Zee op Zicht: Inzicht
Gepubliceerde Literatuur &
Verslag slotbijeenkomst

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Voorwoord

Dit is deel twee van de rapportage over het Zee op Zicht programma. In deel 1, de *'reader'* werden de bevindingen van Zee op Zicht gepresenteerd. In dit deel vindt U een overzicht van publicaties die mede door een bijdrage van Zee op Zicht tot stand zijn gekomen. Daarnaast vindt U een verslag van de activiteiten van de bijeenkomst gehouden op 4 december 2014. Op deze dag zijn de resultaten van zee op Zicht gepresenteerd en bediscussieerd met een publiek afkomstig uit maritiem beleid, sectoren en NGOs.

Wij zijn dank verschuldigd aan al diegenen die over de achterliggende periode direct of indirect hebben bijgedragen aan het tot stand komen van deze studie en met name aan degenen die aanwezig waren bij de bijeenkomst van 4 december 2014. Dit project is tot stand gekomen middels financiering vanuit het Kennisbasisprogramma VI Transitie & Innovatie wat zich richt op het ontwikkelen van kennis over de stuurbaarheid van transitie- en innovatieprocessen, nieuwe methodieken en strategieën voor innovatie en valorisatie, en condities voor duurzame handelspraktijken van ondernemers en burgers/consumenten.

Literatuur

The projects:

MERMAID: Innovative Multi-purpose offshore platforms: planning, design & operation

In the near future, the European oceans will be subjected to a massive development of marine infrastructures. The most obvious structures include offshore wind farms, constructions for marine aquaculture and the exploitation of wave energy.

The development of these facilities will increase the need for marine infrastructures to support their installation and operation and will unavoidably exert environmental pressures on the oceans and marine ecosystems. It is therefore crucial that the economic costs, the use of marine space and the environmental impacts of these activities remain within acceptable limits. Hence, offshore platforms that combine multiple functions within the same infrastructure offer significant economic and environmental benefits.

MERMAID will develop concepts for the next generation of offshore platforms which can be used for multiple purposes, including energy extraction, aquaculture and platform related transport. The project does not envisage building new platforms, but will theoretically examine new concepts, such as combining structures and building new structures on representative sites under different conditions.

The 28 partner institutes forming MERMAID are Universities (11), Research institutes (8), Industries (5) and Small and Medium Enterprises (4 SME's), from many regions in EU. The group represents a broad range of expertise in hydraulics, wind engineering, aquaculture, renewable energy, marine environment, project management as well as socio-economics.

MERMAID is one of three EU-FP7 funded projects selected for funding in response to Ocean 2011 on multi-use offshore platforms (FP7-OCEAN.2011-1 “Multi-use offshore platforms"). This project shall have a cost of 7,4 million euro. The European Union has granted a financial contribution of 5,5 million euro.

MESMA: Monitoring and Evaluation of Spatially Managed Areas

The EU FP7 project MESMA has focused on marine spatial planning and aimed to produce integrated management tools (concepts, models and guidelines) for Monitoring, Evaluation and implementation of Spatially Managed marine Areas, based on European collaboration.

MESMA has supplied innovative methods and integrated strategies for governments, local authorities, stakeholders, and other managerial bodies for planning and decision making at different local, national, and European scales, for sustainable development of European seas.

At the heart of the MESMA project was the MESMA framework. This framework explores in a logical way how the management initiatives in a certain area were established, so that they can be evaluated and monitored. In cases where no management plans are available, following this framework leads to recommendations for future plans.

JAKFISH: Judgement and knowledge in fisheries including stakeholders

The project investigated how different actors in the marine sector, including fisheries, make use of scientific knowledge, how the roles that scientists play help formulate policies and how governance approaches can be developed which enable policy decisions to address uncertainty and complexity based on research and with the participation of stakeholders. The project will collect and build on experiences from a diverse range of EU policy areas which address interactions between human activities and nature. The main objectives of the proposal are to examine and develop the institutions, practices and tools that allow complexity and uncertainty to be dealt with effectively within participatory decision making processes. The proposal will develop these institutions, practices and tools in respect to European marine management with a particular focus on fish harvesting and marine spatial plannin via two linked strategies. Where Strategy One is to develop tools to facilitate participatory decision making processes based on recently developed bio-economic modeling techniques. While Strategy Two carries out a sociological analysis of the

practices and institutional forms that can most effectively involve the wider community in debates over developing science-based policies.

ODEMM: ODEMM Options for Delivering Ecosystem-Based Marine Management

The Marine Strategy Framework Directive deals with the implementation of an ecosystem approach to marine environmental management, and the Habitats Directive contributes to the protection of representative habitats. Human activities may have a severe impact on marine ecosystems. Therefore it is important that conduct and management of such activities (including fisheries, dredging etc.) are carried out in a way that supports the objectives of the Marine Strategy and the Habitat Directive. The challenge here is to investigate and quantitatively evaluate, specify and propose options and actions for a gradual transition from the current fragmented management of these activities (e.g. fish stock based regime for fisheries management) to a mature integrated management, including strategies for the implementation of the ecosystem approach at regional level, reconciling short-term economic objectives with long-term ecosystem sustainability objectives.

The overall aim of the ODEMM project is to develop a set of fully-costed ecosystem management options that would deliver the objectives of the Marine Strategy Framework Directive, the Habitats Directive, the European Commission Blue Book and the Guidelines for the Integrated Approach to Maritime Policy. The key objective is to produce scientifically-based operational procedures that allow for a step by step transition from the current fragmented system to fully integrated management.

1. The interaction triangle as a tool for understanding stakeholder interactions in marine ecosystem

Published as: Röckmann, C., van Leeuwen, J., Goldsborough, D., Kraan, M., & Piet, G. (2015). The interaction triangle as a tool for understanding stakeholder interactions in marine ecosystem based management. Marine Policy, 52(0), 155-162. doi: http://dx.doi.org/10.1016/j.marpol.2014.10.019

Expectations about ecosystem based management (EBM) differ due to diverging perspectives about what EBM should be and how it should work. While EBM by its nature requires trade-offs to be made between ecological, economic and social sustainability criteria, the diversity of cross-sectoral perspectives, values, stakes, and the specificity of each individual situation determine the outcome of these trade-offs. The authors strive to raise awareness of the importance of interaction between three stakeholder groups (decision makers, scientists, and other actors) and argue that choosing appropriate degrees of interaction between them in a transparent way can make EBM more effective in terms of the three effectiveness criteria salience, legitimacy, and credibility. This article therefore presents an interaction triangle in which three crucial dimensions of stakeholder interactions are discussed: (A) between decision makers and scientists, who engage in framing to foster salience of scientific input to decision making, (B) between decision makers and other actors, to shape participation processes to foster legitimacy of EBM processes, and (C) between scientists and other actors, who collaborate to foster credibility of knowledge production. Due to the complexity of EBM, there is not one optimal interaction approach; rather, finding the optimal degrees of interaction for each dimension depends on the context in which EBM is implemented, i.e. the EBM objectives, the EBM initiator's willingness for transparency and interaction, and other context-specific factors, such as resources, trust, and state of knowledge.

2. MERMAID: Stakeholder views

Mascha Rasenberg, Marian Stuiver, Sander van den Burg Fabio Zagonar

Background information of the MERMAID project

The MERMAID project[1] has as aim to develop concepts for the next generation of offshore activities for multi-use of ocean space. The project does not envisage to actually implement these activities, but it examines new design concepts for combining offshore activities like energy extraction, aquaculture and platform related transport at various areas in the ocean. The combination of these activities is referred to as a Multi-Use Platform (MUP).

In order to achieve this, the MERMAID project puts the integration of technical, economic, ecological, spatial and social aspects at the heart of the development of MUPs in two ways. First, by analysing and integrating all these aspects in the design and second, by involving all stakeholders in the entire design process. For the latter, a participatory design process is developed that focusses on involving all relevant stakeholders in the design process (see D2.2 Rasenberg et al., 2013).

The focus of the participatory design process is to work together with the users and other relevant stakeholders throughout the design and development process. For this purpose, a participation process is executed throughout the MERMAID project that focusses on a cyclical, iterative and participatory process of scoping, envisioning and learning through which a shared interpretation of MUPs is developed and applied in an integrated manner.
Objectives of the report

This report aims to provide input for the final draft MUP designs in the four MERMAID case studies. The report focusses on providing input from the stakeholders to the designers in the MERMAID project. The design concepts are developed by the site managers and their team in workpackage 7 of the project: innovative platform plan and design[1]. The information of the input is based on the discussion and results from group interviews (round table) following the participatory design.

This report summarises the results of the second step in the participatory design process and is a follow up of deliverable 2.2 which gave input for the draft design options based on the first round of the participatory approach. In the final chapter, both the results from D2.2 and this report are combined in recommendations to the designers. In three of the four case studies, the methodology (see chapter 2) was followed. At the Baltic site this was however, not done (see chapter 2).
Outline of the report

Chapter 2 describes the methodology of the work which has been executed. Both the overall methodology of the participatory interactive design process is described as well as the applied methodology of the round table session. Chapter 3 describes the results of the round tables that were held in the different case studies. Chapter 4 gives recommendations to the designers based on this report and D2.2.

MERMAID interactive participatory design

The participatory design is developed to involve stakeholders in the process of designing the MUP. Two principles underlie this approach:
The principle of non-linear knowledge generation. This principle acknowledges that knowledge is developed in a complex, interactive process of co-production with a range of stakeholders involved (Gibbons et al., 1994; Rip, 2000).
The principle of social learning. This principle states that all one can do in complex and uncertain search processes for sustainable designs with no ready-made solutions at hand, is to experiment and learn from these experiments in a social environment through interaction with other actors and learn from each other's behaviour (Bandura, 1971).

The first step that was executed during the MERMAID participatory design process which consisted of defining the views and needs of relevant stakeholders in four different case studies. These four case studies were chosen during the first phase of the MERMAID project and are:
The Baltic Sea - a typical estuarine area with fresh water from rivers and salt water.
The transboundary area of the North Sea & Wadden Sea - a typical active morphology site
The Atlantic Ocean - a typical exposed deep water site
The Mediterranean Sea - a typical sheltered deep water site.

