Project RAIA.
Towards a North Portugal - Galician Oceanographic Monitoring Network: Quality control data.

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INTRODUCTION

The Galician coast (NW Spain) and mainly the "Rias Baixas" (southern Galician rias) are one of the most productive ecosystems in the world. In this context, the regional government of Galicia, in the framework of EASY and EROCIPS (Interreg IIIB projects), and being aware of the importance of the monitoring of hydrographical conditions, started the installation of real-time ocean-meteorological stations along the Galician Coast. To assure the quality of oceanographic and meteorological data, an automatic quality control system was developed.

The project **RAIA** (financed by the EU through the "Programa de cooperación transfronteriza España-Portugal) constitutes a great opportunity to improve and to consolidate this network in the Iberian Margin, moreover, the increase in number of platforms deployed will allow the development of new control tests, based on the spatial variability of data.

1.- RAIA PROJECT

The aim of the project is the development of a solid and cross-frontier ocean observatory network, along the Iberian Margin, based on both, monitoring by development of new oceanographic-meteorological platforms and prediction of the ocean environment through the use of numerical models. One of the challenges of RAIA Project is the development of an interoperability platform to disseminate all the collected data. This platform will achieve three important issues: First, it will be oriented to provide web services based on Inspire Directive and OGC services. Second, it will develop the capability of merge several heterogeneous sources (mooring buoys, CTD profiles, HF radar fields, models outputs,...), and third, it will be an user-friendly platform since it will provide services to public/private institutions in order to assure the future sustainability of the network.
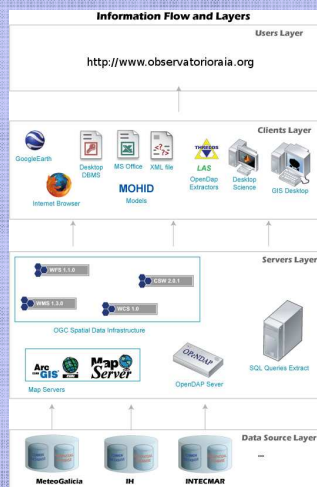
OBJETIVES
- Development of new technologies that will allow construction, completion and consolidation of cross-frontier ocean observation.
- Adapt and validate operational ocean models that reproduce the regional ocean dynamics.
- Establish a platform of cross-frontier interoperability for the management and distribution of the data.
- Develop a management model for the cross-frontier ocean observatory.
- Develop and implement a wide range of products for end users (current and mixing predictions, spill propagation models, larval dispersion models, sea state prediction, water quality forecasting

2.- RAIA NETWORK
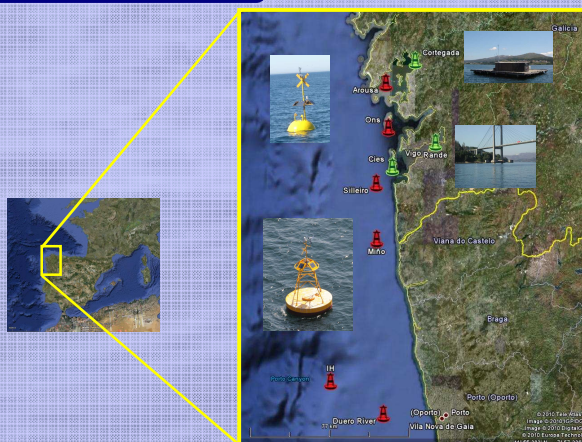
With the development of this network (Red buoys will be deployed in a close future) Galicia and Northern Portugal will be placed amongst the leading regions of the world related to the level of monitoring and modelling of the coastal zone

PARTNERS

3.- DATA QUALITY CONTROL

The stations along the Galician coast collect meteorological and oceanographic data (temperature, humidity, wind direction and velocity; salinity, temperature and currents direction and intensity at different depths).

Data acquisition is via inductive cable to the data logger and continuously (each 10 minutes) sent via GPRS communications to the central server, once in the central server a data quality control is carried out to assure the quality of the data.

Working on the raw time series data and based on the means of execution, our quality control program is divided into automated (labelled as Automatic QC, performed when data is collected) and daily manual (labelled as Manual QC) procedures control.
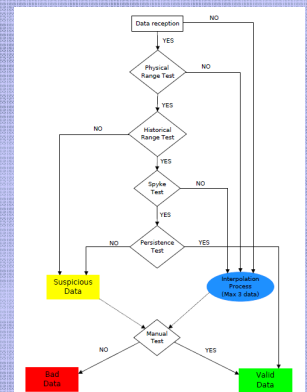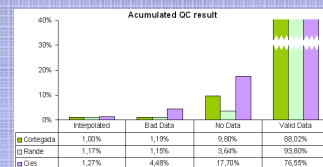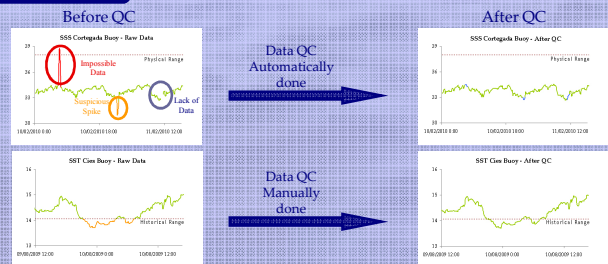

The Automatic QC uses four kinds of tests to examine a large amount of measurements and then the Manual QC is applied to the suspicious and interpolated data identified by the AutoQC for further check:

- **Physical range test**, to require that the data observations should be possible. The data are tested against ranges derived from WOD98 appendixes and physical limitations of sensors. The values that fail this test should be flagged as bad data and, whenever it is possible is automatically interpolated.
- **Historical range test**, the time series data are tested against specific ranges, for each month based on the historical observations from the monitoring area. Individual values that fail these ranges should be flagged as suspicious data.
- **Spike test**, the difference between sequential measurements is tested against a clearly-defined threshold. The values that fail the spike test should be flagged as suspicious, and whenever it is possible is automatically interpolated.
- **Persistence test**: To detect the systematic repetition by using Standard deviation. Values that fail these ranges should be flagged as suspicious data.

Once the Automatic QC is finished all the data have assigned a quality flag, then the Manual QC is made by the operator on the suspicious and interpolated data to validate ones and to reject others on the basis of their experience and knowledge, finally a definitive quality flag is assigned. End-users should read and use carefully those flags to be sure that only good quality data are used, guided by Coriolis control flag scale.

4.- RESULTS

	Interpolated	Bad Data	No Data	Valid Data
Cortegada	1,00%	1,19%	9,80%	88,02%
Rande	1,17%	1,15%	3,64%	93,80%
Cies	1,27%	4,48%	17,70%	76,55%

Last 3 years QC global statistic of current network

The increase in number of platforms deployed will allow the development of new control tests based on the spatial variability of data.