Maritime spatial planning in the Black Sea
ISBN 978-973-614-977-1 | 117-126

UkrSCES experience in Maritime Spatial Planning

Oleksandr NEPROKIN[1], Oleksandr LEPOSHKIN[1], Olga BRATCHENKO[1], Maksym MOTYLOV[1], Laura ALEXANDROV[2]
[1]Ukrainian Scientific Centre of Ecology of the Sea, Odessa, Ukraine,
UkrSCES web-site: www.sea.gov.ua, o.neprokin@gmail.com
[2]National Institute for Marine Research and Development
"Grigore Antipa"Constanta, Romania, *NIMRD-GA web-site: www.rmri.ro,laurenta05@yahoo.com*

ABSTRACT. The presentation will started from short history of UkrSCES and its activities at the international level. The main part will be focus on the experience of marine spatial planning at the national and international levels. The main principles of MSP have been successfully applied by UkrSCES while working on the following projects: PlanCoast, Environmental Collaboration for the Black Sea, CoCoNet. In addition, will be presented current work on the implementation of the MSFD directives in Ukraine.

KEYWORDS. Maritime Spatial Planning; Ukraine coast; UkrSCES.

I. INTRODUCTION

UkrSCES was founded in January in 1992 on the basis of the Odessa Branch State Oceanographic Institute. It is the main institution of the Ministry of Environmental Protection of Ukraine in the field of marine ecological researches. UkrSCES – is a unique institution of all state ecological systems of monitoring within the Black and Azov Seas, which provides a whole complex of tasks of the ecological monitoring.

One of the first experiences using the MSP on the National level was preparing proposition to establish MPA in Ukrainian North-Western part of the Black Sea - Zernov's *Phyllophora* Field. Our institution was appointed as the managing authority of the Zernov's *Phyllophora* Field.

On the International level the most noticeable results was achieved during 3 projects:
First one - PlanCoast was the Project with the aim to develop the tools and capacities for an effective integrated planning in coastal zones and maritime areas in the Baltic, Adriatic and Black Sea regions. Within the PlanCoast our institution prepared Maritime spatial plan of the Pilot Area – Odessa Agglomeration.

The second is the Pilot Project on Marine Protected Areas (MPA) in Ukraine was carried out in 2008-2010 within the Project on Environmental Collaboration for the Black Sea (ECBSea). After completion of the Project and as the result in the 2012 was established the Botanical Reserve Small *Phyllophora* Field.
Within the **third Project -** CoCoNet our institute and colleagues from CNR-ISMAR (Bologna, Italy) were responsible for development and creation of the Project's geodatabase and Web-GIS creation.

Ukraine made a commitment to implement European directives till 2020 According to this our organization - Ukrainian Scientific Center of Ecology of the Sea as the main institution of the Ministry of Environment and Natural Resources of Ukraine have the task to provide implementation of international obligations of Ukraine - MSFD in particular.

II. UKRAINE

The **Spatial planning** system in Ukraine includes:

- **Facilities for planning** (land and national, private, communal facilities, ownership of local communities);
- **Institutional framework** (legislative, executive, judicial and local authorities, institutions, organizations and enterprises that are subjects of planning and land use);
- **Regulatory legal framework** (laws, statutes and regulations governing the relationship that formed when planning development and land use);
- **Resources providing** (human, property, financial and other resources needed for development planning and land use);
- **Monitoring** of the environment;
- Development of **information system**s;
- **International obligations** in the sphere of environmental protection;
- Development of **new methods and methodology** of taking measurements.

The Strategy of **Territorial Administration Ukraine** today have to escape of uncertainties, equilibrating institutional frame, roles and responsibilities of local management of coastal territorial formations for the coastal marine environmental management. It is still persists the lack of stable funding sources to solve environmental problems in coastal and marine zones.
The national support for a vision of the key areas of use and development of the area is reflected in the approved strategic documents: General Planning Scheme in Ukraine State Regional Development Strategy of Ukraine until 2015, Fundamentals of Urban Development, Promotion of regional development, Planning and Development, Development Code of Ukraine. Coastal application are not only strip of land, but also the adjoining areas, the planning of its uses is usually directly associated with:

