Marco Capello

Researcher

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Education and training

1998
Ph.D. in Environmental Sciences (Sea Science)
Relationships between physical structure and suspended matter flows in bottom water formation areas (Ross Sea - Antarctica)
Consortium Univ. Trieste Genoa and Urbino - Final exam Parma - Genoa - IT

1996
Expert (Cultore della materia) in Lithology and geology
University of Genoa - Degree in Environmental Sciences - Genoa - IT

1994
Degree in Geological Sciences
Sedimentological characterization of the continental shelf between the mouth of the Magra and Arno Rivers (Northern Tyrrhenian Sea) - 102/110
University of Genoa - Genoa - IT

Academic experience

2008 - ONGOING
Confirmed Permanent Researcher
University of Genoa - Genoa - IT
Research and Education

2000 - 2008
Research Fellow
Univerisity of Genoa - Genoa - IT
Research

Language skills

English
Independent

Teaching activity
From 1995 to 2009 I carried out teaching support activities for the Degree Course in Environmental Sciences Marine, and for the Specialized Degree Course in Geological Sciences.
Since 2009 (when I took service at the University of Genoa) I am lecturer of

the Course on 'Introduction to physical oceanography and oceanographic instrumentation' for the Three-year Degree Course in Geological Sciences; since 2010 I am lecturer of the Course on 'Physical Oceanography' for the Master's Degree Course in Biology and Marine Ecology (formerly Marine Sciences); and since 2011 I am lecturer of the Course on 'Meteorology and climatology' for the Three-year Degree Course in Environmental and Natural Sciences.
From 1999 I have been Supervisor of 52 Degree Theses (since 2009 the thesis are 42) of the Degree Courses in Geological Sciences (Three-year and Master), Marine Environmental Sciences, Environmental and Natural Sciences, Marine Sciences, Biology, Marine Biology and Ecology, Geography, Environmental analysis and management, Biological monitoring.
Today I am the Supervisor of 13 graduate thesis students (thesis in progress).
From 2012 I have been Tutor of 24 Trainees at the DISTAV Laboratories and at other Public Research Bodies.
Since 1994 I have held numerous Geological-environmental Seminars at the I and II Degree Ligurian Schools to illustrate the Geology (in my case, with particular attention to the Physical Oceanography) to the Students, and to make them understand the importance of the figure of the Geologist in society modern.

Postgraduate research and teaching activity

Supervision of PhD students, residents and post-doctoral fellows

I am currently Tutor of 2 PhD students and I am / have been Tutor of 5 Research Fellows.

Research interests

Since 1994 I carry out my research activity in the field of Physical oceanography and Sedimentology, focusing in particular on sedimentary dynamics, interactions between bottom currents and suspended sediment, and, in general, on the environmental monitoring.
This led me to study the formation of dense bottom waters in Antarctica and their characterization from the geological point of view (research for 'geological' markers of water masses).
Since 2000 I have dealt with environmental monitoring from a physical point of view, with particular attention to aspects linked to the turbidity of water masses and their interaction with the surrounding marine environment. Following the direction that my research took, I collaborated with various Regional Agencies for environmental protection and with ISPRA (formerly ICRAM), specializing in the physical environmental monitoring of areas subject to sediment handling (dredging, nourishment, creation of marine structures).
I was so involved in the physical and dynamic monitoring of many marine works such as the dredging in some important ports (Genoa and Piombino),

the removal of the Costa Concordia wreck at the Giglio Island, the search for relict beaches for sand removal and nourishment (along the Ligurian, Tuscan and Lazio coasts). This monitoring was mainly aimed at the protection of the *Posidonia oceanica* meadows and other marine phanerogams, and other valuable areas of the seabed of our seas.
In the last 5 years we have started a collaboration with the DISTAV mineralogist colleagues for the study of the transport of metals (as contaminants and not) from the rivers and the sea, also analyzing, with the collaboration of fellow biologists, the state of health of fishes taken in the study areas.
As regards the bottom sediments, in collaboration with the DISTAV colleagues, we started the study of marine fungi and the possibility of using them for mycoremediation of the sediments themselves.
In recent years I have been interested (with a European project) also in the safety of navigation in port areas studying the dynamics of these areas subjected to intense dredging activity that cause modification of the morphology of the seabed.

