

CONNECT  BLACK SEA

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

BLACK SEA STRATEGIC RESEARCH AND INNOVATION AGENDA IMPLEMENTATION PLAN



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AUTHORS

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LAYOUT DESIGN AND GRAPHICS

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BLACK SEA STRATEGIC RESEARCH AND INNOVATION AGENDA AND ITS IMPLEMENTATION PLAN

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 (2019), endorsed by the same Black Sea countries, provided more backing for this approach and the context for its implementation. The Horizon 2020 Programme 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. To do so, national level SRIA consultations were held in the Black Sea countries in the second 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 strategic joint actions to address the key challenges and goals of the SRIA. The Operational Network of Funders will provide easy contact for strategic joint actions with other relevant EU, national or regional initiatives.

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. This was further complemented by 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 was held, and the results are incorporated into the Final SRIA and its Implementation Plan.

The Final SRIA and the Implementation Plan aim to set the foundational work for protecting the 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, build vital support systems and innovative research infrastructure, enhance education, and build capacity. The Implementation Plan will be a long-lasting guide to catalyse new ideas and innovations towards and with the Black Sea community and beyond with adjacent regions, actors and instruments.



BLACK SEA SRIA MAIN GOALS

SRIA PILLAR 1: ADDRESSING FUNDAMENTAL BLACK SEA RESEARCH CHALLENGES

MAIN GOAL 1

Developing innovative multi-disciplinary research, building on existing initiatives, including data-sharing mechanisms that will generate the knowledge needed to increase ecosystem resilience.

MAIN GOAL 2

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.

SRIA PILLAR 2: DEVELOPING INNOVATION, SOLUTIONS, AND CLUSTERS UNDERPINNING A SUSTAINABLE BLACK SEA BLUE ECONOMY

MAIN GOAL 1

Supporting marine and maritime research and innovation domains of all the Black Sea countries to create synergy, increase economic benefits, and reduce hazards in service of prospering, resilient and empowered communities deriving interest from the Black Sea basin.

MAIN GOAL 2

Creating incentives for maritime innovation in existing and new, emerging blue economy sectors.

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

MAIN GOAL 1

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.

MAIN GOAL 2

Advancing a harmonised set of working methodologies, standards and procedures on all aspects of coastal and marine research.

MAIN GOAL 3

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.

MAIN GOAL 4

Mechanisms to create, support and promote start-ups oriented towards the circular and blue economy in the Black Sea region.

SRIA PILLAR 4: EDUCATION AND CAPACITY BUILDING

MAIN GOAL 1

Supporting formal and informal learning, education, training and use of knowledge and technologies for established and emerging marine and maritime jobs.

MAIN GOAL 2

Empowering ocean-engaged citizens contributing to a clean, plastic-free, healthy and productive Black Sea.

MAIN GOAL 3

Contributing to enhanced science policy dialogue in formulating coastal and marine policies and programmes.

BLACK SEA SRIA IMPLEMENTATION PLAN



THEME 1: DIGITAL TWIN OF THE BLACK SEA



THEME 2: EFFECT OF MULTIPLE STRESSORS ON THE BLACK SEA ECOSYSTEM



THEME 3: CHANGING BLACK SEA BIODIVERSITY AND ECOSYSTEM RESILIENCE UNDER CLIMATE CHANGE AND MULTISTRESSORS



THEME 4: ECOSYSTEM BASED FISHERIES, HIGH-TECH AQUA- AND MARICULTURE



THEME 5: BLUE BIOTECHNOLOGY



THEME 6: ONE HEALTH APPROACH AND IMPROVED SAFETY FOR BLACK SEA COASTS



THEME 7: MARINE LITTER



THEME 8: MARINE RENEWABLE ENERGY



THEME 9: INNOVATIVE OBSERVING SYSTEMS



THEME 10: BLACK SEA UNDERWATER AND COASTAL HERITAGE




THEME 11: INNOVATIVE APPROACHES TO CONNECT SCIENTISTS, POLICYMAKERS, INDUSTRY AND SOCIETY



THEME 12: BLUE SKILLS AND CAPACITY BUILDING ON MARINE SCIENCES

CORRESPONDING PILLAR:

 SRIA PILLAR 1: ADDRESSING FUNDAMENTAL BLACK SEA RESEARCH CHALLENGES

 SRIA PILLAR 2: DEVELOPING INNOVATION, SOLUTIONS, AND CLUSTERS UNDERPINNING A SUSTAINABLE BLACK SEA BLUE ECONOMY

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

 SRIA PILLAR 4: EDUCATION AND CAPACITY BUILDING

BLACK SEA SRIA IMPLEMENTATION PLAN



THEME 1: DIGITAL TWIN OF THE BLACK SEA



THEME 2: EFFECT OF MULTIPLE STRESSORS ON THE BLACK SEA ECOSYSTEM



**THEME 3: CHANGING BLACK SEA BIODIVERSITY AND ECOSYSTEM RESILIENCE
UNDER CLIMATE CHANGE AND MULTISTRESSORS**






**LINKED TO SRIA PILLAR 1:
ADDRESSING FUNDAMENTAL
BLACK SEA RESEARCH CHALLENGES**



THEME 1: DIGITAL TWIN OF THE BLACK SEA

LINKED TO SRIA PILLAR 1

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. A Black Sea-specific ocean observing system should fundamentally support data sharing among participants and further contribute to the handling and management of Digital Twin of the Black Sea.