Figure 2.1 gives an overview of the participatory design process which is applied in these four case studies in the MERMAID project. The design process of MUPs in the four cases is organised in three steps:

[1] http://www.mermaidproject.eu/

Prepare the designs by identifying the views and needs of all stakeholders with interviews (Result: D2.2; Rasenberg et al., 2013)
Designing the MUP by organising a round table session involving all stakeholders (result D2.3; this report)
Evaluate the design by organising a round table session with all stakeholders (result D2.4)

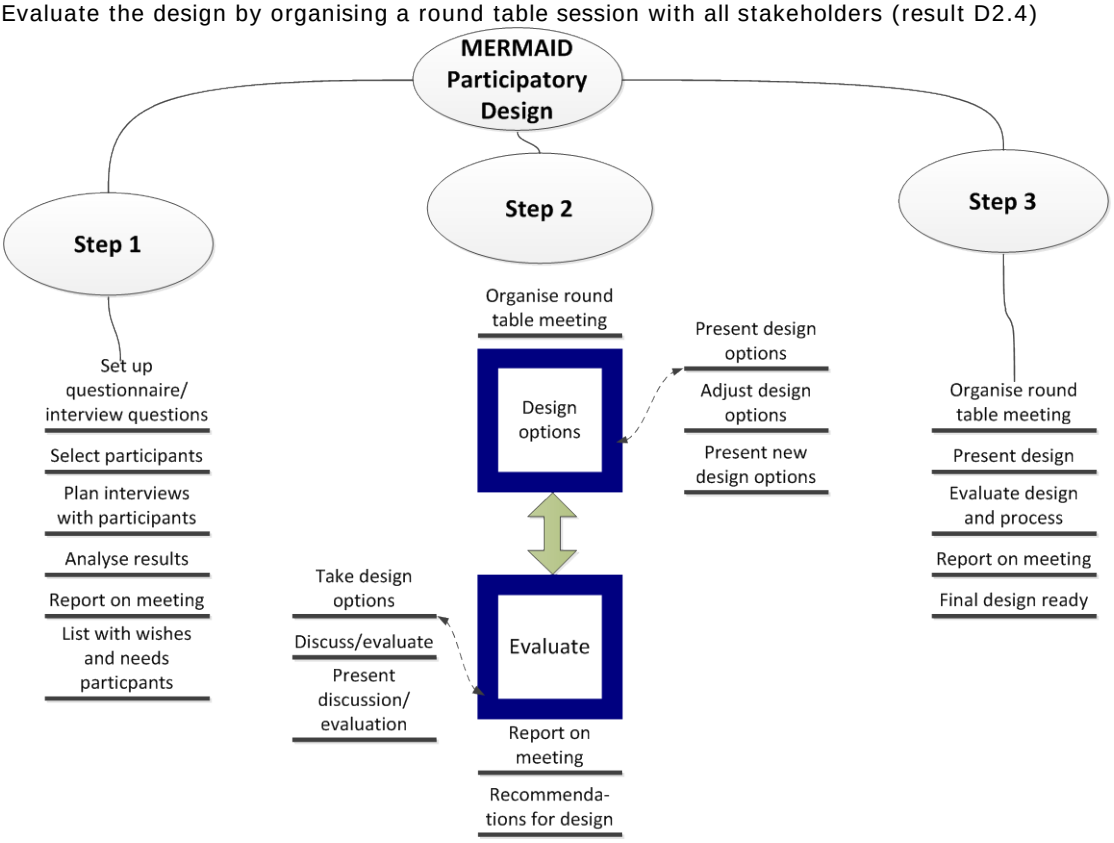


Figure 2.1 Overview of the MERMAID participatory design process

The work that is performed in the participatory process is not to make the final design, but to organise the input of the stakeholders that can be used to make the final design. The final design is the responsibility of the site managers (each of the sites has a site manager) for the different case studies in workpackage 7 of the MERMAID project. The site managers also play a crucial role in organising the three steps of the participatory design.

Central in this approach are the interviews in step 1 with all the stakeholders and the two so-called round table sessions in steps 2 and 3. Steps 2 and 3 have a cyclical, iterative nature. In these round table sessions, the design will be discussed and adapted according to the wishes of all stakeholders involved. Given the cyclical, iterative and participatory nature of the work a sequence of steps can be envisaged, which may be repeated. A group of representatives of all major types of stakeholders are invited for the interviews and round table sessions, where six stakeholder categories were identified:
Governing bodies/policy makers such as regional, national and European officers
End users of the MUP, e.g. energy companies and aquaculture entrepreneurs
Suppliers of the MUP such as cable companies and construction businesses
Representatives of other offshore activities such as fisheries, shipping, and mining sectors
Discourse community, including e.g. (environmental) NGO's, local citizens
Universities and research institutes
Step 1 took place in 2012 and the results of step 1 are reported in Rasenberg et al. (2013). In step 1, interviews were held with representatives of a wide range of stakeholders. Step 1 focussed on identifying different views on ecological, economic and social objectives of MUPs, challenges and technical, social-economic and ecological constraints faced. Equipped with a resulting wish list from this step, designers started working on developing the first MUP design options. These design options are discussed later in step 2, an interactive round table session involving all relevant stakeholders.

Steps 2 constitutes of an iterative cycle where draft design options are presented and developed. The information provides valuable input to the designers that are responsible for the final design. This report describes the results of step 2, in which the design options were discussed with stakeholders. Based on the discussions in the round table sessions on these design options with regard to ecological, economic, social, technical and governance aspects, the design options are translated into a final design concept.

Step 3 constitutes of a round table session where the final design concept is evaluated with the participating stakeholders. This ultimately leads to a design concept which is thoroughly analysed, technically feasible and preferably supported by all the stakeholders represented at the round table.

Implementation of step 2: round table session methodology

After step 1, the designers of each of the case studies made one or more design options based on technical feasibility and the earlier wishes expressed by the stakeholders. These options for design(s) were discussed with the stakeholders in step 2 of the participatory approach: the round table. Below, information can be found on the methodology that is used in each of the round tables. Note that the process was not identically applied in all four case studies.

The main objective of this round table is to involve stakeholders in the design process of multi-use platforms and to receive input from the stakeholders for the final draft MUP designs in the four MERMAID case studies. Involving stakeholders in the design process aims at reaching agreement on the most feasible design in each of the case studies. Besides, by involving stakeholders' knowledge, the design is developed on the technical, economic, ecological, spatial and social possibilities in a complex, interactive process.

The results of the round table session in each of the sites can be found in chapter 3. To get a clear overview of all the input from the stakeholders, the information from the first step will also be taken into account in the final recommendations (chapter 4).

Baltic Sea site

In the Baltic Sea, the site of Kriegers Flak has been proposed as the location for a MUP design. The round table that took place had a different character than that proposed by the participative methodology. Instead, the site manager and the MERMAID scientists presented their design to the MERMAID industry partners involved and together they reflected on this design. The reason that the Baltic site has a different approach is due to the fact that their process has reached further down the innovation path. It reflects a real business case and the actors involved were gathered to develop this business case. Relevant stakeholders were selected based on their interest in a multi-use platform in the Baltic Sea. A total of 19 stakeholders from 10 different organisations were invited to the meeting and 16 stakeholders from 7 different organisations attended the meeting (see Annex 1).

The round table meeting took place on 17 Januari 2014 and was held in Danish. The meeting was facilitated by the overall MERMAID project leader and notes were made by the site manager. On forehand, an agenda was made which was followed during the round table meeting. The agenda of the meeting was:

General introduction on the MERMAID project by MERMAID project leader
Review of Danish actions in the various working groups
WP 2 – Assessment of policy, planning and management strategies
WP 3 - Development of renewable energy conversion from wind and waves
WP 4 - Systems for sustainable aquaculture and ecologically based design
WP 5 - Interaction of platform with hydrodynamic conditions and seabed
WP 6 - Transport and optimization of installation, operation, and maintenance
WP 7 - Innovative platform plan and design
Discussion and follow-up actions

The outcomes of this discussion are recommended to the designers and will be used for the final draft design (Chapter 4).

North Sea site

Relevant stakeholders for the round table session in the North Sea were selected based on their interest in a multi-use platform in the North Sea. This list of stakeholders was discussed in a selective group of MERMAID project participants involved in the North Sea case study (Deltares and Stichting DLO). All selected stakeholders received an invitation to join the round table session. In total, 26 stakeholders were invited to attend the round table session, and 12 stakeholders confirmed their attendance. Finally, 9 stakeholders attended the meeting. In addition, 5 persons from the MERMAID project were present and brought in their expertise into the round table discussion (see Annex 1).

The meeting was held in Dutch and took place on 12 March 2014. The meeting was facilitated by the site manager and notes were made by one of the colleagues of the site manager. Before the meeting, the agenda was set and sent to all invited participants. The agenda of the round table meeting was:

Welcome by the site manager of the North Sea site
Introduction round: introduction of the stakeholders and their expectations of the meeting
General introduction on the MERMAID project and North Sea site by the site manager
Presentation on the different possible multi-use functions by a participant of the North Sea site in the MERMAID project
Interactive sessions in four groups were the user functions are discussed
Plenary session where each group gives feedback on their conclusions
Conclusion of the day

The outcomes of the discussions are recommended to the designers and will be used for the final draft design (chapter 4).

Atlantic Ocean site

Relevant stakeholders for the round table session in the Atlantic Ocean were selected based on their possible interest in a multi-use platform. The list was discussed in a selective group of MERMAID project participants involved in the North Sea case study. All these stakeholders received an invitation for the meeting including the agenda. A total of 24 stakeholders were invited to participate in the roundtable and 15 stakeholders confirmed their attendance. Finally, 9 stakeholders attended the meeting (see Annex 1).

The round table meeting took place on 19 September 2013 in Santander. The round table session was held in Spanish. The meeting was facilitated by the site manager and notes were made by one of the colleagues of the site manager. An agenda was set prior to the meeting and the program was as follows:

Welcome by the site manager
Introduction to the MERMAID project by the site manager
Introduction of the MUP designs by the site manager
Round table (facilitated by the site manager and four colleagues) to discuss different MUP alternatives and the criteria that affect the design of a MUP installed at the Atlantic Site
Final conclusions by the site manager

The outcomes of the discussions are recommended to the designers and will be used for the final draft design (chapter 4).

Mediterranean Sea site

Relevant stakeholders for the round table session in Italy were selected based on their interest in a multi-use platform in the Mediterranean Sea. A list of stakeholders was discussed in a selective group of MERMAID participants involved in this case study. In total, 18 selected stakeholders received an invitation to participate in the round table session. Finally, 6 stakeholders attended the meeting (see Annex 1).

