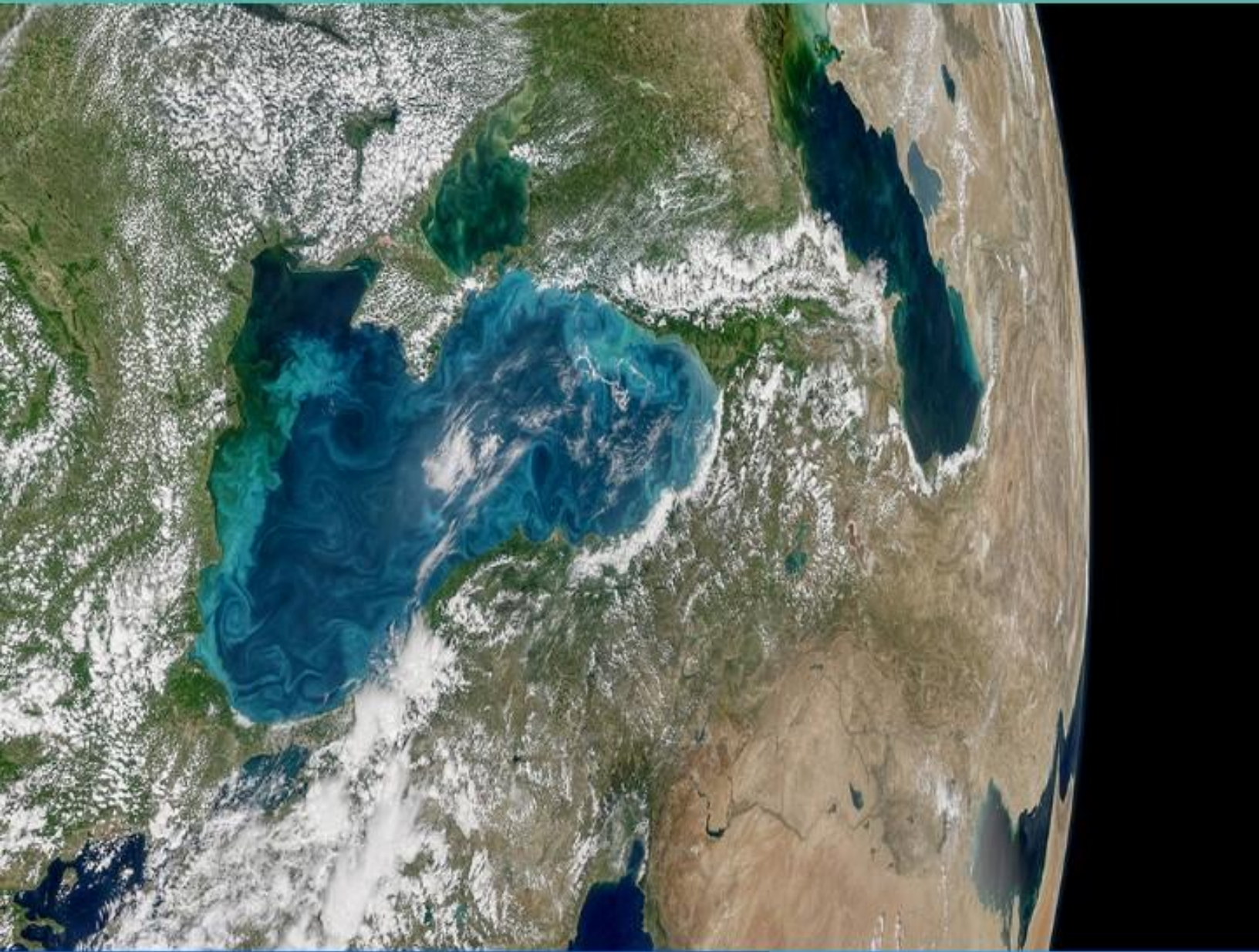


Black Sea CONNECT

Coordination of Marine and Maritime Research and Innovation in the Black Sea



D2.3 FIRST DRAFT OF THE
IMPLEMENTATION PLAN



CONNECT  BLACK SEA

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BLACK SEA STRATEGIC RESEARCH AND INNOVATION AGENDA

With the support of the European Commission, a working group of experts from countries bordering the Black Sea gathered in 2017 to develop a shared agenda for research and innovation for the Black Sea and provide guidance to national and EU policymakers. The group collaborated with marine experts from top European marine institutes and organizations and produced the Burgas Vision Paper, the key framework document for a shared vision of a productive, healthy, resilient, sustainable, and better-valued Black Sea by 2030. The publication was introduced at the 2018 European Maritime Day in Burgas, Bulgaria (May 2018). It addresses the key pillars on which the Black Sea Strategic Research and Innovation Agenda (SRIA) is built on. The Ministerial Declaration towards a Common Maritime Agenda for the Black Sea (2018), endorsed by the same Black Sea countries, provided more backing for this approach. The Horizon 2020 Program provided funding for the "Coordination of Marine and Maritime Research and Innovation in the Black Sea - Black Sea CONNECT" Coordination and Support Action (CSA) in 2019.