- port facilities which cannot be developed without the use of waters
- resorts and recreational activities which are not limited to using only coastal resources, applying also the nearby sea water (bathing, yachting etc.).
- **a complete system of planning specifically for marine areas in Ukraine** started to be done by our efforts and new projects

III. ABOUT UkrSCES

The Ukrainian Scientific Center of Ecology of the Sea (UkrSCES) was founded in January, 1992 on the basis of the Odessa Branch State Oceanographic Institute. It is the main institution of the Ministry of Ecology and Natural Resources of Ukraine in the field of marine ecological researches. UkrSCES – is a unique institution of all state ecological systems of monitoring within the Black and Azov Seas, which provides a whole complex of tasks of the ecological monitoring.

The main task of UkrSCES is scientific and practical providing of realization of public policy of Ukraine in relation to the protection, rational use and rehabilitation of natural resources of the Black and Azov Seas basin, and also providing implementation of international obligations of Ukraine, in relation to marine aspects.

UkrSCES is ready for collaboration with national and foreign partners, based on the experience underlined.



UkrSCES INTERNATIONAL ACTIVITIES

- Active participation in many international activities and projects (EMBLAS, MIS ETC 995 (LSP), Baltic2Black (Regional Database on Pollution), CoCoNET, EMODnet, SeaDataNet, etc.);
- International Regional Activity Center for Pollution Monitoring and Assessment (RAC PMA) of the Black Sea Commission, from 1993 UkrSCES;
- IODE Associate Data Unit (ADU) designated on 15 July 2014;
- Accredited UkrSCES as the Black Sea OBIS node from February 2016.

In 2008 within the framework of the National Program of the Ministry of Environment and Natural Resources of Ukraine was established Ukrainian MPA – State Marine Botanical Reserve – Zernov's *Phyllophora* Field. Fig.no.1,2.

IV. GENERALITIES ABOUT COASTAL ZONES AND SPATIAL PLANNING IN UKRAINE

Coastal waters and **the coastal zone** are considered as a special object management with the release of spatial boundaries of the dominant role of local governments. Coastal wetlands are associated with water dwellers by default. In Ukraine special importance is attached to the coastland of the Black Sea. Seawater dynamics is observed due to swells, currents and tidal events. As far as the Black Sea has, practically, no high and low tides (their maximum value does not exceed 8 cm), its dynamic parameters are closely connected with wind conditions and runoff of the Danube, the Dnieper and the Dniester (Nature of Odessa Region, 1979).

The management of sea natural resources are based on rational combination of elements national, sectorial and territorial management to prevent conflicts between marine natural resources and promoting integrated solution of environmental problems and seas coast. Regional planning is a key component of territorial plans; it has specific content and is defined as the process of regulation and land use areas. Within the framework of the some projects (BSERP Project, 2005, PlanCoast, 2005-2007) and under the Permanent Secretariat of the Black Sea Commission request in the Ukrainian Scientific Centre of Ecology of the Sea (UkrSCES) prepared ecological sensitivity maps of the Black Sea coastal zone of Ukraine in MARPLOT system to be included to the Regional Contingency Plan. In 2008 within the framework of the National Program of the Ministry of Environment and Natural Resources of Ukraine was established Ukrainian MPA – State Marine Botanical Reserve – Zernov's *Phyllophora* Field. (Fig.no.1,2)

