

<p>Steps Forward in Maritime Spatial Planning in Romania <i>(Laura Alexandrov, Gheorghe Radu, Eugen Anton, Alina Daiana Spînu, Dragoş Niculescu, Victor Niţă, Magda-Ioana Nenciu, Alexandru Nicolaev, Adrian Filimon, Elena Vlăsceanu, Mădălina Gabriela Roşca)</i></p>	<p>“Cercetări Marine“ Issue no. 48 Pages 75-91</p>	<p>2018</p>
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STEPS FORWARD IN MARITIME SPATIAL PLANNING IN ROMANIA

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ABSTRACT

The National Institute for Marine Research and Development “Grigore Antipa” developed, since 2006, research activities in the field of Maritime Spatial Planning (MSP) merging different ecological, social and economic approaches. Within a unified framework, MSP provides overall information of the marine environment and future development for maritime activities, also including spatial conflicts between different users and stakeholders’ points of view. It developed, implemented and integrated European already existing models, new for the Black Sea basin:

- MSP Case Studies, contribution to MSP legislation, methodology, indicators, data base in the frame of MSP Transboundary approach for Romania-Bulgaria, under the frame of MARSPLAN BS - DG MARE Project;
- MSP methods, e.g. DISPLACE, GRID, Cumulative impact, INVEST, Ecological footprint of aquaculture, under ECOAST Project - COFASP Program;
- MSP Focal Point for the Black Sea activity, under the Assistance Mechanism for the Implementation of MSP Project and European MSP Platform.

These projects’ goals were to research and deliver MSP products and results and:

- to map productive marine areas and priority areas for maritime activities, mainly for fisheries and aquaculture; to elaborate thematic and integrated maps for sectoral details and for the National Spatial Plan elaboration;
- to assess the interaction of maritime activities with marine fisheries and aquaculture;
- to assess the cumulative impact of fisheries and aquaculture on ecosystem components with special focus on priority and sensitive habitats;

- to measure economic and ecological performance of alternative spatial plans by scenario evaluations including delineating locations and space limits;
- to develop an operational modelling framework to analyze stakeholders' behavior and predict their likely responses to spatial management options;
- to assess common opportunities and obstacles to integrate fisheries and aquaculture in MSP after stakeholder consultations.

This paper presents results obtained in the field of Maritime Spatial Planning in Romania, stressing the major contribution of NIMRD in spatial and temporal evaluation of fisheries and aquaculture in relation with environment and other maritime activities, due to new MSP methods implementing.

Key-Words: fisheries, aquaculture, spatial, temporal, assessment

AIMS AND BACKGROUND

In the last two years, the National Institute for Marine Research and Development continued the research activity started thirteen years ago concerning ICZM and maritime spatial planning domains. It was intensified in the last three years and the results obtained were support for the implementation of the Maritime Spatial Planning Directive (MSP) - 2014/89/EU, under the coordination of the National MSP Authority of the Ministry of Regional Development and Public Administration (MRDPA), Bucharest.

EXPERIMENTAL

The three main projects with a major NIMRD contribution were the most important:

- I. ***Cross border maritime spatial planning in the Black Sea - Romania and Bulgaria*** (MARSPLAN-BS): EASME/EMFF/2014/1.2.1.5/2/SI2.707672 MSP LOT 1/BLACK SEA/MARSPLAN-BS (DG-MARE “European Commission Directorate-General for Maritime Fisheries Affairs and Fisheries” 24/2014 Call); 2015-2018, coordinated by the MDRAP, <http://www.marsplan.ro/en/238-about-marsplan-%E2%80%93-bs-project.html>, Romania;
- II. ***New methodologies for an ecosystem approach to spatial and temporal management of fisheries and aquaculture in coastal areas*** (ECOAST): COFASP Program - Cooperation in Fisheries, Aquaculture and Sea Food Processing, 2016-2019, <http://www.e-coast.eu/wp/>, <http://msp-platform.rmri.ro/ecoast.html>;
- III. ***Assistance Mechanism for the Implementation of Maritime Spatial Planning*** (EU-MSP Platform); EASME/EMFF/2014/1.3.1.7/SI2.721508 /ECORYS (DG-MARE 23/2014 Call, 2015-2018, as MSP Focal Point for the Black Sea, <https://www.msp-platform.eu/>.

RESULTS AND DISCUSSION

- I. ***Cross border maritime spatial planning in the Black Sea - Romania and Bulgaria*** (MARSPLAN-BS) Project is a MSP transboundary project for the both nominated countries. The project main achieved objectives were:

- Support for the implementation of the EU Directive for Maritime Spatial Planning in the Black Sea Basin, Romania and Bulgaria as Member States;
- Support for the consolidation of the cross-border cooperation and new created MSP institutional framework for Romania-Bulgaria;
- Support for the development of all Black Sea countries and Black Sea Commission the communication in the field of MSP, in traditional and new partnerships;
- Support for MSP vision and strategic goals set out for Black Sea area, including the land sea interaction,;
- Thematic and integrated maps elaboration for a common MSP Plan of Romania-Bulgaria cross-border area by MARSPLAN BS partners contribution (MRDPA Bucharest, MDRAW Varna, MWF Bucharest, NIMRD Constanta, URBAN-INCERC Bucharest, DDNIRD Tulcea, IOBAS Varna, UOC Constanta, EAMA Sofia, BPI Co, Sofia);
- Contribution to gathering information, wider dissemination of MSP results, organization of stakeholders' meetings, public consultation, inventory of practices and research in the Black Sea area.

Added to these main objectives, in 2017, NIMRD followed specific responsibilities and results, as follows:

I.1. Three Studies in coordination, with contributions from other MARSPLAN partners: *Complete analysis of sea space from Romania and Bulgaria* and two other Cases Studies: *Eforie - Coastal Erosion* and *Marine Fisheries and Aquaculture*. All of them are published as books.