The round table session in Venice took place on 14 January 2014 and was held in Italian. The meeting was facilitated by the site manager and notes were made by one of the colleagues. The agenda of the meeting was mostly based getting information on the (technical, ecological, social and economic) feasibility of the different user functions in the Mediterranean Sea. The following issues were presented and discussed at the round table session:

Welcome and introduction of the MERMAID project by the site manager
Presentation on the Mediterranean Sea site and possible design options by different MERMAID representatives
Simulations about shore impacts of the functions by different MERMAID representatives
Presentation of the feasibility assessment tool and its use (used in workpackage 8)
Economic procedures to be implemented to estimate social and economic impacts
Draft designs of multi-use platforms (Wave Energy Converters, Fish Farms and Wind)

The outcomes of the discussions are recommended to the designers and will be used for the final draft design (chapter 4).

Analysis of input from stakeholders for recommendations

This paragraph will describe the method that is used to analyse the discussions and results of the stakeholder interactions that took place. In chapter 4, an overview of the recommendations from the stakeholders for each of the four sites is given. These recommendations are based both on the discussions and results of step 1 (Rasenberg et al., 2013) and step 2 (this report). Note that chapter 4 only gives the opinion of the stakeholders that were either interviewed or present at the round table session.

These materials are analysed following the outline of the assessment tool of workpackage 8 to address the topics relevant on basis of an assessment for design. In the assessment tool the following criteria are relevant:

A. Technical Feasibility Assessment (TFA)
B. Environmental Impact Assessment (EIA)
C. Financial and Economic Assessment (FEA)
D. Social Cost Benefit Analysis (SCBA)

We specify these four categories with the following questions in mind.

Technical recommendations

What recommendations did the stakeholders express concerning the technical aspects regarding the site? Choose from:
Is placement possible?
Legal Considerations
Technically Considerations
Possibilities for combined use
Possibilities for technological upgrades
Definition of project time horizon

What did the stakeholders mention concerning risks?
Technical uncertainty
Impact diffusion (correlated risks between functions)
Political uncertainty
Unclear definition of property rights
Environmental recommendations

What recommendations did the stakeholders express concerning the environmental aspects regarding the site? Choose from:
Significant negative environmental impact (local, regional, global)
Significant positive environmental impact (local, regional, global)
Do they mention or express the need for an EIA available?

What did the stakeholders mention concerning risks?
Uncertainty about climate change and other environmental parameters
Non-linear environmental effects & threshold identification
Irreversible environmental effects
Financial and economic recommendations

What recommendations did the stakeholders express concerning the financial and economic aspects regarding the site? Choose from:
Estimated financial costs: capital, O&M, administrative
Estimated financial revenues
Efficiency gains from combined use
Regulatory/Institutional restrictions
Sustainable Business Plan
Calculation of efficiency prices for the inputs and outputs of the investment
Determination of indirect and induced effects (creation of jobs, increased economic activity, increased incomes, etc.)

What did the stakeholders mention concerning risks?
Sensitivity to changes of output/input prices
Difficulty in time horizon and interest rate definition
Socio-economic recommendations

What recommendations did the stakeholders express concerning the socio-economic aspects regarding the site? Choose from:
Environmental externalities
Health and other (e.g. educational or safety) externalities
Local accessibility effects
Perceived stakeholders' fairness of distribution of costs and benefits (between income groups; spatial; intergenerational)

What did the stakeholders mention concerning risks?
Uncertainty and missing information in estimation of external effects
Uncertainty and missing information in perception formation
Results

This chapter describes the results of the four round table sessions in each of the sites. The outcomes of the discussions are divided in four categories: technical feasibility, ecological impacts, financial & economic impacts, and socio-economic impacts. These categories are chosen because this division is typically used in other MERMAID products (see chapter 2.3).

Baltic Sea site
The site of the Baltic Sea is located near Kriegers Flak. A wind farm with 600 MW will be installed on the Danish part of Kriegers Flak by 2020 at the latest. On the German side, the wind farm Baltic II with 288 MW is under development. On the Swedish side, project plans are on hold. If these plans will be implemented, this would provide a substantial annual energy production[2]. The challenge of

[2] www.vattenfall.se/kriegersflak

Kriegers Flak is to plan a multi-use platform with the combination of wind turbines and offshore aquaculture. The preliminary MUP design suggestion is to combine wind turbines and floating fish cages with trout/salmon production.

Kriegers Flak is located at the intersect of Danish, German and Swedish exclusive economic zones, 30 – 40 km offshore. The distance does not seem to be a problem for the transport and maintenance of both the wind- and fish farm structures. Kriegers Flak has good conditions for fish farm activities: a water depth between 17-40 metres and a stable seabed. A shallow water depth is also important for the construction of windfarms, such that construction costs remain low. The wind velocity at Kriegers Flak is high and uniform, and can generate a large amount of energy[2]. Furthermore, it is located in the flow-path for deep water renewal of the Baltic Sea and thus, located on the main path for nutrient transport out of the Baltic.

The location of Kriegers Flak (Source: Google maps)

Stakeholders present

A total of 16 stakeholders from 7 different organisations were present at the meeting on the Baltic case study. All these 7 organisations participate in the MERMAID project. They can be categorized as follows:

Type of stakeholder	# organisations present
Governing bodies/regulators/policy makers as regional, national and European officers	0
End users of the MUP, e.g. energy companies and aquaculture entrepreneurs	2
Suppliers of the MUP such as cable companies and construction businesses	0
Stakeholders from other offshore activities such as fisheries, shipping & mining sectors	1
Discourse community, including e.g. (environmental) NGO's, local citizens	3
Universities and research institutes	1

Outcomes of the round table session

Technical feasibility

At present, the technical feasibility of the MUPs is analysed within the different work packages of the MERMAID project. At Kriegers Flak, it is suggested to focus on a combination of gravity or jacket based wind turbines and offshore aquaculture.

The MUP is located at intersect of the Danish, German, Swedish exclusive economic zones. Important conditions include:
Land proximity
Shallow water, stable seabed
Moderate metocean conditions
Cold water located on main nutrient transport path

Environmental impacts

During this session, no considerations were made on the environmental impacts. However, some environmental considerations were discussed. It was concluded that the MUP needs to have the following characteristics for environmental reasons:
Located on the path for deep water renewal of the Baltic
Located on the main path for nutrient transport out of the Baltic

The next steps needed to fully investigate environmental impacts are:

Establishment of a site-specific database with metocean conditions
Database with climate variations and extreme events

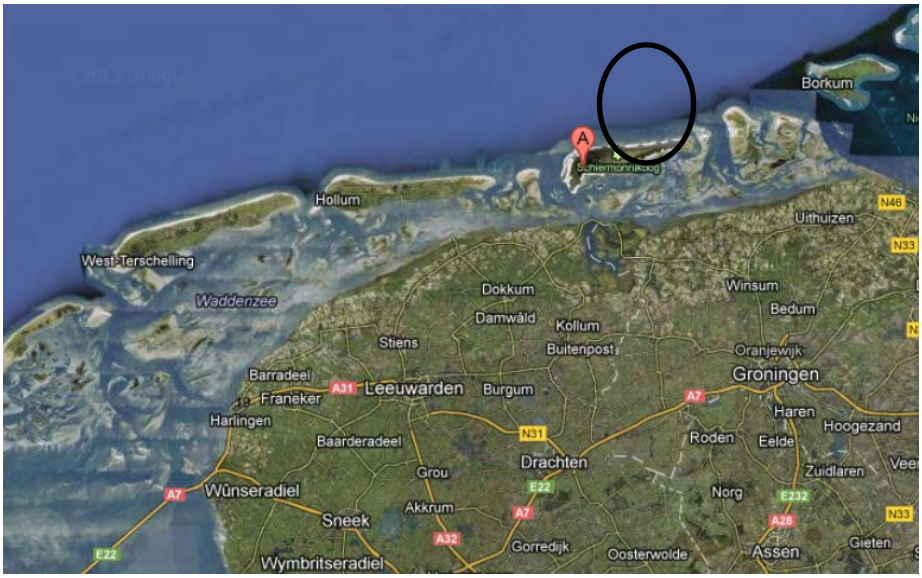
Financial and economic impacts
The financial and economic impacts will be discussed during the last round table session with a wider group of stakeholders.

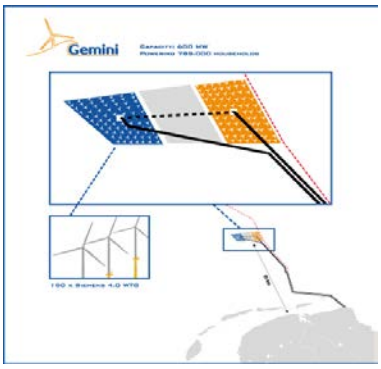
Socio-economic impacts
The socio-economic impacts will be discussed during the last round table session with a wider group of stakeholders.
Conclusion

It was concluded that the Kriegers Flak is suitable for multi-use. The general picture is that wind energy in combination with aquaculture is considered to be the most viable option, generating the highest benefits.

North Sea site

The North Sea site is an area with typical active morphology. The Dutch MERMAID partners have unanimously concluded that the most interesting test study area lies above the Wadden Sea Islands in the North of the Netherlands.





The location of the Gemini site (Source: Google maps)

In this area, the Dutch authorities (Rijkswaterstaat) awarded 3 permits for larger offshore wind farms, the so-called Gemini project[3]. These 3 projects are named Buitengaats (300MW), Clearcamp (275MW) and ZeeEnergie (300MW) and fully acquired by Typhoon Offshore in July 2011. Two projects, Buitengaats and ZeeEnergie, were granted a subsidy in May 2010 and were brought to financial close (spring 2014). The next step is to start with the construction process for these two projects. The third project, Clearcamp is still without subsidy and may serve as a future test field for new offshore wind technologies. This means that for the Gemini site already on going impact studies are conducted regarding safety and stability of mono-pole and jacket constructions, as well as for the environmental impacts[4].

The challenge of the Gemini wind farm is to combine the farm with offshore aquaculture, fisheries and tourism. The site (54.036 degrees centre latitude, 5.964 degrees centre longitude) is situated near a fishery harbour, Lauwersoog, and a shipping & offshore harbour, Eemshaven. The distance from shore is approximately 85 km, which is out of sight from the shore.

Stakeholders present

A total of 9 stakeholders were present at the roundtable. These can be categorised as follows:

Type of stakeholder	# organisations present
Governing bodies / regulators / policy makers as regional,	2

[3] http://www.typhoonoffshore.eu/projects/gemini/
[4] http://www.rvo.nl/subsidies-regelingen/windpark-gemini-fase-1

national and European officers	
End users of the MUP, e.g. energy companies and aquaculture entrepreneurs	3
Suppliers of the MUP such as cable companies and construction businesses	0
Stakeholders from other offshore activities such as fisheries, shipping & mining sectors	1
Discourse community, including e.g. (environmental) NGO's, local citizens	1
Universities and research institutes	2

Outcomes of the round table session

Technical feasibility
Maintenance on the wind farm and cables must be possible on all circumstances.

