**Matrixes; Blue Growth Initiative for Research and Innovation in the Black Sea**

**Matrix B. Regional and national boundary/framework conditions for the R&I needs and opportunities for successful implementation**

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| **Contribution** | **R&I Needs/Opportunities** | **Availability of Suitable Public and Private R&I Partnerships** | **Availability of Regional and National Supporting R&I Policies (Incentives, Regulatory Frameworks, Etc)** | **Availability of Regional and National Infrastructures** | **Availability of Regional and National R&I Funds** | **Availability of Regional and National Raw Materials / Resources to Exploit** |
| Georgia-TSU(Kakhaber Bilashvili)2017.12.08 | Problems of social-economic development of coastal areas should be addressed, since these are the main drivers of marine environmental transformations. |   |   | Available, especially as research centers and higher education institutions, select NGOs. | n/a |  |
| Georgia-TSU(Kakhaber Bilashvili)2017.12.08 | Attitudes of population at large as well as such specific actors as government officials, business representatives and NGOs should be investigated in order to understand needs of further support for marine policies implementation as well as to see the existing and potetntial gaps in policies' planning and implementation mechanisms from the main stakeholders' perspective. |   |   | Available, especially as research centers and higher education institutions, select NGOs. | n/a |  |
| Georgia-TSU(Kakhaber Bilashvili)2017.12.08 | In depth training for government officials of various levels in areas directly affecting marine and coastal zone environment |   | Legislation regulating education programs and institutions is in place | Available, especially as research centers and higher education institutions, select NGOs. | n/a |  |
| Georgia-TSU(Kakhaber Bilashvili)2017.12.08 | Training/retraining of specialists in marine environment and CZM should be introduced ar various levels of higher education (preferably graduate and doctoral) in order to fill in the existing gaps in management and planning due to shortage/absence of such cadres. |   | Legislation regulating education programs and institutions is in place | Available, especially as research centers and higher education institutions, select NGOs. | n/a |  |
| GeorgiaICZM National Focal Point(Mamuka GVILAVA)2017.12.07 | Establish common MSP methodology at national and regional levels e.g. through transboundary pilot schemes and common methodology for the Black Sea Basin. | Initial experience with MSP in BG and RO lead by governmental and research institutions (developed within MARSPLAN project).European MSP Platform. | European IMP for Black Sea initiative and related stakeholder network.Existing EU MSP Directive.Generic support of Black Sea Commission towards MSP.European MSP Platform. | Experience, cooperation arrangements between BG and RO developed within MARSPLAN.Potential for basin-wide cooperation of EU and Black Sea Commission. | E.g. Black Sea Basin Cross-Border Cooperation 2014-2020 (second call) and/or EMFF. | Spatial coordination of fisheries, maritime transport, MPAs, joint environmental monitoring, etc. for sounder governance of Black Sea Basin-wide resources. |
| GeorgiaICZM National Focal Point(Mamuka GVILAVA)2017.12.07 | Develop compact, comprehensive and commonly agreed SEA guidelines for area-specific (sub-national), national, as well as the Black Sea Basin-wide regional MSPs. | Black Sea Commission (e.g. ICZM Advisory Group) could provide forum for targeted SEA guidance development, thus channelling the EU support and experience.MSP national focal points in place in BG and RO. | European SEA Directive.European MSP Platform.SEA legislation in EU-Members and newly enacted SEA legislation in non-EU countries, compatible with EU SEA Directive (e.g. Georgia). | Draft recommendations for transboundary EIA available for Black Sea region (developed with EU support). SEA experiences in BG, RO. | IFI-s such as EIB and EBRD could be interested to support MSP and SEA framework, facilitating Blue Growth (BG) investments in the Black Sea Basin. | Coherent development of IMP and MSP initiatives, including sound investments in BG without jeopardising sustainability of marine resources and maritime activities. |
