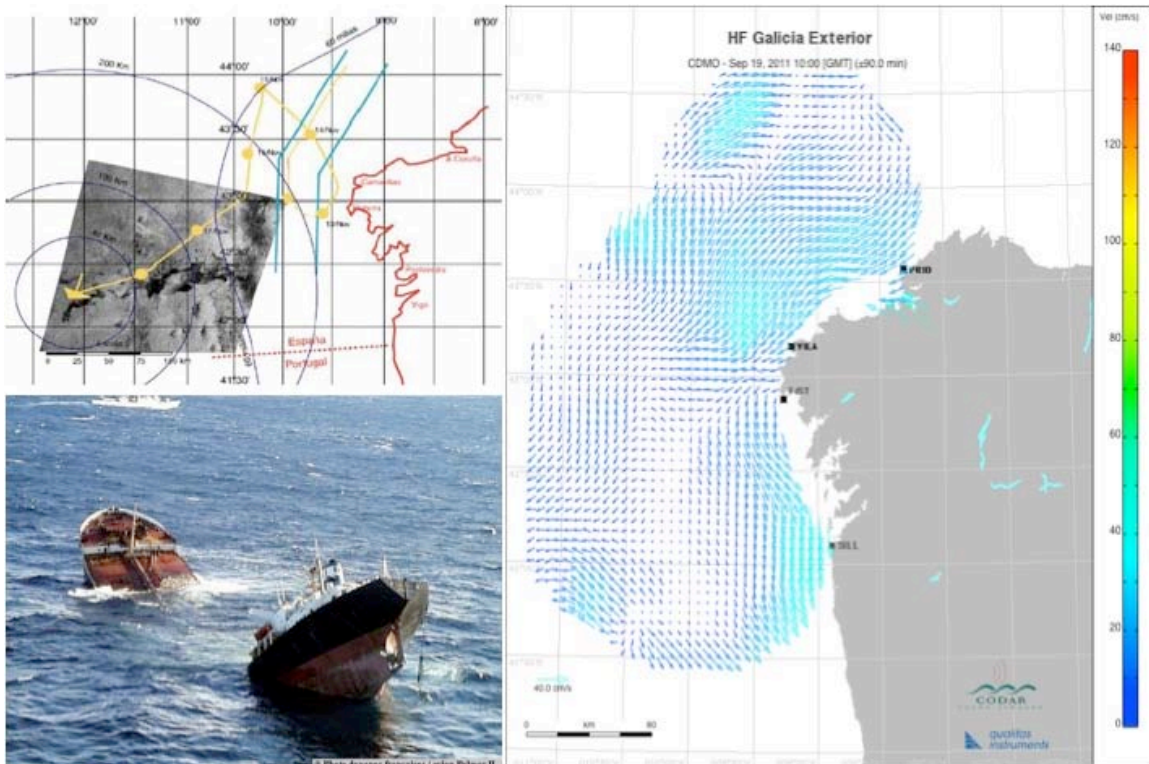


Galicia expresses its commitment with marine sciences and marine environmental protection inaugurating the widest HF Radar observing system in Europe

In 2002, the Prestige oil spill disaster off the northwestern coast of Spain acted as a wake up call highlighting the importance of preparing for such a crisis. It led to Spanish and Galician government prioritizing the improvement of maritime protection related activities; operational oceanography and oil spill response preparedness.