	STRATEGIC JOINT ACTION			
1.1	Develop 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	3-5 Years	EU Mission: Mission Restore our Ocean and Waters, EU Mission: Adaptation to Climate Change, Space Strategy for Europe, UN SDG13 Climate Action, Smart Specialisation Strategies, Common Maritime Agenda for the Black Sea (CMA), Türkiye's Climate Council Decisions, Romanian National Plan for Research and Innovation IV	EU Mission: Mission Restore our Ocean and Waters, Horizon Europe Sustainable Blue Economy Partnership, Horizon Europe Cluster 6, INTERREG NEXT BSB 2021-2027, Marine Ecosystem and Climate Research Center - DEKOSIM (Türkiye), European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Interregional Innovation Investments (I3) Instrument, European Digital Twin of the Ocean (European DTO), Copernicus Marine Environment Monitoring Service (CMEMS), Relevant Ministries and Agencies from the Black Sea Countries, DANUBIUS-RI, H2020 DOORS
1.2	Advance AI-powered decision support tools (DSTs) for ecosystembased management in the Black Sea	3-5 Years	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	EU Mission: Mission Restore our Ocean and Waters, Horizon Europe Sustainable Blue Economy Partnership, Relevant Ministries and Agencies from the Black Sea Countries



THEME 2: EFFECT OF MULTIPLE STRESSORS ON THE BLACK SEA ECOSYSTEM

LINKED TO SRIA PILLAR 1

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 climate change, fisheries, invasive species, and pollution, despite the fact that these stressors often interact with one another (such as fisheries and invasive species) or have difficult-to-distinguish and complicated dynamics (such as climate change and deoxygenation) in the wider context of the special Black Sea unique genesis, evolution and characteristics. 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.




STRATEGIC JOINT ACTION				
2.1	Organize 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.	1-3 Years	EU Marine Strategy Framework Directive (MSFD), EU Mission: Mission Restore our Ocean and Waters, UN SDG13 Climate Action, UN SDG14 Life Below Water	Horizon Europe, European Maritime, Fisheries and Aquaculture Fund (EMFAF) 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, EU OFLEETS, other R/Vs of countries, Marine Ecosystem and Climate Research Center - DEKOSIM (Türkiye), Relevant Ministries and Agencies from the Black Sea Countries
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	3-5 Years	EU Marine Strategy Framework Directive (MSFD), EU Water Framework Directive (WFD), EU Mission: Mission Restore our Ocean and Waters, UN SDG14 Life Below Water, The European Green Deal, EU Action Plan: "Towards Zero Pollution for Air, Water and Soil", EU One Health Action Plan	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, DANUBIUS RI, Relevant Ministries and Agencies from the Black Sea Countries



THEME 3: CHANGING BLACK SEA BIODIVERSITY AND ECOSYSTEM RESILIENCE UNDER CLIMATE CHANGE AND MULTISTRESSORS

LINKED TO SRIA PILLAR 1

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 (such as 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 such as e-DNA, acoustic, optical and chemical sensing 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.

STRATEGIC JOINT ACTION				
3.1	Cost-effective mapping of the Black Sea biodiversity via emerging tools (such as e-DNA) at genetic, species and ecosystem levels	3-5 Years	EU Marine Strategy Framework Directive (MSFD), EU Water Framework Directive (WFD), EU Birds and Habitats Directives (EU Nature Directives), EU Biodiversity Strategy, Global Environment Facility (GEF)/United Nations Development Programme (UNDP)/UNESCO Black Sea Ecosystem Based Management (EBM) projects/initiatives, FAO Climate Change Programmes, The new Sustainable Blue Economy approach in the EU, The European Green Deal, UN SDG14 Life Below Water	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, Relevant Ministries and Agencies from the Black Sea Countries
3.2	Uncover the extent of invasive species in the Black Sea and developing tools to forecast their impact in the context of the Black Sea multiple stressors as a basis for prevention, mitigation and adaptation policies	5-7 Years	EU Marine Strategy Framework Directive (MSFD), EU Water Framework Directive (WFD), EU Biodiversity Strategy, Global Environment Facility (GEF)/United Nations Development Programme (UNDP)/UNESCO Black Sea Ecosystem-Based Management (EBM) projects/initiatives, FAO Climate Change programmes, The new Sustainable Blue Economy approach in the EU, The European Green Deal	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, Relevant Ministries and Agencies from the Black Sea Countries

