



Remote sensing to support marine environment monitoring in Europe

Achievements from the FP7 AquaMar project to exploit Earth Observation services in coastal areas monitoring

Water quality (WQ) is a focus of monitoring agencies and the public and it is subject of several European Directives and regional conventions. WQ refers to the physical, chemical and biological characteristics of water. It is a measure of the state/condition of a water basin relative to certain requirements and is most frequently used with reference to a set of standards against which compliance can be assessed. Some European policy directives and international conventions actually set common rules for all the member states, such as:

- EC Water Framework Directive (WFD) (2000)
- Marine Strategy Directive - (EMS) (2008)
- EC Bathing Waters Directive (2006)
- Environment Impact Assessment Directive (EIA) (1985, amended in 1997)
- EU Integrated Coastal Zone Management (ICZM) Recommendations (2002)
- Regional Seas conventions: Helsinki (Baltic Sea), Oslo and Paris (NE Atlantic), Barcelona (Med. Sea)

In order to be effective, the implementation of such legislations needs to be rigorously monitored. In this respect, and in the context of European Global Monitoring for Environment and Security initiative (GMES), water quality services are paramount.

The most accurate measurements of WQ are made on site; more complex measurements are often made in a laboratory using water samples. However on-site measurements present the disadvantage of a limited temporal and spatial view of a sea area and of high operative costs. WQ measurements from Earth

Securing water quality is a key European priority. AquaMar provides valuable information for aquaculture or infrastructure impact in the coastal environment



Observation (EO) can provide valid support to and complement on-site data. At the European level, the GMES Marine Core Service (MCS) provides basic products also concerning WQ, which however need further added value to meet the institutional European and national end user requirements. Various ESA and FP7 GMES projects have been conducted to develop pre-operational support to institutional and private users with EO data for WQ monitoring. For example, the two GMES MarCoast projects (2006–2012) have aimed to develop operational services using satellite data, paving the road for building a reference organizational and technical body at European level for water quality services, service quality management and services validation. This was complemented by various FP7 research projects, among them AquaMar (2009-2013) had the objective to improving existing services and develop new products for supporting users' reporting duties at European level, further matching their requirements. A parallel key objective was to bring benefits to the European citizens: e.g. on all

European beaches, the blue flag that signals good quality of bathing water comforts families. Securing water quality is a key European priority and AquaMar developed products aimed in helping to monitor this quality. Beyond health benefits, AquaMar aimed in bringing economical added value by providing valuable information for aquaculture or infrastructure impact in the coastal environment. The AquaMar project developed downstream services transforming MCS products into WQ services, demanded by end user. The research and development (R&D) activities focused on five innovative lines of services allowing to bring EO

- applications to novel sectors or to strengthen their use:
- 1) Support to EU Water Framework Directive and European Marine Strategy
 - 2) Harmful Algal Blooms (HAB) Detection
 - 3) Support for assessment and monitoring of large scale marine coastal infrastructure projects
 - 4) Quality of bathing water, supporting the EU Bathing Water Directive
 - 5) Support to aquaculture precision farming.

➔ **Project resources:**
www.planetek.it/eng/aquamar