Environmental impacts
It was discussed that the environmental impact of multi-use must be low. An environmental assessment must take place before multi-use is implemented.

Financial and economic feasibility
It is important that the location that is chosen will generate economic benefits for all user functions. It was questioned whether the Gemini area is the best suitable option for either mussel or seaweed farming. A representative of a seaweed culture companies mentioned that he would only start seaweed culture on the best places in the North Sea. It was suggested to look at the critical success factors for each of the different user functions and see in which area this could best be achieved. For both the culture of mussel and seaweed it is important to have nutrient rich and clear water. If other places in the North Sea are more suitable, then it is likely that mussel and seaweed farming will take place there or the added value for synergies of a MUP must be very large.

There was a general consensus that companies will only start looking for synergies after their business is operationalized and they are in the process of making the business more efficient. Synergies must lead to an economic benefit. Besides, the risk assessment is of major importance for the wind farm owners/managers. The Dutch wind farms companies use experiences from abroad to see how multi-use is done there (especially looking at Denmark). One of the suggestions was made to make multi-use obligatory in the licensing procedure by the government.

One of the present policy advisors also mentioned that the Gemini location was chosen because of the heavy winds but also because of the low interference with other users. It was concluded that when you want to start multi-use in the North Sea, the business models of the different user function must overlap.

Socio-economic feasibility
The location of the park is far offshore (85 km) and might therefore not be a suitable location to generate extra jobs for tourism or labour intensive aquaculture.

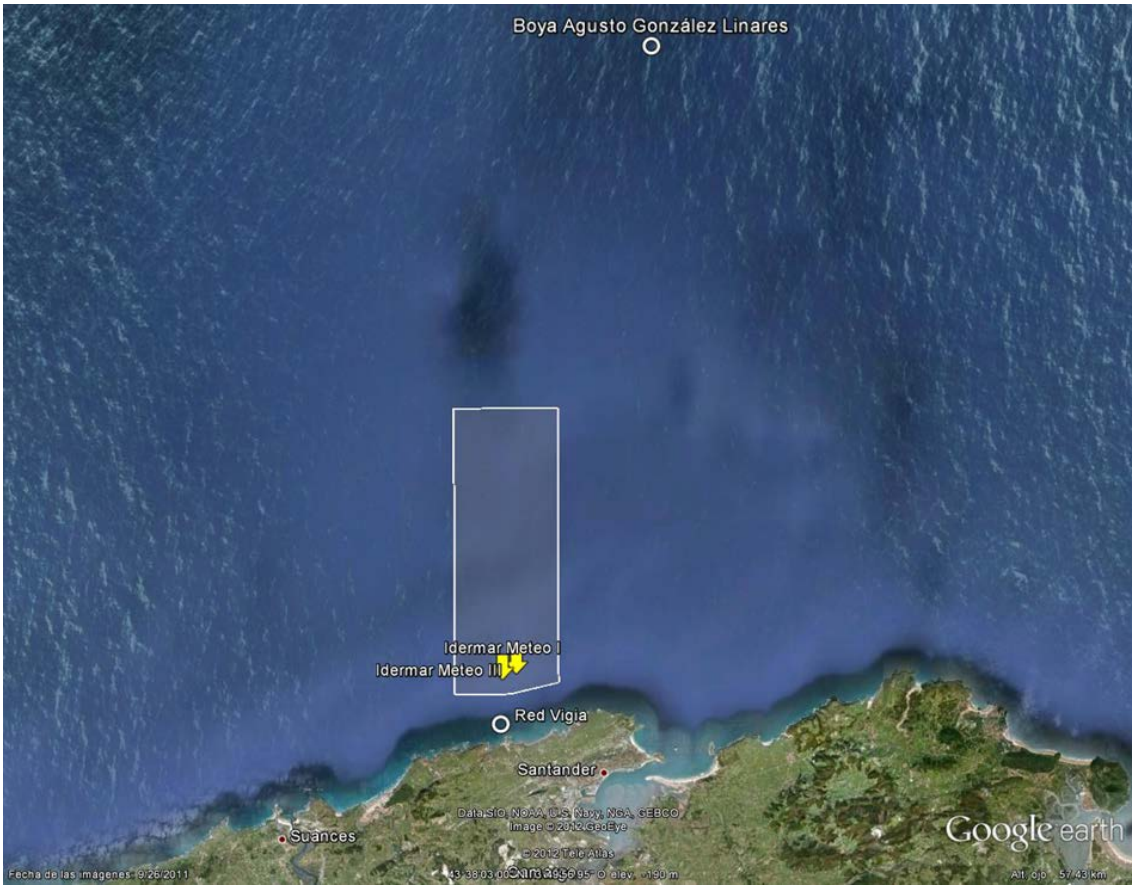
One of the most evident problems might be the insurance of the activities. The stakeholders think it might be very difficult to insure multi-use wind farms. Besides, multi-use must also be safe and safety and rescue (SAR) procedures must be possible in the wind farm.
Conclusion

It was concluded that the Gemini park might not be as suitable for multi-use as was expected. When starting multi-use, it is important that the location is suitable for other user functions as well. It must be further researched whether the Gemini location is suitable for other functions.

It was concluded that the best way to start multi-use at sea was to look at the different business models of the different user functions and see where they overlap. The location where overlap occurs might be the best suited location for multi-use. This is a new way of looking at multi-use instead of trying hard to add activities/new functions to already existing activities/platforms.

Atlantic site

The Cantabrian Offshore site was discussed in the interviews and the round table session with stakeholders. This site is located in Spain, off shore the region of Cantabria. It is able to accommodate floating wind turbines and wave energy generators as well. These can be deployed reducing interaction and wake effects between them. A meteorological mast installed by the R&D Company IDERMAR (June 2009 and October 2011) will monitor the metocean conditions.



The location of the Ubiarco site (Source: Google maps)

The site will be fully monitored by the existing operational systems for wind, waves and currents. The floating platforms open up the opportunity of installing wind farms in deep waters because they do not need anchorage, something especially important in Spain, where the continental shelf is narrow. Aquaculture experiences from other deep water sites will be used as a basis for analysing the potential at this site. The site is in particular challenged with very harsh wave conditions, potentially a large problem for aquaculture equipment.
Stakeholders present

A total of 9 stakeholders were present at the roundtable. These can be categorised as follows:

Type of stakeholder	# organisations present
Governing bodies / regulators / policy makers as regional, national and European officers	2
End users of the MUP, e.g. energy companies and aquaculture entrepreneurs	1
Suppliers of the MUP such as cable companies and construction businesses	3
Stakeholders from other offshore activities such as fisheries, shipping & mining sectors	0
Discourse community, including e.g. (environmental) NGO's, local citizens	1
Universities and research institutes	2

Three MUPs alternatives presented
In the introduction of MUP designs, the following three alternatives were presented:
Alternative 1: Wave energy generation in combination with aquaculture. For this alternative, a wave energy converter has been selected that could be combined with an aquaculture cage.
Alternative 2: Wind energy generation in combination with aquaculture. This alternative combines a wind energy converter and aquaculture production.
Alternative 3: Wind and wave energy generation, in combination with aquaculture. This alternative combines both wave and wind energy with aquaculture.
Outcomes of the round table session

Respondents were asked to evaluate these alternatives on various criteria. Next to the three alternatives, respondents were given a "blank" option where they could introduce and discuss their

own MUP combination. This “blank” option was only used by one respondent and is therefore left out of the following analysis.

Following the discussion during the roundtable, a fourth alternative was introduced in which no activities are undertaken at all (no MUP). Below, the outcomes of the discussion on each of the three criteria are presented.

Technical feasibility
The stakeholders mentioned that there is a high risk on geotechnical failure and failure with land connections. These risks are expected to be highest on alternative 3.

Environmental impacts
Of the environmental impacts, the biggest impact - across all alternatives - is expected on visual impact, underwater sound, and birdlife. Alternative 1 is expected to have the lowest impact on environment. The following impacts were mentioned: visual impact and impact on birdlife. Alternatives 2 and 3 have higher expected impacts on visual impact and birdlife than alternative 1. Beside it was mentioned that all MUPs have a risk regarding a risk regarding sea bed disruption (through mooring).

It was also mentioned that alternative 1 is expected to deliver more environmental benefits than the other two alternatives.

Financial and economic feasibility
Concerning costs, a number of aspects were discussed that determine the costs for the alternative systems. In general, high costs are expected for the equipment, decommissioning and operation & maintenance (O&M) of the platform. Alternative 1 is expected to have the lowest costs, on both equipment and power extraction systems, compared to the other alternatives. Alternative 3 is expected to have the highest costs on almost all of the criteria, suggesting it is a costly alternative.

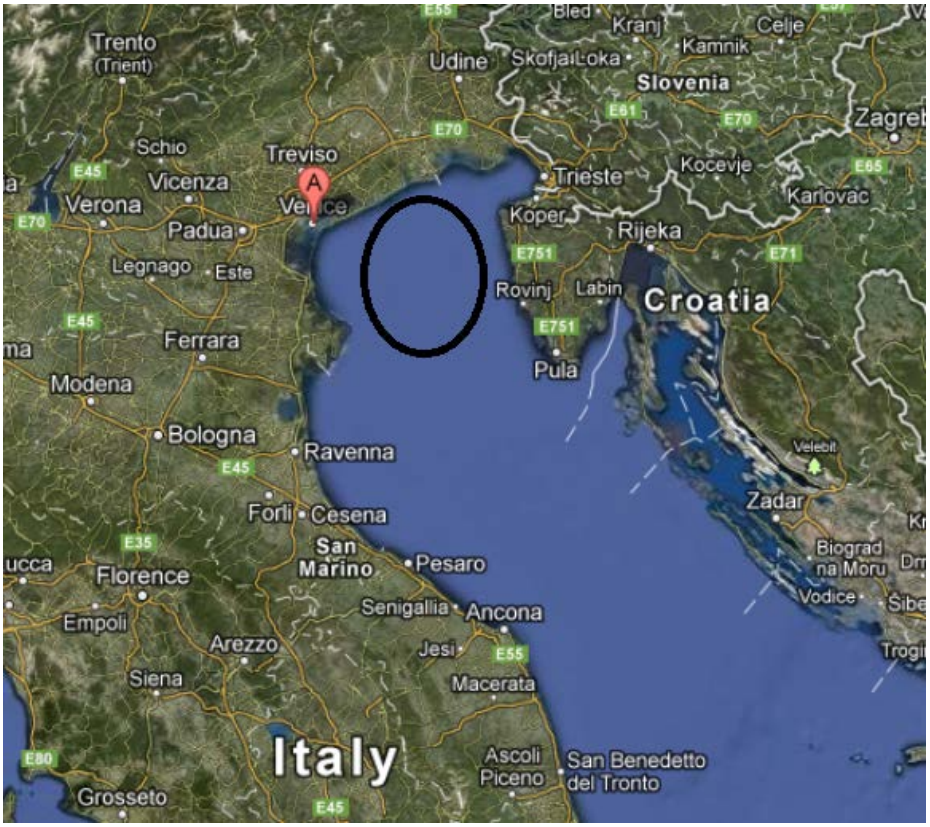
Socio-economic feasibility
Besides costs, MUP also have some related benefits. All options are expected to have an increase in temporary employment, benefits for industry and benefits for existing businesses. We also observed that alternative 1 is expected to provide access to new markets.