Creating a responsible and effective SRIA Implementation Plan based on the essential framework requirements to translate SRIA outputs into actions in collaboration with national research funders and key stakeholders is one of the goals of the Black Sea CONNECT CSA. In order to do so, national-level SRIA consultations were held in the Black Sea riparian countries in the latter half of 2020. These consultations provided direct input to the SRIA and its Implementation Plan with regard to country level goals and priorities. In order to ensure the involvement of funding agencies and ministries from Black Sea countries, a network called the Operational Network of Funders has also been established. Its goal is to strengthen regional cooperation among public research funders and facilitate the alignment of national priorities (such as research and innovation strategies) and prepare the ground for the focused funding of joint actions to address the key challenges and goals of the SRIA.

The 1st Draft of the Implementation Plan was developed using input from the Operational Network of Funders in addition to national level input gathered through the consultations and input from European and regional level priorities and policies like the European Green Deal, EU Mission: Mission Restore our Ocean and Waters, Sustainable Blue Economy Partnership, and UN Decade of Ocean Science. Based on this initial draft, the second round of national and international SRIA consultations will be held, and the results will be incorporated into the Final SRIA and its Implementation Plan.

The Final SRIA and the Implementation Plan aim to set the foundational work for protecting unique habitats of the Black Sea while supporting the development of sea-based sectors, which will then boost the blue economy and help create more jobs. The SRIA and its Implementation Plan will direct participants from academia, funding organizations, industry, policy, and society to address the fundamental challenges of the Black Sea, to promote the blue economy, to build vital support systems and innovative research infrastructure, to enhance education, and to build capacity. The Implementation Plan will be a long-lasting guide to catalyse new ideas and innovations.



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BLACK SEA SRIA MAIN GOALS¹

Pillar 1 - Addressing fundamental Black Sea research challenges - Black Sea Knowledge Bridge	
MG1	Developing innovative multi-disciplinary research, building on existing initiatives, including data-sharing mechanisms that will generate the knowledge needed to increase ecosystem resilience.
MG2	Providing new knowledge to mitigate the impacts of global climate change and the multiple environmental and anthropogenic stressors in the Black Sea from the land-sea interface to the deep basin.
Pillar 2 - Developing products, solutions and clusters underpinning Black Sea Blue Growth - Black Sea Blue Economy	
MG1	Supporting marine and maritime research and innovation domains of all the Black Sea countries to create synergy, increase economic benefits, reduce hazards in service of prospering, resilient and empowered communities deriving interest from the Black Sea basin.
MG2	Creating incentives for maritime innovation in existing and new, emerging blue economy sectors.
Pillar 3 - Building of critical support systems and innovative Infrastructures - Key Joint Infrastructure and Policy Enablers.	
MG1	Developing smart, integrated observing and monitoring systems in support of addressing scientific and socioeconomic challenges of the Black Sea, towards governance for a sustainable ecosystem, mitigation of climate change impacts, and accurate forecasting for adaptive management.
MG2	Advancing a harmonised set of working methodologies, standards and procedures on all aspects of coastal and marine research.
MG3	Developing new marine based technologies by benefiting from the fourth industrial revolution for the Black Sea to promote the safe and sustainable economic growth of the marine and maritime sectors, and the conservation and valorisation of marine cultural heritage.
MG4	Mechanisms to create, support and promote start-ups oriented towards the circular and blue economy in the Black Sea region
Pillar 4 - Education and capacity building - Empowered Citizens and Enhanced Blue Workforce	
MG1	Supporting formal and informal learning, education, training and use of knowledge and technologies for established and emerging marine and maritime jobs.
MG2	Empowering ocean-engaged citizens contributing to a clean, plastic free, healthy and productive Black Sea.
MG3	Contributing to enhanced science policy dialogue in formulating coastal and marine policies and programmes.

¹ Only main goals of the SRIA is given here. Please read the full SRIA via http://connect2blacksea.org/wp-content/uploads/2019/12/Black_Sea_SRIA_Final.pdf



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BLACK SEA SRIA IMPLEMENTATION PLAN

SRIA Pillar 1: Addressing fundamental Black Sea research challenges			SRIA Pillar 2: Developing products, solutions and clusters underpinning Black Sea Blue Growth				
Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7	Theme 8
Digital Twin of the Black Sea	Effect of Multiple Stressors on the Black Sea Ecosystem	Changing Black Sea biodiversity and ecosystem resilience under climate change and multistressors	Ecosystem Based fisheries, high-tech aqua- and mariculture	Blue biotechnology	One Health Approach and Improved Safety for Black Sea Coasts	Marine Litter Pilot	Marine Renewable Energy
SRIA Pillar 3: Building of critical support systems and infrastructures for the benefit of Black Sea communities			SRIA Pillar 4: Education and capacity building				
Innovative Observing Systems	Black Sea Underwater and Coastal Heritage		Innovative approaches to connect scientists, policy makers, industry and society		Blue Skills and Capacity Building on Marine Sciences		



