

Tuesday 27 February 2024
9:00 – 11:00 (CET)

Context and methodology

The project [BRIDGE-BS, Advancing knowledge, delivering research, empowering citizens for sustainable and climate-neutral Black Sea](#), aims at developing predictive tools and capabilities necessary to understand and predict the impacts of climate-driven and anthropogenic multi-stressors on the services stemming from Black Sea ecosystems.

BRIDGE-BS is structured around **three nodes** (see Graph 1.), where **“Empowered citizens”** encompasses **supporting science-based policy making in the Black Sea**. It is aimed at **increasing science-policy interaction** through actions based on three pillars: (1) dialogue, (2) knowledge transfer and (3) upskilling.

In this context, former and/or current good practices in other sea-basins outside the Black Sea, addressing topics of priority under the BRIDGE-BS, are being identified and analyzed. These practices, and more importantly the acquired experience from their development and implementation process, will serve as example and inspiration for knowledge transfer actions to be proposed and developed under BRIDGE-BS.



Graphic 1. The BRIDGE-BS 3 nodes

Selection of good practices from other sea-basins is based on: i) their success in fostering interactions between the scientific community and policy making (and delivery) bodies, ii) relevance of the topic to the priorities identified within the project. Emphasis is placed on how science-policy interactions are managed to achieve successful cooperation, rather than delving on the scientific content of the experiences.

Ocean monitoring is addressed in BRIDGE-BS through the identification of relevant data sources, the development of specific surveys for data collection and the development and testing of innovative observation devices. One of the ultimate goals of the project is to propose how to conduct future monitoring programmes in a more effective manner.

In June 2021, the European Marine Board (EMB), partner of BRIDGE-BS involved in the activities dealing with science-policy interaction, released a policy brief on [“Sustaining in situ Ocean Observations in the Age of the Digital Ocean”](#) that provides recommendations to achieve the ambitious goals associated with this topic.

The [Oceanic Observatory of the Iberian margin \(RAIA Observatory\)](#) has been identified as a good practice in this domain and has been analyzed addressing aspects related to its impact, sustainability potential, factors of success, areas of improvement and recommendations for further implementation of similar experiences.

In this context, an **online workshop on Coastal Observation Systems** was organised by BRIDGE-BS partners CETMAR and ICBSS, on 27 February 2024. The workshop aimed at bringing together **project partners and policy stakeholders** whose work deals with, or needs, the provision of oceanographic data, to open debate about the



current situation and the challenges affecting ocean observation in the Black Sea. The conclusions are expected to contribute to the groundwork for advancing the development of coastal observation systems in the region.

The online workshop was structured in two parts:

- **Part 1:** Two keynote presentations were delivered by the EMB and the Raia Observatory (represented by CETMAR, its regional coordinator in Spain) to set the scene and explain the experience from another sea basin;
- **Part 2:** a moderated discussion with a panel of science and policy experts was held, open to interventions from attendees.

Panel members:

- [Dr. Sheila Heymans](#), Executive Director of the European Marine Board
- [Dr. Silvia Torres](#), Head of the Marine Technologies Unit from CETMAR
- [Dr. Laura Boicenco](#), National Institute of Marine Research and Development “Grigore Antipa” (NIMRD), Romania
- [Prof. Dr. Mustafa Yucel](#), Institute of Marine Science Middle East Technical University (METU), Türkiye
- [Dr. Irakli Megrelidze](#), Deputy Head of the Hydrometeorological Department of the National Environmental Agency, Georgia
- [Dr. Bogdan Ghinea](#), Head of Unit, Ministry of Development, Administration and Public Works, Romania.

Participants

The online workshop was attended by 65 participants, representing science and policymaking bodies from the Black Sea countries. Participants included also representatives of regional and international organisations such as the Black Sea Commission, BSEC, etc.



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Keynote presentations

→ Recommendations for sustainable ocean observations

Dr. Sheila Heymans, Executive Director of the European Marine Board

Dr. Heymans summarized the main recommendations arisen from the aforementioned policy brief and, more recently, from the EuroSea project.

