

# Real-time ADCP current measurements with both mobile and fixed systems for monitoring the dredging of the Port of Genoa (Italy)

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**Introduction:** During the pre-dredging phase (presented at the SedNet Conference in Oslo, 2008 [1]) and the dredging operations of the Port of Genoa, physico-chemical and current measurements were taken to define the “normal” conditions of the port.

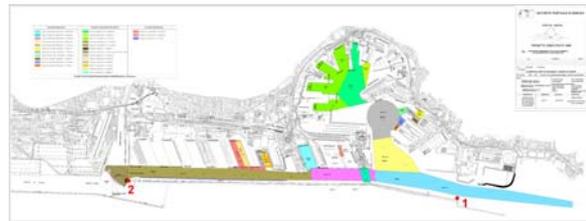
Following the pre-dredging phase, a monitoring system, consisting of two fixed stations housing a Vertical ADCP, a Horizontal ADCP, and a CTD with attached turbidimeter, was set up at the eastern and western port entrances. To make the monitoring system more efficient a vessel equipped with a Vertical ADCP and a CTD with attached turbidimeter followed the dredge as it removed the sediments and deposited them in a predisposed landfill site.

The data we obtained from the instruments described above and various optical and acoustic tests were then elaborated with SediView software to provide us with a detailed high-resolution 3-D description of the dynamics of the port-waters.

**Methods:** The dynamics of the area are being studied on the basis of all the parameters considered essential for understanding the processes taking place there: the concentration of the suspended sediment (TSS), the physical characteristics of the water column, wave action, the winds and currents determining the hydrodynamic characteristics of the area, and the sea traffic. This analysis has provided the “white values” for the turbidity and TSS in the port area itself and in the surrounding area influenced by port activities, and indicated critical and maximum values during the work.

The fixed stations (Fig.1) are monitoring the turbidity at the port entrances in real time during the dredging while the monitoring vessel is following the dredge to check on the impact of the dredging operations inside the port itself.

**Results:** We have obtained vertical and horizontal measurements for the entire area involved in the dredging. These measurements and the TSS and turbidity measurements have provided us with a detailed picture of the dynamics of the are



**Fig. 1:** Areas subjected to dredging; the red dots (1 and 2) represent the two fixed monitoring stations (positioned at the port entrances).

**Discussion:** This method has enable us to anticipate and stop the eventual outflow of dredged material, the cause of a possible environmental disaster.

**References:** [1] Capello et al. (2008). Definition of the natural sediment dynamics before the dredging of the port of Genoa, Italy. SedNet Conference 2008, Oslo (N) - <http://www.sednet.org/library/library-sednetconference5.htm>;