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SRIA PILLAR 1: ADDRESSING FUNDAMENTAL BLACK SEA RESEARCH CHALLENGES

Theme 1: Digital Twin of the Black Sea The Digital Twin of the Black Sea will consist of real-time information from available database systems, high-resolution models of the sea and the Black Sea watershed supported by artificial intelligence tools and socio-economic models. The Digital Twin will further our understanding of the Black Sea ecosystem, help predict its state under changing climate and environmental stressors, test alternative socio-economic scenarios, and support decision making.	
Strategic Joint Action 1.1	Developing the Digital Twin of the Black Sea, 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
Proposed starting date	<i>1-3 years</i>
Policy, programmes	EU Mission: Mission Restore our Ocean and Waters, Common Maritime Agenda for the Black Sea, EU Mission: Adaptation to Climate Change, Space Strategy for Europe; Turkey's Climate Council Decisions, Romanian National Plan for Research and Innovation IV, UN SDG 13 Climate Action
Funding Opportunities and Research Infrastructures	EU Mission: Mission Restore our Ocean and Waters, Horizon Europe Sustainable Blue Economy Partnership, Horizon Europe Cluster 6; INTERREG NEXT BSB 2021-2027, COPERNICUS, DEKOSIM, DG MARE Sea Basin Assistance Mechanism
Strategic Joint Action 1.2	Advancing AI-powered decision support tools (DSTs) for marine ecosystem management in the Black Sea
Proposed starting date	<i>3-5 years</i>
Policy and programmes	EU Mission: Mission Restore our Ocean and Waters, Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, UN SDG14 Life Below Water
Funding Opportunities and Research Infrastructures	EU Mission: Mission Restore our Ocean and Waters, Horizon Europe Sustainable Blue Economy Partnership



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<p>Theme 2: Effect of Multiple Stressors on the Black Sea Ecosystem</p> <p>Forecasting how changes will affect the Black Sea environment and its services is only possible by understanding the impact of various stressors on the ecosystem. Studies tend to concentrate on understanding the individual effects of various stressors, such as the climate, fisheries, invasive species, and pollution, despite the fact that these stressors often interact with one another (e.g. fisheries and invasive species) or have difficult-to-distinguish and complicated dynamics (e.g. climate and deoxygenation). The H2020-funded BRIDGE-BS project's efforts to understand the effects of various stressors present difficulties and knowledge gaps regarding the synergistic and isolated effects of the stressors, highlighting the need for additional research on developing new tools and investigations to close the knowledge gaps.</p>	
Strategic Joint Action 2.2	Organizing synoptic/joint oceanographic expeditions to identify synergistic and individual effects of each stressor (such as deoxygenation, acidification, sulfide build-up) on the entire ecosystem
Proposed starting date	<i>1-3 Years</i>
Policy and programmes	EU Marine Strategy Framework Directive (MSFD), EU Mission: Mission Restore our Ocean and Waters, UN SDG 13 Climate Action
Funding Opportunities (National & International):	Horizon Europe, DG MARE calls, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, Joint cruise H2020 BRIDGE-BS & H2020 DOORS is a first step, EUROFLEETS, other R/Vs of countries, DEKOSIM
Strategic Joint Action 2.2	Developing a source-to-sink 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
Proposed starting date	<i>3-5 Years</i>
Policy and programmes	EU Marine Strategy Framework Directive (MSFD), EU Mission: Mission Restore our Ocean and Waters, UN SDG14 Life Below Water
Funding Opportunities and Research Infrastructures	National Science Fund - Ministry of Education and Science Bulgaria; European Maritime, Fisheries and Aquaculture Fund (EMFAF); Horizon Europe; INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV



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<p>Theme 3: Changing Black Sea biodiversity and ecosystem resilience under climate change and multistressors</p> <p>Studying an ecosystem's biodiversity is important, however, how changing environmental conditions affect an ecosystem's resilience also needs to be understood. To understand how biodiversity influences an ecosystem's health, production, and resistance to stresses, there is a need for novel, thorough, faster, and less expensive methods of mapping biodiversity. One of the subjects covered by recent research (e.g. BRIDGE-BS project) is understanding the Black Sea ecosystem's adaptability in the past and future. However, there are still important gaps in assessing the resilience of the ecosystems. New methods and data are required to understand the resilience of the ecosystems better, as well as how biodiversity is affected by changes. Efforts should be integrated for mapping biodiversity with those for ecosystem dependency assessment.</p>	
Strategic Joint Action 3.1	Cost-effective mapping of the Black sea biodiversity via emerging tools (such as the e-DNA) at genetic, species and ecosystem levels
Proposed starting date	<i>5-7 years</i>
Policy and programmes	EU Marine Strategy Framework Directive (MSFD), EU Biodiversity Strategy, GEF/UNDP/UNESCO Black Sea EBM project/initiative, FAO Climate Change programmes; The European Sustainable Blue Economy; The European Green Deal, UN SDG14 Life Below Water
Funding Opportunities and Research Infrastructures	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF), Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV
Strategic Joint Action 3.2	Uncovering the extent of invasive species in the Black Sea and developing tools to forecast their impact in the context of Black Sea multiple stressors as a basis for mitigation and adaptation policies.
Proposed starting date	<i>5-7 years</i>
Policy and programmes	EU Marine Strategy Framework Directive (MSFD), EU Biodiversity Strategy, GEF/UNDP/UNESCO Black Sea EBM, project/initiative, FAO Climate Change programmes, The European Sustainable Blue Economy, The European Green Deal
Funding Opportunities and Research Infrastructures	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF); Horizon Europe; INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV



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SRIA PILLAR 2: DEVELOPING PRODUCTS, SOLUTIONS AND CLUSTERS UNDERPINNING BLACK SEA BLUE GROWTH

Theme 4 - Ecosystem Based fisheries, high-tech aqua- and mariculture The study of fish stocks has dominated Black Sea fisheries science, but a more comprehensive understanding of the environment, in which fish populations play a key role, is needed. It is crucial to have a better understanding of the fish biomass and how fisheries interact across the different fish populations. Research focuses on how fisheries affect the target species. However, there is a need to understand the effect of fisheries on the overall ecosystem and the primary production of the Black Sea. Focusing on understanding fish production zones and expanding the Black Sea's extremely small protected areas is important since attaining sustainable fisheries is a hotly debated topic. These will be the first steps toward ecosystem-based fisheries, which is a poorly understood and unaddressed notion. Alternative methods of utilizing proteins and other nutritional products from the sea need to be researched while Europe aims towards zero carbon practices.	
Strategic Joint Action 4.1	Determination and validation of fish productivity zones and protected areas in the Black Sea using ecosystem-based approaches involving multi-actor platforms including artisanal (traditional) fisheries towards a basin wide network of complementary traditional fisheries and mariculture
Proposed starting date	<i>3-5 Years</i>
Policy and programmes	EU Marine Strategy Framework Directive (MSFD), EU Maritime Spatial Planning Directive, GEF/UNDP/FAO Black Sea Fisheries initiative (GFCM), The European Green Deal, Smart specialization strategies, Smart specialization platform on the sustainable blue economy, UN SDG 2 Zero Hunger and SDG12 Responsible Consumption and Production
Funding Opportunities and Research Infrastructures	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF), Horizon Europe, ANPA (National Agency for Fisheries and Aquaculture, Romania),
Strategic Joint Action 4.2	Develop carbon-neutral sustainable mariculture in the Black Sea, including supporting related research in alternative carbon-neutral protein sources
Proposed starting date	<i>5-7 Years</i>
Policy and programmes	GEF/UNDP/FAO Black Sea Fisheries initiative (GFCM), The European Green Deal, EU Marine Strategy Framework Directive (MSFD), The European Sustainable Blue Economy, UN SDG 2 Zero Hunger and SDG12 Responsible Consumption and Production
Funding Opportunities and Research Infrastructures	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF), Horizon Europe, INTERREG NEXT BSB 2021-2027, ANPA (National Agency for Fisheries and Aquaculture, Romania), Romanian National Plan for Research and Innovation IV



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<p>Theme 5: Blue biotechnology</p> <p>Marine waters include rich multicellular but also microbial biodiversity much of which is under-documented. This situation is further amplified in the Black Sea. Much of the basin has a unique biogeochemical structure, rendering this system as a habitat for anaerobic microorganisms and extreme eukaryotes. These organisms represent a large potential for new bio-inspired products and solutions. Besides, the productive surface waters of the Black Sea result in seasonal algal blooms which can further be cultivated for potential fuel and protein products. The joint actions in this theme will emphasize the documentation and sustainable use of this potential.</p>	
Strategic Joint Action 5.1	Establishing a knowledge system of candidate species and habitats that support bioactive compounds, such as novel pharmaceuticals, biofuels, enzymes, fishmeal, and biopolymers, for sustainable development and food security in the region
Proposed starting date	<i>1-3 Years</i>
Policy and programmes	The European Green Deal, European Marine Biology Resource Centre (EMBRC), LifeWatch ERIC, EU Bioeconomy Strategy, UN SDG 2 Zero Hunger and SDG12 Responsible Consumption and Production
Funding Opportunities and Research Infrastructures	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF), Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, EMBRC
Strategic Joint Action 5.2	Transforming hazards into resources: performing a feasibility study on the role of algae (from algal blooms) as biofuels, alternative protein sources and other natural products of the second generation
Proposed starting date	<i>3-5 Years</i>
Policy and programmes	The European Green Deal, Common Maritime Agenda for the Black Sea, The European Circular Economy Action Plan, Turkey's Climate Council Decisions, EU Bioeconomy Strategy, UN SDG 2 Zero Hunger and SDG12 Responsible Consumption and Production
Funding Opportunities and Research Infrastructures	Horizon Europe, Romanian National Plan for Research and Innovation IV, National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF)