- EMB Policy Brief [Sustaining *in situ* Ocean Observations in the Age of the Digital Ocean \(June 2021\)](#)

The launch webinar of this document is available at the [EMB YouTube channel](#) and the main recommendations provided are listed below:

1. **Sustained *in situ* ocean observations** should be supported as [distributed] **infrastructure** delivering **ocean data** as a **public good**.
2. Empower and support **streamlined, efficient coordination efforts** (GOOS/EOOS) to support pan-European and global ocean observing.
3. Strengthen **integrated capability of the ocean observing system**, to deliver fit-for-purpose data and information **supporting sustainable development**.
4. Establish ongoing process to **review costs and performance of the system** and **map its economic and environmental benefits**.
5. Establish **partnerships with private sector and civil society** to include wider ocean observation, and **establish incentives** to share observations with wide users, **and support the marginal costs** of using existing public and privately-owned infrastructures as ocean observation platforms.
6. **Co-design a holistic observing system** to integrate *in situ* observations with satellite observations and models.

- [EuroSea project](#) – Improving and integrating the European Ocean Observing and Forecasting System, run from November 2019 to December 2023.

During this project, pathways to ocean observation sustainability were explored in two ways, “business as usual” and “improve the situation”. The main outcomes in this regard can be found in the documents linked below.

[Report on initiatives, strategies and roadmaps that contribute to foresight in ocean observation.](#)

[Roadmap and recommendations on how to ensure a sustainable and reliable Ocean Observing and Forecasting System.](#)

Main recommendations from the project:

1. **Change the narrative** of the need for sustainable ocean observing and forecasting systems.
2. Establish **clear, regularly revised, priorities** on what to observe and forecast and why, at **global, European and national** levels.
3. **Address the tension** between supporting **blue economy** development and its impact in the environment, and the **role of ocean observing** and forecasting systems.
4. Agree and develop a **standardized procedure** to gather and assess the **cost and benefits** of ocean observing and forecasting systems.
5. **Tackle the known difficulties** to sustain ocean observing and forecasting systems.
6. Ensure sustained ocean observation systems **comply with UNCLOS** (the UN Convention on the Law of the Sea).

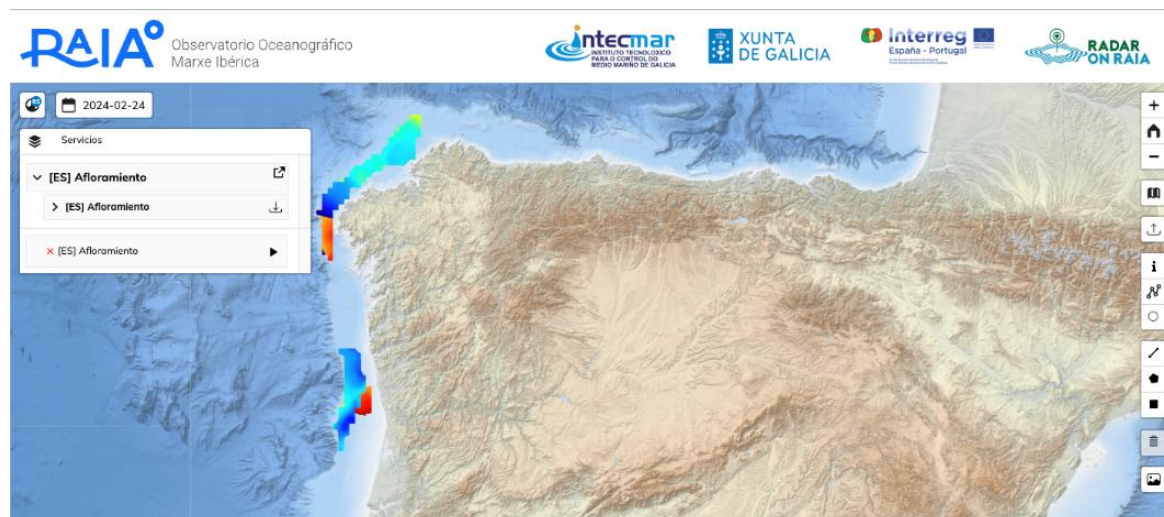


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→ **RAIA Observatory (Oceanographic Observatory of the Iberian Margin)**
 Dr. Silvia Torres, Head of the Marine Technologies Unit, CETMAR

Dr. Torres summarized the process of developing and implementing the [RAIA Observatory](#), which supports the development of operational oceanography along the NW Iberian coast and addresses specific regional and local socio-economic needs.