- a. *Complete Analysis of the Romanian and Bulgarian Maritime Areas. Detailed Study*, 2017, ISBN 978-606-642-166-9; <http://www.MARSPLAN.BS.ro/en/results/msp-studies.html>; <http://www.marsplan.ro/en/results/msp-studies.html>; 400 pg.;
- b. *Eforie - Coastal Erosion - Case Study 1*, 2017 ISBN 978-606-565-131-9; <http://www.marsplan.ro/en/results/case-study/433-eforie-nord-eforie-sud-area.html>; 100 pg., <http://msp-platform.rmri.ro/downloads/2018%20Eforie%20Case%20Study.pdf>;
- c. *Marine Fisheries and Aquaculture under Maritime Spatial Planning. Approach Toward Integration - Case Study 5*, 2017, ISBN 978-606-642-165-2; 100 pg., <http://www.marsplan.ro/en/results/case-study/430-aquaculture-and-fisheries-in-the-cross-border-area-romania-%E2%80%93-bulgaria.html>; <http://msp-platform.rmri.ro/downloads/2018%20STUDY%20CASE%20Aquaculture%20and%20>

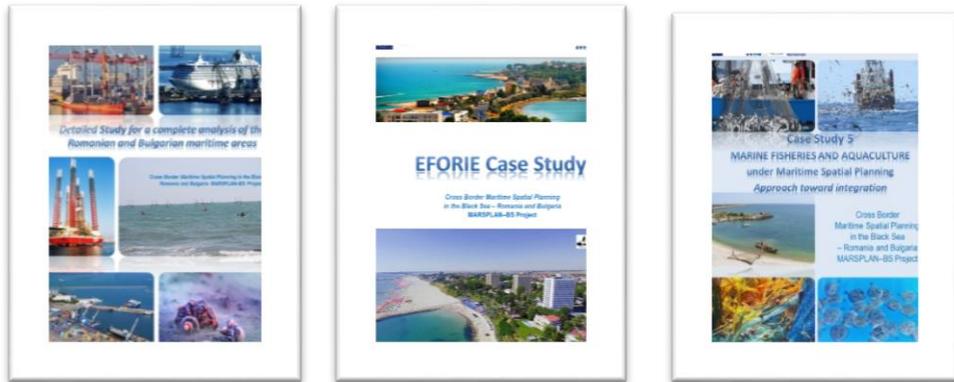


Fig. 1 a,b,c. Three MSP Publications edited under the MARSPLAN-BS Project.

Inside these studies, the elaborated maps include coastal and marine habitats (10 x 10 km), Natura 2000 sites (SCI, SPA), marine mammals distribution (10 x 10 km), sailing/navigation routes and anchorages areas, fishing (trawl and pelagic trawl) and aquaculture areas (Fig. 2b), hydrocarbon exploitation areas, coastal erosion location (Fig. 2a), land–sea interaction processes (Fig. 2c) etc.

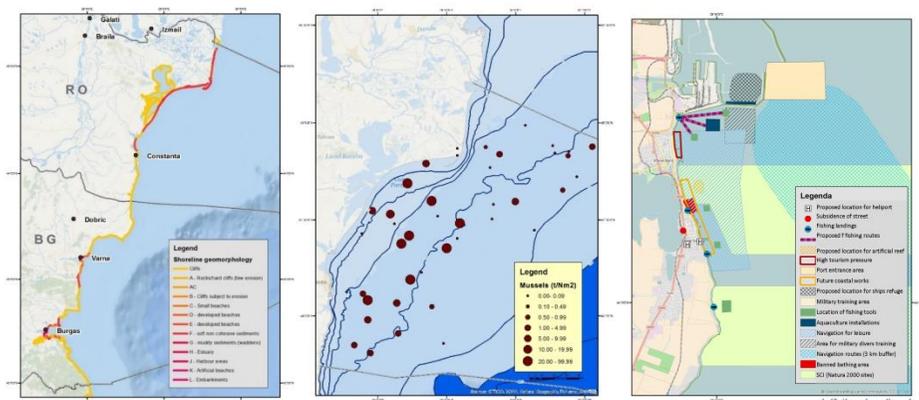


Fig. 2. a. Romanian and Bulgarian coast vulnerability and erosion, b. Romanian distribution of mussel density, c. Case Study Eforie.

I.2. The MSP Methodology was elaborated for Romania and Bulgaria and NIMRD contributed to this, providing:

- MSP Indicators for biodiversity, marine ecology, fisheries, coastal erosion, ICZM, tourism;
- Integrated assessment of marine environment and natural resources, including case studies, transboundary area Mangalia and 2 Mai - Vama Veche MPA;
- Monitoring and Management Plan for the 2 Mai - Vama Veche MPA included in the transboundary spatial plan, NIMRD having the Custody of this MPA;
- In the same transboundary marine area, based on public consultation (Fig. 3 a,b,c), other maps were elaborated including: (5, 10, 20, 30 m) harbor area,

distribution of habitats ROSCI0269, 2 Mai - Vama Veche, Natura 2000 - SCI and SPA zones, sailing routes and anchorages, submarine cables.

Stakeholder consultation meetings organized by the Danube Delta NIRD Tulcea, “Ovidius” University Constanta and URBAN INCERC Bucharest in Sfantu Gheorghe, Eforie (2016) and Mangalia (2017), with the participation of the main project partners involved allowed to us to identify conflicts in the marine area to be underlined and elaborated synergies among maritime activities and environment, key issues for transboundary MSP, followed by solutions, recommendations, lessons learned underlining. The identification and spatial representation of conflicts (users-users and users-environment) have been done for new MSP approach in Romania and Bulgaria, mainly including public information and opinions.

