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UNIVERSITY OF THESSALY

FINAL REPORT

MSP Med – Greece

(Athens, December 2015)

Paving the Road to Marine Spatial Planning in the Mediterranean

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LIST OF ABBREVIATIONS

BP	Blue Plan
CBD	Convention on Biodiversity
CAMP	Coastal Area Management Programme
CEMAT	Conférence Européenne des Ministres de l'Aménagement du Territoire
COP	Conference of Parties
CP	Contracting Parties
DSM	Digital Surface Model
EBM	Ecosystems Based Management
EBSA	Ecologically and Biologically Sensitive Area
EC	European Commission
EcAp	Ecosystems-based Approach
EEA	European Environment Agency
EIA	Environmental Impact Assessment
EP	European Parliament
EU	European Union
FP	Focal Point
GEF	Global Environment Facility
GES	Good Environmental Status
GREEN_PLAN	Geographical Research and Environmental Planning Laboratory
HCMR	Hellenic Centre for Marine Research
ICZM	Integrated Coastal Zone Management
IMP	Integrated Maritime Policy (EU)
IOC	Intergovernmental Oceanographic Commission
MAP	Mediterranean Action Plan
MCA	Multi-Criteria Analysis
SEA	Strategic Environmental Assessment
MEECC	Ministry of the Environment, Energy & Climate Change, Greece
MPREE	Ministry of Productive Reconstruction, Environment and Energy
MS	Member State
MSFD	Marine Strategy Framework Directive (EU)
MSP	Marine Spatial Planning
MSSD	Mediterranean Strategy for Sustainable Development
NFP	National Focal Point
NGO	Non-Governmental Organisation
NMPZ	National Marine Park of Zakynthos
PAP	Priorities Action Programme
RES	Renewable Energy Sources
SLR	Sea Level Rise
SPA	Specially Protected Areas
SPAMI	Specially Protected Area of Mediterranean Importance
RAC	Regional Activity Centre
UAV	Unmanned Aerial Mapping
UNEP	United Nations Environment Programme
UTH	University of Thessaly

1 INTRODUCTION: ABOUT THE PROJECT

1.1 Preamble – General framework

This project was commissioned by PAP/RAC, one of the Regional Centres of MAP/UNEP, to the University of Thessaly – GREEN_PLAN Laboratory, in collaboration with external experts, in an effort to facilitate implementation of the Protocol on Integrated Coastal Zone Management (ICZM) in the Mediterranean, in particular as regards the provisions related to the marine part of the coastal zone.

For the assignment of the project, the following facts have been taken into consideration:

- the Art. 3 of the Protocol on Integrated Coastal Zone Management in the Mediterranean, which sets the seaward boundary of the coastal zone at the external limit of the territorial sea of the Parties;
- the statement made by the UNEP/MAP National Focal Points (NFPs) at their meeting held in Athens in September 2013, which was endorsed by the 18th Ordinary Meeting of the Contracting Parties to the Barcelona Convention (COP18) held in Istanbul in December 2013, that "*marine spatial planning was a significant avenue to be explored for the future of MAP and in particular for the implementation of the ICZM Protocol*" and that "*given its potential and the work already done by PAP/RAC on marine spatial planning, provision should be made for further development of related activities in the programme of work*";
- the entry into force of the EU Directive 2014/89 (of July 23, 2014) establishing a framework for maritime spatial planning; and
- the particular interest expressed by Greece, through its NFPs for UNEP/MAP and PAP/RAC, to undertake a pilot project to explore the legal, institutional, scientific and methodological prerequisites, in order to support the implementation of the ICZM Protocol and in particular its provisions related to the planning and management of the marine space.

Carrying out such a project in Greece has a double advantage since the country has the longest coastline in the Mediterranean and it is at the same time a Contracting Party (CP) to the Barcelona Convention and a Member State (MS) of the European Union (EU). Therefore, the outcomes of the project can combine the elements needed for the implementation of both the ICZM Protocol and the respective EU Directive. Thus, the project can be beneficial on the one hand to the CPs that are also EU/MS who can avoid overlapping of actions and unnecessary administrative burden and on the other hand to the non-EU CPs that could be inspired by the experience of the others.

This project offers also a triple opportunity to:

1. Network with the Coastal Areas Management Projects (CAMPs), concluded and/or on-going in the Mediterranean, and thus contribute to both exchange of experience and interactions of land and sea planning in coastal zones;

2. Combine planning at national level with consultations and implementation needed at Regional level through a case study in one of the insular Greek Regions, that of the Ionian Islands; this can also contribute to exploring and promoting proper governance schemes;
3. Incorporate the principles of ecosystems-based approach (EcAp) and good environmental status (GES) in the Marine Spatial Planning (MSP).

One can find in the ICZM Protocol several explicit references to marine spatial planning providing the legal basis for planning and management of the seas in the Mediterranean. There are also several provisions related to measures of a horizontal nature, which apply to both the land and the sea part of the coastal zones. What one cannot find in the Protocol is the ways to implement the commitments within each CP; this is absolutely natural since such ways depend on the specific conditions of and policies in each one of the Mediterranean countries and they are considered to be under national competence. The current project intends to contribute offering some responses to the question "how" as regards the implementation at national and Regional levels.

To this end,

- Other commitments under different relevant legal and/or institutional contexts are taken into consideration (e.g., the Framework EU Directive on Marine Strategy, the United Nations Convention on the Law of the Sea / UNCLOS, the Mediterranean Strategy for Sustainable Development / MSSD currently under revision);
- Relevant methodological tools developed and/or used within other projects as well as good practices are evaluated briefly, in an effort to identify those which fit better to the Mediterranean conditions and also to build upon the most appropriate ones, use them for the case study.

The timing of the project is good for the promotion of the MSP issues in Greece as well, since the competent authorities are in the process of identifying the necessary steps to facilitate implementation of both the ICZM Protocol and the MSP EU Directive in concrete ways. Though Greece has not ratified the ICZM Protocol as yet, it is broadly understood that, after the accession of the EU to the Protocol, it constitutes part of the "*acquis communautaire*" and, therefore, its provisions are equally binding for Greece as if the ratification had already taken place. Furthermore, the revision of the MSSD is expected to be adopted by the CPs of the Barcelona Convention at their 19th Conference of Parties (COP19) to be held in February 2016 in Athens. Therefore, a framework Strategy will be in place in the Region offering the necessary vision and acting as the overarching Mediterranean policy where the national or sub-Regional marine plans could fit.

Greece has only a limited experience in practicing MSP so far: two hybrid plans for the Zakynthos and Sporades marine parks, aiming at protecting the threatened species (marine turtle and monk seal respectively) through restriction of some marine and land uses, as well as a framework spatial plan for one specific use only, aquaculture.

It is not needless to underline that spatial planning (on land or on sea) is a very important vehicle to promote three policies at the same time and in a coherent and integrated manner:

- Sustainable development ensuring balanced co-existence of the economic, the social and the environmental components in a long-term perspective;
- Regional and territorial cohesion; and
- Protection of species, habitats and ecosystems services and contribution to improvement of life quality.

Therefore, methodologies and tools that would promote the implementation of MSP in the Mediterranean could offer to the CPs significant added value contributing to the objectives of the Barcelona Convention and the MSSD.

Given the fact that MSP has several special characteristics diversifying it from the spatial planning on land and that the related experience in the USA, Australia or the northern European countries cannot be automatically transferred and applied in the Mediterranean countries, the project team has preferred to follow a prudent approach, compile relevant information, evaluate the existing tools, tackle the MSP issues step by step and, where appropriate, suggest alternative methods and tools.

To this end, the Region of the Ionian Islands has been selected as a case study combining a number of challenging characteristics.

1.2 Team Members – Co-ordination

The GREEN_PLAN Laboratory for Geographical Research and Environmental Planning (University of Thessaly, Greece) hosted the project.

The Green_Plan researchers and staff have closely cooperated, for the needs of this project, with external experts from the Ministry for the Environment and the Hellenic Centre for Marine Research. The composition of the core project team is as follows:

Core Team of the Project

- **BERIATOS Elias**, Prof. in Geography, Spatial and Environmental Planning / Director of GREEN_PLAN Laboratory, DPRD-UTH (Coordinator of the Project).
- **Dr. MOURMOURIS Athena**, Honorary Director General for the Environment of MEECC – Environmental Engineer and Planner (Policy guidance, contribution to coordination and governance).
- **Dr. PAPAGEORGIOU Marilena**, Adjunct Asst. Professor in Spatial Planning at the Univ. of Thessaly (DPRD – UTH) – Expert in tourism planning and management of natural and cultural heritage.
- **Dr. FARASLIS Ioannis**, Laboratory Teaching Staff at the Univ. of Thessaly (DPRD – UTH) – Expert in environmental management and GIS.
- **Dr. VASSILOPOULOU Vassiliki**, Research Director at the Hellenic Centre for Marine Research (HCMR) – Expert in Marine Biology and Fisheries.
- **Dr. PANAYIOTIDIS Panayiotis**, Research Director at the Hellenic Centre for Marine Research (HCMR) – Expert in Marine Environment and Pollution.
- **Dr. ANAGNOSTOU Christos**, former Researcher Director at the Hellenic Centre for Marine Research (HCMR) – Expert in Marine Geology and Oceanography.

Additional / Assisting Staff:

- **KRINAKIS Stavros**, Research Associate at the Univ. of Thessaly (DPRD – UTH), Spatial Planner – MSc in Sociology and Demography.
- **DRAGOIDOU Evi,** Administrative Staff at the University of Thessaly / Secretariat.
- **CHARALAMPIDOU Vassiliki**, Undergraduate Student at the DPRD UTH – Assisting Staff / Secretariat.
- **KITSOS Konstantinos**, Undergraduate Student at the DPRD UTH – Assisting Staff / Secretariat.

1.3 Leader and Co-operating/Associate Partners

Leader Partner

The GREEN_PLAN Laboratory for Geographical Research and Environmental Planning (University of Thessaly, Department of Planning and Regional Development, Greece) was the Leader Partner of the MSP Med – Greece project and was in charge of the management aspects.

Collaborating/Associate Partners

Other partners having cooperated for the project – by providing information, participating in stakeholders meetings, facilitating local meetings and field visits, and expressing views as end-users – are:

Ministry for the Environment and Energy

Region of Ionian Islands – R.I.I.

Regional Union of Local Administration in the Ionian Islands – R.U.L.A.I.I.

Hellenic Centre of Marine Research – H.C.M.R.

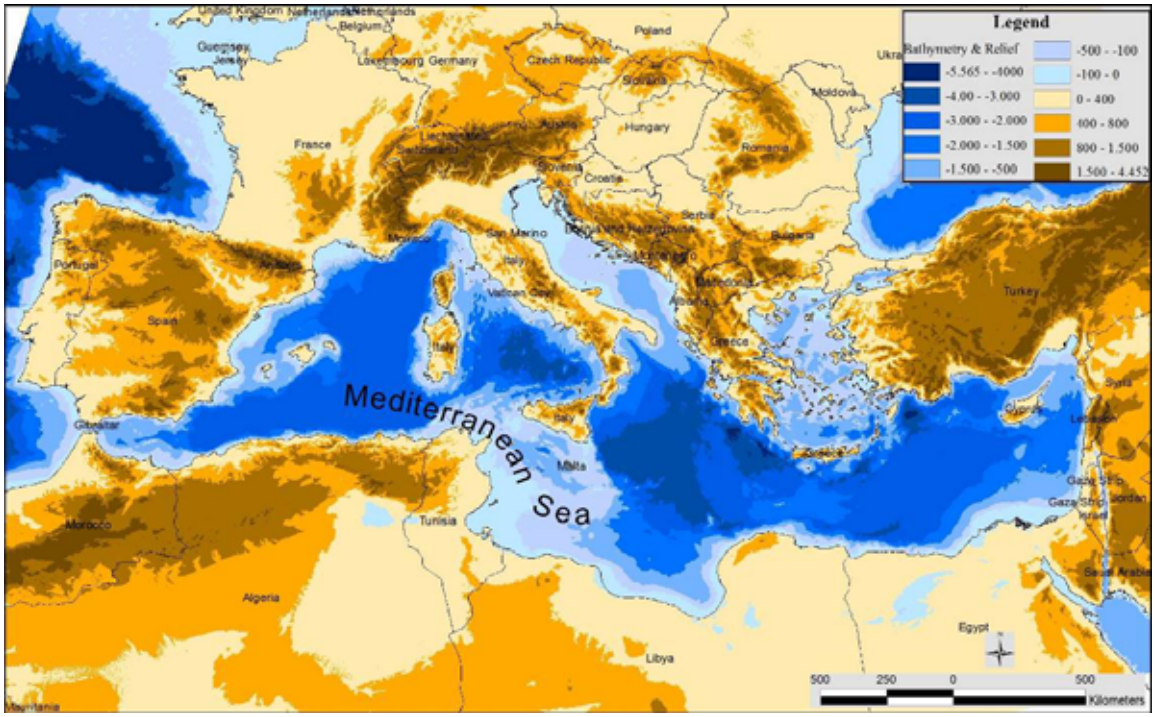
National Marine Park of Zakynthos – N.M.P.Z.

1.4 Goals and objectives of the project

The Mediterranean Basin is a fragile coastal and marine ecosystem, undergoing tremendous pressure due its nature and its use by the multi-cultural nations living along its inter-continental coasts, as well as the tourists originating from all over the world. Therefore, it is of paramount importance that it is judiciously preserved and used for the common benefit of all people.

The ICZM Protocol of the Barcelona Convention, adopted in 2008, aims to ensure integrated coastal zone management of the Mediterranean, through cooperation amongst the Contracting Parties (CPs) and covers both the land and the marine part of the coastal zone. This approach is reflected in the Action Plan for the implementation of the ICZM Protocol in 2012–2019, adopted by the CPs in 2012.

In this framework, the project – that is of a pilot nature – intends to facilitate the implementation of the ICZM Protocol, in particular with regards to its provisions related to the marine part of the coastal zone, by evaluating methodologies and existing tools, proposing possible cooperation/management schemes and identifying prerequisites andpossibleways to deal with the challenges, in an effort to assist the CPs to meet the common objectives of integrated marine spatial planning and management.



Map 1: Geomorphological map of the Mediterranean Basin (MAP/UNEP geographical scope)
Source: processed by the authors

Issues, methodologies and tools that are selected for further evaluation within this project (due to their important role in the process of Marine Spatial Planning), are the following:

- **MSP methodologies, practices and other issues**: with a particular interest in defining the limits of Marine Spatial Plans (i.e. the territorial waters and maybe extension to the EEZ limits where possible, the administrative limits in the sea for management purposes), the interaction between sea and land (coherence among Marine and respective Land Spatial Plans), MSP planning practices and models etc.
- **Legal, Institutional Aspects and Governance Issues**: giving special emphasis to the provisions and/or limitations raised by the UNCLOS to the MSP process in each coastal country, to the identification of the competent Authority as well as the rest competences for MSP *(elaboration, decision making, approval, implementation, monitoring, evaluation)*, to the provision and implementation of participatory democracy (*identification of consultation bodies, public participation procedures)* etc.
- **Tools in the service of MSP**, such as the:
  - ***Cartography and Mapping Tools***: with specific regards to: (a) identification of the geographical data set needed for MSP (so as to visualize the marine space and facilitate the decision making and public participation); (b) the assessment of the existing data bases (open or of restricted access) and the identification of data missing; and (c) the evaluation of 3-D mapping tools and their potentials in the service of MSP.
  - ***Compatibility Tools***: in order to identify compatibilities, synergies or conflicts among sea uses and other human activities (in sea and land).
  - ***Cumulative Impact Assessment Tools***: for the assessment of impacts of current situations as well as of different options and alternative scenarios for blue/green development.
  - ***Vulnerability Assessment Tools***: in order to identify zones facing habitat loss, erosion, degradation of seawaters quality, loss of fishing stocks, risks from pollution, human pressures or extreme natural phenomena. Identification of vulnerable areas can facilitate competent authorities in setting out their priorities and proceeding on time with appropriate policies, plans and measures.

- ***Multi-criteria Analyses***: in order to identify areas fulfilling multiple criteria (legal, economic etc.) or possible development scenarios.
- ***Risk Analyses***: with reference to risks and hazards due to natural phenomena (coastal erosion, sand removal, tsunami etc.), mostly affecting the shoreline as well as the coastal zone and its natural and human elements (ports, land facilities, tourism etc.).

All the above mentioned methodologies, approaches and tools are used in the case study area, in an effort to test their feasibility in the Mediterranean conditions, their limits and their possible added value in the process of Marine Spatial Planning.

Ultimate scope of the project is to serve as guide to all CPs involved, in order to formulate or further strengthen their own national MSP systems, keeping always in mind the various needs and specificities (natural, social, economic and institutional) of all involved CPs at national and Regional levels. A challenge which has a special added value for the CPs that are at the same time EU Member States to apply MSP in their territorial waters, in particular after the adoption of the EU Directive on MSP, which makes it compulsory. Non-EU CPs could certainly profit from such development in the Region.

1.5 Pilot Case Study Area: Region of Ionian Islands (Greece)

The Region of the Ionian Islands, situated in the Ionian Sea (in the middle of the Mediterranean Basin and adjacent to the Adriatic Sea), is selected to serve as the specific case study area of the project MSP Med – Greece.

Apart from its insular nature and therefore its extensive marine space, the Region of the Ionian Islands is considered to be an ideal case study area for the project, due to the following parameters and criteria fulfilled:

Environmental and geophysical features

- Diverse geomorphology (resulting frequent earthquakes);
- Diverse natural and cultural environment (submarine canyons / ship wrecks etc.);
- Dense system of Marine Protected Areas (including areas with endangered species and key priority habitats) and Sites of Community Importance .

Economic and political peculiarities

- Direct relation to the Adrionian Macro-Region, where numerous side projects are being elaborated, providing valuable experience and input to the MSP Med-Greece project;
- Representativeness among other insular Greek Regions and average ranking in relation to the Regions of other Mediterranean countries;
- Proclaimed (since 1978) limits of continental shelf in the marine space between Greece and Italy.

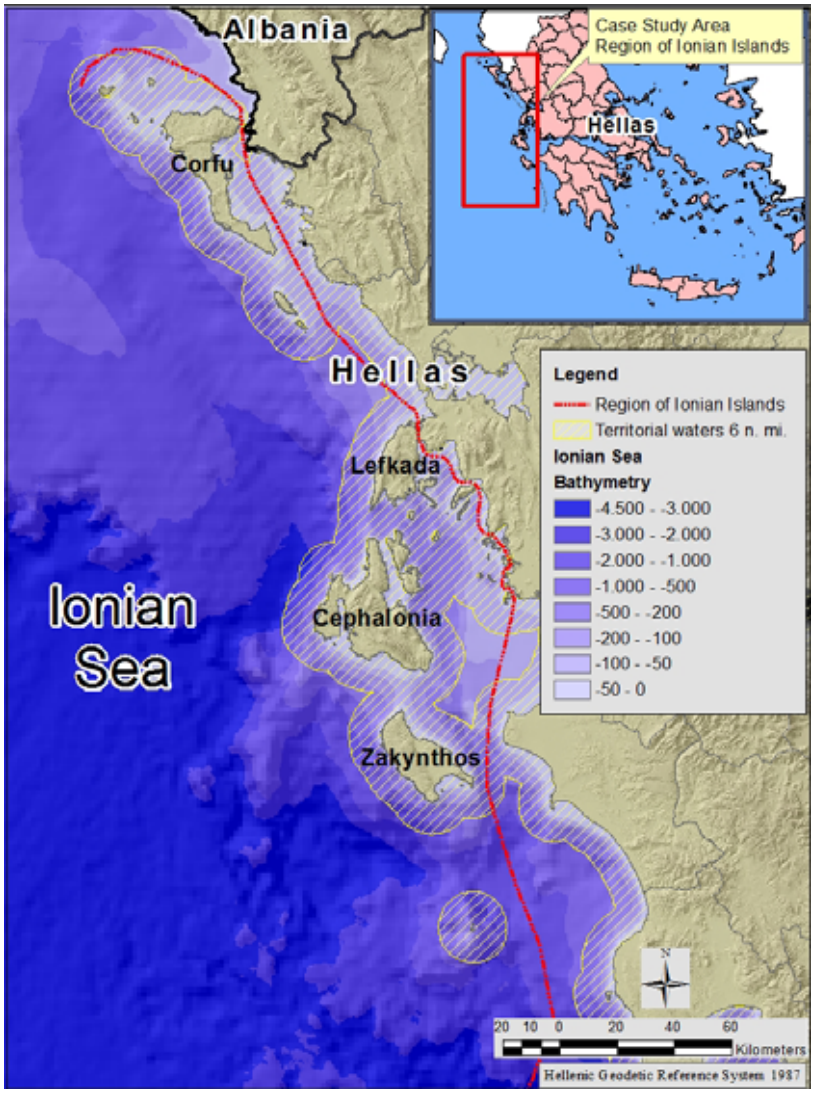
Sea Uses complexity, interaction and conflicts

- Dense maritime system of transportation;
- Dense network of aquacultures;
- Extensive fishery zones;
- Developed maritime/nautical and coastal tourism (cruise, yachting, diving etc.);
- Dense network of submarine cables and pipelines;
- Manifested interest for developing off-shore wind farms and for conducting research for hydrocarbon exploitation.

Up-to-date geographical data (for cartography and mapping)

- Ongoing Regional Spatial Plan in the Ionian Islands;

- Existence of sectorial (and other) projects with the same area of study (Ionian Islands);
- Existence of geographical information on the marine environment;
- Available data for marine transportation and navigation;
- Accessible data for areas with manifested interest for developing sea uses.



Map 2: The case study area (Region of Ionian Islands)
Source: processed by the authors

1.6 Methodological approach of the project

Literature review – Completing the knowledge base

For the needs of the project, extended literature review took place, as regards the identification and documentation of relevant methodological and technical approaches on MSP, and the identification of the best international MSP practices.

Additional review also regardsed the relevant tools for MSP (Cumulative Impact, Vulnerability, Compatibility etc.), in an effort to better evaluate their usefulness in the MSP process.

Extra research made, also regarded other projects in the case study area that would provide valuable input and information to the MSP Med-Greece project.

Collection of geo-spatial data

For the acquisition of the necessary geo-spatial data for the case-study area of the MSP Med-Greece project, extended research had to take place in several Authorities, Institutes, Universities etc., such as (non-exhaustive list):

- The Hellenic Ministry for the Environment;
- The Hellenic Ministry of Mercantile Marine and Transportation;
- The Regional Authority for the Ionian Islands;
- The Hellenic Centre for Marine Research.

For more information on the data collection and process, please see Chapter 3.1.1 and 3.4.2)

International Meetings

During the elaboration of the project, several International Meetings were organized (in Athens and Split), aiming to:

a) Exchange experience and know-how on MSP issues with national and international decision-makers (Ministry representatives from all over the Mediterranean);

b) Discuss the needs and gaps to be filled-in by the project;

c) Create networks for exchange of information.

Further details on these meetings are presented below.

1st meeting: *30 January 2015, Inception Meeting (held in Athens, Greece)*

- **Objective:** initiation of the project (kick-off meeting), discussion and finalization of the Inception Report, establishment of the project network [among the Core Team and the rest of the partners].
- **Participants:** MAP/UNEP-PAP/RAC Representative, MPREE (former MEECC) Representatives, Ministry of Agricultural Development /Fisheries Representative, Region of Ionian Islands Representatives. Representative of the Association of Municipalities located in the Region of Ionian Islands (PED-IN).

2nd meeting: *12–14 May 2015 (held in Split, Croatia) (on the occasion of the PAP/RAC NFPs meeting)*

- **Objective:** presentation of the preliminary findings of the project, collection of information with the use of a questionnaire form, discussion and exchange of information with all participants.
- **Participants:** Members of the core team of the project and FPs of the PAP/RAC involved with the ICZM Protocol.

3rd meeting: *30 of November 2015 (held in Athens, Greece)*

- **Objective:** presentation of the project's findings and proposals, discussion with all partners and other stakeholders, dissemination of the project's outcomes, in order to facilitate the implementation of MSP in all CPs.
- **Participants:** MAP/UNEP-PAP/RAC Representatives, Representatives of the Ministry for the Environment and other competent Ministries or public authorities, Region of Ionian Islands Representatives, 1st tier local authorities representatives, relevant NGOs.

Furthermore, on the occasion of the annual Meeting of the UNEP/MAP National Focal Points (held in Athens in May 22, 2015), an extra side meeting of took place with the Director of PAP/RAC, for further bilateral discussions and cooperation on the progress of the project.

Local Meetings

Additional meetings planned during the project were dedicated to the interaction among the local stakeholders in the case study area and the core team of the project. These "local meetings" took place as described below:

- 1st local meeting (30 of March 2015): Corfu island;
- 2nd local meeting (30 of June 2015): Ithaca island;
- 3rd local meeting (7 of September 2015): Zante island.

Organization of the Local Meetings aimed to:

a) Discuss critical issues of MSP with local stakeholders;

b) Test the of methodological tools for MSP;

c) Test the governance schemes;

d) Create networks for exchange of information.

For more information on the local meetings, please see also Chapter 3.1.2.

Conferences participation

Beyond the scheduled events of the project, members of the Core Team profited from other meetings and conferences organized, in order to seek additional views and information, test some proposals and promote cooperation and synergies. Such events were the following:

- Montenegro CAMP final conference (Budva, Montenegro, 18 December 2014);
- 11th Oceanographic Congress (Mytilene, Greece, May 2015);
- SPA/RAC NFPs meeting (Athens, Greece, 25-29 May 2015), where a questionnaire was addressed to NFPs;
- European Maritime Day (Athens, Greece, 28-29 May 2015);
- Meeting of the Coast Agencies of Europe and the Mediterranean, and Mediterranean Coast Day (Antibes, France, 24-25 September 2015);
- 4th Pan-Hellenic Congress of Spatial Planning and Regional Development (Volos, Greece, 24-27 September 2015);
- Meeting of the Inter-ministerial Committee in charge of the preparation and implementation of the Croatian Coastal and Marine Strategy Conference (Sibenik, Croatia, 21-22 October 2015);
- EU Conference on Maritime Spatial Planning and the Marine Environment (Brussels, Belgium, 7 December 2015).

Questionnaire survey

In order to obtain as much as possible information for the project, three types of Questionnaires were distributed during the elaboration of the study:

- The first type of Questionnaire was addressed to the local stakeholders, in order to select information regarding their awareness in MSP issues, their involvement in sea-use interactions, synergies or conflicts, as well as their specific needs to be tackled in future Marine Spatial Plans.

- The second and third type of Questionnaires was addressed to the FPs of the PAP/RAC and SPA/RAC respectively: in order to obtain information, especially in terms of international experience and practice, regarding planning and governance issues of the marine space.

Synergies and networking

The core team worked in close cooperation with the competent Directorates of the Hellenic Ministry for the Environment and Energy (as it is currently its title), in order to have access to relevant information and ensure feasibility of proposals, consistency of policies and follow up of actions.

Representatives of the Regional Authority of the Ionian Islands also cooperated with the core team of the project, providing input as regards the effectiveness of the methodological tools and the governance schemes.

Moreover, first steps were achieved towards the establishment of a network around the Mediterranean (including PAP/RAC NFPs and other competent bodies). Given the limited duration and the small scale of the project, there was no real possibility to invest in the operation of such a network. However, since it is based on FPs for PAP/RAC and SPA/RAC as well as on managers of CAMPs, if there is interest, this scheme could be further developed and operate as a forum to exchange views and experience on MSP issues – in relation also to ICZM. It could be even extended to FPs for REMPEC and Blue Plan.

On the contrary, local stakeholders (i.e. participants to the local meetings in the case study area) were more susceptible to the establishment of a local network.

2 METHODOLOGICAL APPROACHES AND TOOLS FOR MARINE SPATIAL PLANNING

2.1 Conceptual and methodological framework for MSP

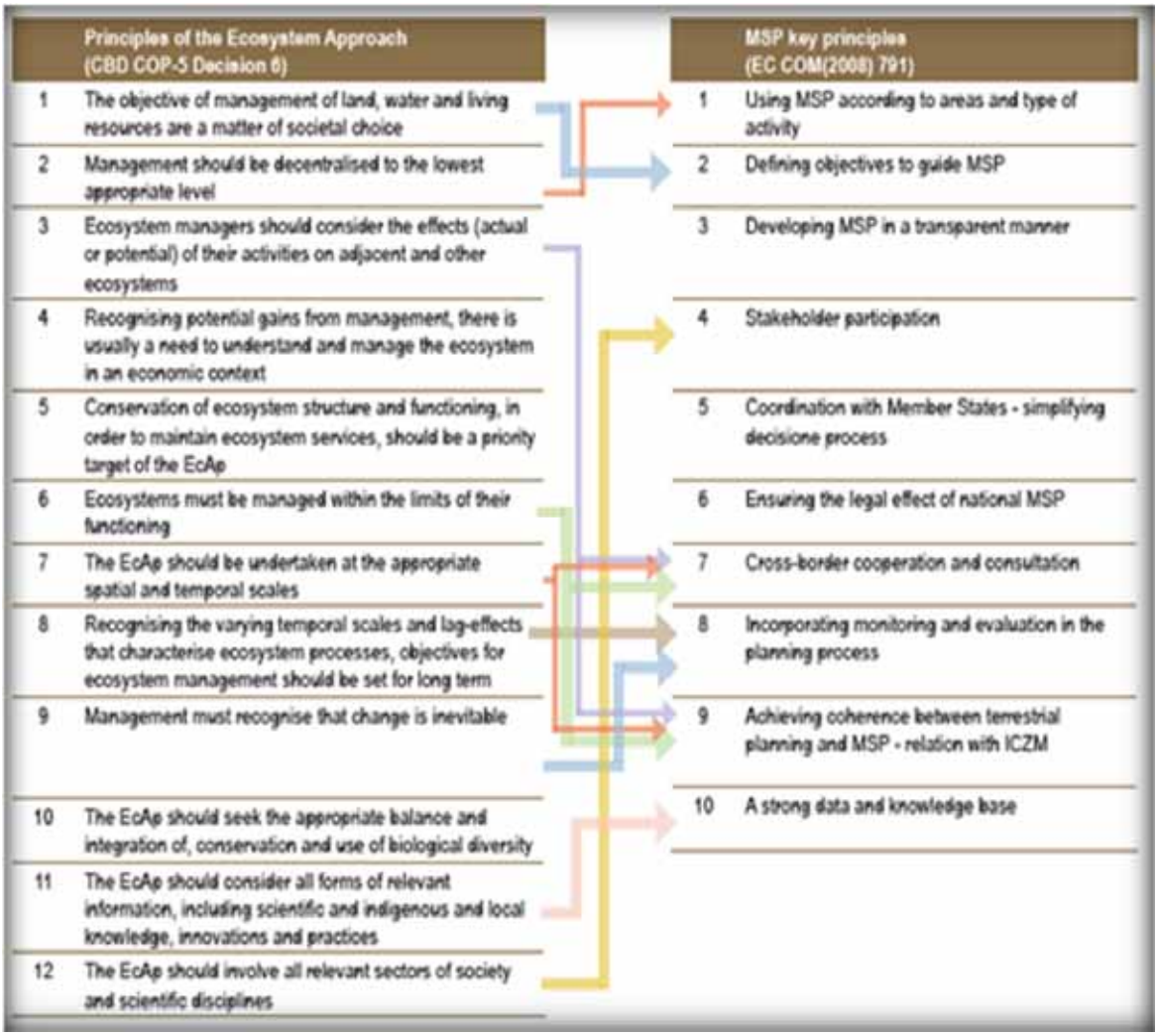
2.1.1 Main documents and principles for MSP: adapting to the Ecosystem Approach

In January 2008, 14 Mediterranean Countries signed the Protocol on Integrated Coastal Zone Management in the Mediterranean (UNEP/MAP/PAP, 2008), in the framework of the Barcelona Convention. To date, nine countries and the EU have ratified the Protocol; consequently, on the 24th of March 2011, the Protocol entered into force, becoming binding for all Contracting Parties. In implementing the Protocol, the Parties shall be guided by general principles of integrated coastal zone management, which lay among else on the application of an ecosystem approach.

Indeed, in recent years an ecosystem-based management (EBM) has been embodied in a broad range of environmental planning and management activities, including integrated coastal and oceans management, marine spatial planning (MSP), and strategic and Regional environmental assessments. UNESCO-IOC (Ehler & Douvere, 2009) defines EBM as "*an integrated approach to management that considers the entire ecosystem, including humans*". The goal of EBM to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the goods and services humans want and need. EBM emphasizes on the protection of ecosystem structure, functioning and key processes taking into account the interconnectedness within (e.g. interactions between target and non-target species) and among the involved system (e.g. land-sea interaction) by integrating ecological, social, economic, and institutional perspectives; indeed, EBM is a place-based process focusing on specific ecosystems and human activities that may affect them (Ehler & Douvere, 2009).

Marine Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM) provide the framework for integrated management of human activities at sea required under EBM, and are in line with the EU Marine Strategy Framework Directive (MSFD) goals aiming to ensure that the collective pressures of human activities are kept within levels compatible with the achievement of good environmental status (GES). The EC COM(2008) 791 aims to facilitate the development of Maritime Spatial Planning (MSP) by Member States and encourage its implementation at national and EU level by setting out 10 key principles for MSP seeking to encourage the development of a common approach among Member States. These principles are closely linked to the ecological objectives of the Ecosystem Approach (EcAp) defined by UNEP/MAP based also on related CBD decisions (Table 1).

Table 1: The links between the Principles of the Ecosystem Approach and Marine Spatial Planning
Source: adapted from Ramieri et al., 2014



A structured step-by-step approach is usually adopted to develop marine spatial plans described within several efforts, such as the PlanCoast (Integrated) MSP Framework (PlanCoast Handbook, 2008), the IOC-UNESCO Framework (Ehler & Douvere, 2009), the 12-stage process on how a marine plan is made in England (https://www.gov.uk/marine-plans-development), and the MESMA Framework (Stelzenmüller *et al.*, 2012). These frameworks aim to enable decision makers to map gaps, recognize relevant challenges, and contribute to strategic thinking that will be required in order to face these challenges. They should be applicable to areas of different spatial scale, reflecting the underlying natural (ecological processes and functions are scale dependent), and socioeconomic factors (considering stakeholder interests), and with different levels of maturity of spatial management plans. Additionally, the temporal scale is an important factor influencing the assessment outputs, as it is relevant for the detection of response.

The study of the existing conditions with a forward looking dimension leads to the definition of clear management objectives that should guide the general vision at national and cross-border level; high-level policy goals must be translated into operational objectives before specific targets, limits and measures can be elaborated (Katsanevakis *et al.*, 2011). Operational objectives are defined as those for which operational, quantifiable targets can be set such that management measures can be targeted and performance can be evaluated, and are called SMART (Specific, Measureable, Achievable, Realistic, Time-bound) (Pomeroy *et al.*, 2005).

In general, MSP Frameworks comprise the definition of key desired outcomes, identification of management objectives, performance indicators and thresholds, monitoring and risk analysis, assessment of findings in relation to objectives, and evaluation of current management and recommendations for adaptation. An example from the application of an MSP Framework was the effort referring to the MESMA Framework (Figure 1) which was applied in a case study in the Ionian Sea (Vassilopoulou *et al.*, 2011).

Furthermore, the PEGASO experience (2014) as regards the Spatial Data Infrastructure (SDI) will be assessed and used as appropriate.

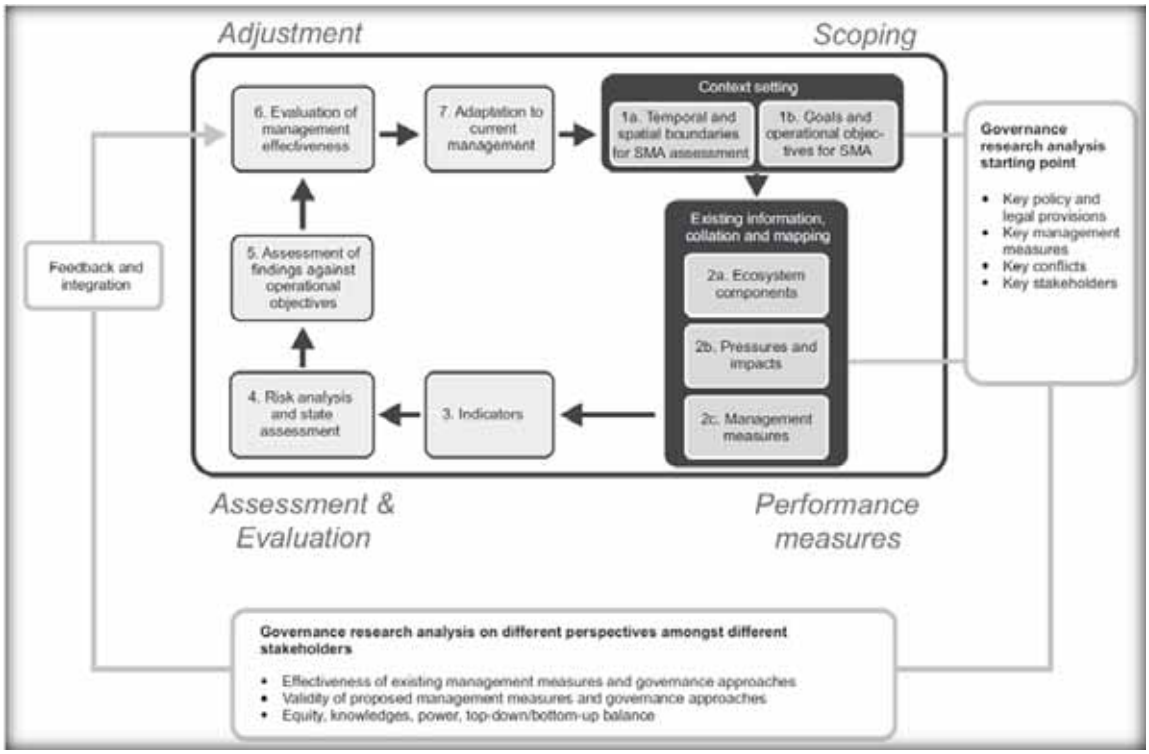


Figure 1: The MESMA Framework for monitoring and evaluation of spatially managed areas
Source: Stelzenmüller et al., 2012

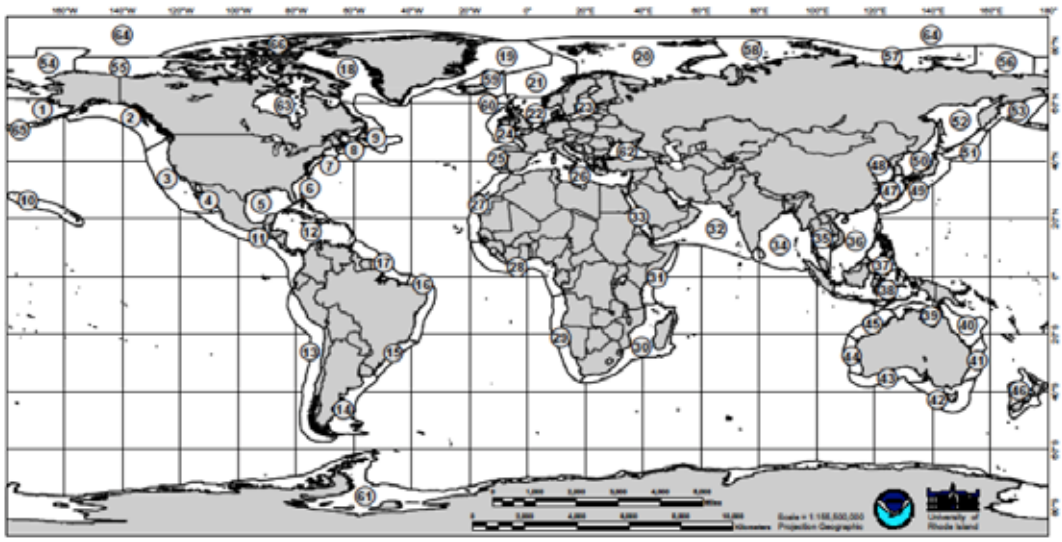
2.1.1 Defining the appropriate management units for MSP

Today, it is more than ever argued that the traditional approach of making project-by-project or permit-by-permit decisions in the sea (e.g. for disposal areas, aquaculture sites, marine protected areas etc.) cannot be considered as contribution to the wise management of the marine space (Ehler, 2008). Instead, it is more and more admitted that ecosystem-based approaches, being placed-based and giving emphasis to the local habitats and species interaction, can further contribute to the sustainable management of the marine space and the activities taking place in it (Douvere, 2008; Maes, 2008; Martin and Hall-Arber, 2008).

Implementation of the EcAp in MSP, considerably lies in the identification of the appropriate management units, in which integrated management and spatial planning will take place to effectively tackle user-user conflicts and user-environment conflicts (Douvere and Ehler, 2009). In this notion, designation of ecosystem-based management units in MSP, should definitely consider and adapt to the:

- Ecosystem boundaries (including marine and terrestrial areas);
- Geopolitical boundaries (as described in the UNCLOS);
- Administrative boundaries (national, Regional etc.).

As regards the ecosystem boundaries and limits, “Large Marine Ecosystems-LMEs” was the first marine management units to be defined back in the 1980’s (see Map 3). The LME system was adopted by UNEP (http://www.unep.org/Regionalseas), while it also supported the objectives of Chapter 17 of Agenda 21, adopted at the UNCED, in 1992 (Maes, 2008). Designation of LMEs includes ocean and coastal areas, exceeding from river basins and estuaries up to the limits of continental shelves and high seas, so as to comprise major current ecosystems. LMEs are subdivided into EcoRegions (which are further divided into biogeographic Regions; which are also divided into multiple types of habitats).



Map 3: The Large Marine Ecosystems
Source: http://lme.edc.uri.edu/ Large Marine Ecosystems of the World

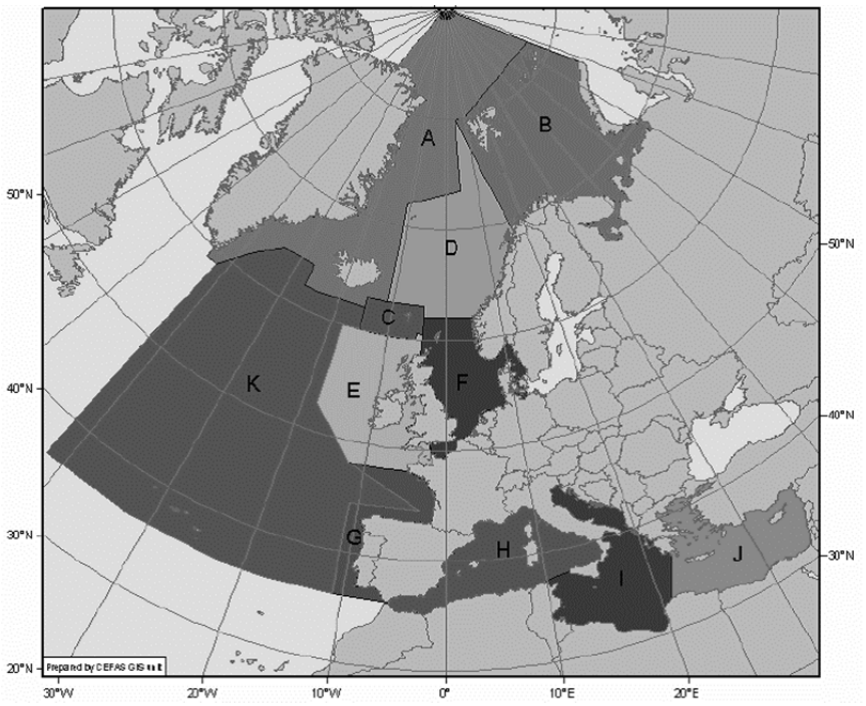
On a European perspective, attempts to identify ecosystem-based management units in the marine space are presented in Map 4. “Marine Regions” or “Eco-Regions” constitute large marine areas (management units), defined in order to facilitate the implementation of the Marine Strategy objectives among EU member-states. In the Mediterranean Sea, 3 Marine “EcoRegions” were defined.

As regards the geopolitical boundaries, among those defined by the United Nations Convention on the Law of the Sea (UNCLOS, 1982) the most important to be considered in MSP are (Papageorgiou, 2015):

a) the Territorial Waters limit (12 n.m. from the baseline);

b) the Continental Shelf limit; and

c) the Exclusive Economic Zone limit (up to 200 n.m. from the baseline).



A- Groenland /Iceland Sea
B- Barents Sea
C- Feroe islands
D- Norvegian Sea
E- Celtic Seas
F- North Sea
G- South Atlantic
H- Western Mediterranean
I- Adriatic/Aegean Sea
J- Aegean-Levantine Sea
K- North-East Atlantic Ocean

Map 4: The EcoRegions for adapting to the E.U. Marine Strategy
Source: ICES, 2006

Finally, beyond ecosystem and geopolitical criteria, definition of ecosystem-based management units should also consider existing administrative structure of coastal states, although it is strongly recommended that MSP is seen as a field of International cooperation (Smith *et al.*, 2010; Ardron *et al.*, 2008; Douvere and Ehler, 2008. Nevertheless, beyond international considerations, it is also strongly recommended (Foley *et al.*, 2010; Douvere and Ehler, 2008; Maes, 2008) that, since the national boundaries do not conform to ecosystem boundaries, MSP is tackled at different scales, with the elaboration of:

- national marine spatial plans;
- regional marine spatial plans;
- local marine spatial plans.

After all, adoption of a multi-scalar approach in MSP – as in the case of terrestrial spatial planning – is of vital importance, since according to the scale of the plan, different kinds of spatial management and organization are achieved [e.g. local plans are the ones to ensure effective resource management (Agardy *et al.*, 2011), whilst Regional and international plans ensure better integration and coordination (Ardron *et al.*, 2008; Douvere and Ehler, 2008)].

When coming to the local scale of MSP, the EcAp (or EBM –Ecosystem Based Management – as others prefer to call it) could be reflected in the definition of the management geographical units by taking into account two categories of **criteria** (Mourmouris, 2015):

- the geomorphological and ecological criteria, usually starting at the land part of the coast and continuing into the sea, which include species and habitats interactions, ecosystem services as well as possibility to be affected by the same human activities and uses; and
- the marine areas for which there is commitment by law for protection (e.g., SPAs and SPAMIs, marine Natura 2000 etc.), the ecologically sensitive areas needing protection (e.g., EBSAs on an indicative basis), as well as the necessary buffer zones ensuring ecological connectivity and that such protection can be effective.

Furthermore, exactly because ecosystems do not follow administrative borders, the EcAp should be also observed in cases where marine spatial plans will have a **cross-border character** (involving several administrative bodies, or two or more neighboring countries) and cooperation would be needed as appropriate.

2.1.2 Planning model in the marine space – context of the marine spatial plans

As mentioned in previous sections, MSP is an important tool for the implementation of ecosystem-based sea-use management. As Gilliland and Laffoley (2008) argues, MSP can be used to identify ecologically and biologically sensitive marine areas, to identify existing and potential human uses and activities taking place in the sea, and to evaluate the cumulative impacts of human activities on marine ecosystems. Therefore, it is the appropriate tool, to organize human activities (both in space and time) and to encourage synergies, reduce conflicts among sea-uses and between sea-uses and the environment.

As international planning practice shows, to achieve the above goals elaboration of marine spatial plans have to be based on a zoning system, adapted to each national legislation and functions (Douvere, 2009). This zoning system is recommended to include the following types of zones (Agardy, Notarbartolo di Sciara and Christie, 2010 Douvere and Ehler, 2009 Gee, 2007):

- **Zero-use zones**, within which no activity or use is allowed, either because these zones are destined for military use, or because they are kept as "reserve areas" (for future use), or because of hazardous phenomena taking place within (whirlpools, currents, etc.);
- **High-level protection zones** (of natural or cultural heritage), within which varying limitations and interdictions will apply, as regards the practice of human uses and activities;
- **Sectoral Zones** (for economic and productive activities): designated and organized according to the needs of marine uses and activities in each country;
- **Networks and linear zones**, for transportation, energy infrastructures (e.g. pipelines, cables) etc.

In general, it is worth noting that as in terrestrial spatial planning, in MSP too, priority should be set to the identification of sensitive areas and of zero-use zones, before designating all other sectoral zones for the development of productive and economic activities. Then, this zoning must become more detailed, with the definition of spatial regulations and a pertinent permit system (Douvere, 2009). Besides, as applies with land-use planning, MSP is necessary to become a statutory process in each country and marine spatial plans have to become binding ones (Plasman, 2008).

Besides spatial zoning, other measures that can also apply to supplement spatial regulations at the sea, are: a) limitations to human activities (e.g. on fishing activity and capacity), b) limitations on the methods used (e.g. environmental friendly practices), c) resource exploitation limits (e.g., tonnage limitations on mineral extraction) (Douvere and Ehler, 2009).

2.1.3 Interaction and compatibility between terrestrial and marine spatial planning

Marine Spatial Planning focuses on preparing spatial plans in marine waters by addressing land-sea interactions in a coordinated way with a view to ensuring their sustainable development. In recent years there is increasing and uncoordinated use of coastal and marine areas resulting respectively in multiple increasing pressures on coastal and marine resources. It is evident that sustainable use of resources will lead to sustainable development of maritime and coastal economies by linking “Marine Spatial Planning" and "Integrated Coastal Zone Management" strategies; the challenge is to plan and manage inshore and offshore anthropogenic activities in a harmonized manner considering the functional integrity of the land-sea continuum.

To effectively tackle the above, development of a more comprehensive understanding of land-sea interactions should be pursued by adopting consistent approaches to mapping these interactions, exploring at the same time best practices in terms of terrestrial-marine governance. The typology of land sea interaction developed e.g. within ESPON could be used as a spatial tool for understanding these interactions and informing policy development and decision making at a range of different scales. Coupling MSP and ICZM frameworks will also contribute towards this direction.

During the last years it is more and more agreed that the coastal zone is no longer confronted as a boundary between sea and land. On the contrary, it is confronted as a space of interaction calling for integration of spatial planning. Besides, issues related to both sides of the coastline keep growing in number, resulting in an increasing need for holistic arrangements and spatial planning, covering both sides of the coastline.

In this context, compatibility between sea and land-use planning has to be accomplished at two levels:

- Spatial planning frameworks per se (i.e. integration of land and sea-use planning systems);
- Spatial planning regulations and arrangements (affecting unilaterally sea and land areas).

Regarding spatial planning frameworks, each coastal state has an already configured terrestrial spatial planning system (with distinct levels of planning) and also has configured administrative boundaries (national, Regional, municipal) which do not stop at the shoreline (or the so called by the UNCLOS «baseline») but usually extend to the Territorial Waters – and sometimes to the EEZ (if proclaimed).

However, integration between terrestrial and marine spatial planning does not necessarily mean that marine and terrestrial plans must coincide at all scales. After all, interesting examples of contralateral planning (i.e. planning covering marine and land areas), already exist and these are (Smith *et al.*, 2010):

- River basin management plans;
- Natural hazard management plans (flooding, coastal erosion etc.);
- Conservation plans.

What is of major importance is to ensure coherence, compatibility and synergies among the different plans applied in the same broader marine space as well as in adjacent areas.

On the other hand, with regards to the spatial planning regulations and interventions, compatibility between terrestrial and marine spatial planning should aim at:

- addressing and managing the impacts of natural hazards that occur at the shoreline, as a result of the climate change effects (e.g. sea level rise) and natural disasters (tsunami, coastal erosion, etc.) that affect both the natural ecosystem (e.g. coasts, wetlands) and the human environment (e.g. coastal cities, ports, aquaculture);
- addressing and managing the impact of human interventions that take place from either the inland or the sea side, affecting both other activities and infrastructure (terrestrial and marine) as well as the ecosystem itself (terrestrial and marine too)

To conclude, key element for achieving integration and compatibility between terrestrial and marine spatial planning is the "amphibious" ecosystem of the coastal zone, which should be part of MSP projects and also mapped and closely monitored on a continuous and systematic basis.

2.1.4 Planning steps and selection of tools

The core team of the project considered that the UNESCO publication (Ehler and Douvere, 2009) *"MSP, A step by step approach"* offers very useful guidance, to both more and less advanced countries in the field, for the preparation and implementation of their respective policies. This publication suggests the following 10 steps for building up a solid Marine Spatial Planning policy, interlinked as shown in Figure 2.

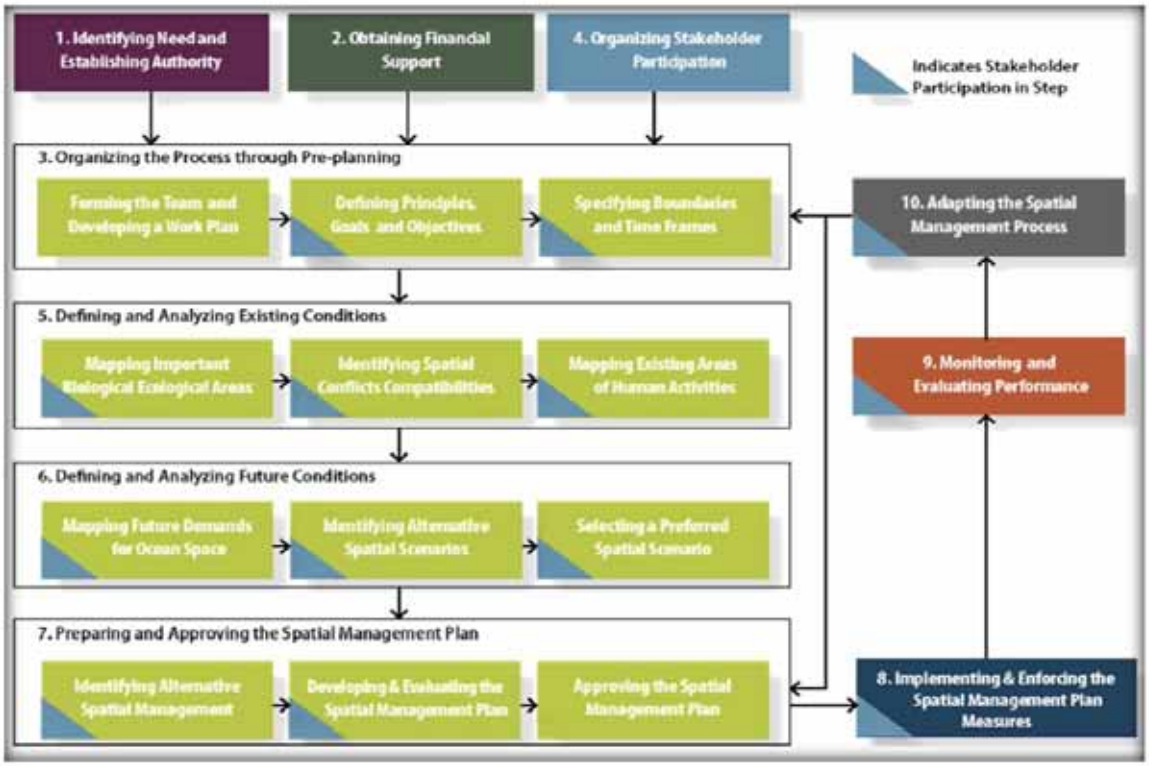


Figure 2: The 10 steps of the MPS process

Source: Ehler and Douvere, 2009

Obviously, each country will proceed in its own way to analyse, plan and implement – on the basis of its specific conditions, needs and capacities. Yet, identification of appropriate methodologies and tools is most important in view of facilitating fulfillment of commitments related to MSP, such as those undertaken by the Mediterranean countries under the ICZM Protocol – and, for some of them – the relevant EU Directive.