After fifteen years, there is an observation system, a forecasting system and a set of services and products in place.



Main barriers encountered during the process of developing the observatory:

- **Uncertainty for long-term sustainability**, due to the lack of dedicated staff for data management and budget for equipment maintenance (limited lifetime of sensors and buoys).
- **Lack of stakeholders' engagement in costs** that makes difficult to have an economic return for data providers. The effort behind collecting marine data is not sufficiently visible or appreciated.
- **Lack of a clear roadmap for this kind of observatories** that are nor EU, nor regional, nor local level, and therefore lack of commitment and flexibility of funding mechanisms to maintain this cross-border coordination.

Main achievements:

- **More than 15 years of data available** for some parameters. These data time-series allow to quantify changes and trends associated with the effects of climate change.
- **New technologies** available allow a significant **cost reduction** in monitoring.
- Long experience **working with final users**, which allowed to implement products and services according to their needs and indications. This is a key aspect of the observatory.

Future challenges:

- To **stand close to local final users** for the implementation of new services that contribute to improve their resilience to the climate change (early warning systems about heat waves, low salinity waves, ...).
- To foster **cross-border coordination** and achieve **long-term sustainability**. Local efforts may need some extra support to work well in their specific context.
- To achieve a **fair balance between local marine observation** (small investments provide valuable insights to local communities) **and global observation**. This is a key aspect, and it is important to blend these two approaches, recognizing the strengths and value of each.



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General remarks

This section includes some general remarks as made by the panel members during the open discussion in relation the state-of-play of data collection for policies' support in the Black Sea region.

Since the endorsement of the [Common Maritime Agenda for the Black Sea](#) in 2019, attention and big efforts are concentrating in marine research, **ocean observation** being one of the key aspects.

Furthermore, the [Strategic Research Agenda for the Black Sea](#) (2019) and its [Implementation Plan](#) (2023) are the result of many deliberations at national, regional and EU levels with the objective to strengthen **regional cooperation among public research funders**, facilitate the **alignment of national research and innovation priorities**, and prepare the ground for the **focused funding of strategic joint actions** to address the key challenges and goals identified during the consultation process.

During the debate, it became evident that the **relevance of data collection**, both for marine research and for evidence-based policy making, is unquestionable. Achieving sustainable development based on the blue economy in the Black Sea, entails considering and managing the effects of these activities on the ecosystems through continuous monitoring of the environmental conditions and the uses of the sea and the coastal area. From the perspective of policy stakeholders, evidence-based policy signifies the development and implementation of plans and regulations relying on the most accurate available data. At the same time, data are also necessary to assess the impact of policies and the potential need of further adaptation.

In general, Black Sea research and policy experts concur they are facing the **similar challenges with other European areas**, as highlighted during the keynote presentations, but the strategies to address them should be tailored to match the **particular characteristics of the region**. The Black Sea is a **singular area**, not only because of its **environmental factors**. The **geopolitical conditions**, especially at present, and the **specific characteristics of the countries** around it strongly influence the approach to ocean observation in the area, not only technically and operationally but also financially. As **EU member states, Romania and Bulgaria** are required to comply with European regulations, such as the Marine Strategy Framework Directive (MSFD), the Maritime Spatial Planning Directive (MSPD), the Common Fisheries Policy (CFP) or the Water Framework Directive (WFD), among others. Likewise, these countries have access to funding instruments that facilitate and reinforce the fulfilment of the legal obligations and commitments linked to the EU policies.

On the other hand, **Türkiye, Georgia and Ukraine**, as **EU candidate states**, are progressively adapting to the EU requirements by implementing some directives such as the MSFD or the WFD, and they have limited or conditioned access to EU funding programmes. Additionally, the three of them are in a quite different socioeconomic and political situation from each other.



Highlighted areas for further action

This section summarizes the main topics arisen during the debate. This information will be taken into account for designing and proposing knowledge transfer pathways for the results of BRIDGE-BS, specifically those from work packages 1 and 5.

