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An interoperable infrastructure for the Italian Marine Research

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Background

The Italian maritime cluster represents for Italy an important economic sector contributing to 2.6% of national GDP, 11% of production in the industry of transport, and using almost 1% of the units of work identified in the country, share as high as 2% including the impact of upstream and downstream, for a total of around 480,000 employees (Cluster and maritime development in Italy and in the regions CENSIS - September 2011). In the European scenario Italy keeps the 1st place in Europe in terms of imports across the sea (185.4 million tonnes of freight), and the 3rd in terms of exports (47 million - not far from Germany and the Netherlands). Moreover Italy is in the first place in the passenger transport sector with 6.7 million people as a base and cruise destinations.

RITMARE (la Ricerca Italiana per il MARE – Italian Research for the sea) Flagship Project is one of the National Research Programmes funded by the Italian Ministry of University and Research, involving the whole marine research sector, including various public research bodies (CNR, OGS, INGV, ENEA, ISPRA, Stazione Zoologica) and Inter-university consortia (CoNISMa, CINFAI)l, as well as many private companies working in the sector and, as a result of technological transfer, enhancing the competitiveness of Italian industry.

Objectives

In its Blue paper (COM2007/575 of October 10th 2007) the European Commission highlighted the need to implement an integrated maritime and marine policy in order to "enhance Europe's capacity to face the challenges of globalisation and competitiveness, climate change, degradation of the marine environment, maritime safety and security, and energy security and sustainability." It stated further that such a policy "must be based on excellence in marine research, technology and innovation".

The aim of RITMARE is to implement what is suggested in the Blue Paper in terms of research and innovation, by means of a national programme of scientific and technological marine research.

More specifically, RITMARE has been structured around the following three objectives:

- to support integrated policies for the safeguard of the environment (the health of the sea);

- to enable sustainable use of resources (the sea as a system of production);
- to implement a strategy of prevention and mitigation of natural impacts (the sea as a risk factor).

Structure

The RITMARE project is organised into seven sub-projects:

- SP1. Maritime Technologies for the development and construction of a Demonstration Vessel.
- SP2. Technologies for Sustainable Fishing.
- SP3. Planning of the Maritime Space in Coastal Waters.
- SP4. Planning of the Deep Marine Environment and the Open Sea.
- SP5. Observation System for the Marine Mediterranean Environment.
- SP6. Research, Training and Dissemination Structures.
- SP7. Interoperable Infrastructure for the Observation Network and Marine Data.

Interoperable Infrastructure for the Observation Network and Marine Data

This work presents the sub-project 7 of RITMARE, that aims at designing and developing an infrastructure that allows coordinating and sharing data, processes and information produced in the various different sub-projects, without forcing the pre-existing practices and the enabling technologies already adopted by the RITMARE scientific communities.

The great variety of actors is reflected in the coexistence, within the project, of different data, formats, practices, approaches, needs and scopes.

The RITMARE information infrastructure will consist of a network of interconnections and tools, to help the data flows, information and service management, to meet the needs of the involved scientific communities and to support their growth.

The design of the information Infrastructure will take place through some steps, which are connected to the objectives of four work packages (WP):

- a robust preliminary analysis of requirements of the project participants and on their goals as regards the infrastructure, and an analysis of the solutions found not only by marine research (WP1);
- a survey on data, technologies, processes and standards used, to share multidisciplinary observations, data, metadata and products as well as solution adopted by the participants (WP2);
- the definition and application of a data policy, in order to support the reuse of data and resources, respecting the constraints, the needs of the participants and the existing ruling conventions (WP3);
- the design, development and implementation of the infrastructure, tested on and complemented by prototypes and demonstrators (WP4), besides technological support tools; with the envision of maintenance and sustainability plans.

The approach to the infrastructure design is intended as user-driven, while based on a constant interaction with the experts' requirements, on the cooperation in setting goals and testing solutions, through the use of participative tools and methods. This will allow to achieve the fulfilment of the

requirements coming from all the involved communities and to facilitate a common growth, while preserving the peculiarities of individual collaborators.

Scalability, flexibility, distribution and decoupling are the conditions to ensure the progressive growth of the infrastructure during the working period and to facilitate its sustainability after the project end. Maintenance and sustainability plans will be defined in order to reach these aims.

The RITMARE infrastructure will not only focus on Italian capabilities and experiences on the marine research area; it will also integrate in the wider European and international domain. The development of the sub-project must therefore be consistent with the technological context and international regulations. To make it possible, international initiatives (GEO / GEOSS), European directives (INSPIRE, SPI, MFSD, WFD, Fishery Directive) and previous experiences in European projects (SeadataNet) will provide basic references and will be considered as sources of valuable information for the infrastructure design and maintenance.The focus of this work will be on the first two Work Packages, presenting and describing the results from the preliminary analysis of requirements of the project participants and from the survey on data, technologies, processes and standards used. First steps toward the design, development and implementation of a prototype of the infrastructure will also be presented.