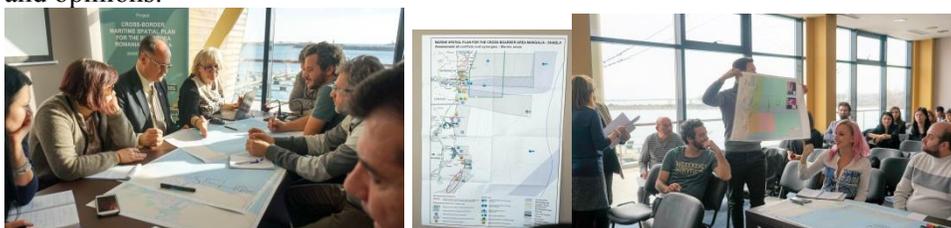


Fig. 3 a, b, c. Meeting of MSP experts with the stakeholders from Mangalia area, maps, plans presentation, public consultation for the evaluation of competitions for space between maritime activities of the area (NIMRD - MSP Data Base, DTU Aqua DK).

I.3. A MSP Database for Romania and Bulgaria was prepared, selecting the main significant spatial data (domains, description, data format, type, data sources).

The needs for a huge documentation concerning all marine fields and activities have been underlined. A larger data list was shortened, selecting the most significant parameter for MSP.

The processed marine data are transposed in text (explanatory memorandum) and GIS format (Romanian Projection System STEREO 70 transformed in the data into WGS84-UTM35N), adding land data using TransDateRO (ANCPI). The geographical coordinates and LAU level were also used for maps elaboration. Identified data sources, partners and data holders contributed to the spatial data collection and permanent up-dating.

Metadata are also prepared, NIMRD establishing the geodatabase based on the own layers. NIMRD opened a *SMART ATLAS Web-site* for the Romanian marine space mapping (<http://86.127.36.56/smartatlas/>) and developed a MSP site, related to NIMRD’s website www.rmri.ro, which includes a special file for MSP and MARSPLAN-BS Project.

NIMRD was nominated MSP Focal Point for the Black Sea under the European MS Platform (<https://www.msp-platform.eu/>) and an initial support (including GIS and additional equipment) for a MSP Centre or marine branch of a National MSP Center, NIMRD being National Center for Oceanography and Environment Data, Technical Secretariat for National Committee of Coastal Zone, Focal Point for Fisheries and Aquaculture in the Black Sea, Remote Sensing Center COSMOMAR; with IT-GIS Offices.

The dissemination of results consists and the MSP experience was shared, by participating to: i) MARSPLAN-BS Conferences, Scientific Conference, May 3-4, Constanta, 17 oral presentations and 3 posters; ii) Final Conference, January 11, 2018, Eforie and Marine Fisheries Cases Studies results as oral and books presentation; iii) 6 articles for the of MARSPLAN-BS Scientific Conference Proceeding, were published in the Maritime Spatial Planning in the Black Sea book, by University Ovidius Constanta, 978-973-614-977-1.

II. The ECOAST MSP project *New methodologies for an ecosystem approach to spatial and temporal management of fisheries and aquaculture in coastal areas* developed in the last two years for six European countries (Italy, Denmark, Norway, Greece, Portugal and Romania) and sea basins 1) Adriatic Sea, 2) Ionian Sea, 3) Black Sea, 4) Tyrrhenian Sea, 5) Baltic Sea, 6) Norwegian Fjords and 7) NE Atlantic Coasts, has important objectives related to Black Sea fisheries and aquaculture relation and impact in ecological, social and economic way, included in the Romanian Case Study, aiming the: a) application of the new spatial methods; b) identification of regional management objectives for marine fisheries and aquaculture; c) application of the Integrated Assessment of Ecosystem Services adapted to the local conditions; d) mapping the artisanal fishing areas and relation with other maritime activities; e) establishment of sectoral and cumulative impact of fishing and aquaculture activities, f) evaluating traces of the ecological impact of mariculture. More specifically, the project has focused from the beginning, on the followed aspects, to support:

- facilitation the information exchange about national regulations regarding the grant of fishing rights, fishing effort estimation, aquaculture and fishing possible impact on natural ecosystems, stressing good environmental practices for fishing and aquaculture;
- build, maintain and update the Romanian marine fishery and aquaculture database with statistical information focused on environmental conditions to evaluate the interdisciplinary research for stocks assessment and programs at regional level, as part of the information system in the Black Sea basin;
- promotion of new and development of standardized techniques, useful for fishing, stock assessment and exploitation of important-key species with commercial value;
- support the annual data exchange (national statistics and fisheries research reports);
- coordination of the regular stocks' assessment and joint surveillance of fishing vessels;
- recommendations for the important fish stocks management to establish fisheries management procedures, available and practical for all Black Sea countries, taking also into account EU recommendations, international relevant institutions advices and decisions;
- coordination of specific aspects for protection and rehabilitation of critical habitats and conservation of threatened species, especially areas and habitats for the fish breeding and juvenile rearing of the key-valuable species;

- specific activities in preparing and coordination the Black Sea marine aquaculture development;
- Collaboration with relevant international and regional fisheries organizations: FAO / GFCM, ICES, BSEC, Fisheries Commissions for the Baltic and Mediterranean Sea;
- The participation to numerous meetings, to national and international workshops defining managerial objectives for marine fisheries, aquaculture and other important-key marine sectors stressed our essential role in terms of decision-making factor. Meetings with fisheries communities followed the development of the sector, identifying needs and problems which aim issuing solutions for the improvement of the aquatic environment quality and exploitable resources, and to improve activity and life of fishermen, (Fig 4 a,b,c).



Fig. 4 a,b,c. Meetings with Romanian fisheries and aquaculture authorities, decision-makers, organizations and communities.

A number of MSP methods were applied for the first time at the Romanian Black Sea coast for the fisheries and aquaculture spatial distribution.