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<p>Theme 6: One Health Approach and Improved Safety for Black Sea Coasts</p> <p>Adopting the One Health Approach to marine systems, this implementation theme will emphasize that the health and well-being of coastal populations cannot be separated from the resilience and health of the marine and coastal ecosystems. This theme will link the broad range of science and innovation included in the Implementation Plan with the health and well-being of communities and citizens living around the Black Sea. In this approach, the increasing frequency of climate-driven extreme events will be considered along with disruptive activities affecting the resilience of coastal communities - including socioeconomic and psychological angles. The COVID-19 Pandemic was a sharp demonstration of the need for such an approach. The assessment of the impact of COVID-19 on the Black Sea ecosystem, long term and episodic (storm-related) sea level rise and coastal floods, impact of pollution accidents, impact of war related activities (effects of ammunition, noise and episodic pollution events - unexploded ordnance), development of remote detection of shipwrecks with chemicals, estimation of free-floating hazards such as mines are all current disruptive events in the Black Sea. Available research and innovation tools need to be mobilized to better understand and predict these disruptive hazards for the well-being of citizens.</p>	
Strategic Joint Action 6.1	Investigate the long term and episodic (extreme weather event-related) changes related to sea level rise and coastal floods with associated impacts and adaptations including social aspects
Proposed starting date	3-5 Years
Policy and programmes	EU One Health Action Plan, EU Marine Strategy Framework Directive (MSFD), The European Green Deal, Mission Board on Healthy Oceans, Seas, and Coastal and Inland Waters, EU Mission: Mission Restore our Ocean and Waters, IOC's International Harmful Algal Bloom (HAB) Programme, UN SDG3 Good Health and Well-being and SDG14 Life Below Water
Funding Opportunities and Research Infrastructures	National Science Fund – Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF); Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV
Strategic Joint Action 6.2	Risk assessment of harmful algal bloom (HAB), jelly blooms and mucilage events at the regional level and their impact on ecosystem services, food safety and evaluation of their potential biotechnological applications
Proposed starting date	1-3 Years
Policy and programmes	EU One Health Action Plan, EU Marine Strategy Framework Directive (MSFD), The European Green Deal, Mission Board on Healthy Oceans, Seas, and Coastal and Inland Waters; EU Mission: Mission Restore our Ocean and Waters, IOC's International Harmful Algal Bloom (HAB) Programme, UN SDG3 Good Health and well-being and SDG14 Life Below Water
Funding Opportunities (National & International):	National Science Fund – Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund, Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, The Scientific and Technological Research Institution of Turkey
Strategic Joint Action 6.3	Identification of the ecosystem impact of civil and military disruptive activities (hazardous pollution, unexploded ordnance etc) affecting the resilience of coastal communities, integrating coastal scientific, socioeconomic and psychological angles
Proposed starting date	3-5 Years
Policy and programmes	EU Marine Strategy Framework Directive (MSFD), The European Green Deal, EU Mission: Mission Restore our Ocean and Waters, Cluster 6 in Horizon Europe UN



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	SDG14 Life Below Water, JPI Ocean Munitions in the Sea, JPI Oceans Underwater Noise in the Marine Environment
Funding Opportunities and Research Infrastructures	National Science Fund – Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF), Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV

Theme 7: Marine Litter Pilot

Marine litter is a common global challenge that is needed to be tackled with cutting-edge actions and as well as forming a platform of circular economy solutions.

Following the mandate of the Marine Litter Action Forum organised under the EU H2020 Black Sea CONNECT in November 2022, the need to address marine litter at the source is of high importance. In addition, information on the distribution and the concentration of marine litter, and especially plastics, in the water column and in sediments in the Black Sea is missing.

The Black Sea Marine Litter Action Forum has been established as one Forum to present the actions in place for existing and new initiatives and projects and to best coordinate all efforts for future cutting-edge interactions at different stakeholder groups (such as policy-science-industry-NGOs etc.) on marine litter pollution in the Black Sea. The establishment of the Marine Litter Action Forum as a recurring event will not only facilitate the discussion for decisions needed at the basin level but will leave a legacy in the region, in supporting the proper actions for the reduction, legal obligations and management of marine litter. Recycling, prevention of marine plastic and mitigation options to increase the blue circular economy and fulfil the goals of the European Green Deal will also be explored.

Strategic Joint Action 7.1	Raise awareness on the marine litter pollution and solutions in the Black Sea targeting the broader public by linking with already existing initiatives and creating novel activities (such as activities of Black Sea Young Ambassadors and other Early Career Ocean Professionals (ECOPs))
Proposed starting date	<i>1-3 Years</i>
Policy and programmes	EU Mission: Mission Restore our Ocean and Waters, Danube and Mediterranean Lighthouses, Green Deal, Common Maritime Agenda of the Black Sea, EU Strategy for Plastics in a Circular Economy, UN SDG14 Life Below Water
Funding Opportunities and Research Infrastructures	Horizon Europe, Romanian National Plan for Research and Innovation IV
Strategic Joint Action 7.2	Enable the Black Sea CONNECT Marine Litter Action Forum as a recurring platform/forum to tackle the pollution crisis in close links to Mission Starfish 2030: Restore our Ocean and Waters
Proposed starting date	<i>3-5 Years</i>
Policy and programmes	EU Mission: Mission Restore our Ocean and Waters, EU Danube and Mediterranean Lighthouses, The European Strategy for Plastics in a Circular Economy, UN SDG14 Life Below Water
Funding Opportunities and Research Infrastructures	Horizon Europe Sustainable Blue Economy Partnership, DG MARE Sea Basin Assistance Mechanism, Plastic Producer Associations