BLACK SEA SRIA IMPLEMENTATION PLAN



THEME 4: ECOSYSTEM BASED FISHERIES, HIGH-TECH AQUA- AND MARICULTURE



THEME 5: BLUE BIOTECHNOLOGY



THEME 6: ONE HEALTH APPROACH AND IMPROVED SAFETY FOR BLACK SEA COASTS



THEME 7: MARINE LITTER



THEME 8: MARINE RENEWABLE ENERGY

**LINKED TO SRIA PILLAR 2:
DEVELOPING INNOVATION, SOLUTIONS,
AND CLUSTERS UNDERPINNING A
SUSTAINABLE BLACK SEA BLUE ECONOMY**








THEME 4: ECOSYSTEM BASED FISHERIES, HIGH-TECH AQUA- AND MARICULTURE

LINKED TO SRIA PILLAR 2

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	Determine and validate 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	3-5 Years	EU Marine Strategy Framework Directive (MSFD), EU Water Framework Directive (WFD), EU Birds and Habitats Directives (EU Nature Directives), EU Maritime Spatial Planning Directive, The European Green Deal, Smart Specialization Strategies, GEF/UNDP/FAO/GFCM Black Sea Fisheries projects/initiatives, UN SDG2 Zero Hunger and SDG12 Responsible Consumption and Production, Common Maritime Agenda for the Black Sea (CMA), Fisheries and Oceans Package (Action Plan: Protecting and Restoring Marine Ecosystems for Sustainable and Resilient Fisheries)	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Horizon Europe, ANPA (National Agency for Fisheries and Aquaculture, Romania), European Sustainable Blue Economy Partnership, Relevant Ministries and Agencies from the Black Sea Countries
4.2	Develop carbon-neutral sustainable mariculture in the Black Sea, including supporting related research in alternative carbon-neutral protein sources	5-7 Years	GEF/UNDP/FAO/GFCM Black Sea Fisheries projects/initiatives, The European Green Deal, EU Marine Strategy Framework Directive (MSFD), Smart Specialization Strategies, The European Sustainable Blue Economy, UN SDG2 Zero Hunger and SDG12 Responsible Consumption and Production, Common Maritime Agenda for the Black Sea (CMA), The EU Algae Initiative, Fisheries and Oceans Package (Action Plan: Protecting and Restoring Marine Ecosystems for Sustainable and Resilient Fisheries)	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Horizon Europe, INTERREG NEXT BSB 2021-2027, ANPA (National Agency for Fisheries and Aquaculture, Romania), Romanian National Plan for Research and Innovation IV, Interregional Innovation Investments (I3) Instrument, Relevant Ministries and Agencies from the Black Sea Countries



THEME 5: BLUE BIOTECHNOLOGY

LINKED TO SRIA PILLAR 2

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 strategic joint actions in this theme will emphasize the documentation and sustainable use of this potential. They will be implemented with an interdisciplinary approach, connecting results from different points of view (oceanographic, geochemical, physical, and environmental processes).

STRATEGIC JOINT ACTION			
5.1 Establish 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	1-3 Years	The European Green Deal, EU Bioeconomy Strategy, UN SDG2 Zero Hunger and SDG12 Responsible Consumption and Production, Smart Specialization Strategies, Common Maritime Agenda for the Black Sea (CMA), The EU Algae Initiative	National Science Fund - Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, European Marine Biology Resource Centre (EMBRC), LifeWatch ERIC, Interregional Innovation Investments (I3) Instrument, Scientific and Technological Research Council of Türkiye (TÜBİTAK), Relevant Ministries and Agencies from the Black Sea Countries, Shota Rustaveli National Science Foundation of Georgia (SRNSFG)
5.2 Transform hazards into resources: performing a feasibility study on the role of algae as biofuels, alternative protein sources and other natural products of the second generation	3-5 Years	EU Mission: Mission Restore our Ocean and Waters, The European Green Deal, Common Maritime Agenda for the Black Sea (CMA), The European Circular Economy Action Plan, Türkiye's Climate Council Decisions, EU Bioeconomy Strategy, UN SDG2 Zero Hunger and SDG12 Responsible Consumption and Production, Smart Specialization Strategies, The EU Algae Initiative	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) Calls, Interregional Innovation Investments (I3) Instrument, Scientific and Technological Research Council of Türkiye (TÜBİTAK), Relevant Ministries and Agencies from the Black Sea Countries






THEME 6: ONE HEALTH APPROACH AND IMPROVED SAFETY FOR BLACK SEA COASTS

LINKED TO SRIA PILLAR 2

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 and the potential risk of marine geohazards (submarine landslides, earthquakes) 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, estimation of geohazard-related coastal risks, impact of pollution accidents, impact of armed conflict related activities (effects of ammunition, noise and episodic pollution events - unexploded ordnance), development of remote detection of shipwrecks with leaking chemicals, estimation of free-floating hazards such as mines are all current disruptive events in the Black Sea. Available monitoring, research and innovation tools need to be mobilized to better understand and predict these disruptive hazards for the well-being of citizens.