Searching for information one can note very quickly that several countries and/or researchers, mostly outside the Mediterranean, are using a great number of tools for MSP. Some of them are rather sophisticated for countries that practically start to set out this new policy. To identify most appropriate methodologies and tools for the Mediterranean Region, the core team proceeded in a categorisation of actions needed per preparation step and tools needed per step and user category (Authorities, Planners and Stakeholders), as presented in Table 2.

The methodologies and planning tools that are selected for further evaluation within this project (due to their important role in the process of Marine Spatial Planning), are the following:

- MSP methodologies, practices and other issues;
- Legal, Institutional Aspects and Governance Issues;
- Tools in the service of MSP, such as the: *Cartography and Mapping Tools, Compatibility Tools*, *Cumulative Impact Assessment Tools*, *Vulnerability Assessment Tools, Multi-criteria Analyses*, *Risk Analyses*.

Table 2: Steps of the MSP process and necessary tools per user category
Source: processed by the authors

STAGE OF MARINE SPATIAL PLANNING	METHODOLOGIES AND TOOLS		
	COMPETENT AUTHORITIES	PLANNERS	STAKEHOLDERS
1. IDENTIFY & ESTABLISH COMPETENT AUTHORITY (PLANNING, IMPLEMENTATION)	**Legal/Institutional arrangements**		
2. OBTAIN FINANCIAL SUPPORT (POSSIBILITIES, FEASIBILITY)	Available Funding (e.g., EU, GEF, …) Allocate Funding (e.g. National Assistance Framework Programmes)		
3. PREPARE PRE-PLANNING (TEAMS, WORKPLAN, TIMEFRAME, PRINCIPLES, GOALS/OBJECTIVES, RISKS …)	Policy Priorities Vision, objectives Scientific Data Base, State of Art **Vulnerability Assessment** *(Identify the data needed/available)*	Collection of Data, Studies **Vulnerability Tools**	
4. ORGANISE STAKEHOLDERS PARTICIPATION (WHO, WHEN, HOW …)	Identify Network Select the appropriate Timing Select appropriate Ways **Governance Tools**	Networks, Timing and Ways to be adapted to individual Plans **Governance Tools**	Communication, Information, Consultation **Governance Tools**
5. DEFINE/ANALYSE CURRENT CONDITIONS (COLLECT & MAP INFO ON ENVIRONMENT & ACTIVITIES, CONFLICTS, COMPATIBILITIES …)	**Scientific Data Base, Core Indicators per Use, Compatibility Tools for Main Sea Uses, Cumulative Impact Mapping Tools, Integrated Regional Assessment, 3-D Mapping** *(Identify the data needed/available)*	**Same with Authorities adapted** to Individual Plans **Governance Tools**	Communication, Information, Consultation **Governance Tools**
6. DEFINE/ANALYSE FUTURE CONDITIONS (TRENDS, TEMPORAL NEEDS, EXPECTED NEW DEMANDS, ALTERNATIVES, SELECT SCENARIO)	Policy priorities Analysis/evaluation of information Selection of preferable Scenario **Interaction of Plans & Measures** **Governance Tools**	Identify Alternatives **Cumulative Impact Assessment of Alternatives** **Interactions Sea/Land** **3-D Mapping of Alternatives and their Effects** **Assess impacts of Climate Change, Sea Level Rise, Erosion, Extreme Phenomena,** **Governance Tools** *(Identify the data needed/available)*	Communication, Information, Consultation, Dialogue, Concertation **Governance Tools**
7. PREPARE & APPROVE THE SPATIAL MANAGEMENT PLAN (TEMPORAL MEASURES, INCENTIVES, SELECTION CRITERIA, ZONING PLAN, EVALUATION, APPROVAL)	Selection Criteria **Compatibility & Interaction of Policies/Measures** Incentives **Governance Tools** Decision-Making/Approval Process	Selection Criteria **Compatibility Tools** **Zoning Plan proposals** **3-D Mapping, Interactions** Evaluation **Governance Tools**	Communication, Information, Consultation, Dialogue, Concertation, Negotiation **Governance Tools**
8. IMPLEMENT/ENFORCE THE MANAGEMENT PLAN (HOW, COMPLIANCE …)	**Legal/Institutional Arrangements** **Cooperation Schemes among Authorities, Appropriate Ways, Compliance, Interaction** **Governance Tools**		Communication, Information, Consultation, Dialogue **Governance Tools**
9. MONITOR/EVALUATE PERFORMANCE (PROGRAMME, OUTCOME TO MEASURE, INDICATORS, BASELINE DATA, OUTCOME TARGETS, EVALUATION, REPORTING RESULTS	Programme the Monitoring/Evaluation/Reporting Process Identify what to Monitor & respective Indicators Set out Targets, **3-D Mapping** Ensure Baseline Reference Data Evaluation Criteria & Process Set out Reporting Process (Who, to Whom, What, Frequency) *(Identify the data needed/available)*		Communication, Information
10. ADAPT THE MSP & MANAGEMENT PROCESS (REDESIGN, APPLIED RESEARCH NEEDS, NEXT ROUND OF MSP)	Feed back Define process for small amendments or full Review/ Re-planning Restart from Stage 5 accordingly	Feed back Restart from Stage 5 accordingly	Feed back Restart from Stage 5 accordingly

To better facilitate the implementation of the ICZM Protocol in the marine area of the Mediterranean countries, the above mentioned methodologies and tools are used in the case study area, in an effort to test their feasibility in the Mediterranean conditions, their limits and their possible added value in the process of Marine Spatial Planning.

It is noted with interest that a number of other projects have already used or are in the process of using some of these tools (using similar techniques and information sources), in different perspectives. Putting all dispersed elements together and filling in the puzzle (at Mediterranean and/or at the case study area level) is a challenge. Completing the information for each separate study (or management) area provides by itself useful planning tools to the future planners and decision makers.

Finally, other interesting attempts to define the MSP steps are the ones described in projects, such as: the **Plancoast Handbook on Integrated Maritime Spatial Planning** (INTERREG III) and b) **Methodological Handbook on Maritime Spatial Planning in the Adriatic Sea** (www.shape-ipaproject.eu*).*

Plancoast Handbook on Integrated Maritime Spatial Planning (INTERREG III)

- **Getting organised –** Defining of planning scale and space, timeline and schedule of the process; identifying who needs to be involved, process leader and/or coordinator, responsible for the plan implementation and evaluation;
- **Laying the ground for MSP –** Stocktaking about the current state of the coastal and marine space; mapping of current uses and pressures; identifying spatial impacts of uses and compatibility/ incompatibility among uses;
- **Assessing the context and establishing a general framework for MSP –** Reviewing the existing policy and plans affecting the sea; drawing-up a guiding framework for MSP; establishing or supporting the establishment of a legal framework for MSP;
- **Drawing-up a guiding vision –** Developing a vision describing what is desired for the area in question;
- **Refining the stocktake and mapping –** Refining data collection and analysis focusing on: more detailed scales, major spatial impacts and conflicts, particularly sensitive areas, etc.;
- **Identifying issues and problems** – Drawing up maps of conflicts; assessing vulnerability on the basis of collected data; focusing the analysis on most relevant issues and problems related to MSP;
- **Developing solutions for the problems identified –** Rating impacts and conflicts; defining priorities of uses over others and identifying future uses; planning concrete objectives to develop solutions;
- **Drawing up a plan –** Zoning; drawing up cartographic visualization; drafting a document describing the specific measures to be applied (uses regulation);
- **Implementation –** Setting out responsibilities and priorities; identifying timeline and costs; raising awareness and highlighting MSP benefits; ensuring political commitment and responsibility;
- **Evaluation and reviewing –** Spatial monitoring and indicators; evaluating the delivery (objectives) of the plan; evaluating the benefits and impacts of the plan; adjusting/reviewing the plan.

Maritime Spatial Planning in the Adriatic Sea

- Step 1 – Starting the process and getting organized;
- Step 2 – Assessing the context and defining the overall framework for MSP;
- Step 3 – Analysing existing conditions;
- Step 4 – Analysing future conditions;
- Step 5 – Elaborating the Maritime Spatial Plan;

- Step 6 – Adopting the Plan and organising implementation;
- Step 7 – Monitoring the Plan;
- Step 8 – Adapting the Plan.

2.1.5 The needs in geo-spatial data

Geo-spatial dataset needed for cartography and decision-making

Acquisition of all the necessary geographical data, is a sine-qua-non in the MSP process, ensuring elimination of failures in the decision-making process. Data needed to this end are as follows, to a different degree of details depending on the case/use:

a) International and National Designations, Geological Lines of special interest:
   - Territorial Waters (6 or 12 nautical miles);
   - International Waters;
   - Exclusive Economic Zone (EEZ) or limit of Continental Shelf;
   - Bathymetry line of 200 meters;

b) Geophysical data:
   - Bathymetric / terrain data;
   - Marine caves submerged or semi-submerged;
   - Seismic bows, geological faults etc.;
   - Sea streams, currents;
   - Maximum ripples;
   - Whirlpools;
   - Wind power;

c) Marine Natural Environment and Resources:
   - Posidonia oceanica meadows;
   - Cartilaginous;
   - Fish breeding areas;
   - Fossils (mineral and oil resources);

d) Protected Areas of Natural and Cultural Importance:
   - Marine Natural Protected Areas;
   - Specially Protected Areas of Mediterranean Importance (SPAMI);
   - Marine Natura 2000 sites (SCI and SPA);
   - Ramsar sites;
   - Important wetlands;
   - Underwater cultural sites (antiquities, ship wrecks etc.);

e) Economic and Productive Zones – Sea uses:
   - Fishery zones;
   - Mariculture /Aquaculture Zones and relevant coastal installations;
   - Offshore Renewable Energy Infrastructures (wind farms etc.);
   - Oil and gas extracting installations;

f) Linear structures and uses:
   - Marine transportation network (navigation corridors);
   - Submarine/Underwater power cables;
   - Submarine/Underwater pipelines;

g) Environmentally degraded areas / Banned Areas due to natural and environmental hazards:
   - Oil spills;
   - Waste disposal areas;

- Areas of toxic dump/repositories;
- Agriculture run-off;

h) Restricted Zones:
- Zones reserved for military use;
- Zones reserved for archaeological excavations;

i) Land-uses, infrastructures and activities interacting with the sea:
- Harbors, Marinas and Ports
- Tourist resorts;
- Swimming beaches;
- Liquid and solid waste management infrastructures;
- Agriculture;
- Coastal Industries;
- Dumping and dredging material;
- Sand and gravel excavation;
- Agriculture;

j) Natural risks and hazards threatening the coastline:
- Sea level rise;
- Tsunami;
- Coastal erosion.

Although the above list may not be exhaustive (due to the geophysical phenomena and nature as well as due to the zoning provisioned in each country), it is estimated that the above categorisation adequately covers the wide range of data needed for MSP in most of the Mediterranean countries. Therefore, collection of all the above data, is a prerequisite condition in order to have a clear picture of the nature of each marine area under study and therefore, for the decision-making process of MSP It is to be pointed out that such information, with longer or shorter time-series, with broader or not geographical coverage, exist already in many countries – but usually not in the Ministries or authorities assuming the competence of spatial planning. One major issue, therefore, is to **ensure cooperation** among different services **and accessibility** of information and another is to **complete such databases** on the basis of priorities of each country.

Compatibility and accessibility of digital geo-spatial data

Since marine space was considered to be a "terra incognita" until recent times, most of the above mentioned data needed, is most likely to be missing or to be incompatible to each other (when it exists). The use of different analysis scales for the collection of data as well as the use of uncommon specifications, in many cases made impossible the display of combined data in the same marine area. In general, when searching for datasets, the following questions should be asked:

- What is the data format?
- When was the data collected?
- What is the data resolution?
- What coordinate system is used?
- Does the data have the right attributes?
- Does the data have free access or not?

In general, digital geographical data for Marine Spatial Planning must comply with common standards for metadata, common vocabulary, data transport formats, quality control methods and flags, and access. To this end, it is of paramount importance that all geographical data for MSP comply with the INSPIRE Directive (Infrastructure for Spatial Information in the European Community), that is already compulsory for Europe's Mediterranean countries.

As regards open access geographical data for the Mediterranean Sea, it can be found in the following sources:

- European Marine Observation and Data Network (EMODnet Bathymetry portal) developed by a European partnership;
- http://www.emodnet-bathymetry.eu/content/content.asp?menu=0020000_000000;
- Marine Regions. It is managed by the Flanders Marine Institute;
- http://www.marineRegions.org/index.php;
- Trip in view. www.tripinview.com;
- http://ec.europa.eu/maritimeaffairs/atlas/seabasins/mediterranean/index_en.htm;
- http://espon.eu;
- http://medgismar.rempec.org/.

Missing – but important – data for MSP

Until recent times, research for geophysical and environmental data in the Mediterranean Sea, was very limited. Hence, the greatest needs in data fall into the following two categories (non-exhaustive list):

a) Geophysical data:
   - Bathymetry / terrain data;
   - Marine caves submerged or semi-submerged;
   - Seismic bows, geological faults etc.;
   - Sea streams, currents;
   - Maximum ripples;
   - Whirlpools;
   - Wind power;

b) Marine Natural Environment and Resources:
   - Posidonia oceanica meadows;
   - Cartilaginous;
   - Fish breeding areas;
   - Fossils (mineral and oil resources).

Most of the above mentioned data regarding bathymetry and terrain data (such as the relief, the strata etc.) can become available by using multi-beam, side-scan and ground-trothing methods and tools.

The rest of the data need specialized and long lasting observations, which – nevertheless – are indispensable for the MSP process and decision making. Therefore, all Mediterranean countries should proceed, at their earliest convenience, and plan on time the collection of the necessary (but missing) data for MSP.

2.2 Legal and institutional aspects – Governance issues

2.2.1 The international experience

The Mediterranean countries have not applied MSP so far, as confirmed by the questionnaires addressed to NFPs. They have designated, though, in several cases marine areas for sectoral management, such as fishing regulation, ecosystems and/or species protection, aquaculture organisation, navigation corridors, etc. In almost all of the Mediterranean countries there is also some experience, broader or more limited, in ICZM with emphasis on its land component.

A country cannot move from land spatial planning to marine spatial planning in an “automatic” way by just extending the principles of the first one to the latter. The fact that there is no private ownership on the sea and that it “belongs” to the State is a facilitating factor. On the other hand, there are new categories of data needed, new actors with strong roles and a possibility to use the sea in a multiple way at its three different

dimensions (surface, water column and sea bottom). This explains why other European, non-Mediterranean, countries have first proceeded with pilot projects (in the North, Bothnian and Baltic Seas) before developing marine spatial plans with a statutory character. The characteristics of these countries (mostly United Kingdom, Netherlands, Belgium, Germany, Sweden) and their respective Regions are considerably different than those of the Mediterranean. Therefore, their experience cannot be "transplanted" in a mechanic way. It can, of course, inspire and – together with any good practices – it needs to be taken into consideration when analyzing the Mediterranean conditions and before selecting the schemes and tools to use in each Mediterranean country, adapted to fit its own specific needs, possibilities and options.

To start preparing their MSP process, the Mediterranean countries will need to ensure legal clarity on three issues:

1. Which will be the Competent Authority?
2. Which will be the geographical coverage of the Marine Spatial Plans?
3. Which will be the broader governance scheme?

2.2.2 Governance and public participation

The notion of governance is understood in many different ways and long discussions have taken place on the issue and different approaches expressed. Weakness has been observed in this field in almost all countries, trust relations among actors involved being a most critical point. Governance is imperative for MSP and its implementation, while governance tools are needed at all "steps" of the process involving all types of interested groups.

The general scheme of potential stakeholders' involvement is reflected in Figure 3.

To better face the challenges and to ensure effectiveness, the countries need to clarify formally at their earliest convenience, together with the Competent Authority, the following major elements of good governance:

a) The competences of the other relevant authorities in the field;
b) The institutional ways of coordination;
c) The consultation schemes (including identification of major stakeholders to be formally involved); and
d) The decision-making process.

Horizontal and vertical cooperation, with respect to know-how of experts and competences of authorities, is most important and can take different forms from simple information to formal consultation/negotiation.

In the context of this project, emphasis has been put on consultations, on the basis of the scheme presented in Figure 4 and in particular focusing on the local stakeholders in the case study area (through meetings on the Islands, interviews & networking – within Greece & in the Mediterranean, with Focal Points, RACs and CAMP coordinators).

It is to be noted that Natura sites contribute to the provision of ecosystem goods and services, a great number of which are non-marketed and therefore largely ignored in management decisions to date. Alternative forms of governance, such as involving key stakeholders and the local society in the management process, are needed to achieve a common understanding of basic structure, functions and needs for protection. This may enable the development of effective and widely acceptable spatial plans, balancing trade-offs between conservation and socio-economic objectives.

Figure 3: Perspective of the Stakeholders Involvement
Source: BaltSeaPlan 2009-2012

Stakeholder Groups
National Administrators
Regional / Municipal Administrators
End Users (Socio-economic groups)

Tools
Questionnaires
Stakeholder Meetings (in Athens & 4 islands)

Aim
Identification of
Conflicts/ Obstacles/Synergies/ Future Investments

Needs and Priorities for MSP

Figure 4: Cooperation with Stakeholders in the case study area
Source: processed by the authors

2.2.3 Defining the competent Authority

It is not by chance that the 2014/89/EU Directive (MSP) sets this issue as the first priority. For the EU-MS in the Mediterranean the deadline for designating the Competent Authority is the 18th of September 2016. The non-EU Mediterranean countries might wish to consider a similar deadline. The point is that, without clarity on this question, initiatives cannot start in a coherent and coordinated way and there is considerable risk of delays, conflicts, waste of resources, etc. The Competent Authority will create the enabling environment for MSP policy and actions.

In fact, there are three roles to clarify as regards the Competent Authority:

a) The planning role;

b) The implementation role; and

c) The implementation control role.

These three roles can be played by the same Authority or by different ones, depending on the special conditions, capacities and options of each country.

In most of the cases, at international level, countries have designated Competent Authorities for MSP using to the maximum extent existing mechanisms and taking advantage of existing competences and knowledge. In some countries (e.g., Taiwan), where spatial planning competence for land laid with Municipalities, there was extension to the same for MSP as well. In Sweden, where Municipalities had responsibility for land spatial planning, it was decided (2008) to designate the Ministry for Planning as competent for MSP (in cooperation with other co-competent Ministries) given the national importance of EEZ.

Marine Spatial Planning is a tool to ensure at the same time blue/green development and environment protection in a sustainable manner. Marine Spatial Plans cannot be limited to a mere compilation of available data on a marine area and mapping of such data and existing marine uses. *"Marine spatial planning (MSP) is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process"* (UNESCO).

Therefore, for reasons of efficiency, when considering within each country which among the Authorities should be designated as the Competent one for MSP, the following aspects should be taken into account:

- which authority has formal (= by law) competence and know-how on spatial planning and in particular on ICZM;
- which authority has competence in marine environment issues and in particular in setting and supervising the policies and measures for Good Environmental Status as well as for marine biodiversity;
- which authority has competence in licensing and in particular in EIA and SEA;
- which authority supervises and coordinates the existing formal consultation mechanism for spatial planning (e.g., inter-Ministerial and/or stakeholders National Councils or Committees).

In particular for the implementation and controlling roles, capacities in monitoring, licensing and in controlling enforcement would be most valuable respectively.

2.2.4 Geographical coverage – Legal issues and limitations deriving from the UNCLOS

The ICZM Protocol sets the seawards limit for ICZM (and therefore MSP) in the Mediterranean to the extent of the territorial waters. The limit for the EU-MS, following the MSP Directive, is the extent of the EEZ.

Only in very few cases in the Mediterranean has the EEZ been agreed upon. Therefore, for most of the Mediterranean countries MSP should extend to the official limit of the territorial waters to ensure the necessary legal basis. In general, limitations deriving from the United Nations Convention on the Law of the Sea (UNCLOS, 1982) to be considered in MSP are described below (Papageorgiou, 2015):

- **Territorial Waters limit** (12 n.m. from the baseline): within which no limitations apply; the coastal state has full jurisdiction for zoning and MSP, thus no limitations in exploiting waters and resources at all vertical levels of the sea (surface, water column, seabed, sub-soil);

- **Continental Shelf limit**: within which sovereign rights of coastal states are limited to the exploitation of mineral and non-living resources of the sea-bed and sub-soil;
- **Exclusive Economic Zone limit** (up to 200 n.m. from the baseline): within which sovereign rights of coastal states are expanded, so as to include exploring and exploiting, conserving and management of natural resources (living or non-living) of the seabed and the sub-soil, as well as of the waters super-adjacent to the seabed. As concluded, UNCLOS sets no serious limitations to the coastal state for zoning and MSP within the EEZ limits.

Finally, an element of importance for the study of the benthic organisms (to assess the environmental sensitivity or the economic <e.g., fishing> potential) is the bathymetric line of 200 m. In case that this line goes beyond the limit of the territorial waters, countries might need to assess the possibility to extend their planning activities reaching this line on the basis of delimitated continental self.

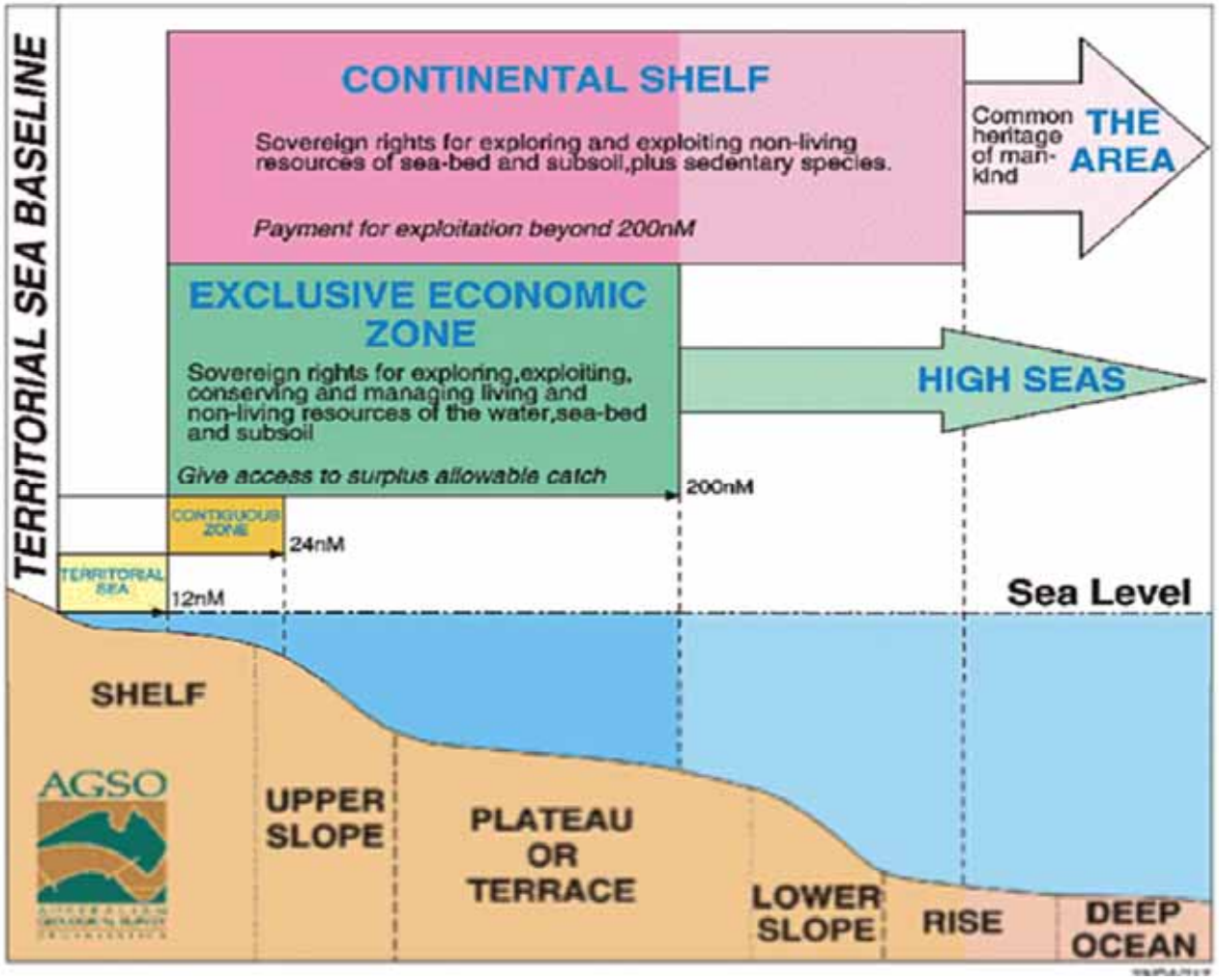


Figure 5: The extent of the Continental Shelf and other marine zones contained within the 1982 UNCLOS
Source: Lynn Seckinger

2.3 Tools in the service of MSP

2.3.1 Cartography and mapping tools

Due to the multidimensional nature of the sea, cartography and mapping tools are of vital importance in the MSP process. Such tools can prove valuable not only to the decision-making process (involving the competent Authorities or Planners), but also to the participatory/consultation process. Along this line, the present section focuses on the examination of the state of the art regarding cartography and mapping tools (2D-GIS and 3D-GIS), in an effort to define the appropriate ones – and the way these can be user-friendly and useful – depending on the stakeholder and the step of the MSP process.

GIS tools

As Martin and Hall-Arber (2008) argue, *GIS is rapidly becoming the forum where marine spatial data is aggregated, planning options are visualized, impact analyses are performed and regulatory zones are established and mapped*.

At the same time, 2D and 3D GIS maps allow better conceptualization of MSP features, both to experts and non-experts involved. For the moment being, 3D GIS tools – though they are needed to support the spatial planning needs – cannot yet sufficiently provide reliable and clear 3D maps, displaying all the necessary spatial and geographical data at whichever level/scale of MSP. It is not by chance that almost all existing marine spatial plans in the N.W. Europe reflect both spatial analysis and proposals through classic 2D GIS mapping, using different layers.

As presented in previous sections (see also Table 2), the use of cartography and the visualisation of geographical and spatial data in maps is mandatory in various steps/phases of MSP In addition, as a tool, it is valuable and useful not only to the Planners and the competent Authorities (having jurisdiction for the marine space and being involved in the decision-making), but also to the rest of the stakeholders, participating in governance and participatory schemes.

Cartography and mapping tools are necessary to Planners in the following steps of MSP:

- Definition and analysis of current situation;
- Identification of alternative planning scenarios;
- Finalization of the selected scenario.

On the other hand, competent Authorities – involved in the decision making as well as in the licensing of infrastructures and investments in the marine space – need the cartography tools at the following stages of MSP:

- Assessment of alternative planning scenarios;
- Selection of preferred scenario;
- Implementation of the plan;
- Monitoring and evaluation of the plan;
- Licensing of infrastructures.

Ultimately, cartography tools are respectively valuable and useful to the public and to the rest of the stakeholders, especially during public participation and/or consultation procedures, which might take place in various phases of the MSP process.

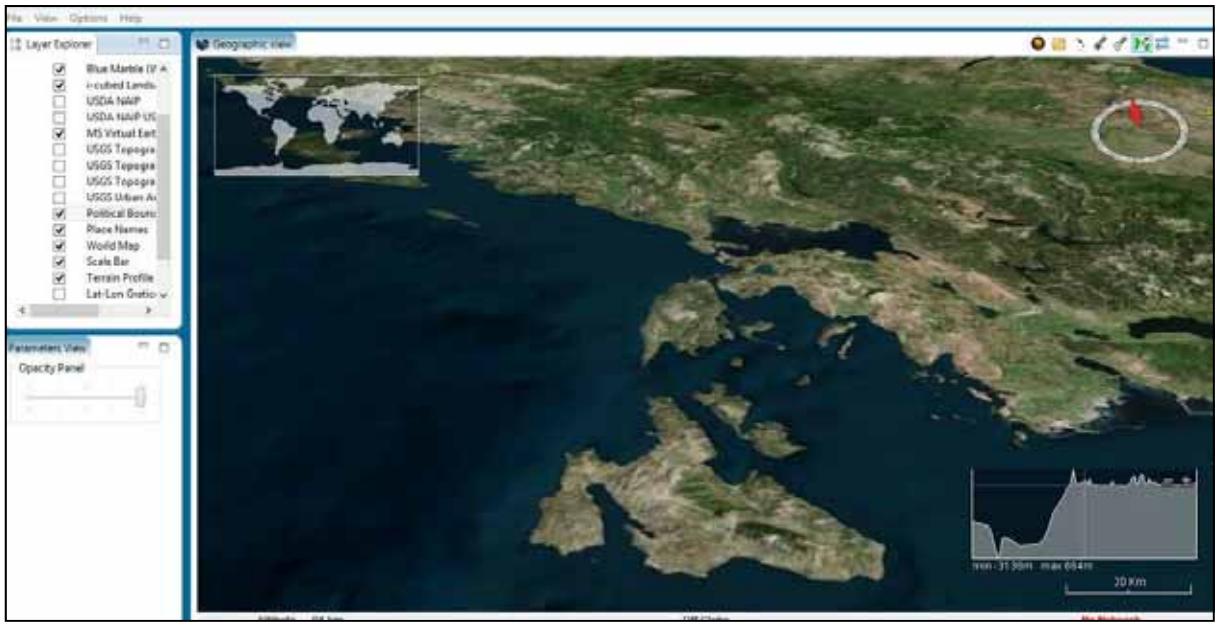
3D GIS visualizations

Despite the fact that 3D tools are since longtime developed (e.g. QGIS, Geo-Seas-Viewer[4] etc.), for the moment they can only display basic geological and physical data, having no flexibility either to incorporate all geo-spatial data that are necessary for the maps of MSP or to easily adapt to data changes (i.e. automatically add or remove data), without previously resetting the tool.

Another issue about 3D visualizations lies in the lack of open GIS softwares. Although there is a great number of free GIS softwares for 2D mapping (like QGIS), available software for 3D mapping (e.g GIS/remote Sensing software, ArcGis, Erdas imagine, etc.) is still a very expensive technology. In fact, creation of a precise Digital Surface Models (DSM), require high-resolution land-cover and land-use data (for the crucial coastal zone) and the use of photogrammetry and satellite images (of less than a meter), that are quite expensive for the time being. Therefore, for the moment, 3D-mapping is mainly used to support visualisations already mapped in 2D-GIS tools.

However, a quite affordable and promising technique that has been lately developed for 3D mapping, is the Unmaned Aerial Mapping (UAV). This technique makes possible the collection of primary geodata, serving to the creation of orthomaps and DSM. Several Institutes, among them the University of Thessaly, use small electric quadcopters (or airplanes) to take vertical pictures, from low altitude (60-100 meters), in order to survey small areas (about 10-500 hectares). The UAV mapping technique is cheaper compared to others and gives highly detailed data (less than 10 cm pixels size).

Map 6, illustrates an example of UAV mapping in the Enipeas River in the Region of Thessaly in Greece. A small area (about 15 hectares) between the dam and the bridge was mapped. The generated products (DSM and orthomap), had pixel size 10 cm and 5 cm respectively. The red color indicates that one spectral band of the camera was in near infrared electromagnetic spectrum (beyond the visible).



Map 5: Testing Geo-Seas-3D Viewer in the Region of Ionian Islands
Source: processed by the authors

[4] Geo-Seas-3D Viewer: (Pan-European infrastructure for the management of marine and ocean geological and geophysical data). This software has been developed in the EU FP7 Geo-Seas project (Map 9).

Map 6: 3D mapping using UAV Infrared aerial photography
Source: processed by the authors

To conclude, it is estimated that the use of 3D GIS can become a valuable asset in specific occasions, such as the public participation, the consultation and decision making procedures. In particular, 3D tools can help the public or other consultation bodies to comprehend and visualise (at the local scale only) the alternative scenarios for specific infrastructures (sea farms, wind farms etc.), in order to form their opinion and make their contribution to the MSP process. Without the 3D visualisation, it is only logical that non-experts (general public etc.) will face many difficulties in conceptualizing alternative scenarios and Marine Spatial Plans in general.

2.3.2 Core Indicators per sea-use

Operational objectives are described in more detail by related attributes and criteria. To measure the status of these attributes and criteria a set of indicators – i.e. measurements that should quantify and simplify information related to trends that cannot easily be observed – are required. Indicators together with carefully chosen thresholds can be used to define both performance measures to assess the achievement of management objectives, as well as decision rules for adaptive management strategies to respond to impacts (see Sainsbury *et al.*, 2000; Fulton *et al.*, 2005). Moreover, indicators could also reflect aspects of concern to stakeholders and their meaning should be understood by as wide a range of stakeholders as possible (Douvere & Ehler, 2010).

Practical tools facilitating the implementation and assessment of EBM in marine ecosystems are the advanced Organization for Economic Cooperation and Development's (OECD), Pressure – State – Response (PSR) framework (OECD, 1993), and the Drivers-, Pressures- State- Impact- Response (DPSIR) adopted by the European Environment Agency in 1995 (EEA, 1995). According to these Frameworks socio-economic developments exert Pressure on the environment and, as a consequence, its State changes, leading to Impacts

on human health, ecosystems and materials that may elicit a societal Response. The selection of suitable indicators reflecting the above components provides the basis for such an assessment. Indicators should be viable from both a scientific and a management perspective (Rice and Rochet, 2005; Rochet and Rice, 2005; Diedrich *et al.*, 2010). Scientifically they should be easy to measure, interpretable, grounded on scientific theory, sensitive and response specific (in relation to human activities). From a management perspective they should be cost effective, concrete, relevant to the objectives, linked to the outcome being monitored, developed inclusively, part of the management process (Diedrich *et al.*, 2010). Another important process is the definition of thresholds or reference points against which the status of the indicators can be assessed, however, in some cases where thresholds cannot be established the assessment of trends may be sufficient (Tallis *et al.*, 2010).

The main advantages of using indicators in environmental assessments are:

a) the information they can give to decision makers, to end-users and to the general public;

b) the possibility of a comparison in terms of time and space; and

c) the facilitation of the process for collecting information.

Recently, the EU Commission Decision 2010/477/EU on criteria and methodological standards on good environmental status of marine waters under the MSFD were used as the basis for developing the Mediterranean Ecological Objectives and indicators under the UNEP/MAP EcAp. The 11 adopted objectives within EcAp are coherent with the EU MSFD state and pressure descriptors and have been complemented with relevant indicators.

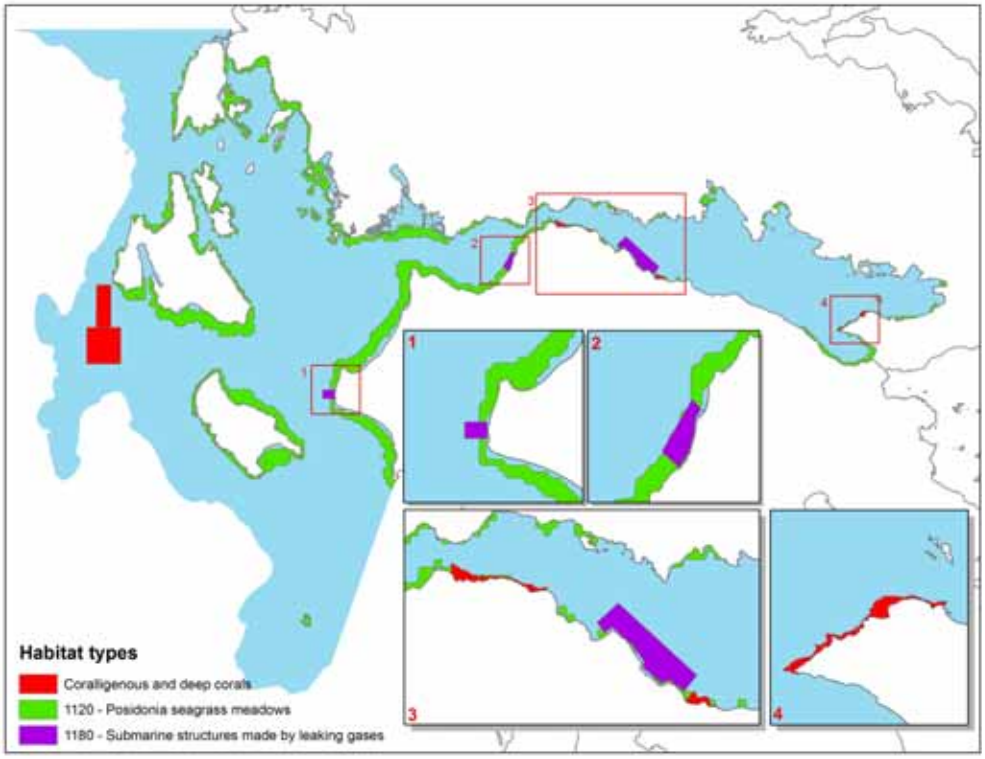
Two examples, one of a so-called state indicator and another of a pressure indicator that were used for spatial analysis purposes, being visualized using GIS techniques, and referring respectively to the distribution of certain important habitats and to the fishing effort exerted from trawlers in the Greek MESMA case study area, are provided below (Maps 7 and 8).

In the frame of the project, once the operational objectives of the case study will be determined through effective interaction with key stakeholders, identification of suitable indicators, reflecting a wide range of ecosystem processes, relevant functional groups and structures, as well as pressures exerted on them, considering those proposed by the EcAp process in the Mediterranean in conjunction with similar ones under the MSFD, will be made following a structured and objective process (Fulton *et al.*, 2005).

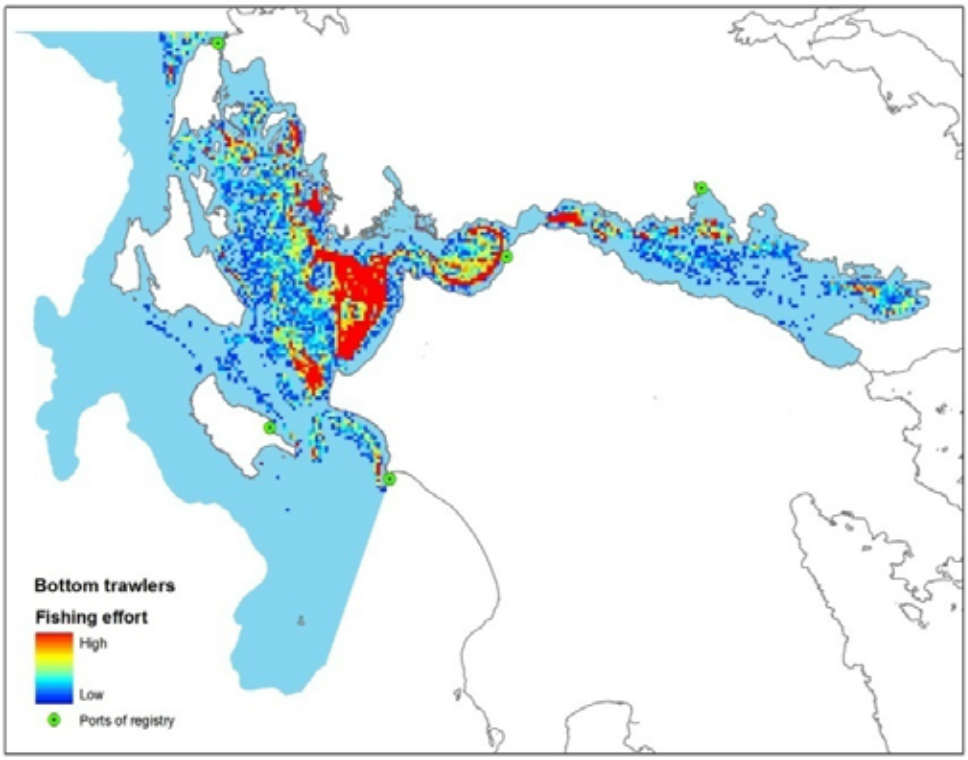
2.3.3 Compatibility tools

In the past, human activities taking place in the sea were very limited and entirely related to the water element (boating, fishing etc.). However, today's technological evolution (providing technical solutions for creating infrastructure in the sea) made easier the exploitation of the multidimensional nature of marine space.

These past years, new horizons opened regarding the productive potentials of the marine environment, resulting in the essential increase of resource exploitation and sea-uses taking place at all sea levels. The sea surface, the water column, the seabed, even the subsoil of the seabed are discrete parts of the sea, in which human activities take place, sometimes trespassing/"occupying" more than one level, as in the case of the extraction of minerals from the subsoil of the sea, using also partly the water column, part of which might be also used by some forms of fisheries.



Map 7: Distribution of selected habitats in the Greek MESMA case study area



Map 8: Distribution of fishing effort from bottom trawlers
Source: Vassilopoulou et al., 2011

Given this variety and complexity of different human activities taking place within the marine space, interactions (synergies or conflicts) among sea uses are inevitable. Generally, four types of interactions are identified among human activities in the sea:

a) activities competing for the same space;

b) activities competing for the same resource;

c) conflicting and incompatible uses in the same area;

d) synergetic interaction among uses in the same area.

Table 3: Estimates of compatibility of individual forms of use on coasts and seas
Source: Gee et al., 2006

	Off-shore wind Farms	Marine Protected Areas	Fisheries	The sea as public good	Cables	Tourism	Shipping and Shipping Routes	Harbours and Ports	Agriculture run-off	Sand and gravel excavation	Oil and gas exploration	Dumping & dredging material	Mariculture	Coastal Services Centres	Nature Conservation	Π Coastal Protection	Military Use
Off-shore wind Farms																	
Marine Protected Areas																	
Fisheries																	
The sea as public good																	
Cables																	
Tourism																	
Shipping and Shipping Routes																	
Harbours and Ports																	
Agriculture run-off																	
Sand and gravel excavation																	
Oil and gas exploration																	
Dumping and dredging material																	
Mariculture																	
Coastal Services Centres																	
Nature Conservation																	
Coastal Protection																	
Military Use																	

Incompatible uses **Conditionally compatible** **Compatible**

The analysis of compatibility among human activities and uses, as well as the implementation of the related tools, constitute a critical process in the procedures of prioritization and decision-making which are essential parts of an effective MSP. In general, the project proposals will build upon previous projects and existing bibliography, in an effort to synthesize knowledge, adopting it to the case of the Mediterranean Sea (example of previous attempts and Matrices are shown below). Especially, the identification of spatial interactions between human uses can also be based on spatial explicit approaches (compatibility matrices) that allows their categorization into synergies, conflicts or neutral interactions and the quantification of the conflicting levels in relation to predefined criteria (see e.g. Gramolini *et al.* 2013, Krassanakis *et al.* 2015). Additionally, the interactions among human activities can also be expressed in social and/or economic terms. Hence, the analysis of overlapping uses is bale to be based on several types of aspects.

In Tables 3 and 4, are presented Matrices developed already in the context of different projects & studies. Our interest is mostly focused on the conditions under which some conflictual uses might become compatible.

Table 4: Compatibility matrix of marine uses
Source: Ehler and Douvere, 2009

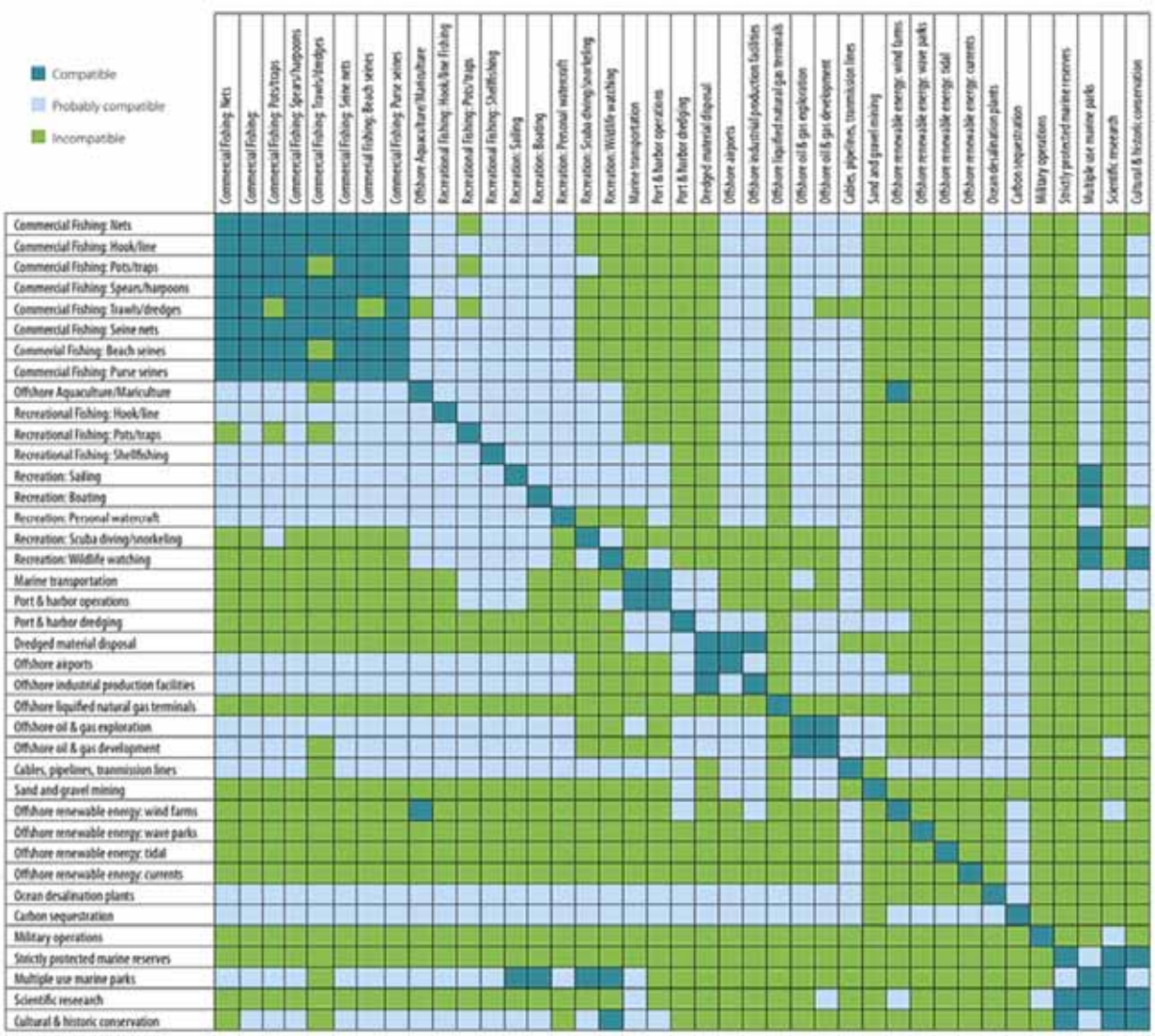


Table 5: Summary of activities used in zones
Source: Great Barrier Reef Marine Plan

ACTIVITIES GUIDE
(see relevant *Zoning Plans and Regulations* for details)

	General Use Zone	Habitat Protection Zone	Conservation Park Zone	Buffer Zone	Scientific Research Zone [2]	Marine National Park Zone	Preservation Zone
Aquaculture	Permit	Permit	Permit [1]	✗	✗	✗	✗
Bait netting	✓	✓	✓	✗	✗	✗	✗
Boating, diving, photography	✓	✓	✓	✓	✓ [2]	✓	✗
Crabbing (trapping)	✓	✓	✓ [3]	✗	✗	✗	✗
Harvest fishing for aquarium fish, coral and beachworm	Permit	Permit	Permit [1]	✗	✗	✗	✗
Harvest fishing for sea cucumber, trochus, tropical rock lobster	Permit	Permit	✗	✗	✗	✗	✗
Limited collecting	✓ [4]	✓ [4]	✓ [4]	✗	✗	✗	✗
Limited spearfishing (snorkel only)	✓	✓	✓ [1]	✗	✗	✗	✗
Line fishing	✓ [5]	✓ [5]	✓ [6]	✗	✗	✗	✗
Netting (other than bait netting)	✓	✓	✗	✗	✗	✗	✗
Research (other than limited impact research)	Permit	Permit	Permit	Permit	Permit	Permit	Permit
Shipping (other than in a designated shipping area)	✓	Permit	Permit	Permit	Permit	Permit	✗
Tourism program	Permit	Permit	Permit	Permit	Permit	Permit	✗
Traditional use of marine resources	✓ [7]	✓ [7]	✓ [7]	✓ [7]	✓ [7]	✓ [7]	✗
Trawling	✓	✗	✗	✗	✗	✗	✗
Trolling	✓ [5]	✓ [5]	✓ [5]	✓ [5,8]	✗	✗	✗

PLEASE NOTE: This guide provides an introduction to Zoning in the Great Barrier Reef Marine Park. Relevant Queensland Marine Park Zoning Plans or the Queensland Environmental Protection Agency should be consulted for confirmation of use or entry requirements.

1. Restrictions apply to aquaculture, spearfishing and harvest fishing for aquarium fish, beachworm and coral in the Conservation Park Zone.
2. Except for One Tree Island Reef (SR-23-2010) and Australian Institute of Marine Science (SR-19-2006) which are closed to public access and shown as orange, all other Scientific Research Zones are shown as green with an orange outline.
3. Limited to 4 catch devices (eg. crab pots, dillies and inverted dillies) per person.
4. By hand or hand-held implement and generally no more than 5 of a species.
5. Maximum of 3 lines/rods per person with a combined total of 6 hooks per person.
6. Limited to 1 line/rod per person and 1 hook per line. Only 1 dory detached from a commercial fishing vessel.
7. Apart from traditional use of marine resources involving an activity otherwise 'as of right', a permit or an accredited Traditional Use of Marine Resources Agreement is required.
8. Pelagic species only. Seasonal Closures apply to some Buffer Zones.

Detailed information is contained in the Great Barrier Reef Marine Park Zoning Plan and Regulations.

- Permits are required for most other activities not listed above.
- Commonwealth owned Islands in the Great Barrier Reef Marine Park are zoned 'Commonwealth Islands Zone' - shown as cream.
- All Commonwealth Islands may not be shown.
- Special Management Areas may provide additional restrictions at some locations.
- The Zoning Plan does not affect the operation of s.211 of the *Native Title Act 1993*.

ACCESS TO ALL ZONES IS PERMITTED IN AN EMERGENCY.

Using such indicators and compatibility conditions one could identify zones of compatible uses (like in the following table and accompanying maps in the case of the Great Barrier Marine Plan), as a first stage for a Marine Spatial Plan of each specific area.

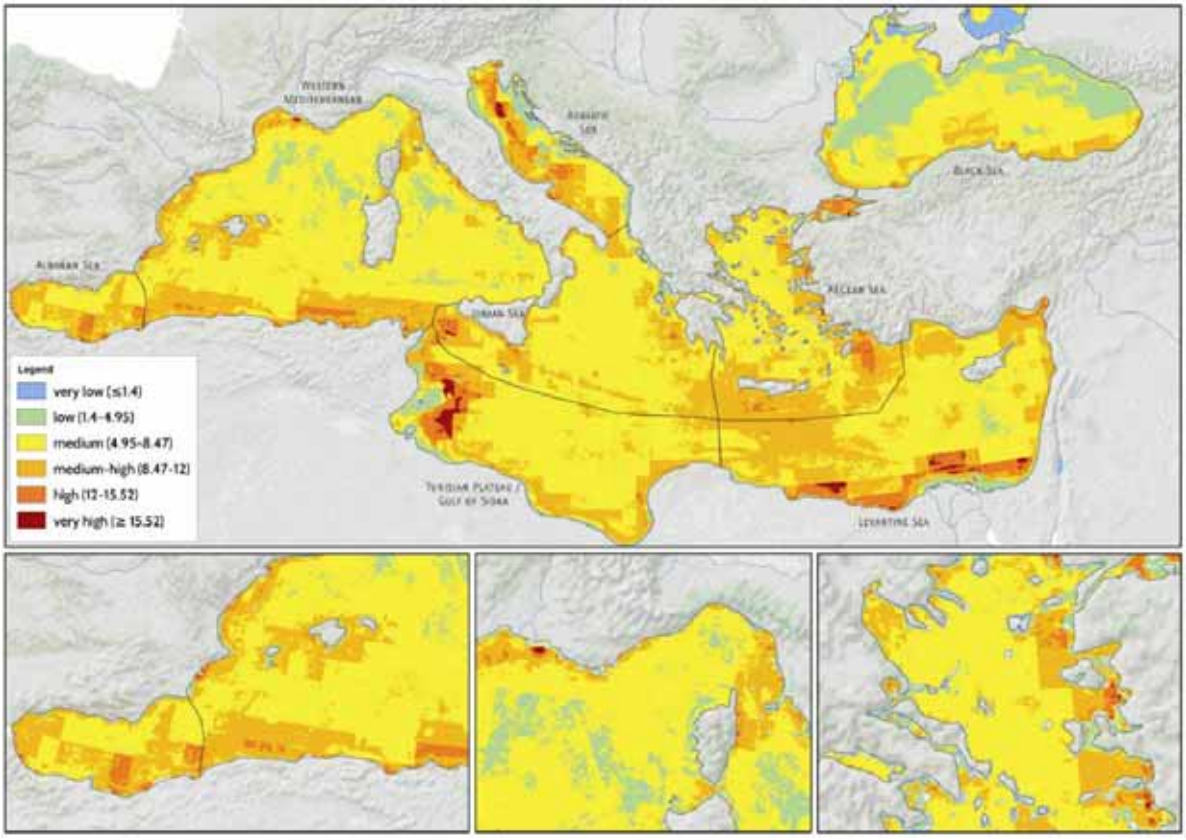
2.3.4 Integrated Regional assessment and cumulative impact mapping tools

An ecosystem-based approach for marine spatial planning and management needs to involve cumulative and interactive impacts of several human activities and the related pressures (Evans and Klinger, 2008). Cumulative impacts can be described as the impact combination produced by multiple pressures over space and time (McDonald *et al.*, 2007). The modeling of cumulative impacts as additive values (Halpern *et al.* 2008; Korpinen

et al. 2012; Andersen *et al.* 2013; Micheli *et al.* 2013) is based on the assumption that human activities act independently. Hence, ecosystems' sensitivity can be estimated as a cumulative score. Additionally, from another point of view, sensitivity analysis can be also based on geospatial modeling procedure that resulted in a number of alternative risk scenarios (Stelzenmüller *et al.* 2011).

The analysis of cumulative impacts and the related mapping procedure require the use of analytical tools that allows the implementation of the computations as well as the visualization of the results. The spatial explicit approach for the computation of impacts requires also the normalization and harmonization of the available spatial data. For the computation of impacts (or cumulative impacts) expressed in a spatial manner, the harmonization of the available data is based on grid approach in order to be sufficient for the analysis (see for example Halpern *et al.* 2008; Korpinen *et al.* 2012; Micheli *et al.* 2013). The geospatial data (e.g. specific habitats and their main threat pressures) are transformed into values of absence/presence or intensities which are expressed in each cell of the used grid. The definition of the grid cell size can be defined by the maximum resolution of the available data (see Stelzenmüller *et al.* 2011). The available tools (see Stelzenmüller *et al.* 2013) are mainly implemented (or adapted) in order to be compatible with geographic information systems (GIS).

The case study presented by Micheli *et al.* (2013) constitutes a representative example of this approach. More specifically, the aim of this study is to calculate cumulative human impacts on the Mediterranean and Black Sea Marine Ecosystems considering 22 different types of anthropogenic pressures and 17 marine ecosystem components. The quantification and mapping of cumulative impacts' scores indicate the most threatened marine Regions within the examined marine Region (Map 9). Similar work has been carried out in the context of PEGASO (2014) for the Mediterranean and the Black Sea and will be taken into consideration.