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<p>Theme 8: Marine Renewable Energy</p> <p>With the European Green Deal, the seas and oceans will have an elevated role in providing grounds for the development of carbon-zero, climate-neutral blue and green industries. The seascape, with its abundance of wave and wind energy, will have a large role in the transition to a climate-neutral economy. The Black Sea, in previous EU and nationally funded projects, has been shown as of a high potential for offshore wind and wave energy. Now a more robust roadmap and detailed feasibility studies will be needed, but the community will also need to start testing prototype renewable energy solutions that potentially integrate other blue carbon solutions such as macroalgal cultivation and hydrogen generation from biofuels. This theme and the associated Strategic Joint Actions suggest two implementable actions to start tapping the Black Sea's high renewable energy potential.</p>	
<p>Strategic Joint Action 8.1</p>	<p>Development of an experimental renewable wind and wave energy demonstrator for identifying energy outputs, impact on the ecosystem and economic feasibility and social acceptability</p>
<p>Proposed starting date</p>	<p><i>3-5 Years</i></p>
<p>Policy and programmes</p>	<p>The European Green Deal, The European Circular Economy Action Plan, Turkey's Climate Council Decisions, Energy Union and the Strategic Energy Technology Plan (SET-Plan), UN SDG7 Affordable and Clean Energy</p>
<p>Funding Opportunities and Research Infrastructures</p>	<p>Sustainable Blue Economy Partnership, Romanian National Plan for Research and Innovation IV</p>
<p>Strategic Joint Action 8.2</p>	<p>Advance the concept and design and feasibility of a future multi-use offshore platforms or protected areas for piloting solutions integrating solar energy, green hydrogen production, and link to blue carbon (carbon capture underwater)</p>
<p>Proposed starting date</p>	<p><i>5-7 Years</i></p>
<p>Policy and programmes</p>	<p>The European Green Deal, The European Circular Economy Action Plan, Turkey's Climate Council Decisions, new ESFRI RI MARINERGi envisaged for the Romanian partners (and any other Black Sea partner), UN SDG7 Affordable and Clean Energy</p>
<p>Funding Opportunities and Research Infrastructures</p>	<p>Horizon Europe Sustainable Blue Economy Partnership, Romanian National Plan for Research and Innovation IV</p>



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SRIA PILLAR 3: BUILDING OF CRITICAL SUPPORT SYSTEMS AND INFRASTRUCTURES FOR THE BENEFIT OF BLACK SEA COMMUNITIES

Theme 9: Innovative Observing Systems

The observation of key oceanographic features, essential ocean variables, and critical parameters that underpin MSFD (EU Marine Strategy Framework Directive) criteria are of great essence to addressing any issue related to marine health and a sustainable blue economy. These observations include those made through research-vessel-based seagoing expeditions, fixed platforms such as buoys, mobile platforms such as gliders, ROVs, AUVs and ARGOS, and also by remote sensing through satellites or via acoustic observations. These approaches generate a wealth of observations on the state of marine physical and ecosystem processes and they are increasingly logged in standardized, harmonized databases at least at the metadata level. There is a great need for all these observation actions to be realized in a coordinated, targeted way tailored to the need of the policymakers and scientific knowledge gaps. While the two Strategic Joint Actions in this theme will recommend the implementation of key next steps towards integrated observations in the Black Sea, we also put forward the concept of, Open Data and Open Innovation are two underlying, cross-cutting principles underpinning these two actions.

Strategic Joint Action 9.1	Designing of an integrated joint observing system, including regular sea expeditions, standardized fixed observing systems supported by mobile platforms
Proposed starting date	1-3 Years
Policy and programmes	DEKOSIM, BulArgo, European Data Strategy
Funding Opportunities and Research Infrastructures	Activities started in H2020 DOORS (System of Systems) with the integration of data from Danube Delta Supersite of DANUBIUS-RI, Romanian National Plan for Research and Innovation IV, MASRI – Infrastructure for sustainable development in the field of marine research and participation in the European infrastructure EURO ARGO
Strategic Joint Action 9.2	Advance the mobile component of the Black Sea observatory by expanding the ARGO and glider deployment in a coordinated way
Proposed starting date	3-5 Years
Policy and programmes	DEKOSIM, EMODNET, SeaDataNet, BulAArgo, Copernicus
Funding Opportunities and Research Infrastructures	Horizon Europe, DG MARE, INTERREG NEXT BSB 2021-2027, MASRI – Infrastructure for sustainable development in the field of marine research and participation in the European infrastructure Euro-Argo, DANUBIUS-RI, EURO ARGO