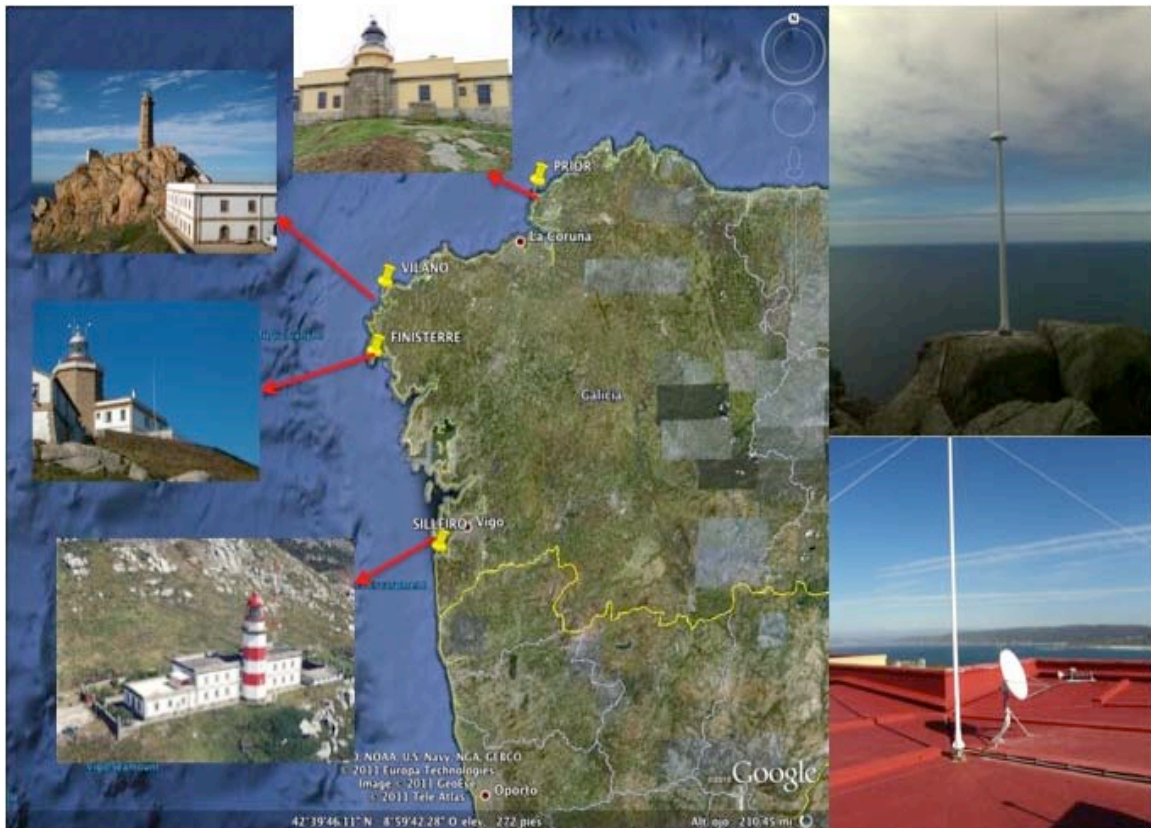
Back in 2005 a cooperation agreement aimed to increase marine safety and efficient harbors management was signed between Puertos del Estado and the General Directorate of the Merchant Marine of the Spanish Ministry of Public Works and the Galician Government. One of the primary focuses of the agreement involved the development of advanced ocean observing infrastructures and, as an essential element, the installation of an HF coastal Radar network, which has become the largest HF Radar network in Europe. It was installed and is being operated by the engineering company QUALITAS Remos.



*Upper left: Trajectory followed by Prestige (in yellow), mostly within HF radar coverage now.
Bottom left: Prestige ship sinking. Right: Currents vector map for Galicia HF radar network.*

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Today, in 2011, the network is made up of four CODAR SeaSonde long range 5-MHz Radars that provide real time surface currents and wave information along the Atlantic Galician Coast from Sillesiro in the south to Prior in the North (280 km or 75 % of Galicia coast) and with a range of up to 200 km from the coast. This network is completed with the more advanced system operation practices and state of the art geophysical visualization interfaces as part of institutional websites (Puertos del Estado and Xunta de Galicia).



Left: Different locations of each HF Radar station inside lighthouses' buildings.