Map 9: Cumulative impacts in the marine Regions of Mediterranean and Black Sea
Source: adapted from Micheli et al. 2013

2.3.5 Vulnerability assessment tools

Marine ecosystems may be affected by several human threats exerted by the variety of human activities and uses that take place within marine Regions. The process of threat assessment and analysis constitutes a critical procedure towards the estimation of ecosystems' responses in human changes and decisions. The aforementioned process results to critical indications about the vulnerability of marine ecosystems to anthropogenic threats. According to Zacharias and Gregr (2005), vulnerability can be described as *"the probability that a feature will be exposed to a stressor to which it is sensitive"*. Hence, it can be used as an indicative measure for the processes of evaluation and ranking during threat assessment analysis. From another point of view, the impact of a threat on a specific ecosystem (e.g. a fish habitat) can be estimated by the ecosystem's vulnerability to that threat. The overarching goal behind vulnerability analysis aims to contribute to a quantitative approach that is based on representative factors for the description of different types of anthropogenic threats (see Halpern *et al.*, 2007).

Several methodologies and approaches have been developed in order to support threat analysis and the identification of the most vulnerable marine Regions. According to Halpern *et al.* (2007), threat analysis requires an integrated approach which contains methods and techniques to quantify the vulnerability of each component. These factors are related with both spatial and temporal characteristics while variables which are able to measure ecosystem responses (e.g. resilience) to human threats are also considered for the analysis. Additionally, the quantification of certainty accomplishes the analysis of threats in the referred vulnerability factors. This approach is based on the quantification of the representative factors using a common numerical scale that also allows the comparison among them. Moreover, the lack of empirical spatial data increases the need to use expert judgment in combination with literature-based surveys for the evaluation of main threats in order to serve as the base framework for the process of threat assessment. Following this approach, the most threatened marine ecosystems can be highlighted while critical indications about the pressures related to the human activities that take place within specific marine Regions can also be provided (see e.g. Kokkali *et al.*, 2015).

The approach described by Halpern *et al.* (2007) constitutes a first step towards the identification of human threats related to specific ecosystems within a specific marine area. Despite the fact that this methodology is able to serve as a significant ranking tool for threat assessment process, it cannot be used in order to represent human impacts in a spatially aware manner. Hence, a next step consists of the computation of impacts produced by each human activity to each ecosystem component. This approach allows the quantification of the impact in a spatial explicit way. A series of studies including Halpern *et al.* (2008), Korpinen *et al.* (2012), Andersen *et al.* (2013) and Micheli *et al.* (2013) follow this approach in order to calculate the cumulative impacts on ecosystem components. The translation of human pressures into potential environmental impacts and their expression as cumulative scores in a spatial-based approach allows the identification of "hot spots" where an examined marine Region is most threatened. The implementation of this procedure requires three different units including anthropogenic pressures, ecosystem components and weighting coefficients. The process of weighting can be based on expert judgment (see e.g. Korpinen *et al.* 2012) while anthropogenic pressures and ecosystems can be described through their spatial dimension.

The assessment of ecosystem components' sensitivity is also described in another approach implemented by Stelzenmüller *et al.* (2010). This study examines the vulnerability of specific fish species while the sensitivity of each variable (fish species) is expressed as a sensitivity index based on several factors involving among them variables that are also related to geographical distribution and threat status. An interesting point of this approach is referred to the involvement of economic issues in the analysis. More specifically, the importance of fisheries is expressed in terms of economic cost in this study while mapping procedure is based on both sensitivity index and the predictions of species distributions produced using kriging indicator.

Considering the aforementioned approaches, it becomes obvious that, in the most of the cases, the essential tools for the evaluation of vulnerability issues must be compatible with a spatial aware expression. Hence, the method followed by Halpern *et al.* (2008), Korpinen *et al.* (2012), Andersen *et al.* (2013) and Micheli *et al.* (2013) as well as the modeling approach including economic issues (Stelzenmüller *et al.* 2010) requires the use of geographic information systems (GIS) for the computation of spatial based factors and for the mapping of the outcomes where the level of sensitivity can be visualized. Another issue that is raised is directly connected with the quality and accuracy of the available spatial data. A range of different criteria including the identification of data gaps, the suitability of the collecting methodology, the time period and the accuracy of data collection, and processes of data validation and validation checking etc. (Shucksmith & Kelly, 2014) must be considered for the implementation of the analysis. Hence, threat analysis is directly connected to the uncertainty of the available data. The understanding and quantification of uncertainty requires the combination of different sources including expert knowledge and data (see for example Pollino *et al.* 2006). The vulnerability of an ecosystem can be also ranked in combination with the uncertainties which are linked with the main threats (e.g. by the application of Bayesian Belief Networks- see for example (Stelzenmüller *et al.* 2011).

The implementation of the aforementioned approaches for the quantification of threats as well as for their spatial description can be applied using several available tools that are developed and reported in recent studies. More specifically, an extensive collection is cited in Stelzenmüller *et al.* (2013a, 2013b). Additionally, in the broader concept of ecosystem-based management, related tools (www.ebmtools.org) can be used for the implementation of threat assessment analysis.

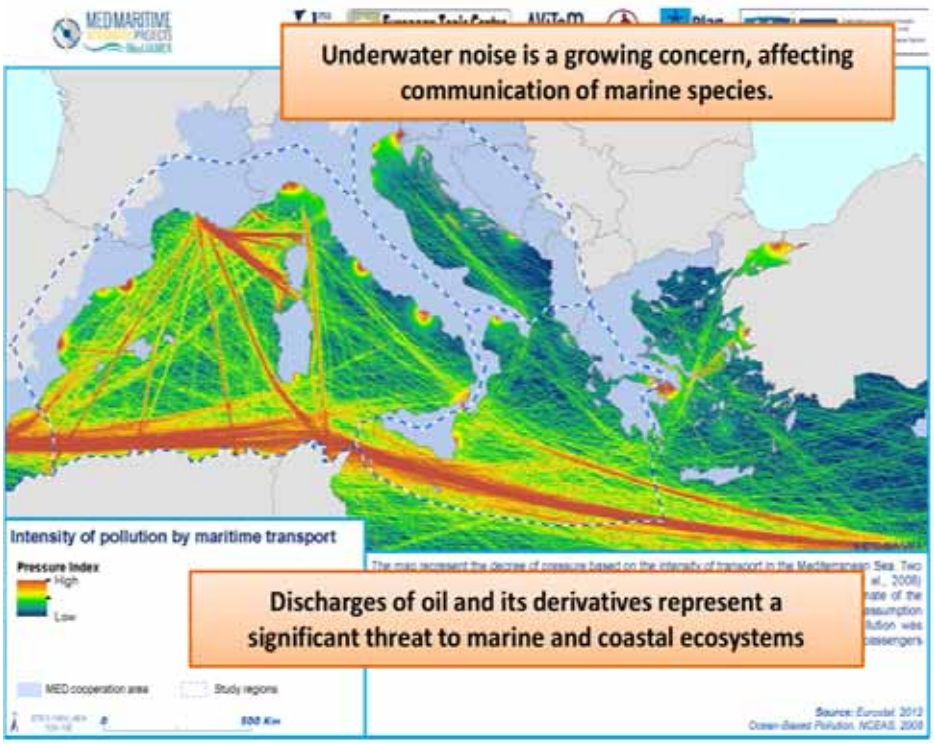
2.3.6 Risk and hazard Analysis

The coastal zone constitutes a crucial and vulnerable zone, within which multiple interactions and phenomena occur. Indeed, interactions between sea and land can be distinguished into two categories:

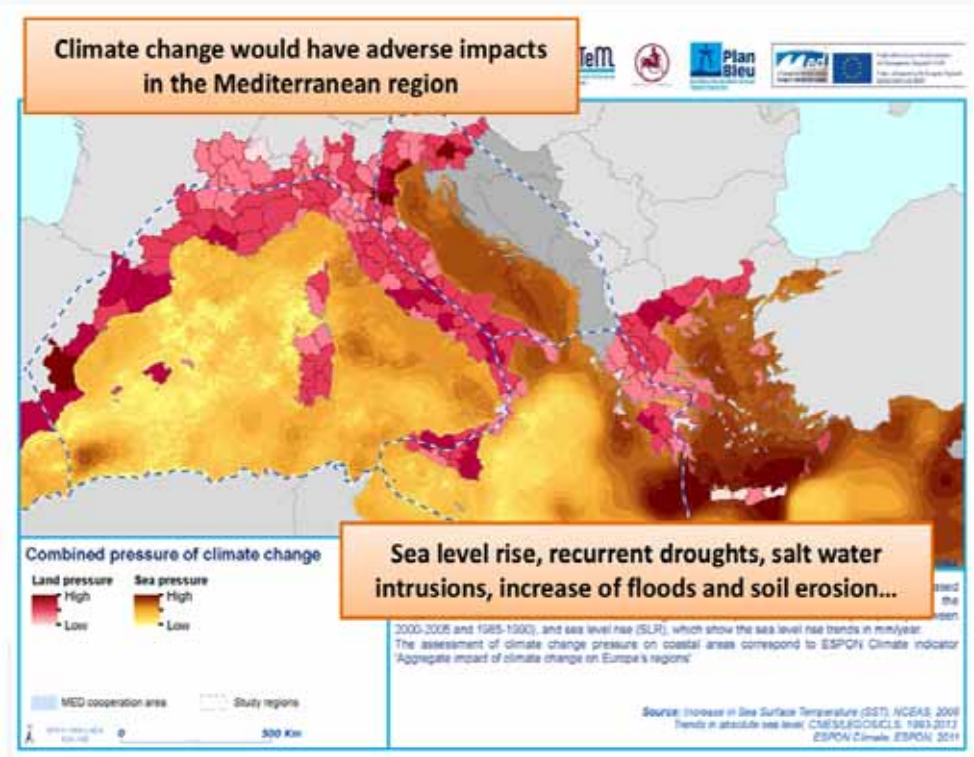
- Those related to the natural dynamic mechanisms, as well as the effects of climate change and other parameters on coastal and marine areas (sea level rise, coastal erosion, tsunami etc.) as well as on technical infrastructures (ports, aquaculture installations, etc.);
- Those related to synergies or conflicts among different uses and human activities in the coastal areas, affecting both the economic development and the ecosystems.

The study of all the above parameters will allow the understanding of the nature and the threats and/or challenges (climate change, pollution, etc.) that each country and the Mediterranean Basin faces and, therefore, the needs that are to be addressed and the priorities to be set out for the implementation of integrated Marine Spatial Planning (MSP) in all countries surrounding the Mediterranean Basin.

Maps 10 and 11, present examples of risk assessment in the Mediterranean Basin, in particular as regards the Sea Level Rise and underwater noise (maps used in the PEGASO project as regards risk of oil from ships, risk from Climate Change and risk from Sea Level Rise).



Map 10: Intensity of pollution by maritime transport
Source: PEGASO project



Map 11: Combined pressure of Climate Change
Source: PEGASO project

2.4 Funding possibilities

Potential sources for financing the marine spatial plans, using funds beyond national resources, can derive, *infer alia,* from:

- the Mediterranean Trust Fund (to a limited extent for horizontal actions mainly);
- the European Union projects, initiatives and financial instruments, such as LIFE, the Adriatic-Ionian Strategy (macro-Region), ex-DG MARE calls, SMAP (for coastal areas), INTERREG, Research FP8, Horizon 2020 etc.;
- the Global Environment Fund (GEF), for the southern Mediterranean countries;
- the French GEF;
- the World Bank funding programmes;
- the Union for the Mediterranean;

It is in the interest of the CPs, at national but also sub-Regional levels, to follow attentively the calls of the above mentioned funding instruments for projects and to build good partnerships in order to increase chances of getting financial assistance in their efforts for MSP implementation.

3 EXPERIENCE FROM THE CASE STUDY AREA

3.1 Methodological approach of the research in the case study area

Research regarding the case study area (Region of Ionian Islands) covered the following tasks:

- collection of data and information needed;
- organisation of "Local Meetings";
- distribution of Questionnaires.

3.1.1 Collection of data and information needed

Research for the collection of the necessary data and other relevant information, had to two main objectives:

- identify the current -spatial and economic- situation in the Region of Ionian Islands;
- produce the necessary 2D GIS and 3D GIS maps.

To this purpose, the core team addressed the following sources:

- Ministry for the Environment and Energy (for spatial data etc.);
- Ministry of Mercantile Marine, the Aegean and islands policy (for marine transportation data etc.);
- Hellenic Centre for Marine Research (for fisheries, ecosystem data etc.);
- Region of the Ionian Islands (for the Regional development plan until 2020, other relevant studies, economic planning etc.).

Additional information for the case study area was also derived from the existing Spatial Plans (at the Regional and National Level) as well as from the relevant legislation for spatial and environmental planning.

3.1.2 Organisation of Local Meetings

As initially planned, several "Local Meetings" took place in the framework of the project. In particular, these meetings aimed at testing:

a) the degree of usefulness of the existing MSP tools to the different stakeholders (Public, Decision Makers, Planners);

b) Governance schemes, among stakeholders and the competent Authorities having jurisdiction for Marine Spatial Planning.

Key information on the "Local Meetings" that took place in the case study area is provided below.

1st local meeting: *30 March 2015 (held in Corfu island)*

- **Participants:** Representatives of the Region of Ionian Islands, the Regional Association Municipalities (1st tier Local authorities), Local Agencies, major Associations, NGOs and other local or Regional stakeholders.
- **Objective:** Discussion and exchange of information, data and ideas among the partners and the local stakeholders on main ICZM and MSP issues, distribution of questionnaires.

2nd local meeting: *30 June 2015 (held in Ithaca island)*

- **Participants:** Representatives of the Region of Ionian Islands, the Regional Association Municipalities (1st tier Local authorities), Local Agencies, NGOs and other local stakeholders.
- **Objective:** Discussion and exchange of experience and know–how among the partners and the local stakeholders on MSP issues; testing of governance scheme, distribution of questionnaires.

3rd local meeting: *7 September 2015 (held in Zante island)*

- **Participants:** Representatives of the Region of Ionian Islands, the Regional Association Municipalities (1st tier Local authorities), Local Agencies, NGOs and other local stakeholders.
- **Objective:** Discussion and exchange of experience and know–how among the partners and the local stakeholders on MSP issues; testing of the governance scheme, distribution of questionnaires.

3.1.3 Distribution of Questionnaires

Distribution of Questionnaires to the local and Regional stakeholders as well as to the Regional and Local Authorities, aimed at:

a) collecting information about their needs and point of views regarding MSP;

b) evaluating their needs in know-how and tools, in order to proceed to MSP in the near future (for decision-makers);

c) testing the governance schemes and public participation.

Questionnaires were distributed to all stakeholders invited to the local meetings (along with the invitation letter sent by e-mail). Despite the fact that only part of the stakeholders that participated to the Local Meetings filled-in the Questionnaire Form, the final sample was adequately balanced among the following categories:

- Decision makers / licensing Authorities;
- Surveillance Authorities (Coast Guard etc.);
- Sea an coastal users (Professionals, Entrepreneurs etc.);
- Protected Area Managers / Ecologist groups;
- Chambers – Associations.

In total, only twenty five (25) Questionnaires were filled-in. Even if insufficient for conducting safe conclusions, the sample is rather suitable for identifying trends.

The Questionnaire included the following questions:

- Describe the activity / responsibility of your Agency in marine space;
- Describe the natural resources your activity uses;
- Describe the consequences of your activity on the marine environment;
- List any conflicts you notice in marine space;
- Describe the level and form of contribution of your activity to the local economy and society;
- Note your Agency's proposals for the optimal organization planning of marine space.

Participation to the Questionnaire survey varied as described below:

- 13 Questionnaires were filled-in in Corfu island;
- 8 Questionnaires were filled-in in Ithaca island;
- 4 Questionnaires were filled-in in Zante island.

It is noted that weak participation in the Questionnaire survey would have turned out even weaker if there wasn't for the persistence and persuasive spirit of the core team, constantly inviting all stakeholders to spend a few moments filling-in the questionnaire. For more information on the Questionnaire Form, please see Annex III.

3.2 Key Information about the Region of Ionian Islands

3.2.1 Characteristics and main problems

The Ionian Sea (Division 37.2.2) is geographically defined in three sub-areas: the Western Ionian Sea (sub-area 19), Eastern Ionian Sea (sub-area 20) and Southern Ionian Sea (sub-area 21) (FAO 2011) and is located at the Eastern part of the Mediterranean, bounded to the west by the Italian coast and to the east by the Greek coast (D' Onghia *et al.* 2003). Diverse geomorphology characterizes the area which gives unexpected and uncalculated earthquakes, mass movements from the shelf to the deeper zone. Submarine canyons are located along the Western Ionian coasts being potential refuge for many bathyal and endemic species (Gili *et al.* 1998). The Ionian Sea constitutes a vital area for biodiversity while it hosts critically endangered species and key populations of marine mammals and reptiles under threat and it presents some key priority habitat (SoHelME 2005, SoHelFI 2007).

The main maritime activities emerging in the Ionian Sea are maritime transport (passengers – cruise), fisheries, coastal tourism, cables and pipelines, wind farms aquaculture, Marine Protected Areas and Site of Conservation Interest. (Med-IAMER, 2014).

The needs and priorities in the Ionian Sea that could be tackled through MSP initiatives have been identified through activities within the ADRIPLAN project including interaction with key stakeholders in the area. National and Regional administrators and end users through semi structured interviews provided feedback and main issues have been identified (ADRIPLAN, 2014):

- Aquaculture vs other economic activities (mainly tourism, Sagiada case);
- Fisheries (intra-sectoral conflicts in the Corfu Strait between trawl and small-scale fisheries;
- Fisheries conflicts between neighbouring countries;
- Coexistence of incompatible activities such as sewage treatment, oil storage;
- Impacts from aquaculture development;
- Competition of uses in ports (Fishing shelters and tourism ports).

Main barriers in achieving blue development and blue economy in the area appeared to be bureaucracy, lack of legislation, policy agreements particularly for cross-border issues raising jurisdictional disputes (e.g. in deep sea fisheries), fragmented dialogue, lack of a management body in areas of conservation importance (i.e. Natura sites), lack of integration amongst administration levels, lack of engaging stakeholders in decision making (ADRIPLAN,2014) – as well as synergies between sectors as a fruitful way of cooperation.

Indeed through the IMP–Med project it became evident that there is priority in increasing stakeholder capacity building in the Mediterranean along with the development of a common Strategy for an integrated sea basin perspective. The latter would result in realizing key opportunities and increasing synergies between sectors.

Moreover conflicts between sea uses in the Ionian Sea reflect ambiguities between EU policies (i.e. Conservation and the Common Fisheries Policy). Also, the lack of a clear international framework for Integrated Coastal Zone Management (ICZM) leaves room to the national authorities to formulate sectoral spatial plans, which are rather vague and sometimes fuel conflicts instead of mitigating them (MESMA, 2013).

The adoption and entry into force of the Mediterranean Protocol on ICZM gives, of course, new perspective to the Region.

Certain points mentioned above were tackled within the project with the aim to consolidate cooperation among relevant authorities, to provide recommendations for better governance and support effective MSP activities. Proposals and conclusions will also take account also of the development model agreed upon already in 2004 for the area by the Regional Spatial Plan for the Ionian Region (currently under revision).

3.2.2 Spatial planning and existing plans affecting the case study area

A number of adopted Spatial Plans concern the case study area. Most of them regards the land part, while very few to the sea space. In particular, existing Spatial Plans at national level (providing spatial guidelines for the sustainable development for all Regions of Greece), are:

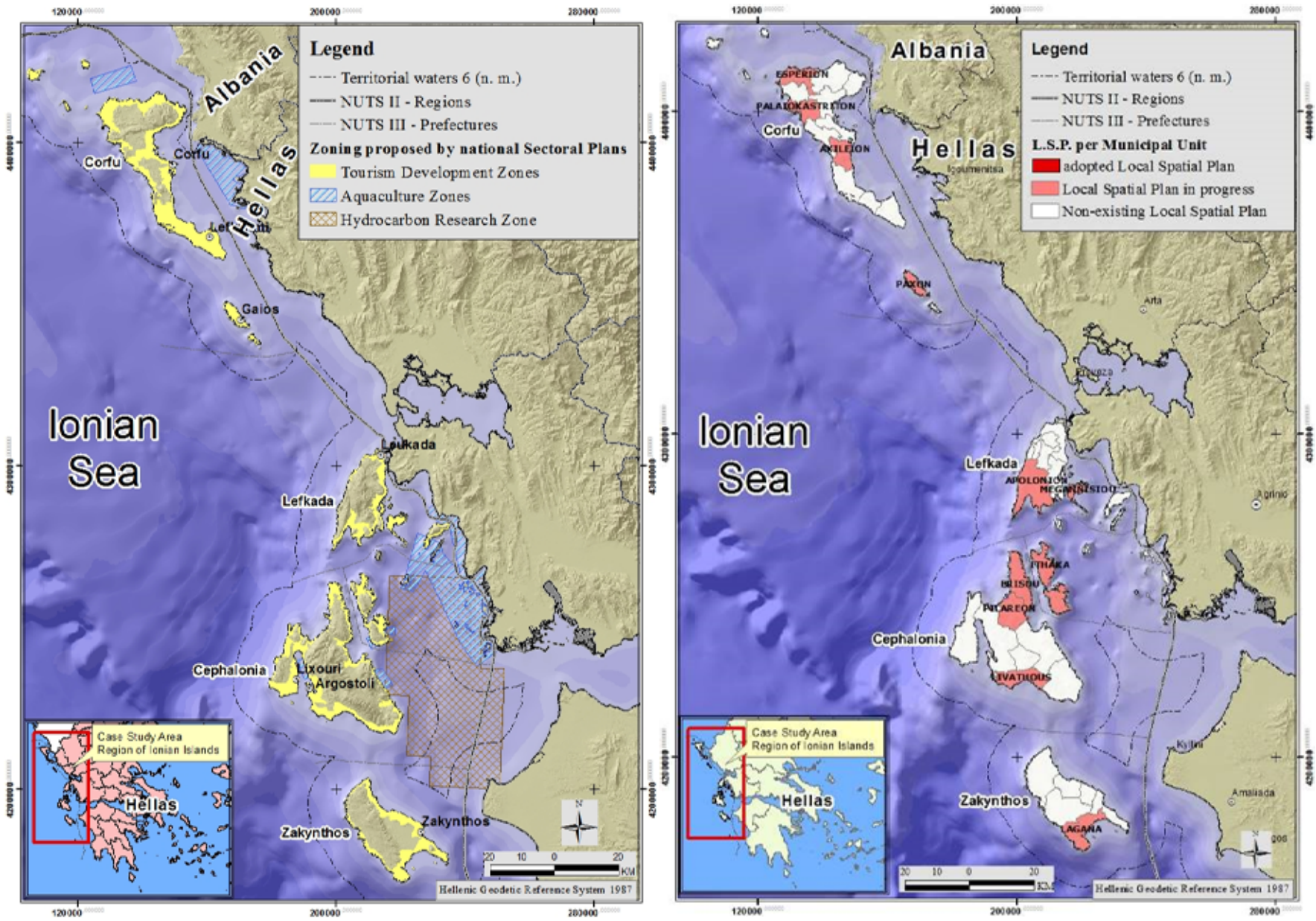
- The General National Spatial Plan (adopted in 2008);
- The Sectoral National Spatial Plan for Renewable Energy Sources (adopted in 2008);
- The Sectoral National Spatial Plan for the industrial development (adopted in 2009);
- The Sectoral National Spatial Plan for tourism (adopted in 2009, revised in 2013);
- The Sectoral National Spatial Plan for aquaculture (adopted in 2011), which is the only National Spatial Plan referring to and regulating an economic activity totally connected to the sea.

At the Regional level, the existing Regional Spatial Plan for the Ionian Islands is currently under revision. The first Regional Spatial Plan (still in value, until the revised one is approved) was adopted in 2004 (see maps 12, 13 and 14).

At the local level, progress is very slow. Out of 39 Local Spatial Plans that must be approved in the Region (corresponding to the 39 Municipal Units of the Region), only 10 of them are currently under process, while none was approved until the end 2015.

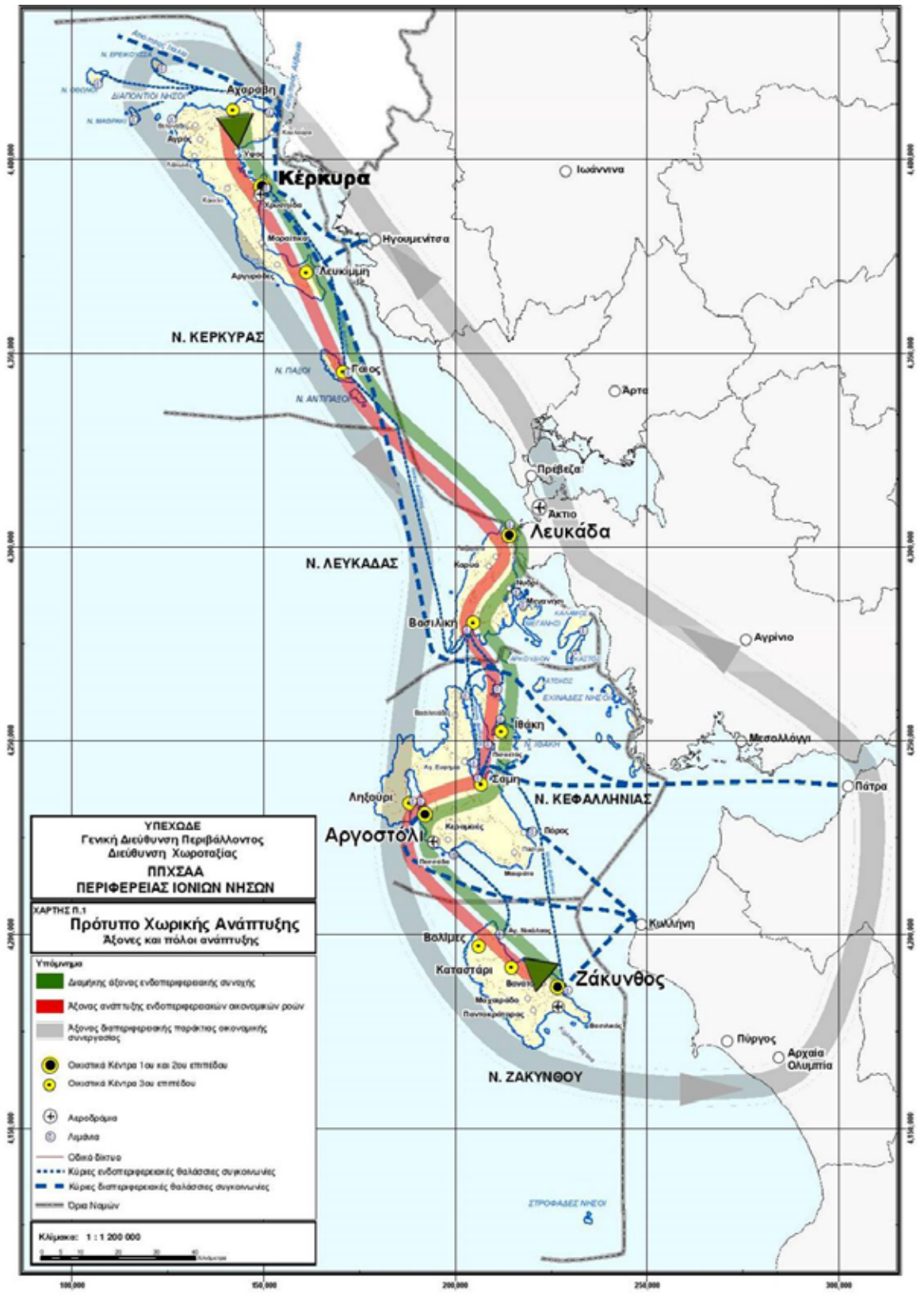
Finally, regarding the sea space, despite the fact that the water territory of the Region of Ionian Islands is rather extended and “overloaded” with transport networks, energy pipelines and cables, environmental zones, aquaculture, hydrocarbon research areas etc., very few spatial plans concern the sea space.

For the moment, as mentioned above, existing planning concerns the aquaculture activity (regulated at the national level), while one could consider as a second Marine Spatial Plan, is considered to be the one elaborated for the National Marine Park of Zakynthos (for the protection of the marine turtles Caretta caretta). At the same time, the Regional Spatial Plan under revision, despite the fact that it identifies and codifies uses and activities taking place at the sea, planning guidelines mainly focus on the land part of the Region.

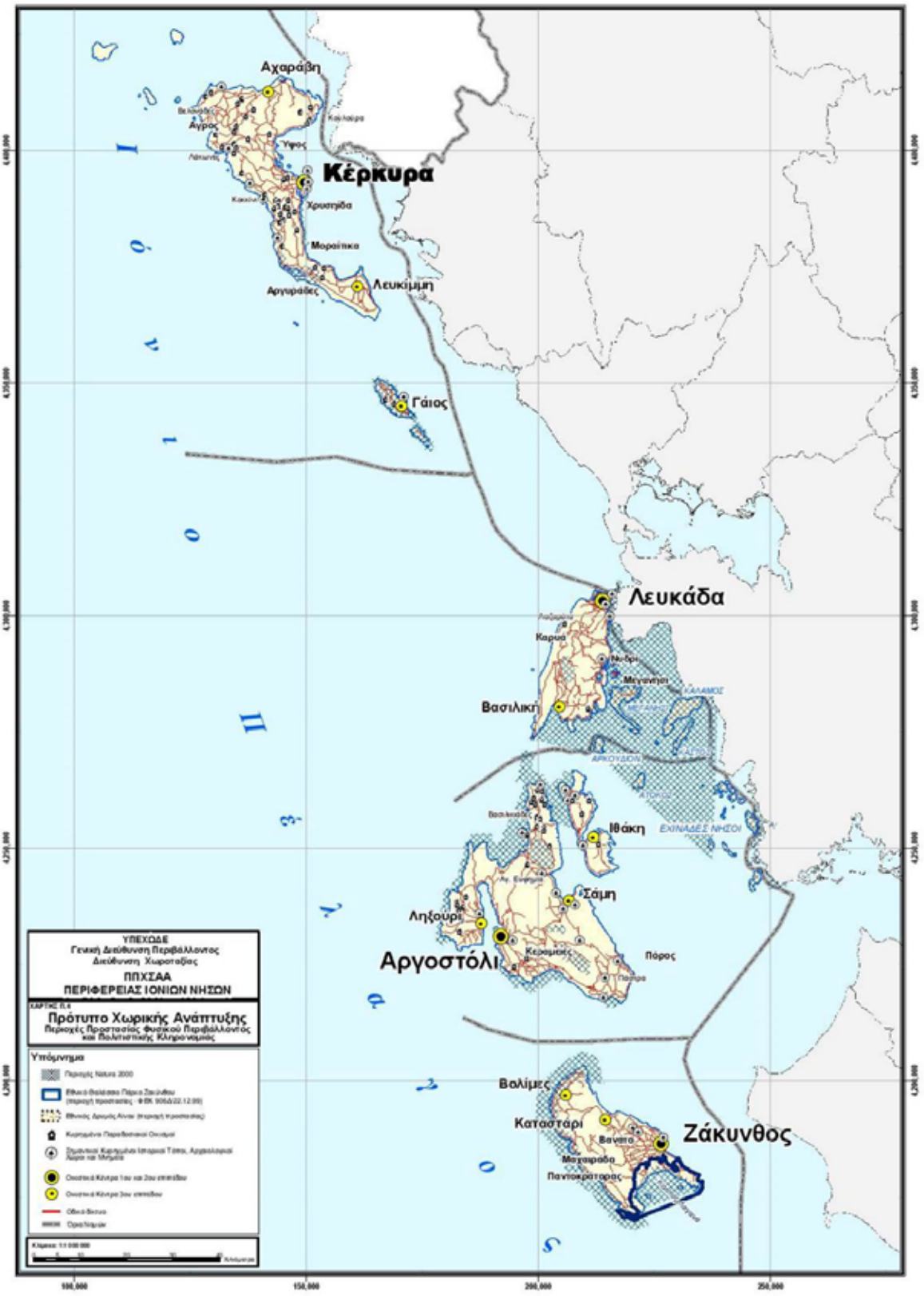


Map 12, Map 13: Implementation of Local Spatial Planning and Zoning proposed by the existing Sectoral National Plans in the case study area

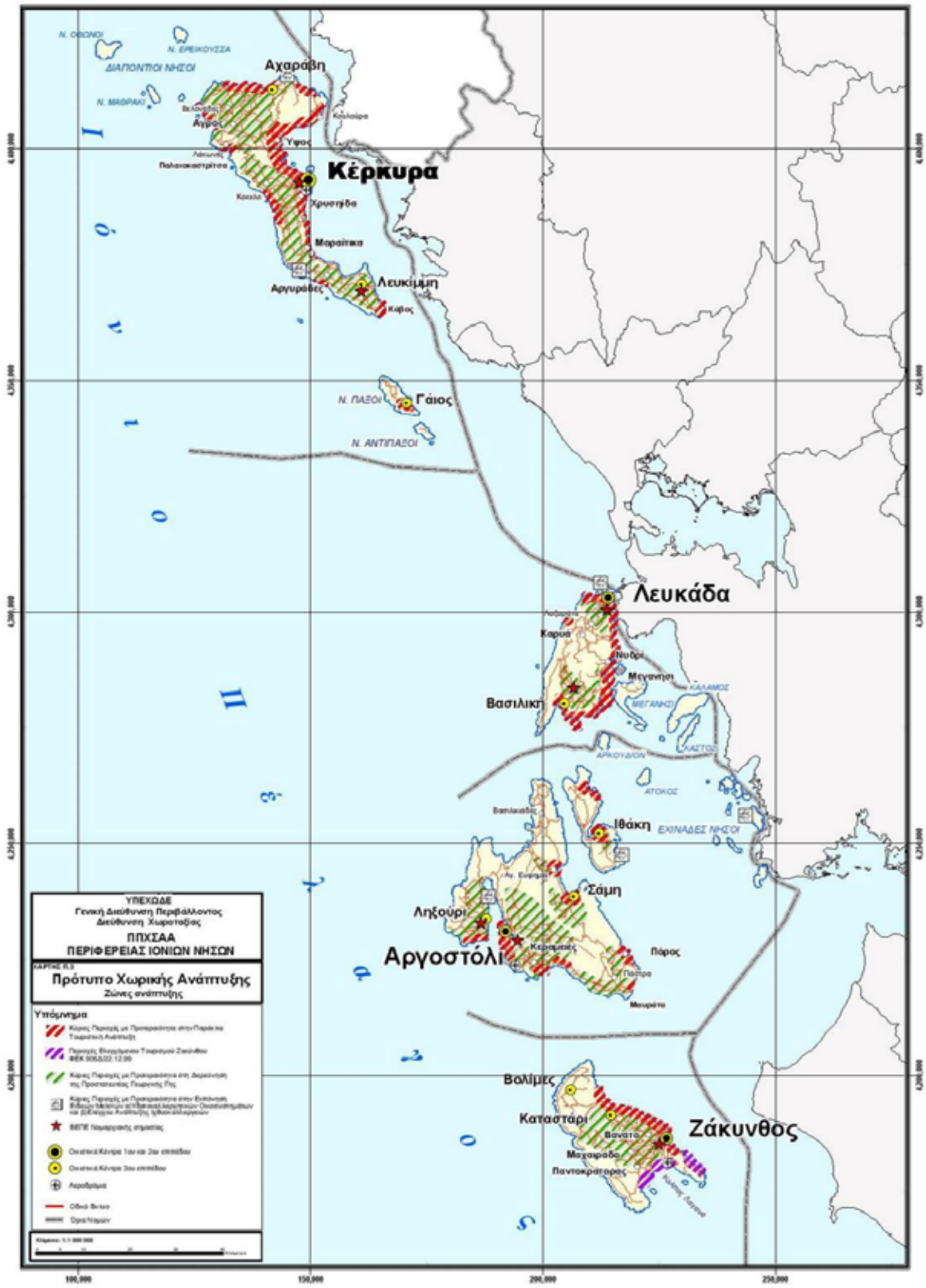
Source: processed by the authors



Map 14: Proposed Developmental Axis and Poles
according to the Regional Spatial Plan of Ionian Islands (adopted in 2004)
Source: Official Gazette No 56/B (Date: 19.01.2004)



Map 15: Management of Natural Environment and Cultural Heritage according to the Regional Spatial Plan of Ionian Islands (adopted in 2004)
Source: Official Gazette No 56/B (Date: 19.01.2004)



Map 16: Proposed Zones of Development in the Region of Ionian Islands according to the official Regional Spatial Plan (adopted in 2004)
Source: Official Gazette No 56/B (Date: 19.01.2004)

3.2.3 Other projects in the case study area and/or on related tools

The project built upon previous projects tackling MSP and ICZM issues that were carried out in the Mediterranean as well as other regions, trying to apply some of the tools developed or used by them (e.g. cumulative impact mapping). When formulating proposals, the project also took into account the ecosystems-based approach and built upon the EcAp indicators.

Projects that were carried out in the Adriatic – Ionian appear in Table 6.

Moreover, Table 7 mentions international projects providing useful methodologies on MSP. In particular for the Mediterranean, one can also mention the projects Med–Iamer, IMP– Med, EcAP–Med, the outcomes of which will be considered too under the current project.

Table 6: Projects carried out in the Adriatic – Ionian
Source: processed by the authors

Project	Funding scheme / Customer	Relevance to the Adriatic – Ionian Sea
ADRIAMED	MiPAAF – FAO.	Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea
ADRIAMOS	DG MOVE	Sea-based transport service integrated in the logistic chain along the Adriatic-Ionian transport corridor
ADRIAPAN	Adriatic Protected Areas Network	Adriatic Protected Areas Network
ADRI.BLU	INTERREG	Stakeholder involvement for sustainable fishery in northern Adriatic Sea
ADRICOSM	AII	Integrated coastal zone management system in the Adriatic Sea
ADRIFISH	INTERREG	Sustainable fishery in northern Adriatic Sea
ADRIPLAN	DG MARE	Cross – border MSP Adriatic-Ionian Sea
APICE	MED	Maritime activities in the Adriatic
BALMAS	IPA	Maritime transport; ballast water management
BEACHMED	MED	Best practices for coastal management – defense
CADSEALAND	INTERREG III	Land-sea interaction: coastal state and evolution
CAMP s	PAP/RAC	Coastal zone management (In several Med countries)
COASTANCE	IPA	ICZM in the Adriatic
COCONET	FP7	Investigation of synergy between MPAs and OWFs
DeFishGear	IPA	Marine litter
EM Master Course on MSP	Erasmus Mundus	Networking and stakeholder involvement
EASTMED	DG MARE – MiPAAF – HMRDF – FAO	Scientific and Institutional Cooperation to Support Responsible Fisheries in the Eastern Mediterranean
ECOSEA	IPA	Sustainable fishery in the Adriatic
EcoSea	IPA	Sea & coastal environment protection; Fisheries
EMODNET-Chemistry PP 2009-2012	DG MARE	Environmental data collection in the North Adriatic
EMODNET-Chemistry 2	DG MARE	Products for MSFD needs in the Mediterranean Sea
GHOST	LIFE+	Ghost fishing – preservation of biodiversity
HAZADR	IPA	Risk prevention management in the Adriatic
HAZADR	ADRIATIC-IPA	Cross-border network for the prevention of risks and for the early management of emergencies
IONAS	INTERACT	Partnership between European ports and cites and ports and cites from the neighbouring countries in the Adriatic and Ionian area
MAREMED	MED	ICZM in the Adriatic
MARLISCO	FP7	Marine Litter
MICORE	FP7	Coastal Defense/CCA in the northern Adriatic

Project	Funding scheme / Customer	Relevance to the Adriatic – Ionian Sea
NATREG.	SEE	Management of MPA
NETCET	IPA CBC Adriatic Programme	Common strategies for the conservation of cetaceans and sea turtles in the Adriatic ADRIPLAN – Adriatic Ionian maritime spatial planning AIP-1.2-1.1 Initial Assessment 30 through pan-Adriatic cooperation
OBAS	INTERREG III	Biological Oceanography of the Northern Adriatic
PEGASO	FP7	Stakeholder involvement; ecosystem-based approach; ICZM
Perseus	FP7	Stakeholder involvement; ecosystem-based approach
PlanCoast	INTERREG	ICZM/MSP in the Adriatic
RITMARE	MIUR-IT	Ecosystem-based approach; sustainable fishery; ICZM/MSP in the AI Sea
SHAPE	IPA	ICZM/MSP in the Adriatic
SPICOSA	FP6	Ecosystem, anthropogenic pressures
THESEUS	FP7	Coastal Defense/CCA in the northern Adriatic
TRECORALA	INTERREG IT-SLO	Rocky outcrops and coralligenous formations in the northern Adriatic
TOSCA	FP7	Marine accidents in the Mediterranean concerning oil spill pollution and search and rescue (SAR) operations
-	INTERREG II	Interventions for the water protection

Table 7: International projects providing useful methodologies on MSP
Source: processed by the authors

Project	Funding scheme / Customer	Relevance to the project/ tools
Balance	INTERREG	Marine nature conservation
BaltSeaPlan	INTERREG	Experience of MSP in a transboundary context
BONUS	FP7	Proposals for maritime activities
CLEANSEANET	EMSA	Satellite oil spill monitoring
COEXIST	FP7	Sustainable fishery
ECASA	FP6	Ecosystem approach to the aquaculture sector
EUROISLANDS	ESPON	The Development of the Islands – European Islands and Cohesion Policy
ESaTDOR	ESPON	European Seas and Territorial Development, Opportunities and Risks
ENCORA	FP7	Advancing Sustainable Management of Coastal Zones
HERMES	FP7	Establishing a CompreHEnsive transport Research information Management and Exchange System
KnowSeas	FP7	Ecosystem approach and stakeholder involvement
MARSAFENET	COST	Maritime security and safety
MASPNOSE	DG MARE	Experience of MSP in a transboundary context
MESMA	FP7	Monitoring and evaluation of spatially managed areas
ODEMM	FP7	Ecosystem approach and stakeholder involvement
Ourcoast	DG ENV	ICZM/MSP
PISCES	LIFE+	Ecosystem approach and stakeholder involvement
PEGASO	FP7	Proposals for Knowledge Base, Cumulative Impact assessment, Integrated Regional Assessment, Scenaria, Indicators, Governance
PlanBothnia	DG MARE	Experience of MSP in a transboundary context
TPEA	DG MARE	MSP in the European Atlantic Region

3.3 The Marine Ecological Profile of the case Study Area

3.3.1 The marine Natura 2000 sites in the study area

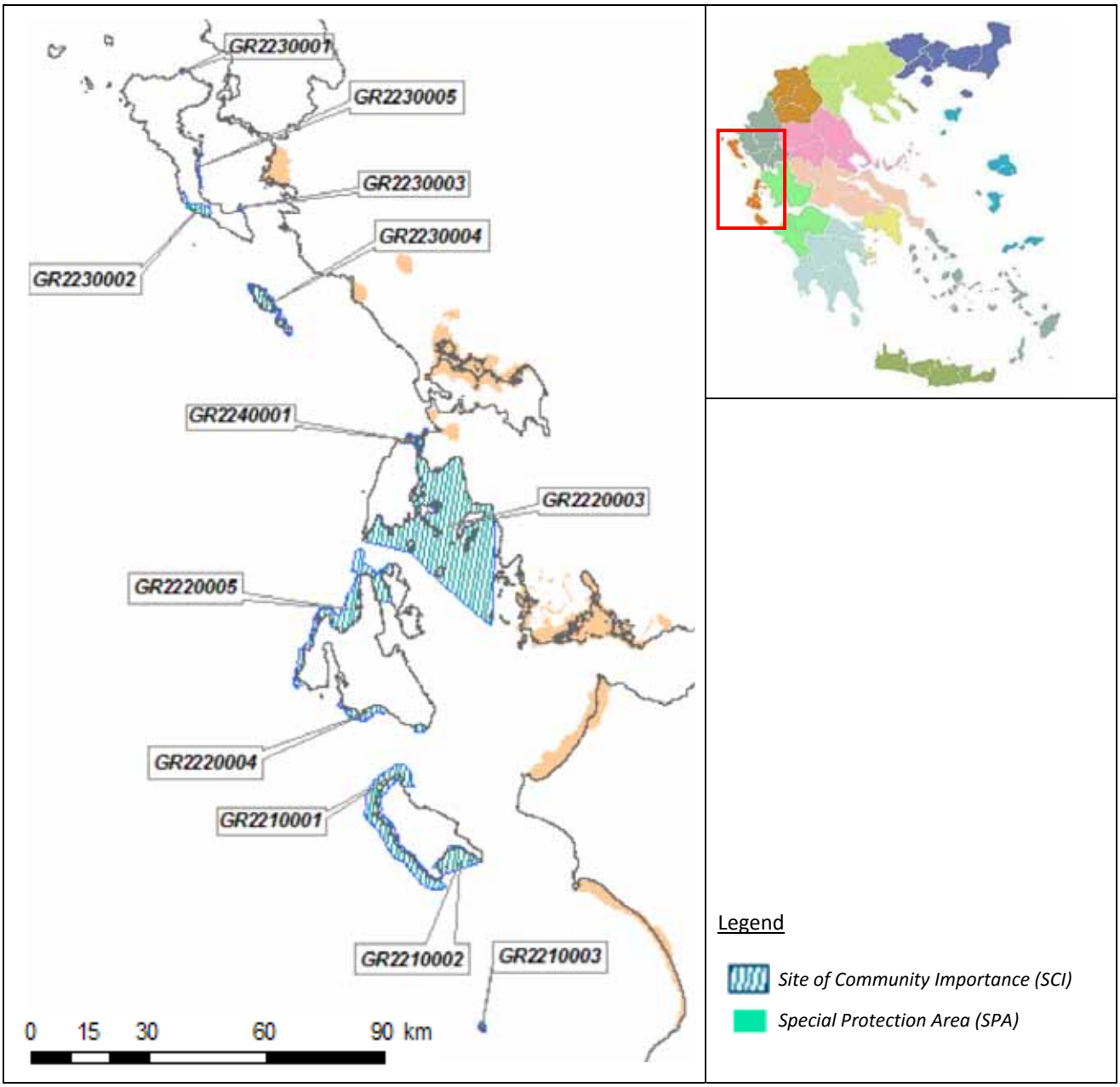
Introduction

A large number of marine Natura 2000 sites are included in the Ionian Island Region. These sites are either Sites of Community Importance (SCI) deriving from the implementation of the EU Habitats Directive (92/43/EEC), or Special Protection Areas (SPAs) designated by Member States under the EU Birds Directive (79/409/EEC). Some of them have additional national or international conservation status, as they are declared as National Parks or areas under the Ramsar Convention.

Methodology

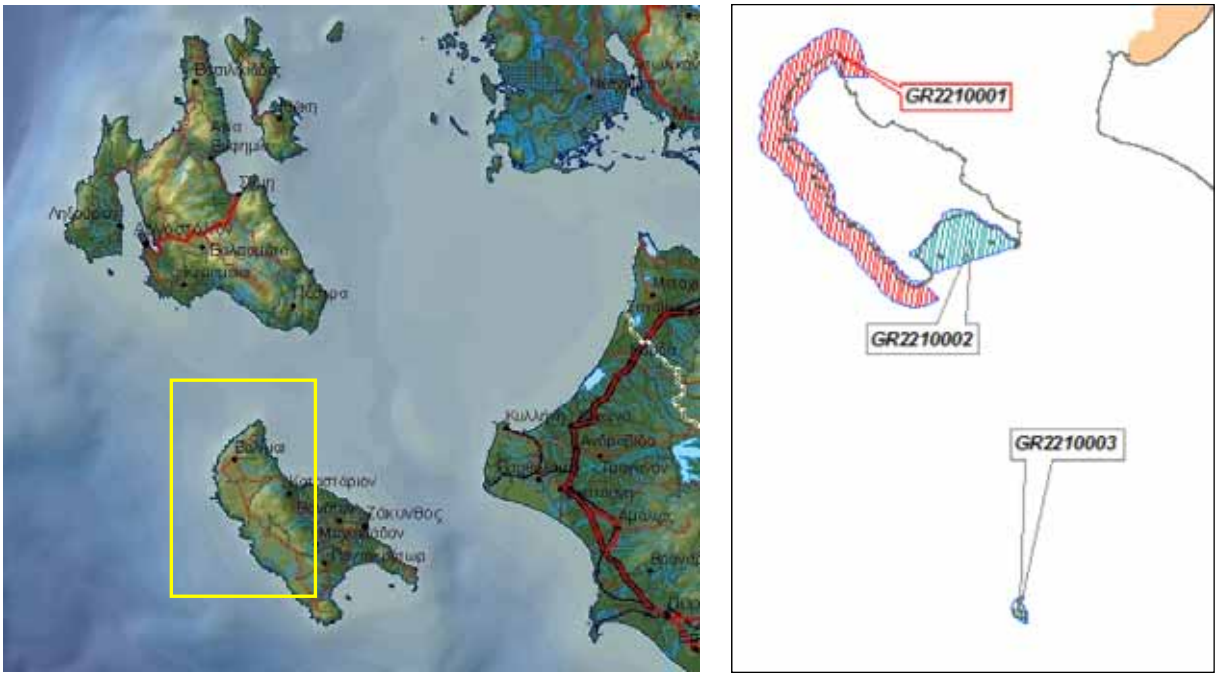
In the next pages the identity of each marine Natura 2000 site, which is included in the case study area, will be presented. Emphasis will be put on the biodiversity (conservation targets), as well as on the conflicts and threats. The presentation of the Natura sites which are included in the case study area is based on the following sources:

1. Dafis S., Eva Papastergiadou, K. Georghiou, D. Babalonas, T. Georgiadis, Maria Papageorgiou, Thalia Lazaridou and Vasiliki Tsiaoussi, 1996. **Directive 92/43/EEC The Greek "Habitat" Project NATURA 2000: An Overview.** Life Contract B4-3200/94/756, Commission of the European Communities DGXI, The Goulandris Natural History Museum–Greek Biotope/Wetland Centre. 917p.
2. Greek Ministry of Environment, 2001 (in Greek). "Identification and description of habitat types at sites of interest for conservation" Study 5: Marine habitats (P. Panayotidis Ed.), Athens 2001.
3. Roumelioti N., 2009 (in Greek). "Marine Natura 2000 sites in the Greek seas", MSc Thesis (P. Panayotidis: supervisor), National Technical University of Athens, 530 p.



Map 17: Natura 2000 sites in the Region of the Ionian Islands.
The following sites are included in the study area: GR2210001, GR2210002, GR2220003, GR2220004, GR2220005
Source: Hellenic Ministry of Environment

Name: WESTERN AND NORTH EASTERN COASTS OF ZAKYNTHOS ISLAND			
Code: GR2210001	**Conservation status:** SCI/SPA		
Location: 20°41′ E, 37°51′ N			
Administrative authority: Region of Ionian Islands			
Total surface (ha): 21,419.24		**Marine surface (ha):** 16,861.40	
Coastline length (km): 46	**Depth (m):** 50	**Altitude (m):** 215	



Map 18: Geomorphology (left) and extent (right) of the site GR2210001.
Source: HCMR / GIS Laboratory

Geography and geomorphology: Bearing the official name "Dytikes kai Vorioanatolikes Aktes Zakynthou", the site covers the entire western coast of Zakynthos island as well as part of its north eastern coast. The landscape is dominated by sharp calcareous rocks, forming sea cliffs and marine caves.

Vegetation and animal life: The dominant vegetation on the cliffs is shrubs (with endemic *Limonium* spp.) and phrygana (*Sarcopoterium spinosum*). The rest of the area consists of rocky hills partially occupied by pine forests (*Pinus halepensis*), sclerophyllous grazed "macquis" forests with *Quercus suber* and/or *Quercus ilex*, as well as cultivated areas (Dafis *et al.*, 1996).

The marine part is not very extended, as the bottom is sharp and goes down to 50 m deep near the coastline. Seagrass meadows (*Posidonia oceanica*) cover the sandy parts of the seafloor (habitat type 1120) and big brown algae (*Cystoseira* spp.) formations cover the rocky part (habitat type 1170). Marine caves (habitat type 8330) occur along the coasts of the site. The dominant vegetation in the caves is the sciaphyllic association *Udoteo-Aglaothamnietum tripinatum*. The habitat type 8330 is linked to the nesting areas of the monk seal *Monachus monachus*. Dolphins (*Ziphius cavirostris, Delphinus delphis*) are also observed in the site.

Table 8*:* Marine habitat types of the site GR2210001 listed in Annex I of the Habitats Directive
Source: Hellenic Ministry of Environment, 2009

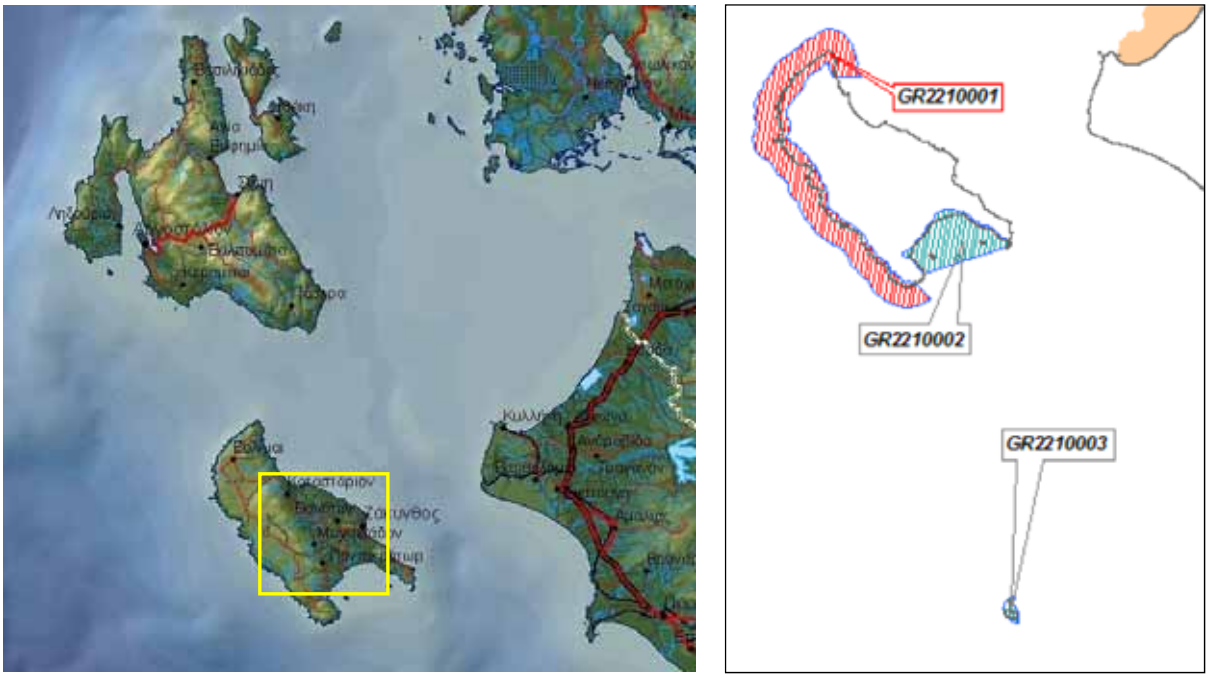
CODE	%COVER	REPRESENTATIVITY	CONSERVATION	GLOBAL ASSESSMENT
1120	10	A Excellent	A Excellent	A Excellent
1170	2	B Good	B Good	B Good
8330	10	A Excellent	A Excellent	A Excellent

The site is also important for birds living in shrub and coastal habitats as well as for migratory birds, because it lies on a main eastern Mediterranean migration corridor. Important bird species in the site are: *Phalacrocorax aristotelis* and *Falco eleonorae*. Other important animals are *Myotis blythi, Testudo hermanni, Elaphe quatuorlineata* and *Elaphe situla.*

Ecological value, conflicts and threats: The seaside cliffs are hosting the most important of Zakynthos island flora, including a number of rare plant species. The most important element of the marine part is the presence of the Mediterranean monk seal (*Monachus monachus*) in the caves of the site. Finally, the site is important for the migratory birds.