Conclusion

The general picture that emerges from the discussion is that alternative 1 (wave energy in combination with aquaculture) is considered to have the lowest environmental impact, lowest risks and lowest costs. It is also expected to have the highest benefits. This reflects the local environmental conditions: harsh environmental conditions lead stakeholders to question the feasibility of offshore wind energy (can the structures withstand the conditions?). High waves offer potential for wave energy. While there is a lot of research on offshore wind energy, local businesses and academia focus on development of wave energy and mooring systems. Consequently, the expected local benefits of wind energy are considered low, whereas wave energy development is believed to strengthen local business.

Mediterranean site

The Mediterranean Sea site is a sheltered water site with a depth of 16 m. The suggested site for multi-use is the Acqua Alta platform. It is a research platform held by CNR (Centro Nazionale Delle Ricerche = National Research Centre) about 12 km from the coastline of Venice.



The location of the Acqua Alta platform (Source: Google maps)

The challenge of this research platform is to combine the research activities at the existing platform with energy generating activities and offshore aquaculture. The site has moderate wind and wave energy potential, but the research platform could be combined with multiple energy converters, i.e. wind and waves. After interaction with stakeholders it was decided that a tailored wave energy converter should be designed, to be installed around this platform, although the precise location is a decision variable. Next to this, there is also a potential for combining research and wave energy with the cultivation of microalgae or fish.

Stakeholders present

A total of 6 stakeholders were present at the roundtable. These can be categorised as follows:

Type of stakeholder	**# organisations present**
Governing bodies / regulators / policy makers as regional, national and European officers	2
End users of the MUP, e.g. energy companies and aquaculture entrepreneurs	1
Suppliers of the MUP such as cable companies and construction businesses	1
Stakeholders from other offshore activities such as fisheries, shipping & mining sectors	0
Discourse community, including e.g. (environmental) NGO's, local citizens	1
Universities and research institutes	1

Outcomes of the round table session

The focus of the discussions is on the combination of energy production (wind and wave) in combination with fish aquaculture. The general picture that emerges from the discussion is that environmental aspects do not exclude any MUP options, while they should mould all options. The localisation of the chosen platform should be kept as a decision variable, consistently with requirements by fish and energy farming, by moving away from the research platform held by CNR. The financial and economic issues do not exclude any MUP options, although they should be crucial in evaluating the chosen and detailed options. Unsatisfactory financial aspects do not exclude any MUP options, although they should be crucial in evaluating the chosen and detailed options. The social-economic issues do not exclude any MUP options, although they should be crucial in evaluating the chosen and detailed options as well. The stakeholders were mostly concerned about the environmental impacts and social-economic feasibility.

Technical feasibility
The stakeholders are concerned about possible anchorage problems nearby the platform. Besides, they mentioned potential problems with day/night distribution of energy production of the platform. Potential synergies between wave and fish farms linked to a reduction of structural risk for cages. For wave energy, there is a need for strong waves, while strong waves increase the risk of damaged of lost fish cages. Stakeholders wonder how these two options link technically.

Environmental impacts:
Stakeholders are concerned about water quality issues in and out the fish farm as there could be a loss of feed. Impact might even be higher with the simulation of currents where these currents take the water further.

Stakeholders also mentioned the potential visual problems from Piazza S. Marco in Venice. The MUP could interfere the landscape from the piazza and also have an effect on tourism and the economic situation.

Financial and economic feasibility
Stakeholders are concerned that fish farms away from the coast line might be unprofitable as the MUP is located 12 km offshore. The stakeholders are also concerned about potential conflicts with the all existing activities in the region, namely with the mussel production and with the routes of recreational navigation from Venice to Rovigno. It is important to examine the economic feasibility of a MUP. In particular, opening a sea bass or sea bream market could rely on a local demand, by reducing transport costs and avoiding monopolistic conditions prevailing in the local market for mussels. Moreover, the off-shore energy consumption of a fish farm (i.e. around 140 kWh for each fish farm unit) does not justify a MUP), since packaging is performed on land. Besides, a lack of knowledge and experience on off-shore fish farming at 12 km from the coastline requires a fish farm to be combined with an energy farm, in order to protect fishery cages from extreme events by energy structures.

Socio-economic feasibility
A potential change in subsidisation policy for renewable energy by the Italian government in the near and distant future could both have a positive or negative impact on the realisation of the MUP. This depends on the change of the subsidisation policy.
Conclusion

The stakeholder do not exclude any MUP options in the discussions, however they do find it important that all options must be clearly examined. It is important to especially check the environmental impacts and the socio-economic feasibility. The localisation of the chosen platform should be kept as a decision variable, consistently with requirements by fish and energy farming, by moving away from the research platform held by CNR.
Recommendations per site

This chapter gives an overview of the recommendations from the stakeholders for each of the four sites. These recommendations are both based on the results of step 1 (Rasenberg et al., 2013) and step 2 (this report). The recommendations are divided in technical, environmental, financial & economic, and socio-economic recommendations.

Baltic Sea

Based on the discussion during the second stakeholder meeting, the combination of wind energy with aquaculture appears to offer the most potential for MUPs in the Baltic region. It is considered to have the lowest environmental impact, lowest risks and lowest costs. It is also expected to have the highest benefits. However, it might be more practical and economically efficient to divide the area in the sea and separate some of the physical installations, for example the cages and wind turbines, and then combine others, such as feeding stations and the maintenance ships. The following recommendations are formulated.

Technical recommendations
The participants express the need to quantify potential risks. When a wind farm and fish farm are combined, more ships will enter the area, which means more traffic and higher risks of accidents for the people and technology involved. First, shipping routes that pass Kriegers Flak need to be changed. Second, when fish cages are located between the wind turbines this means that transportation is more restricted. Good guidelines and rules need to be endorsed to ensure the safety for the people, the vessels, the cages and the wind turbines involved. Third, there is the potential risk of internal damages, for example if the anchors of the fish farm are drifting into the cables of power supply, or if the fish cages are damaged by the wind turbine construction. In order to reduce the risks, the MUP should be clearly marked out and armed with technical monitoring equipment.

It is recommended to execute a risk analysis to identify and quantify the risks of MUP

Environmental recommendations
Participants from nature organisations and R&D centres want to increase a better combination of production and nature values and decrease the negative impacts on the ecosystem. They want to develop a MUP to understand what ecological gains can be pursued and they want to test and analyse how ecological impacts can be minimised, or whether there can be ecological gains achieved. The energy business and fish farm find environmental and ecological issues of big importance, as they acknowledge that they need a licence to produce from authorities.

Part of the seabed area will be taken up by the foundations of the wind turbines and part of the sea will be destined for the fish cages. This will have an effect on the habitats in their living environment. But the foundation and scour protection of wind turbines have proved to become an artificial reef in which algae and invertebrates appear to do well. The foundations are quickly colonized and create entire communities of marine life[5]. Potentially, there are possibilities for improving sea life and ecological conditions that need to be explored.

It is recommended to examine possible ecological gains from the MUP

There should be no impact on the environment and the ecological conditions of the seawater and seabed. One condition involves the preservation of the artificial reefs that are located under the surface. Potential scour protection around foundations may act as artificial reefs. Disturbance of these habitats can be avoided when the fish farms are placed far away from the artificial reefs themselves. In the positioning of the fish cages, one should take this into consideration.

It is recommended to execute an environmental impact assessment

Financial and economic recommendations
The challenge is to combine the production of fish and energy in such a way that costs are reduced more effectively. One example is not to lose energy, but use the energy for the production of fish in confined cages. Hydrogen can be used for energy storage and possible a by-product is oxygen that can be used for the production of fish. Other ways to reduce costs is to use the same ships for transport and maintenance. Fish farms have big vessels for feed and these can possibly be used by the energy businesses as well. Another option is to build a platform for use where both crewmembers can work and the feeding of the fish can be done.

It is recommended to examine possible cost reductions

It is very important to build trust between the parties involved concerning the financial aspects of building a MUP. One important aspect is to work out clear roles and contracts on logistics and risks. Some energy businesses and fish farms feel the need to make an agreement for dealing with logistics and risks for combined transportation and access for monitoring and maintenance. Therefore, an analysis is needed for combined use in which the position of the cabling and the use of shipping are included to prevent risks of damage and accidents. An important aspect in this respect is whether there are insurance companies that are willing to insure against the risks involved.

It is recommended to perform an analysis regarding possible agreements and contracts

Participants feel an urgent need for developing clear procedures for stakeholder involvement among the countries involved. It is recommended that the different claims that stakeholders make on the sea (e.g. nature conservation as well as economic activities and present shipping and transport lines) are articulated and integrated in a special Marine Spatial Plan for Kriegers Flak.

Developing a cross-boundary Marine Spatial Plan that includes the zoning of Kriegers Flak for different multi-use purposes is a necessary step.

It is an obstacle for the fish farm companies on how to get the right permits for the economic exploitation of the sea. For instance, coastal authorities need to be involved more intensively in the process as they are responsible for giving permissions to constructions at sea. Their job will change when MUPs are developed.

It is recommended to develop new guidelines for the administration of the sea territory within relevant authorities

Socio-economic recommendations
Developing a MUP can create social acceptance but also opposition for developing more intensive economic activities at sea and therefore all relevant parties should have a say in the process. One of the goals of developing a MUP is therefore to involve society in the development of economic solutions that make benefits for society. Others suggest to leave options open and make the design in

such a way that also for instance tourism and energy storage is possible. Others warn that there should not be overriding conflicts between the economic activities and that the sky is not the limit. In the future there could be totally new designs needed that have spatial effects.

It is recommended to involve a broad range of stakeholders in the development of the MUP

A MUP will affect the landscape to a greater or lesser extent. In the view of the participants, there should not be any effect on views from the shore. However some of the wind turbine towers at Kriegers Flak would be below the horizon, since the wind turbines are located around 30 km off shore. Depending on the weather conditions, the farm will seldom be clearly visible from the coast.