Grants

2017 - ONGOING

Interreg Maritime Project 2014-2020 'SEDITERRA - Guidelines for the treatment of dredged sediments in the Maritime area'

European Union - IT

Project Amount Euro 1.845.860 - Partner DISTAV Lab Euro 230.913 - Participant

Partner: Leader Département du Var of the PACA Region (FR); Partner ISPRA, INSA (FR), Province of Pisa, Autonomous Region of Sardinia, Département de la Haute-Corse and University of Genoa (Distav Laboratory).

The Project: The amplification of the silting phenomena linked to climate change and the presence of pollutants mainly of anthropic origin fixed on the sediments make it necessary to organize their management by integrating risk control. The costs of treatment and management of non-submersible sediments weaken or endanger economic activity and the competitiveness of ports. Moreover, the scientific data useful for writing a regulatory framework for the management of sediments on the ground are partial, scarce and often without access. Responses must be provided, as sediments present in ports, rivers and canals can have a lasting impact on ecosystems and ultimately on people's health. Hence the need to implement operational solutions that are jointly controlled and economically acceptable within the Italy France Maritime area.
Entering the objectives of the Europe 2020 strategy, the project enhances the production of eco-materials deriving from the management of sediments. With a main streaming process, SEDITERRA proposes the operational structuring of the management of a new public waste: the sediment refusal. Inspired by the living lab, the goal is to share experiences and build on the results of local solutions that have been able to provide

partial answers to a global problem.
The application and monitoring of pilot operations on the Maritime territory, with sediments from partner ports, will produce data and information widely disseminated during interviews open to all, then summarized, disseminated and published online for free and free access www.cap-sediments. fr SEDITERRA aims to expand a capitalization process through an exchange of good practices and a cross-border membership by participating in the emergence of a regulatory framework adapted to the management of sediments on land.

2018 - ONGOING

Interreg Maritime Project 'GEREMIA - Waste management for the improvement of port waters'

European Union - IT

Project Amount Euro 2.099.330 - Leader UniGe (DICCA+DISTAV) Euro 577.380 - Co-Leader DISTAV Euro 240.844 - Pricipal investigator

Partner: Leader University of Genoa (DICCA + DISTAV); Partner SEPG Srl, AdSP-MLO (Port of La Spezia), ISPRA, Département du Var, Université de Toulon, IAS-CNR

The Project: Blue Growth, this will be the long-term path that our territories will have to follow and the ports, thanks to their activities, will be among the main actors. Reconciling the need for growth with the preservation of cultural and environmental heritage will be the challenge to face. The evaluation of impacts and pressures on ecosystems by human activities must be developed on a solid scientific / technical basis as suggested by the most modern management approaches, such as for example Ecosystem-based Management. Following this approach and with the awareness that the environmental quality of a port influences the marine environment on very large spatial scales, pollution risk management must be shared on a cross-border basis. GEREMIA proposes itself as a general objective to train and support, with innovative tools and solutions, those who will be responsible for managing port waters. The harmonization of the results of the modeling actions, monitoring and analysis of the risk management procedures, will lead to the preparation of a Decision Support System developed for the port realities and easily exportable to different contexts, in addition to the pilot sites of the project. The DSS, thanks to the characteristic of managing different levels of information and a large amount of data, will represent a significant increase in the managerial capacity of the operators for prevention and intervention in the event of emergencies. The project will not only be the occasion to propose management strategies, but these will be applied in pilot actions on different port realities of our territories (installation of bioremediation systems and containment of wastewater, exercise of intervention procedures). Furthermore, during the project the proposal of a new integrated and weighted environmental quality index will be developed to complement the TRIX, more suitable for the specific and variegated port realities.

2018 - ONGOING

Interreg Maritime Project 'SPlasH - Stop to plastics in H2O'

European Union - IT

Project Amount Euro 811.477 - Leader UniGe (DICCA+DISTAV) Euro 328.000 - Co-leader DISTAV Euro 174.020 - Pricipal investigator

Partner: Leader University of Genoa (DICCA + DISTAV); Partner ERI Onlus, Université de Toulon (FR)