STRATEGIC JOINT ACTION

			
6.1 Investigate the long term and episodic (extreme weather event and geohazard-related) changes related to marine heatwaves, sea level rise and coastal floods with associated impacts and adaptations including social aspects and nature-based solutions	3-5 Years	EU One Health Action Plan, EU Marine Strategy Framework Directive (MSFD), The European Green Deal, 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, European Rural Development Policy, Smart Specialization Strategies, EU Climate Adaptation Strategy (2021), WHO One Health Joint Plan of Action	National Science Fund – Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, Interregional Innovation Investments (I3) Instrument, EU Climate Adaptation Strategy (2021), Relevant Ministries and Agencies from the Black Sea Countries, EMSO ERIC, DANUBIUS-RI
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	1-3 Years	EU One Health Action Plan, EU Marine Strategy Framework Directive (MSFD), The European Green Deal, 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, Smart Specialization Strategies	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 Türkiye, Interregional Innovation Investments (I3) Instrument, Copernicus Marine Environment Monitoring Service (CMEMS), Relevant Ministries and Agencies from the Black Sea Countries
6.3 Identify the ecosystem impact of civil and military disruptive activities (such as hazardous pollution and unexploded ordnance) affecting the resilience of coastal communities, integrating coastal scientific, socioeconomic and psychological angles	3-5 Years	EU Marine Strategy Framework Directive (MSFD), EU Water Framework Directive (WFD), The European Green Deal, EU Mission: Mission Restore our Ocean and Waters, Cluster 6 in Horizon Europe UN SDG14 Life Below Water, JPI Ocean Munitions in the Sea, JPI Oceans Underwater Noise in the Marine Environment, Common Maritime Agenda for the Black Sea (CMA), Joint Communication on an Enhanced EU Maritime Security Strategy and its Action Plan	National Science Fund – Ministry of Education and Science Bulgaria, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Horizon Europe, INTERREG NEXT BSB 2021-2027, Romanian National Plan for Research and Innovation IV, Relevant Ministries and Agencies from the Black Sea Countries, EURO ARGO, EMSO ERIC



THEME 7: MARINE LITTER

LINKED TO SRIA PILLAR 2

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 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 and NGOs) 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))	1-3 Years	EU Mission: Mission Restore our Ocean and Waters, Danube and Mediterranean Lighthouses, The European Green Deal, Common Maritime Agenda for the Black Sea (CMA), EU Strategy for Plastics in a Circular Economy, UN SDG14 Life Below Water, EU Zero Pollution Action Plan, EU Initiative Plastic Pirates Europe, The Convention on the Protection of the Black Sea Against Pollution	Horizon Europe, Romanian National Plan for Research and Innovation IV, INTERREG NEXT BS, Relevant Ministries and Agencies from the Black Sea Countries, Black Sea Economic Cooperation (BSEC), European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, World Bank, Shota Rustaveli National Science Foundation of Georgia (SRNSFG)
7.2	Enable the Black Sea CONNECT Marine Litter Action Forum as a recurring platform/forum to tackle the pollution crisis with close links to EU Mission: Mission Restore our Ocean and Waters	3-5 Years	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, The Convention on the Protection of the Black Sea Against Pollution, The European Green Deal, EU Action Plan: "Towards Zero Pollution for Air, Water and Soil"	Horizon Europe as well as the Sustainable Blue Economy Partnership, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Plastic Producer Associations, Black Sea Economic Cooperation (BSEC), Relevant Ministries and Agencies from the Black Sea Countries



THEME 8: MARINE RENEWABLE ENERGY

LINKED TO SRIA PILLAR 2

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.

