Assessing the Vulnerability of the Black Sea Marine Ecosystem to Human Pressures

Common borders. Common solutions.

ANEMONE

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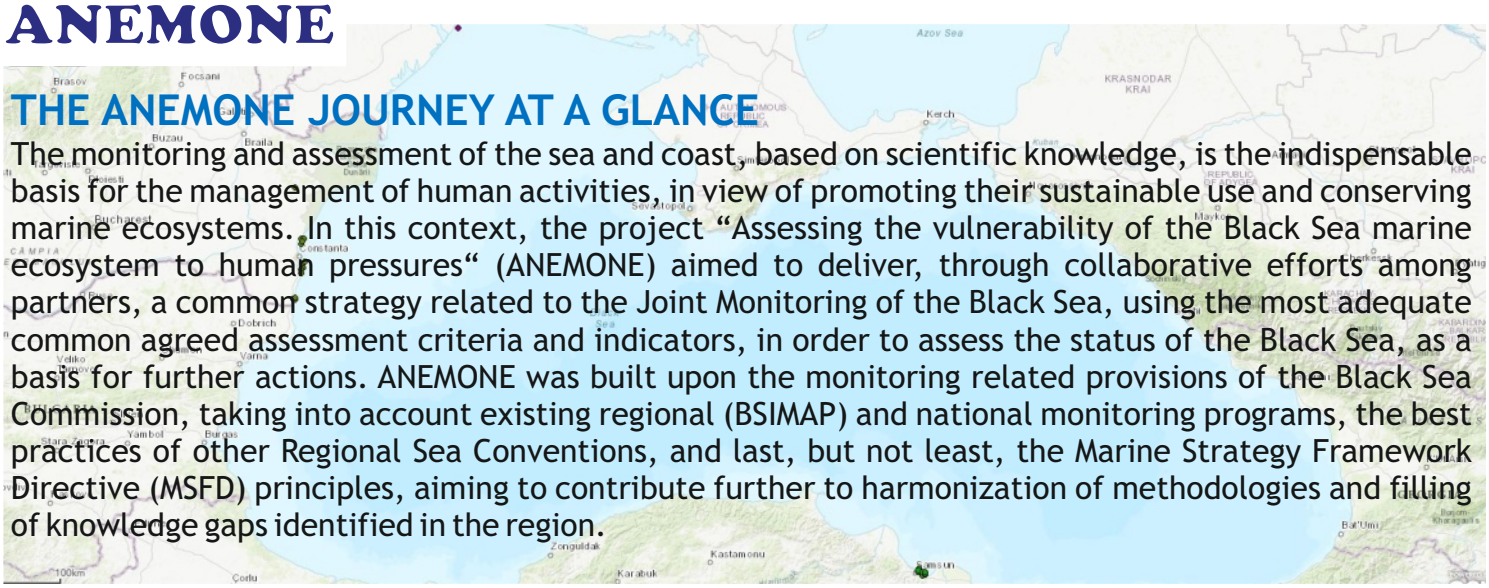
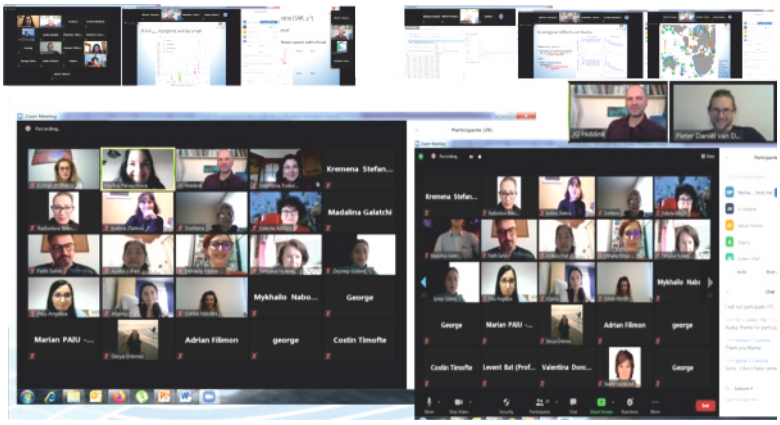


THE ANEMONE JOURNEY AT A GLANCE

The monitoring and assessment of the sea and coast, based on scientific knowledge, is the indispensable basis for the management of human activities, in view of promoting their sustainable use and conserving marine ecosystems. In this context, the project "Assessing the vulnerability of the Black Sea marine ecosystem to human pressures" (ANEMONE) aimed to deliver, through collaborative efforts among partners, a common strategy related to the Joint Monitoring of the Black Sea, using the most adequate common agreed assessment criteria and indicators, in order to assess the status of the Black Sea, as a basis for further actions. ANEMONE was built upon the monitoring related provisions of the Black Sea Commission, taking into account existing regional (BSIMAP) and national monitoring programs, the best practices of other Regional Sea Conventions, and last, but not least, the Marine Strategy Framework Directive (MSFD) principles, aiming to contribute further to harmonization of methodologies and filling of knowledge gaps identified in the region.