DATA COLLECTION AND AVAILABILITY

Contribution from BRIDGE-BS

After a thorough analysis of the **current knowledge base for the Black Sea** (WP1), BRIDGE-BS partners conclude that there is a fair amount of data available, but the readiness level is lower than expected. Many data exist, but access can be challenging, and data may not always be readily available for different purposes, including reporting under different regulation frameworks at EU level. In this regard, fragmentation occurs as each of them (MSFD, WFD, Habitat Directive, CFP, etc.) has its own data platforms with different format requirements. Additionally, countries in the region need to fulfil the commitments related to the regional database for the Black Sea, under the coordination of the Black Sea Commission.

As for smart observation systems, the project is focusing on data gaps and figuring out how to conduct monitoring more smartly, covering larger areas and bringing capacities of the different countries together (WP5). Additionally, smart tools, new sensors and novel biodiversity assessment methods are being developed and applied, with the ultimate goal of proposing how to **conduct future monitoring programmes in a more effective manner**.

COORDINATION

At national level

Coordination at national level involves interaction between data providers and policy stakeholders, as well as having an overview of all the observations that are carried out, to avoid overlapping and facilitate the access to the available information.

In **Türkiye** a big effort is made to coordinate what is happening on the field. The community involved is relatively small, and includes scientists and the Ministry of Environment, as the body in charge of the ocean monitoring programmes. All the participating actors make an effort to coordinate among themselves, to be aware of what is being done and to propose new possibilities to be included in the monitoring programmes, that are revised and updated every three years. Participating experts do not consider there is overlapping, because the work carried out has still a limited scope; spatial scale should be expanded, as some parameters and ecosystem components are currently monitored at a pilot scale.

The [Turkish Integrated Monitoring Programme](#) is coordinated by the Ministry, that adopted the integrated standard ecosystem-based approach, and are set mainly according to international environmental conventions, such as the Bucharest convention and the Barcelona convention. Monitoring in Türkiye is mostly related to regulatory compliance, such as the MSFD and WFD. Other EU directives, like MSPD, are not adopted yet, but they could be in the future, increasing the monitoring needs in terms of both spatial coverage and parameters to be observed.

As an EU member state, **Romania** is obliged to comply with the European regulations. The Ministry of Environment has transposed the relevant directives and is in charge of the monitoring process by gathering data, working closely with some research institutes.

The coordination related to maritime spatial planning is managed at a high level. It integrates all the uses and the analysis from all the public authorities (ministries and departments) with responsibilities in each of them, that directly collect the relevant data and information, under the central management of the Ministry of Development, Administration and Public Works. As the ministry responsible for the territorial planning, they take advantage of their former expertise and apply to MSP.



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The situation in **Bulgaria** is quite similar to that in Romania; both countries joined the EU simultaneously and have been bi-laterally cooperating in adapting to the European regulations (see next section below).

The Institute of Oceanology (IO-BAS) is mentioned in the legislation as responsible for MSFD and WFD monitoring, working in close collaboration with the Ministry of Environment and Waters, as well as with the Black Sea Basin Directorate depending on it.

Georgia is facing bigger challenges in this regard. The Hydrographic Service from the National Environmental Agency is the body responsible for managing all the monitoring stations and delivering the weather forecast for the whole country, which includes the sea conditions. A specific unit under this department responsible for the monitoring of morpho-dynamic processes. Over the last decades, the country is facing a big challenge the coastal erosion as a consequence of the climate change. Monitoring is carried out under a programme of expeditions and includes bathymetry and topographic surveys. From the information gathered, special reports are produced and shared with municipalities affected by the progress of the coast, together with recommendations to mitigate the erosion processes.

The Hydrographic Service is aware of some institutes carrying out some monitoring activities, but they lack a cooperation dynamic, and information on research projects that involve monitoring activities in the Black Sea is not easily accessible for this department. This is acknowledged as a major challenge to be addressed in the near future, and they express willingness to communicate and work further on this coordination to **be part of a joint monitoring effort in the Black Sea**.