STRATEGIC JOINT ACTION			
8.1 Develop an experimental renewable wind and wave energy demonstrator for identifying energy outputs, impact on the ecosystem and economic feasibility and social acceptability	3-5 Years	The European Green Deal, The European Circular Economy Action Plan, European Marine Spatial Planning Directive, Türkiye's Climate Council Decisions, Energy Union and the Strategic Energy Technology Plan (SET-Plan), UN SDG7 Affordable and Clean Energy, Offshore Renewable Energy Strategy, Smart Specialization Strategies	Horizon Europe as well as the Horizon Europe Sustainable Blue Economy Partnership, Romanian National Plan for Research and Innovation IV, Horizon Europe European Clean Energy Transition Partnership, BlueInvest, Interregional Innovation Investments (I3) Instrument, Relevant Ministries and Agencies from the Black Sea Countries, Fisheries and Oceans package (Communication from the Commission: On the Energy Transition of the EU Fisheries and Aquaculture sector)
8.2 Advance the concept, design and feasibility of future multi-use offshore platforms allocating zones for piloting solutions integrating solar energy, green hydrogen production, carbon capture underwater	5-7 Years	The European Green Deal, The European Circular Economy Action Plan, Türkiye's Climate Council Decisions, MARINERG-i - ESFRI, UN SDG7 Affordable and Clean Energy, Offshore Renewable Energy Strategy, Smart Specialization Strategies, Fisheries and Oceans package (Communication from the Commission: On the Energy Transition of the EU Fisheries and Aquaculture sector), European Marine Spatial Planning Directive, EU Mission: Mission Restore our Ocean and Waters, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls	Horizon Europe Sustainable Blue Economy Partnership, Romanian National Plan for Research and Innovation IV, Horizon Europe European Clean Energy Transition Partnership, BlueInvest, Interregional Innovation Investments (I3) Instrument, Relevant Ministries and Agencies from the Black Sea Countries, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls

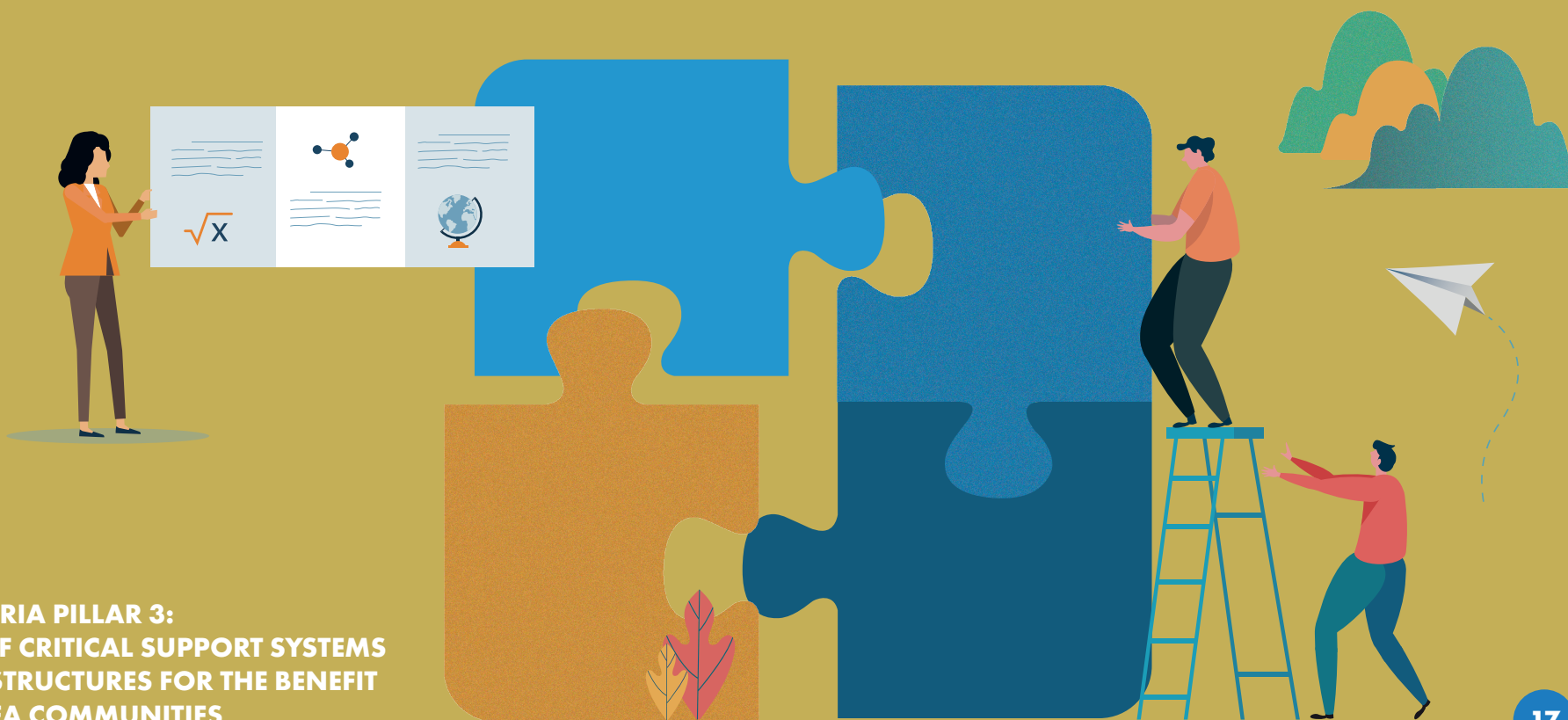
BLACK SEA SRIA IMPLEMENTATION PLAN



THEME 9: INNOVATIVE OBSERVING SYSTEMS



THEME 10: BLACK SEA UNDERWATER AND COASTAL HERITAGE






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



THEME 9: INNOVATIVE OBSERVING SYSTEMS

LINKED TO SRIA PILLAR 3




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. The concept of, cost-effective instrumentation, Open Data and Open Innovation are underlying and cross-cutting principles underpinning these Strategic Joint Actions.