1) Dynamic evaluation on DISPLACE method

The DISPLACE method was used as a tool for assessing the spatial two-ways relation between marine fisheries and ecosystem, stressing the benefits and consequences of fisheries in terms of its management (including temporary closure of fisheries areas) aiming the sustainable use and exploiting of marine resources (fish and marine invertebrates: crustaceans and mollusks). The model introduced: i) the simulation of the spatial distribution of individual vessels and their ability to carry out their fishing effort when they are reported to certain spatial or temporal limits; ii) case of some managerial decisions and space restrictions; iii) case of simultaneous use in the marine space (fish farms, lines-commercial areas, sailing, energy resource parks) all taken into the attention. Results have been achieved, deeply understanding places where fishermen can move boats for fishing on other or adjacent areas, for species of their interest and ways in which fishing vessels or motor boats operate. In the Exclusive Economic Zone of Romania, (Fig. 5a) the DISPLACE method was applied for the first time in the Black Sea basin, connected with the fishing effort distribution (Fig. 5b).

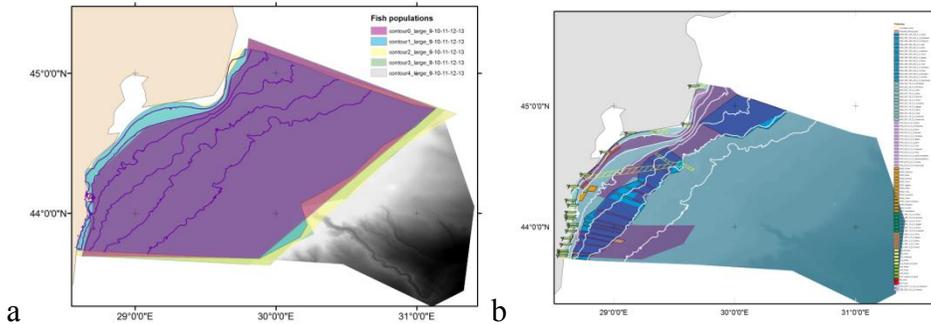


Fig. 5a. The marine space of the fish populations evaluated (0: DGS, 1: MUT, 2: SPR, 3: TUR, 4: WHG) targeting the marine fishery in the Romanian Exclusive Economic Zone (EEZ), based on data collected and used on DISPLACE method for bio-economic parameterization purposes.

Fig. 5b. The Spatial Distribution of Marine Fishing Boats in Romania to the Exclusive Economic Zone (EEZ), using the bio-economic DISPLACE method based on data collected and uses in the fisheries domains.

This representation is an important spatial assessment because it is the first trial for the inventory of the geographical positions of all fishing boats from national marine space on significant variables estimation: depth-bathymetry, width of the fishing area for each boat, number and length of the fishing tools, fish species for which they are dedicated.

2) Cumulative Impact of Aquaculture and Fisheries on Ecosystem Components in the Black Sea Case Study

The purpose of this method is to support the marine spatial planning process taking into account the ecosystem-based approach (EBA) by assessing the potential cumulative effects of maritime activities on the marine environment. The cumulative impact assessment tool was developed during the ADRIPLAN project (<http://adriplan.eu>) and became example for others approach, also for the Black Sea area, in the frame of the ECOAST project. It is the basic method of the Tools4MSP tool, an *open-source* type, library model based on geopython program. The methodology includes data about stages, study area, cumulative impact modeling and data sets/series collection.

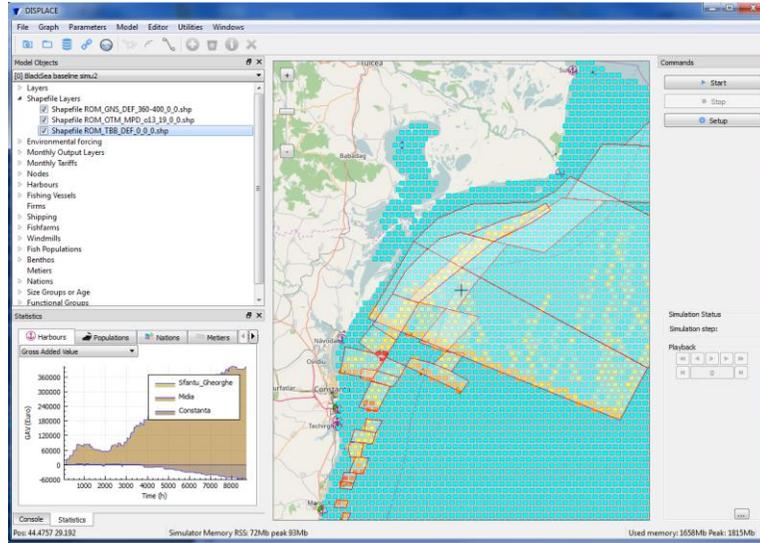


Fig. 6. The first representation obtained by the DISPLACE method in the Romanian Exclusive Economic Zone, Black Sea, in order to obtain the baseline scenario for the marine fishery (NIMRD - MSP Data Base, DTU Aqua DK)

The data collected were based on the most important environmental features and economic activities: *Navigation and anchorages routes, Oil / gas extraction and pipeline extraction platforms, Fishing gear: Pelagic trawl, Beam Trawl, Gillnets (GNS), Pound nets (FPN)*. Accordingly, the cartographic representations were obtained: local fishing gear and maritime activities maps (Fig. 7-8).

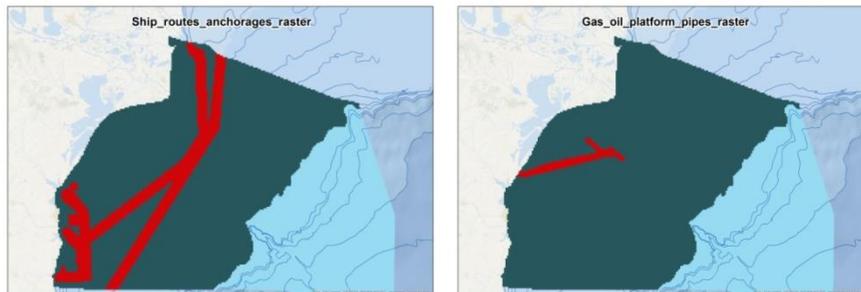


Fig. 7, 8. Human activities, raster 1 km²: (7) navigation routes (8) gas and oil transport pipes from the marine platforms of extraction to the coast (NIMRD - MSP Data Base, HCMR, Athena Greece integrated image).

