



SCHeMA open and modular in situ sensing solution

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Marine environments are highly vulnerable and influenced by a wide diversity of anthropogenic and natural substances and organisms that may have adverse effects on the ecosystem equilibrium, on living resources and, ultimately, on human health. Identification of relevant types of hazards at the appropriate temporal and spatial scale is crucial to detect their sources and origin, to understand the processes governing their magnitude and distribution, and to ultimately evaluate and manage their risks and consequences preventing economic losses. This can be addressed only by the development of innovative, compact, rugged, automated, sensor networks allowing long-term monitoring. Development of such tools is a challenging task as it requires many analytical and technical innovations.

The FP7-OCEAN 2013-SCHeMA project aims to contribute to meet this challenge by providing an open and modular sensing solution for autonomous in situ high resolution mapping of a range of anthropogenic and natural chemical compounds (trace metals, nutrients, anthropogenic organic compounds, toxic algae species and toxins, species relevant to the carbon cycle). To achieve this, SCHeMA activities focus on the development of : 1) an array of miniature sensor probes taking advantage of various innovative solutions, namely: (polymer-based) gel-integrated sensors; solid state ion-selective membrane sensors coupled to an on-line desalination module; mid-infrared optical sensors; optochemical multichannel devices; enOcean technology; 2) dedicated hardware, firmware and software components allowing their plug-and-play integration, localization as well as wireless bidirectional communication via advanced OGC-SWE wired/wireless dedicated interfaces; 3) a web-based front-end system compatible with EU standard requirements and principles (INSPIRE, GEO/GEOSS) and configured to insure easy interoperability with national, regional and local marine observation systems.

This lecture will present examples of innovative approaches and devices successfully developed and currently explored. Potentiality of the SCHeMA individual probes and integrated system to provide new type of high-resolution environmental data will be illustrated by examples of field application in selected coastal areas.

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