STRATEGIC JOINT ACTION			
9.1 Design of an integrated joint observing system, including regular sea expeditions, standardized fixed observing systems supported by mobile platforms	1-3 Years	Marine Ecosystem and Climate Research Center - DEKOSIM (Türkiye), BulArgo, European Data Strategy, EU4OceanObs	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, Infrastructure for sustainable development in the field of marine research and participation in the European infrastructure EURO ARGO (MASRI), Relevant Ministries and Agencies from the Black Sea Countries, EMSO ERIC
9.2 Advance the mobile component of the Black Sea observatory by expanding the ARGO and glider deployment in a coordinated way	3-5 Years	Marine Ecosystem and Climate Research Center - DEKOSIM (Türkiye), BulArgo, Copernicus, EU4OceanObs	Horizon Europe, Infrastructure for sustainable development in the field of marine research and participation in the European infrastructure EURO-ARGO (MASRI), DANUBIUS-RI, EURO ARGO, Relevant Ministries and Agencies from the Black Sea Countries, EMSO ERIC, EMODNET, SeaDataNet

**THEME 10: BLACK SEA UNDERWATER AND COASTAL HERITAGE**

LINKED TO SRIA PILLAR 3

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 economy 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.

	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	3-5 Years	Potential Common Maritime Agenda for the Black Sea Underwater Heritage Technical Group, the UNESCO Convention on the Protection of the Underwater Cultural Heritage, Council of Europe	National Science Fund - Ministry of Education and Science Bulgaria, Horizon Europe, INTERREG NEXT BSB 2021-2027, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Creative Europe 2021-2027 European cooperation projects (Cultural heritage), Black Sea Economic Cooperation (BSEC), Relevant Ministries and Agencies from the Black Sea Countries
10.2	Open the Common Cultural Heritage of the Black Sea coast to the wider public through the development of sustainable and innovative tourism models	3-5 Years	Potential Common Maritime Agenda for the Black Sea Underwater Heritage Technical Group, Horizon Europe Sustainable Blue Economy Partnership, Joint Operational Programme Black Sea, the UNESCO Convention on the Protection of the Underwater Cultural Heritage, Council of Europe	National Science Fund - Ministry of Education and Science Bulgaria, Horizon Europe, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, Creative Europe 2021-2027 European cooperation projects (Cultural heritage), Relevant Ministries and Agencies from the Black Sea Countries, European Commission Directorate-General for Neighbourhood and Enlargement Negotiations (DG NEAR)

BLACK SEA SRIA IMPLEMENTATION PLAN



**THEME 11: INNOVATIVE APPROACHES TO CONNECT SCIENTISTS,
POLICYMAKERS, INDUSTRY AND SOCIETY**



THEME 12: BLUE SKILLS AND CAPACITY BUILDING ON MARINE SCIENCES



**LINKED TO SRIA PILLAR 4:
EDUCATION AND
CAPACITY BUILDING**






THEME 11: INNOVATIVE APPROACHES TO CONNECT SCIENTISTS, POLICYMAKERS, INDUSTRY AND SOCIETY

LINKED TO SRIA PILLAR 4

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. 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 economy 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 and preventing stakeholder fatigue.

STRATEGIC JOINT ACTION				
11.1	Develop mechanisms to continue the identification of new SRIA priorities and emerging topics of implementation	1-3 Years	EU Mission: Mission Restore our Ocean and Waters and its Danube and Black Sea Lighthouse, Common Maritime Agenda for the Black Sea (CMA)	Joint Operational Programme for the Black Sea, New EU Mission calls, emerging EU calls (such as Erasmus+, EMFAF calls), European Commission Directorate-General for Neighbourhood and Enlargement Negotiations (DG NEAR), European Commission Directorate-General for Regional and Urban Policy (DG REGIO), Relevant Ministries and Agencies from the Black Sea Countries, Shota Rustaveli National Science Foundation of Georgia (SRNSFG)
11.2	Engage research and innovation stakeholders through sustainable stakeholder platforms such as Living Labs, Multi Actor Forum (MAF), World Cafes	1-3 Years	EU Mission: Mission Restore our Ocean and Waters and its Danube and Black Sea Lighthouse, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls	DANUBIUS RI, European Green Deal projects such as ARSINOE, Horizon Europe and also related Horizon Europe Partnerships, European Commission Directorate-General for Neighbourhood and Enlargement Negotiations (DG NEAR), European Commission Directorate-General for Regional and Urban Policy (DG REGIO), Relevant Ministries and Agencies from the Black Sea Countries



THEME 12: BLUE SKILLS AND CAPACITY BUILDING ON MARINE SCIENCES

LINKED TO SRIA PILLAR 4

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, therefore, change the thinking of the public towards the merits that the Black Sea can lead to a more ocean-literate society 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).

