SEVENTH FRAMEWORK PROGRAMME

Monitoring and Evaluation of Spatially Managed Areas

Deliverable 3.6

Zoning plan of case studies:

Evaluation of spatial management options for the case studies

Due date of deliverable D3.6: month 35
Actual submission date: month 35

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UNIVERSITEIT GENT

Grant Agreement number:	226661
Project acronym:	MESMA
Project title:	Monitoring and Evaluation of Spatially Managed Areas
Funding Scheme:	Collaborative project
Project coordination:	IMARES, IJmuiden, the Netherlands
Project website:	www.mesma.org

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Contents

1 Introduction

1.1 Marine Spatial Planning, Spatially Managed Areas, Zoning Plans

Within MESMA, nine case studies (CS) represent discrete marine European spatial entities, at different spatial scales, where a spatial marine management framework is in place, under development or considered. These CS (described in more details below) are chosen in such a way (MESMA D. 3.1) that they encompass the complexity of accommodating the various user functions of the marine landscape in various regions of the European marine waters. While human activities at sea are competing for space, there is also growing awareness of the possible negative effects of these human activities on the marine ecosystem. As such, system specific management options are required, satisfying current and future sectoral needs, while safeguarding the marine ecosystem from further detoriation. This integrated management approach is embedded in the concept of ecosystem based management (EBM). The goal of marine EBM is to maintain marine ecosystems in a healthy, productive and resilient condition, making it possible that they sustain human use and provide the goods and services required by society (McLeod et al. 2005). Therefore EBM is an environmental mangagement approach that recognises the interactions within a marine ecosystem, including humans. Hence, EBM does not consider single issues, species or ecosystems good and services in isolation. Operationalisation of EBM can be done through place-based or spatial management approaches (Lackey 1998), such as marine spatial planning (MSP). MSP is a public process of analysing and allocating the spatial and temporal distribution of human activities aiming at achieving ecological, economic and social objectives. These objectives are usually formulated through political processes (Douvere et al. 2007, Douvere 2008). Within MESMA, a spatially managed area (SMA) is then defined as "*a geographical area within which marine spatial planning initiatives exist in the real world*". Marine spatial planning initiatives refer to *existing management measures actually in place within a defined area, or in any stage of a process of putting management in place, e.g. plans or recommendations for a particular area.* Management can include management for marine protection (e.g. in MPAs), or management for sectoral objectives (e.g. building a wind farm to meet renewable energy objectives). Within MESMA, SMAs can have different spatial scales. A SMA can be a small, specific area that is managed/planned to be managed for one specific purpose, but it can also be a larger area within which lots of plans or 'usage zones' exist. This definition is different from the definition mentioned in the DoW (page 60). The original definition was adapted during a CS leader workshop (2-4 May 2012 in Gent, Belgium) and formally accepted by the MESMA ExB during the ExB meeting in Cork (29-30 May 2012).

MSP should result in a marine spatial management plan that will produce the desired future trough explicit decisions about the location and timing of human activities. Ehler & Douvere (2009) consider this spatial management as a beginning toward the the implementation of desired goals and objectives. They describe the spatial management plan as a comprehensive, strategic document that provides the framework and direction for marine spatial management decisions. The plan should identify when, where and how goals and objectives will be met.

Zoning (the development of zoning plans) is often an important management measure to implement spatial management plans. The purpose of a zoning plan (Ehler & Douvere 2009) is:

- To provide protection for biologically and ecologically important habitats, ecosystems, and ecological processes
- To seperate conflicting human activities, or to combine compatible activities
- To protect the natural values of the marine management area (in MESMA terminology: the SMA) while allowing reasonable human uses of the area
- To allocate areas for reasonable human uses while minimising the effects of these human uses on each other, and nature
- To preserve some areas of the SMA in their natural state undisturbed by humans except for scientific and educational purposes

1.2 MESMA Case Studies: state of the art

Within MESMA, different aspects of SMAs are being investigated. Within WP2, a standardised and generic framework (FW) for the monitoring and evaluation of SMAs is developed. This framework provides guidance on the selection, mapping and assessment of ecosystem components and human pressures, the evaluation of management effectiveniss and potential adaptations to management (Stelzenmüller et al. in press). In order to help completing this FW, technical tools (including a geonetwerk) are developed and tested within MESMA (cfr. WP 4 and WP5). A second line of research involves a governance analysis (WP6). While the FW analysis is a quantitative in nature, the governance analysis is a qualitative analysis. Integrating both lines of research proved to be challenging in the MESMA CS (Stelzenmüller et al. 2012).

In an earlier phase of MESMA, CS used the generic FW to evaluate whether it was possible to monitor and evaluate existing MSPs, or to provide guidance for the implementation of such MSP. By doing so, the CS actually tested the generic applicability of the FW to a variety of cases. This resulted in suggestions for improvement of the FW and its associated manual. This was reported upon in MESMA D3.3 (delivered in December 2011).

Implementation of the feedback in the FW by MESMA WP2 members should result in a final FW version. To ensure the quality of this final version, it was planned to use the updated FW during a second FW run. Given the deadline for the present deliverable, it was not possible to wait for a finalised version of the FW to conduct a 2nd FW run, to be reported in this deliverable. In addition, given the difficulties in data gathering for some areas, not all CS actually completed the FW during the first run. As such, a pragmatic way forward, and directly targeted towards the overarching MESMA goals, was followed. CS focussed on the governance analysis, while the second version of the FW and manual were drafted. As soon as these documents were available, CS used them for their second run of their CS. The second run was done to focus on certain aspects of the CS or to provide a full FW run, when this was not possible durin the first testing phase. As such, all CS reached step 7, and provided adaptations to current management. This does not necessarily mean that CS provided adaptations to Zoning Plans! Given the variation of the actual implementation phase of the CS-MSP, zoning plans were not available for all CS. Neither was it the plan of the MESMA CS to provide a comprehensive zoning plan. Meanwhile, further attempts were made to integrate the quantitave (WP2) and qualitative (WP6) lines of research, where possible. Rather than reporting the completed second FW runs, or to provide a list of recommendations to management per CS, we decided to provide a state of the art of CS work within MESMA, based upon the analyses leading to those recommendations. This allowed for a first comparison between CS, harvesting from (and attempting to integrate) WP2 and WP6 work. In addition, a reflection on the tools developed during MESMA so far, will lead to a further improvement of the MESMA toolbox (the integration of all tools developed and tested by MESMA, allowing the user to monitor and evaluate SMAs in a standardised and structured way). This toolbox is currently under development, and is considered as the prime outcome of MESMA. As MESMA is not finished yet, and analyses are still ongoing, we explicitly state that this report does not contain final results for the CS but it reflects a state of the art of the ongoing WP2 and WP6 related research, making use of tools tested and developed in WP4. Maps produced during for the current deliverable (directly reported here, or within the FW runs) will be submitted to WP5. As such, the CS played their central role as MESMA laboratories, by testing various tools and providing feedback, in order to guarantuee the quality of the final MESMA toolbox. For the sake of completeness, results of the second FW run are reported in Annex 2-An to this report.

1.3 Structure of this deliverable

Due to the large variability in implementation or planning of MSP in the different CS, a comparison is not straightforward. In order to achieve a level of uniformity in this report, it was decided (CS workshop, 2-4 May 2012, Ghent, approved by MESMA ExB 29-30 May, Cork) to structure this text around 4 topics. Topics included (1) dealing with administrative boundaries; (2) key drivers in MSP; (3) Progress and obstacles towards sustainability and (4) a reflection on MESMA tools.

Each CS provided information, based on their research performd by running the FW and the ongoing governance analysis. Here, we first give a full description of the CS geographical area. We then provide an integrated summary per topic. The final governance analysis results will be delivered by WP6 in a later stage of MESMA, the full FW results for each CS, and the individual CS answers to these questions are

reported here as annex to this text (Annex 1). One exception includes the Southern North Sea case study. This area consists of 4 subareas. MESMA analyses were carried out at both the Southern North Sea level, and the subcase level. As such, we report on our findings on both the Southern North Sea level, and the subcase level.

2 Case study areas: Description and application of MESMA tools

2.1 The Southern North Sea

The MESMA "Southern North Sea" (SNS) case study is situated within the "Greater North Sea", a shallow continental shelf region (Fig. 1). The area lies within OSPAR region II, an ecological entity, characterized as cool-temperate Boreal biogeographic zone. The SNS case study area is an international region covering territorial waters and (parts of) the EEZs of Denmark, Germany, the Netherlands, Belgium, and the United Kingdom (i.e. England)..." (MESMA D3.3, Part I, p.2). Applying GIS, the total surface area of the MESMA SNS case study is estimated at 280.000 (279.504) km^2. This area represents roughly 37% of the entire "Greater North Sea" area, which comprises about 750.000 km^2 (OSPAR 2000, chapter 2).

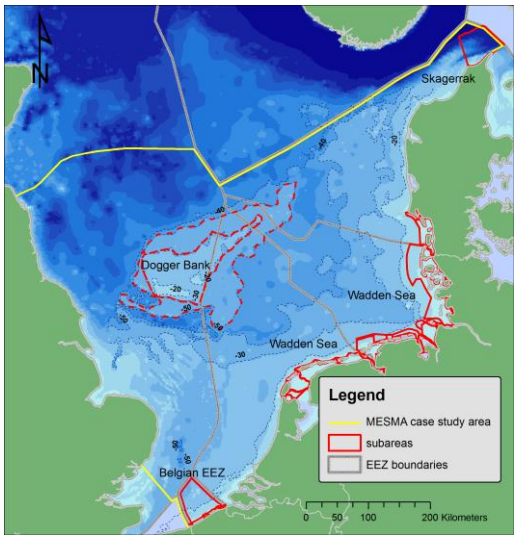

Figure 1. Southern North Sea Case Study area, with indication of the sub case studies

Due to the large size of and ecological and economic heterogeneity within the SNS area, the MESMA SNS case study has selected four smaller subareas within the SNS region for targeted in-depth analyses with relevance for spatial management (cf. MESMA D3.1-3.2 Annex). The four subareas are: Skagerrak Sea Danish Natura 2000 sites (SK), Belgian part of the North Sea (BPNS), the Wadden Sea (WS), and the Dogger Bank (DB) (Figure 1). Both, the WS and the DB are highly transnational subareas, with the former being an inshore area and the latter an offshore area. The BPNS and the SK represent a national and a subnational area.[1] The subareas will be discussed in more detail below.

On the scale of the SNS, no zoning plan currently exists or is planned (cf. MESMA D3.3 p.2).

[1] NB: The identification of smaller subareas within the SNS area is in line with OSPAR's identification of 'focus areas': "Many areas in the Greater North Sea region consist of a typical and valuable habitat for marine life, are under (anthropogenic) stress or of strategic or economic importance, and as such deserve special attention." (OSPAR 2010). The Danish and German Wadden Sea coasts, the Skagerrak and the Belgian coast are among those OSPAR 'focus areas'.

However, several sectoral maps have been produced – from science as well as from different international, national and subnational management bodies – illustrating the activities and/or ecosystem components in the central and southern North Sea or parts thereof. Based in this, the SNS CS developed a combined map of areas planned for offshore wind energy development, Natura 2000 areas and fishing activity (Fig. 2).