The country is making efforts for enhancing their monitoring the Black Sea, but it should be taken into account that it is still a **developing country**. Over the last 2-3 years they have received support from the UNDP Global Climate Fund¹ to implement an anti-hazard early warning system for the entire country, that has contributed to improve the weather forecasting system. At present, two marine meteorological stations are located in Batumi and in Poti.

Georgia has recently acquired the status of **candidate country** to become an EU member (Dec 2023) and there are still many obligations **and requirements** derived from this that they have to fulfil. It is also foreseen to receive **additional funding to support the adaptation process**, which is also expected to contribute to improve their monitoring systems.

Bilateral/ cross-border cooperation

Romania and Bulgaria have developed quite a strong cooperation dynamic over the years, mainly in terms of adaptation the EU policies and regulations after their accession as member states. Both countries have tried to harmonise their procedures and advance towards a coordinated monitoring. In particular, strong interaction has been developed during the elaboration of their National Maritime Spatial Plans, as teams from both countries learnt together the planning process, the necessary information, the data collection and the way to standardize it.

At regional level – the role of the Black Sea Commission.

Established as an intergovernmental organisation for the implementation of the Bucharest convention in 1992, the **Black Sea Commission (BSC)** acknowledges the relevance of monitoring the Black Sea and the challenges it faces, especially those derived from the current political situation.

¹ [Reducing the risk of climate driven disasters in Georgia](#). It is a 7-year programme with an overall budget of US\$74 million, co-financed by the government of Georgia with US\$38 million.



The BSC monitoring programme has been collecting data for more than 25 years in a quite effective manner. At present, due to the political situation, the fragmented nature of their monitoring data, and the lack of data related to newly arising challenges such as marine litter or climate change, this monitoring programme is not fully operational. In this context, the efforts to comply with the MSFD, WFD and MSP obligations have boosted the provision of additional resources by some Black Sea countries.

Despite the difficulties, the willingness to cooperate within the research community has led in the recent years to a number of **collaborative initiatives** that have contributed to the monitoring and availability of marine data in the region and contributed to sustain the BSC's effort. These initiatives, such as the [MISIS project](#) (DG ENV Programme "Preparatory action – Environmental monitoring of the Black Sea Basin and a common European framework programme for development of the Black Sea region/Black Sea and Mediterranean 2011") and [ANEMONE project](#) (Interreg Black Sea Cross Border Cooperation), have been promoted and developed under different European Union funding frameworks. More recently, [BRIDGE-BS](#), together with its sister project [DOORS](#) (Horizon 2020) are gathering together most of the community involved in the Black Sea research. Particularly, a huge effort has been made from [BRIDGE-BS](#) to identify data needs within the project, to inventory existing data sets and to assess data readiness and integrity. This inventory is an outstanding step and, together with the readiness assessment, has allowed to organise the collection of data necessary for the project and fill the identified gaps.

Position of DG Mare

The **European Commission** acknowledges the fragmentation of observations required under different legislative frameworks. This recognition is behind DG Mare's [Ocean Observation Initiative](#), which aims to enhance understanding of who collects what data, for what purposes, and where. The initiative seeks to facilitate better coordination and potentially foster synergies among Member States (MSs) and neighbouring countries to identify and address gaps in observation efforts. DG Mare intends to collaborate with MSs through the [Integrated Maritime Policy Council Group](#) to develop this process as robustly as possible, while also acknowledging and seeking to address specific challenges in the Black Sea. They are eager to engage in further discussions and provide support to overcome these challenges.

FUNDING

Ocean monitoring is a highly demanding activity, both in terms of qualified staff and budget. Data gathering is a costly process that requires steady funding to produce robust and reliable data that can be shared, available and open.

All the participant countries have national monitoring programmes in place under different time cycles (yearly updated in Bulgaria, 3-yearly in Türkiye). These programmes have limited budgets, and the addressed priorities are revised at the beginning of each cycle, which in some cases can lead to a time-series disruption.

As already mentioned, the research community around the Black Sea is keen to collaborate, and joint monitoring initiatives have been carried out in different projects over the past few years. However, the uneven access to funding by the different countries, particularly under the EU programmes, makes it difficult to achieve full financial coverage for these joint initiatives.