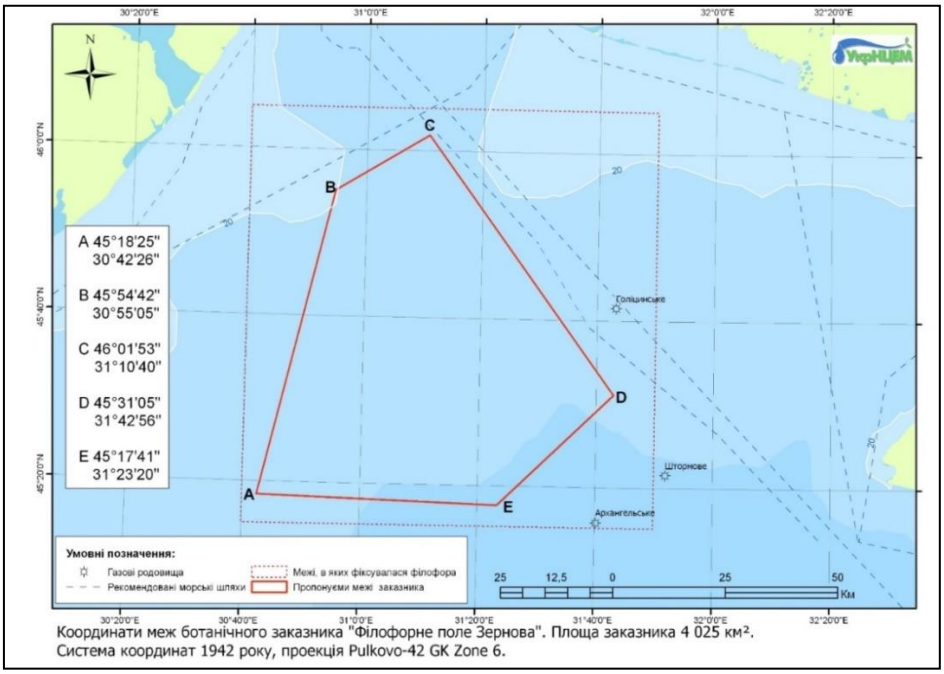


Fig. 1. Practice of Marine Spatial Planning nationally and regionally, projects PlanCoast

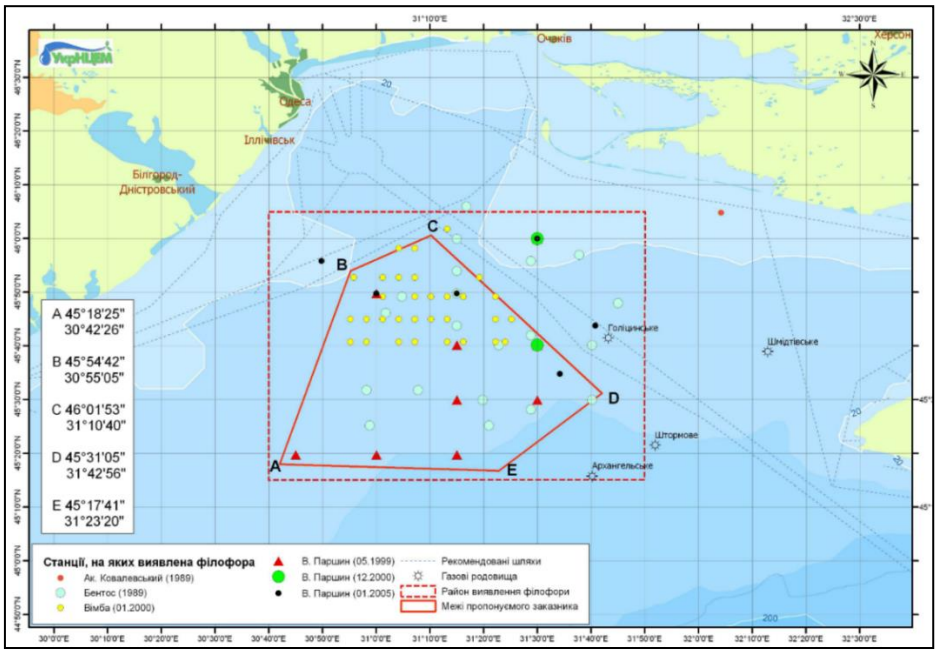


Fig. 2. Practice of Marine Spatial Planning nationally and regionally, projects PlanCoast

Information on biological resources - biological productivity of coast site, specific structure of flora and fauna of the shore strip and sea water areas, sensitivity to oil pollution; areas of distribution, inhabiting, nesting and spawning have been evaluated.

Information on anthropogenic use - Areas of the coastal strip having the status of nature protection territories, places and objects of cultural, historical and archaeological value, and also beaches, parks, water intakes, objects of household activities, have been also evaluated, etc.

The conventional works devoted to ecological monitoring of the sea provide for launching long-term and costly expeditions across the entire sea and all depths, including very significant depths, can be replaced, in many cases, with less costly studies of the sore spots of the sea that have been identified in the coastal stretch.