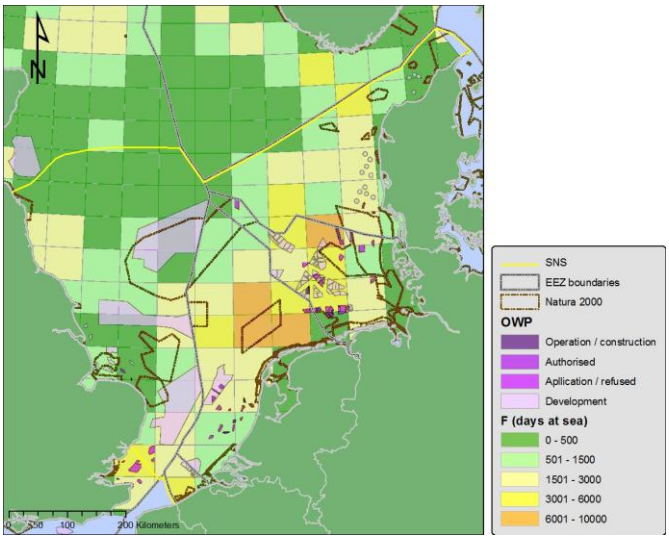

Figure 2. Sectorial map of Natura 2000, fisheries activities (F, days at sea) and location of offshore windmill farms (OWP) in the SNS CS area.

Application of the Mesma framework and tools.

Representing one of the nine "laboratories" of the MESMA project, the SNS case study tested whether the MSP-monitoring and evaluation (M&E) methods developed in MESMA can be useful in an MSP process in the SNS case, and how various types of information for MSP can be used for this purpose. In the initial case study description, the idea of "integration from subarea scale to SNS scale" was highlighted in order to "feed a fundamental discussion on scales: do priorities shift when "zooming out"? Is there a need for management at the SNS scale?" (MESMA D3.1-3.2). Thus, the SNS case study focused particularly on aspects of spatial scale: The work started off at the large SNS scale in the first WP2-Framework-test, then zoomed in on four SNS subareas for the second WP2-Framework-test and the WP6-governance analyses, and is now in the process of finishing on SNS scale again[2]. This final step of synthesizing all the information and, where possible, extrapolating from SNS-subareas to SNS scale is currently still on-going. The diversity of the four subareas (inter-/transnational, national, subnational, inshore, offshore) allowed us to compare marine spatial management initiatives and the respective governance institutions at different spatial scales, and relating to different marine ecosystems (and biotopes).

2.1.1 Sub case 1: The Belgian part of the North Sea

The Belgian part of the North Sea (BPNS) is a relatively small (3600 km²) and shallow area (Figure 3). It is up to 46 m deep and extends about 87 km from the coast. The coastline is about 65 km long. The BPNS heavily used for human activities. Besides, it is characterized by several valuable habitats. This is partly due to the presence of a complex system of sandbanks, stretching out from Zeeland to Calais. A similar system can only be found in the southeast of England (Maes *et al*., 2005a). Besides the sandbanks, the

[2] see figure in MESMA D3.1-3.2, p.20 (Southern North Sea case study description): "Flow diagram of the suggested 3-step approach, combining the integral SNS analysis and the four in-depth subarea analyses."

BPNS also comprises 'reef' habitats, which are formed by either gravel banks or bristle worm aggregations (e.g. the sand mason, *Lanice conchilega*).

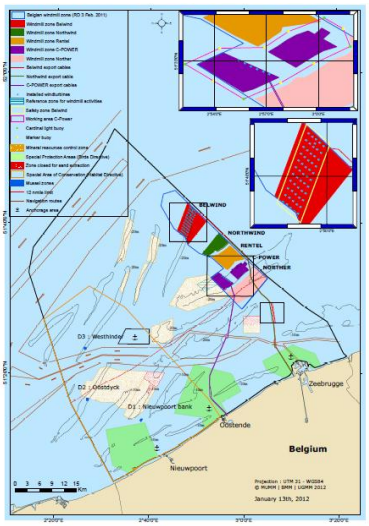

Figure 3. Map of the Belgian Part of the North Sea, with indication of ongoing activities, Special Areas of Conservation and Special Protection Areas.

In the BPNS, a territorial zone (up to 12 nautical miles from the coastal baseline) and an Exclusive Economic Zone (EEZ) can be distinguished. The Belgian EEZ was established by law in 1999 (EEZ law), and its boundaries coincide with the outer boundaries of the Belgian Part of the North Sea. The boundaries of the BPNS with France, the Netherlands and the UK were established in treaties (cf. Vlimar gazetteer website). The boundaries of the fishery zone, which was established in 1978, were adjusted by the law on the Belgian EEZ and coincide with the EEZ boundaries. Conservation and protection of the marine environment in the Belgian EEZ is regulated by the Law on the Protection of the Marine environment (Law Marine Environment).

While there is no integrated spatial management plan yet, several steps towards MSP were undertaken in Belgium, both on the scientific level and governmental level. On a scientific level, several research projects on MSP were designed and carried out. One example was the three year SPSD II research project GAUFFRE (cf. Maes *et al*., 2005b). This project provided a thorough analysis of the existing spatial planning structure in the BPNS and paved the way for MSP. An ongoing research project is C-scope (2007-2013), where an innovative approach of coastal and marine spatial planning is developed (http://www.cscope.eu/nl/home/). On a governmental level, equally important steps were taken towards MSP. In 2002, a federal Minister responsible for the management of the BPNS was appointed. Between 2003-2005, a Master Plan for the Belgian Part of the North Sea was developed by the federal government. This Master Plan is not really a plan in the sense of a book or a map but is a combination of several decisions in the federal council of Ministers, which are executed by a number of Royal Decrees and a change of the Marine Environment law. The Master Plan provides a translation of current and future management objectives of various sectors into a spatial vision (Douvere *et al*., 2007). This lead to spatial delimitations for sand and gravel extraction, a zone for offshore wind energy and the delimitation of marine protected areas as part of the EU Natura2000 network. The borders of these original delimitations have slightly changed due to various reasons (all stated in Royal Decrees[3]).

As for the delimitation of marine protected areas, some major changes were implemented. Originally, 5 MPA's were delimitated: 3 Special Protection Areas (SPAs) protected under the Birds Directive and 2 Special Areas of Conservation (SACs) protected under the Habitats Directive. One SAC (called "Vlakte van

[3] Cf. www.Ejustice.just.fgov.be

de Raan") was canceled by the Council of State in 2008[4] because scientific proof was lacking that the area's ecological characteristics were such that a protection was needed. The second area ("Trapegeer-Stroombank") has been expanded to a larger area. This area, called "Vlaamse Banken" was delineated as a Natura 2000 site in 2011.

Application of the Mesma framework and tools.

In the Belgian case study, the MESMA framework/tools were used to analyze and evaluate the Belgian marine policy.

There is no integrated spatial management yet, so we used the existing sectoral plans that are in use in the area. Because of the lack of SMART operational objectives in the majority of the plans, we also used the document "Description of the Good Environmental Status and the settlement of the environmental goals for Belgian Marine Waters[5]". This document is not really a plan in *sensu strictu* but it sets clear environmental objectives to obtain GES. In the WP2-framework test, we particularly focused on answering the question: "Is it possible to obtain a Good Environmental Status in the SAC "Vlaamse Banken" without additional management measures?"

2.1.2 The Dogger Bank area

The Dogger Bank is the largest sandbank in the North Sea, and it is divided among the Exclusive Economic Zones (EEZs) of the United Kingdom (UK), the Netherlands (NL), Germany (GER) and Denmark (DK) (Fig. 1). The relatively shallow flat top of the sandbank is more dynamic than the surrounding slopes which are considered to be more stable. The sandbank is 300 km long with an east-northeast/ west-southwest orientation and the maximum width is approximately 120 km. The total surface area of the feature is 17600 km^2 and the nearest land is the UK at a distance of 100km.

As a submerged sandbank the Dogger Bank potentially qualifies as a special area of conservation (SAC), i.e. a Marine Protected Area (MPA) under the Habitats Directive. The current status of the Dogger Bank is that, at different points in time, Germany, the Netherlands and the United Kingdom have proposed their part of the Dogger Bank as a SAC under the habitats directive to the EC, and Denmark has not assigned a specific status to their part of the sandbank. The delineation of the Natura 2000 sites (SACs) is shown in Fig 4.

At the Dogger Bank area, the MSP process is in progress. The focus of this spatial planning is to produce a fisheries management plan that will meet the nature conservation objectives. As mentioned before this is carried out within the Natura 2000 legal framework, specifically the Habitats Directive. Therefore the proposed spatial plans are all limited to the SAC areas as shown in figure 4. On the UK part of the sandbank a large offshore wind farm is being developed and this wind farm is expected to effect the fisheries management in the area in the future. Work on this fisheries management plan is carried out in collaboration by the four Dogger Bank member states, united in the Dogger Bank Steering Group (DBSG), with scientific support from ICES and participation of the EC. The DBSG objective is to achieve international coherence among fisheries measures on the Natura 2000 sites (SACs) on the Dogger Bank and to develop a fisheries management plan in relation to nature conservation, including a zoning proposal for the combined area, covered by the 3 national Natura 2000 sites (SACs) of the Dogger Bank.

The starting point for the current spatial planning was a FIMPAS (Fisheries Management in Marine Protected Areas) workshop in January of 2011. At this meeting the cross boundary nature of the Dogger Bank SACs and their fisheries was recognized, and consequently an inter-governmental Dogger Bank

[4] Council of State's decision nr. 179.254 of February 1st, 2008

[5] In Dutch: "Omschrijving van Goede Milieutoestand en vaststelling van Milieudoelen voor de Belgische mariene wateren (2012)" http://www.health.belgium.be/eportal/Environment/Inspectionandenvironmentalrigh/Environmentalrights/PublicConsultations/MMEvalStateObj/index.htm?&fodnlang=nl or directly the PDF document: http://www.noordzeeloket.nl/krm/Images/Belgi%C3%AB%20MSFD%20Art%209-10%20GMT-Doelen%20NL_tcm19-5117.pdf

Steering Group (DBSG) was set up, with as members: NL (chair), UK, GER, DK, ICES and the EC. The DBSG then invited the North Sea Regional Advisory Commission (NSRAC) to propose a fisheries management plan for the combined Dogger Bank SAC area. This stakeholder-led spatial planning process ran for over a year and stakeholder meetings were held regularly. This DBGS process was planned to be finished within a year, but the process is still ongoing.

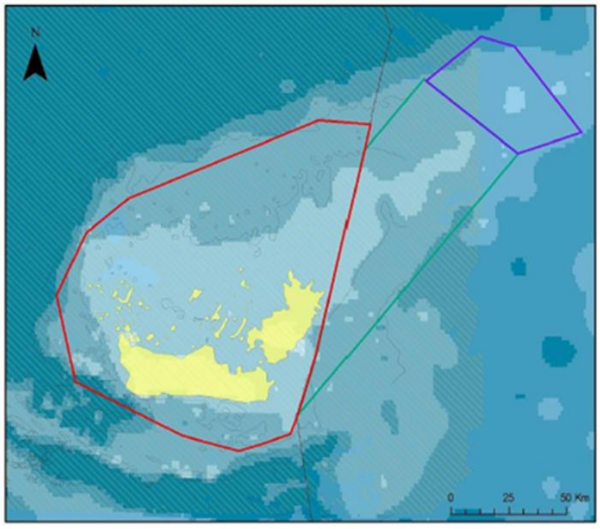

Figure 4. Delineation of the German, Dutch and UK Dogger Bank SACs.