The required ecosystem components were mentioned for future integrated evaluations:

- **Habitats (Natura 2000)** (Fig. 9-12):
 - 1110 - Sandbanks slightly covered by seawater all time (Fig. 9);
 - 1140 - Mudflats and sandflats uncovered by sea water at low tide (Fig. 10);
 - 1170 - Reefs (including biogenic reefs) (Fig. 11);
 - 1180 - Submarine structures made by leaking gases (Fig. 12).

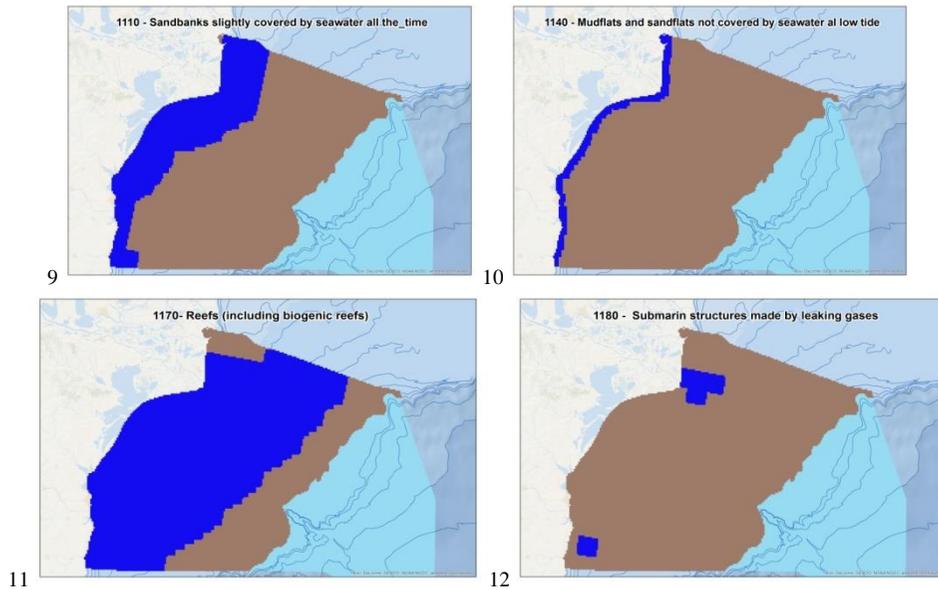


Fig. 9-12. Habitats of Community interest, raster 1 km²
(1110, 1140, 1170 and 1180) (NIMRD - MSP Data Base, HCMR, Athena Greece integrated image).

- **Habitats of breeding and growth of fish early stages**, for the species: *Spratus spratus*, *Psetta maxima*, *Squalus acanthias*, *Trachurus mediterraneus*, *Mullus barbatus*, *Merlangius merlangus*, *Engraulis encrasicolus* (Fig. 13-15).



Fig. 13-15. Breeding and growing habitat for fish (*Psetta maxima*, *Merlangius merlangus*, *Trachurus mediterraneus*) (NIMRD - MSP Data Base, DTU Aqua Denmark integrated image).

3) GRID Cartographic representation and spatial interactions between activities. Conflict Analysis by the Matrix Method for Assessing Spatial Compatibility of Maritime Activities

Cartographic representation of spatial interactions between activities and conflicts analysis was performed through the GRID Method and the assessment of the spatial compatibility of the maritime activities was done through the matrix method.

The description of GRID method, the data analyze and development of possible scenarios aimed calculation of conflicts score, generation of interaction matrices, thematic and integrated maps elaboration, spatial interactions evaluation in marine area, calculation of asymmetric space overlays and the impact or stress level calculation.

GRID application parameterization consisted in selecting activities, quantification of harmonized or in conflicts interactions, spatial representation of activities (uploading files). Fig. 16-18.

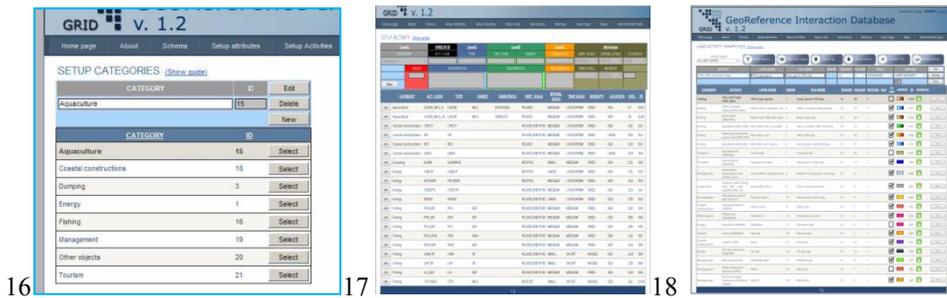


Fig. 16. Page of categories configuration.

Fig. 17. Setting activities for the “Black Sea Case Study, Romania”.

Fig. 18. Spatially represented activities (shape files) Romanian coast.

The spatial analysis was based on a 2 km cell grid. Overlapping activities and uses of marine space allowed the calculation of cumulative impact and the identification of conflict zones using all methods described (Fig. 19).