Ensuring youth involvement in ocean literacy activities has great importance to raise awareness of seas and oceans. The Black Sea Young Ambassadors Programme, which is going to continue through the BRIDGE-BS Project, could co-create activities with Young Ambassadors/Youth Initiatives from other sea basins with and on UN Ocean Literacy and UN SDGs. The Programme itself will help to bring the general public closer to the Black Sea Early Career Ocean Professionals (ECOPs), especially through their activities in BRIDGE-BS Project. For the implementation of these joint actions, opportunities such as the EU year of skills (2023) will be exploited.

Additionally, while it is evident that skills are a pathway to employability in the marine and maritime sectors, there is still a great divide between industry requirements and skills gained through formal education and training systems. To contribute to a more resilient labour market, increase capacity and the attractiveness of blue careers, there is a need to tailor both formal and informal training courses for a wide spectrum of stakeholders, ranging from the experienced to early career researchers and policymakers.

STRATEGIC JOINT ACTION



12.1 Build on the momentum of the existing Black Sea Young Ambassadors Programme, new approaches for all ECOPS will be developed to engage the general public to create ocean literate societies such as the Citizen Science initiatives - actively involve citizens in science-related processes using innovative tools for learning by doing (water quality, biodiversity monitoring)

1-3 Years

EU Mission: Mission Restore our Ocean and Waters and its Danube and Black Sea Lighthouse, Other sea and ocean basin Young Ambassadors/Youth Initiatives, European Marine Science Educators Association (EMSEA), UN Decade of Ocean Science and UN SDG4 Quality Education, UN ECOPs, 2023 European Year of Skills, Common Maritime Agenda for the Black Sea (CMA), EU4Ocean

Existing projects (BRIDGE-BS, Black Sea CONNECT CSA), European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, EU Erasmus+ Calls, INTERREG NEXT BS 2021-2027, European Commission Directorate-General for Neighbourhood and Enlargement Negotiations (DG NEAR), European Commission Directorate-General for Regional and Urban Policy (DG REGIO), Relevant Ministries and Agencies from the Black Sea Countries

12.2 Develop an Intergenerational Training series (including summer school-type activities) for ECOPs and LATE COPS (peer training, involving late-career professionals as mentors)

3-5 Years

EU Mission: Mission Restore our Ocean and Waters and its Danube and Black Sea Lighthouse, European Marine Science Educators Association (EMSEA), Black Sea Universities Network (BSUN), UN SDG4 Quality Education, UN ECOPs, 2023 European Year of Skills, Common Maritime Agenda for the Black Sea (CMA), Relevant Ministries and Agencies from the Black Sea Countries

Existing projects (BRIDGE-BS, Black Sea CONNECT CSA), DANUBIUS-RI, European Maritime, Fisheries and Aquaculture Fund (EMFAF) Calls, INTERREG NEXT BS 2021-2027, European Commission Directorate-General for Neighbourhood and Enlargement Negotiations (DG NEAR), European Commission Directorate-General for Regional and Urban Policy (DG REGIO), Relevant Ministries and Agencies from the Black Sea Countries

Adopt a "Train the Trainer" Programme Approach (through staff exchanges, secondments, mobility programmes etc.) to increase the capacity of mentors/researchers who can act as mentors to younger researchers

SRIA PILLAR 1

ADDRESSING FUNDAMENTAL BLACK SEA RESEARCH CHALLENGES

THEME 1: DIGITAL TWIN OF THE BLACK SEA

Strategic Joint Action 1.1

Develop 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

Strategic Joint Action 1.2

Advance AI-powered decision support tools (DSTs) for ecosystembased management in the Black Sea

THEME 2: EFFECT OF MULTIPLE STRESSORS ON THE BLACK SEA ECOSYSTEM

Strategic Joint Action 2.1

Organize 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.

Strategic Joint Action 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

THEME 3: CHANGING BLACK SEA BIODIVERSITY AND ECOSYSTEM RESILIENCE UNDER CLIMATE CHANGE AND MULTISTRESSORS

Strategic Joint Action 3.1

Cost-effective mapping of the Black Sea biodiversity via emerging tools (such as e-DNA) at genetic, species and ecosystem levels

Strategic Joint Action 3.2

Uncover the extent of invasive species in the Black Sea and developing tools to forecast their impact in the context of the Black Sea multiple stressors as a basis for prevention, mitigation and adaptation policies