It is recommended to examine and illustrate if and how the MUP is visible from the shore
Perceptions of the public and the image of wind turbines and fish farms are variable. Fish farms and aquaculture at sea are less accepted by the public than wind farms. However, public images can change. There is a debate that argues that aquaculture is not polluting and produces healthy food in an environmentally very efficient and correct way.

It is recommended to involve the public debate in the discussion

Participation should take place with all countries involved as well as the stakeholders that want to develop activities. It is very important that trust between the stakeholders is built. Competing claims between the stakeholders in terms of economy and ecology need to be tackled in a mutual process and should result in new guidelines for the exploitation of the sea.

It is recommended to involve all relevant stakeholders in the development of the design

North Sea

The North Sea case study focusses on combining wind energy with mussel and/or seaweed aquaculture. During the round table discussion with stakeholders, it was concluded that the chosen location of the Gemini park might not be as suitable for multi-use as was expected at the start of the MERMAID project. The main reason was that the wind farm is located too far offshore for a combination with either aquaculture and/or other activities like tourism. Based on the interviews in step 1 and round table session in step 2, the following recommendations are formulated.

Technical recommendations
The main concerns regarding possible technical impacts come from the wind energy sector. They explicitly mention that the multi-use activity should not interfere with the day-to-day operations in the wind farm. Examples are no hindrance of wind turbines, no obstacles in case of operational and maintenance (O&M) activities on both wind farms and cables. At the moment, the wind sector sees the interference of other activities as ballast. This opinion could however change when the added user function leads to cost reduction for the wind farm company.

It is recommended to make clear agreements on how multi-use activities take place so that interference with the day-to-day operations of the wind farm is avoided

It is clear to all stakeholders that technical risks should be minimized.

It is recommended to execute a risk analysis to identify and quantify the risks of MUP

Environmental recommendations
During the round table session not much was mentioned regarding environmental impacts. Most of the environmental issues were mentioned by various stakeholders during the individual interviews. In one of the interviews it was mentioned that wind farms have proven to have a positive effect on the existing ecosystems. Any detrimental effect caused by the transition from single to multi-use is not acceptable. It is mentioned that all activities must be managed in such a way that it contributes to the sustainable development and equity of the whole. Besides, during the round table sessions all stakeholders did agree that the risks of environmental impacts of multi-use must be low.

It is recommended to perform an environmental impact assessment before multi-use is started and to monitor effects closely after multi-use is started

Financial and economic recommendations
All stakeholders agree that it is important that the location chosen will generate economic benefits for all user functions. It was questioned whether the Gemini location is the best suitable option for aquaculture and other activities. Especially as the Gemini park was chosen as wind farm location because of the low interference with other users. It was suggested to look at the critical success factors of the different possible user functions and see which location might be best suitable.
It is recommended to execute an economic feasibility study for the different user functions and investigate which location would be best suitable for multi-use using the critical success factors of the

individual user functions

Combining infrastructures and O&M activities of the different user functions could decrease operational costs for the individual activities. These synergies must lead to economic benefits. Furthermore, it was mentioned that companies will only start looking for synergies after their business is operationalized (running) and the company is in the process of increasing the efficiency of their work. Attractive financial arrangements would stimulate companies to invest in multi-use. It was also mentioned that the government should enforce multi-use.

It is recommended to get insight in the possible economic benefits of the MUP

It is recommended to develop attractive financial arrangements for multi-use investments

One of the concerns that was expressed by multiple stakeholders was the possible high insurance costs for multi-use activities.

It was recommended to talk with insurance companies to get more insight in insuring possibilities of multi-use activities

Socio-economic recommendations
Regarding socio-economic issues it was mentioned that the location might be too far offshore and not suitable to generate extra jobs for tourism or labour intensive aquaculture.

It is recommended to research how multi-use activities could contribute to more jobs

Another issue that was addressed multiple times was safety. When working in a wind farm a certain level of safety must be ensured and SAR procedures must be executed when needed.

It is recommended to execute a risk assessment regarding the interference of multi-use activities with safety and SAR procedures in the wind farm

Atlantic Ocean

Based on the discussion during the stakeholder meeting, the combination of wave energy with aquaculture appears to offer the highest potential for MUPs in the Cantabria region. This combination is considered to have the lowest environmental impact, lowest risks and lowest costs. It is also expected to have the highest benefits. Based on the discussions in step 1 and 2, the following recommendations are formulated.

Technical recommendations
The main concern among stakeholders is the robustness of the systems discussed. In some ways this concern “overrides” all other concerns; if one is sceptical on the possibility to build a MUP it becomes difficult to talk about expected impact or benefits.

It is recommended to show the technical feasibility of building a MUP that can withstand the harsh site conditions
Harsh environmental conditions lead respondents to question the feasibility of offshore wind energy in particular (can the structures withstand the conditions?) whereas high waves offer potential for wave energy. However, wave energy is in an early stage of development and it needs to mature before large-scale commercial exploitation can be expected.
It is recommended to improve the knowledge of wave energy through research and development
Of the identified risks, the highest expected risks, for all design options, are due to geotechnical failures, disruptions of sea bed integrity, and failures with land connections. Particularly, a combined wind, wave & aquaculture design is considered more risky than the other alternatives, e.g. with respect to structural failure and energy extraction. The general feeling is that little is still known about the actual risks.
It is recommended to perform a risk analysis to identify and quantify the risks of MUPs

Environmental recommendations
In general, environmental impacts are considered relatively small. Site conditions are important here as well. The site is situated in a relatively sparsely used area with strong ocean currents which means that water-borne pollutions are rapidly diluted. Three environmental concerns are discussed in greater detail.

The main environmental concern is the visual impact of offshore wind turbines. The site is partly visible from shore and the placement of a MUP could have a negative impact on the landscape. In this context, respondents speak about the possibility that this coastal area in the future will be developed into a housing area. The visual impact of offshore wind energy is considered higher than the visual impact of wave energy.

It is recommended to examine and illustrate if and how MUPs are visible from the shore
A second concern that was discussed is the impact on birdlife. The general feeling is that this impact is rather small and therefore this is not a main concern from the stakeholders for development of MUP. Looking at the three alternatives in more detail, offshore wind is expected to have a higher negative impact on birdlife than wave energy.
It is recommended to address impact on birdlife if offshore wind is part of the MUP design
A third concern discussed is the underwater sound. It is expected that offshore wind causes stronger underwater sounds than wave energy, but the differences between the alternatives are less distinct than with birdlife.
It is recommended to examine if underwater sound caused by MUPs has a negative impact on the environment

Financial and economic recommendations
Concerning costs, a number of aspects were discussed that determine the final costs for the systems. In general, high costs are expected for equipment, decommissioning and operation & maintenance. The wave and aquaculture design is expected have the lowest costs, with relatively low expected costs for equipment and power extraction systems, compared to the other alternatives. However, the energy production potential for the different technologies differs: offshore wind has high energy production, whereas the energy production of wave energy is low.

It is recommended to perform financial cost-benefit analysis for the different MUP alternatives to acquire insight in the economic feasibility
It is important that the development of a MUP does not have negative effects on existing economic sectors: preferably, it should even have positive effects. The local fishing community and leisure, particularly sailing, are mentioned.
It is recommended to examine how development of a MUP impacts upon existing users of the sea
In the discussions about the costs of MUPs, the potential high costs for dismantling were raised. It was concluded that little is known about these costs.
It is recommended to improve knowledge on the costs for dismantling MUPs at the end of their life-cycle

Socio-economic recommendations
When it comes to the benefits, across all alternatives, positive effects are expected on temporary employment, benefits for industry and benefits for existing businesses. While there is a lot of research on offshore wind energy, local businesses and academia focus on development of wave energy and mooring systems. Consequently, the expected local benefits of wind energy are considered low, whereas wave energy development is believed to strengthen local businesses.

It is recommended to examine if development of wave energy can strengthen the local economy and can provide business and research institutes in Cantabria with unique knowledge and techniques

Mediterranean Sea

The challenge of the research platform on the Mediterranean site with moderate wind and wave energy potential is to combine the research activities at the existing platform with energy generating activities and offshore aquaculture. Based on the round table session with the stakeholders, two main MUP options appear to have the largest potentials in the Mediterranean study site:
Fixed wave + Small scale wind farm + Fish farm
Floating wave + Fish farm
In particular, the following recommendations are formulated.

Technical recommendations
Apart from the technical risks highlighted by stakeholders for small scale wind and unfeasible combined uses stressed by experts, no technical recommendations arose. However, the stakeholders did have concerns.

During the first step, concerns were raised about the suitability of the location. The location is far offshore and might therefore be too costly. Besides, they are concerned that the suggested multi-use activities might not be possible due to the site conditions and due to some key stakeholders that were not willing to participate in a MUP. Issues that were raised during the round table session were possible anchor problems for ships near the platform and problems with day-night distribution of energy. When wave energy and aquaculture are combined, the stakeholders are concerned about the risk of losing fish farms with harsh waves. The stakeholders concluded that this is all related to a lack of knowledge.

It is recommended to increase the knowledge level on multi-use options and risks

Environmental recommendations
Environmental concerns highlighted by both stakeholders (e.g. for large scale wind farm and fixed wave) and experts (e.g. for fish farming) can be summarised as follow: by espousing an eco-system service approach, in general, the platform should be designed to be as green as possible. The

following issues were mentioned during the round table sessions: 1) Water quality problems around the fish farm, together with simulation of currents, where the fish feed may lead to eutrophication of seawater, 2) potential electro-magnetic problems in and around the wind farm.
It is recommended to execute an environmental impact assessment that addresses the above mentioned issues

Another main environmental concern is the visual impact of offshore wave and wind turbines from the Piazza S. Marco in Venice, an important tourist attraction. Placement of MUP could have a negative impact on the landscape and view from the Piazza.
It is recommended to examine and illustrate if and how MUPs are visible from the shore.

Financial and economic recommendations
During the first step the stakeholders were concerned about the possibility of finding companies that are willing to invest in wave energy, wind energy or aquaculture.

Furthermore, it was mentioned that the location of the site is far offshore and therefore a fish farm might not be profitable as it takes a lot of time and money to visit the farm. Besides, there are concerns about the potential conflicts of a fish farm with the nearby mussel production. The stakeholders are also concerned with the potential conflict with another economic activity, namely tourism. They express concerns about potential conflicts with routes of recreational navigation from Venice to Rovigno.