During the spatial planning process several zoning proposals were produced. The first NSRAC process only led to the proposal of a preferred zoning approach, including example scenarios, with three zones (NSRAC, 2011). To support the on-going spatial planning process Hans Lassen (ICES) prepared three scenarios and these were presented at a stakeholder meeting in Dublin, November 7 & 8, 2011(Hans Lassen-ICES Secretariat, 2011). These scenarios were all limited to two zones. Figure 5 is an illustration of scenario 3, Minimal impact on gross value from fishing (source ICES).

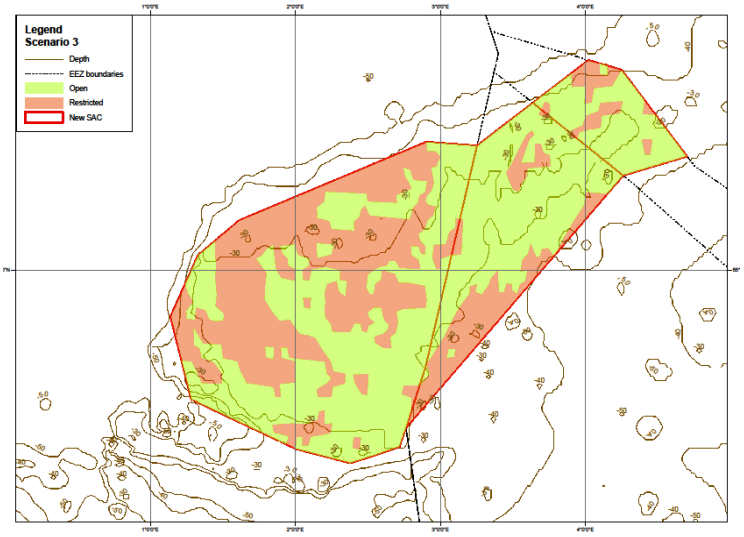

Figure 5. Scenario 3, minimal impact on gross value from fishing (source ICES).

In the later stages of the process NSRAC stakeholders did produce actual zoning proposals, but in the end they were unable to reach final agreement on a joint zoning proposal (NSRAC, 2012

Application of the Mesma framework and tools.

Until now the MESMA framework for monitoring and evaluation of SMAs (WP 2) has not been used to support the spatial planning process on the Dogger Bank. For the proposed second test run of the framework the point of view is that no plan is currently in place. Initially it was thought that a DBSG

spatial plan would be available to use as starting point for this framework application, but at this time (August 2012) that is not the case. To test the effect of proposed zoning proposals two Sand eel models will be run in WP 4 (development and evaluation of management tools). During the spatial planning process no contribution was made to WP 5 (data standards and infrastructure) as most used data was provided by ICES and stakeholders with strict limitations to use and distribution. Most work has been related to WP 6 (Governance) as the Dogger Bank spatial planning process is a very complex governance issue.

2.1.3 Sub case 3: Skaggerak

The study focuses on two large Natura 2000 SAC's (Fig. 6) on the northern tip of Denmark: *Skagens Gren & Skagerrak* and *Store Rev*. *Skagens Gren & Skagerrak* (approx. 2.686 km^2 / 268.622 ha), is designated to protect especially harbour porpoises, although sandbanks are also included as a habitat to be protected. Subarea work has revealed that it is highly relevant to also include *Store Rev* in the subarea analyses. *Store Rev* (approx. 109 km^2 / 10.892 ha) is an SAC also designated to protect harbour porpoises, along with reefs and bubbling reefs. The geographical boundaries of both SAC's are clearly defined in Danish legislation and reported to the EC.

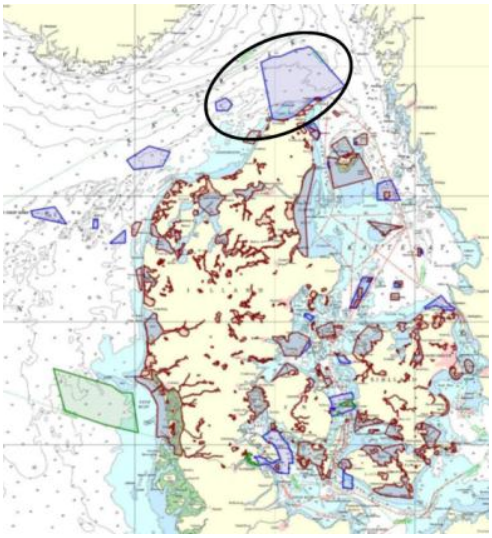

Figure 6. Location of focus areas within Skagerrak sub case

The two sites were designated to protect high density harbour porpoise areas which were identified based on monitoring results from aircraft line transects and towed hydrophone arrays (Teilmann et al. 2008). As a result of administrative timing/reporting issues, the current management plans do not apply fully to harbour porpoises in the two sites but will be included in the next revision of the plans in 2015. However, already now Member States are legally obliged to prevent damage to habitats and species in designated N2000 sites. In addition, the harbour porpoise is an Annex IV species (to be protected where it occurs) so it will likely be included in current planning of management for these sites.

The focus of the *Skagens Gren & Skagerrak* (and *Store Rev*) case study is on conservation of harbour porpoise populations within and around SAC's in the Danish part of the Skagerrak; and reducing impacts of fishing. The primary objective is to restore and maintain the harbour porpoise conservation features represented in the SAC's. The main conflict that the case study addresses is between the gillnet fishery and conservation of the harbour porpoise.

Application of the Mesma framework and tools.

The WP2 MESMA FW was primarily used to determine if the chosen boundaries and overall management strategy are effective in facilitating the achievement of the two Natura 2000 sites' objectives. Maps of porpoise densities, gillnetters' fishing effort and bycatches of porpoises will be overlaid within GIS in order to determine if the selected boundaries of the SMA includes areas with high risk of bycatch. As bycatch is determined as one of the biggest threats to porpoises we hypothesise that SMAs containing the high bycatch risk areas have the highest potential to fulfil the objective.

Much emphasis within the Skagerrak case study is on governance. The approach is to consider the process of the implementation of the SMA and the involvement of stakeholders. Until now all work on stakeholder involvement from the ministry has been conducted on a high level. MESMA governance case study work includes interviews with directly affected fishers that have very detailed knowledge and are very reliant on access to fishing grounds within the areas. Interviews also provide advice and suggestions from affected fishermen regarding future management of the SMAs.

2.1.4 Sub case study 4: The Wadden Sea

The Wadden Sea (WS) is internationally recognized as a biologically highly productive ecosystem of great natural, scientific, economic and social importance. Its outstanding value is reflected in numerous designations, such as UNESCO World Heritage Site, RAMSAR, PSSA, Natura 2000. The WS is the largest (14,700 km²) temperate zone tidal-flat expanse in the world. It stretches along the North Sea coasts of The Netherlands, Germany and Denmark. The governments of these three Wadden Sea states officially cooperate on management, monitoring, research and political matters relating to the Wadden Sea. They defined a Wadden Sea Cooperation Area and within this a Nature Conservation Area as the geographical basis of their cooperation. The Wadden Sea Area itself represents a bio-geographical zone, which includes several administrative boundaries (Fig. 7)

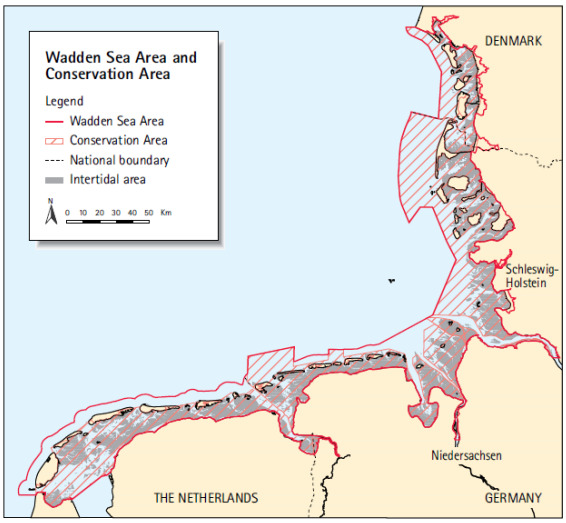

Figure 7. Trilateral Wadden Sea Area and Conservation Area (Marencic (Ed.) 2009).

Focus of the Wadden Sea case study is to analyse spatial management processes related to monitoring and evaluation on trilateral and national scale. The "Trilateral Wadden Sea Cooperation"(TWSC), which is the governmental cooperation between the Netherlands, Germany and Denmark on the protection and conservation of the Wadden Sea has existed since 1978. Within the TWSC organizational structure, the Trilateral Wadden Sea Governmental Council is the politically responsible body (Ministers) for the Cooperation and the Common Wadden Sea Secretariat (CWSS[6]) takes care of implementation and support. Based on the "Joint Declaration on the Protection of the Wadden Sea" from 1982, two trilateral management plans are in place for the Wadden Sea Area:

(1) The"Wadden Sea Plan" (WSP) provides a framework for the management of nature conservation, considering certain human activities (CWSS 2010). The WSP sets out a series of targets, as well as policies, measures, projects and actions to achieve these targets, to be implemented by the three Wadden Sea countries. The WSP is legally non-binding.

(2) The "Seal Management Plan" (SealMP) has existed for more than twenty years; the first version was adopted in1991, and the renewed version in 2011. It is seen as a pioneering model for species

[6] http://www.waddensea-secretariat.org/

management and monitoring (Moser & Brown 2007). The SealMP is legally binding, according to the Seal Agreement concluded under the Convention on the Conservation of Migratory Species of Wild Animals (CMS, Bonn Convention). To assess the progress in the implementation of the Wadden Sea Plan target(s), i.e. the monitoring and evaluation process, the Trilateral Monitoring and Assessment Program (TMAP) has been established. The TMAP provides the basis for the overall evaluation of the Wadden Sea ecosystem quality (Quality Status Report: QSR).

Apart from the official cooperation on ministerial level, there is also "an independent platform of stakeholders ... to contribute to an advanced and sustainable development of the trilateral Wadden Sea Region", the "Wadden Sea Forum" (WSF). The WSF was established in 2002. It is not part of the formal organizational structure of the TWSC (schedule below).

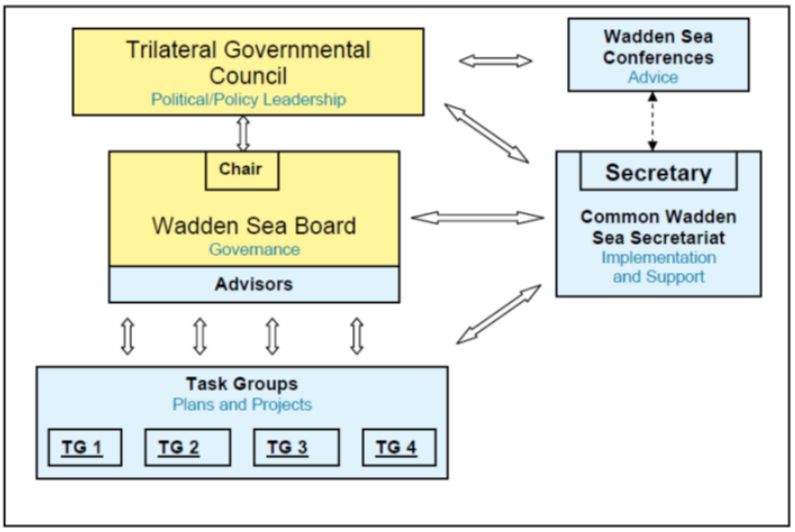

Figure 8. Organizational Structure Trilateral Wadden Sea Cooperation

Application of the Mesma framework and tools.