Tourist motor boat activity is becoming very common in the site, which is not accessible by road. Daily cruises to visit the caves are organized during the summer period. Thus, there is important conflict between tourism and wild life protection.

Name: LAGANAS BAY (CAPE GERAKI-KERI) AND ISLETS OF MARATHONISI AND PELOUZO		
Code: GR2210002	**Conservation status:** SCI	
Location: 20°52′ E, 37°43′ N		
Administrative authority: Region of Ionian Islands		
Total surface (ha): 6,957.70	**Marine surface (ha):** 6,079.27	
Coastline length (km): 20	**Depth (m):** 50	**Altitude (m):** 3



Map 19: Geomorphology (left) and extent (right) of the site GR2210002
Source:HCMR / GIS Laboratory

Geography and geomorphology: Bearing the official name "Kolpos Lagana Zakynthou (Akr. Geraki-Keri) kai Nisides Marathonisi kai Pelouzo", the site includes the wide Laganas Bay with its extended high hydrodynamic sandy beach (exposed to southern winds) as well as isles Marathonisi and Pelouzo to the south, with sharp rocky coasts.

Vegetation and animal life: The site is well known for its sandy beaches which are considered as the main nesting areas of the sea turtle *Caretta caretta* in the Mediterranean. The presence of *Posidonia* beds (habitat type 1120) is generally extensive although in central Laganas Bay the coverage becomes sparse and the species *Caulerpa prolifera* and *Cymodocea nodosa* are dominant (soft substrata with vegetation 119B). In between the coastline and the *Posidonia* beds we find sandbanks (habitat type 1110) without vegetation or scattered *Cymodocea nodosa*. At the rocky coasts of the isles and at the capes bordering Laganas Bay there are reef formations (type 1170) which co-exist with *Posidonia* beds in deeper waters. The rest of the site consists of soft substrata without vegetation (type 119A). Beyond the beach there is common Mediterranean vegetation with endemic species. Some important vertebrates have been observed in the area (apart from bird species)

amongst which is the *Algyroides moreoticus,* a species of lizard endemic to the Peloponnese and some Ionian Islands.

Ecological value, conflicts and threats: Together with Strofades islands the site is included in the national marine park of Zakynthos. The contradiction between ecologists who fight for the strict protection of the site and a section of local stakeholders who support tourist development is remarkable.

Nevertheless, the site is very important for the nesting of *Caretta caretta*. Keeping in mind that nesting is a critical stage of the biological cycle of *Caretta caretta* relevant with the survival of the species, the ecological importance of the site becomes rather high, magnified also by the fact that both the terrestrial and the marine part of the site are characterized by the presence of important habitats (sand dunes, sandy beaches, rocky coasts, sharp cliffs) which all together form a high quality ecosystem.

Table 9: Marine habitat types of the site GR2210002 listed in Annex I (Habitat Directive)
Source: Hellenic Ministry of Environment, 2009

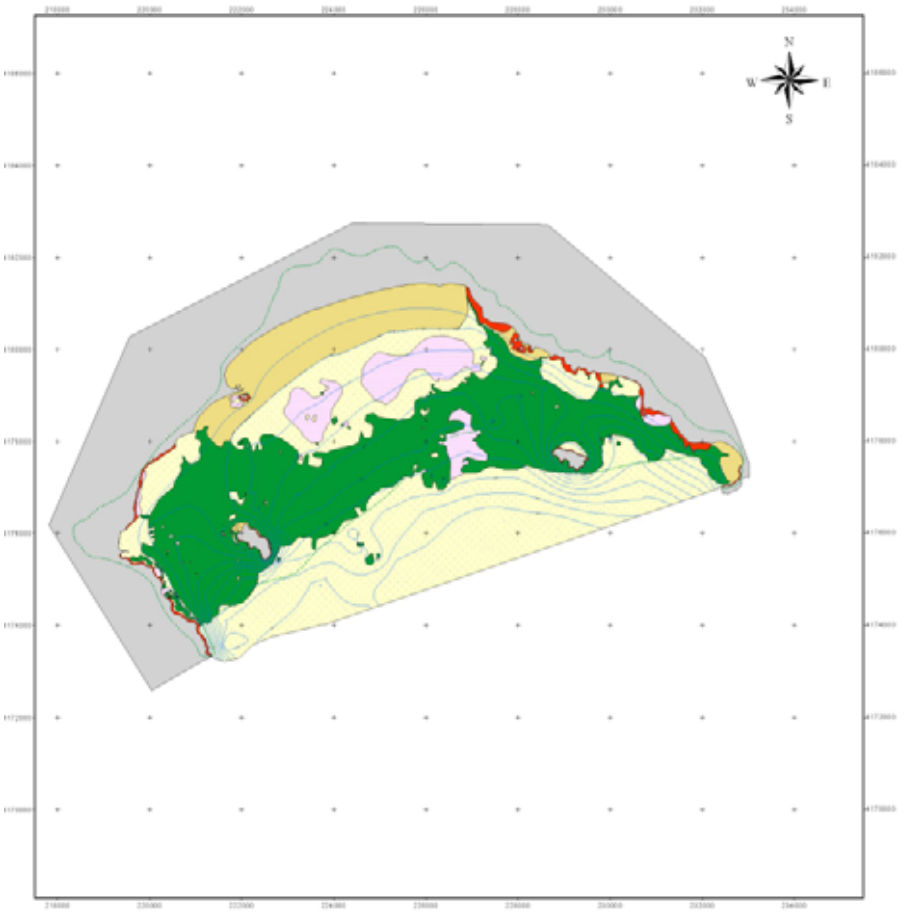
CODE	%COVER	REPRESENTATIVITY	CONSERVATION	GLOBAL ASSESSMENT
1110	14.47	A Excellent	A Excellent	A Excellent
1120	44.58	A Excellent	B Good	B Good
1170	1.75	A Excellent	A Excellent	B Good

Table 10: Marine habitat types of the site GR2210002 not listed
Source: Hellenic Ministry of Environment, 2001

CODE	%COVER	REPRESENTATIVITY	CONSERVATION	GLOBAL ASSESSMENT
119[A]	43.11	A		A
119B	8.88	A		A

Table 11: Syntaxonomic table of the site GR2210002.
Source: Hellenic Ministry of Environment, 2001

Class	Order	Alliance		Association	
HALODULO-THALASSIETEA	Thalassietalia	Cymodoceion nodosae	111020	Cymodoceetum nodosae	111021
POSIDONIETEA	Posidonietalia	Posidonion oceanicae	112010	Posidonietum oceanicae	112011
CYSTOSEIRETEA	Cystoseiretalia	Cystoseiron	117010	Ass. *Cystoseira amentacea*	117011
CYSTOSEIRETEA	Cystoseiretalia	Cystoseiron	117010	Ass. *Cystoseira schiffneri*	117016
HALODULO-THALASSIETEA	Thalassietalia	Cymodoceion nodosae	119B10	Cymodoceetum nodosae	119B11
CYSTOSEIRETEA	Cystoseiretalia	Cystoseiron	117010	*Cystoseira compressa*	



Scientific coordinator:
K. SIAKAVARA

Scientific team:
K. SIAKAVARA
A. C. BANKS

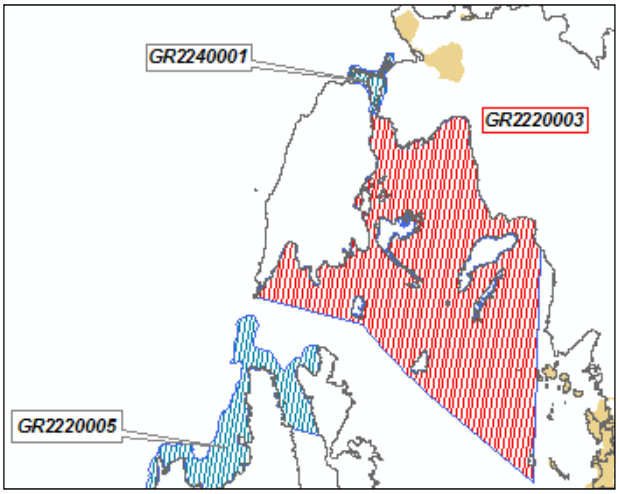
Habitat types

1110
1120
1170
119A
119B

Area limits
Coastline
Depth contours

Map 20: Distribution of marine habitat types in the site GR2210002
Source: Hellenic Ministry of Environment, 2001

Name: INNER IONIAN ARCHIPELAGO (MEGANISI, ARKOUDI, ATOKOS, VROMONAS)		
Code: GR2220003	**Conservation status:** SCI	
Location: 20°56′ E, 38°30′ N		
Administrative authority: Region of Ionian Islands		
Total surface (ha): 88,333.27	**Marine surface (ha):** 86,620.10	
Coastline length (km): 230	**Depth (m):** 50	**Altitude (m):** 11



Map 21: Geomorphology (left) and extent (right) of the site GR2220003
Source: HCMR / GIS Laboratory

Geography and geomorphology: Bearing the official name "Esoteriko Archipelagos Ioniou (Meganisi, Arkoudi, Atokos, Vromonas)", this is mainly a marine site which is bordered by the island of Lefkada to the west, Kefalonia and Ithaki to the south and mainland Greece (Prefecture of Aitoloakarnania) to the east and north. It includes an important archipelago of 36 small islands. Meganisi, Kalamos, Kastos and Skorpios islands are the only ones inhabited. High hydrodynamic rocky coasts are dominant except from the straits between the islands where we find low hydrodynamic coasts.

Vegetation and animal life: The marine environment of the archipelago offers shelter to many important predator species, a fact that highlights the ecological abundance of the area. Common dolphins (*Delphinus delphis*) and various shark species are among these. There are also many submerged and partly submerged sea caves which form an ideal habitat for monk seals (*Monachus monachus*). Owing to this, the site constitutes one of the most important areas in Greece (and in the Mediterranean in general) for this mammal which is the most threatened with extinction in Europe. Two other extremely important marine species, the *Tursiops truncatus* dolphin and the *Delphinus delphis* dolphin, are sympatric in the site. The population of the *Delphinus delphis* which is encountered in the site is one of the few (three or four) in the entire Mediterranean. Animals

of this species survive in the area most probably as a remnant of a population which once occupied the waters of the Adriatic and Ionian seas.

Moreover, the geomorphology of the coasts creates various potential habitats for the marine and terrestrial flora and fauna. A very common habitat species of the site is Seagrass meadows (*Posidonia oceanica*) and their conservation status is currently excellent. There are also reef formations (habitat type 1170) in less extended areas. The biggest part of the site is covered with soft substrata without vegetation (119A). The land vegetation is made up of *Juniperus phoenicea* which is in good ecological status, shrubs, *Pinus halepensis* trees and olive groves.

Ecological value, conflicts and threats: The site was designed for the protection of the marine mammals. For that reason the surface of the site is huge (more than 80.000 ha of marine surface). Although the presence of human activity is very limited, some conflicts occur between conservation and aquaculture. Navigation of large ferries from Patras port to Italy is also a potential threat.

Table 12: Marine habitat types of the site GR2220003 listed in Annex I of the Habitats Dir.
Source: Hellenic Ministry of Environment, 2009

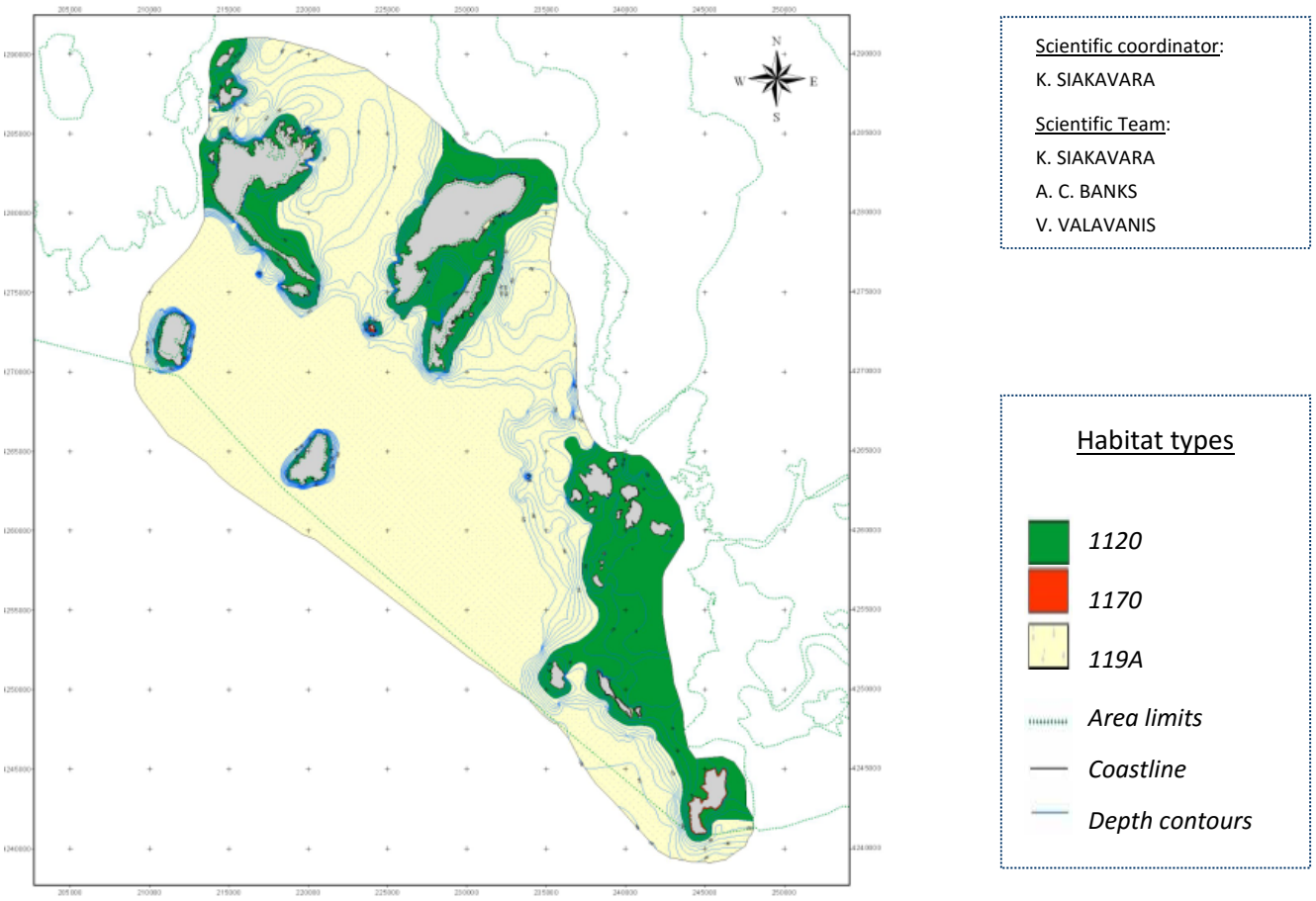
CODE	%COVER	REPRESENTATIVITY	CONSERVATION	GLOBAL ASSESSMENT
1120	10.07	A Excellent	A Excellent	A Excellent
1150	0.01	B Good	B Good	B Good
1170	0.22	A Excellent	A Excellent	B Good
8330	0	A Excellent	A Excellent	B Good

Table 13: Marine habitat types of the site GR2220003 not listed in the Habitats Directive
Source: Hellenic Ministry of Environment, 2009

CODE	%COVER	REPRESENTATIVITY	CONSERVATION	GLOBAL ASSESSMENT
119^{A}		A	A	A

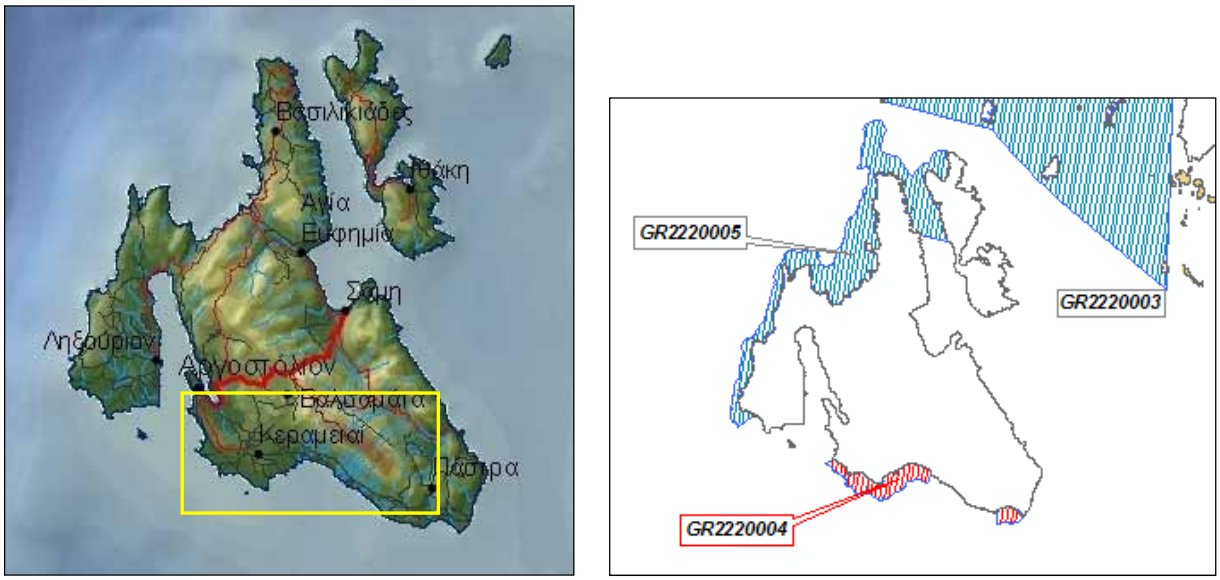
Table 14: Syntaxonomic table of the site GR2220003
Source: Hellenic Ministry of Environment, 2001

Class	Order	Alliance		Association	
POSIDONIETEA	Posidonietalia	Posidonion oceanicae	112010	Posidonietum oceanicae	112011
CYSTOSEIRETEA	Cystoseiretalia	Cystoseiron	117010	Ass. *Cystoseira crinitophylla*	117013
CYSTOSEIRETEA	Cystoseiretalia	Cystoseiron	117010	Ass. *Cystoseira spinosa*	117014
CYSTOSEIRETEA	Cystoseiretalia	Cystoseiron s.l.	117020	Ass. *Corallina* spp., *Jania* spp. & *Amphiroa* spp.	117021
CYSTOSEIRETEA	Cystoseiretalia	Cystoseiron	117010	*Cystoseira brachycarpa* var. *balaerica*	



Map 22: Distribution of marine habitat types in the site GR2220003
Source: Hellenic Ministry of Environment, 2001

Name: MARINE AREA FROM ARGOSTOLI TO VLACHATA (KEFALONIA) & MOUNTA BAY		
Code: GR2220004	**Conservation status:** SCI	
Location: 20°34′ E, 38°06′ N		
Administrative authority: Region of Ionian Islands		
Total surface (ha): 3,736.16	**Marine surface (ha):** 3,734.72	
Coastline length (km): 29	**Depth (m):** 50	**Altitude (m):** -



Map 23: Geomorphology (left) and extent (right) of the site GR2220004
Source: HCMR / GIS Laboratory

Geography and geomorphology: Bearing the official name "Paraktia Thalassia Zoni apo Argostoli eos Vlachata (Kefalonia) & Ormos Mounta", the site includes the marine area between the entrance of Argostoli Gulf and the village of Lourdata, as well as the small bay of Mounta to the south east of the island of Kefalonia.

Vegetation and animal life: High hydrodynamic coasts are dominant, with seagrass meadows (*Posidonia oceanica,* type 1120) and reef formations (habitat type 1170), whereas there are some parts with sandbanks (habitat type 1110). We can distinguish between two separate areas in terms of their characteristics:

- The rocky western-northwestern coast;
- The sandy eastern-southeastern coast.

Between these areas, there is a transitional zone with mixed characteristics. The sea bed in the first instance is rather heterogeneous, with a combination of soft and hard substrata and *Posidonia* beds co-existing with big brown algae forest (*Cystoseira crinita*). This quite rare combination has special ecological value and runs from the coastline to the depth of 40 m. The dense vegetation starts from the area of the airport to the east, demonstrates the best growth conditions near the bay of Agia Pelagia (due to the presence of reefs) and reaches the coast at the village of Lourdata.

Soft sand substrata are dominant in the second area (habitat types 1110 and 119[A]). Due to their high hydrodynamism these areas are usually not covered by vegetation (although there are scattered areas with *Cymodocea nodosa*). *Posidonia* beds begin at 10-15 m depth and extend to 40 m underwater. A rocky cape to the west indicates the west boundary (coast of Lourdata), where common habitats of the type 1170 (reefs) occur.

Finally, the bay of Mounta is considered as the most important reproducing site in Kefalonia for the sea turtle (*Caretta caretta*).

Ecological value, conflicts and threats: The high quality of the marine habitats give to the site a unique ecological value. Nevertheless, tourism is rapidly developing in the area and the major threat is the construction of marinas and port facilities.

Table 15: Marine habitat types of the site GR2220004 listed in Annex I
Source: Hellenic Ministry of Environment, 2009

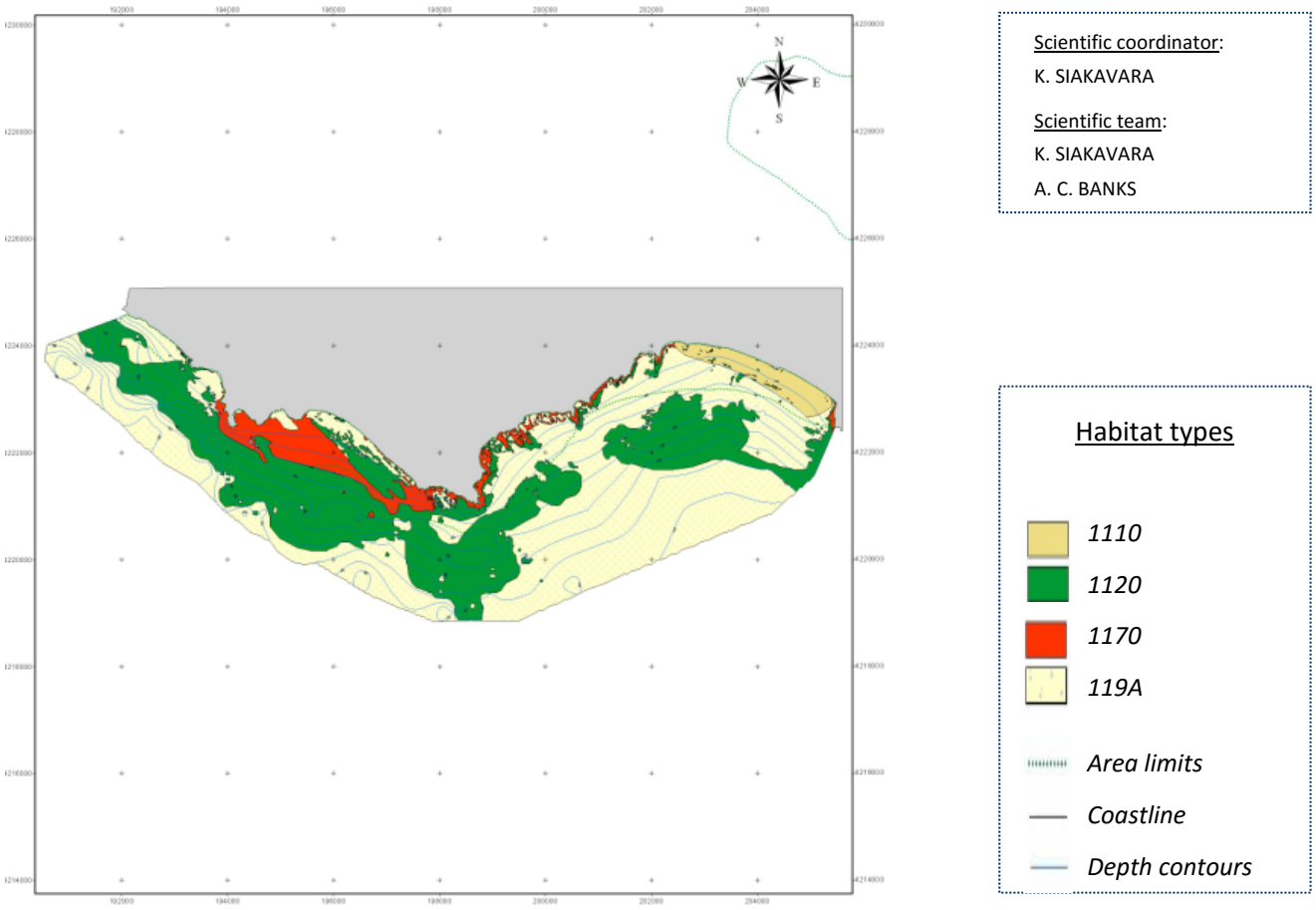
CODE	%COVER	REPRESENTATIVITY	CONSERVATION	GLOBAL ASSESSMENT
1110	3.79	B Good	B Good	B Good
1120	45.71	A Excellent	A Excellent	A Excellent
1170	7.88	A Excellent	A Excellent	A Excellent

Table 16: Marine habitat types of the site GR2220004 not listed
Source: Hellenic Ministry of Environment, 2001

CODE	%COVER	REPRESENTATIVITY	CONSERVATION	GLOBAL ASSESSMENT
119[A]	19,87	A	A	A

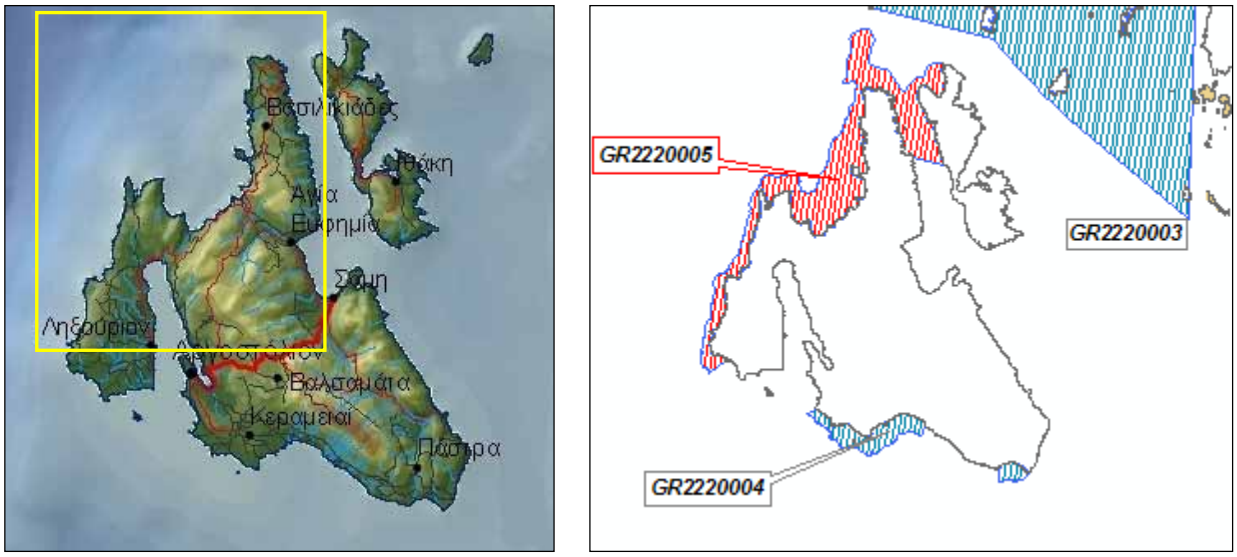
Table 17: Syntaxonomic table of the site GR2220004
Source: Hellenic Ministry of Environment, 2001

Class	Order	Alliance		Association	
POSIDONIETEA	Posidonietalia	Posidonion oceanicae	112010	Posidonietum oceanicae	112011
CYSTOSEIRETEA	Cystoseiretalia	Cystoseiron	117010	Ass. *Cystoseira crinita*	117012



Map 24: Distribution of marine habitat types of the site GR2220004
Source: Hellenic of Environment, 2001

Name: WEST COASTS OF KEFALLONIA – KEFALLONIA ITHAKI STRAIGHT – NORTHERN ITHAKI			
Code: GR2220005	**Conservation status:** SCI		
Location:			
Administrative authority: Region of Ionian Islands			
Total surface (ha): 18,742.55		**Marine surface (ha):** 18,741.50	
Coastline length (km): 90	**Depth (m):** 50	**Altitude (m):** 85	



Map 25: Geomorphology (left) and extent (right) of the site GR2220005
Source: HCMR / GIS Laboratory

Geography and geomorphology: Bearing the official name "Dytikes Aktes Kefallinias – Steno Kefallinias Ithakis – Boria Ithaki (Akrotiria Gero Gompos – Drakou Pidima – Kentri – Ag. Ioannis)", this site extends from the 200 m depth contour to a narrow terrestrial band of 50 m width. The coastal zone starts from the middle of the Kefalonia – Ithaki Channel and extends to the SW of Kefalonia (Cape Gero Gompos) and northern Ithaki (Cape Drakou Pidima).

Vegetation and animal life: This is an important site for the Mediterranean monk seal (*Monachus monachus*). From 1985 until 1995 five research projects have been carried out on the islands with the aid of the European Union. Fundamental monitoring activities of the population and the nesting sites and recording of damaging on fishing equipment have been run by the NGO ARCHIPELAGOS after completion of the projects. A constant population of 15-25 individuals living in the area represents 5-7% of the world's population and 10% of the Greek population. Ten to fifteen individuals is estimated to be the number of individuals of a certain period and not the standing population. During the 15-years period of research a total number of 30-35 individuals has been recorded. The whole area is also very important for several cetaceans included in the Bern Convention: *Delphinus delphis* (reproduction), *Stenella coeruloalba* (resident), *Grampus griseus* (sporadic), Ziphius cavirostris (resident), *Balaenoptera physalus* (probably resident) and *Pseudorca crassidents* (one observation), *Tursiops truncatus*. *Orcinus orca* (in Bern Convention) and *Physeter catodon* have been reported

by local fishermen offshore NW Zakynthos and the west coast of Kefalonia. In general, both terrestrial and marine habitats are in good conservation status in a quite intact natural environment. The site comprises extended *Posidonia oceanica* meadows (habitat type 1120), large shallow inlets and bays (1160), marine caves (8330), as well as reefs (1170) and sea cliffs.

Ecological value, conflicts and threats: The high variety of marine mammals gives to the site a unique ecological value. Nevertheless, tourism is rapidly developing in the area and the major threat is motor boats (daily cruisers) visiting massively the area during summer.

The site also includes areas with special archaeological value such as: the Loizos cave at the bay of Polis in Ithaki, the greater area of Hersonisos in Fiskardo Kefalonia and the submarine archaeological site south of Fiskardo.

Table 18: Marine habitat types of the site GR2220005 listed in Annex I
Source: Hellenic Ministry of Environment, 2009

CODE	%COVER	REPRESENTATIVITY	CONSERVATION	GLOBAL ASSESSMENT
1120	20	A Excellent	A Excellent	A Excellent
1160	30	A Excellent	A Excellent	A Excellent
1170	5	A Excellent	A Excellent	A Excellent
8330	1	A Excellent	A Excellent	A Excellent

3.3.2 Habitat types present in the study area and conflicts

In the Ionian Island Region occur some good examples of the habitat types described in the Annex I of the EU "Habitats" Directive (92/43/EEC). Although these types are described under geomorphological terms, there is a direct link between them and the biological communities included in the Barcelona Convention. The following paragraphs present the biological information under the codes of the EU "Habitats" Directive.

Habitat type "Sandbanks which are slightly covered by sea water all the time" (Natura code 1110)

The habitat type 1110 is identified by the coexistence of sandy bottom and high hydrodynamic conditions. The sand deposits can move on the sea floor like the sand dunes in the desert. Therefore, this habitat type is expected to appear in exposed coastal areas with extensive sandy coasts and a gentle slope. This combination is common in some Ionian coasts (e.g. the bay of Laganas in Zakyntos Island). The habitat type 1110 is related to the nesting areas of the sea turtle *Caretta caretta*, therefore bay of Laganas has status of National Park for the protection of this species. Nevertheless, even in the Park area there is important conflict between tourism infrastructures and wild life protection.

The habitat type 1110 usually is not covered by vegetation or the vegetation not permanent. When vegetation occur two types of sea grass meadows are present:

- Meadows of the sea-grass *Cymodocea nodosa*. Their presence depends on the frequency of extreme weather conditions. A severe winter storm (which appears every 5-10 years) could eradicate the *C. nodosa* beds, but they can be established again during the next spring since this species blooms and fruits almost every year.
- Meadows of the sea-grass *Halophila stipulacea.* As in the previous case this formation is ephemeral. The sea-grass *Halophila stipulacea* is a Lessepsian migrant and appears only in the eastern Mediterranean where its successful establishment depends on its ability to occupy free ecological niches. Therefore, this species often plants on the free space of the unvegetated sand banks and stabilizes them with their root system.

According to the Barcelona Convention typology in the habitat type "sandbanks" the following biocenoses could be included:

- Biocenosis of well sorted fine sands (BC type III. 2. 2.), associations with *Cymodocea nodosa* on well sorted fine sands (III. 2. 2. 1.) and associations with *Halophila stipulacela* (III. 2. 2. 2);
- Biocenosis of coarse sands and fine gravels mixed by the waves (III. 3. 1.), association with rhodolithes (III. 3. 1. 1);
- Biocenosis of coarse sands and fine gravels under the influence of bottom currents (III. 3. 2.), the maërl facies (= Association with *Lithothamnion corallioides* and *Phymatoliton calcareum*), also found as facies of the biocenosis of coastal detritic (III. 3. 2. 1) and the association with rhodolithes (III. 3. 2. 2.);
- Biocenosis of infralittoral pebbles (III. 4. 1.), facies with *Gouania wildenowi* (III. 4. 1. 1.), small teleostean which lives among pebbles.

Habitat type "Posidonia oceanica meadows" (code 1120)

Posidonia meadows are the most common biological feature in the case study area, although representative meadows occur mainly in the inner Ionian archipelago coasts. In the Ionian coastline usually the meadows grow from the surface down to 35-40 m depth. In the bay of Laganas the lower limit of Posidonia meadows goes down to 45 m depth.

The species *P. oceanica* is endemic in Mediterranean. In the Annex I of Directive 92/43/EEC meadows of *P. oceanica* are sited as a priority habitat type due to their ecological role. Posidonia meadows do not appear in areas with low salinity and weak light penetration due to pollution. The ecological parameters that affect the distribution of the upper and lower limit of the meadows as well as their density are light and hydrodynamic conditions.

Although Posidonia meadows are considered priority habitat type in the case study area there is conflict between fisheries (trawling) and protection of the meadows.

According to the Barcelona Convention typology, in the habitat type "Posidonia meadows" (BC type III. 5. 1) two ecomorphosis are described: The ecomorphosis of striped meadows (III. 5. 1. 1.) and the ecompphosis of barrier-reef meadows (III. 5. 1. 2.). A facies of dead "mattes" without much epiflora and an association with *Caulerpa prolifera* has also to be added.

Habitat type "Large shallow inlets and bays" (Natura code 1160)

The main ecological characteristics of the habitat type 1160 are the presence of semi enclosed embayments where the depth does not exceed the 10-15 m.

Typical examples of the habitat type 1160 are present in the case study area (Argostoli bay). In this area there is conflict between aquaculture and wild life protection, as the aquaculture infrastructure in Greece is old and the activity is taking place in shallow semi-closed areas.

Meadows of the Angiosperm *Cymodocea nodosa* are the dominant vegetation elements, as well as the populations of some *Cystoseira* species, such as *Cystoseira barbata* and *Cystoseira schiffneri*, growing on small stones and shells in low hydrodynamic conditions. During the last decade of the 20th century the invasive Lessepsian Chlorophyte *Caulerpa racemosa* is rapidly covering the muddy sands of habitat type 1160.

The habitat type 1160 corresponds to the Barcelona Convention "Biocenosis of superficial muddy sands in sheltered waters" (BC type III. 2. 3), also known as SVCM according Peres & Picard (1964). The following associations are included:

- Association with *Cymodocea nodosa* on superficial muddy sands in sheltered waters (BC type III. 2. 3. 4.);
- Association with *Zostera noltii* on superficial muddy sands in sheltered waters (BC type III. 2. 3. 5);
- Association with *Caulerpa prolifera* on superficial muddy sands in sheltered waters (BC type III. 2. 3. 6.).

Habitat type "Reefs" (code 1170)

The geomorphological term "reefs" describes isolated rocky substarta surrounded by deeper waters, near the coast or offshore. At the upper part of these substrata the light conditions are favourable to the growth of photophilic algae, which can form well-structured vegetation (canopy, bushy, grass & encrusting layers). At the deeper part sciaphilic algae are usually present, but the scientific knowledge on this issue is very limited.

In the case study area good examples of the photophilic vegetation of the habitat type 1170 occur in the inner Ionian archipelago (Echinades islands).

Type 1170 can be regarded highly problematic, as it comprises a large variety of natural habitats (e.g. Biocenosis of the upper mediolittoral rock, Biocenosis of the lower mediolittoral rock, Biocenosis of infralittoral algae, Coralligenous biocenosis, Biocenosis of deep sea corals, etc. *sensu* UNEP-MAP RAC/SPA (2002), which can range significantly in their biological and ecological aspects. Thus, addressing *en masse* all 1170 components may pose serious difficulties, especially when tackling mapping and management issues.

When the ecological conditions (wave energy, competition, trophic status) are favourable the vegetation of habitat type 1170 is dominated by the big brown algae of the genus *Cystoseira.* These populations develop mostly in the upper sublittoral zone (0.5 m depth) due to the favourable light conditions.

Habitat type "Marine caves submerged or semi-submerged" (Natura code 8330)

Marine caves were observed along many rocky calcareous coasts of the case study area. The dominant vegetation was the sciaphilic association *Udoteo-Aglaothamnietum tripinatum*. The most common species were *Flabella petiolata*, *Peyssonnelia squamaria* and *Peyssonnelia rubra.* Good examples of the habitat type 8330 in the Ionian coasts occur in the Echinades archipelago, as well as in Zakynthos, Kefalonia and Corfu islands.

The habitat type 8330 is linked to the nesting areas of the monk seal *Monachus monachus*. Although the species is endangered, tourist motor boat activity near the caves is very common and there is important conflict between tourism and wild life protection.

3.4 Defining the appropriate management units in the case study area

3.4.1 A trial to understand how to apply the ICZM Protocol

Focusing on the core of the ***"Marine Spatial Planning" (MSP)*** and the ***"Integrated Coastal Zone Management" (ICZM)*** strategies it is clear that the challenge is to plan and to manage anthropogenic activities in a harmonized to the nature manner. The harmonization can be expressed as ***"adaptation"*** of the human activities to the functioning of the nature, or as ***"Ecosystem Based Approach"***, which means organization of the human activities following the ecosystem dynamic.

What do we understand as "coastal zone"? "Coastal zone" means the geomorphologic area either side of the seashore in which the interaction between the marine and land parts occurs in the form of complex ecological and resource systems made up of biotic and abiotic components coexisting and interacting with human communities and relevant socio-economic activities (ICZM Protocol).

What does "Integrated Coastal Zone Management (ICZM) mean? "Integrated coastal zone management" means a dynamic process for the management of the human activities on the coastal zone, taking seriously into account the fragility of coastal ecosystems and landscapes.

The seaward limit of the coastal zone can be extended to the shelf brake (90-110 m depth), the landward limit to the drainage divides, which are the boundaries of the drainage basins influencing the functioning of the coastal system.

These limitations help to identify concrete ***physiographic units*** which can be also planning as ***management units.***

What are the main objectives of ICZM? The main objectives of ICZM (*Article 5 of the Protocol)* are:

- to facilitate the sustainability of coastal zones systems, by ensuring the harmonization of the human activities to the functioning of the nature;
- to preserve coastal zones for the benefit of current and future generations;
- to ensure sustainability of natural resources;
- to preserve the integrity of coastal ecosystems, landscapes and geodiversity;
- to include in the management plans the ***invisible*** natural risks, earthquakes, tsunamis as well as the effects of the sea level rise, as the result of the climate change;
- to promote the stakeholder participation principle as the active decision platform.

What are the most significant implementation guidelines of the ICZM? These are *(Article 6 of the Protocol)*:

- to take into account that, the land and the marine parts of the coastal zone form an ***entity***, with a unique natural and functioning dynamics;
- to integrate all elements related to ***hydrological, geomorphological***, ***climatic***, ***ecological***, ***socio-economic*** and ***cultural systems***, taking into account not to exceed the ***carrying capacity*** of the coastal zone;
- to apply the ***ecosystem approach*** to coastal planning and management, ensuring the ***sustainability*** of coastal zones;
- to ensure ***participation*** in a transparent decision-making process by local ***populations and stakeholders***, in issues related to coastal zones uses;
- to organize cross-sectoral coordination of the various administrative services and Regional and local authorities competent in coastal zones;
- to formulate land use strategies, plans and programmes;
- to take into account the multiplicity and diversity of activities in coastal zones and giving priority, where necessary, to public services and activities requiring the immediate proximity of the sea;
- to balance uses throughout the entire coastal zone, avoiding unnecessary concentration and urban sprawl;
- to pre-assess risks associated with the various human activities and infrastructure so as to prevent and reduce their negative impact on coastal zones;
- to prevent damage to the coastal environment, where it occurs and to carry out the appropriate restoration.

What are the most important economic activities on the coastal zone, needing a coordinated management in the frame of the ICZM-principles? These are *(Article 9 of the Protocol)*:

- Agriculture and industry, Fishing, Aquaculture, Tourism, Utilization of specific natural resources (excavation and extraction of minerals, including the use of seawater in desalination plants, extraction of sand, including seabed and river sediments), Infrastructure, energy facilities, ports and maritime works and structures, Maritime activities.

What are the specific coastal ecosystems needed measures to protect their characteristics? These are *(Article 10 of the Protocol)*:

- Wetlands and estuaries, Marine habitats, Coastal forests and woods, Dunes.

What "instruments" exist, helping the implementation of ICZM? These are:

- Monitoring and observation mechanisms and networks;
- Mediterranean Strategy for ICZM;
- National coastal strategies, plans and programmes;
- Land policy;
- Economic, financial and fiscal instruments.

3.4.2 Applying the ICZM principles in the Ionian Islands

The general frame

Ionian Islands form a land-sea system in the middle of the Mediterranean sea. The area is ***geodynamically*** active. Seawards of the Ionian Islands a ***subduction zone*** is formed. Along this zone the African plate moves northwards, beneath the European plate. This dynamic resulted to a ***diverse geomorphology***: land, shelf area, island arc, shelf brake, deep sea.

The geodynamically active area is a place which gives unexpected and uncalculated earthquakes, mass movements from the shelf to the deeper zone. The earthquakes as well as the mass movements can lead secondarily to the creation of ***tsunami*** waves.

Map 26: The geomorphology of the case study area and the Mediterranean Basin
Source: processed by the authors

Integrated planning and integrated management have to take seriously into account both natural phenomena, earthquakes and tsunami. It is ***"obligatory"*** to make the ***"invisible"*** risk of the earthquakes and the tsunami ***"visible".***

A result of the mentioned geodynamic is the complicated ***geodiversity*** of the study area, island complexes, semi-enclosed seas, gulfs, straits, shelf areas, shelf brake, canyons, deep sea, … The complicated ***geodiversity*** forms the appropriate "substratum" for a significant ***biodiversity***.

Mapping the steps how to apply the ICZM principles in the Ionian Islands

Step 1: ***Organizing active administrative core groups in the different administrative levels and establishing a continuous cooperation***

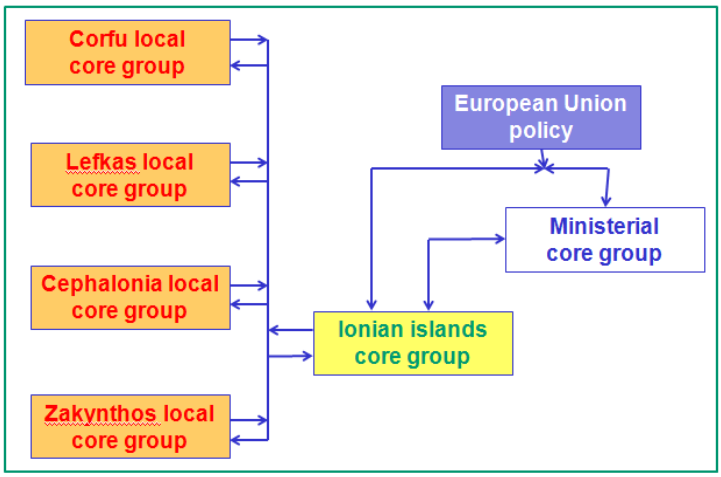


Figure 6: Possible cooperation schemes and groups in the study area
Source: processed by the authors

In the local, Regional and ministerial groups participate permanent scientific staff and administrative persons. They have the mandate to formulate separately the local, Regional and central plans and management tools related to the management of coastal zone, following concrete steps.

Step 2: ***Collection of information related to the natural system of the islands***

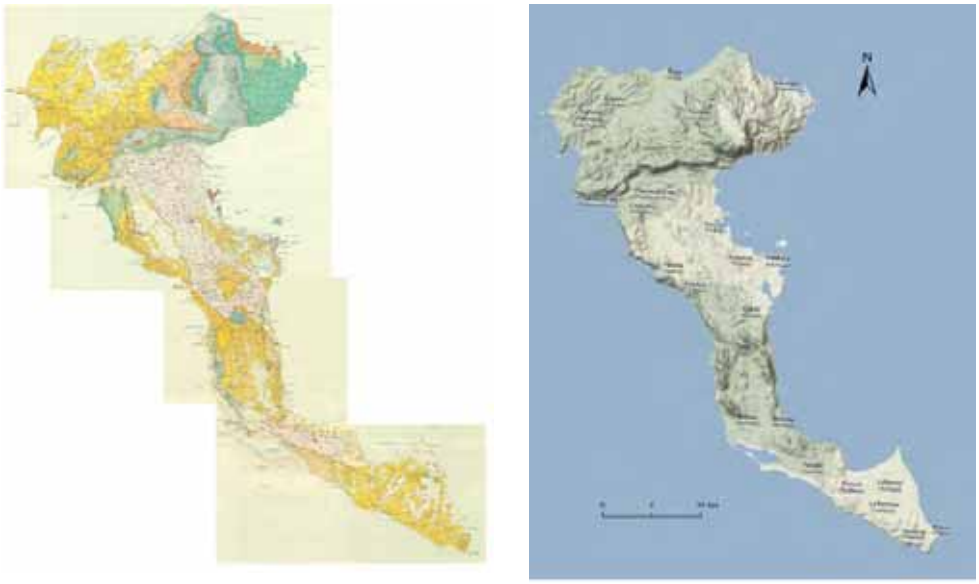
The existing information of the natural system of each island will be collected. Maps and open access data banks will be established. Geological, geomorphological, hydrographical, meteorological, flora and fauna etc. information will be the content of the local, Regional and central information banks.

An example: Corfu Island

Corfu island is chosen as demonstration example to present useful tools for the collection of information related to the coastal zone of the island. In Map 27, the geological and the geomorphological structure of the island is presented. In the geological structure of the island Alpine and post Alpine formations and deposits are involved. The greater part of the island can be characterized as mountainous to semi-mountainous with intramontanous valleys and coastal basins.

The correlation of the morphological features with the geological elements reflects an effect of the geology of the area on the development of the morphological features. The geological and the geomorphological characteristics of the island are the main factors controlling the drainage system of the island as well as the orientation and the diversity of the coasts.

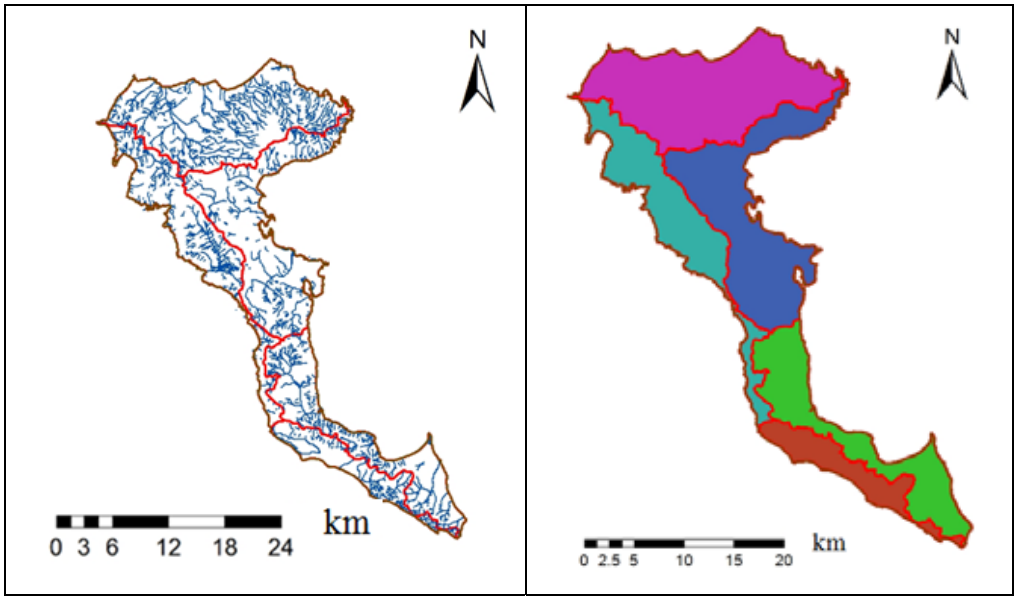
Taking into account the orientation of the coasts and the shape and extension of the drainage basins we can divide the land area in ***physiographic units***. Based on this principle the Corfu island is divided in five physiographic units, one looking to the north, two to the east, one to the southwest and the last one to the west.



Blue, green colour = Alpidic formations
Light colours = post Alpidic formations

Map 27 (a and b): Geological layers and relief of the Corfu Island
Source: processed by the authors

In Map 28 we can see the drainage system of the Corfu island as well as the boundaries of the main drainage basins, which define the extension of the ***physiographic*** units.



Map 28 (a and b): Drainage network grouped in main physiographic units in the Corfu Island
Source: processed by the authors

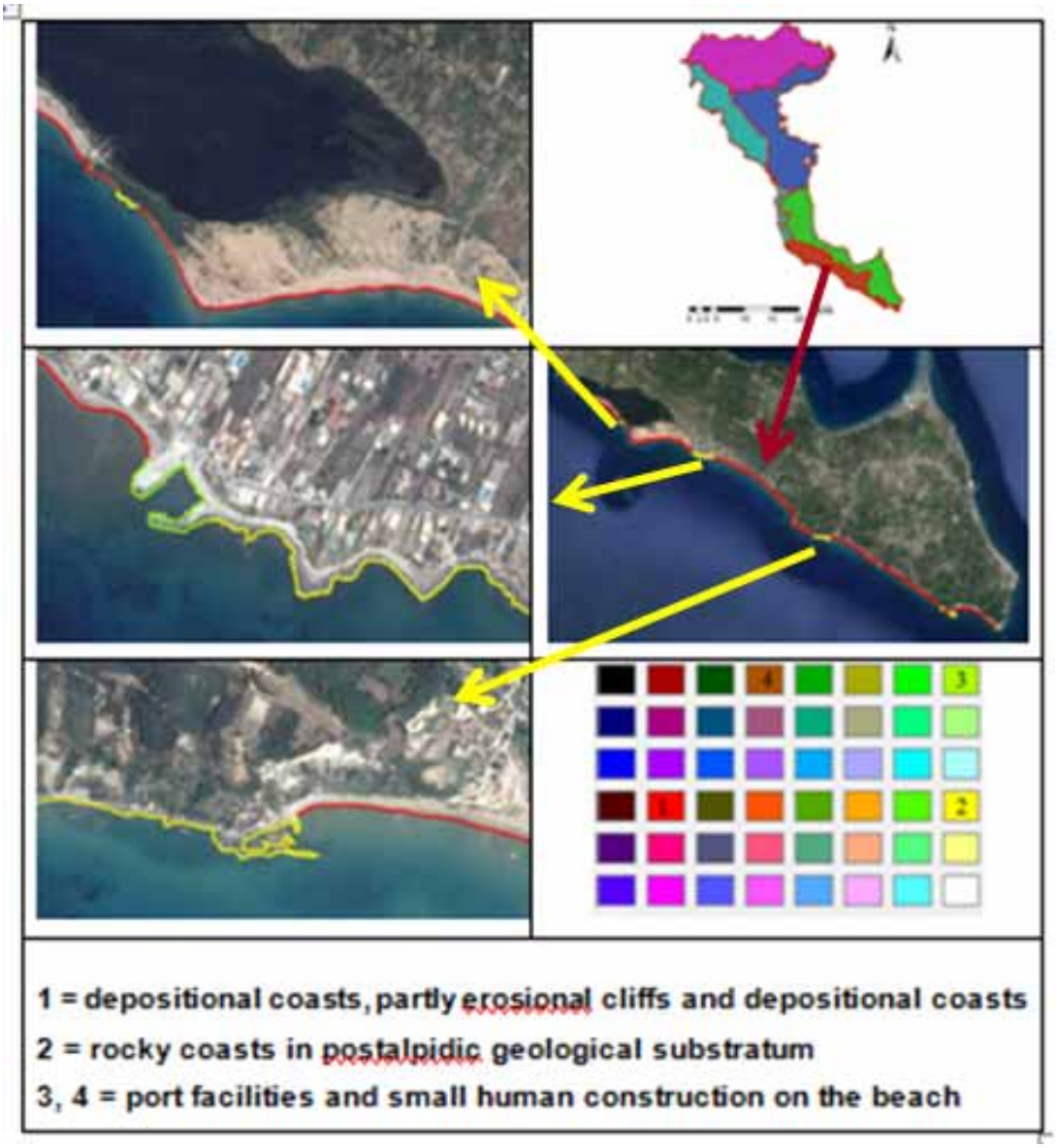
The next useful tool for the collection of important information related to the coastal zone of the island is the classification of the coasts using the Google Earth Images and information.

Using this technique we classified the coasts of the ***SW physiographic unit*** of the Corfu island. We used different colors to distinguish coastal types, to qualify and quantify them. In the image mosaic of Map 29 the applied technique is shown.

The quantification of the data collected using the above technique shows the dominance of the depositional coasts. A part of the depositional coasts is formed as a narrow beach at the base of a cliff face. The data of these measurements are included in Table 19.

Table 19: Typology of the Corfu coasts
Source: processed by the authors

Coastal type **SW physiographic unit of Corfu island**	**Length in meters (m)**	**%**
Depositional coasts, partly narrow beaches at the base of a cliff face	22,600	82.0
Rocky coasts in postalpidic geological substratum	4,200	15.2
Port facilities and small human construction on the coast	800	2,.8
Total	**27,600**	**100.0**



Map 29: Coastal typology of Corfu Island
Source: processed by the authors

The data collected can be saved using as geographical unit the **km^2**. Each **km^2** has an identity number. Using this identity number we can create a data base with all the information related to the natural system as well as the anthropogenic presence and activities.

Map 30 shows the **km^2** covering the whole coastal area of Corfu island and an example of the **km^2** geographic unit showing how the unit can be used as data base unit.

Map 30: Geographical units using the km^2 method
Source: processed by the authors

As it is mentioned above Integrated Coastal Zone Management has to take seriously into account:

a) long term natural phenomena, like Sea Level Rise due to the climate change;

b) the invisible risk of a tsunami.

The geomorphology of the Ionian Islands shows generally steep slopes and the sea inundation due to the Sea Level Rise will be less extensive. The Sea Level Rise is a slow procedure, so the societies can adapt their activities to the evolution of the phenomenon.