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Black Sea CROSS BORDER COOPERATION

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Monitoring: current situation, needs, requirements for improvement, revision


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Three main activities were accomplished successfully under GA T1:
Activity T1.1 delivered a **review of the national marine monitoring programmes of Bulgaria, Romania, Turkey and Ukraine**. Information was presented on the policy/legal frameworks of monitoring and the national management specifics, types of implemented monitoring, parameters measured, monitoring networks, spatial and temporal coverage of available data on the biodiversity of pelagic and benthic habitats and selected species groups, contaminants and marine litter, which are examined against the requirements of the European Directives - WFD and MSFD, as well as the regional BSMAP. A chapter is dedicated to the updated MSFD requirements through the revised MSFD Annex III on the indicative ecosystem elements, anthropogenic pressures and human activities relevant to the marine waters and COMMISSION DECISION (EU) 2017/848 of 17 May 2017, which sets up the revised criteria, methodological standards, specifications and standardised methods for the monitoring and assessment of the marine environment. National reviews reveal gaps at all levels - legal frameworks and implementation, institutional capacity and cooperation, scientific and technological methodologies for monitoring and assessments, spatial and temporal coverage of available data, integrated assessment approaches. Based on the gap analysis, the research needs are outlined and recommendations are produced, which take into consideration the requirements of the MSFD to provide for knowledge-based decision-making.
Under Activity T1.2, **two workshops on methodologies for monitoring methods, common indicators and new tools for the assessment of the ecological status were organized**. The First Workshop was dedicated to "Tools and indicators for the integrated assessment of Black Sea environmental status" and held during 19-20 June 2019 in Istanbul, Turkey. The general objective of the workshop was to share experience and apply indices in a coordinated manner in order to obtain a regional assessment of the Black Sea status. During the workshop, specific tools and indicators for the integrated assessment of the Black Sea environmental status were discussed and tested, namely NEAT and CHASE. The Second Workshop was dedicated to "Methodologies for monitoring and assessment of the ecological status under the Descriptors D1,6 - Benthic habitats and Seabed integrity, D1 Biodiversity and D2 Non-indigenous species in Black Sea" and held online during 15 – 16 December 2020. Workshop was aimed to train the participants on the methods for assessing the impact on the benthic habitats/communities using innovative approaches based on the longevity distribution of benthic communities with focus on underpinning science and to apply Benthic Impacts Tool to sample data.
The Benthic Impacts Tool (BIT) is a decision support tool and aims to support the user in quantifying the impact of bottom towed fishing activity on sedimentary habitats.
Activity T1.3 delivered the Black Sea Monitoring and Assessment Guideline **(BSMAG).** This document represents the first comprehensive regional recommendation on the implementation of a harmonized methodological framework for the monitoring and assessment of the Black Sea environmental status. The Guideline was developed in line with the European legal requirements laid down in the Marine Strategy Framework Directive that aims at implementing a precautionary and holistic ecosystem-based approach for managing European marine waters.

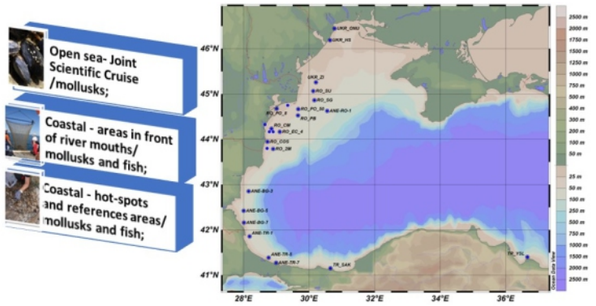
Field work: conducting pilot monitoring studies in selected study areas