| GeorgiaICZM National Focal Point(Mamuka GVILAVA)2017.12.11 | Establish policy research in MSP as the separate theme or integrated with ICZM within the framework of the Black Sea Scientific Conferences organised biannually by the Black Sea Commission, complemented by the MSP thematic promoted by biannual Medcoast ICZM conference series. | EU supported Black Sea Blue Growth Conference Series.BSC Black Sea Scientific Conference Series.Medcoast ICZM Conference series for Med and Black Sea. | EU sponsored Blue Growth Stakeholder conferences are already visible event in the region. MSP is certainly promoted by EU MSP and MSF Directives. BSC member states include two EU Members willing to promote MSP proliferation in EU non-member countries, Two non-EU-Member Black Sea states per EU Association Agreement need to harmonise with EU legal and institutional systems, including with MSP and MSFD requirements. | Medcoast and Black Sea conference series are established forums.EU is strongly prompting MSP in in all neighbouring sea regions.BSC is supportive of MSP developments.Two EU-member countries are BSC members as well and are willing to promote MSP.  | Medcoast has sustained its ICZM conferences for 2 decades. Black Sea Conference series need support with co-organisation, e.g. EU sponsoring MSP addition to existing ICZM sessions/thematic. | Medcoast and Black Sea bi-annual Conference series could provide research platform for interaction of MSP practitioners with other research directions and stakeholders. |
| GeorgiaICZM National Focal Point(Mamuka GVILAVA)2017.12.11 | Provide for interdisciplinary scientific research on ICZM and on the interaction between land-based and sea-based activities and their impacts on coastal zones, both landward and seaward. | Black Sea Commission and its ICZM Advisory Group provide regional partnership for implementation. MoU between BSC and Med RAC PAP/RAC | Black Sea Commission approved [Guideline on ICZM in the Black Sea](http://www.blacksea-commission.org/Downloads/Black_Sea_ICZM_Guideline/Black_Sea_ICZM_Guideline.pdf). It is not legally binding, but provides roadmap for implementation. | Guideline is based on the model set by Mediterranean ICZM Protocol, latter in force in Med and ratified by EU. | E.g. Black Sea Basin Cross-Border Cooperation 2014-2020 (in case some research is accompanied by implementation). | [Guideline on ICZM in the Black Sea](http://www.blacksea-commission.org/Downloads/Black_Sea_ICZM_Guideline/Black_Sea_ICZM_Guideline.pdf), as well as results of numerous projects (many of them European) quoted in the document (e.g. PEGASO, IASON, PlanCoast, etc.). |
| GeorgiaICZM National Focal Point(Mamuka GVILAVA)2017.12.11 | Need in regional MSP training facility. | Medcoast already organised with EU support first edition of regional MSP training. | EU MSP directive is strong impetus for capacity building in EU-Member and even non-member states, e.g. those under association agreement. | Medcoast has strong experience with ICZM training and capacity building and access to MSP expertise to organise quality training like it did in first edition. | European funding most likely support mechanism, as capacity building is key to promote MSP in the region, | MSP capacity building is indispensable to sustainably manage marine and maritime resources. |
| GeorgiaICZM National Focal Point(Mamuka GVILAVA)2017.12.112018.03.10 | Development and harmonisation of implementation progress and state of the environment indicators across catchments, coastal zones and marine-maritime domains. | Black Sea Commission, through its ICZM Advisory Group is already fully reporting ICZM progress indicators as well as partially state of the coastal zone indicators, both developed by EU ICZM Working Group. No similar instruments for tracking MSP and IRBM progress available yet. | Black Sea Commission approved [Guideline on ICZM in the Black Sea](http://www.blacksea-commission.org/Downloads/Black_Sea_ICZM_Guideline/Black_Sea_ICZM_Guideline.pdf), which mandates reporting of both ICZM progress and state of the coastal zone indicators. No policies yet on reporting MSP and IRBM progress markers and state of the marine and catchment areas as indicator sets not available yet. | Black Sea Commission and its Advisory Groups provide institutional framework for reporting based on marine, coastal and catchment indicators (progress markers and state of the environment and economic activities) | FP7 supported several projects such as PEGASO, enviroGRIDS, IASON, PlanCoast. H2020 and BSB-CBC 2014-2020 could be strong instruments to make progress in marine and catchment areas. | Many deliverables of EU ICZM WG, FP7 projects named and reports produced by BSC ICZM Advisory Group. |