Fig. 3. Practice of Marine Spatial Planning nationally and regionally, projects Environmental Collaboration for the Black Sea; http://ims.sea.gov.ua:8081/agglomeration/

A first coast and sea **data base** was created, including risk assessment. Maps according to the Environmental Sensitivity Index Guidelines Version 3.0 (NOAA) in English language have been created. In parallel, work on creation of these maps was carried out using GIS technologies, certificated software - (Arc Editor 9.1) and certificated basic maps (M. 1-200000).

The mapping is dedicated mainly to the coastal zone, including also marine space. The maps were continually up-dated in time and sectorial developed. First integrated maps considered MSP as part of ICZM.

V. PRACTICE OF MARINE SPATIAL PLANNING NATIONALLY AND REGIONALLY, PROJECTS

V.1. Practice related previous experience

V.1.1. Natural factors assessmen

a. High diversity, number and biomass of vegetation and animals in the contour (boundary) biotopes of the sea
b. Spawning migration of fish from the high sea towards the coast (at least 90 species)
c. Feeding of young fish at coats (about 95 species)
d. Feeding of adult fish at the coast (more than 80 species)
e. Spawning migration of transitory fish from the sea into rivers (13 species)
f. Passage of young fish from rivers into deltas and in the coastal zone of the sea(13 species)
g. Wintering migration of adult fish along the coast.
h. Wintering and feeding migration of young fish along the coast.

i. High number and biomass of organisms in limans, lagoons and river deltas.
j. Feeding of sea fish and their fry in limans and lagoons (more than 30 species)
k. Nesting of colonial and other bird species in river deltas and limans (to 150 species)
l. Seasonal migration of birds having their stay in the coastal zone (to 300 species)
m. Striving of land birds to the coastal zone.
n. Striving of land mammals to the coastal zone.

V.1.2. Anthropogenic factors assessment

a. Industry.	j. Extraction of mineral resources
b. Agriculture	k. Artificial reefs
c. Cattle farming	l. Sea transport
d. Fishery	m. Dumping
e. Hydraulic power industry	n. Coast protection
f. Municipal facilities	o. Ecological control
g. Resorts	p. Ecological education and upbringing
h. Night entertainment facilities on shore	q. Complex management of the coastal zone
i. Extraction of living resources	

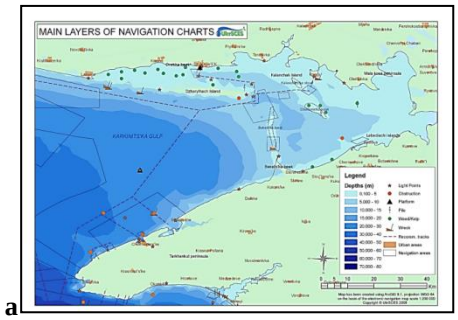
V.1.3. Structure of economic activities related to the coastal zone

	FIELD	Activities
1	**Marine transportation**	- Services to passenger and cargo fleet, port facilities and land-based infrastructure
2	**Offshore operations**	- Activities pursued on the fleet, at floating factories, in fishing ports, canneries and fish breeding
3	**Sea industrial cycles**	- Development of raw resources of the shelf and the World Ocean
4	**By-port industrial production**	- Industrial processing of export and import raw materials
5	**Recreation**	- Services to the resort and recreation industries and public tourist facilities
6	**Export/import and technical activities**	- Formation of special economic zones, joint entrepreneurship and establishment of technopolitan sites and technological parks

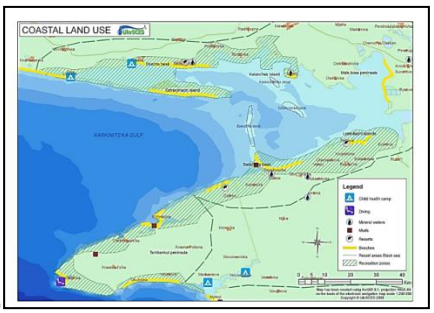
V.1.4. The main parameters of research Data Base which have been registered in the frame of some projects