The Project: The Project SPlasH! will analyze, for the first time, presence, origin and dynamics of microplastics in the ports of project. The study will not only deal with the plastics floating on the sea surface, but also with the fibers present in the water column and on the seabed. The research will provide data on some aspects that are still unexplored: understanding the dynamics of microplastics; to study the influx and the quantitative incidence of the various 'sources' of microplastics from the land to the sea; and the distribution at various depths in densely populated and active areas. The data will provide further elements - also to the international community - to better understand how, when and where to intervene to reduce the impact of this growing pollution of the marine environment, taking into account the regulatory situation - national and community - existing on the subject and its possible evolutions. Sampling will take place in different ways, through a trawl, a small pumping system that will allow data to be collected at various depths, and with sediments taken from the bottom. The samples will then be analyzed for a quantitative and qualitative definition of the debris and the development of a model that can reveal the distribution and concentrations of microplastics in the different points of the port area. An analysis will be carried out on the mullets, fish particularly present in the ports, to evaluate the biological impact of these fibers. Therefore, the best numerical model for the study of the dynamics of microplastics will be analyzed, which, combined with the climatological study, will allow to develop the prediction on the trajectories of plastic debris dispersed at sea. SPlash! will inform and disseminate the theme and the research among the entire population of the interested areas (and not only), with multimedia tools, public initiatives and also directly involving economic actors and citizens

2019 - ONGOING

Interreg Maritime Project 'SINAPSI - Navigation assistance for safe access to ports'

European Union - IT

Project Amount Euro 2.188.294 - Leader UniGe (DISTAV+DICCA) Euro 572.136 - Leader DISTAV Euro 295.000 - Pricipal investigator

Partner: Leader University of Genoa (DISTAV+DICCA); Partner Université de Toulon (FR), AdSP-MTS, Chambre de Commerce et d'Industrie du Var (FR), Lamma, ISMAR-CNR

The Project: In the context of the Blue Economy a crucial aspect is linked to maritime transport as international economic exchanges are based on an efficient and safe transport and logistics system of which ports are a key element. Operational security in the port area is essential because the ports are frequented by an ever increasing number of ships and ever-

growing dimensions. The operations of loading/unloading goods in the ports must be as efficient as possible in order to keep up with the increasingly heated competition of other ports in the Mediterranean and Northern Europe. However, these operations cannot do without the guarantee of safety conditions for ships, cargo and operators. Therefore ensuring the safety of navigation remains an open challenge. In this panorama the weather and sea conditions are fundamental, which can greatly alter the maneuverability of ships inside ports, where space is limited, affecting the safety of maneuvers. Knowledge of weather and sea conditions plays a primary role in guaranteeing it. Despite the application of new technologies, naval accidents due to bad weather and sea conditions are the order of the day: an example of this is the accident of the Sigma cargo ship stranded on the Tuscan coast due to strong wind and rough seas in 2017. The SINAPSI's goal is to respond to the need on the part of port operators to have real-time data on weather and sea conditions to be able to navigate / maneuver inside the ports in total safety. The objective will be achieved thanks to the monitoring and simulation of weather and sea conditions near and within ports. The information produced will be made available to stakeholders (Pilots, Commanders, Port and Maritime Authorities) through a dedicated ICT application. SINAPSI will also integrate the monitoring network present on the Maritime territory for the measurement of weather-marine parameters.

Editorial activity

I'm Reviewer for the Journals: Ecological Indicators (2); Environmental Earth Sciences; Environmental Science and Pollution Research (2); Integrated Environmental Assessment and Management; International Journal of Earth and Environmental Science; Journal of Geophysical Resarch - Atmosphere; Journal of Soils and Sediments; Marine Pollution Bulletin (5); Nature Conservation; National Geographic Society; Natural Hazards; Oceanologia; Environmental Technology; Thalassas: An International Journal of Marine Sciences; Journal of Applied Water Engineering and Research; Journal of Maps (2); Science of the Total Environment.

Other professional activities

Regarding third party activities, I am the person in charge for the DISTAV monitoring of:
- dredging of the Port of Genoa for AdSP-MLO Port of Genoa, VTE Prà, SECH Terminal Genoa, Genoa Oil Port, Santoro Group (from 2007 to present);
- dredging of the Port of Piombino for AdSP-MTS Port of Piombino (from 2014 to present);
- sand samples for beach nourishment for ARPAL, ISPRA (formerly ICRAM), Province of Livorno, CIBM (2004-2010);
- removal of the Costa Concordia wreck at the Isola del Giglio for the University of Rome 'Sapienza', and A.T.I. Titan-Micoperi (2012-2014).