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<p>Theme 10: Black Sea Underwater and Coastal Heritage</p> <p>Since the dawn of history, the Black Sea has been at the crossroads of civilizations. Via shipwrecks, submerged ancient settlements and buried artefacts; the sea keeps unprecedented clues to ancient maritime trade routes, diplomatic relations or wars, and economic developments. The coastal zone of the Black Sea countries is especially rich in this respect, but the deeper water of the Black Sea safeguards uniquely preserved wooden shipwrecks that pave the way for new discoveries. These and many other coastal and deep-water heritage elements constitute not only exciting opportunities for international scientific cooperation, but they also provide pathways for inclusive, sustainable blue growth for the coastal cities and communities. The Strategic Joint Actions of this theme will emphasize both aspects and serve as a fruitful platform for cooperation and innovation in the region.</p>	
Strategic Joint Action 10.1	Continue to map and select (for further promotion) the underwater heritage of the Black Sea and assess the sensitivity of heritage sites to climate change and multistressors
Proposed starting date	<i>3-5 Years</i>
Policy and programmes	Black Sea CMA Underwater Heritage Working Group
Funding Opportunities and Research Infrastructures	National Science Fund - Ministry of Education and Science Bulgaria, Horizon Europe, INTERREG NEXT BSB 2021-2027, Shota Rustaveli National Science Foundation of Georgia
Strategic Joint Action 2	Opening the Common Cultural Heritage of the Black Sea coast to the wider public through the development of sustainable and innovative tourism models
Proposed starting date	<i>3-5 Years</i>
Policy and programmes	Black Sea CMA Underwater Heritage Working Group, Horizon Europe Sustainable Blue Economy Partnership, Joint Operational Programme Black Sea
Funding Opportunities and Research Infrastructures	National Science Fund - Ministry of Education and Science Bulgaria, Horizon Europe, INTERREG NEXT BSB 2021-2027, Shota Rustaveli National Science Foundation of Georgia



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SRIA PILLAR 4: EDUCATION AND CAPACITY BUILDING

Theme 11 - Innovative approaches to connect scientists, policymakers, industry and society

Identifying synergies, co-creating activities and designing new approaches that will actively engage and sustain an interest and commitment from stakeholders in the Black Sea is of utmost importance for the implementation of the SRIA. An engaging and participatory approach for all stakeholders is proposed, through appropriately chosen platforms that can promote and allow an ongoing dialogue at all societal levels, incorporating all current subjects of interest and facilitating exchanges among participants in a timely, efficient and engaging manner.

The information flow among all stakeholders needs to work in synergy for all parties involved and must provide clear benefits to all parties from the start in order to initiate interest.

Research and Innovation stakeholders can be engaged through sustainable platforms such as Living Labs, World Cafes etc. so that a participatory, interactive approach can be adopted, based on improved dialogue, and all parties can be fully aware of the issues discussed. The way to be accomplished can be adapted accordingly depending on the audience.

Adopting and maintaining a coordinated approach, regularly connecting and projecting future scenarios on environmental change, impacts on ecosystems goods and services, blue growth scenarios as well as the impact on jobs and well-being of local communities, can be crucial in addressing these stakeholders and achieving a continuous and fruitful interaction with them.

Strategic Joint Action 11.1	Develop mechanisms to continue the identification of new SRIA priorities and emerging topics of implementation
Proposed starting date	<i>1-3 Years</i>
Policy and programmes	EU Mission: Mission Restore our Ocean and Waters, Danube Lighthouse, DG MARE Sea Basin Assistance Mechanism
Funding Opportunities and Research Infrastructures	Joint Operational Programme the Black Sea, New Lighthouses' calls, emerging EU calls (e.g. Erasmus, DG MARE calls etc.)
Strategic Joint Action 11.2	Engaging research and innovation stakeholders through sustainable stakeholder platforms such as Living Labs etc., World Cafes
Proposed starting date	<i>1-3 Years</i>
Policy and programmes	EU Mission: Mission Restore our Ocean and Waters, Danube Lighthouse, DG MARE Sea Basin Assistance Mechanism
Funding Opportunities and Research Infrastructures	DANUBIUS RI, H2020 Green Deal projects such as ARSINOE, ERICs, Horizon Europe Partnerships, Multinational calls from the Black Sea countries, bilateral cooperation, cross-border cooperation calls



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Theme 12: Blue Skills and Capacity Building on Marine Sciences

While it is evident that skills are a pathway to employability in the marine and maritime sector, there is still a great divide between industry requirements and provisions made by existing education and training systems. In order to contribute to a more resilient labour market, increase capacity and increase the attractiveness of blue careers, there is a need to tailor training courses for a wide spectrum of stakeholders, ranging from the general to young researchers and to policymakers. Raising awareness among the general public, through ocean literacy activities, and thus contributing to a more ocean-literate and empowered society is crucial for the sustainability of the region.