In this sub-area of the Southern North Sea case study, the focus of the WP2 analysis is on the management of seals as laid down in the trilateral "Wadden Sea Plan 2010" (WSP 2010) and the "Seal Management Plan 2007-2010", including the data and science behind the existing spatial management plans. The approach is therefore a "process analysis": The WP2 framework is tested and compared with the monitoring and evaluation process as practised in relation to the Seal Management Plan. The SealMP is considered an exercise and example to study the monitoring and evaluation process within the trilateral cooperation. In our analyses we consider the Trilateral Wadden Sea Cooperation as a successfully established international cooperation in spatial management. Lessons learned will be identified for improvement of international cooperation elsewhere. In addition, testing the framework may identify recommendations to the TWSC and SMP.

The Wadden Sea case study work has focused on analysing the success factors, as well as conflicts and failures, in the trilateral WS cooperation. In consultation with key policy makers and stakeholders, monitoring and evaluation of the Wadden Sea has been identified to be related to the trilateral guiding principle for the Nature Conservation Area: "To achieve, as far as possible, a natural and sustainable ecosystem in which natural processes proceed in an undisturbed way" (Joint Declaration 2010). The targets of the WSP 2010 are consistent with the national conservation objectives of EU directives, such as MSFD and N2000. Main focus of the analysis is on the Wadden Sea Plan in general, and the management of seals and fisheries in particular.

2.2 Pentland Firth and Orkney Waters (PFOW), Scotland

Case Study 2 examines the development of the **non-statutory pilot marine spatial plan** for the PFOW in Northern Scotland. Preparation of the plan started in 2008 and it will be published probably in 2014, two

years later than planned because of the complexity of the process. The boundaries of the plan area are irregular following the 12nm limit of the part of the UK territorial sea around the Orkney Islands. The area is roughly rectangular measuring about 120km x 100km (12000km^2) (Fig. 9).

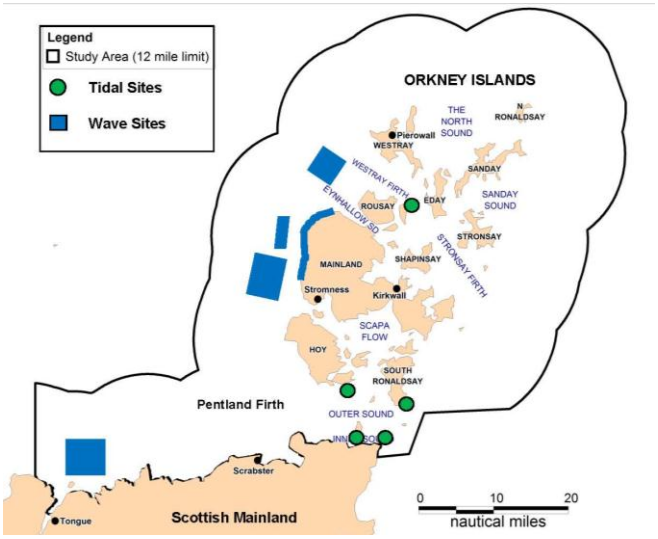

Figure 9. PFOW Case Studyarea showing wave and tidal sites

It is of strategic importance to the development of wave and tidal energy and the Government has ordered the preparation of the plan in advance of the statutory plan required by new legislation. The implementation of the statutory process will result in a statutory plan about 2016/2018. The non-statutory pilot plan will temporarily substitute for the statutory plan and will be used to inform the licensing process for commercial wave and tidal energy farms which are the subject of current consenting applications.

The area has been designated by the UK Government as one of the two first 'Marine Energy Parks' in the UK, the other being in the South West of England off Cornwall. The purpose of the 'park' designation is to foster *"…a collaborative partnership between local and national government, local enterprise partnerships, technology developers, academia and industry creating a physical and geographic zone with priority focus for marine energy technology development.."* [7]. It is the policy of the Government to encourage clusters of renewable development in UK waters thereby limiting development areas and making best use of shared services and infrastructure. Priority is given to sites rich in marine energy resources where support infrastructure and power export are practicable. On these criteria, the PFOW represents one of the best such sites in the world.

The research, development and testing of wave and tidal energy in the PFOW is already of world significance. The European Marine Energy Centre (EMEC) in Orkney is recognised as the leading centre in the world for the testing of wave and tidal energy devices. More than five wave device technologies and ten tidal device technologies are on test in the sea at full scale. Several have delivered electricity to the national grid. EMEC is also acting as consultant for the establishment of similar centres in the USA, China and Australia. Commercial developers have been awarded agreements to lease eleven seabed sites for the purposes of wave and tidal energy farms. Applications for licences have been made.

The area also contains important habitats and species protected by SAC and SPA designations. Large parts of the coastal regions have national designations such as 'National Scenic Areas' and 'Sites of Special Scientific Interest'. Other activities include a thriving community based fishery, international shipping, marine archaeology and extensive recreational interests. The adjacent island and rural coastal communities retain strong cultural and economic links with the seas around them. The implementation of

[7] South West Marine Energy Park Prospectus, Cornwall Council and Plymouth City Council, January 2012

the Marine Strategy Framework Directive (MSFD) and the Scottish contribution to the European network of Marine Protected Areas are under study.

Application of the Mesma framework and tools.

The purpose of the Case Study is to examine evidence from the PFOW Plan preparation and identify issues relevant to a generic framework for marine spatial planning. The monitoring and evaluation arrangements are considered in relation to the WP2 MESMA Framework. A test run of the Framework is populated with PFOW data.

2.3 The Barents Sea

The Norwegian Integrated Management plan for the Lofoten – Barents Sea area (hereafter the Barents Sea plan) covers approximately 1,4million km^2 of the Norwegian EEZ and the Norwegian Fisheries protection zone around the Svalbard archipelago. It is bordered towards the coast by the coastal baseline (outermost scurries), in the east with the border with Russia and to the west by an administrative border following the base of the continental shelf.

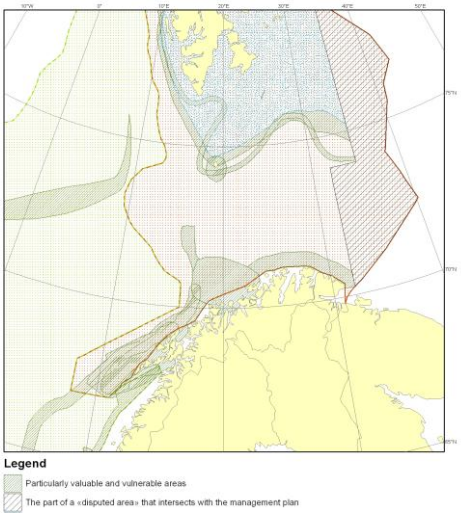

Figure 10. Map showing the area of the integrated management plan for the Barents Sea with red borders. The fluctuating ice covered area is in blue and the particularly valuable and vulnerable areas in dark green. This area was used in the broad MESMA FW assessme

The Barents Sea plan is a comprehensive and integrated marine spatial plan covering all ecosystem components and all human activities in the area, even extending to how human activities outside the plan area (eg. Land and coastal) affect the plan area. Zoning is limited to petroleum and shipping in addition to various levels of marine protection. For petroleum activities the zoning designates areas where activities are allowed, not allowed or allowed under stricter conditions than normal. IMO approved shipping lanes (traffic separation scheme) constitute the zoning for shipping. So far no systematic assessment has been made of which marine habitats in the Barents Sea–Lofoten area are to be classified as endangered or vulnerable. MAREANO, a cross-sectoral programme to develop a marine areal database for Norwegian waters, has been set up to conduct more thorough surveys of the seabed, including vulnerable benthic communities. In the period 2005–2010 the programme concentrated mainly on the northern areas. Moreover, as part of the changeover to ecosystem surveys by the Institute of Marine Research, the monitoring of benthic fauna at certain sampling stations has been started. The above monitoring and survey activities will provide a much sounder foundation for deciding on measures to prevent further damage to vulnerable marine habitats, and on which areas should be closed to fishing with certain fishing gear or to other activities that could damage these habitats.

The Government has taken the initiative for a new mandatory routing and traffic separation scheme for maritime transport about 30 nautical miles from the coast. The Government also stresses the importance of a cautious approach to the expansion of petroleum activities in the Barents Sea–Lofoten area. On the basis of an evaluation of the areas that have been identified as particularly valuable and vulnerable and an assessment of the risk of acute oil pollution, the Government has decided to establish a framework for

petroleum that prevent activities in several of these areas. This framework will be re-evaluated on the basis of the information available each time the management plan is updated. In 2010 it was decided to maintain the closure and continue mapping and monitoring seabirds and seabed to gain more knowledge.

Application of the Mesma framework and tools.

Within MESMA, the Barents Sea case study has especially focused on applying WP2 and WP6 frameworks/ guidelines for monitoring and evaluation of the case as part of WP3.

In the Barents Sea area a management plan has been in place since 2006. In 2010/11 the management plan was revised based on a state assessment including new information gained in the period 2005-2009. We have been using two approaches when applying the MESMA WP2 FW. These two approaches involve different scales and available environmental data:

1. Assessing the whole Barents Sea management area following the approach in the FW from step 1 to step 7. We have used the background data that was available when the management plan was developed in the first steps and the evaluation and revision of the plan in 2010/11 in the later.
2. A detailed assessment of an area of 70 000 km^2 where sea floor and benthic fauna has been mapped by MAREANO to fill knowledge gaps that was identified in the Barents Sea management plan. This area, which was closed to petroleum activities while gaining new knowledge before a revision of the management plan, was prioritized for mapping by the government. For the assessment, human activities and ecosystem components were mapped using a grid size of 5 x 5 km. Based on the collided information of human activities, pressures were estimated and were together with the sensitivity of ecosystem components quantified to produce impact maps.

The governance analysis is currently being implemented, but the ongoing WP6 work has presented us with new perspectives and research questions to be investigated. The structured approach in evaluating the drivers, policy and legal setting, incentives etc. has also been useful in structuring the analysis of a complex governance situation. The MSP initiatives are analyzed in the context of its "institutional landscape". These institutions represent the complexities of participation, conflict management and implementation processes. Analysis of the institutional landscape and the influence of MSP on these institutions are necessary to gain an understanding of the options for MSP and the development of "good practice" for MSP processes. The rich contextual institutional analyses of governance issues through case studies are complementing the MESMA framework.

2.4 The Celtic Sea

The Celtic Sea CS focuses on Finding Sanctuary, a stakeholder-centred MPA planning tasked with delivering recommendations to the UK Government on the location, boundaries and conservation objectives for Marine Conservation Zones (MCZs) in south-west England (Fig. 10). MCZs are a type of MPA designation required under national legislation, the Marine and Coastal Access Act (2009), and together with other types of designation (including Natura 2000 sites) will contribute to the meeting of national obligations under the MSFD. Finding Sanctuary delivered its recommendations in September 2011. Since then, they have been reviewed and commented on by England's statutory nature conservation bodies, and passed to Defra (the responsible Government department), whose minister will designate MCZs in 2013, following a public consultation. It is very unlikely that all the recommended sites will be implemented in 2013.

