Multifunctional Web Enabled Ocean Sensor Systems for the Monitoring of a Changing Ocean

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As stated in the 2010 "Ostend Declaration", a major challenge in the coming years is the development of a truly integrated and sustainably funded European Ocean Observing System for supporting major policy initiatives such as the Integrated Maritime Policy and the Marine Strategy Framework Directive. This will be achieved with more long-term measurements of key parameters supported by a new generation of sensors whose costs and reliability will enable broad and consistent observations. Within the NeXOS project, a framework including new sensors capabilities and interface software has been put together that embraces the key technical aspects needed to improve the temporal and spatial coverage, resolution and quality of marine observations. The developments include new, low-cost, compact and integrated sensors with multiple functionalities that will allow for the measurements useful for a number of objectives, ranging from more precise monitoring and modeling of the marine environment to an improved assessment of fisheries. The project is entering its third year and will be demonstrating initial capabilities of optical and acoustic sensor prototypes that will become available for a number of platforms. For fisheries management, there is also a series of sensors that support an Ecosystem Approach to Fisheries (EAF).

The greatest capabilities for comprehensive operations will occur when these sensors can be integrated into a multisensory capability on a single platform or multiply interconnected and coordinated platforms. Within NeXOS the full processing steps starting from the sensor signal all the way up to distributing collected environmental information will be encapsulated into standardized new state of the art Smart Sensor Interface and Web components to provide both improved integration and a flexible interface for scientists to control sensor operation. The use of the OGC SWE (Sensor Web Enablement) set of standards like OGC PUCK and SensorML at the instrument to platform integration phase will provide standard mechanisms for a truly plug'n'work connection. Through this, NeXOS Instruments will maintain within themselves specific information about how a platform (buoy controller, AUV controller, Observatory controller) has to configure and communicate with the instrument without the platform needing previous knowledge about the instrument. This mechanism is now being evaluated in real platforms like a Slocum Glider from Teledyne Web research, SeaExplorer Glider from Alseamar, Provor Float from NKE, and others including non commercial platforms like Obsea seafloor cabled observatory.

The latest developments in the NeXOS sensors and the integration into an observation system will be discussed, addressing demonstration plans both for a variety of platforms and scientific objectives supporting marine management.