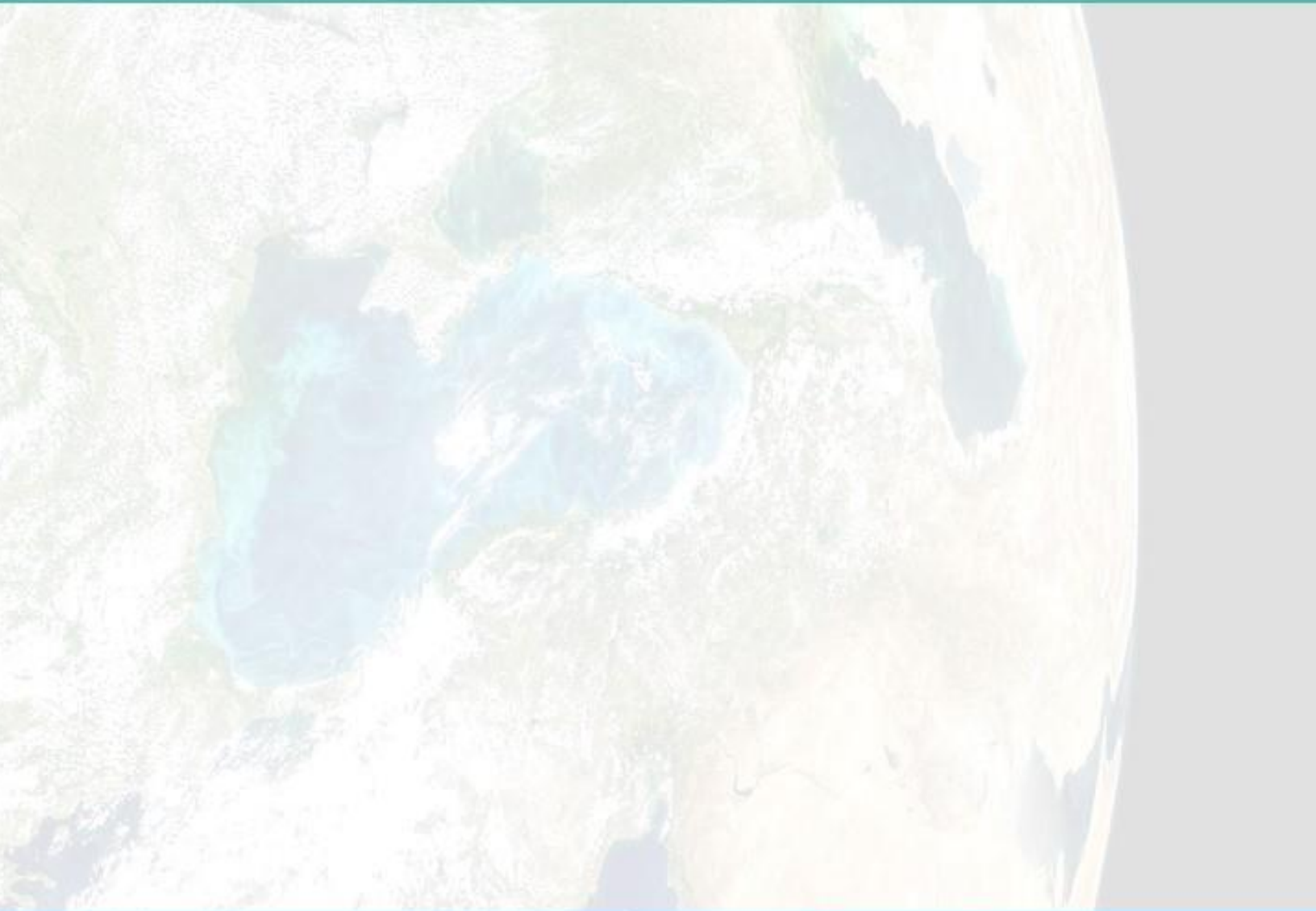
To develop ocean education and, in a way, change the thinking of the public towards the merits that the Black Sea can provide we need to develop a more ocean-literate public and enhance marine citizenship. Participation in environmental education has been identified as the most important predictor of environmental behaviour. This can be accomplished through citizen-science initiatives, engaging the public in activities in which they will actively participate in local/regional activities, and using innovative tools for learning by doing (water quality, biodiversity monitoring).

As well as ocean education, youth involvement of ocean literacy activities has great importance to raise awareness on seas and oceans. The Black Sea Young Ambassadors Programme, which is going to continue through the BRIDGE-BS Project, could co-create activities with Ambassadors/Youth Initiatives from other sea basins & mutual activities with UN Ocean Literacy and UN SDG. The Programme itself will help to bring the general public closer to the Early Career Ocean Professionals (ECOPs), especially through their activities in BRIDGE-BS.

Strategic Joint Action 12.1	Building on momentum of existing Black Sea Young Ambassadors Programme, new approaches for all ECOPs will be developed in order to engage general public such as the Citizen Science initiatives – actively involve citizens in science-related processes using innovative tools for learning by doing (water quality, biodiversity monitoring)
Proposed starting date	<i>1-3 Years</i>
Policy and programmes	Other sea basin Young Ambassadors/Youth Initiatives, EMSEA, UN Decade of Ocean Science and UN SDG4 Quality Education
Funding Opportunities (National & International):	Ongoing projects (BRIDGE-BS, CONNECT CSA), European Maritime, Fisheries and Aquaculture Fund (EMFAF), DG MARE Calls, EU Erasmus Calls
Strategic Joint Action 12.2	Develop a Training series (including summer school-type activities) for ECOPs and LATE COPS (peer training, involving late careers as mentors) Adopt a "Train the Trainer" Programme Approach (through staff exchanges, secondments, mobility programmes etc.) in order to increase the capacity of mentors/researchers who can act as mentors to younger researchers.
Proposed starting date	<i>3-5 Years</i>
Policy and programmes	EMSEA, Black Sea Universities Network, UN SDG4 Quality Education
Funding Opportunities (National & International):	Existing Projects (BRIDGE-BS, Black Sea CONNECT CSA), DANUBIUS-RI, European Maritime, Fisheries and Aquaculture Fund (EMFAF)



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