| GeorgiaICZM National Focal Point(Mamuka GVILAVA)2017.12.112018.03.10 | The Black Sea region and countries to make use of and strengthen existing appropriate mechanisms for monitoring and observation, or create new ones if necessary. To prepare and regularly update national inventories of coastal zones, covering information on resources and activities, as well as on institutions, legislation and planning that may influence coastal zones. | Black Sea Commission, and its ICZM Advisory Group is already fully reporting ICZM implementation audit reports (ICZM stock-taking) following example set together with Med countries and their ICZM Protocol and as reflected in [Guideline on ICZM in the Black Sea](http://www.blacksea-commission.org/Downloads/Black_Sea_ICZM_Guideline/Black_Sea_ICZM_Guideline.pdf). MoU exists between BSC and Med RAC PAP/RAC. | Black Sea Commission approved [Guideline on ICZM in the Black Sea](http://www.blacksea-commission.org/Downloads/Black_Sea_ICZM_Guideline/Black_Sea_ICZM_Guideline.pdf), which mandates ICZM stock-taking (implementation audit reporting) with approach strongly equivalent to reporting requirements of Med ICZM Protocol. This *inter alia* indicates harmonised policies between Med and Black Sea Basins. | FP7 IASON project supported Black Sea Commission’s ICZM Advisory Group with online survey system for ICZM stock-taking (available at <http://iason-fp7.eu/survey> for Black Sea, Med and any other regional sea). Audit as of 2012 completed and as of 2017 ongoing. | FP7 supported IASON project was of major help. H2020 and/or BSB-CBC 2014-2020 could be indispensable, but funds needed are indeed small and any ongoing or future project could include such support, complementing support by BS countries to BSC. | ICZM implementation audit reports as of 2012 available and as of 2017 ongoing. Online survey portal is up and running at <http://iason-fp7.eu/survey> for Black Sea, Med, any other EU regional sea). |
| GeorgiaICZM National Focal Point(Mamuka GVILAVA)2017.12.112018.03.10 | Implement innovative Data Cube technology for integration of Earth Observation across sea, coast and catchment domains of the Black Sea, providing easy to apply toolsets. | Black Sea Commission Advisory Groups (AG), including Information and Data Exchange AG (not functional yet) could host such a system.MoU between BSC and University of Geneva to maintain and use Black Sea Catchment Observation System (BSC OS, see [portal.envirogrids.net](http://portal.envirogrids.net/)).This toolset can indeed be complemented by Data Cube technology promoted by UNEP, UNEP/GRID-Geneva and UNIGE (pilot implemented in Georgia and Moldova). | Black Sea Commission joined Group and Earth Observations (GEO).Implementation experience available by UNEP/GRID-Geneva to demonstrate Data Cube tools in Black Sea areas, such as in Georgia (also covering part of neighbouring Turkey) and in Moldova, showing great potential both as landward and seaward application tools. | There are various separate systems created for separate geographical domains such as sea (e.g. JRC marine data observation systems including the Black Sea), coasts and catchments (e.g. FP7 enviroGRIDS Black Sea Catchment Observation System). Certainly there is a need to integrate marine, coastal and catchment observation systems. | H2020 and/or BSB-CBC 2014-2020 could be indispensable. BS countries could provide institutional support funding activating BSC AG on Information and Data Exchange.UNEP might be interested in leveraging support to BS countries for further Data Cube implementation. ESA might be interested in Sentinel applications for the Black Sea. | BSC OS developed by FP7 enviroGRIDS project, available at [portal.envirogrids.net](http://portal.envirogrids.net/), can indeed be complemented by Data Cube technology promoted by UNEP, UNEP/GRID-Geneva and UNIGE.ESA conducted at least one Black Sea from Space Workshop, see [eo4blacksea.info](http://eo4blacksea.info) and could be interested in permanent follow-up together with regional partners such as ROSA (Romania). |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Develop plans for the interdisciplinary study of the Black Sea deep part (shelf break – slope – abyssal part) – integrating microbiology (including molecular biology and genetics – for the definition of specific microbiomes), geochemistry, sedimentology, physical oceanology, tectonics and neotectonics |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Develop research dedicated to the profound understanding of river – sea interactions, fluxes of water and particles from hydrographic basins into the Black Sea, physical and chemical processes in the transition zones (deltas, estuaries, lagoons) |  |  | Existence of DANUBIUS-RI Initiative (the pan-European Research Infrastructure for Advanced Studies on River-Sea Systems, accepted on the ESFRI Roadmap in 2016) |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Develop a strong operational oceanographic network, integrating in situ data providers (marine platforms, such as EMSO and ARGO), coastal stations, Earth Observation data and numerical models.  |  |  | Existence of several operational oceanographic numerical models, facilities such as EUXINUS (EMSO Romania), ARGO (including EURO – ARGO – Bulgaria), other coastal stations. |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Development of coherent basin-scale programmes for the discovery and valorification of the common cultural heritage and history (coastal ancient to modern archaeological sites, wrecks, etc). |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Development of a new Black Sea cultural / scientific identity, through dedicated education and work stage programmes in all fields of research and Blue Economy |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Dedicated basin-scale programmes for the safe and sustainable exploration, prospecting and exploitation of the natural resources, mainly gas-hydrates  |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Programme to harness the marine energy (waves, currents), especially in synergy with coastal protection plans |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Development of second generation of biofuel reactors (using algae as raw material) as plans to control and reduce the effects of algal blooms |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Development of an integrated coastal zone management plan at the entire Black Sea basin, with specific focus on: protection against extreme events, sea level rise, coastal safety, marine and maritime spatial planning |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Development of coherent plans for recovery and conservation of specific marine and coastal ecosystems, including plans for rehabilitation and restoration of natural circulation in closed lagoons, limans etc. |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Implementation of Nature Based Solutions for the protection of Black Sea communities from effects of extreme storms, floods, etc.  |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Development of basin-scale plans for the management of alien species introduction |  |  |  |  |  |
| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | Development of a revolutionary navigation system, with ships promoting carbon efficiency, and with safety measures well incorporated |  |  |  |  |  |
| RussiaSIO\_RAS(Tamara Shiganova)2018.03.27 | Monitoring of the key parameters of the biological (benthic, pelagic) chemical and hydro-physical parameters  | Available partnerships with relevant scientific Institutes and Moscow state University  | Available of national supporting policy from Russian Academy of Sciences, Ministry of Education and Sciences and Federal agency (FASO)  | Available national infrastructure with scientific Institutes and Moscow state University | Available funds from FASO and Presidium of Russian Academy of Sciences | Available of analyses of National Materials of Shirshov Institute of Oceanology RAS |
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| RomaniaGeoEcoMar(Adrian Stanica)2018.03.18 | On the availability / existence of the resources etc.:* All the proposals rely on existing opportunities (e.g. gas-hydrates, wind-dominated sea -for plans to develop wave energy), and/or respond to specific challenges (river-sea interactions in a sea where hydrographic basins of rivers feeding the sea are much larger than the sea itself, numerous lagoons were closed from communicating with the sea half a century ago, strong historical erosion endanger coastal communities, alien species have already disrupted the integrity of the specific marine habitats, etc).

On the existence of funding programmes / opportunities:* There is a series of operational programmes to which most (if not all) Black Sea countries have already agreed on, such as the DG Research & Innovation Framework Programmes, Black Sea Joint Operational Programme, etc.
* Major role (past and present) of the United Nationas initiatives (the United Nations Environmental Programme,etc)
* There is also a need to make operational and implement the outcomes of the Black Sea Strategic Action Plan (2008)
* Specific programmes in some countries (Cross Border Cooperation programmes, Partnership for Peace?)
* On national programming of dedicated competitions - need to build on the expertise of the Black Sea Era Net (and not only)

On the existence of research infrastructures * Existence of a series of initiatives: from DANUBIUS-RI – dedicated to river-sea systems, to EMSO ERIC (EUXINUS – in Romania), ARGO (as part of EURO ARGO – but also as part of the global ARGO Programme)
* Existence of operational oceanographic models in several countries
* Existence of space programmes dedicated also to the marine environment (such as Copernicus in Europe, but also others)

On the existence of regulatory frameworks / etc* All marine international regulations
* Black Sea Strategic Action Plan
* European Marine Strategy Framework Directive and Water Framework Directive (for EU countries and associates)

Existence of an increasing interest in re-connecting East and West along the Silk RoadNB – the proposals try to cover all aspects of science and innovation, from fundamental (interdisciplinary research), to innovation, development / implementation of new technologies and solutions.  |