A contribution to the question of how to make the ***invisible*** risk of a tsunami ***visible*** is in the attached to this report text, as Annex, with the title: ***"Estimating tsunami threat in coastal areas of the Ionian Islands – Case study Gulf of Lagana, Southern Zakynthos"***

Step 3: ***Describing the human activities***

Information about the human activities in the islands will be also content of the established information banks (tourism, navigation, fisheries, aquaculture, wind farms, etc., hydro carbons, marine pollution, climate change, underwater cultural heritage, …).

Step 4: ***Description of the recent management practices – Lessons to learn***

Step 5: ***Establishing stakeholder groups – Bridge the stakeholders with the knowledge producers [from the science to society]***

The mobilization of the stakeholders and the participatory principles are the challenge and the most innovative procedure by the planning and the management of the nature.

Step 6: ***Navigating to the future – Apply the principles of the ICZM***

Step 7: ***Communicating the experience to other Contracting Partners***

3.5 Testing and evaluation of MSP methodologies and tools in the case study area

3.5.1 Lessons learnt by the simulation of governance schemes in the local meetings

Lessons learnt by the Meetings in the case study area, will be commented according to the following thematic:

- **MSP governance lessons** (i.e. comments regarding the governance scheme for MSP: representativeness, interaction etc. according to each group of participants and island);
- **MSP lessons** (i.e. comments regarding MSP itself: awareness, needs, conflicts, synergies etc. according to each group of participants and island).

It is reminded that the comments are based on the interventions made by the local stakeholders during the interactive "local meetings" as well as on the Questionnaires filled-in by the stakeholders that participated in those meetings.

Governance lessons learnt

Organization of each Local Meeting proved to be a very difficult, complex and time-consuming process, mainly due to the following reasons:

- Absence of an up-to-date- list of Associations, NGOs etc. as well as of Authorities in each island, resulting in long efforts to obtain contact details and therefore, to reach all competent stakeholders and Officers;
- Skepticism on behalf of the Stakeholders, regarding the purpose of the "Local Meetings" (unknown background of the project team members and on their views regarding the topic of the meeting etc.);

- Skepticism on behalf of the Stakeholders, regarding other stakeholders participation to the meeting (due to previous conflicts, uncooperative attitude etc.);
- Difficulties regarding the ability of stakeholders to attend the Local Meetings (due to poor ferry connections, bad weather conditions etc.).

To overcome the above obstacles, multiple reminding e-mails and personal contacts by phone had to be done (even the very day of the Meeting), so as to ensure maximum participation and presence of representatives from all relevant stakeholders in each island.

Finally, after all these efforts, all Local Meetings were – more than expected – successful, i.e. achieved maximum participation and more importantly, balanced participation among stakeholders. However, only local and Regional Authorities were represented by several Officers in every Meeting; the rest of the stakeholder organisations were usually represented by a single person (rarely accompanied by a second one).

During the Meetings, Authority Officers were particularly involved in discussions and interactive. They were also more interested in filling-in the Questionnaire, providing answers to all questions included in the Form. On the other hand, Associations, Chambers and Marine Professionals (e.g. fishermen) in many cases were rather hesitant in expressing their views on the topic under discussion. As a result they were the ones to provide the fewest answers to the Questionnaires, both in quantity (total questionnaires filled-in) and in quality (shorter answers, and only in few of the questions asked). Finally, the group of Stakeholders that expressed the greatest interest in participating to the Local Meetings was the Entrepreneurs. In most of the cases, Entrepreneurs that attended the Meetings were very well prepared; i.e. with Notes and PowerPoint presentations, in order to promote and/or defend their business interests, especially those receiving criticism for being seen as conflicting by other sea or coastal users.

Regarding differences noticed per island, it is worth noting that in Corfu and Zante (which are both medium-sized islands, with an overdeveloped tourism sector), stakeholders from the tourism industry were poorly represented in the Local Meetings (if not at all represented, as in the case of Zante). On the other hand, in the island of Ithaca (a small-sized island, with an under development tourism sector) stakeholders' participation and representativeness was even more balanced. At the same time it was more than obvious that due to the limited population of the island (creating intimacy bonds among inhabitants), local society and stakeholders proved to be more flexible in tackling conflicts unofficially (in a friendly way), unlike Corfu and Zante, where local societies are not that connected (because of the bigger population and anonymity of citizens).

The fact that Corfu is the capital of the Region of Ionian Islands, thus an administrative center, resulted in a higher interest among stakeholders to become part of a wider governance network/scheme dealing with Marine Spatial Planning. They were also the ones to express the highest interest in getting information on future funding possibilities (EU projects etc.), concerning and affecting their marine space and activities. On the other hand, Ithaca's stakeholders expressed their deep concern whether a small society's opinion matters, so as to be truly heard by the distant decision-making centers (as is the central government of Greece in this case). As regards Zante, stakeholders seemed rather opposed to the possibility of a decision-making process not locally handled and they were the ones to fill-in the fewest Questionnaire Forms.

MSP lessons learnt

General comment: As reflected in the answers given to the Questionnaires, very few participants were aware of MSP as a process and as a tool for organizing sea-uses and achieving ecosystem based management in the sea. Therefore, attending these interactive meetings was a unique opportunity for all stakeholder groups to get information and/or feedback on the Mediterranean Protocol on ICZM, the latest EU Directive on MSP, the Adriatic-Ionian Strategy, as well as on other commitments of the country regarding the management of marine

and coastal space and the relevant tools for achieving sustainable development and blue growth. This lack of input and information is probably the reason why all groups were more or less unable to provide specific and well prepared answers to the question regarding their proposals for future Marine Spatial Plans in their marine Region (question included in the Questionnaire Form).

Comments on the Questionnaire answers and interventions made during the Meetings: Regarding the questions addressed exclusively to Professionals and Entrepreneurs, these related to the marine resources they use, their impact to the marine ecosystem and the contribution of their activity to the local society. In general, answers differentiated a lot among groups; Entrepreneurs (in aquaculture sector, hydroplane services etc.), were rather defensive with their professional field, often referring to studies proving the low impact of their activities to the environment. On the other hand, traditional professionals of the sea (e.g fishermen) being labor workers directly affected by the deterioration of the marine ecosystem and its ability to produce catches, were apologetic, recognizing the impact on the ecosystem caused by illegal practices adopted even by their own professional group.

Regarding the rest of the questions (addressed to all groups of stakeholders), they referred to conflicts among sea-users and proposals for future MSP attempts in their Region. As expected, Marine Professionals and Entrepreneurs mainly referred to conflicts and threats affecting their business units, naming aquaculture as one the most conflicting activity. Fishermen, pinpointed professional fishing boats as a threat to the marine ecosystem (causing loss of biodiversity and catches) and along with Authority Officers, Protected Areas Managers and Ecologist groups reported water pollution as a major threat to the marine ecosystem, caused both from the sea users and from the sailing boats of all types.

Table 20, presents a matrix, with the estimation/perception of local stakeholders on the conflicting uses and activities in the case study area. As reflected in Table 20, all regular activities taking place in the coastal zone are considered to be conflicting and threatening to the tourism industry (which is a sector highly prioritized in every island). In other words, tourism activity is perceived as the only use that cannot have synergies with other sectors, so it would be better in their view if it is never mixed with other uses. Environment follows, receiving almost equally high references (for being threatened by the majority of sea uses), while-aquaculture is perceived as a rather non-fitting activity in tourism oriented societies (as are the majority of Greek islands).

Given the above views, proposals made by the local stakeholders for future MSP attempts in the Region of the Ionian Islands, varied significantly. Entrepreneurs and other professionals listed a series of proposals, to the benefit of their professional interests (e.g. creation of hydroplane facilities, new rules in yachting tourism, creation of water parks, diving parks, other tourism facilities etc.). Authority Officers on the other hand, suggested stricter rules and building regulations along the coastline, protection of marine ecosystems (*Posidonia oceanic*a, etc.) and catches, further development of aquaculture (as an alternative to the monoculture of tourism) and limitation of air and water pollution. Finally, surveillance of the sea-users and of the marine space on a more regular basis was a common proposal made by all groups of stakeholders.

Other proposals made, were more specialized, referring to the specific needs of each island. In Corfu for example, special reference was made to the need for addressing conflicts with neighboring countries. In Zante for adopting stricter rules, or prohibiting exploitation of hydrocarbons close to the sensitive and highly touristic beaches of the island. Finally, in Ithaca, proposals referred to a better surveillance system that would protect marine space from waste disposal and at the same time would allow further development of marine ecotourism.

Table 20: Local stakeholders' estimation on conflicting sea uses and activities in the Ionian Sea
Source: processed by the authors

	Aquaculture	Fishing	Tourism	Navigation	Environmental Protection	Sea infrastructure	Residence
Aquaculture			6		1		
Fishing			5		2		
Tourism	6	5			10	1	1
Navigation					2		
Environmental Protection	1	2	10	2		2	
Sea infrastructure			1		2		
Residence			1				

Semi-compatible | Conditionally compatible | Compatible

To conclude, common place among all stakeholders in all Ionian Islands was the priority that should be set for elaborating a marine spatial plan in the Region of Ionian Islands, so as to achieve a more rational and fair organization of uses and activities on the coastal and marine space, to the mutual benefit of the local societies and the marine ecosystem as well. In addition, due to their demanding responsibilities and jurisdictions, Authorities expressed their need for more user-friendly MSP tools that will serve and facilitate the decision-making process as well as the licensing decisions. As such tools, they mentioned those related to the carrying capacity (vulnerability assessment) of the marine ecosystem and the environmental impact assessment of uses (indicators and cumulative impact assessments).

3.5.2 2D-GIS and 3D-GIS applications in the case study area

Working in GIS environment for the development of MSP maps for the Ionian Islands Region

In order to adjust the GIS tool for the needs of Marine Spatial Planning in the Ionian Islands Region, a four-step procedure was adopted:

- Search and collection of data;
- Editing and digital formatting of data;
- Visualization of the results / Cartography and mapping.

Quest and collection of geo-spatial data

Research for the acquisition of the necessary geospatial data in a digital format, can become an extremely time-consuming and rather expensive task in the MSP procedure. In our case study area we had the pleasant

surprise to find more relevant data than what we expected initially. Most of them were scattered, products of several previous projects, not necessarily of the same scale all of them. It is of major importance on the one hand to **compile** all this information on the sea as well as on projects and their outcomes, and on the other hand to make them **available and accessible** at least to decision-makers and planners.

For the collection of the available and necessary geospatial data, the core team addressed the following authorities, Institutions etc.:

- the Ministry for the Environment and Energy;
- the Ministry of Mercantile Marine, the Aegean and islands policy;
- the Hellenic Centre for Marine Research;
- the Region of the Ionian Islands;
- National, European, International Geoportals.

Editing and digital formatting of geo-spatial data

Datasets found, were initially checked in further detail (for their features, attributes and metadata) and then edited so as to correspond to the format needed, to be used in the MSP analysis.

In the case of the Region of Ionian Islands, the majority of the data found was in different formats, projection systems, scales and other attribute details; therefore, prior and extended editing had to take place, so as the data obtained the appropriate format for the GIS tool. Procedure followed, included:

a) Conversion of dataset in a GIS format

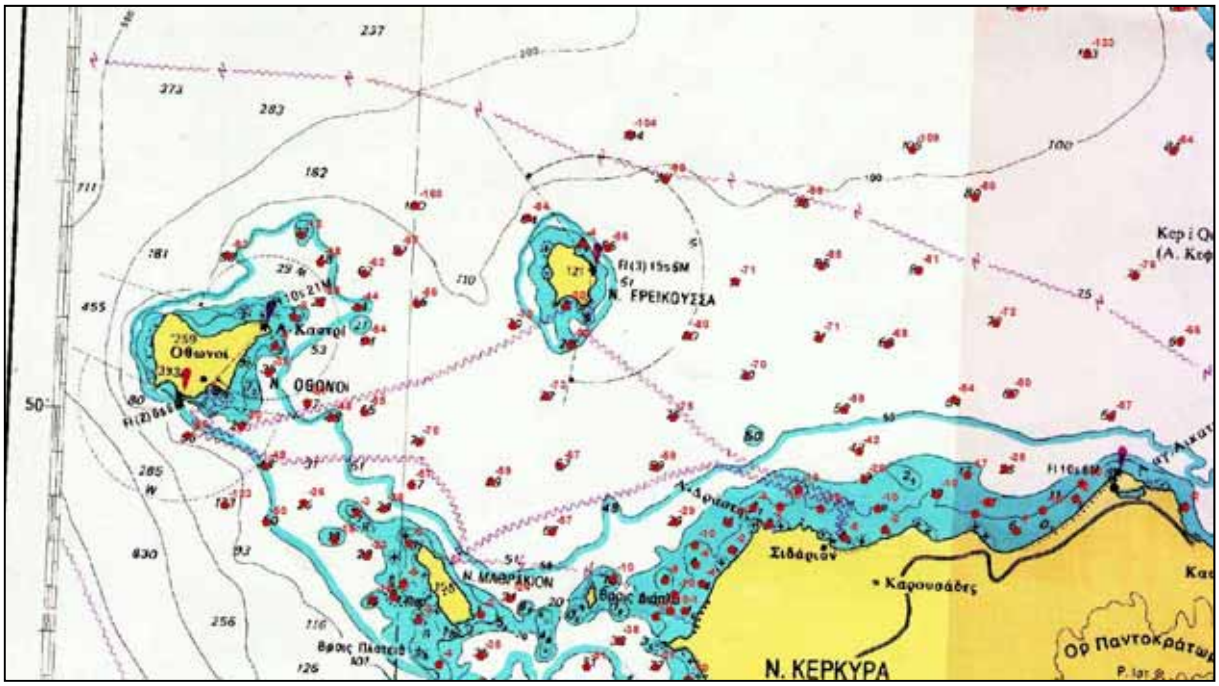
Available geo-spatial data from the case study area was in different formats and had to be converted into a suitable form for the GIS tools. To this purpose, the process followed, included:

- Conversion of geo-spatial data in digital formats: many maps from the case study area were in hardcopy format. Using scanners, all maps were converted into digital ones.
- Definition of the coordinate system: The coordinate system chosen for the datasets of the Ionian Islands Region was the Hellenic Geodetic Reference System 1987 or HGRS87. As a result, additional conversions had to be done, especially in the case of:
  - Data having different coordinate system (e.g. data in WGS84 coordinate system had to be reformed and reprojected into the national HGRS87).
  - Data without a defined coordinate system, as in the case of most scanned maps, for which the procedure followed included projection to the Greek coordinate system and then application of geometric corrections.

b) Creation of new vector layers

A great number of geospatial information was exported from georeferenced digital maps. Using the digitizing procedure, new vector layers (like: bathymetric point data, shipping routes, submarine power cables, etc.) were created.

Among all layers created for the case study area, the relief was the most difficult to create, since availability of bathymetric data varied considerably. For example, isocontour bathymetric data per 2 kilometers were available for all the Mediterranean Basin, while in areas close to the shoreline, isocontours were available per 10 meters. Given that, and the fact that in the Region of Ionian Islands - 200m marine benthic contour line was also available, it was finally decided to work on a 50 meters spatial resolution of bathymetry model, using interpolation techniques to reproduce the terrain in more details. Such interpolation techniques were used both in both 2D maps and 3D maps.



Map 31: Section of scanned map, requiring geoprocessing before used for the creation of bathymetry dataset
Source: Hellenic Navy Hydrographic Service

c) Categorization and grouping of geo-spatial data

Available geo-spatial data were categorized and organized according to its thematic. In the case of the coastal and marine areas of the Ionian Island Region, these groups of data regarded:

- Administrative & National Boundaries:
  - Declared Continental Shelf;
  - Territorial waters 6 n. mi.;
  - NUTS II – Regions;
  - NUTS III – Prefectures;
  - Settlements;
- Geophysical Data:
  - Bathymetric Data and Terrain Data;
  - Bathymetric of 200 meters;
  - Marine caves;
- Marine Natural & Cultural Environment :
  - Posidonia oceanica meadows;
  - Natura 2000 sites (SCI and SPA);
  - Landscapes of Exceptional Beauty;
  - Important wetlands;
  - National Parks;
  - Corfu UNESCO Cultural Site;
  - Traditional Settlements;
- Economic and Productive Zones – Sea uses:
  - Fishery zones;
  - Zones with permission for Aquaculture;
  - Hydrocarbon Research Zones;
  - Marine Transportation Network;
  - Submarine Power Cables;

- Infrastructures, Land-uses:
  - Ports (International, National, Regional);
  - Airports;
  - Heliports;
  - Road Network;
  - Touristic Zones;
  - Liquid and solid waste management infrastructures;
  - Blue Flag Beaches;
  - Secondary Sector.

Visualisation of the data (cartography and mapping)

Visualization of the datasets in interactive maps was made with the use of 2D and 3D cartographic methods.

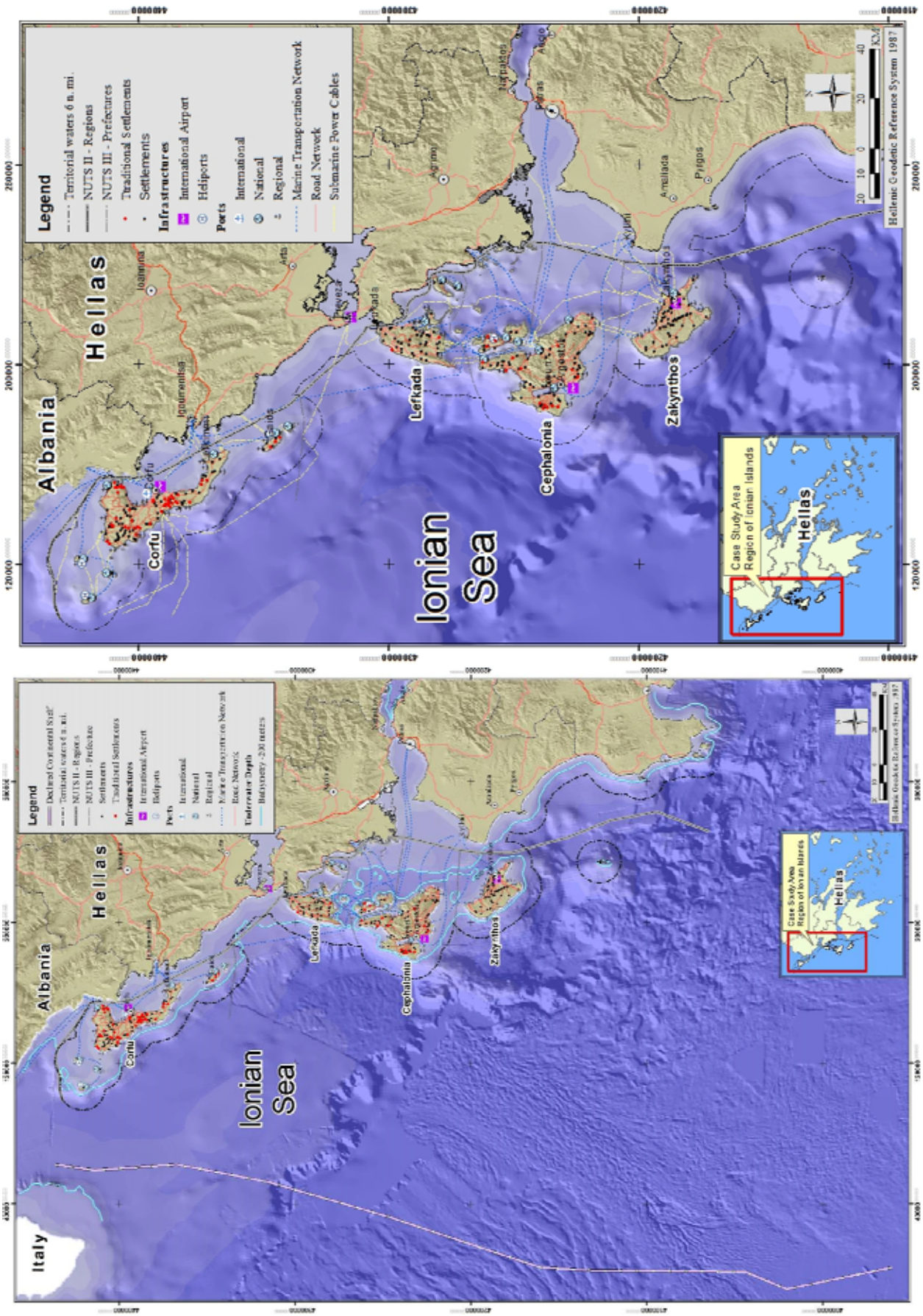
a) 2D Mapping

In the case study area, most of the above data required further digital analysis and editing, in order to be displayed in 2D-GIS maps. Then, proper colors, symbols etc. were chosen, in order to keep maps clear and understandable to all users. Special attention was given in the blue shading of the sea, so as to keep a clear picture both of the relief and of the rest data displayed, concerning infrastructure and activities taking place in the rest layers of the sea. 2D maps were also used in the meetings with the local authorities and the rest of the stakeholders, in order to facilitate the collection of more geospatial data and the interaction between stakeholders and the core team.

b) 3D Mapping

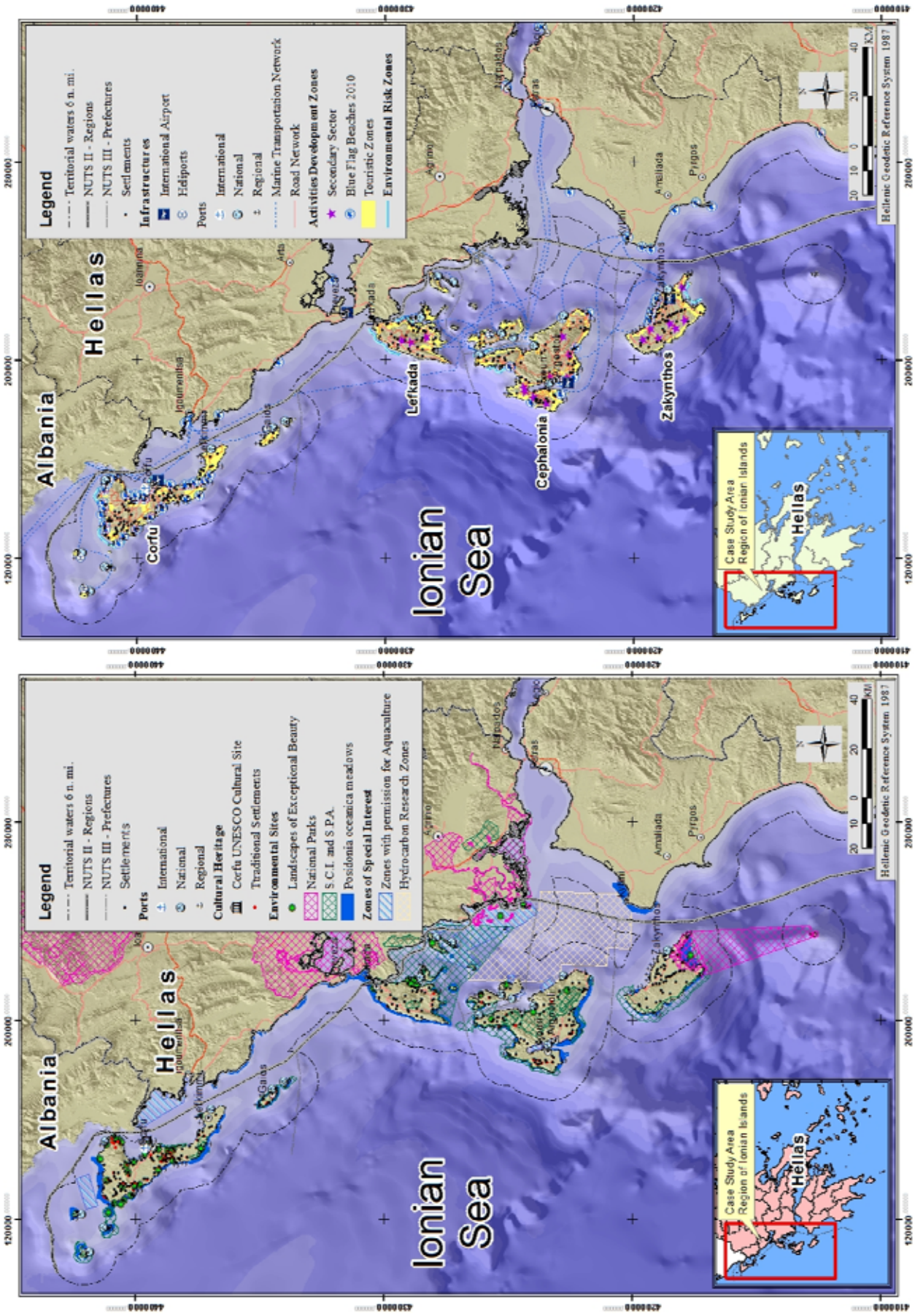
Creation of 3D maps for the Region of the Ionian Islands required a virtual-user interface environment which renders 3D models, map layers, aerial photos, remote sensing images, digital elevation models (DEM), as well as other data in a unified 3D interactive environment. Objectives of the 3D-GIS interactive maps developed for the Region of the Ionian Islands were:

- The display and visualization of the current situation (sea-uses, land covers etc.) in small-scales;
- The facilitation of public participation and consultation that was simulated in the local meetings in the Region of Ionian Islands.



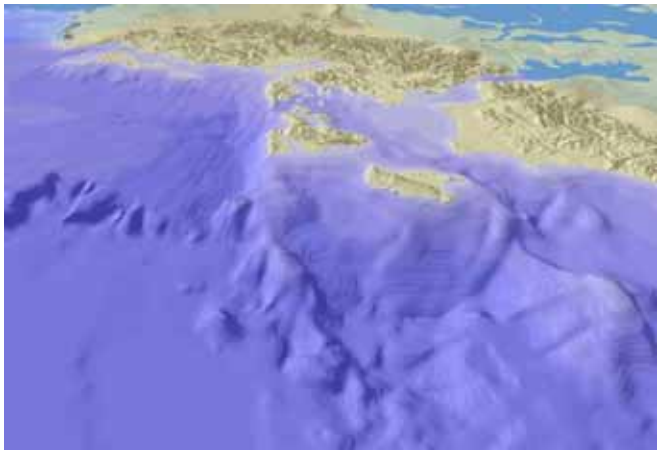
Map 32, Map 33: Main geophysical data and Delimitations and main infrastructure in the case study area

Source: processed by the authors

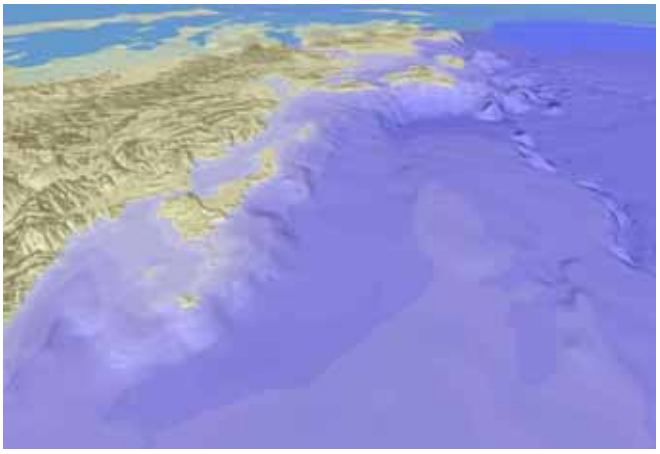


Map 34, Map 35: Natural and Cultural Environment and Coastal infrastructure interacting with the sea in the case study area

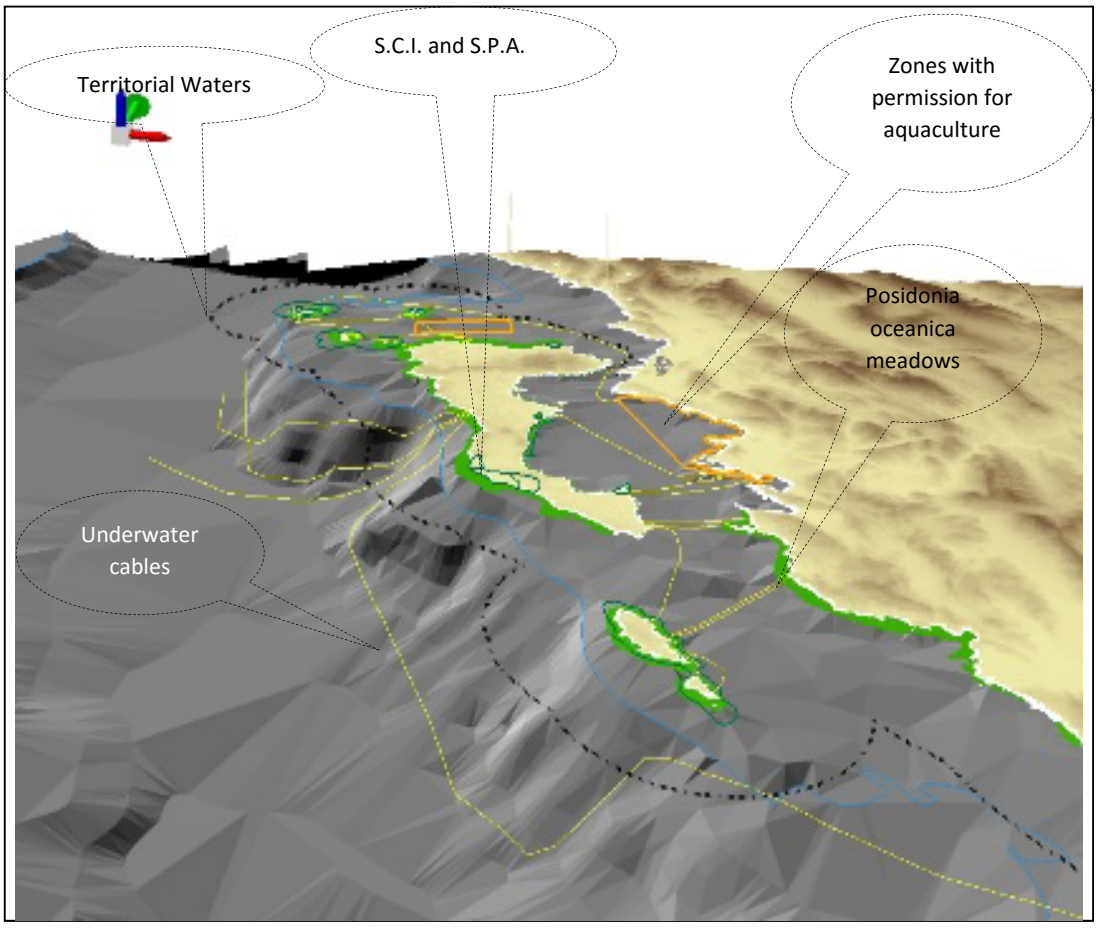
Source: processed by the authors



Map 36*:* 3D view of the underwater relief of Ionian Sea (I)
Source: processed by the authors



Map 37: 3D view of the underwater relief of Ionian Sea (II)
Source: processed by the authors



Map 38: 3D view of main geophysical, environmental and other data in the case study area
Source: processed by the authors

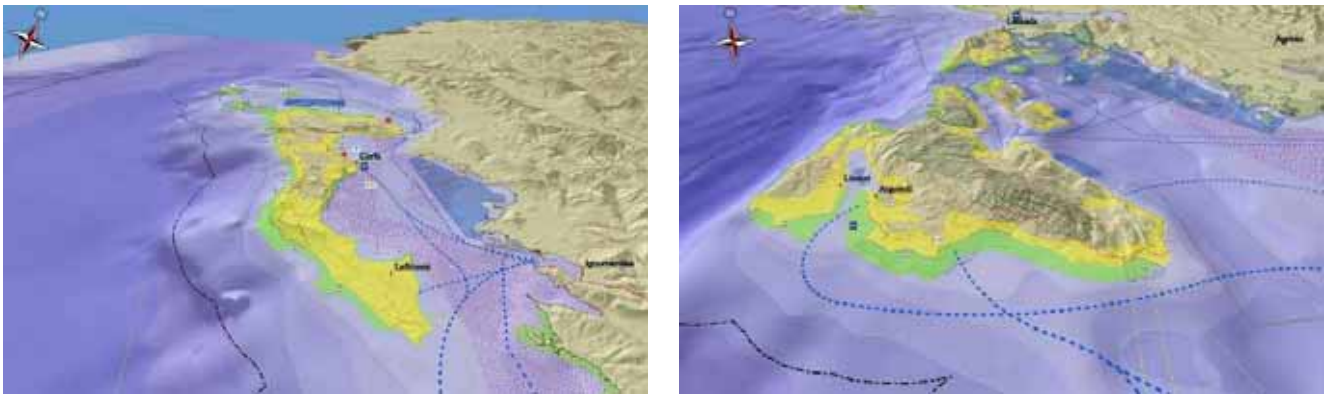
3D mapping methodology for MSP in the case study area

Creation of 3D maps, required acquisition and editing of a series of geo-spatial data as described in section 2.4.1. For the 3D visualizations in the case study area, methodological steps followed are described below:

- setting of the basic 3D interactive environment with the use of official geo-spatial data;
- enrichment of the 3D datasets with qualitative – quantitative information acquired from the local stakeholders, participating in the local meetings;
- creation and testing of MSP scenarios during the local meetings.

3D maps produced for the case study area, were broadly used in the local meetings with stakeholders of the Region of Ionia Islands and particularly served to:

a) the better understanding of the complexity and interconnection of sea and coastal uses;
b) the enrichment of the datasets for the marine space;
c) the expression of needs in future attempts for MSP in their Region.

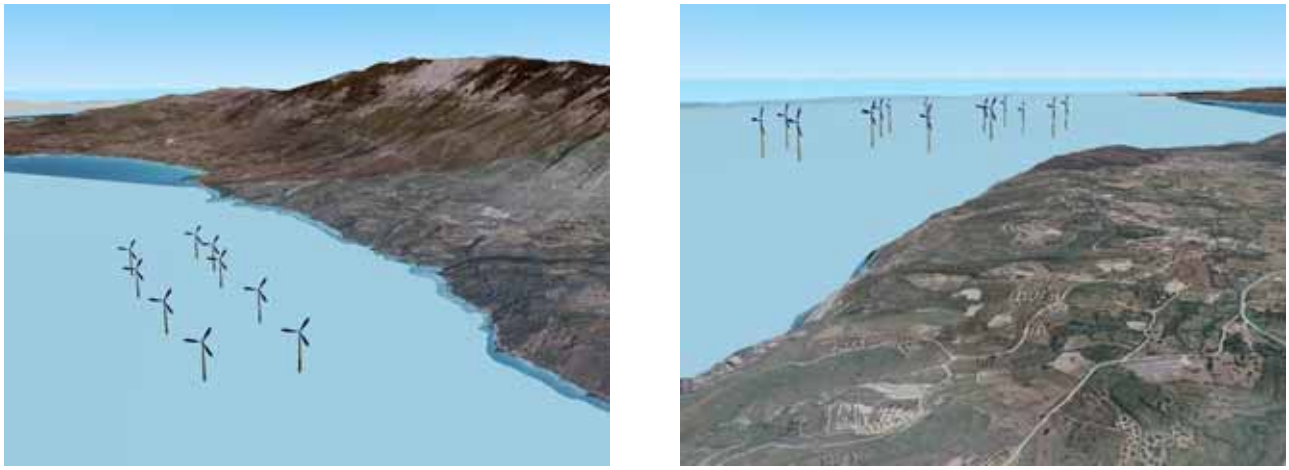


Map 39: 3D-visualization of the Ionian Islands with a complex spatial information
Source: processed by the authors

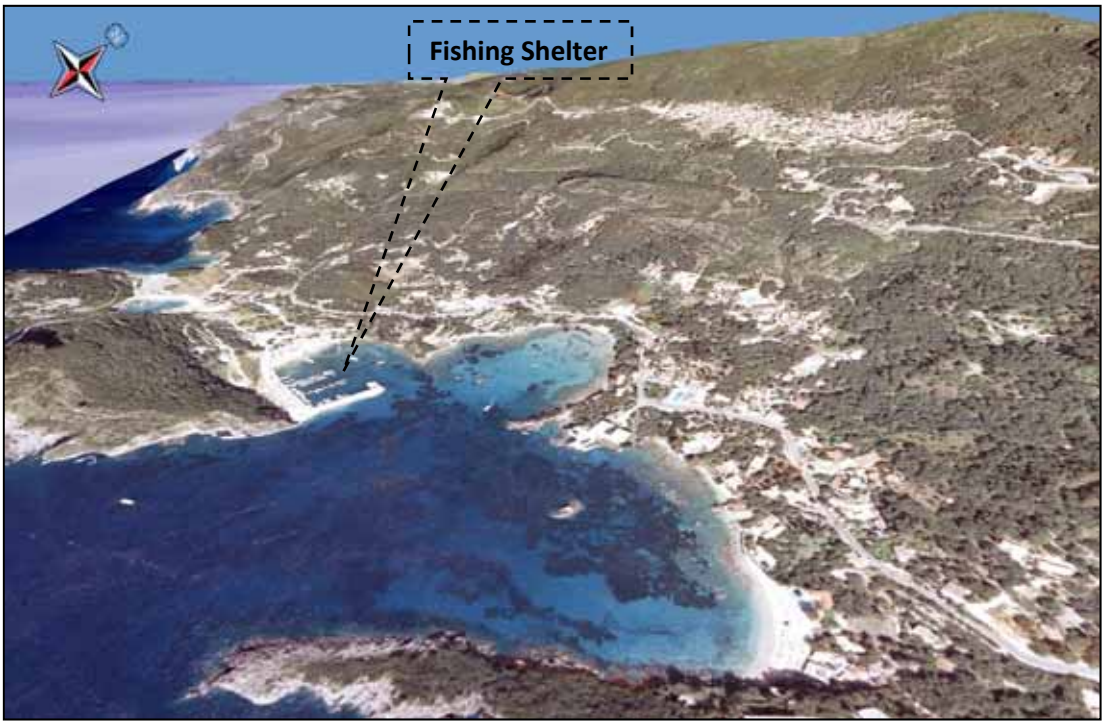
Map 40 illustrates a scenario of an off-shore wind farm. In this case, the interactive 3D model permitted clear observation of the off-shore wind farm from different perspectives (seawards and landwards) through the ability it provides for virtual flying above the area or installation in question.

Map 41 illustrates a screenshot of the 3D-gis environment that was used in the Corfu local meeting. High resolution aerial photos permitted the easy detection of fishing shelters. Spatial resolution of the images is 1x1 meters.

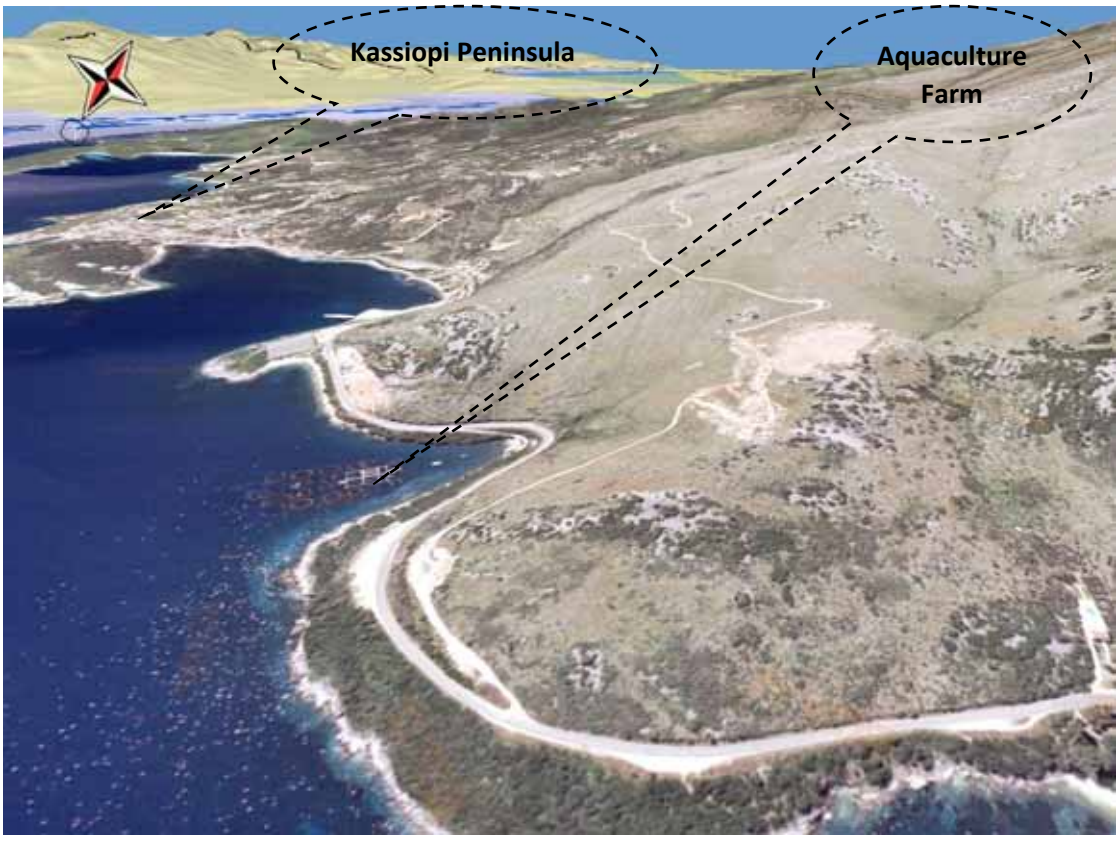
Map 42 illustrates a screenshot of the 3D-GIS environment that was used for the visualization of the existing aquaculture farm, near Kassiopi peninsula, in the northern part of Corfu Island.



Map 40: Perspective view of an off-shore wind farm – *Source: processed by the authors*



Map 41: Identification of fishing shelters in a 3D-GIS interactive environment
Source: processed by the authors



Map 42: Visualisation of aquaculture farms in a 3D-GIS interactive environment
Source: processed by the authors

3.5.3 Assessment of marine ecosystem's vulnerability to human threats in the Region of Ionian Islands

The case of the Marine Protected Area of Zakynthos (presentation by Kokkali et al., 2015)

Mapping of pressures is imperative for the effective management of human activities but it does not allow the identification of the extent and nature of ecosystems' responses which are related to their vulnerability to a given threat (Zacharias and Greg, 2005; Halpern *et al.*, 2007; Korpinen *et al.*, 2012). The assessment of ecosystems' vulnerability to human stressors is of high importance in impact and risk assessment processes as it depicts which species/habitats are mostly affected by specific activities. This approach may contribute to the development of alternative scenarios for an effective spatial management process (Arkema *et al.*, 2014).

The example of vulnerability assessment is derived from the application of Halpern *et al.*, (2007) methodology in the case study of the National Marine Park of Zakynthos (NMPZ) within the frame of the FP7 projects MESMA and CoCoNET. This study aims to evaluate the vulnerability of key marine ecosystem species of the National Marine Park of Zakynthos (NMPZ) to pressures exerted by main human activities in the area. The NMPZ was established for the conservation of the nesting and breeding areas of the loggerhead seaturles (*Caretta caretta*), as well as the protection of certain other priority species and habitats. Following the EU Habitats Directive (92/43/EEC) selected ecosystem components of the study area were classified into two categories in terms of their conservation status and are shown in Table 21 along with the main human activities taking place there.

Table 21: Vulnerability scores of high and low priority ecosystem components for the marine Region of the National Park of Zakynthos
Source: adapted from Kokkali et al. 2015

Priority status	Ecosystem component	Activity	Pressure	Vulnerability Score
High	*Caretta caretta*	Small scale fishing	Accidental entanglement	2.1
	Caretta caretta	Boating	Boat strike	2.1
	Caretta caretta	Tourism (use by visitors)	Physical damage-Disturbance	2.5
	Caretta caretta	Boating	Contamination	1.9
	Monachus monachus	Small scale fishing	Prey depletion	1.9
	Monachus monachus	Small scale fishing	Direct killing	2.4
	Monachus monachus	Shoreline development	Habitat loss/degradatione	1.8
	Phalacrocorax aristotelis	Small scale fishing	Accidental by- catch	1.6
	Posidonia oceanica	Small scale fishing	Extraction	1.9
	Posidonia oceanica	Boating	Extraction	1.8
	Posidonia oceanica	Coastal, riverine and atmospheric inputs from land	Contamination	2.1
Low	*Delphinus delphis*	Small scale fishing	Accidental entanglement	1.5
	Delphinus delphis	Small scale fishing	Prey depletion	1.7
	Delphinus delphis	Small scale fishing	Direct killing	1.8
	Tursiops truncatus	Small scale fishing	Accidental entanglement	2.1
	Tursiops truncatus	Small scale fishing	Prey depletion	1.7
	Tursiops truncatus	Small scale fishing	Direct killing	1.8
	Calonectris diomedea	Small scale fishing	Accidental by- catch	2.3

This study is a first attempt to assess the vulnerability of the ecosystem species of the NMPZ in relation to human threats/pressures as they are reported in a previous study (Kokkali *et al.*, 2014). The analysis was based on the assessment of five vulnerability measures (Scale, Frequency, Functional effect, Resistance, Recovery) accompanied with the measure of certainty for the existing ecosystem components proposed by Halpern *et al.* (2007) and modified by Korpinen *et al.*, 2012 using expert judgment.

The results refer to 18 species-threat combinations. Herein, we present an example of the provided results regarding the Mediterranean monk seal (*Monachus monachus*) which is a species of high conservation priority. More details can be found in Kokkali *et al.* 2015. Table 21 indicates the human activities of the area and the exerted pressures on *Monachus monachus* and finally, the vulnerability scores which were derived from the application of vulnerability assessment taking into account the five vulnerability measures and the measure of certainty.

Results of the vulnerability assessment indicated that direct killing has been considered by experts as the main pressure for *Monachus monachus* while prey depletion and even more habitat loss were ranked as less important. Assessment of the selected species vulnerability to human activities of the NMPZ indicated the different responses of each species to pressures/threats arising by these activities. Vulnerability assessment using the specific measures is useful to policy makers and conservation organizations in order to rank diverse threats and ecosystems in a comparable way and prioritize needs towards an effective MSP.

3.5.4 Application of cumulative impact assessment on ecosystem components in two case studies in the Ionian Sea

Herein we provide examples of the application of cumulative impact assessment (Halpern *et al.*, 2008; Micheli *et al.*, 2013) conducted in the frame of the research projects CoCoNet, and ADRIPLAN to quantify the potential effects of pressures from human activities on selected ecosystem components in areas of the Ionian Sea.

It is useful to remember that the credibility and effectiveness of this tool, as well of that of vulnerability assessment, depends on the availability of necessary data. If data are limited, the resulting maps have a considerable degree of subjectivity related to projections and ponderations used.

The CoCoNet case study (the following section is part of the CoCoNet Project / Deliverable 2.3)

The analysis of cumulative impacts in the Ionian Sea (Map 43) was conducted following Micheli *et al.*, 2013. Spatial data of the three marine habitats presented in the CoCoNet Deliverable 2.3 (Vassilopoulou *et al.*, 2015) were considered for the analysis: *Posidonia* meadows (AA.VV, CRISMA, 2006), *Cystoseira* canopies (Fraschetti *et al.*, 2005; Fraschetti *et al.*, 2006; Bulleri *et al.*, 2012; Fraschetti *et al.*, 2012; Sala *et al.*, 2012; Crowe *et al.*, 2013; Fraschetti *et al.*, 2013; National Research Council PRISMA II project; Fraschetti S., personal observations) and coralligenous outcrops (AA.VV., "BIOMAP – BIOcostruzioni MArine in Puglia" project deliverables, www.biomapping.it).

Additionally, spatial data of six different human activities were used for the performance of the analysis: aquaculture, fishing activity, cables network, ports, waste disposal areas, along with the Land Use Simplified Index (LUSI). Spatial information for aquaculture areas was derived from the "Special Frameworks for Spatial Planning and Sustainable Development" (SFSPSD) for aquaculture sector (Ministry of Environment, Energy and Climate Change, 2013). In order to illustrate fishing activity, data of the registered fleet of small-scale fisheries in every single port were used and buffer zones of 5km (Kavadas, personal communication) around the ports were created in order to present the respective fishing effort. Data on trawling activities have not been used as the studied habitats were in areas within 1.5 nm from the shore where trawling is prohibited. Spatial information about the cables, ports and waste disposal areas were provided by data of the Hellenic Centre for Marine Research (HCMR). As for the LUSI index, it was based on quantitative evaluation of official census data or from satellite images that reflect the land use. The latter Index was proposed during the WFD

intercalibration exercise in order to evaluate the effectiveness of the biotic indexes and was based on CORINE Landcover data (HCMR, 2012; HCMR, 2013; Lampou *et al.*, 2015; Simboura *et al.*, 2015a; Simboura *et al.*, 2015b). The computation of the weighting coefficients was based on expert judgment processes evaluating the indicative vulnerability of habitats on each given threat (see Halpern *et al.*, 2007; Halpern *et al.*, 2008; Korpinen *et al.*, 2012).

Following the above, mapping of marine habitats and human activities has been made in a Geographic Information System environment (ArcGIS 10.1), the aforementioned grid was used, the weighting coefficients for each combination have been set and finally the cumulative impact scores were calculated providing also their visualization on the applied grid (Map 43). This process identified potentially highly impacted areas where Marine Spatial Planning (MSP) processes should be applied to mitigate effects. Outcomes suggested that the most impacted areas for the selected habitats were those where aquaculture activities and waste disposal discharges had been more intense.

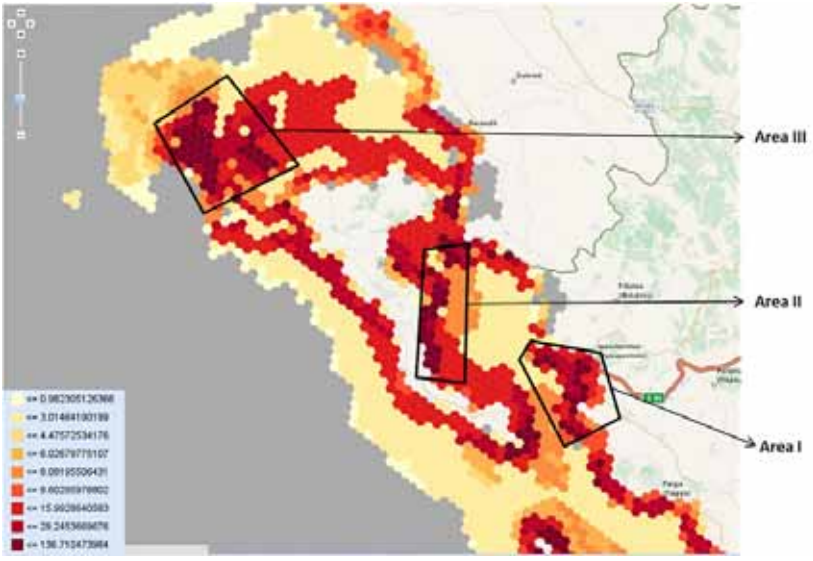
However, it should be noted that the sensitivity of the performed methodology is highly influenced by the process of vulnerability assessment as its results may influence directly the final outcomes. Moreover, despite the fact that the harmonization of the available spatial data serves as a reference for the computation of impacts, specific limitations may arise regarding the type of spatial data (spatial data can be expressed as points, lines and/or areas) as well as their spatial accuracy. The use of a specific cell size within an examined area improves the spatial accuracy of all used data (which may be described either as points, lines or areas). In any case, accounting in parallel for the inherited uncertainty due to points mentioned above, this study also confirmed that cumulative impact assessment efforts may constitute a valuable tool for decision makers engaged in Marine Spatial Planning (MSP).

Map 43: Visualization of cumulative impacts on the selected marine habitats within the case study area
Source: D2.3 CoCoNet project

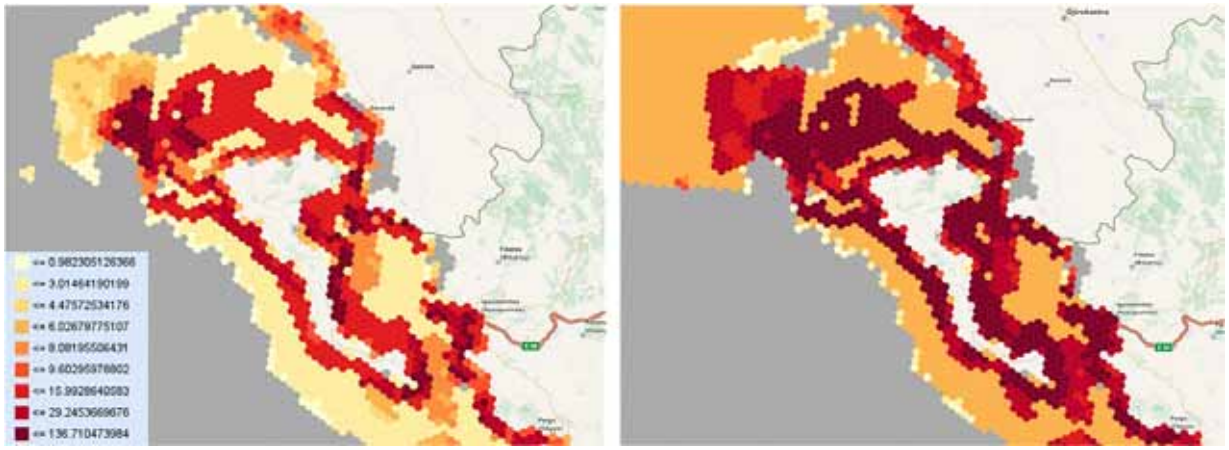
The ADRIPLAN case study (the following section is part of the ADRIPLAN deliverable 3.1/7)

Outcomes suggested a great overlapping of activities and ecosystem components. The assessment of cumulative impact of existing activities on the key ecosystem components was rather high, mainly in coastal areas (Map 44). Three areas could be identified as the most impacted. The first one is located in the area of Igoumenitsa (Area I), where essential fish habitats, sea grass meadows and monk seals seemed to have a high vulnerability to fishing pressure (from both trawling and small-scale fisheries) and then pollution from the Igoumenitsa port (Map 44). In the central-eastern part of Corfu Island, off the city of Corfu, a second area (Area II) of high vulnerability was identified, as the Natura 2000 site established there, the essential fish habitats, as well as the monk seals seemed to have strong interactions with fishing activities (both medium and small scale) (Map 44). Finally, the third area (Area III) was identified in the Diapontia Island complex, where almost all maritime activities had a strong effect on the key ecosystem components (essential fish habitats, Natura 2000 sites, monk seals, cetaceans). Indeed, in the case of the Diapontia complex, cumulative impact scores were higher as compared to the other areas, and considering the fact that this site constitutes an area of high importance, as it has been suggested as an Area of Special Spatial Interventions in the Reform of the Regional SP Framework of the Ionian Islands, the Diapontia complex should be considered as an area of high priority for the elaboration of a solid spatial management plan.

Moreover, an estimate of the impact of activities anticipated to take place in the area in the near future on the key ecosystem components, considering their vulnerability to each one of them, was attempted. Indeed, potential future activities are planned in the already heavily impacted area of the Diapontia Islands complex; nevertheless, the application of cumulative impact assessment revealed that pressures on ecosystems would be more intense in the entire study area not only in the northern parts. In figure 3 the anticipated impact of activities on ecosystems is presented on the basis of the assumption that no spatial management actions will take place in the near future. Once more, it is apparent, from the results of our analyses that the entire area, and especially the Diapontia Islands complex, needs an effective spatial management plan not only to minimize the possibilities of further deterioration of the status of the ecosystem but even improve existing conditions.