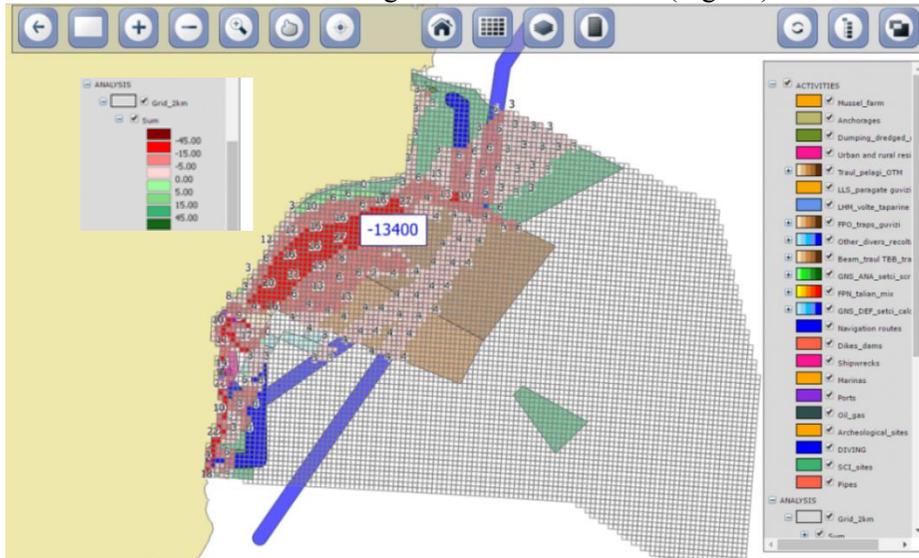


Fig. 19. Spatial analysis and cumulative impact calculation using GRID application (NIMRD - MSP Data Base, DTU Aqua Denmark integrated image).

The sector with a high conflict score (> 15 points) was identified in the

trawling area which overlaps the *Natura 2000* site in the Black Sea case study. The matrix of interactions between different uses of marine space has also been generated (Fig. 20 a,b).

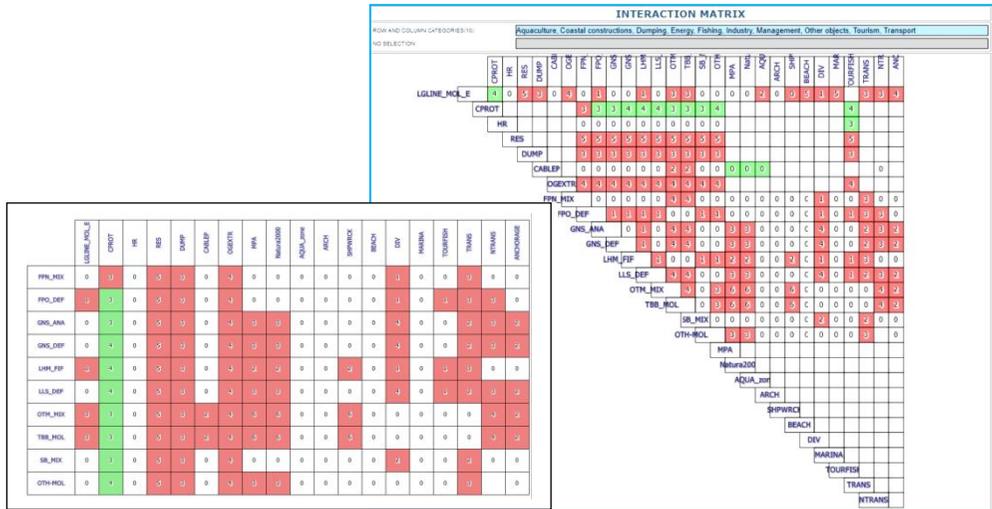


Fig. 20 a,b. Matrix of interaction between main maritime activities, fisheries and aquaculture (NIMRD - MSP Data Base, DTU Aqua Denmark integrated image).

The identification of the delimitation tools for places and spaces that can provide a certain level of production for fishermen and local farmers permitted the following graphical representations on different fishing tools (Fig. 21, 22).

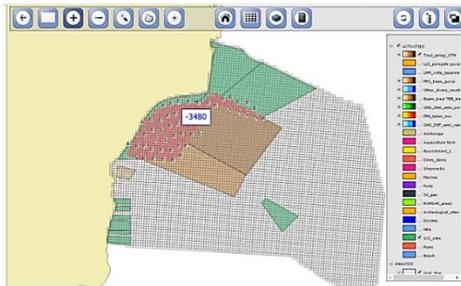


Fig. 21. Beam trawls areas map.

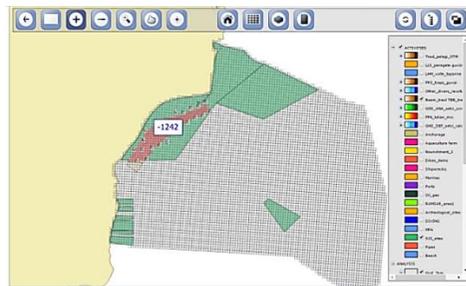


Fig. 22. Pelagic trawl areas map.

- 4) The Method **Ecological footprint of fish farming in coastal areas: identification and response for improved management** evaluates the Aquaculture impact assessment on environment. They are current instruments for acquiring knowledge on fisheries and spatial policies, based on applied EU and Norway models. Research developed in this field present the following details:
- Considerations regarding the approach for eco-toxicological analysis based on samples taken in the pilot area of the Romanian marine mussel farm;
 - Norwegian Protocol for the samples collection assessment evaluating sediment quality in order to analyze the eco-toxicological results, using specific equipment;

The hydro-physical and hydro-chemical analyzes performed in our laboratories were focused on the environmental conditions found in the reference area; as well as, the main sedimentary assessments were done (Fig. 23-27). The location of the samples collection (Fig. 24) and their processing in the laboratory are presented. The results obtained in Romania are compared and completed with sediments samples, preserved, sent and analyzed in Norway to the work package leader, responsible of the applied method). Sedimentary analyses have been made including Total Organic Carbon and stable isotopes.