Finding Sanctuary's planning region encompassed the coastline of England's south-west peninsula and 93,000km^2 of the surrounding territorial sea and UK Continental Shelf area.

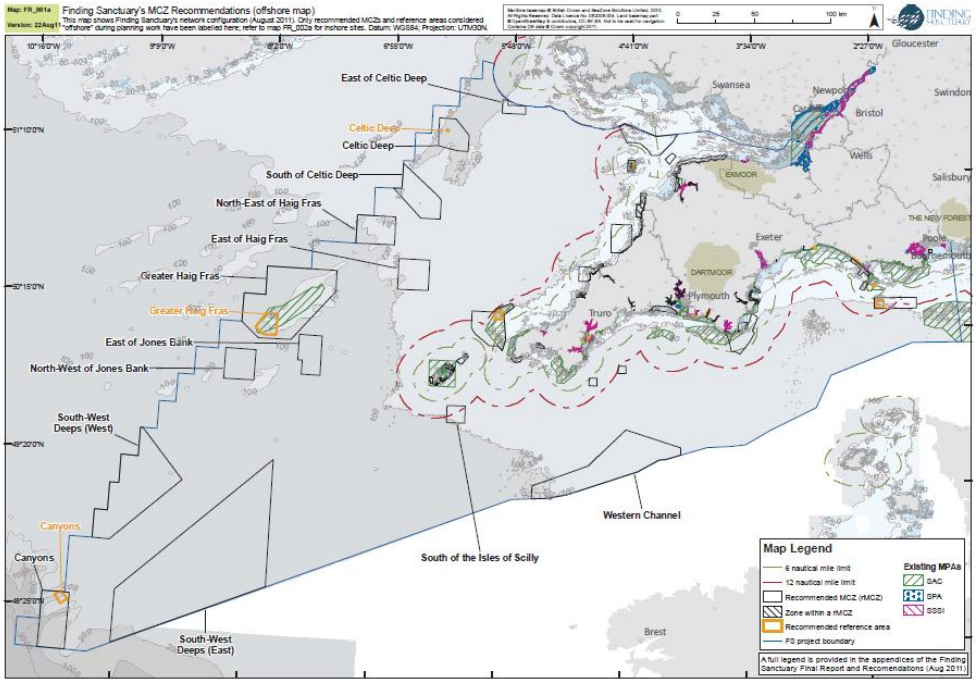

Figure 11. Finding Sanctuary project area

There is no single, integrated, multi-sector zoning plan for the region, as different sectoral activities are managed separately. There are many types of spatial restrictions and regulations in place within the region, many of which overlap (especially inshore). They include:

- 46 relevant existing MPAs, most of which are small, coastal sites. They consist of Natura 2000 sites, and Sites of Special Scientific Interest (SSSIs – a national designation).
- Spatial restrictions on fishing (fisheries management measures)
- areas licensed for the development of offshore windfarms
- areas licensed for disposal of dredged material
- areas licensed for aggregate extraction
- shipping lanes / traffic separation schemes

Maps showing the Finding Sanctuary area with the boundaries of the recommended MCZs and existing MPAs (including Natura 2000 sites) are uploaded at the MEMSA sharepoint (https://teamsites.wur.nl/sites/mesma/WP3Casestudies/Case%20Studies%20Folder/Celtic%20Sea/D3_6_CSCS_maps.zip).

Application of the Mesma framework and tools.

The operational objective for this case study is the designation of a configuration of MCZs in south-west England as part of an ecologically coherent UK MPA network. The process of planning and implementing MCZs is on-going: at present, no decisions have been made on which sites will be designated. Because of this (and other reasons), we have found the MESMA WP2 Framework difficult to apply to this case study (see the report from the first run of the framework, available on the MESMA sharepoint[8]). We have not carried out a second run because the obstacles that prevented the completion of the first run remain unresolved.

[8] the relevant folder is WP3 case studies/Case Studies Folder/Celtic Sea /Feedback on WP2 framework_Celtic Sea

A detailed Governance analysis of Finding Sanctuary is being carried out using the WP6 Governance analytical framework, which will also include some analysis of the on-going MCZ process since the end of Finding Sanctuary.

2.5 The Basque Country (SE Bay of Biscay)

The local (Basque Country) political and socio-economic context is significantly different from that of the national context (Spain). The Basque Country is located in the most southern-eastern part of the Bay of Biscay. It has a surface area of 7,234 km². The designation of the Basque Country as an autonomous community dates back to the Spanish Constitution of 1978 and it is based on the Devolution Act of the Basque Country. The Devolution Act served as the basis for the development of Basque Country regional autonomy (2010). It established a system of parliamentary government which has responsibility over a broad variety of areas, including agriculture, industry, culture, health, tax collection, fishing in interior waters, policing and transportation.

The case study area for MESMA will be the entire Economic Exclusive Zone (EEZ) in front of the Basque coastline. The bio geographical boundaries should be taken into account to provide the basis for an ecologically significant management plan e.g. Bay of Biscay (BoB) but it is not affordable for this study: different countries bordering the BoB are not included in the MESMA project, different management strategies and difficulties in the implementation of integrated management plans. The management plans are implemented at the country level.

The Basque continental shelf is located in the southeastern part of the Bay of Biscay (Fig. 11), in the border between France and Spain. This case study is considered as representative of the eastern Atlantic area of the MESMA study area. The area shows some specific characteristics in terms of biodiversity and marine resources, but it also shares common human activities with other European regions. The Basque continental shelf is small in extent and human activity is intense and diverse. It is characterized by holding some specific (or nearly specific) economic activities such as red seaweed extraction *(Gelidium corneum)*. Moreover, new activities are foreseen to develop such as wave energy converter installation which may involve conflicting interests.

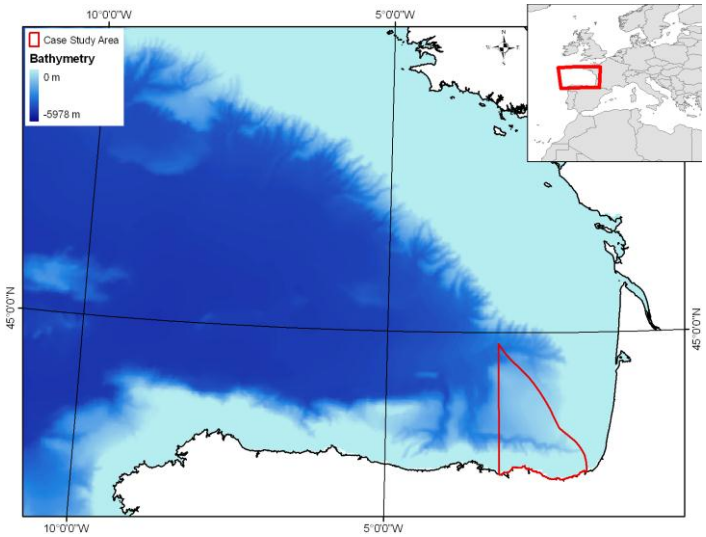

Figure 12. Case study location within the Bay of Biscay.

Currently, there is no marine spatial planning/management in place. Most of the policy/regulations are sectorial, or at least, they just take into account one activity and, in most cases, there is not spatial boundary definition for these regulations. The main problems that could be highlighted are the different governance issues at local, regional and international level and the lack of coordination and iteration between different stakeholders' uses and interests in the marine environment.

Application of the Mesma framework and tools.

The application of the FW was focused on the analysis of the interactions of the present management plans and the development of a new activity in the area. An exhaustive analysis of the administrative process of the implementation of the new activity has been analyzed, focusing mainly on the stakeholders participation and interaction.

The FW has also been used, to identify Ecosystem components and indicators in a spatial basis that could be used to evaluate the effectiveness of the present management plan

2.6 Strait of Sicily

The Strait of Sicily is defined as the part of the Central Mediterranean Sea comprised between the international waters off the African coast, the southern coast of Sicily and the waters surrounding the Maltese archipelago. It roughly coincides with the FAO Geographical Subareas (GSAs) numbers 15 and 16, plus a tiny part of the GSAs 12 (northern tip of the Egadi Islands) and 13 (Pantelleria Island).

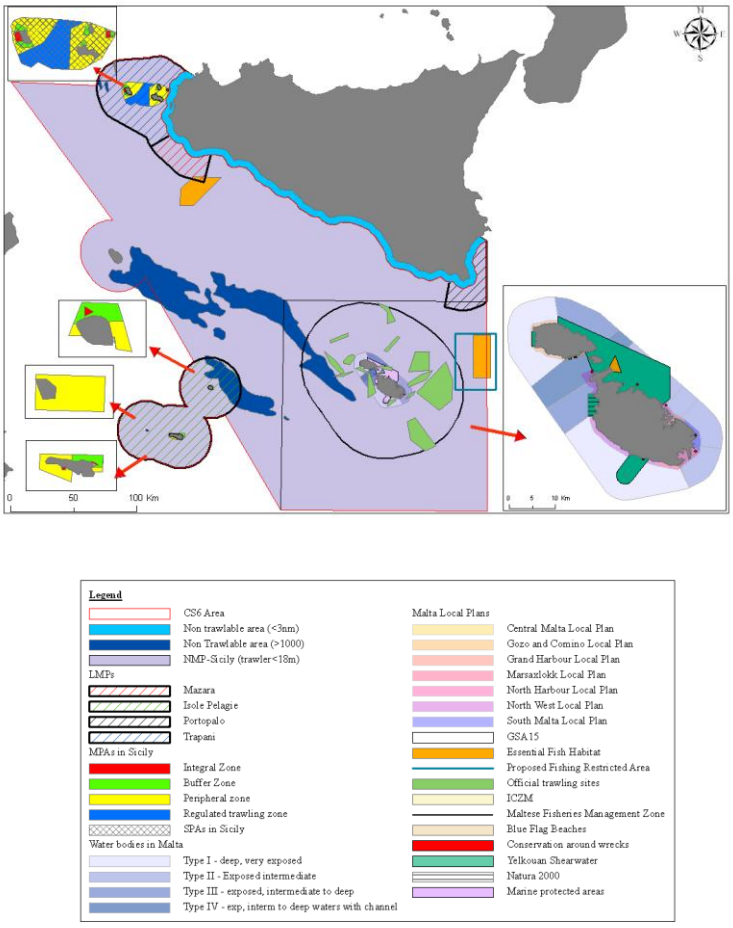

Figure 13. The different boundaries of the different spatial management plans in Malta

Up to date, there is not any integrated zoning plan covering either the whole or a substantial part of the study area. The Strait of Sicily area holds very different human populations that heavily exploit a vast array of marine resources from ancient times. Therefore zones are defined not only by political boundaries and legal obligations, but also by traditional uses. Zones are also defined ad hoc for specific sectoral uses. As a result, several zoning schemes arise locally and often overlap (Fig. 12).

The wider zoning scheme is provided by political boundaries. Territorial waters extend up to 12 nm from the shoreline and Malta has established an EEZ that expand up to 25 nm from the shoreline. The high seas are subjected to zoning for the exploitation of subsoil resources. In Italy establishes three wide zones

(namely C, D and banned zone) which underneath most of Italian waters and a substantial portion of the high seas. Smaller zones are nested within zones C and D.

Navigation channels are also present due to the large volume of traffic through the area, which is necessarily crossed by the navigation routes between the Suez Canal and the Gibraltar Strait.