Map 44: Cumulative impact of current activities on ecosystem components
Source: ADRIPLAN D3.1/7



Map 45: Map showing the results of cumulative impact assessments at present (left) and in the future (right)
Source: ADRIPLAN Deliverable 3.1/7

3.5.5 Identifications of spatial interactions among human uses in the Ionian Sea

In the section below we provide examples from the application of a spatial analysis aiming to identify interactions between human uses which is based on a methodology developed within the COEXIST project (Gramolini *et al.*, 2013). The two examples were conducted respectively within the DG-MARE ADRIPLAN, and the FP7 MESMA as a follow up of tasks accomplished within the latter project [5].

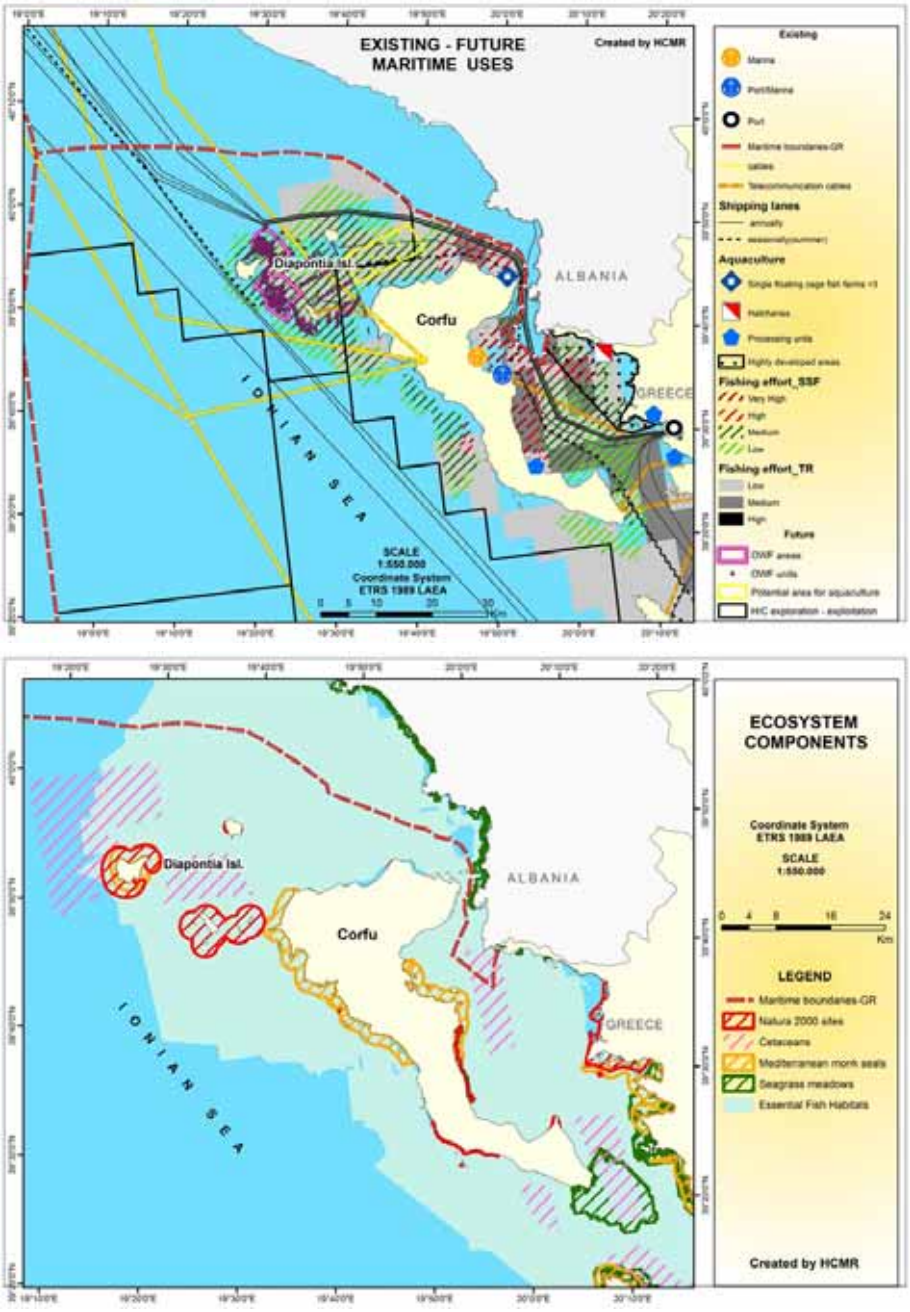
The ADRIPLAN case study (the following section is part of the ADRIPLAN Deliverable 3.1/7)

Off Corfu Island different types of human activities take place, the main of which are related to bottom trawling, small scale fishing, aquaculture, ports, marinas, shipping lanes, telecommunication cables, and they are mapped in Map 46 (top). Apart from the above activities, two more (i.e. off shore wind farms, and hydrocarbon exploration and exploitation) are forecasted to take place in the future. With respect to ecosystem components, five are considered of high importance; namely essential fish habitats, Natura 2000 sites, sea grass meadows, Mediterranean monk seals, and cetaceans (Map 46, bottom).

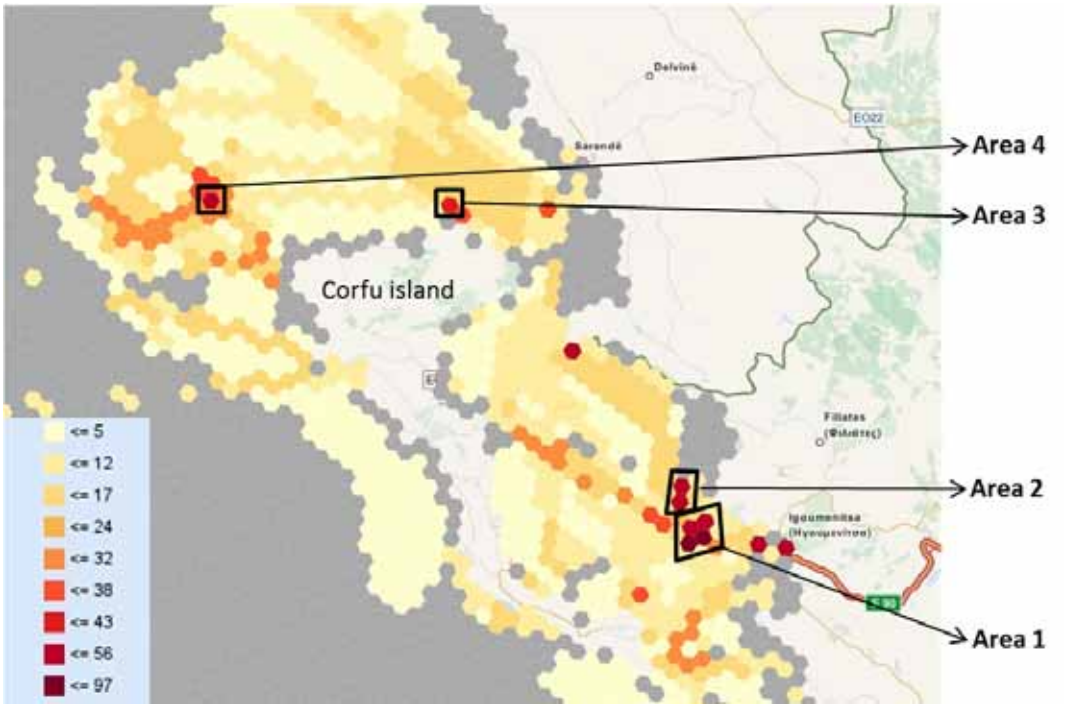
The identification of interactions among human uses has been implemented through a spatial analysis which is based on a methodology developed within the COEXIST project (Gramolini *et al.*, 2013). During the analysis, each activity was characterized by a set of factors considering the vertical (pelagic, benthic or whole water column), spatial (small, medium or large area) and temporal (short, medium or long/permanent) scale, the mobility (mobile or fixed), and the location (land or sea) of each activity. In a next step, giving as input a description of the potential relation (positive, negative or neutral) between all combinations of activities, a conflict score was calculated by summarizing the interactions of individual combinations. The computation of the conflict score was made by using a grid with corresponding cell size value equal to 1 km. The analysis of conflict scores was based on two spatial management scenarios. Scenario *a* referred to the existing situation regarding the human activities/uses within the study area, while scenario *b*, aside from existing activities, took also into account the potential future development of the two additional activities mentioned above. Conflicts were classified into different categories (Map 47), and for the sake of the present study four areas with high level of conflicting interactions were only considered.

[5] Members of this project's core team (from the HMRC) have participated in the ADRIPLAN and MESMA and have worked on the examples mentioned.

The quantification of the level of interactions between existing human activities revealed four (4) areas with high level of conflicting interactions (Map 47 and Map 48a). The first area (Area 1) is located in the southern part of Corfu, between the South-eastern coast of the island and the mainland (close to the city of Igoumenitsa). In this area there is currently high aquaculture development, small-scale fishing, and trawling, all activities appearing to have a strong interaction between them, while shipping lanes and cables, seemed to have low interaction. Then, off the Kalamas estuary a second area of high level of conflicting interactions among activities was identified (Area 2). In this area there is also highly developed aquaculture, as well as small-scale and trawl fishing. The third area (Area 3) was located at the northern coasts of Corfu close to the Region of Kassiopi. The main interacting activities in this area were small-scale fishing and trawling. Finally, in the last area (Area 4) located at the Diapontia Islands complex, the major conflict existed between medium and small scale fisheries exerted there.

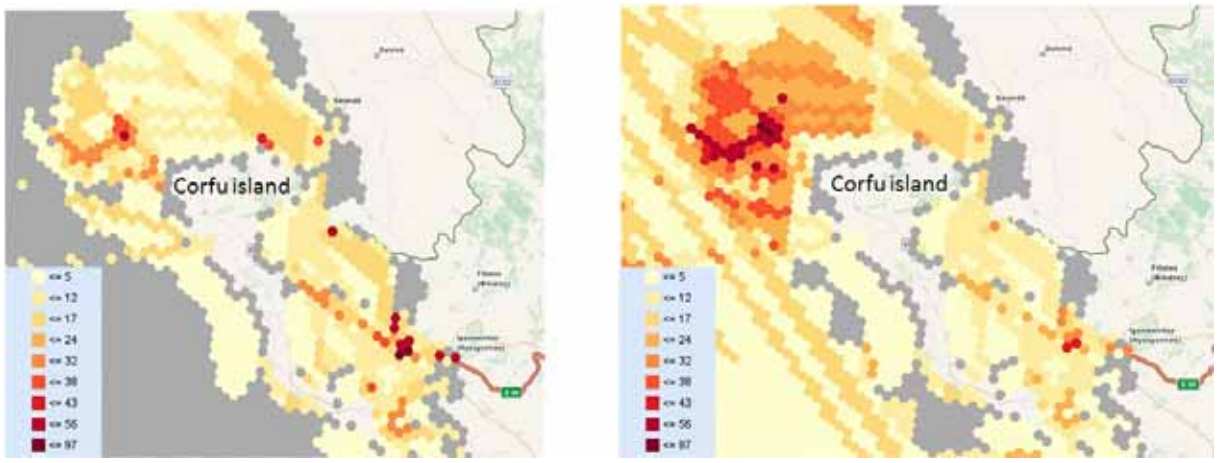


Map 46: Main activities in the area, both current and potential/future (top). Key ecosystem components (bottom)
Source: ADRIPLAN Deliverable 3.1/7



Map 47: Map showing the four areas with high level of conflicting interactions amongst existing human activities
Source: ADRIPLAN Deliverable 3.1/7

Apart from the existing activities, possible establishment of off shore wind farms, as well as hydrocarbon exploration and exploitation has been planned in the northern part of Corfu Island. Hence, outcomes of the conflict analysis referring to the spatial management scenario for the near future suggested that the area where the majority of conflicts would occur was that of the Diapontia Island complex (Map 48b). At this point, however, it should be noted that particularly regarding the exploration of hydrocarbons, as it has been proposed in the 2nd International Licensing Round in 2014, three major Blocks (65 km^2 each) are foreseen. Yet, despite the fact that hydrocarbons were an activity incorporated in the current analysis, chances the Diapontia Islands plateau, being rather shallow and enclosed, and at the same time considered as an area of high conservation priority, to be included among the potential future areas for hydrocarbons exploration/ exploitation are extremely feeble.



Map 48: Map showing the areas with high spatial interactions between human activities at present (left map) and in the future (right map)
Source: ADRIPLAN Deliverable 3.1/7

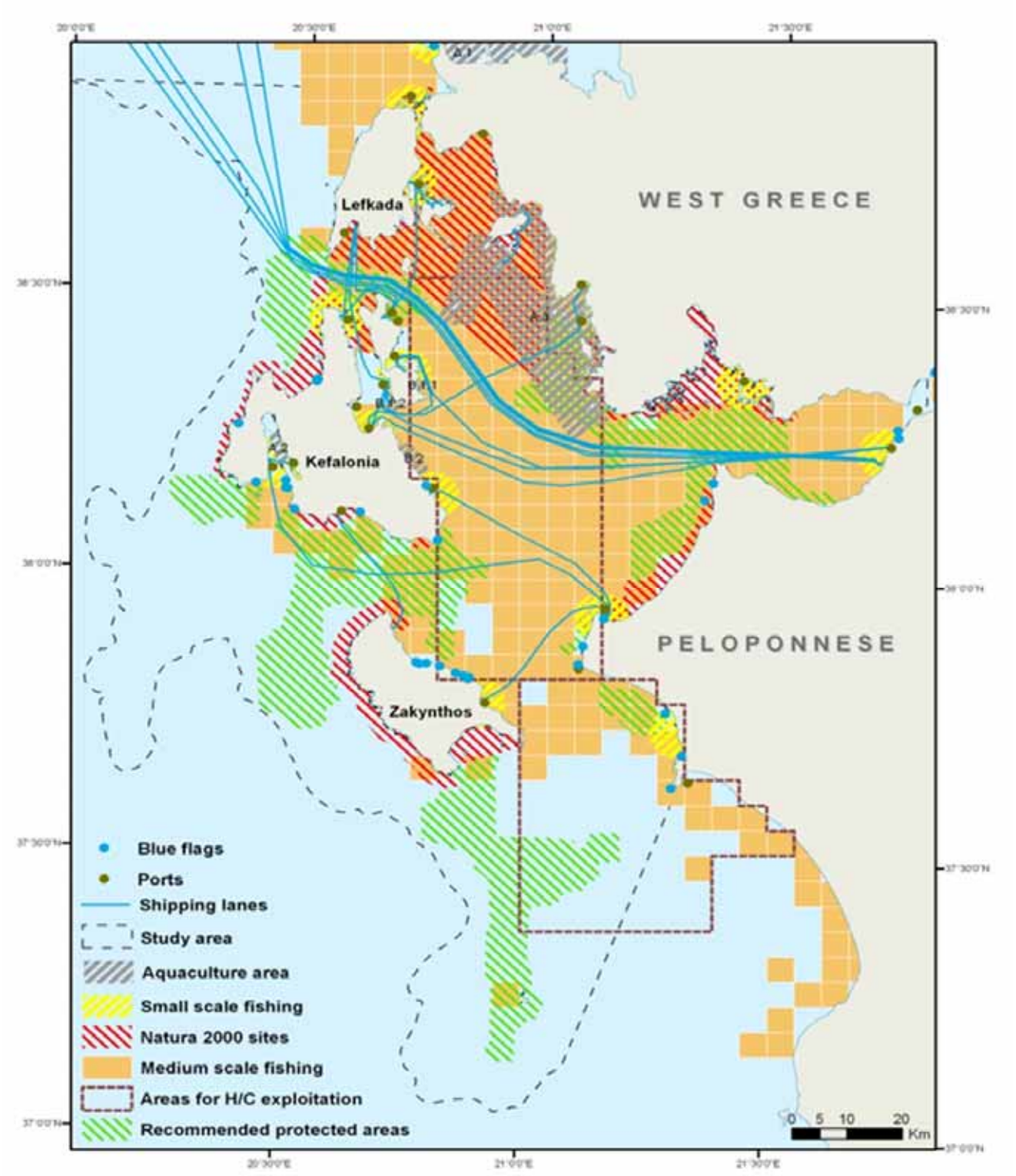
The MESMA case study (the following section is part of a presentation by Krassanakis et al., 2015)

The study was based in a marine Region in Central Western Greece that constituted the Greek case study of the MESMA project (Map 49). Several ecosystem components (e.g. monk seals, seabirds, cetaceans etc.) and different human activities/uses, including fishing, shipping lanes, NATURA sites, aquaculture areas (and recommended areas for hydrocarbon exploitation (HCMR, 2012) coexist. In the analysis except from the existing and the potential uses within the study area, new sites of conservation importance identified by Giakoumi *et al.*, 2012 were also taken into consideration.

The quantification of the level of interactions is achieved considering specific spatial rules which take into account the descriptive factors of each spatial use (Table 22). Interactions are distinguished into: synergies, conflicts, and neutral (i.e. no interactions). Conflicts are classified into five categories indicating low, low medium, medium, medium high, and high level of conflicting interactions.

As shown in Table 22 the most conflicting interactions appear to exist between fishing activities (trawlers and purse seiners) and the potential future uses (i.e. aquaculture, hydrocarbon exploitation areas and NATURA sites), as well as between existing NATURA sites and fishing activities. The analysis identified also neutral interactions (e.g. shipping lanes and fishing activity) as well as synergetic ones (between existing and potential new NATURA sites.

The distribution of all spatial interactions among human uses is computed as the sum of scores for each 1x1km cell of a grid covering the study area considering both scenarios and they are presented in Map 50. It seems that the introduction of new human uses and especially areas for H/C exploitation may contribute to the creation of negative interactions mainly with fisheries (Map 50 a, which should be considered to avoid possible conflicts. Fishing activities may have also considerable conflicts with the proposed areas allocated for aquaculture. On the other hand, interactions produced by the possible establishment of new protected areas are not significant in the majority of the study area (Map 50 b).



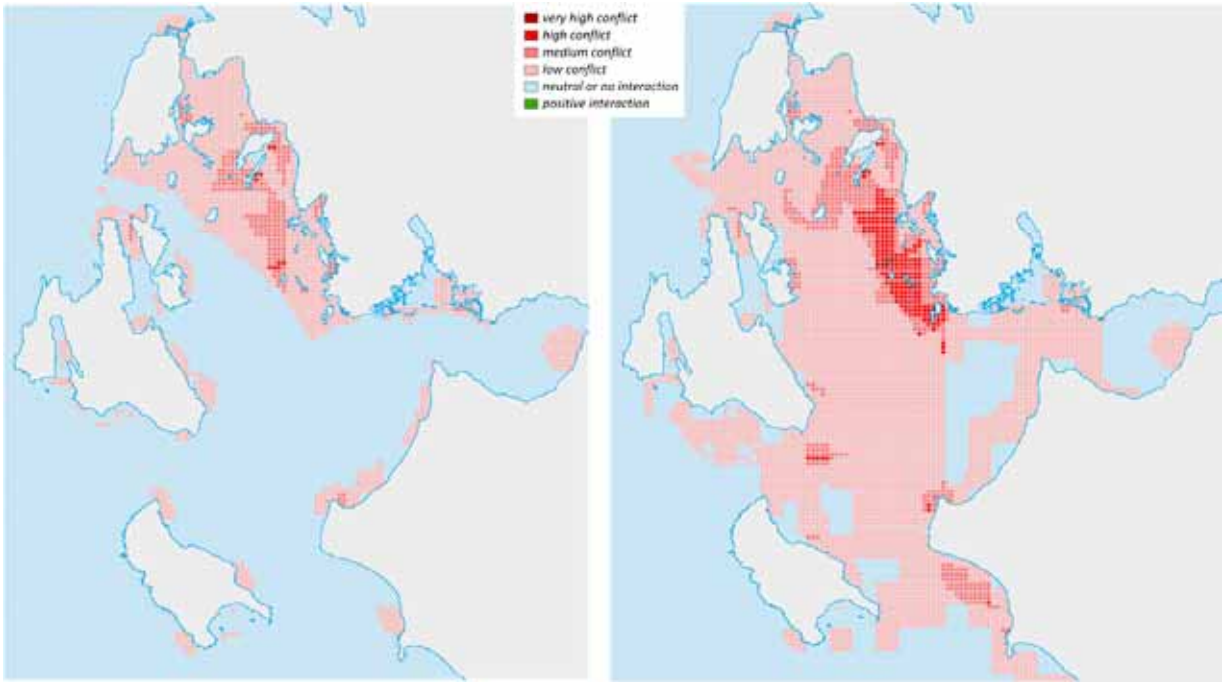
Map 49: Existing and potential future human uses of the marine space within the case study area
Source: Krassanakis et al., 2015

Table 22: Matrix providing the quantification of spatial interactions among human uses within the study area
Source: Krassanakis et al., 2015

Activities	Blue flags	Shipping lanes	Purse seiners	Trawlers	Ports	Small scale fishing	Aquaculture	H/C area 1	H/C area 2	Future Natura
Natura	-4	-4	-5	-5	-4	-4	-4	-4	-4	3
Blue flags		0	0	0	0	0	-4	-4	-4	-4
Shipping lanes			0	0	0	0	-4	-4	-4	-4
Purse seiners				0	0	-3	-5	-5	-5	-5
Trawlers					0	-3	-5	-5	-5	-5
Ports						-4	-4	0	0	-4
Small scale fishing							-4	-4	-4	-4
Aquaculture								-4	-4	-4
H/C area 1									0	-4
H/C area 2										-4

Spatial conflict score

- -6 *high conflict*
- -5 *medium high conflict*
- -4 *medium conflict*
- -3 *low medium conflict*
- -2 *low conflict*
- 0 *neutral or no interaction*
- 3 *synergy*



Map 50: Spatial interactions among human uses on the basis of Scenario a (left) and Scenario b (right)
Source: ADRIPLAN Deliverable 3.1/7

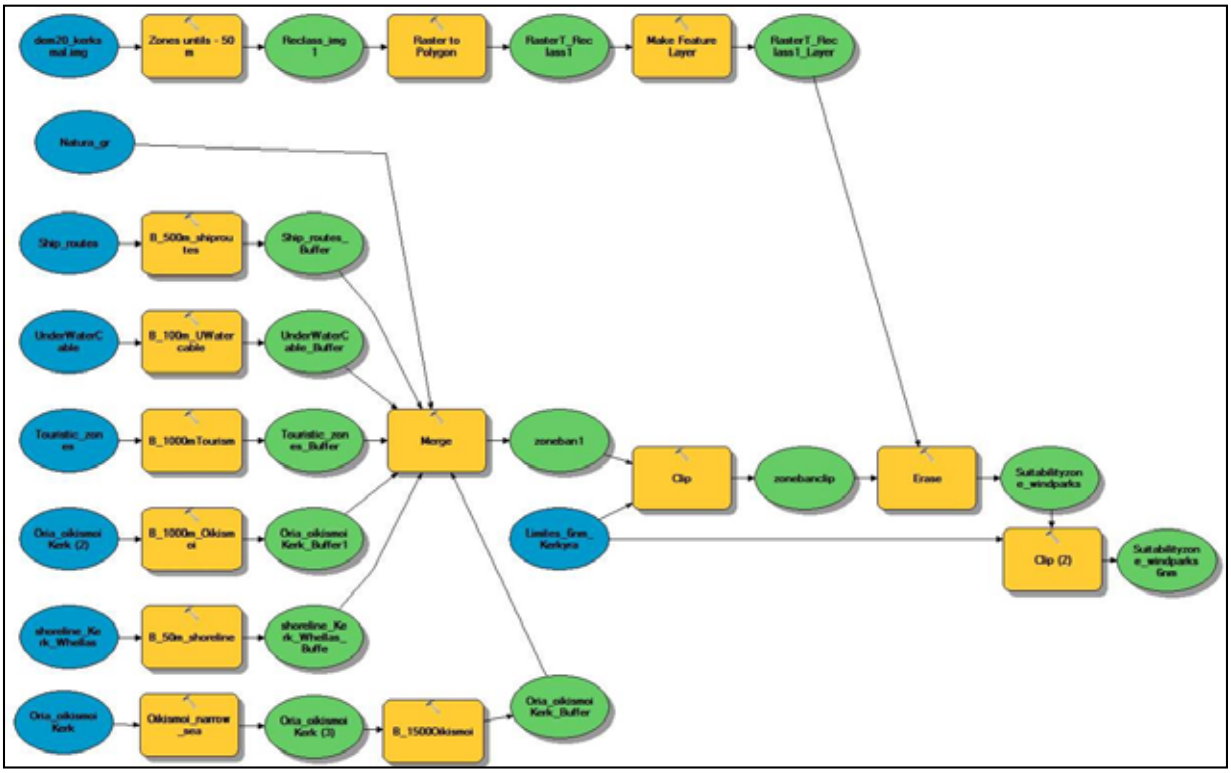
3.5.6 Applications of Multi-Criteria Analysis as a decision making tool for MSP in the Ionian Islands

Defining suitable areas for the development of off-shore wind farms in northern Corfu

In the case of the Region of the Ionian Islands, data analysis was used in order to identify (and visualize for several needs) suitability zones in the sea, for a certain kind of infrastructure, such as the off-shore wind farms. Suitability analysis was based on multicriteria models, in which a great variety of environmental and technical criteria were used, both quantitative as well as qualitative.

Figure 7 illustrates the multicriteria model created for the identification of suitable areas for off-shore wind parks in the northern part of the Ionian Island Region (Diapontia Islands). Eight criteria were used, giving a combination of GIS layers that resulted in the identification of all suitable areas, according to the restrictions and limitations set by the Hellenic national Sectoral Plan for the development of RES (Renewable Energy Sources) Infrastructure and the relevant legislation.

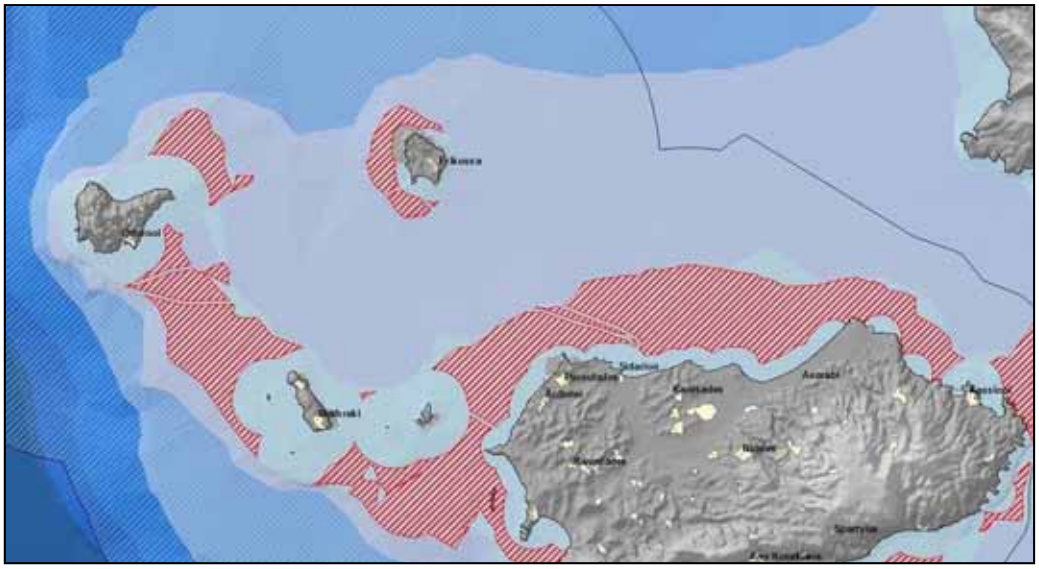
Figure 7: Multicriteria model for identifying off-shore wind park suitability zones
Source: processed by the core team



Identification of suitable areas for developing off-shore wind farms was made feasible after the combination of layers, excluding certain zones in which such developments are – by law – prohibited. These zones are presented below, in terms of minimum distances that should be kept when developing off-shore wind farms.

- Settlements: 1,000 m;
- Traditional settlements: 1,500 m;
- Tourism developments: 1,000 m;
- Underwater cables: 100 m (i.e. zone of 200 m);
- Shipping routes: 500 m (i.e. zone of 1 km).

Additional areas, totally excluded from the identification of suitable areas were also: Natura Sites and the coastal zone up to the –50 m depth contour, within which Posidonia oceanica meadows are usually found. Results of all the above criteria are presented in map 51.



Map 51: Visualisation of suitable areas (in red color) for off-shore wind-farms developments (Diapontia Islands)
Source: processed by the authors

The Diapontia Islands case study (the following section is part of the ADRIPLAN Deliverable 3.1.7)

As the Diapontia Islands complex was considered as a highly impacted area due to pressures from existing, but also potential future activities, and taking also into account that it has been suggested as an Area of Special Spatial Interventions in the Reform of the Regional SP Framework of the Ionian Islands, it was chosen for the application of a multi criteria analysis using DEFINITE v. 3.1 tool (decisions on a finite set of alternatives) (Janssen *et al.*, 2001). This software can be used to develop alternative scenarios, and in this case identify which alternative solution (i.e. anthropogenic activity) is the most suitable/sustainable for developing an effective spatial management plan in the area under study. Initially, alternatives have been set based on the most possible activities to be developed in the area by 2020 consulting experts and public administrators (Table 23). Common criteria for all alternatives were then identified based on an ecosystem approach, taking into account environmental, economic and social objectives/factors (Table 24).

An impact matrix was then constructed of the different alternative scenarios on each criterion. In this study due to the lack of quantitative information, a qualitative five level scale was used where "– –" indicated a very negative effect, "–" a negative effect, "0" no effect, "+" a positive effect and " + + " a very positive effect (Table 25).

Table 23: Alternative scenarios selected for the analysis

Scenarios	Abbreviation	Description
Business As Usual	BAU	Refers to keeping the same level of existing activities
Off shore wind farms	OWF	Refers to the potential development of off shore wind farms
Eco-tourism	ECO-TOURISM	Refers to the further development of eco-tourism activities
Marine Park	MARINE PARK	Refers to the creation of a marine reserve with zoning where specific activities or combination of activities will be allowed

Table 24: Objectives/criteria selected for the MCA
Source: ADRIPLAN Deliverable 3.1/7

Objectives	Criteria	Description / Problem identification
Environmental	Habitat loss	Will the activity have a positive/negative/neutral effect on marine habitat loss in the study area?
	Pollution	Will the activity have a positive/negative/neutral effect on pollution events in the study area?
Economic	Income	Will the activity have a positive/negative/neutral effect on the income of local people?
	Jobs	Will the activity have a positive/negative/neutral effect on the creation of job opportunities for the local people?
Social	Aesthetics	Will the activity have a positive/negative/neutral effect on cultural issues (e.g. recreational space per habitat)
	Quality of life	Will the activity have a positive/negative/neutral effect on the quality of life of the local people (e.g. health)?

Table 25: Matrix assigning scores in each pair of scenarios/criteria after consultation with the group of experts
Source: ADRIPLAN Deliverable 3.1/7

	C/B	Unit	BAU	OWF	ECO TOURISM	MARINE PARK
HABITAT LOSS		--/++	0	--	0	+
POLLUTION		--/++	0	-	-	0
JOBS		--/++	+	0	++	+
INCOME		--/++	+	++	++	+
AESTHETICS		--/++	++	--	+	++
QUALITY OF LIFE		--/++	++	-	0	++

Then, pairwise comparison was carried out between the set of alternatives scenarios in relation to each criterion. The Saaty scale was used and indicated which criterion was more important on the basis of a scale of 1 to 9 (where 1=equally important and 9=extremely more important) after consultation with stakeholders (experts and public administrators) involved in the process. In DEFINITE the scores are automatically translated into weights that add up to a total of 1 (Table 26).

Table 26: Weights assigned for each criterion by the software
Source: ADRIPLAN Deliverable 3.1/7

	EN..LOSS	EN..UTION	ECON..JOB	EC..COME	SO..ETICS	SO..LIFE	Weight
ENV. HABITAT LOSS		1.000	5.000	3.000	1.000	1.000	0.238
ENV. POLLUTION	1.000		5.000	5.000	1.000	1.000	0.268
ECON. JOBS	0.200	0.200		1.000	1.000	1.000	0.091
ECON. IN COME	0.333	0.200	1.000		1.000	1.000	0.096
SOC. AESTHETICS	1.000	1.000	1.000	1.000		1.000	0.153
SOC. QUALITY OF LIFE	1.000	1.000	1.000	1.000	1.000		0.153

Inconsistency: 0.00 — A value above 0.1 is an indication for inconsistencies in the pairwise comparison table

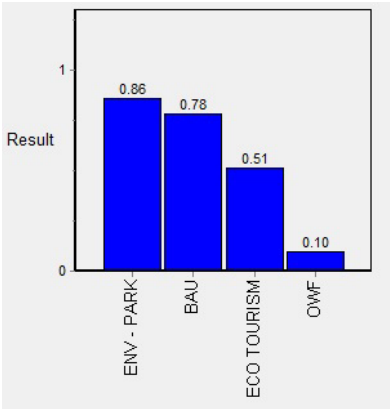


Figure 8: Results of the MCA performed on the data from the Diapontia Islands
Source: ADRIPLAN Deliverable 3.1/7

MCA results showed that the establishment of a Marine Park in the area in the near future (Figure 8) was the best alternative based on the criteria selected, followed by the "Business As Usual" (BAU) scenario. However, as there is high subjectivity in the scoring process, these results should be treated as preliminary and purely indicative and should be further explored.

3.5.7 Estimating tsunami threat in Laganas Gulf

Introduction

The purpose of the present chapter is to highlight some questions related to the geo-hazard vulnerability of the coastal areas of the Ionian Islands and especially to the estimation of the tsunami threats.

The start points for this purpose are some geodynamical characteristics of the Ionian Sea. Indeed, Ionian Sea:

- shows a significant seismogenic potential;
- is a tectonically active area;
- is characterized by submarine movements.

All these natural phenomena are tsunamigenic sources, building the tsunami potential of the Ionian Sea. Keeping this in mind we can formulate some important questions for discussion and in relation to the items of the Marine Spatial Planning and of the Integrated Coastal Zone Management (ICZM). These are:

- How can the coastal area of Ionian Islands be affected from tsunami events in the future?
- Can the tsunami risk assessed and can be included in the ICZM plans of the extended coastal area of Ionian Sea?
- How can the scientists deliver information and how can they bridge with the decision makers and the politicians?

Tsunami is a natural phenomenon, which cannot be avoided. The study of their destructive effects can be very useful in planning and drawing up risk maps and may also help to calculate the maximum inland penetration of impacting waves.

Different studies regarding tsunami flooding have been realized, some of them focusing on the traces of the tsunami events on the coastal area, mostly by the use of mathematical models [TITOV & SYNOLAKIS, 1998; PELINOVSKY *et al.*, 2002; TINTI & ARMIGLIATO, 2003; WEISS *et al.*, 2006].

The core question also is:
How can we establish a methodological tool based on morphological and mathematical data to evaluate the tsunami's inland penetration?

The methodological tool

When a tsunami approaches the coastline, its characteristics [height, wave length, period] change in two different zones:

- in the near-shore zone; and
- in the overland flooding zone.

In the ***near-shore zone*** the tsunami characteristics are influenced by the bathymetry and the coastal geometry (topography and geomorphology). In fact, when a tsunami travels into shallow waters its height increases. The slope of the sea floor is one of the factors that determine the breaking depth as well as the wave height at breaking point.

When the tsunami reaches the coastline it may:

- flood the landscape without breaking, like a rapidly rising sea level;
- arrive as a "train" of breaking waves;
- become a turbulent water-hammer.

To evaluate the tsunami's inland penetration we need an important parameter the ***tsunami height.*** Starting from the evaluated tsunami height it is possible to estimate the extent of inland flooding. To calculate the inland penetration (X) of a tsunami impacting the coast perpendicularly HILLS & MADER (1997) have provided procedures and empirical formulas that could be used for determining the inland penetration of the overland flow from tsunamis. The following formula can be used (HILLS & MADER, 1997),

$$X = (H_{FL})^{1.33}\, n^{-2} k$$

- H_{FL} is the wave height at the shoreline;
- n is the Manning number;
- k is a constant corresponding to 0.06 for many tsunamis (BRYANT, 2001).

In this formula some important parameters are taken into account:

- the type of coastal morphology;
- the density of population along the coastal areas;
- the type of land use;
- the density of the vegetation;
- the type and density of the buildings.

All the conditions can be resumed with a Manning number of 0,05 [TANAKA *et al.*, 2007]

Regional settings – Case study area: Depositional coast in Lagana bay – Zakynthos – Tsunami scenarios

Ionian Islands are placed at the center of the Mediterranean Basin (Map 52), which is a seismically active area and in which large tsunamis in historical times have been produced.

Map 52: Ionian Islands oriented along the subduction zone of the eastern Mediterranean Sea

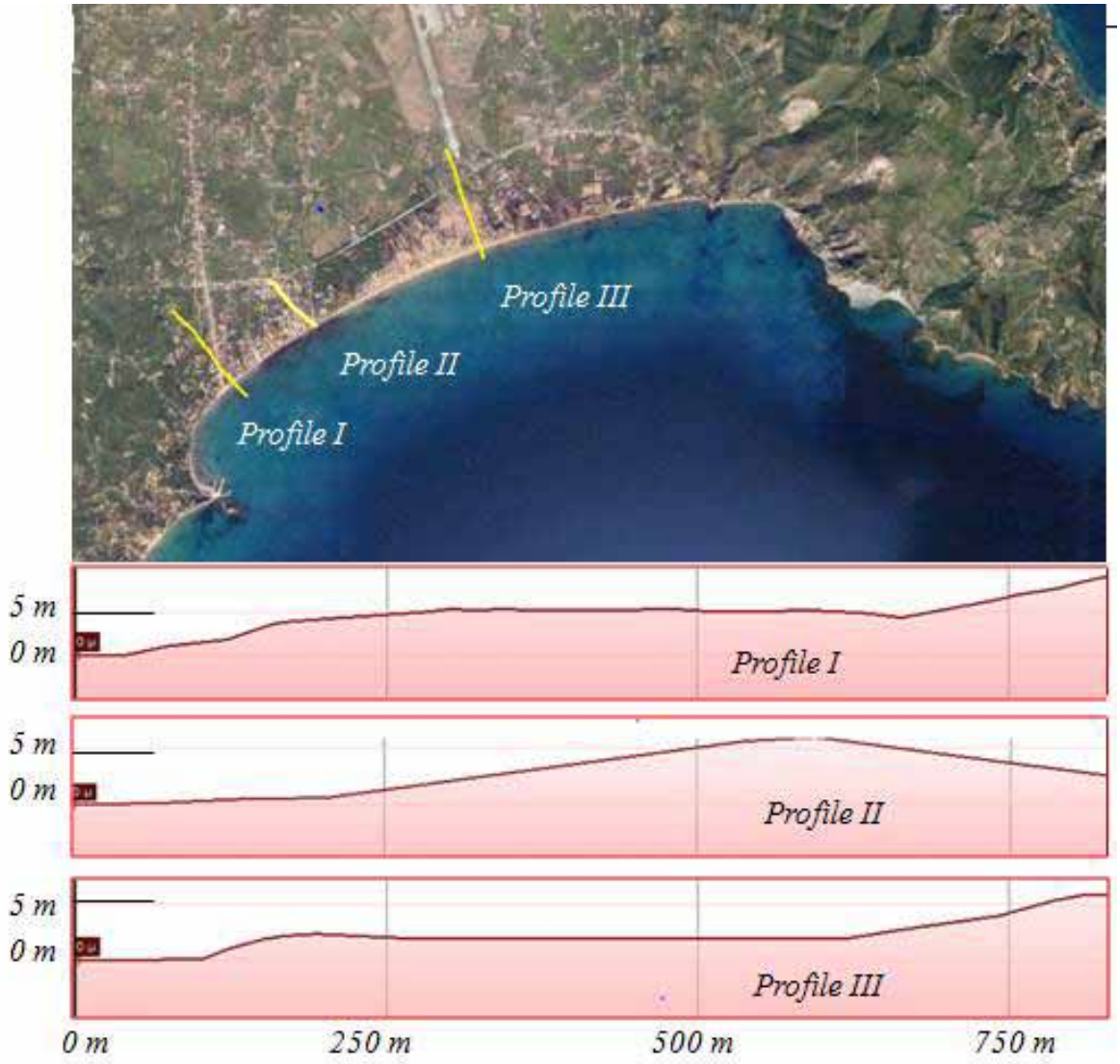
During the last 700 years, at least 17 tsunamis have hit the coasts of the Ionian Sea. Some calculations of the tsunami height in the Ionian Sea based on the tsunami geomorphological evidence (biggest boulder presence) show values from 3- 11 meters (PIGNATELLI *et al.* 2009).

To estimate the inundation (the inland penetration) of a tsunami wave, the depositional coast in Lagana bay (southern Zakynthos) is chosen as a case study (Map 53).

Map 53: The case study area: Coasts of Lagana bay, Zakynthos Island

The coastal zone is characterized by low geomorphological inclinations. Three profiles shows the geomorphological details of the coastal area (Map 54), consisted by depositional beaches and dune formations.

Applying the formula of HILLS & MADER (1997), we calculated the tsunami inland penetration for 5 and 11 meters tsunami wave heights, which are ~200 m and ~550 m approximately. The inundation (inland penetration) of these two scenarios is shown in Maps 55 and 56).



Map 54: Representative profiles across the coastal area of Lagana bay, indicating the low land relief of the area
Source: processed by the authors

Map 55: Approximately calculated tsunami inland penetration for a 5 meters tsunami wave height (red line) and for a 11 meters tsunami wave height (yellow line)
Source: processed by the authors

Map 56: Focusing on the habitable coastal area of the Lagana bay. An approximately calculated tsunami inland penetration for a 5 m tsunami wave height (red line) and for a 11 m tsunami wave height (yellow line)
Source: processed by the authors

Can tsunami threats be integrated in the ICZM planning?

A probable tsunami event leads to implications for the human activities along the coasts. Erosion of depositional coasts is the first negative effect. Beaches can be removed, lagoons can be connected with the open sea, and infrastructure on the beaches can be damaged. In general a tsunami event is connected to property loss as well as to life loss. These are some indices showing the necessity to integrate tsunami threats in the ICZM planning. The integration of concrete steps seems to be the appropriate way out.

1st Step: ***Making invisible risks visible: Establishing the basis of a tsunami risk education and a tsunami risk communication in coastal communities [YAMASHITA, 2009]***

Risk education and risk communication can be defined as the exchange of information among interested parties about the nature, magnitude, significance or control of a risk. Interested parties include government agencies, industry groups, unions, the media, scientists, professional organizations, communities and individual citizens.

The "totally unexpected events" like tsunami events are accounted under the invisible risks. This is the reason why in the conventional planning the probability of a tsunami event is not included. What would be the basis of a tsunami risk education and a tsunami risk communication in coastal communities?

- Awareness that some risk information is "invisible".
- Awareness of possible miscommunication or manipulation of risk information.
- Culture of questioning and accountability.

2nd Step: ***Planning and creating buffer zones along the coast***

Along the coast, a buffer zone has to be established to specify the minimum distance for permanent structures to be constructed away from the coastline. These measures are needed to protect property and life loss from the "invisible" tsunami event. The establishment of buffer zones usually causes reactions of the coastal population and leads to various complications. These reactions and problems need to be discussed with those concerned. Such buffer zones are in line with the setback zone foreseen by the ICZM Protocol. The tsunami risk (together with the erosion and the Sea Level Rise ones) and the resulting losses of properties and lives could be good arguments to persuade the coastal population about the need to respect the setback zones also necessary for the dynamic natural interaction between land and sea.

3rd Step: ***Planning coastal ecosystem rehabilitation and livelihood restoration***

The ICZM planning has to deal, among others, with issues relating damage to coastal ecosystems and their restoration.

4th Step: ***Establishment of a Tsunami Warning System***

The ICZM has also to adopt ***a Tsunami Warning System*** as an approach to mitigate disasters in the coastal areas.

3.5.8 Sea Level Rise scenarios in the island of Cephalonia and Ithaca

Introduction

Sea Level Rise (SLR) is a continuous threat to all coastal and insular countries and Regions. SLR is caused by three primary factors, due to the ongoing global climate change:

- **Thermal expansion:** When seas and oceans heat up, they expand.
- **Melting of glaciers and polar ice caps:** When large ice formations melt (due to global warming), run-offs end to the sea, resulting in water augmentation.
- **Ice loss from Greenland and West Antarctica:** due to the increasing average temperature, ice sheets covering Greenland and Antarctica melt and return as run-offs to the sea.

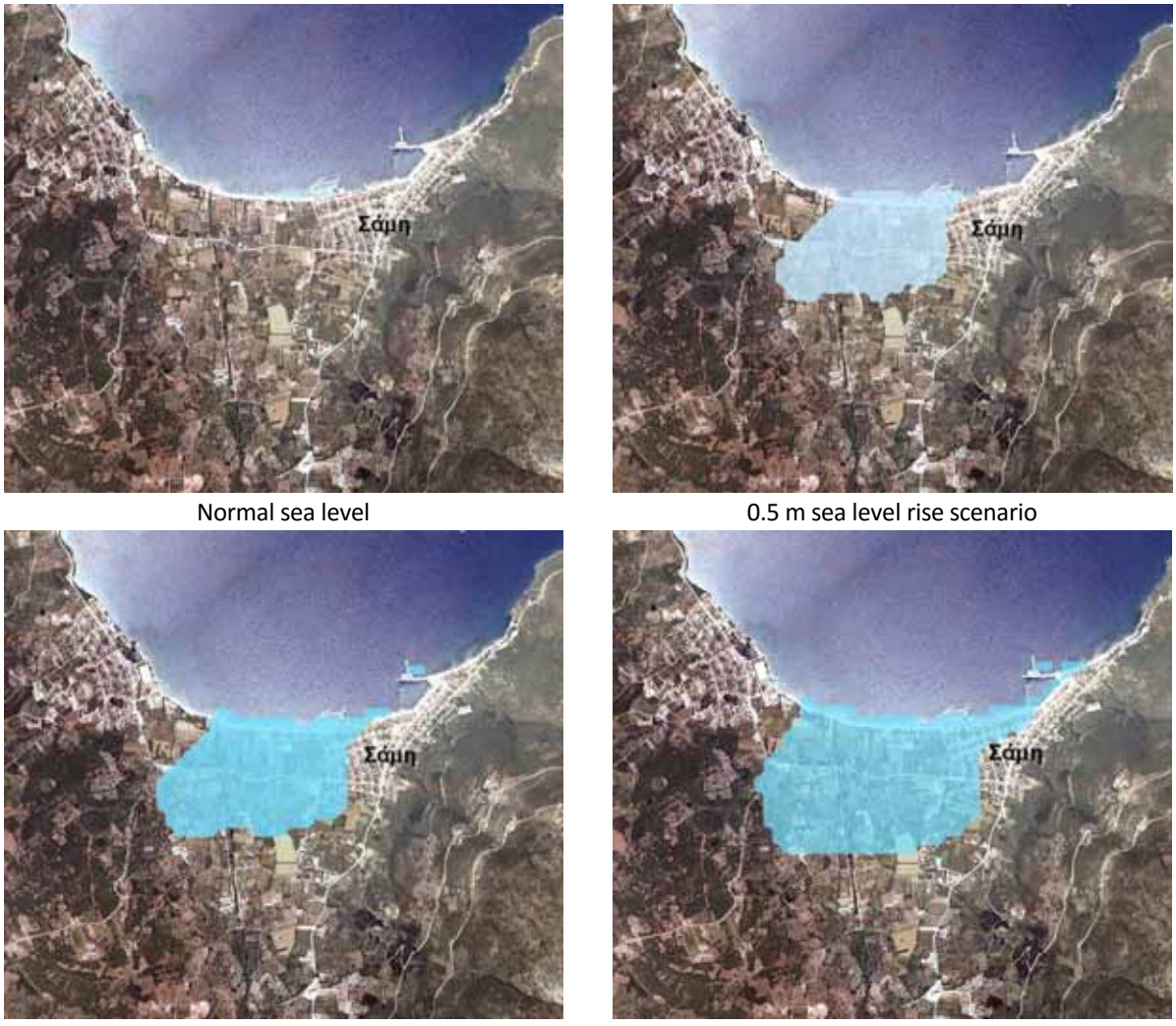
SLR can have devastating effects on coastal habitats, natural or anthropogenic (hundreds of millions of people live in coastal areas threatened by flooding and SLR). Therefore, priority in terms of spatial planning, should be set in the following types of areas:

- Coastal urban spaces and built up areas;
- Sensitive marine and coastal habitats (of natural and cultural importance);
- Infrastructure located close to the sea.

As in the case of tsunami (described in the previous section), planning measures in the coastline should definitely consider a buffer zone, to specify a minimum distance from the higher winter wave (or high tide wave) up to which permanent structures will be totally restricted. In cases where no such buffer zone can apply (due to the existing building conditions) other techniques described in literature can be used (dikes etc.). However, these techniques cause serious costs to the coastal state, since they include extended and permanent constructions. Therefore, as in all cases, prevention is a key approach to the solution.

SLR scenarios in the Region of Ionian Islands

Geomorphology of the insular Region of Ionian Islands has proved to be an asset regarding Sea Level Rise impacts. Indeed, the mountainous morphology, resulting in steep and rocky coastlines in many parts of the Region, operates as protective dikes against sea level rise.



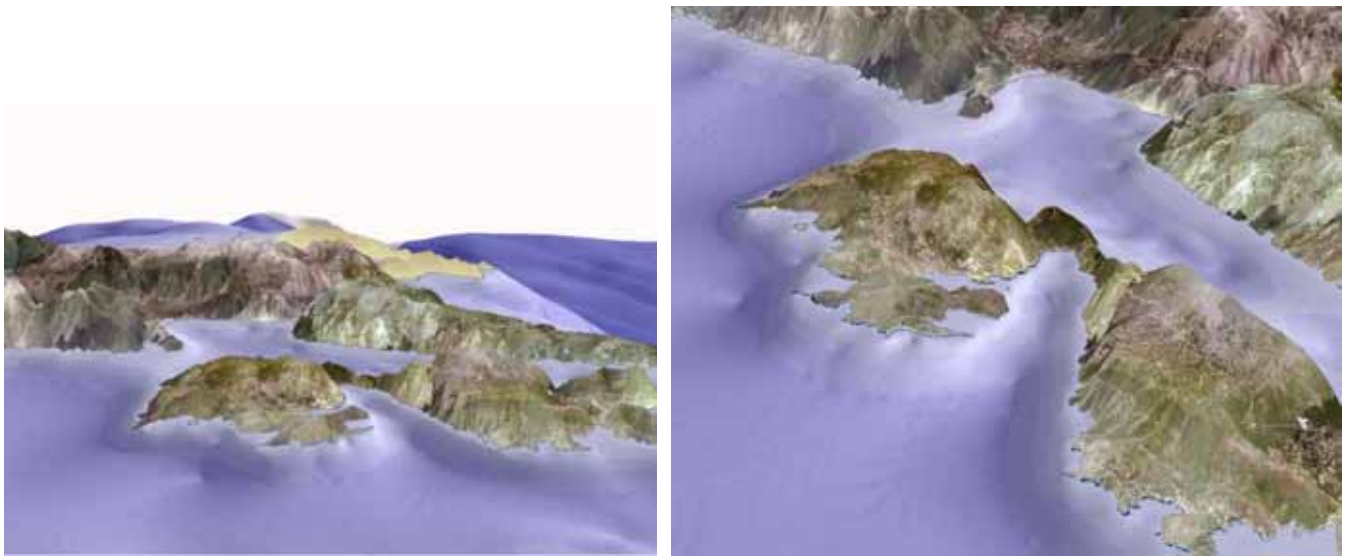
Normal sea level | 0.5 m sea level rise scenario

1 m sea level rise scenario | 3 m sea level rise scenario

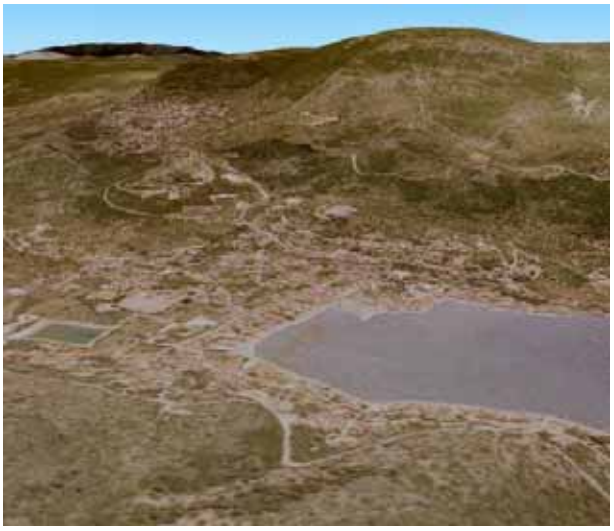
Map 57: Testing of 3 SLR scenarios – *Source: processed by the authors, 2015*

Testing of SLR scenarios so as to identify specific areas at risk in the Region of Ionian Islands, considerably depends on reliable and accurate terrain data. In fact, if SLR scenarios have to be accurate, terrain data must be too analytic; i.e. isocontours must be at least per 20 cm. However, such terrain analysis does not exist in the Region. Therefore SLR scenarios in the case study area were only tested in two small areas (the port-town of Sami in Cephalonia island and the port town of Vathy in Ithaca Island), using interpolation techniques and a Digital Elevation Model (DEM), in order to identify isocontours of 1, 2 and 3 meters (using 1 meter pixel size DEM).

In general, creation of small size pixels for DEM (e.g. of 50 cm pixel size) is rather expensive if traditional methods are used. However, latest evolutions in photogrammetry allow the use of high resolution satellite images (resolution of less than a meter) and the automatic creation of very precise Digital Surface Models (DSM). On the other hand the use of Unmanned Aerial Mapping (UAV) in 3D mapping is a new and very promising technology, creating primary geodata like orthomaps and DSM. A lot of institutes, among them the University of Thessaly, use small electric quadcopters (or airplanes) to take vertical pictures, from a low altitude (60-100 meters), in order to survey small areas (about 10-500 hectares). The UAV mapping technique is much cheaper compared to others and gives high-detailed data (less than 10 cm pixel-size).



Map 58: 3D view of Ithaca and Cephalonia islands
Source: processed by the authors



Normal sea level

1 m sea level rise scenario

2 m sea level rise scenario

3 m sea level rise scenario

Map 59: Testing of 3 S.L.R. scenarios in the Gulf of Vathi (Ithaca island)
Source: processed by the authors, 2015

4 CONCLUSIONS AND LESSONS LEARNT

4.1 Suggestions for an effective MSP governance

4.1.1 Legal and Institutional Aspects

It goes without saying that no competent authority can operate alone. In fact, what is needed is an overall scheme of governance, including:

- The competent authority with a description of its role;
- The other Ministries involved and any special bodies with their roles and the scheme of their cooperation under the coordination of the competent authority;
- The procedures of decision making, with concrete reference also to institutionalized procedures of consultation with and participation of socio-economic partners and NGOS.

Competent Authority (-ies)

In the vast majority of countries in the world, spatial planning policy (and in particular the marine one, where practiced) is responsibility of the Central Government. Ideally, MSP is implemented within the framework of agreed Strategies and fits into the Vision that each country has adopted for sustainable development. MSP is a key tool for the promotion of the blue/green economy and the protection of the marine environment in a time perspective. So, it is the Central Government that will make all the arrangements (legislative and institutional), which will create the "enabling environment", which is essential already at the first stage (out of 10) of the planning process. It is no coincidence that in Directive 2014/89 for the MSP the first obligation for Member States is to decide (not later than September 18, 2016) which will be the **competent authority** for planning and to communicate it to the European Commission.