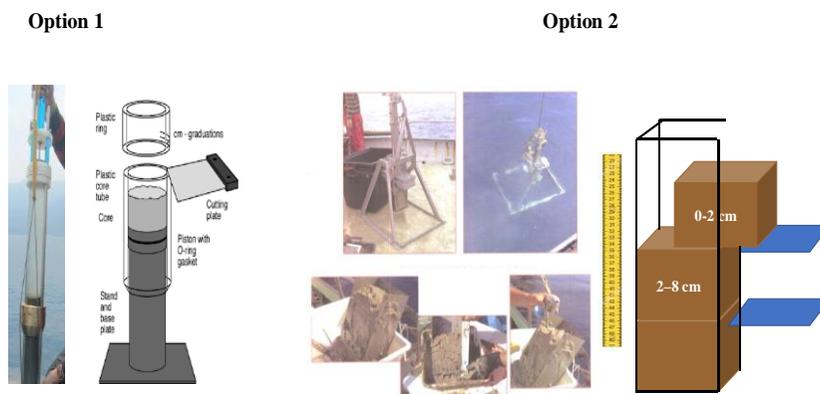


Fig. 23. Devices and details for the extraction and slicing parts from sediments sample.

The collecting and processing protocols for sediments samples are specified using the Corer system for archived sedimentation column and analyzes of slices (Fig. 26). The benthos species structure has been evaluated, density and biomass, also the similarity dendrogram Bray Curtis resulted (Fig. 25b).



Fig. 24 a,b. Location of the Romanian Mussels Farm.

Fig. 25. (a) Network of sampling stations for sediment collection. (b) Bray Curtis dendrogram for the benthos sampling in the marine pilot area.

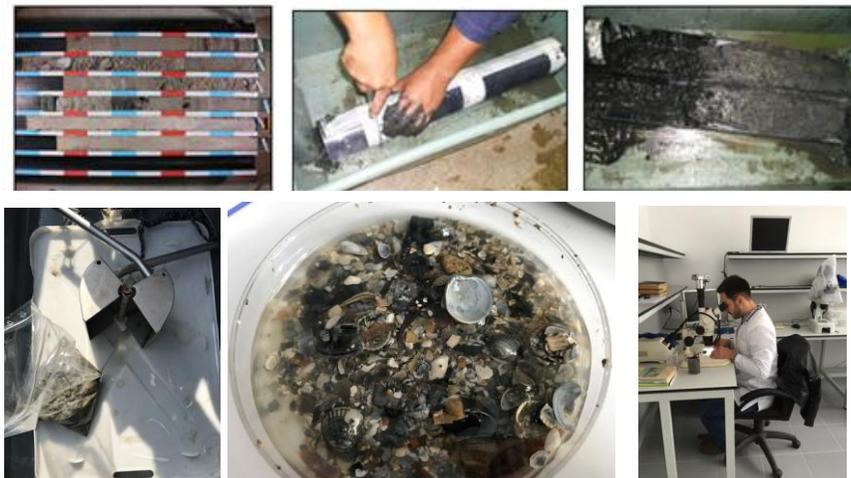


Fig. 26. The main steps in sediments samples processing for different analyses, including eco-toxicology, sediments collection and preservation for benthos analyses; microscopy.

III. In the last three years NIMRD was involved in the **European MSP Platform** activity, supporting necessary information about MSP in Romania and Black Sea Basin basin (<http://www.msp-platform.eu/>) (Fig. 27, 28).

Under the project *Assistance Mechanism for the Implementation of Maritime Spatial Planning* umbrella, NIMRD was nominated MSP Focal Point for Black Sea Basin (European MSP Platform/DG-MARE), functioning as a data center and information for MSP field.

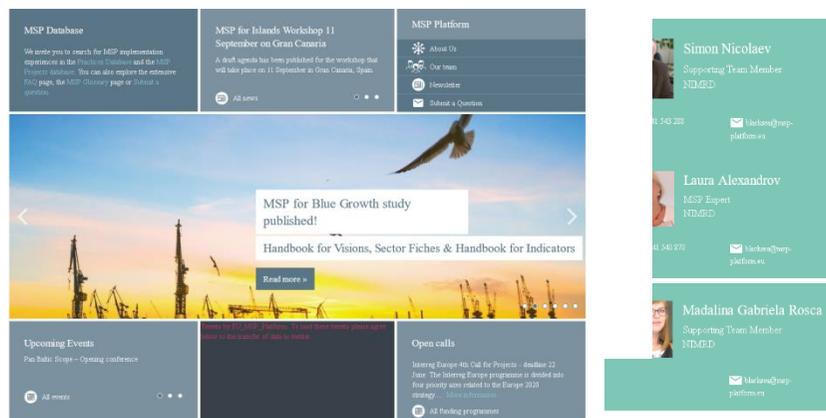


Fig. 27. European MSP Platform.

Fig. 28. Romanian Members of the EU - MSP Platform, Focal Point for the Black Sea Country.

a) NIMRD elaborated and up dated MSP Country Fiche for Romania. It included in this platform, Black Sea MSP Projects and Practices Fishes, MSP Events,

Trainings and other inventories. (Fig. 28). The European MSP Platform is a searchable database with 388 described MSP Practices, 20 coming from the Black Sea and 137 MSP Project descriptions, respectively 17 from our area.