END USERS

From the contributions of the different participants, it seems evident that cooperation between data producers and users from the policy realm is quite fluent and sustained over time. Coordination between both is established and data users show a good understanding of the observations and monitoring carried out.

However, there is a significant group of potential users, namely the sectors within the blue economy, with whom the link has yet to be established. There is work to be done on both sides: the data collection community needs to approach them, and the industry needs to understand what is available and to what extent it can be exploited to benefit their activities.



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Conclusions

The history of coordination efforts in the Black Sea observation and monitoring has provided some strategic instruments that have paved the way for getting cooperation to a next level.

The [Strategic Research and Innovation Agenda \(SRIA\)](#) has been produced as a result of the [Connect-BlackSea](#) project to “guide stakeholders from academia, funding agencies, industry, policy, and society to address together the Fundamental Black Sea challenges, to promote the blue economy and its prosperities of the Black Sea region, to build critical support systems and innovative research infrastructure and to improve education and capacity building”. Further than that, an Implementation Plan (SRIA-IP) to put the SRIA into practice was developed, which is expected to trigger a series of actions across academia, industry, society and policy. From BRIDGE-BS expected results within the scope of ocean observation, foreseen contributions to the SRIA-IP will be related to:

- i) Continue and expand monitoring in the context of a **digital twin of the Black Sea** (SJA 1.1), *building on innovative models at regional and basin-scale that simulate climate change and multiple stressors and integrating them with socioeconomic trends, blue economy scenarios and system of systems approaches.* Looking towards the future, the landscape of monitoring is changing. Further than **observing and documenting** (monitoring, measuring, looking at trends and changes and publishing in journals and reporting to authorities), prediction tools are used to **test different scenarios** and **forecast the change** in the environment.
- ii) Continue to *organise **synoptic/ joint oceanographic expeditions** to identify synergistic and individual effects of each stressor (such as climate change, deoxygenation, acidification, sulphide build-up) on the entire ecosystem, from coasts to the deep parts, covering also sea floor processes* (SJA 2.1). It may sound simple, but it is still very challenging due to different factors (some of them external, due to the current geopolitical situation). This not only to **fulfil the data needs** but also to **train next generation of monitoring experts**.
- iii) The need for measuring/monitoring new parameters is endless, but there are some pressing emerging needs such as emerging contaminants, as identified in SJA 2.2. *(Develop a source-to-sink (and river-to-sea) pilot study to identify the fluxes, transformation and impact of emerging contaminants (such as pharmaceuticals, antibiotics, anthropogenic nanoparticles) and identify hazards arising from their multiple biotic impacts on the marine ecosystem) and cost-effective biodiversity mapping using emerging tools such as eDNA* (SJA 3.1, *Cost-effective mapping of the Black Sea biodiversity via emerging tools (such as e-DNA) at genetic, species and ecosystem levels*)

When boosting cooperation in ocean observing, the role of the BSC should be kept on the loop, despite the difficulties it faces at present, mainly due to the geopolitical situation. Promoting bi-lateral or multilateral cooperation at a lower scale, while keeping an open dialogue with the BSC, could be a suitable strategy for supporting the work carried out in the past and restoring its coordinating role in the future, to amplify and extend any progress achieved in the meantime.

In more specific terms, the main aspects that offer room for improvement and cooperation among the Black Sea countries are:

- **increase data collection** towards an **extensive monitoring programme**;
- consider the **three-dimensional feature of observations** (coastal, open sea and deep sea)
- **harmonisation of data** for ecosystem assessment **through different policies and requirements**;
- improve **strategies for data sharing** (make them open and accessible) – **transparency** with regard to the data being collected will also contribute to avoid overlapping;
- **Smarter design of monitoring stations**;



- **Improve financial support** to monitoring programmes. Candidate countries might take advantage of the adaptation process and funding to upgrade their monitoring capacities.
- Create the **links with the blue economy sectors** as **potential users** of the data and strategic partners to **co-design useful information services**.

The present conclusions will be used to feed the discussions under BRIDGE-BS, and in particular, to help design targeted knowledge transfer actions for the results related to ocean observation, among other thematic areas.