Right: HF radar antenna and satellite communication solution

The locations of the four HF radar stations are lighthouses situated in, from south to north, Silleiro, Finisterre, Vilano and Prior. Unique compactness of SeaSonde HF radars, its patented GPS synchronization frequency sharing technology together with the highly specialized and experienced team of persons involved in the project, both on the contractor side and in the public institutions, have been decisive for the successful implementation, operation and maintenance over the years of the observing network along a rough but precious coastline.

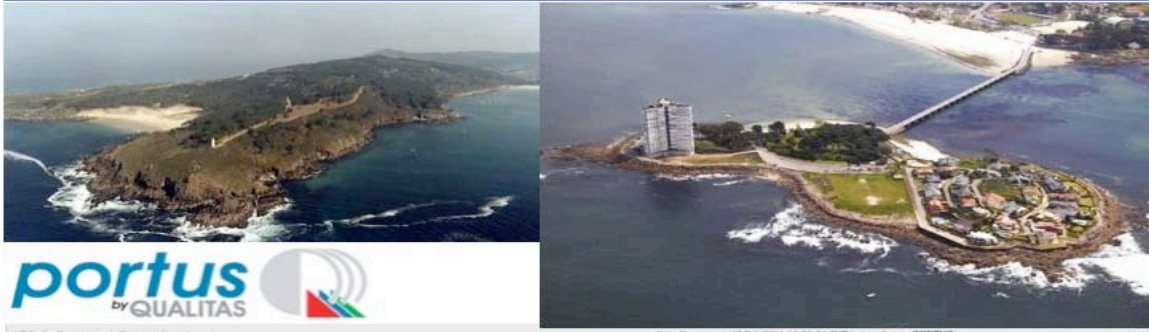
Puertos del Estado runs an online validation and quality control of the radar observations from the very initial project layout and system start up. Further information on the initial validation of the SeaSonde HF Radars in Galicia is available from the Puertos del Estado, QUALITAS and CODAR websites (Marta de Alfonso, Enrique Alvarez and Jose Damian Lopez, "Comparison of CODAR SeaSonde HF radar operational waves and currents measurements with Puertos del Estado buoys. March 2006.")

The four HF Radar stations are connected (by ADSL or satellite-based communications) and sending information in real time to a server network that consists of a CODAR combine station hosted at *Instituto Tecnológico para o control do Medio Mariño* de Galicia (INTECMAR) in Vilagarcía de Arousa, a PORTUS by QUALITAS Marine Information System hosted at the *Galician Meteorological institute* (MeteoGalicia) in Santiago de Compostela, and a national PORTUS Oceanographic Information System located at Puertos del Estado in Madrid.

In addition to the long range HF Radar network, the Physical Oceanography Group of University of Vigo (GOFUVI) has implemented together with QUALITAS Remos, a high-resolution HF radar system in the Ría de Vigo. The locations of the two HF radar stations are the *Marine Science Laboratory* (ECIMAT) in Isla de Toralla and the Lighthouse of Punta Subrido.



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*Upper image: Punta Subrido and Isla Toralla where High Resolution SeaSondes are installed
Bottom: PORTUS by QUALITAS surface currents vector map for Ria de Vigo*

As a principal result of all these efforts over the years, Galicia has turned to be one of the most advanced science and knowledge development platforms around HF Radar technology in Europe. Public research centres and private companies together with operational institutions have been working in close partnership on national and international R+D projects funded by the Spanish Ministry of Science and Innovation (PSE-PROMARES, MORADA) or by regional governments (SODERCAN) developing added value applications of HF surface radar data such as a modal analysis-based short term currents prediction system, gap-filling, trajectory backtracking, PORTUS marine information system...

All these accomplishments have been achieved thanks to the coordinated efforts of regional, Spanish and international research and operational groups, thanks to national and international funding resources and highest return for Galician society in the way of continuous improvement of their current oil spill trajectory forecast and backtracking models and the increase in the quality of both their ocean models and observations.