Sea Data Base	Coastal Data Base
- General meteorological information - Hydrology and hydrochemistry - Geology - Pollution in bottom sediments - Pollution in water - Metals in water - Metals in bottom sediments - Poly aromatics in water - Poly aromatics in bottom sediments - Chlorine organics in water - Chlorine organics in bottom sediments - Radioactive elements in water - Radioactive elements in bottom sediments - Macrozoobenthos - Phytoplankton - Photosynthetic pigments - Meyobenthos - Microphytobenthos - Macrophytobenthos - Methods	- Geography - Urban - Roads, railways - Pipelines - Electrical - Agriculture - Land using - Pollution sources - Underwater and coastal pollution sources - Rivers as pollution sources - Ports and shipping pollution sources - Industrial pollution sources - Domestic pollution sources - Natural-recreation potential - Reservations and protected territories - Recreation resources - Mineral waters and mud’s - Bio resources

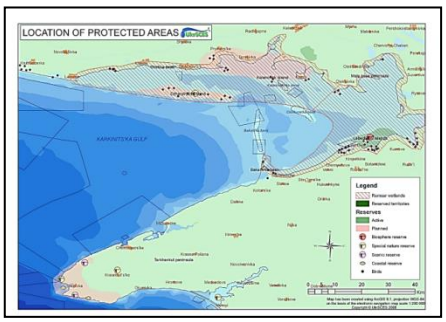
V.2. Practice of Marine Spatial Planning nationally and regionally, projects under Environmental Collaboration for the Black Sea, geographical coordinates (a-h) for all maritime activities and uses concerning navigation (a), land uses (b), MPAs (c), ESI-INDEX Maps (d), Research network (e), macrophytes field (f), *Phyllophora* field (g), Study case area (h).



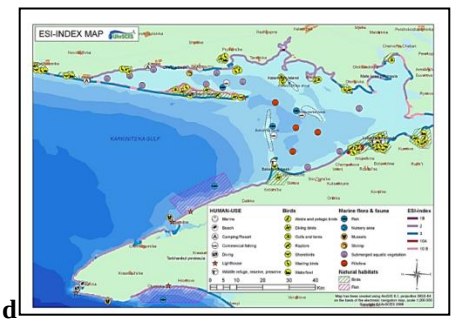
a



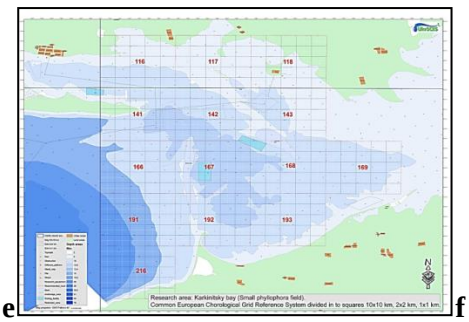
b



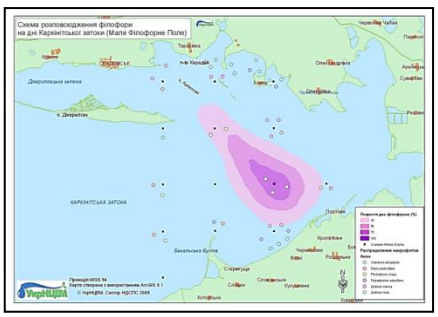
c



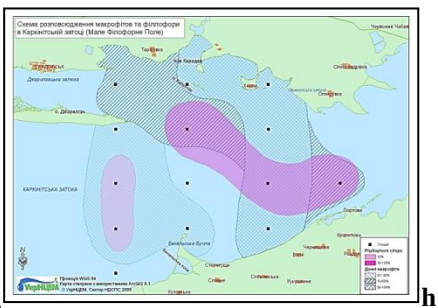
d



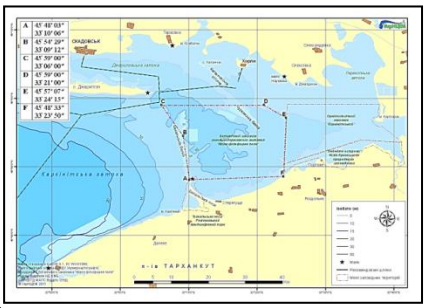
e



f



g



h

V.3. Practice of Marine Spatial Planning nationally and regionally, projects CoCoNet. DURATION 48 months (2012-2016) CONSORTIUM: 37 partners from 22 countries of three continents www.coconet-fp7.eu, Made with funding from the European Commission's Seventh Framework Programme (FP7/2007-2013)