The zoning scheme for fisheries covers most of the area. The trawl-fishing zones are defined beyond 3 nm from the shoreline and between 50 and 1000 m depth. Zones close to the shoreline are open to traditional fishing, generally at less than 200 m depth albeit with noticeable seasonal exceptions like the dolphin-fish fishery.

Marine Protected Areas (MPAs) present a zoning scheme with 3 or 4 types of zones at a much smaller scale. There are 5 MPAs within the study area. An additional area excludes the exploitation of subsoil resources around MPAs. Fishery plans establishes additional zones to protect essential fish habitats, nursery grounds, protection areas around shipwrecks and artificial reefs. There are also a number of proposed Specially Protected Areas of Mediterranean Interest (SPAMIs) on a larger scale although they are not established yet.

Gas pipelines, electrical networks and submarine communication cables require buffer zones that form a network of linear strips zones were any activity interacting with the bottom is not allowed. Due to the geographical position of the Strait of Sicily, such network is dense and pervades the whole area.

Minor administrative zones are established in the coastal areas, notably those defined in the Local Management Plans (LMPs) that extend up to 12 nm from the shoreline. There are five LMPs in the Italian territory of the Strait of Sicily and seven in Maltese waters. Zones defined under two different Integrated Coastal Zone Management plans, as well as specific Beach Management Plans, are also present in Malta.

Application of the Mesma framework and tools.

The application of the MESMA FW to the Strait of Sicily focuses on fisheries and nature conservation as they are specially relevant for EU policies. The use of MESMA FW and Governance Analysis prove particularly useful to analyze the feasibility of the MSFD objectives in the area. This is specially the case at present, since the whole area undergoes rapid change promoted by new external drivers.

2.7 Inner Ionian Achipelago, Patraikos and Korinthiakos Gulf

The Greek case study area is the Inner Ionian Achipelago, Patraikos and Korinthiakos Gulf, located at the central-western part of Greece. It has well defined spatial boundaries and is a semi-closed marine region, especially at the eastern part (Korinthiakos gulf) which has limited connectivity with open sea water masses. It includes coastal waters but also high seas and deep waters. It encompasses a great variety of habitats and species, including 10 NATURA 2000 marine sites and more than 25 Special Protection Areas for the conservation of wild birds (79/409/EEC).

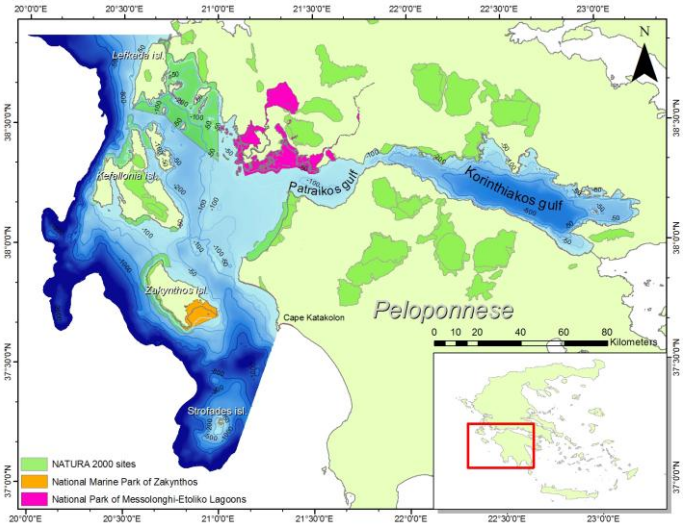

Figure 14. Greek CS study area with indication of protected areas

It hosts several endangered marine species such as the Monk Seal (*Monachus monachus*), the loggerhead sea turtle *Caretta caretta*, the bottle--nosed dolphin *Tursiops truncatus*, and the common dolphin *Delphinus delphis*. Anthropogenic activities occur both along the coasts of the study area and in offshore waters. Human pressures in the coastal zone include fisheries, urbanization, heavy industry, tourism, aquaculture, and shipping, while in offshore waters the main pressures come from fisheries and shipping. Growing conflicts exist among human uses and between uses (mainly fisheries and tourism) and nature conservation.

There is no integrated spatial management plan for the entire area, but sectoral national and regional plans do exist. Very general national plans for development of urbanisation, tourism, fisheries and aquaculture have been compiled, and a detailed spatial management plan for the MPA of Zakynthos island (National marine park) is in place.

Application of the Mesma framework and tools.

In the Greek case study, the FW/MESMA tools were used to evaluate certain existing sectoral plans that are in use or will be soon implemented in the area, identify gaps in basic knowledge that is vital for the decision-making under EBM, gain insight on issues related to MSP, and recommend appropriate initiatives to be implemented in the future. More specifically, we investigated (1) whether current management activities/initiatives are sufficient to reach GES as defined by MSFD; and (2) possible locations for the establishment of new marine Natura2000 sites, in order to fulfil legal obligations derived from the Habitats Directive.

2.8 The Black Sea

The Black Sea is isolated from the world oceans, and is only connected to the oceans via the Mediterranean Sea through the Bosporus Strait, the Sea of Marmara and the Dardanelles strait. The large European rivers, the Danube, Dnieper and Don flow into the Black Sea (Figure 14). For this reason, the Black Sea is very vulnerable to pressure from land based human activity and its health is dependent on the coastal and non-coastal states of its basin. Six countries have a Black Sea shoreline: Bulgaria, Romania, Ukraine, Russian Federation, Georgia, and Turkey (Table 1). Bulgaria and Romania are members of the European Union and Turkey is an accession state. The Russian Federation, Georgia and Ukraine have less intensive relations with the EU, although they all have a 'partnership and cooperation agreement' with the EU.

Figure 15. Geographical context of the Black Sea

At present, the Black Sea Commission (BSC) executes management and ecological evaluation of the Black Sea waters based on a zoning plan (BSC, 2010). The Black Sea Commission has a strict organizational structure (Fig. 15), with the member states Bulgaria, Romania, Ukraine, Russian Federation, Georgia, and Turkey.

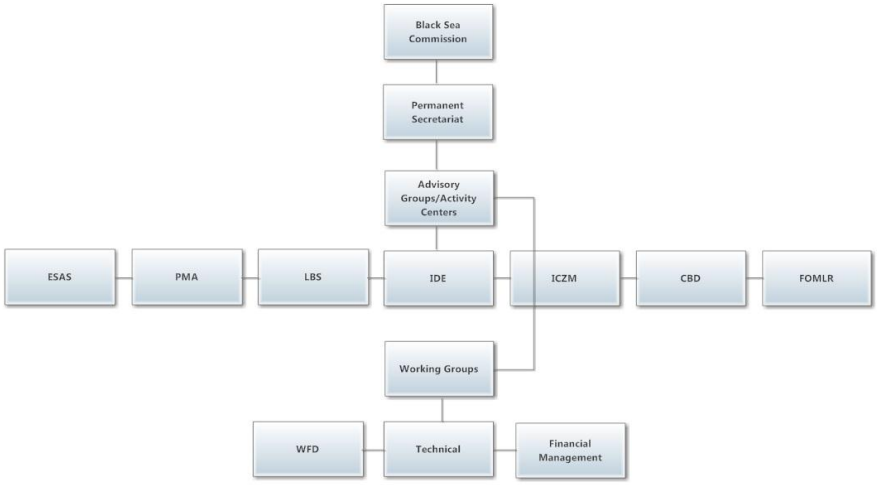

Figure 16. Organisational structure of the Black Sea Commision (BSC, 2012)

The BSC appoints its executive director and the other officials of the permanent secretariat. The permanent secretariat is composed of nationals of all Black Sea states. Concrete activities and work of the permanent secretariat are based on the Annual Work Programs of the BSC and Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (1996).

Along the Black Sea coast chemical pollution from industrial discharge, particularly metal pollution in suspended matter in the water column, is a problem for input of detrital particles (Galatchi and Tudor, 2006; Yiğiterhan, 2011). Intensive chemical discharge via wastewater from ships (Ocak et al., 2004) and the influence of river inflow (Yiğiterhan, 2011) has also impact on the environmental Black Sea ecosystem. The number of fish species harvested in the Black Sea decreased due to the application of unsustainable fishery management regimes (Caddy et al., 2005; Uras, 2006).

In line with the maritime spatial planning (EC, 2010) the BSC aims to recommend the creation of processes that will stimulate the development of maritime activities, focusing on cross-border issues and benefiting strongly from Marine Spatial Planning (MSP) in a way compatible with the good environmental status of the seas as laid down in the Marine Strategy Framework Directive (MSFD) (BSC, 2010). To develop a network of marine protected areas in the Black Sea, the BSC has developed guidelines (BSC, 2010). The

main functions of the BSC defined in the convention are to promote and make recommendations on measures to improve the implementation of the Convention (Fig. 3). Decisions made by the BSC are taken only in full consent of all Black Sea member States in which every state maintains its sovereignty on all issues (Vogel et al., 2012). This makes it hard to be decisive on cross-boundary issues as, every member can use his or her veto.

In 2009 the 'Sofia Declaration' was accepted, recognizing the need to preserve the Black Sea ecosystem as a valuable natural endowment of the region to ensure the protection of its marine and coastal living resources as a condition for sustainable development of the Black Sea coastal states, well-being, health and security of their population. Further, the 'Black Sea Action Plan' (BSC, 2009) provided that each Black Sea state had to adopt regulations and planning instruments for the need to establish a regional conservation strategy for protected areas.

The BSC member states share a common desire for the sustainable management of the natural resources and biodiversity of the Black Sea and recognize their role and responsibility in conserving the global value of these resources. However in the EU member states Bulgaria and Romania an extensive plan the 'Natural Habitats' (Natura 2000) is introduced to ensure biodiversity by conserving natural habitats and fauna and flora. Implementaton of EU policies remains however difficult as these EU member states actually operate in the environmental and institutional setting of the BSC, which is mainly populated by non-EU member states.

Application of the Mesma framework and tools

At present, the planning, management and ecological evaluation of the Black Sea waters in Bulgaria are executed by the Black Sea River Basin Directorate (BSBD), which is subordinate to the Bulgarian Ministry of Environment and Waters. In Bulgaria the BSBD has developed the current Black Sea River Basin Management Plan, which is aimed at implementing the requirements of the WFD for all surface (including coastal marine waters) and ground waters in the Black Sea River Basin. Within the WFD the existing Black Sea River Basin Management Plan is achieving "Good ecological status" of all waters, including coastal marine waters by 2015. A list of ecological objectives are defined, among which those concerning the marine waters, including reduction of contamination with organic matter and nutrients, prevention of contamination with oil products and priority substances, and conservation of habitats and species. In the formulation of the Management Plan all national, regional and municipal plans, programmes, strategies were taken into consideration. Major pressures (especially land-based) are mapped, ecological monitoring and assessment are made and risk analysis is carried out to identify waters at risk to not achieve GES by 2015 (Oral, 2012). No information of Romania is available yet.

2.9 The Baltic Sea

During the first FW run (D3.3), the Baltic Sea CS started off with an analysis of the Baltic Sea Action Plan, covering the entire Baltic Sea. This was a necessary step to be able to conduct a detailed analysis of smaller areas within the Baltic Sea for wich MSP is in place or planned. For this deliverable, we therefore zoom to two smaller subCS, located within the Baltic Sea.