SRIA PILLAR 2

DEVELOPING INNOVATION, SOLUTIONS AND CLUSTERS UNDERPINNING A SUSTAINABLE BLACK SEA BLUE ECONOMY

THEME 4: ECOSYSTEM BASED FISHERIES, HIGH-TECH AQUA- AND MARICULTURE

Strategic Joint Action 4.1

Determine and validate 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

Strategic Joint Action 4.2

Develop carbon-neutral sustainable mariculture in the Black Sea, including supporting related research in alternative carbon-neutral protein sources

THEME 5: BLUE BIOTECHNOLOGY

Strategic Joint Action 5.1

Establish 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

Strategic Joint Action 5.2

Transform hazards into resources: performing a feasibility study on the role of algae as biofuels, alternative protein sources and other natural products of the second generation

THEME 6: ONE HEALTH APPROACH AND IMPROVED SAFETY FOR BLACK SEA COASTS

Strategic Joint Action 6.1

Investigate the long term and episodic (extreme weather event and geohazard-related) changes related to marine heatwaves, sea level rise and coastal floods with associated impacts and adaptations including social aspects and nature-based solutions

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

Strategic Joint Action 6.3

Identify of the ecosystem impact of civil and military disruptive activities (such as hazardous pollution and unexploded ordnance) affecting the resilience of coastal communities, integrating coastal scientific, socioeconomic and psychological angles

THEME 7: MARINE LITTER

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))

Strategic Joint Action 7.2

Enable the Black Sea CONNECT Marine Litter Action Forum as a recurring platform/forum to tackle the pollution crisis with close links to EU Mission: Mission Restore our Ocean and Waters

THEME 8: MARINE RENEWABLE ENERGY

Strategic Joint Action 8.1

Develop an experimental renewable wind and wave energy demonstrator for identifying energy outputs, impact on the ecosystem and economic feasibility and social acceptability

Strategic Joint Action 8.2

Advance the concept, design and feasibility of future multi-use offshore platforms allocating zones for piloting solutions integrating solar energy, green hydrogen production, carbon capture underwater

SRIA PILLAR 3

BUILDING OF CRITICAL SUPPORT SYSTEMS AND INFRASTRUCTURES FOR THE BENEFIT OF BLACK SEA COMMUNITIES

THEME 9: INNOVATIVE OBSERVING SYSTEMS

Strategic Joint Action 9.1

Design an integrated joint observing system, including regular sea expeditions, standardized fixed observing systems supported by mobile platforms

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

THEME 10: BLACK SEA UNDERWATER AND COASTAL HERITAGE

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

Strategic Joint Action 10.2

Open the Common Cultural Heritage of the Black Sea coast to the wider public through the development of sustainable and innovative tourism models

SRIA PILLAR 4

EDUCATION AND CAPACITY BUILDING

THEME 11: INNOVATIVE APPROACHES TO CONNECT SCIENTISTS, POLICYMAKERS, INDUSTRY AND SOCIETY

Strategic Joint Action 11.1

Develop mechanisms to continue the identification of new SRIA priorities and emerging topics of implementation

Strategic Joint Action 11.2

Engage research and innovation stakeholders through sustainable stakeholder platforms such as Living Labs, Multi Actor Forum (MAF), World Cafes

THEME 12: BLUE SKILLS AND CAPACITY BUILDING ON MARINE SCIENCES

Strategic Joint Action 12.1

Build on the momentum of the existing Black Sea Young Ambassadors Programme, new approaches for all ECOPS will be developed to engage the general public to create ocean literate societies such as the Citizen Science initiatives – actively involve citizens in science-related processes using innovative tools for learning by doing (water quality, biodiversity monitoring)

Strategic Joint Action 12.2

Develop an Intergenerational Training series (including summer school-type activities) for ECOPs and LATE COPS (peer training, involving late-career professionals as mentors).

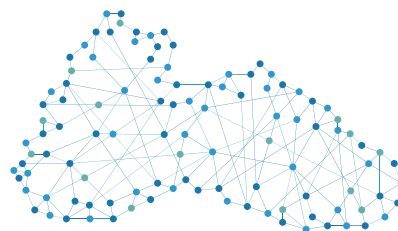
Adopt a "Train the Trainer" Programme Approach (through staff exchanges, secondments, mobility programmes etc.) to increase the capacity of mentors/researchers who can act as mentors to younger researchers.



*Scan QR code for the Black Sea
SRIA Implementation Plan*

NOTES

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CONNECT  BLACK SEA

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



Coordinator
Middle East Technical University
METU-IMS, Türkiye



Organization of the Black Sea
Economic Cooperation | BSEC, Türkiye



Institute of Oceanology, Bulgarian
Academy of Sciences | IO-BAS, Bulgaria



Ukrainian scientific Centre
of Ecology of Sea | UkrSCES, Ukraine



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Council of Türkiye | TÜBİTAK, Türkiye



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and Geoecology | GeoEcoMar, Romania



French Research Institute for
Exploitation of the Sea | IFREMER, France



Ivane Javakhishvili Tbilisi
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Research Consortium, KDM), Germany



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