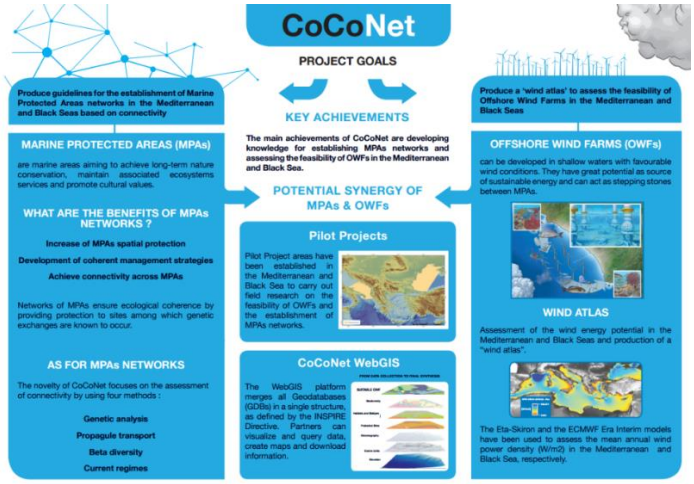


Fig. 4. CoCoNET Project main objectives: *Marine Protected Areas, Off-shore wind Farms, Pilot Projects, Web, Atlas, MPAs Networks, potential Synergy of MPAs and OWFs*

Fig. 5. Black Sea

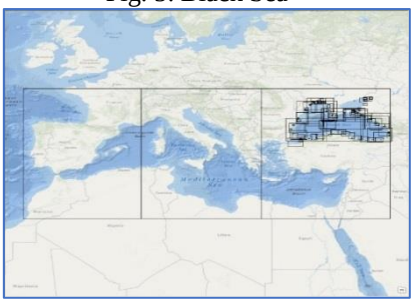
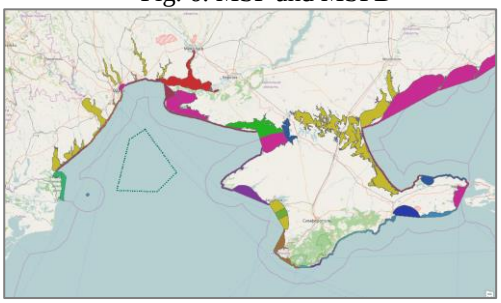


Fig. 6. MSP and MSFD



V.4. Practice of Marine Spatial Planning nationally and regionally, projects MSFD implementation/Fig.6
Under this directive and others related marine space have been elaborated a big number of thematical and integrated maps, almost 180 (Fig.no.6)

V.5. Practice of Marine Spatial Planning: spatial datasets New Nautical charts (S-57) of the Black Sea – (Fig.no.5, 7, 8, 9)

Future needs and goals for the MSP development and implementation in Ukraine, are related to:

- New spatial data purchase and creation;
- Implementation and popularization of the new approaches;
- Launching and popularization different data/spatial data sharing web platforms;

Upgrade existing and purchase new Software and Hardware equipment.

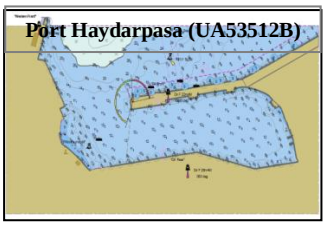


Fig. 7. Port Batumi (1:5 000)

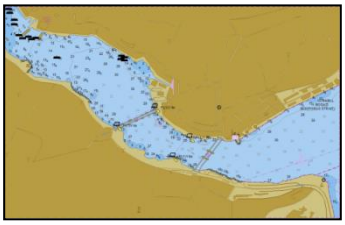


Fig. 8. Halic (UA53512A)