It is recommended to research the willingness of companies to invest in multi-use and to study the economic benefits from multi-use

The financial concerns highlighted by both stakeholders and experts suggest to perform a detailed financial analysis under normal meteor-climate conditions and a comprehensive risk analysis under extreme meteo-climate conditions.

It is recommended to perform a detailed financial analysis

Social-economic recommendations
Although non-significant differences in indirect and direct employment at the regional level are likely to arise from alternative platforms, at least to justify the discharge or the choice of a specific design, attention should be paid to impacts on GDP and employment, by considering both construction, operation and decommission periods.

It is recommended to execute a CBA for the site

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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) km2. This area represents roughly 37% of the entire "Greater North Sea" area, which comprises about 750.000 km2 (OSPAR 2000, chapter 2).

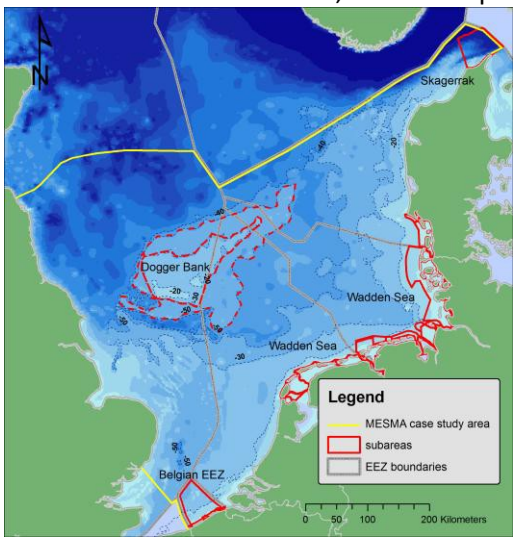


Figure 1. Southern North Sea Case Study area, with indication of the sub case studies

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).

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).

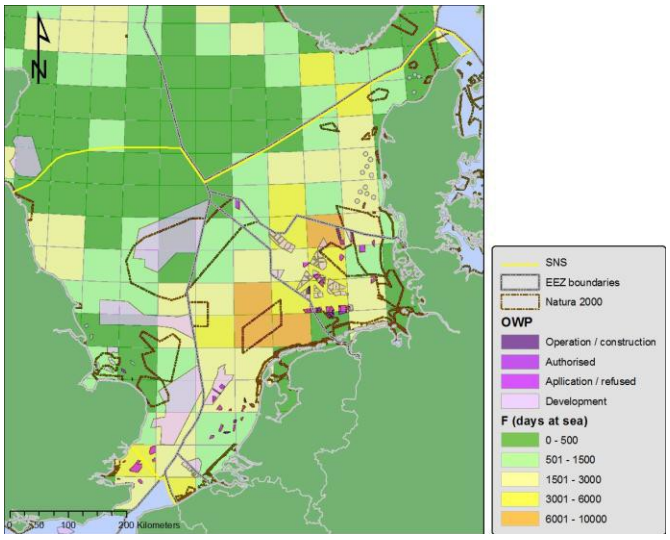


Figure 2. Sectorial map of Natura 2000, fisheries activities (F, days at sea) and location of offshore windmill farms (OWP) in the SNS CS area.

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 again2. 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 BPNS also comprises 'reef' habitats, which are formed by either gravel banks or bristle worm aggregations (e.g. the sand mason, *Lanice conchilega*).

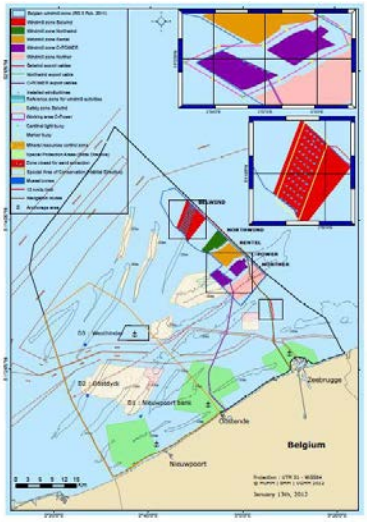


Figure 3. Map of the Belgian Part of the North Sea, with indication of ongoing activities, Special Areas of Conservation and Special Protection Areas.

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 Decrees3).

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 de Raan") was canceled by the Council of State in 20084 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 Waters5". 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 km2 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 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.

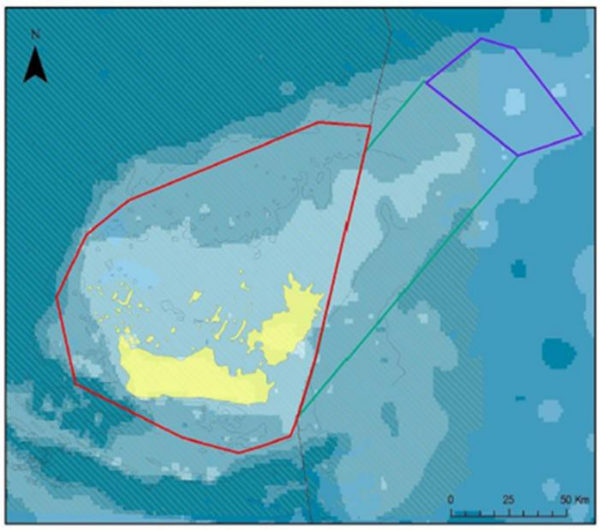


Figure 4. Delineation of the German, Dutch and UK Dogger Bank SACs.

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).

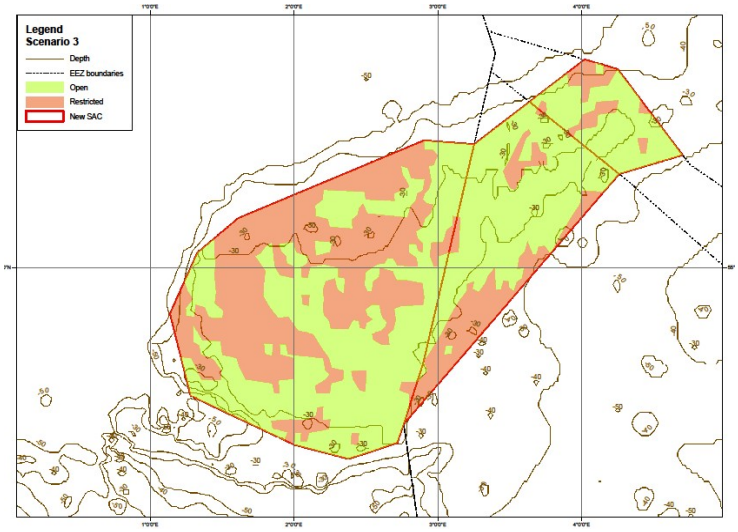


Figure 5. Scenario 3, minimal impact on gross value from fishing (source ICES).

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 km2 / 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 km2 / 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.

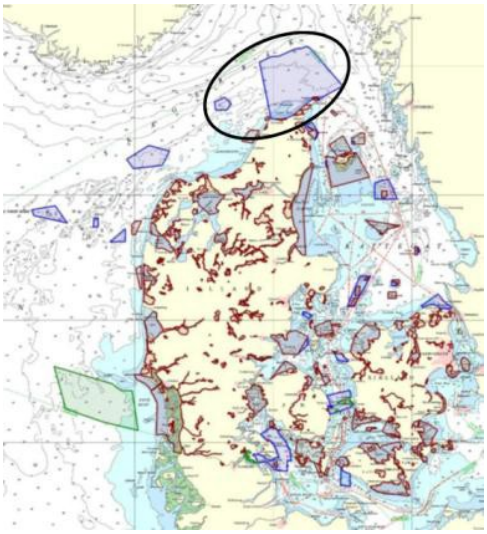


Figure 6. Location of focus areas within Skagerrak sub case

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)

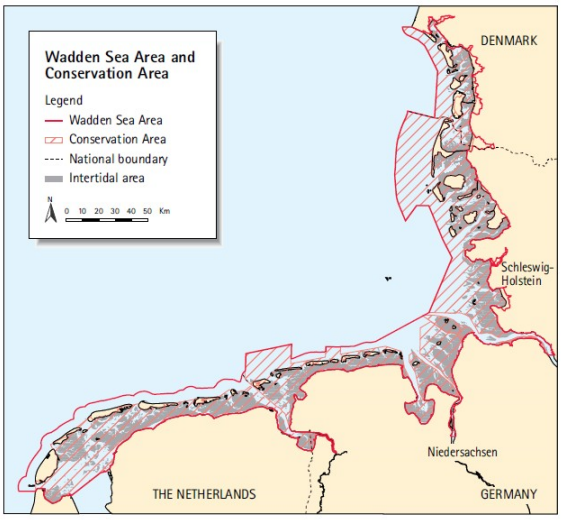


Figure 7. Trilateral Wadden Sea Area and Conservation Area (Marencic (Ed.) 2009).

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 (CWSS6) 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 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).

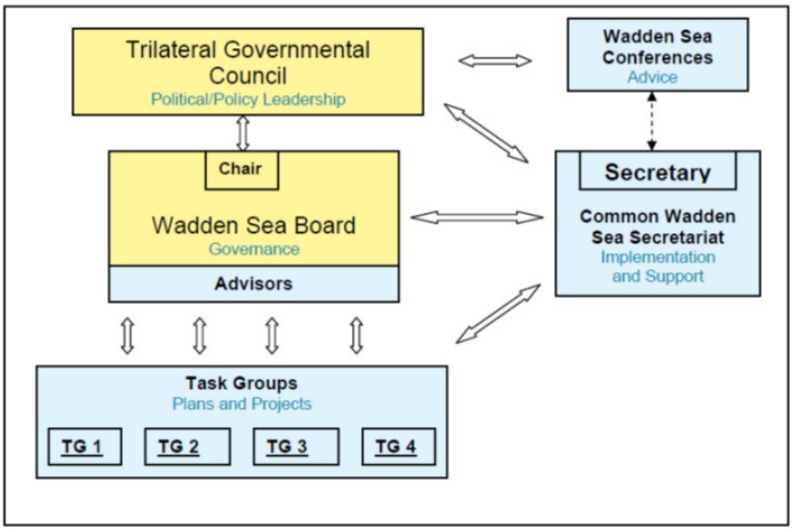


Figure 8. Organizational Structure Trilateral Wadden Sea Cooperation

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 (12000km2) (Fig. 9).