- b) NIMRD gave the own contribution to some MSP studies elaborated from the EU-MSP Platform team, e.g. "Evaluation of data and knowledge gaps to implement MSP" (MSP Data Study) and *Fiches of maritime sectors*; it share all information concerning MSP indicators and vision, prepared presentations and papers.
- c) By all its projects NIMRD updated the MSP Data Base for Romania.
- d) NIMRD has prepared a specific infrastructure for MSP Focal Point Development, including a MSP site <http://msp-platform.rmri.ro/>, related with www.rmri.ro GIS MSP Portal.
- e) NIMRD has spread EU-MSP Platform information at international and national level, in corespondence with partners or during different events, from European level or from the Black Sea basin.
- f) NIMRD participated in all the MSP events organized at the European level, especially to those of the European Platform MSP (<http://www.PSM-platform.eu/>):
 - participated to the main regional or international MSP event sharing experience and presenting MSP results: Second European Conference of PSM, DG MARE-Paris, 15-17.03.2017, <https://www.msp2017.paris/>; International Conference on MSP for the Land-Sea Interaction, Malta, 15.06.2017 <https://www.eventbrite.co.uk/e/maritime-spatial-planning-conference-addressing-land-sea-interactions>;
 - Blue Economy Conference for stakeholders in the Black Sea; Batumi, Georgia, 15.06.2017. Maritime Spatial Planning Conference for Blue Growth. How to Plan a Sustainable Blue Economy, Brussels, 10.10.2017. <https://webgate.ec.europa.eu/maritimeforum/en/node/4091>
 - assured the collaboration with the Black Sea Commission representative with the EU-MSP Platform
 - assured the participation of this and of European and Black Sea experts to participate to the own institutional Scientific Symposium - PROMARE, <http://www.rmri.ro/Home/Publications.Symposia.html>, and to MARSPLAN BS Scientific Conference, <http://marsplan-bs.univ-ovidius.ro/sc/>.

CONCLUSIONS

All elaborated MSP studies involved much time, a high complexity and volume of data collected, gaps in information, the problem of data unavailability for some economic domains, encountered different problems and asked:

- data sources identification and ways of access for a MSP Data Base,
- to support the MSP activity improvement, personnel specialization, methods standardization and equilibrium of work efforts.

Despite complexity of all marine and maritime data, the most significant data selection leads to avoid information excess, overuse or less of significant for spatial analysis.

Dissemination to other relevant institutions marine and maritime policy have to be mentioned. On national level, team members participated:

- to fisheries authorities and communities' meetings;
- to other MRDPA Programs and Projects meetings;
- to the National Committee of Coastal Zone, having the quality of Technical Secretariat of this organism.

At international level, team specialists participated in almost all European MSP events organized by the EU MSP Platform and DG MARE, EASME, EC etc., providing official documents collected to the Romanian MSP Authority, MDRAP, Bucharest.

From the objectives and activities proposed in these projects during the entire period of their implementation (2016-2019), the following actions were subject of the scientific and technical reports, available to interest authorities. The published MSP studies mentioned are important inventories of marine environment and maritime activities. The MSP Data is the main source of MSP information and maps. All NIMRD involvements contributed to other MSP documents, publications, studies, the most important being MSP Methodology, transboundary and national spatial plan.

The result of ECOAST Project have been focused on:

- MSP tools identification and initialization to investigate the required aspects for decision makers in order to define the current distribution of *fisheries effort*;
- contributions to the collected methods and tools required to explain the current distribution of fisheries efforts, starting from data collection organized into spatial thematic layers to utility random models;
- inventory of needs in the field of marine fisheries and aquaculture from authorities and decision-makers level, responsible for the regulations for these field;
- spatial distribution and mapping of marine aquaculture and fisheries for their cumulative impacts on ecosystems;
- defining the management objectives for marine fisheries, aquaculture and other key marine sectors in the Romanian marine waters aiming to identify relation between them and the response of decision makers to improve fisheries and aquaculture management,
- creating models for the Black Sea in accordance with the database and analysis proposed to be done in the project, using all new methods: DISPALCE, GRID, Cumulative Impact, trade-off system INVEST, focused on integrated assessment of ecosystem services,
- cartographic representation of spatial interactions between maritime activities and conflict analysis using the matrix method of spatial compatibility assessment in the marine environment,
- identification of tools able to delimit the locations that can ensure the certain production for marine communities, fishermen and local fish farmers,
- evaluation of aquaculture ecological impact through the Norway method of bio-eco-toxicological analysis for trace marks-footprints in aquatic sediments, collected under the marine farms.

Recommendations for fisheries policy and regulations issuers lead from important references coming from the necessity of carrying out actions in the frame of: i) the National Strategic Plan for the Development of Aquaculture and the Operational Program for Fisheries 2014-2020; ii) the GFCM mid-term strategy for

the marine aquaculture development in the Mediterranean and the Black Sea, iii) e GFCM 36/2012/1 Resolution regarding the Guidelines for the Allocation of Aquaculture Areas (AZA-Allocated Zones for Aquaculture). It is necessary to mention some aspects, taking into account the following:

- It is planned by GFCM to be included in the national maritime spatial planning strategy, also, the development and the management of national aquaculture development aspects and schemes for the identification and allocation of specially reserved areas for aquaculture activities;
- AZA - Allocated Zones for Aquaculture should include specifically allocated areas for aquaculture activities related any future development which should be based on the best available social, economic and environmental information, to prevent conflicts between different marine users, to increase the competitiveness, the distribution of coastal services, ensuring investments.
- AZAs should be established in accordance with spatial plans of GFCM Partners/Members to ensure the sustainability of aquaculture development everywhere in the Mediterranean and Black Sea area and to promote the equity and flexibility between social and ecological systems.

Similarly, it would be appropriate to allocate the Allocated Zones for Fisheries (AZF), in which the fishing will be totally forbidden with the purpose of biodiversity re-enrichment, environment rehabilitation or restoration: i) mainly for specifically areas for feeding, breeding and juvenile rearing of fish species, ii) in particular of those witch are under excessive exploitation or has most valuable species or habitats, as they will be established for each case, on the basis of the best social, economic, environmental information, iii) including research studies which are the most important. This will reduce the recovery period of the targeted stocks, such as the turbot, sturgeons, shark, and the associated species, collected as accidental catch.

As MSP Focal Point for the European MSP Platform, NIMRD mainly contributed in the following directions: i) sharing all significant MSP information in Romania and Black Sea basin; ii) collecting MSP information and preparing MSP projects, practices, event fishes from Black Sea countries; iii) elaborating MSP Country Fiche, Black Sea Fiche and contributing to important MSP Fishes. It consolidated the MSP Database and elaborated the most important maps for maritime space of the Romanian Economic Exclusive Zone.

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