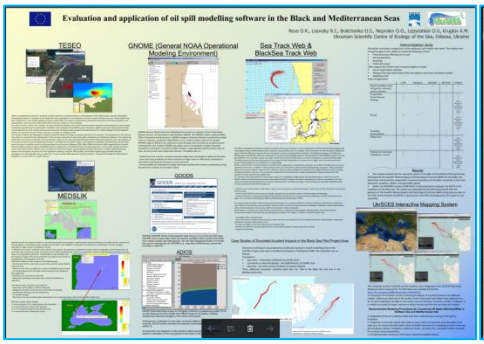
Fig. 9. Port Constanta UA53413A

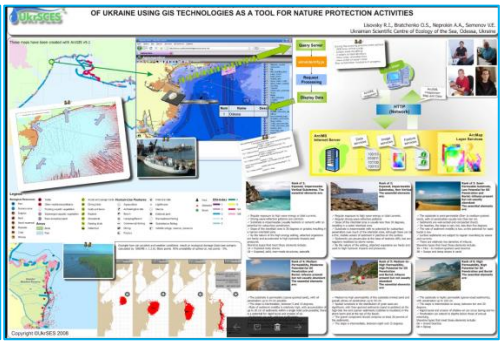
ACKNOWLEDGEMENT

The main Author is *Oleksandr Neprokin* , Head of information support for scientific researches department, *o.neprokin@gmail.com.*
The other authors Oleksandr Leposhkin, Olga Bratchenko, Maksym Motylov who had contribution to the present work thank to the MARSPLAN BS Scientifical Conference organizers and to the funding organism, the European Commission which supported through the European Maritime and Fisheries Fund, grand No. EASME/EMFF/2014/1.2.1.5/2/ SI2.707672 MSP LOT 1 /BLACK SEA/MARSPLAN-BS the participation and the presentation of Maksym Motylov about the MSP in Ukraine.

REFERENCES

Golumbeanu M, Nicolaev S, Alexandrov L & all (+ 14 autors contributors), 2015, *Study on Integrated Coastal Zone Management*, 454p, Ex. Ponto Publishing House, 2015; Or: 978-606-598-397-7, CIP:579.68





Oleksandr Neprokin: Senior Researcher, Data Management Expert, Ukrainian Scientific Centre of Ecology of the Sea, Head of Information Support for the Scientific Researches Department / OBIS Black Sea node Manager, IODE SG-OBIS (Black Sea OBIS node manager). Field of data processing and expertise: Biological Oceanography, Marine Ecology, Chemical Oceanography, Fisheries, Aquaculture, Physical Oceanography, Pollution

Oleksandr Leposhkin: Senior Researcher, Ukrainian Scientific Centre of Ecology of the Sea, Head of Department, SG-OBIS-EVENT-DATA. Subject Area: Biological Oceanography, Marine Ecology

Olga Bratchenko: Senior Researcher, Ukrainian Scientific Centre of Ecology of the Sea, Data Management

Maksym Motylov: Senior Researcher, Ukrainian Scientific Centre of Ecology of the Sea, Data Management

Laura Alexandrov: Senior Researcher I - National Institute for Marine Research and Development "G.Antipa", Constanta, Romania; graduated in Fisheries and Aquaculture technologies and has PhD in Industrial Engineering at University "Lower Danube", Galati. Postgraduated in: Marine Ecology, Aquaculture and Marine Spatial Planning (MSP), ecological effects of pollution (UKA), Maritime Spatial Planning(Belgium), recirculated system (France), fisheries and environment development (Japan), eutrophication (Swiss), fisheries production and management (Israel, Turkey). Representative of MSP Focal Point for the Black Sea under the MSP Platform. NIMRD project coordinator: MARSPLAN BS Project. PlanCoast-INTRREGIII, Tasaul-ESTROM, PEGASO-FP7, SRCSSMBSF-JOP Black Sea-CBC, ECOAST-COFAST. She has been lector affiliated to the University Constanta "Ovidius" Constanta and to Balkan Training Centre (BENA). She is member of Romanian CISE Commission for Maritime Surveillance (under the Ministry of Transport coordination); member of the National Committee of Coastal Zone (coordinated by the Ministry of Waters and Forests) and member of the Scientifical Council of NIMRD "G.Antipa". Author of more than 80 publications.