Aim: to provide new environmental monitoring data and information needed for the assessment of the Black Sea state of environment, including pressures and impacts, focusing on filling the knowledge gaps identified at regional level.
Key scientific questions: What is the magnitude of the pressure from rivers and coastal sources input? What is the impact of the pressures?
Objectives: Assessment of the Black Sea ecosystem components (pelagic and benthic) by collection of quality controlled and comparable data sets during pilot monitoring studies in front of major rivers – Danube, Dniester, Dnieper, Sothern Bug, Kamchia, Sakaria, Yesilirmak.and coastal sources – major WWTPs and ports from Ukraine, Romania, and Turkey. Additionally, the Joint Scientific Cruise complete the data with the shelf status.
Activities: Conducting cruises, sampling of water, sediments and biota, in-situ measurements and laboratory analysis, data analysis and use of tools for integrated assessments – eutrophication (TRIX, BEAST), chemical contamination (CHASE), ecosystem (NEAT) at the regional level.
Main Results: River discharges are one of very important factors affecting the marine ecosystem functioning.
Land-originated inflows, carrying fresh, nutrient or pollutants rich water can be often defined as the factor responsible for creating new physical and biochemical conditions, which in turn can create favourable medium for many marine organisms to run their biological cycles within. Like in the other basins, in the Black Sea land-originated water inflows are associated with the nutrients' enrichment, eutrophication and pollution being one of the factors, which trigger these processes.
Target groups: Scientists love details. That is why maybe the most difficult task it is to decide what to keep and remove, to send the right message to the policymakers. For instance, this pie is the result of 6 cruises organized by 4 countries. To get those slices we measured in-situ seawater transparency and in laboratories - nutrients, dissolved oxygen, and chlorophyll *a*, approx. 1000 results.
Afterwards we analysed it, check each station against reference values and get a qualitative result. With an average of one hour/sample we have put 125 days effort. Only for this. Finally, the message is - In 64% cases ***we need to ACT to reduce the Black Sea eutrophication***.
The action is more complicate and involve much more resources including several priceless, like awareness.


Photo TUBITAK

Seafood safety in Black Sea region

Aim: to provide a broad survey of new data on chemical contamination of aquatic organisms and potential risks, thus filling knowledge gaps and gather new information for the Black Sea region.
The assessment of contaminants in biota is the most important, not only for biomonitoring of the marine pollution, but also in case of biota used for human consumption there are further implications with respect to public health reasons. Since data on this topic are rather limited in the Black Sea region, activity contributed with new relevant information for the region.



Objectives: Hazardous substances assessment in Black Sea biota by collection of quality controlled and comparable data sets during pilot monitoring studies in selected study areas: coastal and open sea, in order to provide new environmental information needed for the assessments of the Black Sea state of environment, including pressures and impacts, focusing on filling the knowledge gaps identified at regional level.
Activities: Conducting case studies on the assessment of contaminants levels in seafood (mollusks, fish). In order to make monitoring results more comparable within Black Sea region, partners agreed on a common set of contaminants (heavy metals, polycyclic aromatic hydrocarbons, organochlorinated pesticides, polychlorinated biphenyls) and selected relevant species (mussels, Rapana, pelagic and demersal fish) to be investigated in the framework of WP-T3. Overall, 49 biota samples from Black Sea region were investigated for hazardous substances presence (23 samples of pelagic and demersal fish, 19 samples of mussels and 7 samples of Rapana).
Main Results: New data on chemical contamination of aquatic organisms, collected during specific pilot studies in the selected study areas from Ukraine, Romania, Bulgaria and Turkey were obtained, thus contributing to an improved knowledge, based on common agreed assessment criteria and indicators, with regard to the progress towards the good environmental status (GES) achievement.
Target groups: Generally, measurements of contaminants in seafood is executed by the public health or sanitary-veterinary authorities, which often are different from the environmental institutions implementing the MSFD and/or marine monitoring. In consequence, cooperation and exchanging information between national authorities and research institutes is strongly encouraged. These authorities could benefit from the project outputs and thus represents an important target group for ANEMONE project.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Enhance stakeholders' participation and public awareness on environmental issues


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Citizen Science is a very important aspect and useful resource these days, and the added value brought by citizens for science, research and policy, represent an essential step made to have the actions carried out focused on the real needs of the community.
ANEMONE project offered the occasion for scientist and non-scientist to interact, share knowledge and collaborate. Citizens did not represent a target group and stakeholder in the past, but now they become a focus group from the Black Sea countries, for the topics addressed.
During the project, 8 public engagement workshops organized in 4 countries (Bulgaria, Romania, Turkey, Ukraine) around the Black Sea, on 2 major topics, marine litter and cetaceans, addressed by over 350 participants.
These workshops represented an effective way to involve citizens in research, by providing them details, technical information, actually building a common ground, from which citizens learn how to contribute to marine litter and cetaceans monitoring.
Project partners involved citizens in two main activities during the project implementation, like: marine litter monitoring and cetaceans monitoring. 248 participants, from 4 countries, were involved in 26 area surveys and with them help 64.703 items of marine litter were removed from the beaches. Speaking about cetacean surveys, 163 people were trained about how to monitor the cetaceans and over 2,000 people were involved in monitoring and data collection. Just by looking at the numbers resulted, it is clear that it would have been impossible to reach such an extensive extent by only involving researchers.
The main benefit of involving citizens in science activities and then in measures proposal is the fact that people become more aware, direct involved and concerned. By thus people can see the most easy to apply, less costly and high efficient ways to solve issues. Sometimes, researchers and public authorities have a huge paper burden that complicates every step and makes hard to accept that complex problems need simple solutions.


Photo Mare Nostrum


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