2.9.1 Östergötland County

The marine area of Östergötland County in Sweden is 2533 km^2 (Fig. 16). The marine area is divided by the three coastal municipalities of Norrköping, Söderköping and Valdemarsvik.

The municipalities are responsible for the physical planning and must, according to the Planning and Building Act, have a current comprehensive plan covering the entire municipality. The County Administrative Board cooperates with the municipalities and other governmental bodies by giving guidance, providing regional basic data for the municipal spatial planning, and reviewing the municipal comprehensive plans to ensure that they regard national and regional interests.

The comprehensive plan accounts for public interests as well as environmental and risk factors that should be taken into account when making decisions about the use of land or water areas. The

significance and consequences of the plan have to be formulated in such a way that they can be understood without difficulty.

The following should be clear from the plan: the outline of the intended use of land and water areas, the municipality's view of how the built environment should be developed and be preserved and how the municipality intends to provide for the presented areas of national interest according to the Environmental Code and the environmental quality standards, if these affect the municipality.

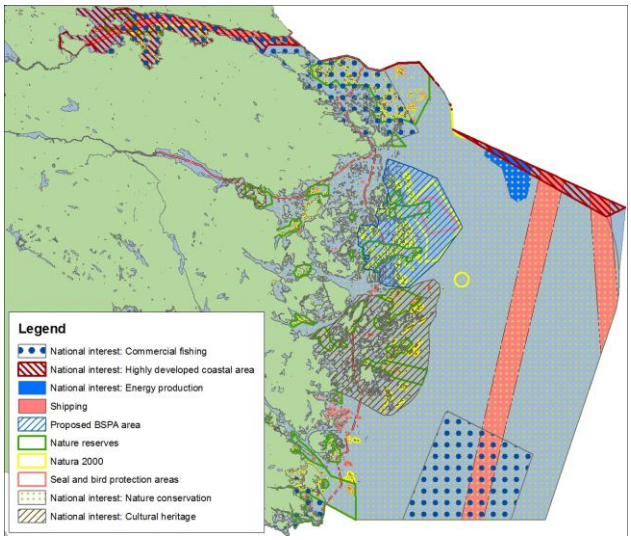

Figure 17. National and regional sectoral interests in Östergötland County.

The comprehensive plan constitutes the basis for the drawing up of detailed development plans and for the examination of permit applications. At least once during each term in office, the local council must determine if the plan remains current. The comprehensive plan is not legally binding for the authorities or individuals but is to give guidance when making decisions.

The 16 Swedish environmental quality objectives are taken into account when setting the objectives relevant for MSP . In addition to these there are regional environmental quality objectives contributing to the national objectives and in some cases also municipal objectives. The municipal environmental objectives and the actions needed to reach the objectives are presented in the nature conservation strategies that complement the municipal comprehensive plans.

Application of the Mesma framework and tools

The MESMA framework has been used to review the current status of spatial management plans and nature conservation objectives for the marine area of Östergötland County, including identification of strengths and weaknesses of these. The output of the evaluation and gathered spatial information will be used in a Marxan analysis of the marine area of the County. The Marxan analyses will be carried out after August 2012, wherefore no information is now presented for step 7 of the MESMA FW.

2.9.2 Puck Bay

Puck Bay is located in Poland off the shores of the Pomeranian Voivodeship. The area is under the great influence of the Tricity agglomeration (Gdansk, Gdynia and Sopot), which has the population of about 760,000 inhabitants. The Tricity metropolitan area is even larger – it has the population of over 1 million. The Puck Bay is the part of the Gulf of Gdansk, which is the system of estuaries with a mix of brackish and marine waters. The entire areas is designated as NATURA 2000 site, protected under the Birds and Habitats directives. Additionally national and HELCOM regulations apply. The part of the bay is the Coastal Landscape Park as well as Baltic Sea Protected Area (BSPA).

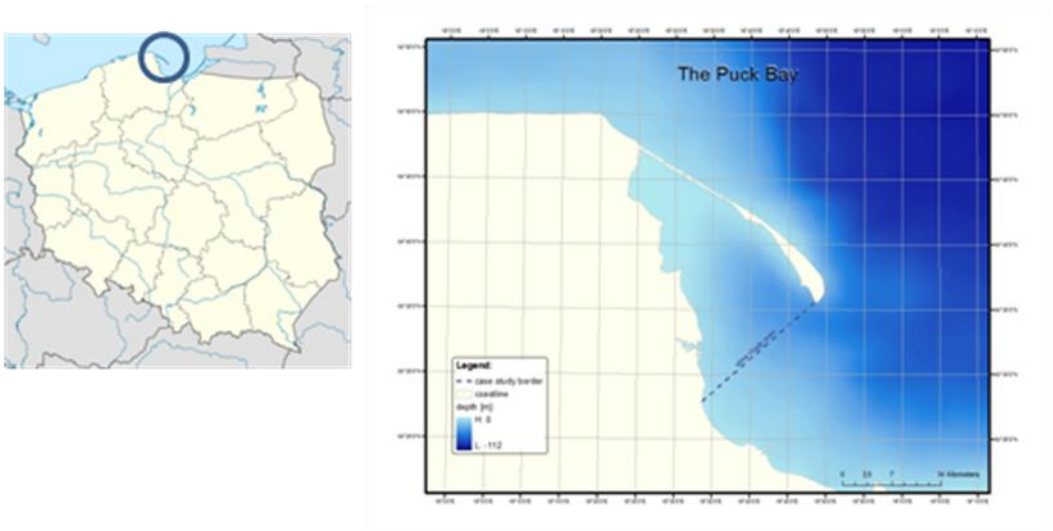

Figure 18. Location of the Puck Bay CS area within the Gulf of Gdansk

For the purpose of the MESMA project, the Puck Bay area was defined following the first draft marine spatial plan developed under the PlanCoast Project[9]. It is therefore defined as the marine territory between the Cypel Helski (18°48'29,12''E, 54°35'33,71''N) and the border between Gdynia and Sopot municipalities (18°33'43,15'' E, 54°27'51,46''N; Fig. 17). The total region equals 405 km. The coastal belt area is 55 km^2 and the coastline length is 117 km. The draft plan is not legally binding, but maritime administration considers it be a kind of guide, or a set of good practices.

The concept of MSP is present in the Polish legal framework through the article 37a of the legal act on "Maritime Areas of Poland and Maritime Administration". However, this policy lacks implementing regulations and bylaws, which makes it practically impossible to introduce the legally binding marine spatial plan.

The Pilot Draft Plan for the Western Part of the Gulf of is considered by the maritime administration as a synthesis of the best available knowledge and practices. It also practically tests the methodology to be applied in the future when the required regulations are formally introduced. The pilot plan defines different uses of the water surface, water column, sea floor and the air. It covers marine areas only (apart from the harbours), but the future development plans of the bordering coastal municipalities were also considered. The general objective of the plan was to minimize and prevent the spatial conflicts and to enhance the ecological, social and economic sustainability of the region. In particular, the pilot plan aimed to decide on (a) the use of the sea space, (b) limitations in these uses, (c) public investment requirements, (d) goals for environment and cultural heritage protection.

No zoning plan exists. However, the area is divided into 30 basins. Major and complementary function(s) are described for each basin, but so-called "additional activities" are only sometimes defined. They include nine functions, which reflect sectors active in the area, i.e., (a) transportation, (b) tourism, sport and recreation, (c) fisheries, (d) surface and underwater installations, (e) linear infrastructure, (f) nature conservation, (g) natural resource extraction, (h) waste deposition, and (i) defence and safety (military reasons). However, these uses are considered at a high level of generality and no limitations/trade-offs within each sector is discussed, e.g., various, often excluding, types of leisure and recreation activities. Detailed arrangements are additionally set for each area. They provide specific requirements regarding: (a) protection of the environment, (b) protection of the cultural heritage, (c) technical infrastructure and marine vessels traffic, (d) public purpose investments, and (e) economic use of the area.

[9] The title of the plan reads: the Pilot Draft Plan for the Western Part of the Gulf of Gdansk

Application of the Mesma framework and tools

The MESMA FW represents the methodological tool to monitor and evaluate the spatially managed marine areas. Through the application of the MESMA FW, we aimed to evaluate the pilot draft plan and to identify its weaknesses and strengths. We aimed to identify not only the shortcomings of the plan itself, but also more generic gaps in data availability, in knowledge on the marine environment and related social and economic aspects. Finally, our goal was to issue recommendation for improvement for the marine spatial planning in the future.

3 Impact of administrative boundaries on monitoring and evaluation of SMAs.

At all CS, a multitude of administrative boundaries exist, ranging from very local boundaries (municipalities, e.g. Östergötland) to countries' borders (Southern North Sea, Dogger Bank, Wadden Sea and the Strait of Sicily CS) (Table 1) . In about half of the CS, regional (provinces, regions, districts) boundaries exist as well. International agreements (shipping routes, territorial sea area, Common Fisheries Policies, ASCOBANS...) affect most of the CS. Marine Protected Areas (as SAC, SPA or other form) are designated in the majority of the CS. Sectoral plans, with corresponding boundaries, exist in almost every CS

The SNS CS and the Strait of Sicily study show that on the regional sea level, the existence of administrative boundaries can affect the monitoring and evaluation process in a negative way. Resolution of available data might not be appropriate (e.g. resolution of freely available fishing effort data is too coarse for analyses on smaller scales), and getting authorisation to use data that are not freely available is time consuming. Administrative boundaries hamper a smooth flow of international data exchange. The BPNS case study noted that satellite based vessel monitoring system data for foreign ships fishing in Belgian waters are difficult to obtain, rendering it extremely difficult to get a correct assessment of the dimension and impact of fishing in the BPNS.The Dogger Bank CS, dealing with one area located in 4 countries, suggest to organise a cross-bordering joint monitoring and evaluation programme efforts as most effective way forward towards monitoring and evaluation of the Dogger Bank area. This is implemented in the Wadden Sea CS (The Netherland, Germany, and Denmark) where monitoring and assessment take place in trilateral governance arrangements at different organisational levels. Where targets and criteria for monitoring of management performance and effectiveness of measures have not been properly defined at the international level (i.e. Black Sea CS, Strait of Sicily), evaluation is not possible. However, it is clear that this is also the case at the more local level.

As such, the CS work revealed that monitoring and evaluation of SMAs encompassing different countries would benefit from (1) integrated monitoring and evaluation processes resulting in standardised data, (2) a free exchange of data and (3) a clear translation of high policy goals in operational objectives.

At the local scale, monitoring and evaluation of SMAs across administrative boundaries often requires different agencies to work together in order to deliver the most effective monitoring and evaluation strategy possible. Such boundaries include the limits of the territorial seas (12 miles), boundaries of areas regulated by the Common Fisheries Policies and boundaries of jurisdiction of regions/provinces/counties...Where data are available (Basque Country CS) for offshore area, the amount and resolution of these data is lower than for data collected on areas closer to the coast. When data on offshore areas would become available in higher quality, local boundaries do not seem to affect monitoring and evaluation of SMAs.

While the effect of administrative boundaries on monitoring and evaluation could be investigated by all CS, some CS also addressed the effect of administrative boundaries on the implementation of an SMP. Especially where multi-level government structures are installed, government competences are scattered across different (i.e. in Belgiuim: European, federal, regional and local level) levels, and within each level, across several departments. This has important consequences.

Table 1 Overview of administrative boundaries within MESMA CS. CFP=Common Fisheries Policy, MPA= marine protected area of any kind (SAC, SPA, areas with a local level of protection).