The competent authority's role is to give guidance on planning policies and coordinate other relevant authorities, to ensure that conditions for effective consultation are in place, to promote appropriate governance schemes. Where MSP is practiced so far, this role is assumed by the Ministry responsible for spatial planning (with one exception, where conditions are different: United Kingdom/Scotland). In fact, there are four fields of competence to be covered: planning, implementation, enforcement control, quality monitoring. Depending on the conditions in each country, all these competences may be combined by the same authority (it happens in rare cases), or be assumed by different entities. It is important, however, to take into consideration for the final decision on the **competent authority for planning** the following **criteria**:

- Which authority has legal competence and scientific knowledge and experience in planning and in particularly in coastal Regions;
- Which authority is responsible for the marine environment and in particular for policies to ensure good environmental status and protection of marine biodiversity;
- Which authority has competence for licensing, for Environmental Impact assessments and for Strategic Environmental Assessments;

- Which authority oversees and coordinates the existing legal procedures of consultation on issues of spatial planning (with other Ministries, economic and social stakeholders, NGOS, through National Councils or Committees, etc.).

As regards **implementation**, the international experience suggests that competence for MSP could remain at the Regional or local level as is the practice for land spatial planning. Thus, for instance, the implementation/ management body could be coordinated by the Regional authority assuming competence for spatial planning, with involvement of more Regional authorities if adjacent to the marine area, respective municipalities, representatives of major socio-economic groups in the area, major NGOs and possibly special scientists related to the issues calling for solutions.

On the other hand, **competences for enforcement control and for quality monitoring** require availability of technical means (e.g., Coast Guard vessels, oceanographic boats, instruments), legal competence to impose fines for non-compliance with the decisions, plans and measures, as well as scientific know how (for sampling and analyzing the quality of marine environment).

Decision-making schemes

It is important to **make the best possible use of existing administrative structures and to combine** where possible committees, implementation of national and international commitments, oceanographic cruises, reporting etc., in order to avoid waste of time and resources as well as unnecessary administrative burden. In particular for Mediterranean countries that are also EU MS, it is important to take into account and profit of the mechanisms in place for the approval of Spatial Plans, the Marine Strategy Framework Directive (MSFD), the Natura 2000, the Integrated Maritime Policy (IMP), the approval of EIA and SEA, etc. Still, following the options of each country, there might be a need to adapt legislation in order to reflect with clarity the objectives, the competences and the relations among different authorities.

What is most important, given the different priorities of each Ministry, at least at the beginning of the process, is to ensure a common understanding and to agree on **common Strategic objectives**, which should be reflected on the marine spatial plans and respected by all. Achieving consensus on such goals is a prerequisite of effectiveness. The optimal approach would be to approve a **National Integrated Marine Strategy**, encompassing priorities stemming from commitments on the marine environment, reflecting a vision regarding the Blue Economy in each country, but also referring to comparative advantages and sensitivities of concrete sub-Regions. This Strategy, which does not need to be a very lengthy document, could be combined with the vision on ICZM, if the individual countries consider it appropriate for their conditions. Such a Strategy with a time horizon must be seen as a tool that will offer clarity, will facilitate cooperation and will offer win-win opportunities. It must in no way become a “ring of conflicts”, a “Christmas tree of wishes” or a pretext for delays.

It is to be noted that both the ICZM Protocol and the MSP Directive pay special attention to and invite to deal with any **cross-border problems**, taking the necessary actions as regards neighbours "as appropriate". This applies to different levels: from the small administrative units (e.g., municipalities) to the bigger entities (e.g., countries). One of the reasons for promoting the Directive from the EU side was to ensure "peaceful economic development" between Member States, which had already developed increased and economically significant activities in adjacent maritime areas.

Consultation process

Experience shows that it is preferable to foresee **formal institutional schemes of consultations**, with reference to who should participate, when (at which stages of the planning process) should they be involved, how should they be involved, which would be the deadlines etc.

The scheme of consultation depends very much on the needs and conditions of each country. To make their choice, countries could take into account the following **reasons** to involve stakeholders in MSP (Ehler and Douvere, 2009):

- *To encourage "ownership" of the spatial plan, engender trust among stakeholders and solution makers and encourage voluntary compliance with rules and regulations;*
- *To gain a better understanding of the complexity (spatial, temporal and other) of the marine management area;*
- *To gain a better understanding of the human influences on the management area;*
- *To deepen mutual and shared understanding about the problems and challenges in the management area;*
- *To gain a better understanding (often sector-oriented) desires, perceptions and interests that stimulate and/or prohibit integration of policies in the management area;*
- *To examine existing and potential compatibility and/or conflicts of multiple use objectives of the management area;*
- *To generate new options and solutions that may have not been considered individually;*
- *To expand and diversify the capacity of the planning team, in particular through the inclusion of secondary and tertiary information (e.g. local knowledge and traditions).*

Countries could also take into account the following **criteria** to assess the importance or relevance of stakeholders (including NGOs) in MSP (Ehler and Douvere, 2009):

- *existing rights to the resources in the management area;*
- *continuity of relationship to the resources (e.g. resident resource users versus migratory users) in the management area;*
- *unique knowledge and skills for the spatial management of the resources in the management areas;*
- *level of losses and damage incurred during or after the MSP process;*
- *historical and cultural relations to the resources in the management area;*
- *degree of economic and social reliance on the resources of the management area;*
- *degree of effort and interest in the management of the management area;*
- *equity in the access to resources of the management area and the distribution of benefits from their use;*
- *compatibility of the interests and activities of the stakeholders; and*
- *present or potential future impact of activities of stakeholders on the management area.*

There are many ways to involve stakeholders (Figure 9). There might be simple information/communication actions, with no real influence on the final results. There is also the option of participation in "negotiations" and a higher weight in decision-making. Countries may select the ways that are more appropriate for them. Substantial involvement of stakeholders has a number of **requirements**, such as:

- Sufficient **information** allowing to have objective views;
- Relations of **trust**, which are built on sincere and credible behaviour and need some investment in **time** at first stages that will help in gaining time in the long run; and
- **Realistic** deadlines.

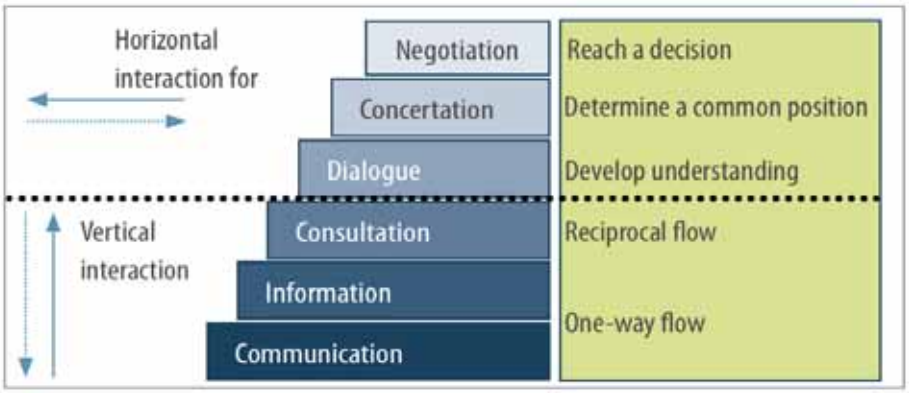


Figure 9: Different types of stakeholder participation
Source: Ehler and Douvere, 2010

4.1.2 Governance of the planning process (strategy, monitoring and evaluation, adaptive)

As mentioned in previous sections, MSP is conceived as a global process comprising all stages from strategy and preparation of the plan to implementation, monitoring and feedback. However, it is to be kept in mind that national policies are not applied in a vacuum. They need to reflect commitments at international/regional level (e.g., UN, EU, MAP/UNEP) and to be further specified and implemented at sub-regional/local level (see Figure 10).

The EcAp is expected to be reflected on and influence the overall governance scheme though in many cases different stakeholders might have conflicting views concerning tradeoffs, which are explicitly or implicitly made usually in planning and management decisions (KNOWSEAS). A basic conceptual model is shown in Figure 11.

Figure 10: Policy hierarchy of Marine Spatial Planning
Source: Visions for a Sea Change

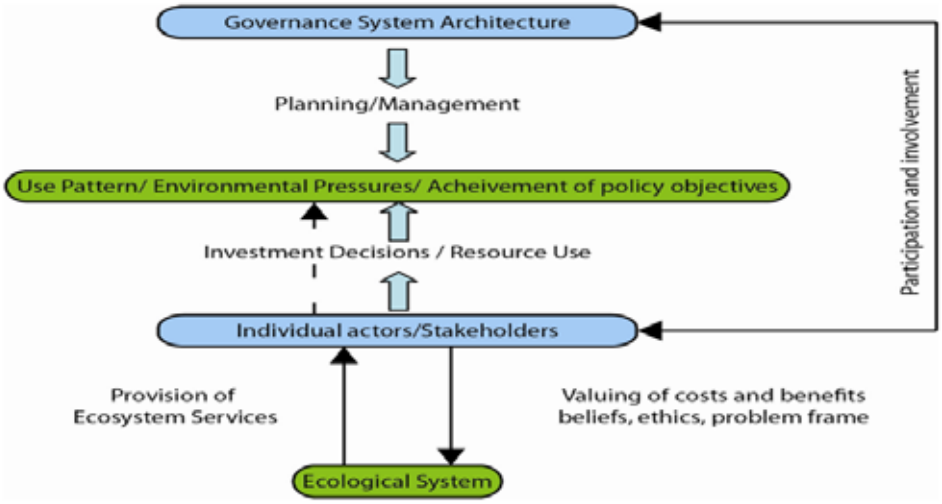


Figure 11: A basic conceptual model describing relevant interactions for governance of socio-ecological systems
Source: Kannen et al., 2010

Application of the EcAp requires a systems approach to marine management and the management framework needs to be adaptive to changing information, tools, objectives, opportunities and constraints. Increased uncertainty due to the limited experience in the marine natural dynamic processes, the limited availability of data on the marine environment in particular in off-shore areas, to impacts of some rather new marine uses and their compatibility or not with other uses and activities makes it imperative to follow a planning and a management approach that include the need for adaptability and the time factor among their major parameters. This makes the role of monitoring, evaluation and feedback even more important for MSP than for land spatial planning. Figure 12 shows how EcAp is reflected in key aspects of the MSP. Obviously, a coherent MSP takes into consideration also economic and social objectives.

A large number of **planning tools and methodologies** that can serve such governance approach are used already for the purposes of MSP, in other projects and/or regions outside the Mediterranean. Most of them (a) are rather sophisticated for the conditions of the Mediterranean and would need to be adapted, (b) are for the use of planners and decision-makers in particular. **Capacity building** might be very useful to prepare necessary skills in at least some of the Mediterranean countries. Stakeholders could profit looking at the outcomes of some of the tools (e.g., cumulative mapping or alternative scenarios mapping) to better understand the impacts and express justified positions.

As regards **compatibility of sea uses**, for the “grey areas” of the different matrixes mentioned in previous chapters, Mediterranean countries could profit from the experience in EU and be inspired by publications of the European Commission with guidance on conditions for operation of aquaculture, wind farms, energy installations etc. in Natura 2000 areas.

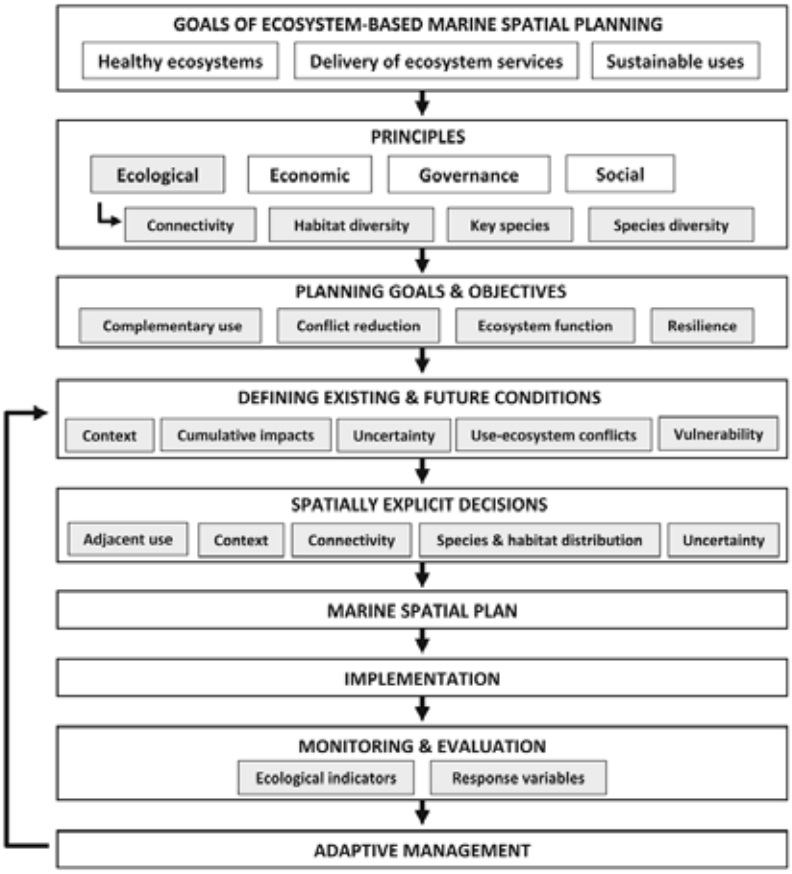


Figure 12: Flow diagramme outlining the key aspects of any MSP process with an emphasis on how ecological principles can be used throughout the planning and implementation process *(grey boxes)*
Source: Foley et al., 2010

4.2 Suggestions for the optimal combination and implementation of ICZM and MSP in the Mediterranean

4.2.1 MSP methodologies, procedures and context

Following the over-all analysis, both in a theoretical and in an empirical basis (in the case study area), the following suggestions and conclusions can be stated for the optimal combination and implementation of the ICZM Protocol (and the EU MSP Directive):

- MSP is necessary to become a statutory process in each country and marine spatial plans have to become binding ones;
- MSP eco-based management units (i.e. geographical coverage of Marine Spatial Plans) must include marine and terrestrial areas, following the concept of the ICZM Protocol, launched by UNEP/MAP;
- Identification of the appropriate ecosystem-based management units in MSP, should definitely consider and adapt to the:
  - Ecosystem boundaries (including marine and terrestrial areas);
  - Geopolitical boundaries (as described in the UNCLOS);
  - Administrative boundaries (national, regional etc.).

- Identification of the appropriate ecosystem-based management units must also adapt to a multi-scalar approach. This means that MSP must be tackled at different scales, with the elaboration of:
  - marine spatial plans at the national level;
  - marine spatial plans at the regional level;
  - marine spatial plans at the local level.
- Connection and compatibility between sea and land-use planning has to be accomplished at two levels:
  - Spatial planning frameworks per se (i.e. integration of land and sea-use planning systems);
  - Spatial planning regulations and arrangements (affecting unilaterally sea and land areas).
- Elaboration of marine spatial plans have to be based on a zoning system (adapted to each national legislation and functions), according to the following types of zones:
  - High-level protection zones;
  - Sectoral Zones (for economic and productive activities);
  - Zero-use zones;
  - Networks and linear zones.

Then, this zoning must become more detailed, with the definition of spatial regulations and a pertinent permit system (adapting to the EcAp).

4.2.2 Creation of the necessary geo-spatial dataset

Unlike terrestrial spatial planning, geospatial data for the marine space are still very limited and hard to find, either because it does not exist at all or because it is not easily accessible. In general, quest and collection of marine geospatial data can become a time-consuming task. Depending on the type of information and data needed, research and management need to address a great variety of sources, varying among national sources (Institutes, Ministries etc.) and international databases that in many cases require a special permission for access (or even a fee). At the same time, in many cases, available geo-spatial data for the same marine space may considerably vary in resolution, format and time-scale, making very hard its use in the MSP process (cartography, spatial analysis etc.). To overcome the above obstacles affecting MSP in the Mediterranean, it is of paramount importance that:

- all Mediterranean countries proceed to the creation of the necessary databases, to the benefit of a better knowledge of the Mediterranean ecosystem and of an integrated management of the Mediterranean marine space:
  - seawards, these data for MSP can be gathered with the use of multi-beam, side-scan and ground-trothing methods and tools;
  - landwards, each Mediterranean country must have detailed orthophotocartopraphy (satellite images) of high resolution and DSM for at least a 500-meters zone (also with the help of UAV aerial photos);
- all geographical data for the Mediterranean Basin must comply with common standards for metadata, common vocabulary, data transport formats, quality control methods and flags, and access. Such standards are provided by the E.U. INSPIRE Directive (Infrastructure for Spatial Information in the European Community) that could be used as a valuable guide for non-EU countries too;
- cooperation is established, both among neighbouring countries and among different Authorities and Organisations in the same country, so as marine information and data are shared and available, for the benefit of marine spatial planning at the national level and at the level of the Mediterranean Basin as well.

To conclude, it should be note that according to the literature review and the lessons learnt from the case study research, geospatial data that are most likely to be missing for the marine space, fall into the following categories:

a) Geophysical data: bathymetric / terrain data, geological faults etc., sea streams, currents, tides, ripples, whirlpools, wind power (in the sea surface) etc.;

b) Marine natural and cultural environment data: Posidonia oceanica meadows, cartilaginous, marine caves submerged or semi-submerged, underwater antiquities (i.e. ship wrecks) etc.;

c) Marine resource data: fish breeding areas, fossils (mineral and oil resources) etc.;

d) Defense and military data: areas for military use, submarine traffic etc.

Compiling the existing data, **identifying gaps and trying to fill them in at Mediterranean level**, as soon as possible, would be of great importance. Mediterranean countries could profit from Regional systems already in place, like EMODnet (European Union), the Virtual Knowledge Centre (EU, IMP-MED), as well as the MAP data bank and the respective webgis platform where data produced in the context of different MAP RACs are in the process of being compiled.

4.2.3 Utility and use of tools in the MSP process

GIS tools

Cartography produced with the use of GIS tools is indispensable in various steps/phases of MSP as well as to all parts involved to MSP procedures (Authorities, planners, stakeholders etc.). For more information see Table 2.

At the same time, 2D and 3D maps allow better conceptualization of MSP features, both to experts and non-experts involved. However, it should be noted that for the time being, 3D maps can only contribute to the better visualization of small-scale areas (in large-scale areas public is getting confused), while software for such purpose is rather expensive for the actual needs it covers. It is not by chance that almost all existing marine spatial plans in the N.W. Europe reflect both spatial analysis and proposals through classic 2D GIS mapping, using different layers.

Vulnerability and Cumulative Impacts Assessments

Both assessments are valuable planning tools, which can offer arguments and justification to options of decision making. Yet, they both require data that do not exist in all areas in the Mediterranean. This fact results in longer time and higher costs demands, as well as in use of extrapolation models. Such assessments can be carried out by scientists with experience and skills.

It becomes important, therefore, to adapt these technical tools to the Mediterranean conditions by simplifying their process and reducing the time needed to complete them at national and/or large scale sub-regional level, without affecting the quality and reliability of their results. Thus, for the vulnerability assessment at large scale a **"rapid approach"** could be used with matrixes of basic ecological characteristics and major pressures with a ponderation system to be based on strategic objectives. Furthermore, countries could use check-lists, as it is the case in the Baltic Sea, to accelerate the process. As regards the Cumulative Impacts Assessment, the map of the Mediterranean Sea prepared by Micheli (see Map 4) can be used as a serious indication of pressures on some marine areas. Yet, for a more accurate picture of the situation, one would need to feed the model with concrete data. This leads us again to the need to stress the importance of ensuring good data bases and information systems related to MSP and making them accessible at least to planners and decision makers.

4.3 Recommendations of the project

As a result of the overall analysis and lessons learnt, the following points are proposed as **Recommendations.** They could be reflected as appropriate in MAP documents for the consideration of the Contracting Parties at their next Conference (Athens, February 2016) and their possible decision, they could be used as guidance by the CPs when preparing their respective national policies on MSP, or they could serve as points for further development by MSP researchers, planners and decision makers.

1. It is of paramount importance to identify and nominate formally, preferably by mid-September 2016, **the competent national authority** or authorities (for planning, implementation and controlling purposes), as well as the consultation/decision process to follow for MSP. The competent authority for MSP is the one that will create the enabling environment for the policy and plans that will be be prepared. It will be the one to create **relations of credibility and trust** among authorities involved and – even more – with and among stakeholders, in order to ensure effective consultations and consensus.

2. Given the fact that there is no previous experience in the Mediterranean on MSP, it is recommended to **follow the 10 steps of MSP** as proposed by IOC, which are also compatible with the ICZM process as proposed by PAP/RAC. It is also recommended to conceive and address MSP in a holistic and integrated manner as a **global process** encompassing strategic objectives, planning, accompanying policies and measures, management schemes, monitoring, evaluation and feedback.

3. In particular for countries with long coastlines, extended territorial waters and limited resources, it is important **to identify as soon as possible the most vulnerable marine areas calling for MSP by priority.** This could be achieved through a **"rapid vulnerability assessment"**, which could be based on a check-list or a matrix system. In such cases, emphasis should be put on ecological vulnerability (taking into consideration marine protected areas, endangered species and habitats, existence of Ecologically or Biologically Significant Marine Areas [EBSA]), as well as on areas under pressure from (conflicting or not) marine uses.

4. Since the data and information systems issue are of key importance for reliable proposals and effective decisions, it is strongly recommended that the Mediterranean countries start as soon as possible to **build and/or complete** their **marine data bases and information systems**. The Institute having so far most of the marine data available in each country could become the main national MSP data coordinator. Its data banks could be **linked with other scientific institutes** (e.g., Universities) gathering and/or producing data as well. Thus, the interested parties (planners, researchers, decision makers) could get more rapid access to the data needed through **"one entry"** that could also organise the information and make it **available in a user-friendly manner**. The same National Institute could be also linked to related regional and international data banks (e.g., MAP, EMODnet), thus expanding the information possibilities. Furthermore, to complete the picture on the marine environment, Mediterranean countries need to plan timely collection of necessary data for MSP, such as bathymetry mapping (and side scanning where possible) at least up to the isobaths of 200 m in priority areas, as well as major oceanographic data (on line and real time where possible) using buoys.

5. It is broadly accepted that countries need to **integrate the EcAp in their MSP processes**. This needs to be done at several levels. It is not sufficient to declare that GES descriptors and indicators need to be respected; it must also be clarified how. **Ecological criteria** must be clearly set out in the Strategic objectives and reflected into the planning process. There must be clarity on which sensitive areas (including buffer zones) will be protected and how. Ecological criteria should also guide the vulnerability assessment, the matrix of compatibility among marine uses, the identification of borders of the management geographical units, as well as transboundary cooperation.

6. MSP constitutes a new "market" and many people with different backgrounds express already enthusiastic interest in participating in the planning process. It is important to remember that spatial planning is a scientific field that can be studied at University level. The MSP process, to be effective, requires **close cooperation among all relevant authorities, all different scientific backgrounds involved** (including obviously, with a significant role, those of marine sciences), **and all major stakeholders** interested. Ensuring good cooperation and **multidisciplinary approach and bridging science with policy making** are imperative elements for successful implementation and effective results.

7. Given that both experience in MSP and resources are rather limited in the Mediterranean, it is recommended to **proceed by pilot projects** both at national and regional levels. One approach that could combine the ICZM Protocol provisions as well as the need for adaptation to possible impacts of Climate Change would be to **integrate MSP in the new generation of CAMPs** starting from the forthcoming biennium. This would allow also taking into account **interactions at three levels**: dynamic natural processes, complementarity of land and sea uses, and coherence of land and marine spatial plans.

8. It would be most useful to **create a GIS tool (an interactive webmap) for the entire Mediterranean** for planning purposes. It should show all the available data and give the possibility to see impacts of alternative location options. This would facilitate both people involved in online consultation and decision makers. UNEP/MAP and in particular PAP/RAC might wish to explore funding possibilities (from the EU and/or GEF) for the preparation of such a tool.

9. Taking into account that countries participating in other Regional Seas Conventions (RSC, e.g., HELCOM, OSPAR, Baltic) have already experience and good practices in MSP, it would be most useful to **explore possibilities of cooperation, exchange of experience and synergies among such RSC**. The UNEP/MAP Coordinating Unit is invited to explore such possibilities that would offer assistance and multiplying effects to the CPs' efforts.

4.4 Dissemination and Follow-Up of the project

Dissemination

Dissemination of the project's findings and recommendations started at an early stage of the project, mainly through the participation of core-team members in several national and international events and meetings. In particular, until the final day (closure) of the project in November 30th, of 2015, the main elements and conclusions of the project were presented in the following occasions:

a) Meeting of the SPA/RAC Focal Points (Athens, Greece, 25-29 May 2015)

One member of the core team participated in the meeting (where the 30 years of the SPA/RAC were celebrated as well), as member of the Greek delegation. She was invited to make a presentation on the *MSP Med – Greece Project* on the 26th of May. The presentation focused mostly on those methodologies and tools that could be of relevance to the SPA people and tried on the one hand to check if some options would be feasible and on the other hand to stress the importance of MSP for the protection of the sensitive marine species and ecosystems. The presentation was very positively received by the participants and connection was made with several activities proposed for the next biennium, the ecological connectivity through MSP being one of the most explicitly mentioned.

A Questionnaire was presented to the FPs and they were invited to fill it in (see Annex III). 11 Questionnaires were filled-in on the spot. Some younger FPs felt the need to consult their colleagues not being aware themselves of all information asked. The replies, though not statistically representative, gave valuable input

for issues related to the identification of the geographical segments (= units) for management, the vulnerability criteria, the management schemes, the EBSAs etc. Cooperation with the UNEP/MAP Secretariat and members of the respective Working Group, in the context of this meeting, offered important information on the EcAp issue and on possibilities to integrate it in the MSP process. The information leaflet of the Project was also distributed to all participants.


b) European Maritime Days (Athens, Greece 28-29 May 2015)

One member of the core team, registered to this event, participated in the special Workshop on Maritime Spatial Planning that took place on May 29th. She had the opportunity to intervene in the course of this Workshop, inform the participants on the *MSP Med – Greece Project,* distribute the information leaflet, call for synergies with other related projects and make proposals to the European Commission on issues including coordination, availability of information, competences etc. The intervention was warmly welcomed by the audience and bilateral discussions followed with expression of interest.

c) Conference of the Coast Agencies of France and Mediterranean Coast Day (Antibes, France, 24-25 September 2015)

One member of the core team was invited to this event, which was attended by a very great number of participants from all around the Mediterranean involved in one or the other way in coastal management. She participated in the special Workshop on ICZM as panelist and presented the links between ICZM and MSP as well as the key elements of the MSP Med – Greece Project. Representatives of Mediterranean countries expressed a clear interest in the issue and the project.

d) Special Session on "Marine Spatial Planning" – 4th Pan-Hellenic Congress of Spatial Planning and Regional Development (Volos, Greece, 24 – 27 September 2015)

On the occasion of the triennial "Pan-Hellenic Congress for Planning and Regional Development" (organized by the Department of Planning and Regional Development of the Univ. of Thessaly), the University of Thessaly

members of the project team organized a special session on “Marine Spatial Planning”, including interventions of several team members as well as of other Greek scholars involved in the MSP research. During the session, the coordinator of the project referred to the work made for the project “MSP Med-Greece” and invited all interested bodies for future collaboration and exchange of know-how among Institutions and Research Laboratories in Greece. The presentation of the main elements of the current project prepared by Dr A. Mourmouris was included in the proceedings of the Congress.

e) Meeting of the Inter-ministerial Committee for the preparation and implementation of the Croatian Conference on the National Coastal and Marine Strategy (Sibenik, Croatia, 21 October 2015)

One member of the core team was invited to this event, which was attended mostly by Croatian officials. She presented the main findings of the MSP Med – Greece Project and highlighted possible ways to integrate them in national policies. Questions and dialogue that followed reflected the interest of participants.

f) Symposium on MSP in sensitive Gulf areas of Greece (Levadia, Greece, 24 October 2015)

Two members of the core team participated in a symposium entirely dedicated to Marine Spatial Planning in sensitive seas, such as the Korinthiakos Gulf in Greece. They both highlighted the importance of MSP as a tool for achieving protection of maritime space, especially in the case of sensitive gulfs, which must get prioritized as regards the elaboration of Marine Spatial Plans. Reference to the MSP Med-Greece project and its findings became also feasible after the symposium, during the interviews that took place on the occasion of the event and the interventions made by the team members.

g) International Scientific Symposium “Marine Protected Areas in Greece and the Mediterranean: Designing for the future by applying lessons learnt from the past” (Zakynthos island, Greece, 4 – 6 December 2015)

Following the official Final Meeting of the project (November the 30th), the project team received an invitation to present the conclusions of the project, in the International Scientific Symposium for *Marine Protected Areas in Greece and the Mediterranean,* held in Zakynthos, i.e. in one of the case study islands. Presentation made in the Symposium intrigued many of the participants, who showed special interest in the MSP procedures and the use of MSP in the case of Marine Protected Areas.

h) EU Conference on MSP and the Marine Environment (Brussels, Belgium, 7 December 2015)

Technically speaking, this Conference took place just after the conclusion of the current project. The purpose of the Conference, which was the fifth of a series of Conferences organised by the European Commission, was to ensure coherence and synergies among the MSP Directive and the EU Directives referring to the marine environment. One member of the core team (Dr. A. Mourmouris) was invited by the EU (DG MARE and DG ENV) to chair and monitor the Conference. Another member of the core team (Dr V. Vassilopoulou) was registered and attended this event. The Conference was attended by 320 participants (official and stakeholders) from all EU Member States and from Regional Seas Conventions. Reference to the *MSP Med – Greece Project* was made by the moderator of the Conference as well as by one of the speakers, the UNEP/MAP Coordinator.

Finally, conclusions and findings of the project are also expected to become part of national and international publications / papers included in scientific journals and/or congresses, dealing with the subjects of marine spatial planning, environmental management and sustainable development.

Follow-Up

The final Report of this project will be uploaded to the PAP/RAC website and will be thus available to all Mediterranean countries. It will also be uploaded to the website of the University of Thessaly. It is expected that a link will be provided also through the website of the Greek Ministry of Environment and Energy.

Conclusions and Recommendations of the project are expected to be taken into consideration at the Conference of the Contracting Parties of the Barcelona Convention (Ministers of Environment from Mediterranean countries), which will be held in Athens, in February 2016.

Furthermore, they are expected to be taken into consideration by the Greek Ministry of the Environment and Energy as well as the other Ministries involved in the issue, when preparing the transposition of the EU Directive on MSP into national legislation and when developing afterwards the national policy on MSP. The information compiled on the Region of the Ionian Islands in particular, as well as the local network formed for the purposes of the current project, could be a valuable asset in case that an interest is expressed to develop a proper marine spatial plan for the Region or to participate in any future project in the framework of the Adriatic-Ionian Strategy and Initiative of the EU.

Other Mediterranean countries are invited to make use of the methodological and technical recommendations of the project as they consider it appropriate to their own needs and conditions.

Marine Spatial Planning
Mediterranean • Greece

Annexes

ANNEX I: Official Meetings

Inception Meeting (Athens, 30 January 2015)

Brief information on the Athens Inception Meeting

The goals of the Inception Report and Meeting can be distinguished into two categories: the organizational and the essential ones. Regarding the organizational goals, they include:

- Initiation (kick-off) of the project;
- Activation of all partners and consolidation of cooperation with all members of the core-team;
- Consolidation of cooperation among relevant authorities (Ministries, Institutions etc.) and the project team, for the facilitation of the program implementation and the provision of the necessary information;
- Finalization of other operational and procedural details of the project.

On the other hand, regarding the essential goals, they include:

- Definition of the methodological approach of the project;
- Identification of the regional and local authorities' scheme (participating as partners in the project);
- Discussion of details and finalisation of the study area in the Ionian Islands Region;
- Discussion and preliminary preparation of the Questionnaires (for the collection of data from the rest of the PAP/RAC FPs as well as the regional/local stakeholders).

The Inception Meeting of the project was held in Athens (Greece) on the 30th of January 2015, at the premises kindly offered by the Technical Chamber of Greece. Apart from the team and partners, invitations to attend the meeting were also sent to the:

- Ministry of Environment, Energy and Climate Change (MEECC):
  - Directorate of Spatial Planning;
  - Department of International Affairs;
  - Department of Nature Management.
- Ministry of Navigation and the Aegean, Directorate for the Protection of Marine Environment;
- Ministry of Culture, Directorate of Underwater Antiquities;
- Ministry of Tourism, Directorate of Studies and Investment;
- Ministry of Rural and Agricultural development, Directorate of Fisheries;
- Technical Chamber of Greece, President of the Executive Board;
- Region of Ionian Islands, Directorate of the Environment;
- Association of Municipalities (1st tier local authorities) of the Region of Ionian Islands – President's Office;
- Managing Authority of the National Marine Park of Zakynthos.

Coordinators of some other CAMPs were informed about the meeting and the National Coordinator of Camp-Italy sent a Welcome Message.

PAVING THE ROAD TO MARINE SPATIAL PLANNINGIN THE MEDITERRANEAN

INCEPTION MEETING

(TECHNICAL CHAMBER OF GREECE, Nikis 4, Athens
30 – 1 – 2015)

AGENDA

09.45 – 10.00	Opening – Welcome
	*(**Prof. E. Beriatos**, University of Thessaly)*
10.00 – 10.30	The Mediterranean context and the ICZM Protocol
	*(**Mr Atila Uras**, Programme Officer, MAP/UNEP)*
10.30 – 11.00	Marine Spatial Planning (MSP) commitments under the ICZM Protocol and the MSP Directive/EU
	*(**Dr A. Mourmouris**, Hon. Director General for the Environment)*
11.00 – 11.30	Main objectives and benchmarks of the project
	*(**Prof. E. Beriatos**, University of Thessaly)*
11.30 – 12.00	The Regional Spatial Planning in Greece: a framework for the Ionian Islands
	*(**Ms Maria Rabavilla**, Spatial Planning Directorate, Ministry of the Environment, Energy and Climate Change)*
12.00 – 12.30	Discussion
12.30 – 14.00	Lunch
14.00 – 14.30	Problems of a typical Region related to MSP
	*(**Mr Scordilis**, Environment Director, Region of the Ionian Islands)*
14.30 – 15.00	Marine ecosystems of the Ionian Sea and human activities: methodologies to study the conflicts and the impacts
	*(**Dr Vassiliki Vassilopoulou**, Marine Biologist, Hellenic Centre of Marine Research)*
15.00 – 15.30	Discussion
15.30 – 16.00	Concluding points
	*(Co-Chairs: **Prof. E. Beriatos and Dr A. Mourmouris**)*

List of Participants in the Athens Inception Meeting

External Participants

Full name	Institution / Affiliation
Uras Atila	Programme Officer UNEP-MAP
Chrysomalidis Stelios	Head of Directorate of Spatial Planning – MEECC
Skaltsa Monica	Head of Unit for General Spatial Planning Policy – MEECC
Gourgiotis Anestis	Head of Unit for the National Spatial Plans – MEECC
Stefani Efi	Head of Unit for Spatial Zones (Directorate of Spatial Planning) – MEECC
Rabavilla Mary	Staff at the Directorate of Spatial Planning – MEECC
Drouga Ioulia	Staff at the Directorate of Spatial Planning – MEECC
Mantzaris Nikos	Staff at the Unit for International Affairs – MEECC
Savopoulou Dimitra	Staff at the Directorate of Fisheries – Ministry of Rural Development and Food
Krassanakis Vassilios	Researcher – Hellenic Center for Marine Research
Maniopoulou Mary	Researcher – Hellenic Center for Marine Research
Skordilis Kostas	Head of Directorate for the Environment – Region of Ionian Islands
Minetos Dionysios	Head of Unit for the Environment – Region of Ionian Islands (Cephalonia)
Oustoglou Alexandra	Legal Advisor – Regional Association of Ionian Islands Municipalities
Sourbès Laurent	Director at the National Marine Park of Zakynthos

Project Team participants

Full name	Institution / Affiliation
Beriatos Elias	Professor at the Depart. of Planning & Regional Development, Univ. of Thessaly – Coordinator of the project
Dr Mourmouris Athena	Honorary Director General for the Environment (MEECC)
Dr Papageorgiou Marilena	Adjunct Asst. Professor at the DPRD, University of Thessaly
Dr Faraslis Ioannis	Laboratory Assistant & Researcher at the DPRD, University of Thessaly
Dr Panayiotidis Panayiotis	Research Director – Hellenic Center for Marine Research
Dr Vassilopoulou Vassiliki	Research Director – Hellenic Center for Marine Research
Dr Anagnostou Christos	Former Research Director – Hellenic Center for Marine Research
Krinakis Stavros	Expert – DPRD, University of Thessaly

Photo Gallery from the Athens Inception Meeting





Minutes of the Athens Inception Meeting

INTRODUCTION

The Inception Meeting of the project was held in Athens (Greece) on the 30th of January 2015, at the premises of the Technical Chamber of Greece.

The core team of the project had opted for a form of "working session" for this kick-off meeting, taking also into consideration the electoral period and the recent political changes.

Around 30 participants attended the meeting. All members of the core team were present as well as experts from the Cooperating Partners: MEECC, Region of the Ionian Islands and the HCMR. One must mention the strong team from the MEECC (recently renamed as MPREE), Directorate of Spatial Planning, as well as the representatives of authorities from the Region of the Ionian Islands and the Marine Park of Zakynthos, who traveled to attend the meeting. Some of the invited representatives of additional competent Ministries could not finally participate, because of the change of guard that they had to prepare and attend after the change of government. Mr Atila Uras, Programme Officer, represented both MAP/UNEP and PAP/RAC.

The Agenda of the Meeting and the List of Participants are included in Annex.

The Greeting Message sent and from the National Coordinator of the CAMP-Italy project is also annexed to these minutes.

MORNING SESSION

Prof. Elias BERIATOS (Coordinator of the Project) opened the meeting. He welcomed all participants, giving emphasis on the representatives of the Ministries and Local Authorities that are directly related to the project and therefore their support is valuable for the realization of the project. Then he informed the participants on the agenda of the meeting and briefly presented the purpose of the meeting and the main goal of the project.

He also informed the audience on the Greeting Message that was sent by the CAMP-Italy Coordinator, Ms Daniela ADDIS, wishing successful implementation (see Annex IV).

Then he called upon the first key-note speaker, Mr Atila Uras, to present the MAP/UNEP and PAP/RAC context (contracting organisation), as well as to present further details on the context of the ICZM Protocol.

Mr Atila URAS (*Programme Officer, MAP/UNEP)*, at the beginning of his speech, conveyed the MAP Coordinator's and the PAP Director's warm wishes, referred to the Bureau meeting scheduled to take place in a few days in Antalya (fact that did not allow a broader participation from MAP in this meeting) and pointed out that this year MAP celebrates its 40 years anniversary. Then he presented the organizational structure of the MAP, the activities of PAP and the CAMP projects in progress in the Mediterranean. He presented the principles and context of the ICZM Protocol and referred to the MSP Directive, giving emphasis on the complementarities and the linkages of the two instruments.

He specifically pointed out that ICZM equally considers marine and land, part of the coastal zone (integration of marine and land part). He also noticed that land use planning is highly developed, while sea use planning – even if equally important – is less or not at all developed. Therefore, he stressed the necessity of harmonising planning with requirements and specific conditions on the land part, and vice versa.

At the end he stressed the importance of the MSP-Greece project for the development of valuable know-how on Marine Spatial Planning issues in the Mediterranean; a project initiative undertaken by the PAP/RAC and assigned to the University of Thessaly (leader), in cooperation with the Ministry of Environment (MEECC) and the Hellenic Centre of Marine Research.

Interventions by the participants

Dr Christos ANAGNOSTOU (ex. Research Director at the HCMR) noticed the exceptional biodiversity and particularities of Greek marine space and therefore its appropriateness as case study in projects such as the "MSP Greece".

Dr Panayiotis PANAYIOTIDIS (Research Director at the HCMR) referred to the plethora of Protocols and policies concerning the marine/maritime space in different ways that need to be harmonized and complemented.

Dr Vassiliki VASSILOPOULOU (Research Director at the HCMR) stressed the importance of integrating the Protocols and solving conflicts and different approaches between sectoral policies.

Dr Athena MOURMOURIS pinpointed the necessity and importance of synergies in matters of MSP that are in progress in the Mediterranean. She invited Mr Uras to provide more information on such initiatives undertaken by MAP/UNEP.

Mr Atila Uras mentioned briefly MoU signed and on-going cooperation activities undertaken together with the Union for the Mediterranean, the EU, the Bucharest Convention for the Black Sea, GEF as well as some major NGOs in the Mediterranean Countries.

Following this information from the Programme Officer of MAP/UNEP, the Chairman invited Dr. Athena Mourmouris to present the Marine Spatial Planning (MSP) commitments under the ICZM Protocol and the MSP Directive/EU.

Dr Athena MOURMOURIS (Honorary Director General for the Environment), after stressing the necessity of implementing marine spatial planning, focused on the provisions of the two related legal instruments (Mediterranean ICZM Protocol and EU Directive), giving emphasis on the commitments and obligations resulting for the Contracting Parties. Special reference was made to the differences of the two documents regarding the geographical coverage, and insight information provided explaining the reasons for not keeping at the end ICZM in the field of application of the EU Directive.

During her speech she stressed the limited experience existing in the Mediterranean region as regards marine spatial planning, as well as the fact that EU Directives are not binding the non-EU Mediterranean countries but that they could inspire them and assist them in selecting tools appropriate for them. Referring to the ICZM Protocol, she reminded that the year of entering into force was 2012 and that even if Greece did not ratify the Protocol, it must be enforced since it constitutes acquis Communautaire. She also listed the next steps the competent authorities should make to be prepared on time for the implementation of the MSP EU Directive.

At the end of her speech, she underlined the usefulness of the "MSP Greece" project, which just started, for all Mediterranean countries, since the tools expected to be proposed could help to meet the common objectives of integrated marine spatial planning and management. This explains why coordinators of different projects (mostly CAMPs) in the Mediterranean accepted to network among themselves and exchange information and experience. She then explained briefly the reasons for selecting the Region of the Ionian Islands as the case study area of the project. The core team will constitute the link between the Mediterranean network of projects and the regional/local network of stakeholders.

Interventions by the participants

Ms Monica SKALTSA (Head of Unit, General Spatial Planning Policy – MEECC) stressed the good timing of the MSP Greece project and the complementarity it can have with other projects carried out in the Macro-region (marine corridor) of the Adriatic and Ionian Sea; she also argued on the importance of consolidating cooperation with the neighboring Regions of the Ionian Islands (Region of case study) and stressed the importance of the islands.

Dr Anestis GOURGIOTIS (Head of Unit, National Spatial Plans – MEECC) informed the audience on a project in progress in the marine space of Cyprus. He also pinpointed the gap in the existing Greek Regional Spatial Plans, in terms of planning guidelines for the marine space.

Ms Efi Stefani (Head of Unit, Spatial Zones – MEECC) wondered about the area that Marine Spatial Plans should cover.

Dr Athena Mourmouris provided some answers to the questions and informed about the related proposals she had submitted several months ago, when she was still active Director General of the Environment in the MEECC, regarding preparation of methodologies, pilot projects and monitoring capacity related to MSP. She also provided information on a study carried out on European Islands.

The Coordinator of the Project, **Prof. Elias BERIATOS**, addressed the audience once again, giving in person further details on the objectives and benchmarks of the project. After his brief presentation on the aims and objectives of the project, he described the contracting obligations and activities foreseen per phase of the project. He explained the cooperation and management schemes with the rest of the partners and outlined the timetable of the official meetings to be held, both with the contracting authority (PAP/RAC) and the cooperating partners.

Special notice was given to the case study and to the role of the Regional and Local Authorities of the Ionian Islands, in the simulation of the proposed methodological tools and governance schemes.

Finally, special reference was made to the advantages – both for the project and for the country of Greece – that are expected to emerge by the establishment of the network that is attempted with the rest of the countries implementing CAMP projects in the Mediterranean.

Following that, the Chairman invited Ms Mary Rambavilla to present the spatial planning system and policy in Greece, focusing on the Spatial Plans produced for the Region of the Ionian Islands.

Ms Mary RAMBAVILLA (Supervisor of the Regional Spatial Plan of the Ionian Islands, Directorate of Spatial Planning – MEECC) presented the spatial planning policy and system of Greece. She focused on the Region of the Ionian Islands. First she referred to the existing – under revision – Regional Spatial Plan and its provisions and then to the new Spatial Plan (in progress). Double insularity was underlined as the dominant feature of the Region, resulting to great disadvantages in terms of coherence and economic/productive development in the Region.

In this framework, "Green islands – Blue growth" was argued as the most appropriate spatial development model for the Region, in order to overcome the disadvantages and to take advantage of the great potentials of the marine space.

Interventions by the participants

Mr Laurent SOURBÈS (Director of the National Marine Park of Zakynthos) stressed the difficulty in incorporating the ecological approach (EcAp) into Marine Spatial Plans and then referred to the marine NATURA sites and Marine Protected Areas and the experience gained from the management of these cases.

Dr Christos ANAGNOSTOU (ex. Research Director at the HCMR) raised the problem of extensive tourism development in all Ionian Islands (mainly along the coastline) and pointed out the lack of the Ecologic Approach in most of the spatial plans of the case study area.

Ms Alexandra OUSTOGLOU (Legal Advisor at the Regional Association of Ionian Islands Municipalities) pinpointed the lack of coherence and communication among the Ionian Islands (due to sparse intraregional transport connections) and underlined the importance of Marine Spatial Plans in creating continuity and cooperation in the Region of Ionian Islands.

Ms Monica SKALTSA (Head of Unit, General Spatial Planning Policy – MEECC) underlined the necessity of considering the land coastal zones as essential part of Marine Spatial Plans and stressed the importance of consultations at all administration levels.

Dr Panayiotis PANAYIOTIDIS (Research Director at the HCMR) raised the problematic and the difficulty in defining the areas that MSPs should cover.

The discussion continued in a relaxed and constructive manner over lunch, with a beautiful view to Acropolis.

AFTERNOON SESSION

According to the Agenda, the afternoon session opened with the intervention of Mr Kostas Skordilis, regarding the problems of a typical Region related to MSP.

Dr Kostas SKORDILIS (Director for the Environment, Region of the Ionian Islands), after outlining the particularities of the insular Region of the Ionian Islands, referred to the existing spatial plans in the Region, underlining their inefficacy/insufficiency in providing safe guidance to the Regional Authorities, when building or activity licensing is needed in the coastal and marine area. Then he quoted the challenges that the Region of the Ionian Islands faces, in terms of sea-uses, giving examples of incompatibilities between tourism installations along the coast line and aquaculture, which is the most typical conflict in the Region.

Therefore, he emphatically argued on the necessity of the project "MSP Greece" and confirmed the willingness of the Regional Authority for further cooperation on the project.

Following the intervention of the Region of Ionian Islands representative, the Chairman invited Ms Vassiliki Vassilopoulou to present projects, which are in progress in the case study area of the Ionian Sea.

Dr Vassiliki VASSILOPOULOU (Research Director at the HCMR) particularly stressed the necessity of implementing the Ecologic Approach (EcAp) Principle when planning in the marine space. She also underlined the importance of correlating the Ecosystem Approach with the key principles of the MSP. Part of her presentation referred to methodologies and tools, for studying the conflicts and the impacts of human activities in the marine ecosystems.

During the last part of her presentation, she referred to the good planning practices in other seas, while special focus was made on projects taking place in the area of the case study in Greece. In particular, she presented the problematic both on the ADRIPLAN and the MESMA projects (respectively, taking place in the northern Ionian Sea and the southern Ionian Sea – islands of Lefkada, Cephalonia, Ithaca and Zante).

Interventions by the participants

Dr Panayiotis PANAYIOTIDIS (Research Director at the HCMR) pointed out the lack of cohesion and synergies among the studies in the area of the Ionian Islands, giving the example of the MESMA project, which was not consulted in the attempted extraction of hydrocarbons in the Ionian Sea.

Dr Christos ANAGNOSTOU (ex. Research Director at the HCMR) stressed the necessity and difficulties of public participation and consultation procedures, as essential parts of integrated spatial planning.

Ms Monica SKALTSA (Head of Unit for General Spatial Planning Policy – MEECC) pinpointed the importance of synthesizing and harmonizing sectoral policies and plans, for eliminating future conflicts in the marine space.

Dr Kostas SKORDILIS (Director for the Environment, Region of the Ionian Islands) referred to the need to involve citizens in the planning process, but also to inform them so that they could participate in a substantial way.

CONCLUDING POINTS

The project Coordinator, Prof. E. Beriatos, invited Dr Athena Mourmouris to summarize the discussions of the day and present some concluding points.

Dr Athena MOURMOURIS (Honorary Director General for the Environment) expressed the appreciation of the core team for the general positive response of all participants and their willingness to cooperate for the progress of the MSP-Greece project. She recalled the existing momentum that favours MSP in Greece: the recently adopted EU Directive, the ICZM Protocol provisions, the Adriatic-Ionian Strategy, the Regional Spatial Plans under revision, the MSSD under revision. It is a challenge to prepare the tools facilitating implementation of MSP and ICZM in a complementary manner.

Though the project will focus on methodological tools, on pilot actions and on access to proper knowledge base, the big challenge – as she said – is to mobilize the Regional/local stakeholders in an efficient governance scheme. To this end, Ms Mourmouris invited the participants to submit proposals in the course of the project that would contribute to creating a feeling of ownership. This could be achieved through appropriate consultation schemes and, in parallel, development and use of tools useful for the needs of the local authorities. Such tools might comprise matrixes of compatible sea uses, arguments for decision making, tools for implementation by the technical services, proposal of incentives or disincentives, funding perspectives etc. She finally thanked them all for their positive response to the team's invitation for cooperation.

Prof. E. Beriatos concluded the meeting by thanking all participants as well and promising to contact them, as part of a broader network, for the next actions within the project.

Welcome Message from the Coordinator of CAMP Italy project

I would like to greet distinguish participants, guests and organizers of the inception meeting of the Greek Project on MSP, and to thank for kindly inviting me to give a message.

It is a great pleasure for me to give my welcome message to this important event for Greece and also for the Mediterranean CAMP/MSP Network as the CAMP Italy Project Coordinator.

it is of special importance to underline the ambitiousness of CAMP Italy Project, focusing on the importance of horizontal level activities in relation with other related Projects in the Mediterranean area, as other CAMPs and/or MSP Projects and referred to the crucial role of CAMP in the Barcelona Convention and in National strategies to implement coastal zone management planning as well as related issues, like the Marine Protected Areas, EcAp process or the Maritime Spatial Planning. In fact, it is important to pursue common goals as a cohesion element of harmonization and calibration.

This type of projects represents real and valuable solution. In this context, CAMP Italy denotes a tangible change for its complexity and richness on proposing new solutions and tools for the Mediterranean network of CAMP and ICZM/MSP Projects.

The importance of CAMP and ICZM/MSP projects is clear, since they are essential as a support to strengthen these policies at the national level as well as at the Mediterranean level to gain experience in integrated coastal zone management and maritime spatial planning, especially as regards understanding and experimenting criticalities. There is a great interest in creating a Mediterranean network to learn from other experiences, in order to find common strategies to be adapted in the Mediterranean framework; to learn from common coordination, collaboration and confrontation; to test and improve contributions on ecosystem approach throughout CAMP Projects and in connection with MSP, ECAP process, EU Marine Strategy and the related Good Environmental Status (GES).

The future steps regards the linkage with the Marine Strategy and the ICZM-Marine/Maritime Spatial Planning pointing out the crucial collaboration among CAMP network, with the new ones of Italy and France and also with Greece, and their common interest in activities of coastal spatial planning.

I strongly believe that the network will offer to the Mediterranean area the chance of improving its environment and sustainable development, contributing to give meaning and implementing the so called 'Blue Growth', the long term Strategy to support sustainable growth in the marine and maritime sectors as a whole.

Once again I thank you for this opportunity to give a message to the participants of the MSP Greek project inception meeting, as a good occasion to construct exchange experience and lessons learned by other Countries and related stakeholders for a better environmental protection, living resources conservation and sustainable development in the Mediterranean Sea.

I wish all of you successful implementation of the follow-up and challenging ideas!

Thank you, thank you very much.

Looking forwards to reading from you,

Daniela Addis

National Coordinator of Camp Italy Project

2nd Official Meeting (Split, 14 May 2015)

Brief information on the Split Meeting

The Meeting in Split, took place on the 14th of May 2015, in the framework of the PAP National Focal Points Meeting. It was the second Official Meeting of the Project (after the Inception Meeting held in Athens on January 30, 2015). During the Split Meeting, apart from the presentation of the preliminary findings of the project, the core team of MSP Med – Greece focused on the exchange of ideas among all FPs of the PAP/RAC that, after all, will be among the end users of the project results.

The core team of the project was represented by Professor Elias Beriatos (Coordinator of the Project), Dr Athena Mourmouris (Honorary Director General of the Ministry of Environment) and Dr Marilena Papageorgiou (Lecturer at the University of Thessaly). Apart from the Director and the Experts of PAP/RAC, there were 14 (out of the 22 in total) National Focal Points present at the Split Meeting, as well as a representative from the European Union.

During the session organised for the discussion of the *MSP Med – Greece* Project, a thorough presentation by the above mentioned team members took place (please see separate file with the "Minutes of the Meeting"), triggering an interesting and enlightening discussion with the involvement of the majority of the present National FPs. The presentation concluded by proposing some elements that could be used by the PAP Secretariat for the formulation of draft Recommendations or draft Decision on MSP, to be submitted for the CP's approval at their next COP (Athens, February 2016). Furthermore, a leaflets (in English and French) were distributed to all participants with information on the project. Almost all NFP present took the floor, mainly to express their opinion and experience rather than to address questions to the team of the project.

Apart from their valuable input over the discussion session, all participants of the meeting were kindly asked to further contribute to the MSP Med – Greece Project, by filling-in a special Questionnaire that was distributed by the team members on the spot, in an effort to collect additional data regarding MSP practices and processes in the Mediterranean Countries.

At the end of the meeting, all participants warmly welcomed the pilot project and kindly thanked team members for their detailed presentation and information provided on the project *MSP Med – Greece*.

On the other hand, the team members also thanked all participants for their interventions and their contribution by filling-in the Questionnaires. Finally, the project team reassured to take into account all information given, so as to deliver a project providing user-friendly methodologies and tools for the implementation of MSP in the Mediterranean (in accordance with the ICZM Protocol as well as the EU Directive on MSP).

Agenda of the Meeting

9:00 – 11:00	Presentation of the status of implementation of PAP/RAC activities.
11:00 – 11:30	Coffee break.
11:30 – 12:30	Marine Spatial Planning (MSP) in the Mediterranean: presentation of the pilot project implemented by Greece and discussion (Mr. E.T. Beriatos, Ms. Marilena Papageorgiou and Ms. Athena Mourmouris).
12:30 – 13:00	Reporting format on the ICZM Protocol: discussion and recommendations (Ms. Željka Škaričić).
13:00 – 14:30	Lunch break.
14:30 – 16:00	EcAp pilot project: Introduction (Mr. M. Prem). Candidate common indicator on "Land use change" in the Adriatic (Mr. Jaume Fons Esteve).
16:00 – 16:30	Coffee break.
16:30 – 18:00	Workplan for 2016-2017 within the 6-year Strategic planning of MAP (Ms. Željka Škaričić).
18:00	Closure.

