

## PHYSICAL OCEANOGRAPHY

**Physical monitoring of works at sea (such as dredging and the search for relict beaches for the removal of sand), heavy metals and microplastics in man-made areas (Port of Genoa and Piombino and the Italian continental shelf) and in natural areas (Gulf of Tigullio), and long-term monitoring in Antarctica [MORSea Project - Marine Observatory in the Ross Sea (Marine observatories for long-term research in Antarctica)]**

The monitoring of the marine-coastal environment is crucial for its protection, therefore the control of the dynamics of the areas subjected to anthropogenic activities turns out to be important in the development of these areas.

For more than 20 years, the Physical Oceanography Research Group has been dealing with the physical-dynamic monitoring of port areas and coastal areas subjected to dredging and marine works. The monitored areas are many, such as Genoa, Piombino, Voltri, Isola del Giglio, the Apulian coast, and the relict sand quarries of the Italian continental shelf. Also the "physical-geological" study of heavy metals in marine sediment and microplastics in different areas (tourist-industrial ports, such as Genoa, and natural areas, such as the mouths of the Gromolo and Entella streams, streams on which drainage waters consist of various mines as well as anthropogenic activities) becomes very important for the biotic sector, affecting various aspects (marine dynamics and effects of heavy metals and microplastics on organisms such as foraminifera, fish and marine fungi).

Finally, since 1990 the research groups of Sedimentology, first, and Physical Oceanography, then, have been dealing with sediment traps positioned in Antarctica. Thanks to the possibility of multiple temporal sampling we can continuously monitor the Ross Sea from the point of view of sediment dynamics, investigating sediment flows, mineralogy, diatoms and spicules present in the samples.

The Physical Oceanography Research Group is involved in various capacities in numerous research projects, both European and non-European, always involving physical environmental monitoring.

### **Keyword:**

Dredging monitoring; heavy metals and microplastics in marine sediment and biotic compartment (fish); mycoremediation of waters and sediment; environmental coring; sedimentary traps in Antarctica

### **Staff:**

**DISTAV personal:** Marco Capello, Laura Cutroneo, Cristina Carbone, Mirca Zotti, Sirio Consani, Simone Di Piazza, Grazia Cecchi, Antonino Briguglio, Anna Reboa, Gabriele Ferretti

**Collaborations:** Giovanni Besio (Structured DICCA University of Genoa), Enrico Dinelli (Structured University of Bologna), Giorgio Budillon (Structured University of Naples)

"Parthenope"), Clara Manno (Structured BAS, British Antarctic Survey, UK), Maria Elena Piccione ( Structured ISPRA Rome), ARPAL (external body), CIBM of Livorno (external body), ISPRA (external body).

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