

# Introduction

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I would like to introduce the presentation of this edition of the *International Symposium on Monitoring of Coastal Areas*, the tenth edition, by recalling the Resolution adopted by the General Assembly of the United Nations on September 2015, where the Sustainable Development Goals (SDGs) are defined in the *Agenda ONU 2030*.

Adopted by all United Nations Member States in 2015, the Agenda represents the world's best plan to build and maintain a better world for people and our planet; to this aim, 17 Goals are defined in terms of targets and scheduled in the time.

The official starting point of the Agenda 2030 and, consequently, the implementation and application of its 17 Sustainable Development Goals, coincided with the beginning of 2016. The aim of the Agenda is to guide the world on the road ahead over the next 15 years, with countries pledging to achieve them – Goals and related targets - by 2030. In the Resolution adopted by the General Assembly of the United Nations held in September 2015 [1] the official document of the Agenda [1], for the environmental sustainability, reported that (cfr.33):

*“We recognize (by the Mondial leaders who attended the General Assembly) that economic and social development depends on the sustainable management of our planet's natural resources. Accordingly, we are determined to preserve and sustainably use seas and oceans, freshwater resources as well as forests, mountains and land; and to protect biodiversity, ecosystems and wildlife. In addition, we are determined to promote sustainable tourism, combat water scarcity and aquatic pollution, enhance cooperation against desertification, sandstorms, environmental degradation, and droughts, and promote resilience to and reduction of the risk of environmental disasters”.*

In the context of the environmental sustainability, attention for the topics of the Symposium have to be made for some targets of the Goal 7 – Affordable and clean energy (*Ensure access to affordable, reliable, sustainable and modern energy*),

Goal 9 - Industry, innovation and infrastructure (*Build resilient infrastructure, promote sustainable industrialization and foster innovation*) and Goal 12 – Responsible consumption and production (*Ensure sustainable consumption and production patterns*). For such targets a correlation with the research activity can be found in many works proposed for the Symposium. However, of particular interest and impact to the content and topic of the Symposium are the Goal 13 – Climate action (*Take urgent action to combat climate change and its impacts*) and especially the Goal 14 – Life below water (*Conserve and sustainably use the oceans, seas and marine resources*). Goal 14, indeed, is about conserving and sustainably using the oceans, seas and marine resources. Healthy oceans and seas are essential to human existence and life on Earth. The Symposium focuses the attention on the Mediterranean Area but some targets of this Goal, as we can see below, are strictly related with the proposals and the research activities developed by the attendees of the Symposium:

- to prevent and significantly reduce all forms of marine pollution, especially that resulting from activities carried out on land, including pollution of marine debris and nutrients;
- sustainably manage and protect marine and coastal ecosystems to avoid particularly adverse impacts, including by strengthening their resilience, and take action to restore them to healthy and productive oceans;
- minimize and address the effects of ocean acidification, including through increased scientific collaboration at all levels;
- preserve at least 10 % of coastal and marine areas, in accordance with national and international law and based on the most accurate scientific information available;
- increase scientific knowledge, develop research and transmission capacity of marine technology, with the aim of improving water health and increasing the contribution of marine biodiversity.

Consequently, considering that the Sustainable Development Goals and related targets are well defined and clearly described in the *Agenda ONU 2030*, a fundamental question can be asked to the Researchers' Community: how the Community can contribute to the study of such topics? What is the state of the art? What approaches and results? What open tasks and future developments? What time and scheduled programs? And so on.

It is clear that the above targets, as defined for Goal 14, are very broad, differentiated in purpose and, as such, involve different and complementary research expertise. A little contribute for the Agenda 2030 and, in particular, for this Goal, but also for some targets proposed in Goals 7, 9, 12 and 13 that can be assumed as strictly correlated with the coastal monitoring, can be found in the topics and research activities developed and proposed in this *International Symposium on Monitoring of Coastal Areas: Problems and Measurement Techniques*.

The broad scope of the Goal 14, but also the interest of researchers in some topics of the Goals 7, 9, 12 and 13 that are strictly correlated with the monitoring activities of the Mediterranean area, is the main reason of why the Scientific board of the Symposium structured this event, as tradition, in different and specific sessions. This choice allows us to focus the research activity on specific fields of interest.

The Symposium, organized every two years, is proposed as a place to make known the research carried out in recent years on the topics of monitoring the Mediterranean; and therefore, it is an opportunity to present new proposals and promote actions in favor of the safeguard of the marine and coastal environment. The Symposium addresses issues related to Mediterranean coastal areas and investigations in technical and instrumental solutions to face problems related to: energy production in the coastal area, coastal pollution, morphology and evolution of coastlines, flora and fauna of the littoral system, management and integrated coastal protection, coastline geography, maritime and coastal tourism human influence on coastal landscape. In detail, the special sessions, for which we give the name and a brief description, cover:

- *Flora and Fauna of coastal ecosystems (chairs: Davide Travaglini, University of Florence, and Sandro Lanfranco, University of Malta)*  
Coasts are ecotones between sea and land. Coastal ecosystems are highly dynamic, they interact with different land use systems and are often in direct contact with urban environments, where the pressure of human activities on the coast is higher. All these features make up a complex environment so that its flora and fauna show particular morpho-physiological, ecological and behavioral adaptations. The session includes the following topics: flora and fauna of coastal (forests, maquis, beach-dune, wetlands) and marine ecosystems; protection and restoration of coastal ecosystems; sustainable management and efficient use of coastal ecosystems and their ecosystem services; resilience and adaptive capacity of coastal ecosystems to climate change-related hazards; biodiversity conservation and protection of threatened species; methods and new technologies for monitoring flora and fauna of coastal and marine ecosystems.
- *Morphology and evolution of coastlines and seabeds (chair: Giovanni Sarti, University of Pisa).*  
The session includes contributions related to the morphodynamic processes that characterize the various types of coasts: from high to low coasts and from natural to anthropized. Each specific topic, inserted in this context, is pertinent to the session: from the space-time evolution of the coastline, including the retro-coastal dune systems, to the morphodynamics of the submerged beach, as well as analysis of the physical-chemical qualities of the water column. Added to these aspects are techniques for evaluating the sedimentary budget (sedimentary contribution of fluvial-deltaic systems, methods of redistribution of sediment along the coast, offshore sediment loss). The topics of the Session also include the dynamics triggered by anthropic factors, both local (defense works, ports, etc.) and global ones (greenhouse effect, climate change and danger of submerging the coasts), as well as the activities of protection and restoration of coastal areas.
- *Coastal and offshore engineering: energy production and transport, port and offshore structures, water quality, measurements and monitoring, data processing and services, digital twins, economic-environmental assessment, regulatory context (chair: Lorenzo Cappiotti, University of Firenze)*  
This session includes the coastal and offshore engineering topics related to:

infrastructures structures devices and techniques for the production of energy that exploit different sources (e.g. waves, currents, tidal range, wind, sun), energy transport infrastructures (e.g. power lines, regasification plants), energy accumulation systems (e.g. compressed-air energy storage, hydrogen, pumped hydro), water desalination plants and techniques, ports and offshore structures, circulation, mixing, marine water quality and pollution (micro and macro plastics, eutrophication, anoxia), sensor systems and instruments for measurements and monitoring, evaluation of the reliability and performance of measurement systems, information and data acquisition systems, digital twins, development of coastal services (e.g. Copernicus downstream services), economic assessments and impact analysis of new energy production plants on local economic systems and climate-changing gas emissions, analyzes of the regulatory context.

- *Geography, Tourism and Landscape of the coastal areas. Enhancement, safeguarding and dynamics of the territory (chair: Donatella Privitera, University of Catania)*

Coastal areas play a strategic role in the Mediterranean basin, one of the most important centers of biodiversity worldwide, as they fulfill natural, residential, recreational, and commercial functions of particular relevance and ancient tradition. Actually, managing and sustainably protecting marine and coastal ecosystems is more important than ever, along with their conservation and development. Therefore, analyzing and deepening our understanding of the physical, environmental, landscape, tourist, and cultural characteristics and dynamics of the reference territories are considered fundamental. This session focuses on the potential and challenges of geographical, landscape, economic, legislative, and socio-cultural aspects, as well as various forms of human impact and environmental restoration that affect coastal territories, with a specific emphasis on gaining a profound understanding of urban system dynamics and their redefinition in a circular and sustainable manner, including Mediterranean waterfronts. Contributions related to the tourism development of coastal areas, landscape and anthropized areas dynamics, the history, description, and enhancement of landscapes, landscape design, planning, and legislation, especially regarding island territories, fall within this session.

Other topics of the session include case studies on coastal smart cities, the relationship between the surrounding environment and the network of local resources within cities as super-organisms, the urbanization of coastal areas and the marine ecosystem, sustainability and protected areas in participatory and shared territorial governance.

- *Underwater and Coastal Cultural Heritage (chair: Marinella Pasquinucci, University of Pisa)*

The session aims to focus on the palaeogeographical, archaeological, topographical, historical and landscape aspects of coastal areas and/or seabeds, in an interdisciplinary perspective, with attention to the settlements and settlement patterns, the archaeology and history of sailing and maritime trade, the structures of ports/ landings, the transmission of cultures and ideas, the landscape context and its evolutionary dynamics, the museum heritage, enhancement and safeguard.

I would like to conclude this brief presentation of the Symposium by recalling the statement of all United Nations Member in 2015, contained in the Agenda 2030: “*We announce today 17 new Sustainable Development Goals with 169 associated targets that are interconnected and indivisible. This is the first time that world leaders have engaged in a common effort and action through such a broad and universal policy agenda. We are moving towards sustainable development, dedicating ourselves to the pursuit of global growth and win-win cooperation that would result in greater gains for all countries and the whole world. We reiterate that all states can, and should, freely exercise total and permanent sovereignty over their wealth, natural resources and economic activities. We will implement the Agenda so that all can reap its benefits, for today's generations and those of the future. In doing so, we reaffirm our commitment to international law and emphasize that the Agenda must be implemented in such a way that it is in line with the rights and duties of states enshrined in international law*”.

Research is, by its nature, a dynamic and interdisciplinary activity. The papers presented at the Symposium, whether in oral or poster form, demonstrate the strong interest and active and systematic involvement of many countries, with the common goal of making a contribution, albeit a contained one due to the breadth and complexity of the issues concerning environmental impact, but above all to nurture fruitful moments of discussion. The intent of the Symposium, now in its tenth edition, is therefore and as far as possible, to constitute one of the points of aggregation and reflection on some of the themes of the UN 2030 Agenda.

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## References

- [1] Resolution adopted by the General Assembly of the United Nations on Sept. 25, 2015 - <https://unric.org/it/wp-content/uploads/sites/3/2019/11/Agenda-2030-Onu-italia.pdf>
- [2] <https://www.un.org/sustainabledevelopment/oceans/>
- [3] <https://asvis.it>
- [4] <https://unric.org/it>