	National Borders	(IMO) Shipping Routes	Territorial Sea/CFP/ ASCOBANS	Provinces/Regions/ Municipalities	MPA
SNS	X	X	X	X	X
BPNS			X	X	X
Dogger Bank	X				X
Skaggerak			X	X	X
Wadden Sea	X			X	X
PFOW		X	X		X
Barents Sea		X	X		
Celtic Sea			X		X
Basque Country			X	X	
Strait of Sicily	X	X	X		X
Inner Ionian Archipelago, Patraikos and Korinthiakos Gulf		X	X	X	X
Black Sea	X	X	X		X
Baltic Sea: Östergötland		X		X	X
BalticSea: Puck Bay			X	X	X

In Belgium, the federal government is the competent authority for the marine environment from the coast onwards, with the exclusion of specific activities that have been transferred to the competence of the Flemish region, including fisheries, dredging and pilotage. While the Belgian government installed the SAC "Vlaamse Banken", it is the Flemish authority that will have to propose fisheries management measures in this federal designated area. For those measures outside the 12 nautical mile zone, these measures need to be formally proposed to the European Commission (EC). While this procedure is already complicated, it remains unclear who will be in charge of the enforcement and monitoring of these management measures.

At the international level, uncertainty exists about the implementation of management measures in those areas where the Common Fisheries Policy is in place. Any management action that affects fishing opportunities for EU Member states must be carried out through the EC of though multilateral agreements with affected states. As such, the final outcome of the SMP process is no longer in national hands. In areas partly subjected to CFP and partly subjected to local decision levels, results in difficulties implementing unified management areas needed to reach i.e. GES for MSFD.

Some CS are located in countries that subscribed to ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas). Such non-binding agreements tend not to influence the national planning to a high degree. They support exisiting binding agreements and obligations and as such they play a more supplementary role in management.

4 Drivers of MSP processes in CS areas

MSP in the case studies is mainly driven by European legislation (MSFD, Water Framework Directive, Bird Directive and Habitat Directive), socio-economic considerations, and ecological concerns. At the Black Sea, the driver is the influential 'Convention on the protection of the Black Sea agains pollution', initiated by the Commission on the Protection of the Black Sea against pollution. The MESMA CS analyses suggest that ecological concerns are the only key driver of policy in those areas where sustaining ecological values had been formulated as prime policy objective before EU legislation wer put in place. A good example is the Wadden Sea CS. The MSP process here was initiated in the 70's, influenced by coalitions of science, policy and NGOs. The WSP (adopted in 1997, renewed in 2010) mainly sets ecological targets, allowing for economic activities and developments within the constraints of suitable protection.

In most CS, European legislation is the key driver. European legislation should here be seen as an umbrella concept, overarching the Habitat Directive, Bird Directive, Waterframework Directive, Natura 2000 and MSFD. It is not possible to explicitely mention one directive as key driver on the European scale, as different Directives are mentioned in different CS. While these Europan legislation serves to protect ecological values, ecological concerns itself cannot be considered askey drivers in most of the CS, as it is unclear whether the steps that are undertaken at present would have been initiated on the basis of ecological considerations alone.

Ecological considerations are also related to the developments of activities mitigating the effects of climate change and reducing carbon emissions. The development of renewable energy sources at sea (wave and tidal energy (Basque Country CS, PFOW CS), offshore windmill farms (SNS CS)) are such initiatives. However, ecological considerations here go hand in hand with socio-economic drivers, because this new industrial sector is expected to create jobs and economic growth. In Scotland, it even contributes to economic credibility to be independent from the United Kingdom. The Skaggerak CS mentions an example of the devolepment of ecolabelling for seafood products as an example where ecological and socio-economic drivers go hand in hand

Socio-economical drivers of MSP processes do not necissarely go hand in hand with ecological drivers. Aggregate extraction, fisheries and tourism have a strong demand for space to maintain/develop activities at sea, even when reaching GES for MSFD will be required. Hence, while developing visions for the future, these socio-economical aspects have been (Celtic Sea CS; Barents Sea CS) and will be important (other CS) in developing user scenarios for the marine environment.

5 Progress and obstacles towards achieving integration and sustainability

MSP should results in marine ecosystems, sustaining human use and providing the goods and services required by society (McLeod et al. 2005). This is not the same as nature conservation, which aims at protecting nature itself.

One of the most striking contrasts between CS is the evolution of the Wadden Sea CS and all other CS. At the start of the Trilateral Wadden Sea Cooperation, focus was mainly on nature conservation management in the Wadden Sea area. This resulted in a high level of environmental quality (2010 Synthesis of the Quality Status Report). Currently, a shift from conservation towards sustainable management is taking place now. This is not only done through the Wadden Sea Plan itself, but also through actions outside the trilateral governmental management, such as the installation of conventants between NGOs and sectors, and certification of sustainaible fisheries (Marine Stewardship Council).

In contrast, in most of the other CS, the marine environment was historically used by humans for harvesting, without taking into account sustainability. In these areas, provision of goods and services, and sustainable use by society is nowadays partly aimed for by a stronger focus on nature conservation, often through European legislation.

In what follows, we analysed whether activities in the marine areas of the MESMA CS are organised/planned in such a way that progress towards sustainable use of the marine area environment is achieved.We provide an overview of the most common obstacles encountered in the CS, and selected promising ways to overcome these obstacles. We refer to Annex 1for an overview of progress and obstacles in each CS.

5.1 Obstacles

Lack of MSP. Where MSP is not implemented or when there is no MSP, sustainability is often not among the high level goals. In these cases, long-term collective goals (reaching sustainable use of the sea) are often considered to be of lower importance than short-term private/sectorial interests.

Human activities at sea are primarily driven by opportunistic private (sectoral) interests without much concern for the long-term collective ones.

International borders. Where SMAs are crossed by international borders, national interests get priority above cross-border joint interests that would promote sustainability in the SMA. In addition, there is difficulty in data exchange between countries, especially in the field of monitoring of fisheries activities (VMS data). Succes of management measures implemented for protection of species at a local scale also depends on the (absence of) management measures in other countries, where the species is present as well.

Local administrative boundaries and dispersed competences. This obstacle is mentioned in many CS. Multilevel governments and/or the fact that competences are distributed among different management bodies often result in a sectoral approach by each governmental level/management body preventing an integrated and holistic approach to management.

Political issues. Here again, there is a discrepancy between the longer time scales associated with societal need to implement sustainability ensuring issues and the relatively short time scales within which politicians need to take decisions to act on emerging issues. In addition, a politicians's point of view can be influenced by short-term electoral constraints as well. Thiss all can result in political hesitance to put strong environmental measures in place in the face of opposition from industrial sectors. There is evidence that designation of MPAs needs to be backed up by strong and detailed scientific evidence underpinning the ecological value of the designated area (BPNS CS, Celtic Sea CS). On the other hand, there is evidence of a 'deploy and monitor' strategy for industrial activities with unkown environmental impacts (PFOW CS).

Communication problems between stakeholders and/or between stakeholders and management bodies. Communication problems can arise when issues related to sustainable use and conservation/restoration goals are not clearly defined or translated to real world objectives. In addition, stakeholder participation in the MSP process can be hampered by the lack of knowledge to implement public consultations.

5.2 Progress

Progress towards sustainability is noted in general were organised communication is improved, and good data were available or collected. Very often, the Europen Habitat, Bird and Marine Strategy Framework direction were triggers to move towards the installation of more integrated management strategies, compared to the sectoral zoning plans that were in place in most of the CS.

The effect of data availability and organised communication go hand in hand. When good data are available, the sustainability issue goes beyond the concept phase and into the real world, which makes it easier for stakeholders to see the light at the end of the tunnel. The Barents Sea case describes how integrated monitoring surveys, complemented by component specific monitoring delivers data that are very useful for the MSP process.

Once data are available, dialogue between stakeholders, and stakeholders and MSP implementing instancies is indispensable. MSP is often regarded as a top-down process, where governments decide and stakeholders need to follow. However, consultation of stakeholders in a very early stage and throughout the MSP process seems to result in a faster paving of the road towards integration and sustainability.

Communication is not only an issue of importance in the stakeholder-governmental body relationship. Dialogue across all administrative boundaries (countries, regions witin a country, different management bodies) is needed to specify cross-boundaries interests and to decrease the level of sectoral management.

Based on our case studies, we conclude that overcoming the obstacles and making progresss towards integration and sustainability can be achieved by

- Stating clear (SMART) objectives, thereby translating higher goals to the real world
- Having good data at hand, or collect missing data where gaps are identified. Data collection should be done using integrated monitoring efforts.
- Organising stakeholder involvement throughout the MSP process
- Organising dialogue across administrative boundaries.
- Reducing the division of competences among different management bodies
- Avoiding scattered competences among many management bodies

6 Reflection on MESMA

In this part, we describe how MESMA scientists used the different work packages to reach the current state of the art. The MESMA CS are at the heart of MESMA, testing tools and products and searching for data needed by or developed within other WPs. This allows MESMA to generate useful tools and products that can be used in the future for monitoring and evaluation of SMAs. As this D3.6 represents a state of the art of how CS actually used the MESMA tools and knowledge, we perform a self evaluation, which will allow us to improve the different products that will be delivered at the end of the MESMA project. Given the very diverse nature of the CS, we report a summary of this self-evaluation, rather than a copy of the individual CS reports, which are reported as Annex 1.

The work performed in **WP1** (Information management) was a very useful start for the CS work, as it provides a state of the art overview of the existing knowledge on SMAs. The papers arising from this WP will be important for the future, certainly in areas where MSP is still in its infancy.

The generic framework for monitoring and evaluation of SMAs, and the accompanying protocol **(WP2** products), where very useful for data gathering, identification of major management plans, high level goals and (presence/absence) operational objectives, mapping conflicting objectives. The strong point of the FW is the fact that it brings structure in the often overwhelming amount of information that is available. This allows users to deconstruct and dissect the information into isolated components, which can be analysed accordingly. In some cases, a link between the information obtained within WP6 (Governance) clarifies the results of the analyses obtained with the generic framework. It should be noted that the FW was evaluated as being rather complex to be used in small SMAs.

WP4 (Developing, testing, and evaluation of management tools) provides information about available tools that can be used during different steps of the FW. These are listed at the MESMA website (http://publicwiki.deltares.nl/display/MESMA/TOOLS) with an indication in which step of the FW they can be used. CS actually found this website very useful as starting point to decide which tool could be useful in their particular case, but did not really use many tools at the current stage of analysis. This can be attributed to the MESMA timeline, as the date for delivery of this report is well in advance of the end of the MESMA project, and the high degree of specialisation needed to correctly apply some of the available tools.

WP5 (Geomatics framework for SMAs) has not been used by the CS. For the time being, CS have delivered maps and associated metadata to WP5. Most of the data and maps were available within the CS, or were compiled and mapped during the analyses of the CS data. Delivery of these existing and newly compiled

maps to WP5, and opening them to the public through the MESMA website will enable future monitoring and evaluation efforts to be more efficient.

The framework provided by **WP6** (Governance) allowed the CS to perform a structured analysis that improved the understanding of given scenarios, clarified the relationship between stakeholders, shed light on the role of scientists in MSP processes and identified conflicts, incentives and cross-cutting issues. Although the WP6 related work is not finalised at the moment, the WP6 work is generally acknowledged to be very important.

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