



## Third Open Tender for Innovations

### Case Study #6: Black Sea – Turkish Demarcation

[Supplementary information](#)

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## The Case Study “Southwestern Black Sea”

ARSINOE Case Study 6 (CS6) focuses on the relationships between coastal and marine ecosystems of the Black Sea and the upstream land use, under climate change conditions and other anthropogenic stressors. It aims to enhance the adaptive capacity of ecosystems and local communities by adopting an integrated watershed management approach – from source to sea – and identifying good practices for climate-resilience. The case’s scope includes the Danube Delta and the connections to the Western Black Sea marine basin.

### The Turkish Demarcation of CS6

The Black Sea is a unique marine ecosystem that may face serious climate-induced problems exacerbated by anthropogenic stressors. Concentrating on the southwestern coast of the Black Sea, including its connection to the Sea of Marmara through İstanbul, METU IMS has been working on marine water quality as an important indicator for a healthy Black Sea. The idea is to increase resilience through the implementation of innovations that will improve adaptive capacity in the sub-case study area to respond to climate change and other anthropogenic stressors.

The focus of this case sub-case study area has been closely linked with the [Black Sea Strategic Research and Innovation Agenda \(SRIA\)](#) and its [Implementation Plan](#), which was launched in June 2023 as a result of the efforts including various events and consultations at national, regional, and international levels. Through novel methods, the SRIA Implementation plan puts a strong emphasis on the need for a better understanding of the resilience of the ecosystems as well as how biodiversity is affected by climate change and other anthropogenic stressors.

## The Living Lab “Southwestern Black Sea”

The inclusion of a diverse set of stakeholders in connection with the southwestern Black Sea is a key element of ARSINOE and the case study. In the first Living Lab, we brought together people from different backgrounds who were interested in and had an impact on the development of the Turkish demarcation of the case study area. We discussed the anthropogenic stressors coupled with climate change that threaten the region as a whole. In the second Living Lab, we envisioned a resilient future for the southwestern Black Sea, and during the third Living Lab, we discussed the means and needs to realize this future based on the outcomes of the first and second events.

The results of the debates in the Living Labs highlight the types of innovations we seek with this open tender for innovations. By sourcing and piloting a selection of innovations, we hope to contribute to solution of the identified problems and to making the jointly-designed vision a reality. The sections below outline the challenges stakeholders have identified, the vision they have formulated for 2050, and the key challenge to address through the open tender for innovations.

## The Problem Statement by Stakeholders

The southwestern Black Sea is already under anthropogenic stressors Urban development, tourism, agriculture/livestock breeding, fishing and fish farms, energy generation, and wastewater discharge distort marine water quality and coastal ecosystems. The lack of

conservation areas and identified key species, and lack of sectoral plans generate governance gaps. Besides, the sub-case study area suffers from the impacts of climate change. Rising temperatures and extreme events exacerbate anthropogenic stressors.

Therefore, it is necessary to prevent marine water pollution and preserve water quality to sustain all the systems within the southwestern Black Sea, which requires enhanced resilience and adaptation to climate change.

## The Vision of a climate-resilient Future

In 2050, the southwestern Black Sea is a synonym for Blue Economy. It is well-known for its holistic and integrated planning and management of various sectors functioning in harmony with the natural environment and is highly resilient. Energy demand is met by green sources with a large storage capacity and the region is carbon neutral. Urban centres are located in the interior parts not to impact the coastal and marine ecosystems. However, there are engineering structures that protect coasts and ecosystems from anthropogenic and climate change impacts. The only mode of public transportation on land is railway. Shipping is also improved and does not disturb marine life. The industrial fish fleet is halved. Small-scale fisheries are dominant. Gender equality is achieved in the sector and fishermen and fisherwomen actively take part in conserving fish stocks and biodiversity, which is not a concern anymore. As a result of strong efforts, marine biodiversity in the region is back, including sturgeon and bluefish. Technology is intensively used for monitoring and conservation activities on land and in the sea. There is an underwater observatory, which is also used for tourism. “Ecotourism” as a term is replaced with “responsible tourism” and is the main sector. It is supported by outdoor sports activities and cultural and historic heritage, and these take place in all seasons. The region is one of the pesca-gastronomy centres. Using marine and coastal products, new and authentic tastes are offered. The region is governed by an international assembly of Black Sea countries. Local governments are also strong so they are effective and efficient in pollution prevention and natural resources management. Citizens are well-informed on sustainability and are empowered. They participate in the governance of the region as well as contribute to monitoring and conservation.

## The Key Challenge for the 2<sup>nd</sup> Open Tender for Innovations

In this context, we invite proposals for innovations that span a spectrum of domains, including social, governance, and technical spheres.

During our collaborative sessions with the stakeholders in the local Living Labs, the following emerged as solution categories of main interest:

- **Smart, Harmonized Monitoring:** There are already many public and scientific institutions working in the sub-case study area and analyzing trends in various indicators. However, there is a lack of cooperation, which hinders potential savings in terms of effort and resources and limits interoperability among different technologies and techniques. Key expected advances here are interoperable, smart monitoring technologies with a particular emphasis on identification/ monitoring of marine pollution source(s) using remote sensing and other data processing technologies, autonomous submarines to monitor pollution sources, current fish stocks, and biogeochemical cycles.

- **Digital Solutions for Monitoring and Conserving Biodiversity:** One of the aims is to protect and improve biodiversity in the area through acoustic monitoring technologies, autonomous devices, new identification techniques such as eDNA, and other data processing techniques.
- **Decision Support Tools for Holistic and Integrated Planning:** The southwestern Black Sea is expected to become a synonym for Blue Economy, which requires holistic and integrated planning and management of various sectors functioning in harmony with the natural environment. To accomplish this, AI-fed monitoring and forecasting and other data processing techniques are required to better identify and coordinate land use needs, including dwelling, energy generation, economic activities, nature conservation and environmental protection.

We seek innovative ideas that will bolster the resilience of the coastal and marine ecosystems in the southwestern Black Sea and that improve the adaptive capacity and the sustainability of the region. Particular emphasis is given to advance smart tools, technologies and innovations –including social innovation. Validating relatively mature solutions in our sub-case for the future upscaling in the whole Black Sea is one of the expected impacts of this call.