List of Participants in Split Meeting

PAP National Focal Points

Full name	Institution / Affiliation
Ms. Borana ANTONI	ALBANIA / Expert in the SEA, EIA, Industrial Pollution, Environmental Standards Unit, Ministry of Environment, Forest and Water Administration
M. Raouf HADJ AISSA	ALGERIA / Ministère de l'Aménagement du Territoire et de l'Environnement
Mr. Tarik KUPUSOVIC	BOSNIA AND HERZEGOVINA / National Co-ordinator for MAP Hydro Engineering Institute
Mr Ivan RADIC	CROATIA / Senior Advisor, Department for the Protection of Sea, Directorate for Climate-related Activities, Sustainable Development and Protection of Soil, Air and Sea, Ministry of Environment and Nature Protection
Ms Joanna CONSTANTINIDOU	CYPRUS / Environment Officer Department of Environment Ministry of Agriculture, Rural Development and Environment
M. Fabrice BERNARD	FRANCE / Délégué Europa International Conservatoire de l'Espace Littoral et des Rivages Lacustres
Ms. Athena MOURMOURIS	GREECE / Honorary DG for the Environment, Ministry of Reconstruction of Production, Environment and Energy
Ms. Maayan HAIM	ISRAEL / Coastal Environment Engineer Ministry of Environmental Protection
Mr. Georges AKL	LEBANON / Civil Engineer, Head of Service of Natural Resources, Ministry of Environment
M. Hafid EL OUALJA	MOROCCO / Direction de la Surveillance et de la Prévention des Risques Ministère Délégué auprès du Ministre de l'Énergie, des Mines de l'Eau et de l'Environnement, chargé de l'Environnement
Ms. Aleksandra IVANOVIC	MONTENEGRO / Advisor Public Enterprise for Coastal Zone Management of Montenegro
Mr. Mitja BRICELJ	SLOVENIA / Secretary Ministry of Environment and Spatial Planning Directorate for Water and Investments / Water Management Division
Mr. Jordi GALOFRE SAUMELL	SPAIN / Jefe del Servicio de Costas en Tarragona Dirección General de Sostenibilidad de la Costa y del Mar Ministerio de Medio Ambiente y Medio Rural y Marino
Mr. Emrah SÖYLEMEZ	TURKEY / Head of Section Ministry of Environment and Urbanisation Directorate General of Spatial Planning Coastal Areas Department
Ms. Marijana MANCE	Policy Officer, UNEP/MAP FP Mediterranean Sea, European Commission, Directorate-General for Environment

MAP National Focal Points

Full name	Institution / Affiliation
Mr. Charles-Henri de BARSAC	FRANCE / Ministère de l'écologie, du développement durable et de l'énergie
Ms. Jelena KNEZEVIC	MONTENEGRO / Adviser to the Minister, Ministry of Sustainable Development and Tourism

PAP / RAC Officers

Full name	Institution / Affiliation
Ms. Zeljka SKARICIC	PAP/RAC Director
Mr. Marko PREM	PAP/RAC Deputy Director
Ms. Branka BARIC	PAP/RAC Programme Officer
Ms. Marina MARKOVIC	PAP/RAC Programme Officer
Mr. Sylvain PETIT	PAP/RAC Programme Officer
Ms Daria POVH SKUGOR	PAP/RAC Programme Officer
Mr. Neven STIPICA	PAP/RAC Programme Officer
Ms. Veronique EVERS	PAP/RAC Consultant
Mr. Ivan SEKOVSKI	PAP/RAC Consultant

Invited Experts

Full name	Institution / Affiliation
Ms. Daniela ADDIS	CAMP Italy National Co-ordinator
Mr. Elias T. BERIATOS	Professor at the University of Thessaly (UTH) MSP Greece Co-ordinator
Ms. Françoise BRETON	Department of Geography, Universitat Autònoma de Barcelona (UAB)
Mr. Jaume FONS-ESTEVE	Senior Researcher, Department of Geography, Autonomus University of Barcelona
Ms. Marilena PAPAGEORGIOU	Adj. Asst. Professor at the Department of Planning and Regional Development, University of Thessaly (UTH)
Mr. Christophe Le VISAGE	Expert, Stratégies Mer et Littoral

Photo Gallery from the Split Meeting

Minutes of the Split Meeting

PRESENTATION OF THE PROJECT

Prof. Elias BERIATOS (University of Thessaly, Coordinator of the Project) in his opening speech thanked PAP /RAC for its hospitality during the Meeting in Split, addressing special thanks to the Director, Ms Zeljka Skaricic for entrusting the MSP Project to the University of Thessaly and the GREEN_PLAN Laboratory, along with its collaborating partners.

He informed the attendants on the collaboration scheme of the Project *MSP Med – Greece*, the composition of the core team, as well as the collaborating partners namely:

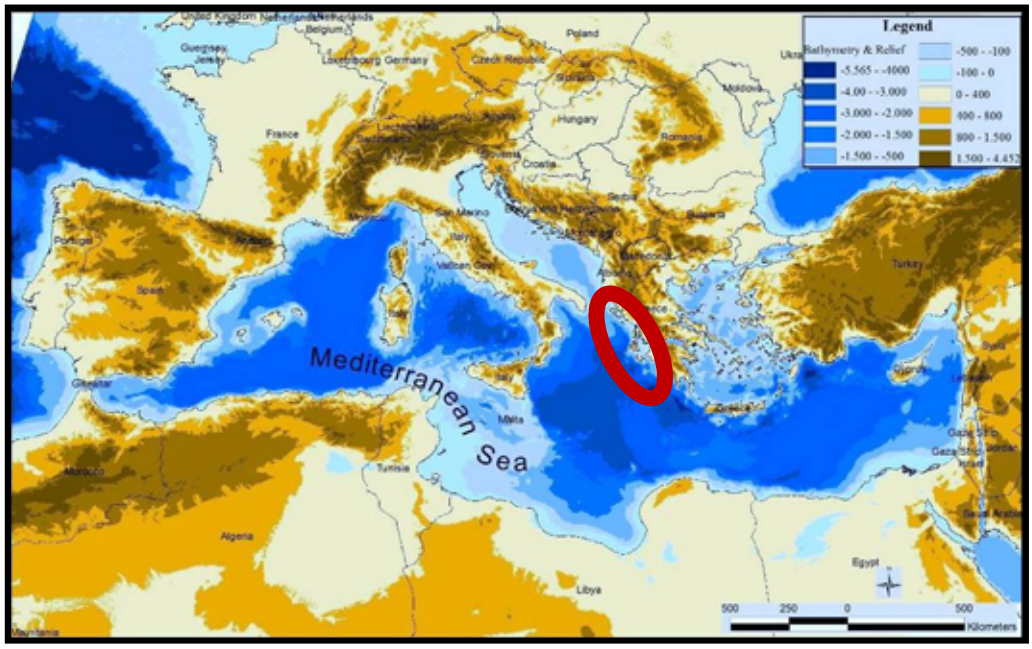
- The Hellenic Ministry of Reconstruction of Production, Environment and Energy;
- The Hellenic Centre of Marine Research;
- The Region of the Ionian Islands;
- The Regional Union of the Ionian Islands Municipalities; and
- The Marine National Park of Zakynthos.

Then he presented more specifically the spectrum of the project team, highlighting the multidisciplinary origin of the experts, deriving mainly from the University of Thessaly, as well as the Ministry of Reconstruction of Production, Environment and Energy and the Hellenic Centre of Marine Research.

Finally, he called upon Ms Athena Mourmouris and Ms Marilena Papageorgiou to present the Objective of the Project and the Activities foreseen.

Dr Marilena Papageorgiou (*Adj. Asst. Professor at the University of Thessaly): referring to the objectives and goals of the Project*, mentioned that these are: **the facilitation of the implementation of the ICZM Protocol,** in particular with regards to its provision for MSP, by testing **methodological tools** that will hopefully serve as guide to all CPs, in order to formulate or further strengthen their own national MSP systems.

Regarding the official meetings of the Project, foreseen by the Memorandum of Agreement, she presented the timetable of the three (3) meetings, giving further information on the first, already held in Athens (in January 2015) and the second, taking place in Split. As for the three (3) local meetings (organized to take place in the case study area), she gave key information on their dates, purpose and agenda.



Location of the case study area in the Mediterranean

Dr Athena MOURMOURIS (Honorary Director General for the Environment, Hellenic Ministry RPEE): following the key information on the project, her presentation focused on eight methodologies and tools that are important for the planning & implementation process and which need to be tested in the case study area, in the aim of facilitating the Marine Spatial Planning (MSP). Her presentation focused in particular on:

- **Legal and Institutional Aspects** (stressing the need for each country to clarify the competent Authority as well as the other related competences: coordination role, consultation schemes and decision-making process);
- **Governance** (Imperative for MSP and its implementation, needed at all "steps" & involving all types of interested groups);
- **Vulnerability Assessment** (important to put priorities on the basis of vulnerability related to habitat loss, erosion, environmental quality of waters, loss of fishing stocks – important to integrate the EcAp);
- **Indicators and Compatibility for main sea uses (**focusing on the conditions under which some conflictual uses might become compatible);
- **Cumulative Impacts & Integrated Regional Assessment** (useful tool for assessment of impacts of different options and alternative scenarios & for consultation / decision-making);
- **3-D Mapping tools** (importance of having visual perception of problems, cumulative impacts, alternatives, real time consultations. Importance of reducing costs using open data. Limited possibilities of tools so far for 3-D, also due to limited data so far for the Med marine areas);
- **Impacts of Erosion, Climate Change, Sea Level Rise etc.** (model/study in progress regarding erosion, SLR & tsunami within our project for some Ionian Islands);
- **Interaction between sea/land (and plans, measures)**: Interactions due to nature (coastal erosion, sand removal, …), Interactions related to human activities (ports/navigation, land facilities/aquaculture, tourism/swimming areas, …), Interactions of coastal plans & MSP / & respective measures.

Intention of the project is that all abovementioned tools and methodologies are tested in the case study area (Region of the Ionian Islands), in order to produce useful conclusions and proposals, regarding the implementation of MSP in the Mediterranean.

Finally, the presentation ended with **proposals of Recommendations** to be presented for approval by the Contracting Parties at their next Conference, to be held in February 2016, in Athens.

Elements for Recommendations (to the CPs of the Barcelona Convention):

1. Set out the **competent national authority** and the consultation/decision process for MSP by mid-September 2016.
2. Identify (through a "rapid assessment") the **vulnerable marine areas**, which would need to have by priority Marine Spatial Plans (taking in due account already protected marine areas, scientific information related to the Ecologically or Biologically Significant Marine Areas [EBSA], as well as marine areas under pressure from [conflictual or not] marine uses).
3. Plan timely **collection of necessary data** for MSP, such as bathymetry mapping (and side scanning where possible) at least up to the isobaths of 200m in priority areas, as well as major oceanographic data (on line and real time where possible) using buoys.
4. Integrate the **Ecological Approach (EcAp) in the MSP.**
5. Request the PAP/MAP assistance in seeking **funding (from the EU) for the preparation of a GIS tool for the entire Mediterranean**, similar to the one under preparation for the Celtic & North Seas. It should show all the available data and give the possibility to see impacts of alternative location options and would facilitate both people involved in online consultation and decision makers.

INTERVENTIONS AND DISCUSSION

The presentation of the project, followed interesting interventions made by the PAP Focal Points:

Ms. Maayan HAIM (Focal Point of Israel): informed on her country's competent Authority for MSP (Spatial Planning Administration), expressing her belief that Marine Spatial Planning should rely on the main Planning Administration. Regarding the 2nd and 3rd Recommendations proposed, she noticed the difficulties that might occur in the effort to identify vulnerable areas in classified areas for military use.

Mr. Hafid EL OUALJA (Focal Point of Morocco): He congratulated the project team for its work and pinpointed that information on MSP aspects of his country (to be filled-in to the Questionnaire), is subject of different Authorities having jurisdiction for marine areas and planning. He expressed also his wish to have the French version of the questionnaire.

Ms. Joanna CONSTANTINIDOU (Focal Point of Cyprus): wondered if the E.U. has launched a methodology for MSP, as the IOC UNESCO ("10 steps for MSP") and then she referred to an INTERREG project, implemented in the east Mediterranean Sea, with the collaboration of Cyprus and Greece. Finally, she welcomed the fact that the MSP Med – Greece project focuses also on the sea and land interactions.

Mr. Jordi GALOFRE SAUMELL (Focal Point of Spain): gave information on the experience of Spain regarding MSP, especially in terms of organizing sea uses, such as the off-shore wind farms and the fishery as there is no real MSP in Spain. Mentioned the efforts being made for trans-boundary planning in the sea, mainly through the pilot project "MSP 2050" and highlighted the importance of achieving combination and coordination of existing Guides, Protocols and Directives for the sea between UNEP- MAP and EU.

Mr. Fabrice BERNARD (Coordinator of the CAMP France): remarked the importance of sharing data, approaches and techniques of all the projects concerning the Mediterranean (like the *MSP Greece*) as well as the specificity of the MSP regarding the islands and pinpointed the value of the Recommendations proposed.

Mr. Mitja BRICELJ (Focal Point of Slovenia): noticed the variety of projects carried out in the Mediterranean sea and stressed out the necessity for the linkage among them. He also expressed his positive opinion regarding the Recommendations proposed by the team.

Ms. Aleksandra IVANOVIC (Focal Point of Montenegro): asked the project team about the competent authority in Greece and expressed her special interest about the 3-D mapping tools, demanding further information from the team.

Mr. Emrah SÖYLEMEZ (Focal Point of Turkey): stressed the complexity of MSP especially in cases of restricted areas for reasons of National Security and military uses. He also pinpointed the need to combine the ICZM Protocol and the MSP with planning and plans of the mainland.

Mr. Raouf HADJ AISSA (Focal Point of Algeria): described his country's experience and progress related to MSP (one project already finished, eight coastal studies under elaboration, marine cartography and GIS for the coastal zone very advanced) and expressed his interest in the indicators for MSP.

Ms Marijana MANCE (E.U. representative): agreed on the 5th Recommendation, regarding the possibility of E.U. funding, for the preparation of a GIS tool for the entire Mediterranean.

CONCLUDING POINTS

At the end of the session, everybody congratulated and thanked the project team for their comprehensive presentation on the MSP Med – Greece project, stressing that the lessons learnt from the case study of the project -regarding the use of the methodological tools for MSP- will be of great use to all Contracting Parties, in their effort to implement the ICZM Protocol in the Mediterranean. The session ended with many wishes for the useful outcome of the project.

Closure Meeting (Athens, 30 November 2015)

PAVING THE ROAD TO MARINE SPATIAL PLANNING IN THE MEDITERRANEAN

CLOSING CONFERENCE

(Athens, 30 – 11 – 2015)

AGENDA

09.30 – 10.00	Registration
10.00 – 10.30	Opening – Introductory speeches –
	Prof. E. Beriatos, University of Thessaly, Project Coordinator
	Ms R. Clabatsea, Secretary General for Spatial Planning, Hellenic Ministry of the Environment and Energy,
	Mr G. Leone, MAP/UNEP Coordinator
	Ms Z. Skaricic, PAP/RAC Director
	Mr G. Zacharatos, Dep. Secretary General for Tourism
10.30 – 11.30	Presentation of the Project and its Results *(by Dr A. Mourmouris, on behalf of the Core Team)*
11.30 – 13.00	Short Interventions by Ministries and Discussion
13.00 – 14.30	*Lunch break*
14.30 – 16.00	Short Interventions on Foreign Experience (e.g., Croatia) and Discussion
16.00 – 17.00	General Discussion with Stakeholders
17.00 – 17.30	Conclusions – Closing session *(Co-Chairs: Prof. E. Beriatos and Dr A. Mourmouris)*

List of Participants

External Participants

Full name	Institution / Affiliation
Clabatsea Rena	Secretary General for Spatial Planning, Hel. Ministry of the Environment & Energy
Zacharatos Gerasimos	Dep. Secretary General for Tourism, Hellenic Ministry of Tourism
Leone Gaetano	*MAP/UNEP Coordinator*
Skaricic Zelijka	*PAP/RAC Director*
Parisis Alexandros	*President at the* Regional Association of Ionian Islands Municipalities
Oustoglou Alexandra	Legal Advisor – Regional Association of Ionian Islands Municipalities
Kovacevic Gordana	Ministry of Physical Planning of Croatia
Koutsoubas Drosos	President at the National Marine Park of Zakynthos
Chrysomalidis Stelios	Head of Directorate of Spatial Planning – MEECC
Skaltsa Monica	Head of Unit for General Spatial Planning Policy – MEECC
Gourgiotis Anestis	Head of Unit for the National Spatial Plans – MEECC
Stefani Efi	Head of Unit for Spatial Zones (Directorate of Spatial Planning) – MEECC
Rabavilla Mary	Directorate of Spatial Planning – MEECC
Manalis Nikos	Directorate of Spatial Planning – MEECC
Aliberti Kalliopi	Directorate of Spatial Planning – MEECC
Lagiou Evgenia	Directorate of Spatial Planning – MEECC
Georgiadou Eirini	Directorate of Spatial Planning – MEECC
Papanikolaou Theofania	Directorate of Spatial Planning – MEECC
Kanollopoulou Katerina	Directorate of Spatial Planning – MEECC
Trifou Eleni	Directorate of Spatial Planning – MEECC
Zifou Mary	Ministerial Cabinet, Hellenic Min. of the Environment & Energy
Litardou Dimitra	Secretariat Gen. for Spatial Planning, Hel. Min. of the Environment & Energy
Platias Charalambos	Directorate of Ports Policy- Ministry of Mercantile Marine and Transportation
Kalara Ageliki	Directorate of Fisheries – Ministry of Rural Development and Alimentation
Tsouvala Maria	Directorate of Fisheries – Ministry of Rural Development and Alimentation
Simoni Ageliki	Directorate of Underwater Antiquities – Ministry of Culture
Dellaporta Aikaterini	Ministry of Culture
Markatou Anastasia	Ministry of Culture
Papagianni Pigi	Building Authority – Municipality of Zakynthos
Stamogiannis Vassilis	Director at MEDASSET
Christopoulou Ioli	WWF Hellas
Maragkou Panayiota	WWF Hellas
Pazimadis Yiorgos	WWF Hellas
Nestoridou Plimnia	Archelon Association (for the protection of Carreta-Carreta)
Panou Alice	Archipelagos: Environment and development
Tritsarolis Giannis	Sea Taxi Enterprise (Ithaki)
Kyriakidis George	Nireus Sea Farms S.A.
Daskalakis George	Former president at the Scuba Diving Company
Manika Vassiliki	Undergraduate student at the DPRD, University of Thessaly

Project Team participants

Full name	Institution / Affiliation
Beriatos Ilias	Professor at the Univ. of Thessaly, project coordinator
Dr Mourmouris Athena	Honorary Director General for the Environment (MEECC)
Dr Papageorgiou Marilena	Adjunct Asst. Professor at the DPRD, University of Thessaly
Dr Faraslis Ioannis	Laboratory Assistant & Researcher at the DPRD, University of Thessaly
Dr Panayiotidis Panayiotis	Research Director – Hellenic Center for Marine Research
Vassilopoulou Vassiliki	Research Director – Hellenic Center for Marine Research
Dr Anagnostou Christos	Former Research Director – Hellenic Center for Marine Research
Krinakis Stavros	Research associate – DPRD, University of Thessaly
Charalampidou Vassiliki	Undergraduate student – DPRD, University of Thessaly

Photo Gallery










ANNEX II: Local Meetings

1st Local Meeting (Corfu, 30 March 2015)

Brief information on the Corfu Meeting

The visit to the island of Corfu (home of the 1st local meeting of the project) lasted three days and took place between 28 and 30 of March 2015. The first two days of the Meeting were spent on the field, in the Northern part of the island, where the only sea farm unit of Corfu is operating.

The 1st Local Meeting – or else the Corfu Meeting – was held on the last day of the visit to the island (March 30, 2015) and took place in the premises of the Region of the Ionian Islands.

Regarding the Agenda of the Meeting, it was planned so as to be dedicated most of the time to the local and Regional Authorities as well as the stakeholders. Therefore, apart from the welcome speeches and a short presentation on the project's goals and objectives, the meeting mainly included interventions and presentations made by the several stakeholders attending the meeting.

These interventions and presentations were made following some questions included already in the invitation letters and mentioned in a more analytic way in the Questionnaires distributed during the meeting.

Apart from the Core Team of the Project, the meeting was attended by several Officials and representatives from the Regional and Local Authorities, as well as local and Regional stakeholders.

The following Authorities and Agencies were represented at the meeting:

- Region of the Ionian Islands;
- Municipality of Corfu;
- Regional Union of the Local Administration in the Ionian Islands;
- Corfu Port Administration;
- Corfu Chamber of Commerce;
- Hoteliers Union;
- Corfu Sea Farm S.A.;
- Fisherman Association;
- Gouvia Water Marina S.A.;
- Hellenic Water Airports S.A.

The meeting went smoothly, according to the agenda, in a spirit of constructive cooperation (despite the last minute change of the venue, on behalf of the hosting Authority). Upon arrival, all participants were provided with:

a) Agenda of the Meeting (in Greek);

b) Leaflet of the Project MSP Greece (in Greek);

c) Questionnaire (in Greek) for the collection of information related to the positions and proposals of agencies / stakeholders regarding marine spatial planning.

At the end of the meeting, all participants and stakeholders, warmly welcomed the project and kindly thanked the project team for selecting the Region of the Ionian Islands to become the case study area of this pilot project.

On the other hand, the project team also welcomed all participants' willingness to cooperate – both with the project team and among themselves – thus establishing: a) a useful network for the project *MSP Med – Greece* and b) a valuable participatory scheme, in view of future attempts to implement Marine Spatial Planning in the Region of the Ionian Islands. Finally, the project team committed to keep updated the attendants of the meeting on the progress of the project and to provide to all participants useful material deriving from the Meeting.

Agenda of the Corfu Meeting

Marine Spatial Planning
Mediterranean • Greece

SETTING THE PRIORITIES AND VISIONS FOR MARINE SPATIAL PLANNING IN THE REGION OF IONIAN ISLANDS

INTERACTIVE COSULTATION MEETING

10.00 – 10.30	Opening – Welcome
	*(**Prof. E. Beriatos**, University of Thessaly)*
	Welcome Note form the Head of the Region of Ionian Islands
	Presentation of the project aim and objectives
	*(**Dr A. Mourmouris**, Hon. Director General for the Environment)*
10.30 – 12.00	Interventions from the local stakeholders
12.00 – 12.15	Coffee Break
12.15 – 13.15	Interactive Discussion
13.15 – 14.00	Preparation of stakeholders cooperation scheme / network
14.00 – 14.30	Conclusions – Closure
	*(Co-chairs: **Prof. E. Beriatos** and **Dr. A. Mourmouris**)*

List of Participants in the Corfu Meeting

Name	Affiliation
Tsoukas Dionysios	Region of Ionian Islands / Vice Head of the Region
Pandi Katerina	Region of Ionian Islands / Vice Head of the Region
Karalis Nikitas	Region of Ionian Islands / General Director
Skordilis Kostas	Region of Ionian Islands / Director for the Environment
Ginis Stamatis	Region of Ionian Islands / Director for Rural Economy
Papzozomenou Chrystalla	Region of Ionian Islands / Head of Dep. for Spatial Planning
Timotheatos Spyros	Region of Ionian Islands / Department for the Environment
Vassilaki Eleftheria	Region of Ionian Islands / Department for the Environment
Ustoglou Alexandra	Regional Union of Local Administration in the Ionian Islands / Legal Advisor
Rigas Spyros	Municipality of Corfu / Director for Building Permissions
Rossis Nikos	Municipality of Corfu / Head of Dep. for Building Permissions
Coulouri Efthimia	Municipality of Corfu / President of the Department of Municipal Real Property
Kalogiannin Maria	Municipality of Corfu / Head of Dep. for the Environment
Batsoulis Aris	Corfu Port Administration / Head of the Cruise Department
Bramos Panagiotis	Hoteliers Union / President
Grammenos Fotis	Corfu Chamber of Commerce / Vice President of the Tourist Agents Department
Savanis Spyros	Corfu Chamber of Commerce / Tourist Agents Department
Papadopoulos Sotiris	Corfu Sea Farm S.A. / C.E.O.
Koutsodontis Dimitris	Gouvia Yacht Marina S.A. / C.E.O.
Nikolouzos Giorgios	Hellenic Water Airports S.A. / Officer
Vassilakis Spyros	Fisherman Association

Present Team Members

- **Prof. Beriatos Elias**, (Coordinator of the Project), University of Thessaly
- **Dr. Mourmouris Athena**, Honorary Gen. Director for the Environment, M.R.P.E.E.
- **Dr. Papageorgiou Marilena**, Adj. Assistant Professor at the University of Thessaly
- **Dr. Faraslis Giannis**, Laboratory Teaching Staff at the University of Thessaly
- **Dr. Panayiotidis Panayiotis**, Research Director at the Hellenic Centre of Marine Research
- **Dr. Anagnostou Christos**, Former Research Director at the Centre of Marine Research

Photo Gallery from the Corfu Meeting

Field trip








2nd Local Meeting (Ithaca, 29 June 2015)

Brief information on the Ithaca Meeting

The visit to the island of Ithaca lasted three days and took place between 28 and 30 of June 2015. The first two days of the Meeting were spent on the field, in the Southern part of the island, which was visited by boat and therefore explored by the seaside.

The 2nd Local Meeting was held on the last day of the visit to the island (June 30, 2015) and took place during a rather difficult political situation (during capital control and in view of a National Referendum).

Regarding the Agenda of the Meeting, it was planned so as to be dedicated most of the time to the local and Regional Authorities as well as the stakeholders. Therefore, apart from the welcome speeches and a short presentation on the project's goals and objectives, the meeting mainly included interventions and presentations made by the several stakeholders attending the meeting.

These interventions and presentations were made following some questions included already in the invitation letters and mentioned in a more analytic way in the Questionnaires distributed during the meeting.

Apart from the Core Team of the Project, the meeting was attended by several Officials and representatives from the Regional and Local Authorities, as well as local and Regional stakeholders.

The meeting went smoothly, according to the agenda, despite the political difficulties. Upon arrival, all participants were provided with:

a) Agenda of the Meeting (in Greek);

b) Leaflet of the Project MSP Greece (in Greek);

c) Questionnaire (in Greek) for the collection of information related to the positions and proposals of agencies / stakeholders regarding marine spatial planning.

At the end of the meeting, all participants and stakeholders, warmly welcomed the project and kindly thanked the project team for selecting the Region of the Ionian Islands to become the case study area of this pilot project.

On the other hand, the project team also welcomed all participants' willingness to cooperate – both with the project team and among themselves – thus establishing: a) a useful network for the project *MSP Med – Greece* and b) a valuable participatory scheme, in view of future attempts to implement Marine Spatial Planning in the Region of the Ionian Islands. Finally, the project team committed to keep updated the attendants of the meeting on the progress of the project and to provide to all participants useful material deriving from the Meeting.

Agenda of Ithaca Meeting

10.00 – 10.30	Opening – Welcome *(**Prof. E. Beriatos**, University of Thessaly)* Welcome Note form the Head of the Municipality of Ithaca Presentation of the project aim and objectives *(**Dr A. Mourmouris**, Hon. Director General for the Environment)*
10.30 – 12.00	Interventions from the local stakeholders
12.00 – 12.15	Coffee Break
12.15 – 13.15	Interactive Discussion
13.15 – 14.00	Preparation of stakeholders cooperation scheme / network
14.00 – 14.30	Conclusions – Closure *(Co-chairs: **Prof. E. Beriatos** and **Dr. A. Mourmouris**)*

List of Participants in the Ithaca Meeting

Name	Affiliation
Tsintilas Spyros	Prefect of Ithaca
Stanitsas Dionisis	Mayor of Ithaca
Anagnostatos Loukas	Mayor Alderman of Ithaca
Zapantis Andreas	Regional Union of Local Administration in the Ionian Islands / Director
Kirkilis Stylianos	Coast Guard Ensign
Panou Alice	NGO "Archipelagos: Environment & Development"
Chanos Gerasimos	Head of the Educational Centre for the Environment
Lilas Georgios	Odyssey Diving Club
Kyriakidis Giorgos	Nireus S.A. (Aquaculture Enterprise)
Politis Giorgos	Aquacultures of Ithaca
Grivas Dionisis	President of Fishermen Association
Mitsouras Xenofon	Fisherman
Couloubis Panagiotis	Fisherman
Artavanis Dimitrios	Guide
Tritsarolis Giannis	Sea Taxi Enterprise
Tritsarolis Theodoros	Captain (Mercantile Navy)
Lekatsa Tasia	Volunteer in seal recording in the Ionian Sea (1990-1995)

Present Team Members

- **Prof. Beriatos Elias**, (Coordinator of the Project), University of Thessaly;
- **Dr. Mourmouris Athena**, Honorary Gen. Director for the Environment, M.R.P.E.E.;
- **Dr. Papageorgiou Marilena**, Adg. Asst. Professor at the University of Thessaly;
- **Dr. Anagnostou Christos**, Former Research Director at the Centre of Marine Research;
- **Dr. Vassilopoulou Celia**, Research Director at the Hellenic Centre of Marine Research.

Photo Gallery from the Ithaca Meeting




Field trip








3rd Local Meeting (Zante, 7 September 2015)

Brief information on the Zante Meeting

The visit to the island of Zante lasted three days and took place between 5 and 7 of September 2015. The first two days of the Meeting were spent on the field, in the Southern part of the island, where the National Marine Park of Laganas is located. The tour of the project team to the Park, was guided and kindly offered by the Administration of the National Marine Park and his Director Mr. Laurent Sourbès.

The 3nd Local Meeting was held on the last day of the visit to the island (September 7, 2015) at the premises of the Region of Ionian Islands.

Regarding the Agenda of the Meeting, it was the same with the previous meetings, i.e. so as to dedicate more time to the local and Regional Authorities as well as to the rest stakeholders. The meeting went smoothly, according to the agenda, despite the political difficulties. Upon arrival, all participants were provided with:

a) Agenda of the Meeting (in Greek);

b) Leaflet of the Project MSP Greece (in Greek);

c) Questionnaire (in Greek) for the collection of information related to the positions and proposals of agencies / stakeholders regarding marine spatial planning.

At the end of the meeting, all participants and stakeholders, warmly welcomed the project and kindly thanked the project team for selecting the Region of the Ionian Islands to become the case study area of this pilot project.

On the other hand, the project team also welcomed all participants' willingness to cooperate – both with the project team and among themselves – thus establishing: a) a useful network for the project *MSP Med – Greece* and b) a valuable participatory scheme, in view of future attempts to implement Marine Spatial Planning in the Region of the Ionian Islands. Finally, the project team committed to keep updated the attendants of the meeting on the progress of the project and to provide to all participants useful material deriving from the Meeting.

Agenda of the Zante Meeting

10.00 – 10.30	Opening – Welcome
	*(**Prof. E. Beriatos**, University of Thessaly)*
	Welcome Note form the Head of the Region of Ionian Islands
	Presentation of the project aim and objectives
	*(**Dr A. Mourmouris**, Hon. Director General for the Environment)*
10.30 – 12.00	Interventions from the local stakeholders
12.00 – 12.15	Coffee Break
12.15 – 13.15	Interactive Discussion
13.15 – 14.00	Preparation of stakeholders cooperation scheme / network
14.00 – 14.30	Conclusions – Closure
	*(Co-chairs: **Prof. E. Beriatos** and **Dr. A. Mourmouris**)*

List of Participants in the Zante Meeting

Name	Affiliation
Niotopoulos Elefterios	Region of Ionian Islands / Vice Head of the Region of Zante
Kampitsis Theodoros	Regional Counselor of Region of Ionian Islands
Botonis Anastasios	Alderman Mayor of Zante
Kokkalas Nikolaos	Harbor Master of Zante
Zivas Theodoros	Captain of Mercantile Navy, Chairman of Zante Port Authority
Sourbès Laurent	Director of Marine National Park of Zante
Georgilas Ioannis	Municipality of Zante / Director of Technical Services
Vardakastanis Dimitris	Region of Ionian Islands / Department for the Environment
Theodosi Sofia	Municipality of Zante / Directorate of Technical Services
Beka Evagelia	Region of Ionian Islands / Department for Fisheries
Plessa Ekaterini	Region of Ionian Islands / Department for the Environment
Plessas Spyros	Region of Ionian Islands / Department for the Environment
Stefos Dimitris	Region of Ionian Islands / Directorate for Development
Tsirigoti Athina	Region of Ionian Islands / Directorate for Development
Zourbanou Ageliki	Region of Ionian Islands / Department for the Environment
Pettas Stelios	Municipality of Zante / Department of Programming
Papagianni Pigi	Building Authority – Municipality of Zakynthos
Faraou Marietta	Municipality of Zante / Directorate of Technical Services
Armenis Georgios	Region of Ionian Islands / Department for Fisheries
Livanis Dimitris	Technical Chamber of Greece / Department of Western Greece
Paraschis Nikolaos	President of Fishermen Association
Gasparatou-Milanou Stamatia	Nautical Museum of Zante

Present Team Members

- **Prof. Beriatos Elias**, (Coordinator of the Project), University of Thessaly;
- **Dr. Mourmouris Athena**, Honorary Director General for the Environment, M.R.P.E.E.;
- **Dr Papageorgiou Marilena**, Adj. Asst. Professor at the University of Thessaly;
- **Dr Panayiotidis Panayiotis**, Research Director at the Hellenic Centre of Marine Research;
- **Dr Anagnostou Christos**, Former Research Director at the Centre of Marine Research.

Photo Gallery from the Zante Meeting




Field trip

ANNEX III: Questionnaire Forms

Questionnaire addressed to the local stakeholders (translated into English)

Note: For convenience and logistic purposes, the Questionnaire was formulated in such a way as to apply to all stakeholders and Islands of the Region of the Ionian Islands.

Place / Date: _____

QUESTIONNAIRE

(to Stakeholders of the Region of the Ionian Islands)

CORRESPONDANCE

Agency:_____

Address: _____

E-mail:_____

Tel: _____

1. Describe the activity / responsibility of your Agency in marine space

_____

_____

2. Describe the natural resources your activity uses

_____

_____

3. Describe the consequences of your activity on the marine environment

_____

_____

4. List any conflicts you notice in marine space

_____

_____

5. Describe the level and form of contribution of your activity to the local economy and society

_____

_____

6. Note your Agency's proposals for the optimal organization planning of marine space

_____

_____

Name and Signature: _____

Affiliation: _____

Questionnaire addressed to the PAP National FPs (in English)

Place / Date: _____

QUESTIONNAIRE

(to PAP/RAC NFPs)

COUNTRY:_____

1. Does your country have any experience regarding Marine Spatial Planning (MSP)?

_____

_____

2. Does your country have (or is about to have) any Marine Spatial Plans (global or sectoral)? If yes, please give key information (where, when etc.).

_____

_____

3. Is the competent Authority for *MSP* defined in your country? If yes, please name the Authority. (*In case of more than one Authority, please match competences for the following procedures: i. decision making, ii. approval, iii. implementation, iv. monitoring, v. evaluation*)

_____

_____

4. Does your country have any Sectoral Marine Management Plans (e.g. for fisheries) or any management Plan for Marine Protected Areas? If yes, please give key information.

_____

_____

5. Are public participation and consultation procedures for MSP foreseen in your country? If yes, please give key information.

_____

_____

6. Up to which distance from the coastline do the territorial waters extend in your country? (12 miles? else?)

_____

_____

7. Has your country declared Exclusive Economic Zone (EEZ)? If yes, does this apply along the entire country's coastline? If not, which areas have been selected and with which criteria? If no EEZ exists, please, mention main reasons.

_____

_____

Name of responding person: _____

Organisation: _____

E-mail: _____

Tel: _____

Questionnaire addressed to the PAP National FPs (in French)

Lieux/ Date: _____

QUESTIONNAIRE

(pour les PFN du CAR / PAP)

PAYS :_____

1. Est-ce que votre pays a déjà une expérience par rapport à la Planification Spatiale Marine (PSM) ?

_____

_____

2. Est-ce que votre pays dispose (ou est en train de disposer) des Plans -généraux ou sectoriels- concernant l'espace marin ? Si la réponse est positive, donnez s' il vous plaît des informations-clés (où, quand, etc.).

_____

_____

3. Est-ce que l'Autorité compétente pour PSM est bien définie dans votre pays? Si oui, quelle est cette autorité ? (*au cas où il y aurait plus qu'une Autorité, accordez, s' il vous plaît, la compétence pour les procédures suivantes : i. prise de décision ii. approbation iii. mise en œuvre iv. surveillance v. évaluation*)

_____

_____

4. Est-ce que votre pays dispose des Plans Sectoriels pour la Gestion de l'espace marin (par exemple pour la pêche) où des Plans pour la Gestion des espaces protégés marins? Si oui, donnez s' il vous plaît, des informations-clés.

_____

_____

5. Est-ce que des procédures de participation publique et de concertation sont prévues à votre pays ? Si oui, donnez s' il vous plaît, des informations-clés.

_____

_____

6. Jusqu' à quelle distance (à partir de la ligne côtière), s'étendent les eaux territoriales à votre pays? (12 milles marins? autre ?)

_____

_____

7. Est-ce que la Zone Economique Exclusive (ZEE) est déjà déclarée dans votre pays ? Si oui, cette zone, existe-t-elle sur toute la ligne côtière du pays? Si la ZEE n'existe pas partout, quels étaient les critères de sélection pour les régions choisies et quels pour les régions exclues?

_____

_____

Nom de la personne répondante : _____

Organisation : _____

E-Mail : _____

Tél: _____

Questionnaire addressed to the SPA National FPs (in English)

Place / Date: _____

QUESTIONNAIRE

(to SPA/RAC NFPs)

COUNTRY:_____

1. Does your country have (or is about to have) any Marine Spatial Plans (global or sectoral)? If yes, please give key information (where, when etc.).

_____

_____

2. Is the competent Authority for *MSP* defined in your country? If yes, please name the Authority. (*In case of more than one Authority, please match competences for the following procedures: i. decision making, ii. approval, iii. implementation, iv. monitoring, v. evaluation*)

_____

_____

3. Does your country have any Sectoral Marine Management Plans (e.g. for fisheries) or any management Plan for Marine Protected Areas? If yes, please give key information.

_____

_____

4. Do you consider the water catchment areas as an appropriate criterion for the identification/delimitation of the geographical management units in your country as regards ICZM? Could the involvement of corresponding local societies be an appropriate alternative form of management/governance? Does your country have already provisions for the articulation/interaction among coastal zone plans (for land parts) and marine spatial plans? If yes, please, elaborate.

_____

_____

5. Do you think that vulnerability assessment of marine areas in your country would need to take into consideration other elements beyond habitat loss, erosion, environmental quality of waters and loss of fishing stock? If yes, please give key information. Would information on SPAs, SPAMIs and EBSAs be useful and reliable for the assessment of marine ecosystems in your country? Please, elaborate.

_____

_____

6. How do you think that the EcAp could be better integrated in the Marine Spatial Planning in your country? Do you consider all EcAp descriptors and criteria/indicators equally important for MSP? If no, please, mention main reasons and proposals.

_____

_____

Name of responding person: _____

Organisation: _____

E-mail: _____

Tel: _____

ANNEX IV: Leaflets

Leaflet in Greek

Πλαίσιο και Στόχοι του Προγράμματος

Η Μεσόγειος, μια θάλασσα ανάμεσα σε τρεις ηπείρους και 22 χώρες, αποτελεί έναν από τους αρχαιότερους τόπους κατοίκησης της γης. Κοιτίδα πανάρχαιων πολιτισμών με αδιάλειπτη ιστορία, εξακολουθεί και σήμερα να φιλοξενεί πλήθος δραστηριοτήτων και λιών, αποτελώντας ταυτόχρονα τον οπουδαιότερο και πιο πολυσύχναστο τουριστικό προορισμό σε όλη τη γη.

Καλύπτοντας μια έκταση ίση με 2,5 εκατ. τ.χλμ περίπου, με μέσο βάθος τα 1.500μ και ανώτερο τα 5.000μ. (στην περιοχή του Ιονίου), η κλειστή λεκάνη της Μεσογείου αποτελεί ένα σπάνιο και συνάμα ευαίσθητο οικοσύστημα, το οποίο δέχεται ισχυρές περιβαλλοντικές πιέσεις, που απαιτούν άμεση και ειδική αντιμετώπιση.

Το Πρωτόκολλο για την Ολοκληρωμένη Διαχείριση των Παράκτιων Περιοχών (ΟΔΠΠ), υιοθετήθηκε από όλες τις μεσογειακές χώρες/μέλη του ΟΗΕ το 2008 στη Μαδρίτη, σε μια προσπάθεια να ενδυναμωθούν οι διακρατικές συνεργασίες και να αντιμετωπιστούν αποτελεσματικά ζητήματα διαχείρισης και προστασίας τόσο της θαλάσσιας λεκάνης όσο και του παράκτιου χώρου της Μεσογείου.

Το πιλοτικό ερευνητικό πρόγραμμα **MSP Med - Greece,** το οποίο υλοποιούεται στο πλαίσιο του Προγράμματος Περιβάλλοντος του ΟΗΕ (UNEP) και ειδικότερα του Μεσογειακού Σχεδίου Δράσης (MAP), ακολουθεί στη διευκόλυνση της εφαρμογής του Πρωτοκόλλου ΟΔΠΠ, αξιολογώντας μεθοδολογικά εργαλεία αλλά και σχήματα διακυβέρνησης με σκοπό την προώθηση/προαγωγή του θαλάσσιου χωροταξικού σχεδιασμού και της προστασίας του θαλάσσιου χώρου της Μεσογείου.

Ανώτερος στόχος του προγράμματος, είναι να προκύψουν χρήσιμα συμπεράσματα τόσο θα χρησιμέψουν σε όλες τις μεσογειακές χώρες, για την επιτυχή και αποτελεσματική ενσωμάτωση του Πρωτοκόλλου της Μαδρίτης, ιδίως σε ζητήματα προσαρμογής και οργάνωσης του θαλάσσιου χώρου, και να συμβάλουν παράλληλα στην εφαρμογή της πρόσφατης (2014) Οδηγίας της Ε.Ε. για τον Θαλάσσιο Χωρικό Σχεδιασμό.

Πιλοτική εφαρμογή στην Περιφέρεια Ιονίων Νήσων

Η Περιφέρεια Ιονίων Νήσων, ως μια κατ' εξοχήν νησιωτική και με εκτεταμένη θαλάσσιο χώρο Περιφέρεια, επιλέχτηκε να αποτελέσει την περιοχή μελέτης και πιλοτικής εφαρμογής του Προγράμματος MSP Med - Greece.

Η επιλογή της Περιφέρειας Ιονίων Νήσων, βασίστηκε σε μια σειρά από παράγοντες όπως:

- πλούσιο και ιδιώμορφο φυσικό περιβάλλον του θαλάσσιου χώρου
- διαμοθετημένη οριοθέτηση υφαλοκρηπίδας μεταξύ Ελλάδας - Ιταλίας
- εκδηλωμένο ενδιαφέρον στην περιοχή για έρευνες αξιοποίησης υδρογονανθράκων
- θέση στο θαλάσσιο άξονα και τη μακρο-περιφέρεια Αδριατικής - Ιονίου, όπου υλοποιούνται σειρά ερευνητικών προγραμμάτων από την Ε.Ε. και υπάρχουν ευκαιρίες χρηματοδοτήσεων.
- αντιπροσωπευτικότητα σε σχέση με τις υπόλοιπες νησιωτικές περιφέρειες της χώρας και ενδιάμεση θέση σε σχέση με τις λοιπές μεσογειακές περιφέρειες.

Χρηματοδότηση του Προγράμματος

Το Πρόγραμμα MSP Greece – Paving the Road To Marine Spatial Planning in the Mediterranean, χρηματοδοτείται από το PAP/RAC (Πρόγραμμα Δράσεων Προτεραιότητας / Κέντρο Περιφερειακών Δράσεων), που αποτελεί μέρος του Μεσογειακού Σχεδίου Δράσης (Mediterranean Action Plan), στα πλαίσια του Προγράμματος Περιβάλλοντος των Ηνωμένων Εθνών (United Nations Environment Program – UNEP).

Ανάδοχος και Συνεργαζόμενοι Φορείς

Το MSP Med - Greece υλοποιείται από το **Εργαστήριο Γεωγραφικών Ερευνών και Περιβαλλοντικού Σχεδιασμού (ΕΓΕΠΣ) του Πανεπιστημίου Θεσσαλίας** (Τμήμα Μηχανικών Χωροταξίας, Πολεοδομίας και Περιφερειακής Ανάπτυξης, σε συνεργασία με εξωτερικούς επιστήμονες προερχόμενους από το ΥΠΑΠΕΝ και το ΕΛΚΕΘΕ.

Συνεργαζόμενοι Φορείς:

- Περιφέρεια Ιονίων Νήσων – Π.Ι.Ν.
- Περιφερειακή Ένωση Δήμων Ιονίων Νήσων – Π.Ε.Δ.Ι.Ν.
- Υπουργείο Παραγωγικής Ανασυγκρότησης, Περιβάλλοντος και Ενέργειας – Υ.Π.Α.Π.ΕΝ.
- Ελληνικό Κέντρο Θαλασσίων Ερευνών – ΕΛ.ΚΕ.Θ.Ε.
- Εθνικό Θαλάσσιο Πάρκο Ζακύνθου - Ε.Θ.Π.Ζ.

Χρονοδιάγραμμα Υλοποίησης

Το Πρόγραμμα έχει διάρκεια ένα χρόνο και αναμένεται να ολοκληρωθεί το Δεκέμβριο του 2015. Συμπεράσματα και προτάσεις του Προγράμματος θα ανακοινωθούν στο πλαίσιο της Συνόδου των Συμβαλλομένων Μερών της Σύμβασης της Βαρκελώνης (= Υπουργοί Περιβάλλοντος Μεσογειακών χωρών), που αναμένεται να λάβει χώρα στην Αθήνα, τον Φεβρουάριο του 2016.

Στοιχεία Επικοινωνίας

E-mail: greece.msp@gmail.com
Τηλ: (+30) 24210 74449,
Φαξ: (+30) 24210 74276

ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
Τμήμα Μηχανικών Χωροταξίας, Πολεοδομίας και Περιφερειακής Ανάπτυξης
Ε.Γ.Ε.Π.Σ. - Εργαστήριο Γεωγραφικών Ερευνών και Περιβαλλοντικού Σχεδιασμού
Πεδίον Άρεως, Βόλος 38334

Ανάδοχος Φορέας

Συνεργαζόμενοι Φορείς

Ερευνητικό Πρόγραμμα

M.S.P. Med - Greece

Προετοιμάζοντας το Δρόμο για Θαλάσσιο Χωροταξικό Σχεδιασμό

Paving the Road to Marine Spatial Planning in the Mediterranean

Marine Spatial Planning
Mediterranean • Greece

Leaflet in English

Goals and Project Objectives

The Mediterranean Basin is a fragile coastal and marine ecosystem, undergoing tremendous pressure due to its nature and use by the multi-cultural nations living along its inter-continental coasts, as well as due to the tourists originating from all over the world. Therefore, it is of paramount importance that it is judiciously preserved and used for the common benefit of all people.

The ICZM Protocol of the Barcelona Convention, adopted in 2008 in Madrid, is aiming to ensure integrated coastal zone management of the Mediterranean, through cooperation amongst the Contracting Parties (CPs) and covers both the land and the marine part of the coastal zone. This approach is reflected in the Action Plan for the implementation of the ICZM Protocol in 2012-2019, adopted by the CPs in 2012.

In this framework, the project - that is of a pilot nature - intends to facilitate the implementation of the ICZM Protocol, in particular with regard to its provision for Marine Spatial Planning (MSP), by developing methodological tools, proposing possible cooperation/management schemes and identifying prerequisites andpossiblewaystodealwiththe challenges, in an effort to assist the CPs to meet the common objectives of integrated marine spatial planning and management.

In particular, the aim of the project is to produce methodological tools, which will serve as guide to all CPs, in order to formulate or further strengthen their own national MSP systems, keeping always in mind the various needs and specificities (environental, social, economic and institutional) of all involved CP at national and regional levels. Such tools can have a special added value in particular after the adoption of the EU Directive on MSP, which makes it compulsory for the CPs that are at the same time EU Member States to apply MSP in their territorial waters. Non-EU CP could certainly profit from such development in the region.

Pilot case study area: Region of Ionian Islands

The Region of Ionian Islands, situated in the Ionian Sea (in the middle of the Mediterranean Basin and adjacent to the Adriatic Sea), is selected to serve as the case study area of the project M.S.P Med - Greece.

Apart from its insular nature and therefore its extensive marine space, the Region of Ionian Islands is considered to be an ideal case study area due to the following parameters:

- diversity of the natural and cultural environment of the marine space
- defined (since 1978) limits of continental shelf in the marine space between Greece and Italy
- manifested interest for exploration and exploitation of hydrocarbons
- Direct relation to the Adrionian Macro-Region, where numerous side projects (financed by the E.U.) are being elaborated and implemented, providing valuable experience, knowledge and input to the M.S.P. Med - Greece project
- representativeness among other insular Greek Regions and average ranking in relation to the Regions of other Mediterranean countries.

Financing

MSP Med - Greece – Paving the Road to Marine Spatial Planning in the Mediterranean is financed by PAP/RAC (Priority Action Programme / Regional Action Centre), of the Mediterranean Action Plan under the umbrella of the United Nations Environment Programme – UNEP.

Leader and Cooperating Partners

The GREEN_PLAN Laboratory for Geographical Research and Environmental Planning (University of Thessaly, Greece) is the Leader Partner of the MSP Med - Greece project, supported by external experts from the Ministry of Reconstruction of Production, Environment and Energy and the Hellenic Centre of Marine Research.

Collaborating Partners:

- Ministry of Reconstruction of Production, Environment and Energy – M.R.P.E.E.
- Region of Ionian Islands – R.I.I.
- Regional Union of Local Administration in the Ionian Islands – R.U.L.A.I.I.
- Hellenic Centre of Marine Research – H.C.M.R.
- National Marine Park of Zakynthos – N.M.P.Z.

Duration and Follow-up

The duration of the project is of one year. The project is expected to be delivered by the end of December 2015. Conclusions and Recommendations of the project are expected to be presented at the Conference of the Contracting Parties of the Barcelona Convention (Ministers of Environment from Mediterranean countries), which will be held in Athens, in February 2016.

Contact References

E-mail: greece.msp@gmail.com
Tel: (+30) 24210 74449,
Fax: (+30) 24210 74276

UNIVERSITY OF THESSALY
Department of Spatial Planning and Regional Development
(www.prd.uth.gr)
GREEN_PLAN – Laboratory for Geographical Research and Environmental Planning
Address: Pedion Areos, Volos 38334, Greece

Leader Partner

UNIVERSITY OF THESSALY
SCHOOL OF ENGINEERING
DEPARTMENT OF PLANNING AND REGIONAL DEVELOPMENT

Cooperating Partners

MINISTRY OF RECONSTRUCTION OF PRODUCTION, ENVIRONMENT & ENERGY

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M.S.P. Med - Greece

Paving the Road to Marine Spatial Planning in the Mediterranean

Marine Spatial Planning
Mediterranean • Greece

Leaflet in French

Cadre et Objectifs du Projet

Entourée par trois (3) Continents et vingt-deux (22) pays, la Mer Méditerranée est un des plus anciens lieux d'habitation humaine sur la Terre. Berceau de civilisations très anciennes et avec une histoire ininterrompue, elle continue jusqu'aujourd'hui d'accueillir une diversité des peuples et d'activités, étant en même temps la destination touristique la plus fréquentée du monde entier.

S'étendant à une superficie de 2,5 millions de km², et avec une profondeur moyenne d'environ 1.500m et maximum 5.000m, la Méditerranée constitue un écosystème rare et fragile, qui reçoit des pressions fortes et par conséquent exige une gestion prudente et particulière.

Le Protocole pour la Gestion Intégrée des Zones Côtières (GIZC) a été adopté par tous les pays Méditerranéens - membres de l'ONU - en 2008 à Madrid, visant au renforcement de coopération internationale, à fin d'affronter efficacement les questions de gestion et de protection de l'espace marin et littoral du Bassin Méditerranéen.

Le projet "PSM Méd-Grèce", élaboré dans le cadre du Plan d'Action pour la Méditerranée (PAM) -qui fait partie du Programme des Nations Unies pour l'Environnement (PNUE)- vise à faciliter la mise en œuvre du Protocole GIZC, en proposant des outils et des méthodologies, ainsi que des forms de Gouvernance, pour promouvoir la Planification Spatiale Marine et la protection de la Méditerranée.

L'objectif ultime du projet est d'assurer que les outils élaborés ainsi que les propositions finales seront au service de tous les pays Méditerranéens, à fin d'intégrer les principes du Protocole GIZC en particulier concernant la protection et l'aménagement de l'espace marin. En plus, ces propositions, pourraient être utiles aux pays-membres de l'U.E. qui sont engagés à mettre en œuvre la Planification Spatiale Marine, suite à la Directive 89/2014.

Etude de cas pilote: Région des Iles Ioniennes

La Région des Iles Ioniennes, située presque au milieu de la Méditerranée, au sud de la Mer Adriatique, est la Région qui a été choisie comme étude de cas pilote, pour la mise en œuvre du projet "PSM Méd - Grèce".

En tant qu'une Région insulaire par excellence, occupant un espace marin vaste, elle a été considérée comme un cas d'étude idéal, pour les raisons suivantes:

- Diversité naturelle et culturelle,
- Délimitation du plateau continental depuis 1978, entre la Grèce et l'Italie.
- Expression d'intérêts manifestée à fin de réaliser des recherches pour l'exploitation des hydrocarbures.
- Localisation dans la Macro-Région Adriatique-Ionienne où plusieurs projets (financés par l'U.E.) se sont élaborés, qui fournissent des données et d'expérience au projet "PSM Méd - Grèce"
- Région modèle parmi les Régions Insulaires Grecques, ayant un positionnement moyen parmi les autres Régions des pays Méditerranéens.

Financement

Le Projet "PSM Méd - Grèce" est financé par le Programme d'Actions Prioritaires (PAP/RAC), Centre de Gestion Côtière, du Plan d'Action pour la Méditerranée (PAM), dans le cadre du Programme des Nations Unies pour l'Environnement (PNUE).

Partenariat

Le partenaire en tête du projet est l'Université de Thessalie (Département d'Aménagement du Territoire et du Développement Régional, Laboratoire de Recherches Géographiques et de Planification Environnementale- GREEN-PLAN) en collaboration avec des experts provenant du Ministère de Reconstruction de la Production, de l'Environnement et de l'Energie (MRPEE) et du Centre Hellénique des Recherches Marines (HCRM).

Les partenaires collaborateurs du projet, sont:

- Le Ministère de Reconstruction de la Production, de l'Environnement et de l'Energie (MRPEE)
- La Région des Iles Ioniennes
- L'Union Régionale de Municipalités des Iles Ioniennes
- Le Centre Hellénique de Recherches Marines (HCRM)
- Le Parc National Marin de Zakynthos

Durée du Projet

La durée du projet remonte à un an, ayant comme date limite le mois de Décembre 2015. Les conclusions et les recommandations du projet seront annoncées dans le cadre de la Conférence des Parties Contractantes de la Convention de Barcelone (Ministères de l'Environnement des pays Méditerranéens) qui aura lieu à Athènes, en Février 2016.

Coordonnées

E-mail: greece.msp@gmail.com
Tél: (+30) 24210 74449,
Fax: (+30) 24210 74276

UNIVERSITE DE THESSALIE
Département d'Aménagement du Territoire et du Développement Régional (www.prd.uth.gr)
Laboratoire de Recherche Géographique et de Planification Environnementale "GREEN-PLAN"
Adresse: Pedion Areos, Volos 38334, Grèce

Partenaire en tête

UNIVERSITY OF THESSALY
SCHOOL OF ENGINEERING
DEPARTMENT OF PLANNING AND REGIONAL DEVELOPMENT

Partenaires Collaborateurs

P.S.M. Méd - Grèce

Préparer la voie pour la Planification Spatiale Marine (P.S.M.) en Méditerranée

Marine Spatial Planning
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ANNEX V: References

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