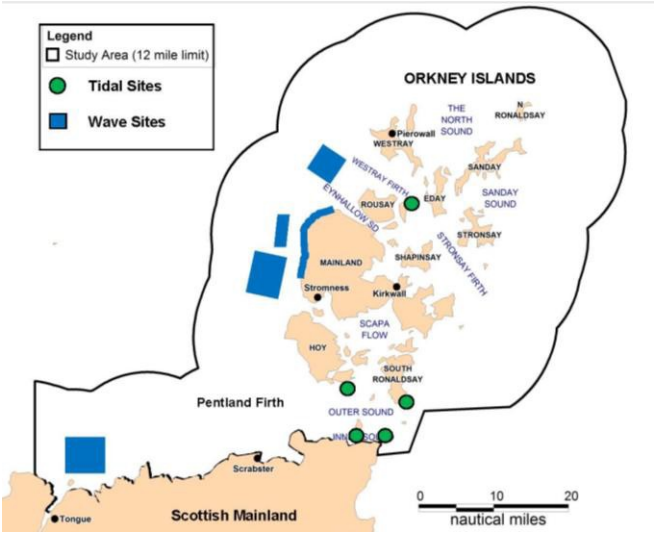


Figure 9. PFOW Case Studyarea showing wave and tidal sites

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 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 km2 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.

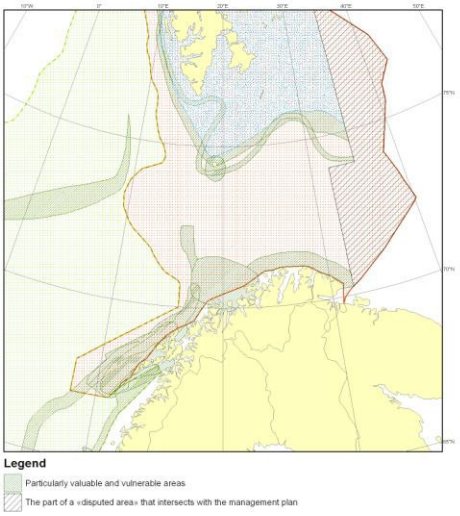


Figure 10. Map showing the area of the integrated management plan for the Barents Sea with red borders. The fluctuating ice covered area is in blue and the particularly valuable and vulnerable areas in dark green. This area was used in the broad MESMA FW assessme

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 km2 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 93,000km2 of the surrounding territorial sea and UK Continental Shelf area.

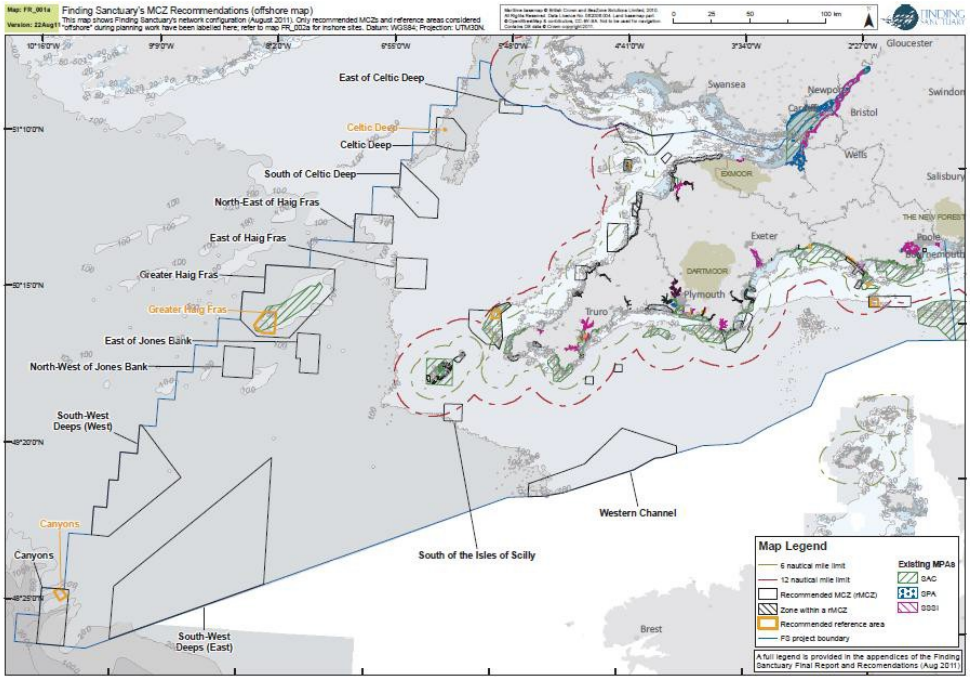


Figure 11. Finding Sanctuary project area

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 sharepoint8). We have not

carried out a second run because the obstacles that prevented the completion of the first run remain unresolved.

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.

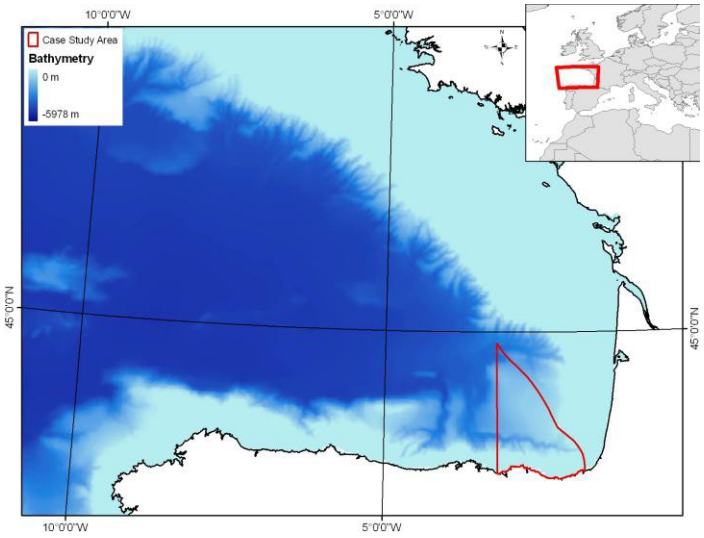


Figure 12. Case study location within the Bay of Biscay.

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.

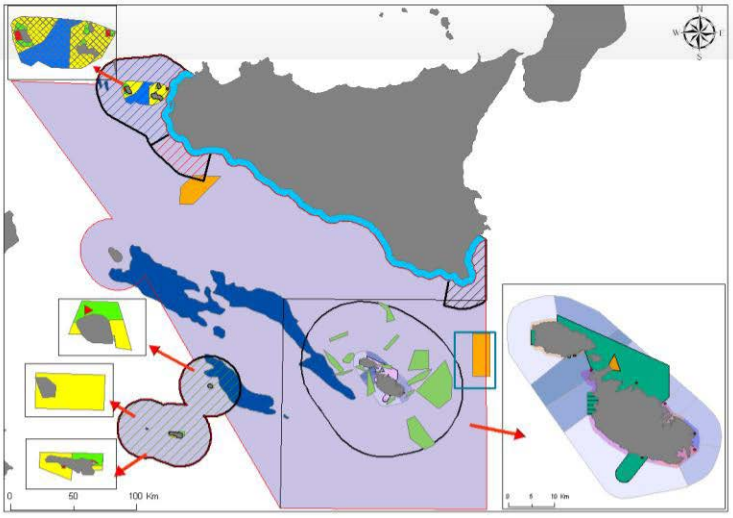
Application of the Mesma framework and tools.

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).



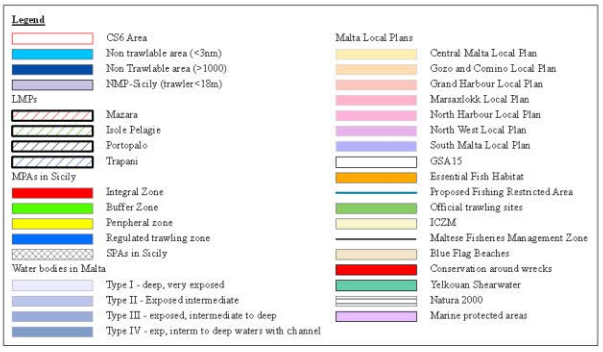


Figure 13. The different boundaries of the different spatial management plans in Malta

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).

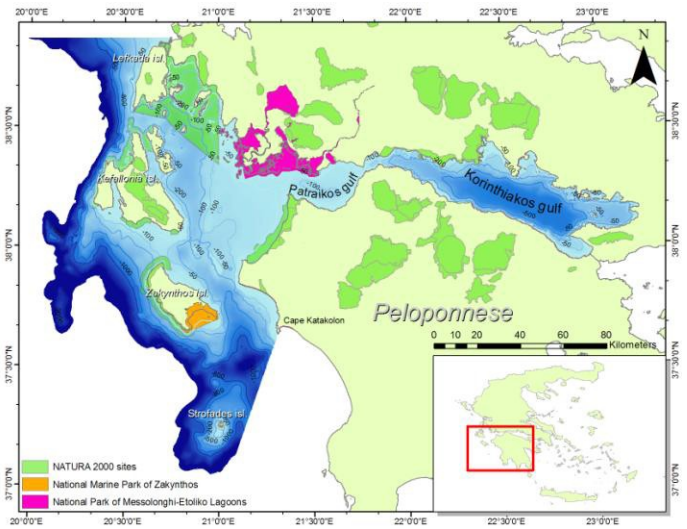


Figure 14. Greek CS study area with indication of protected areas

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.

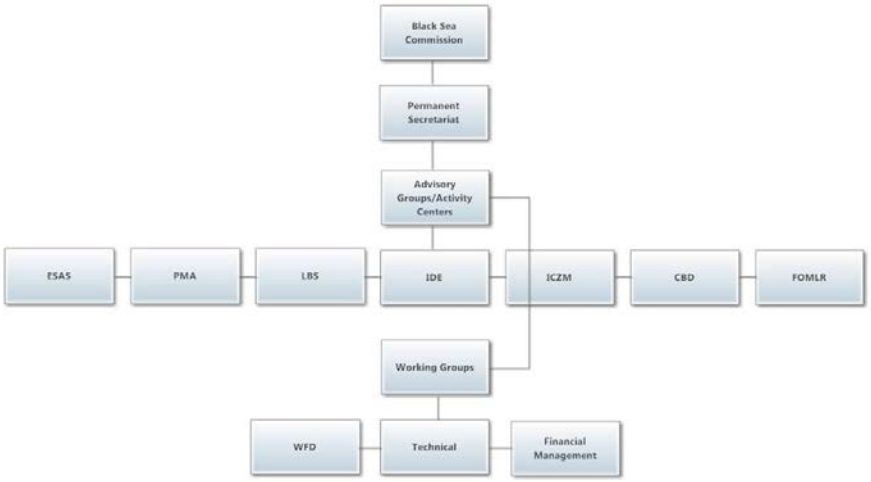


Figure 16. Organisational structure of the Black Sea Commision (BSC, 2012)

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 km2 (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.

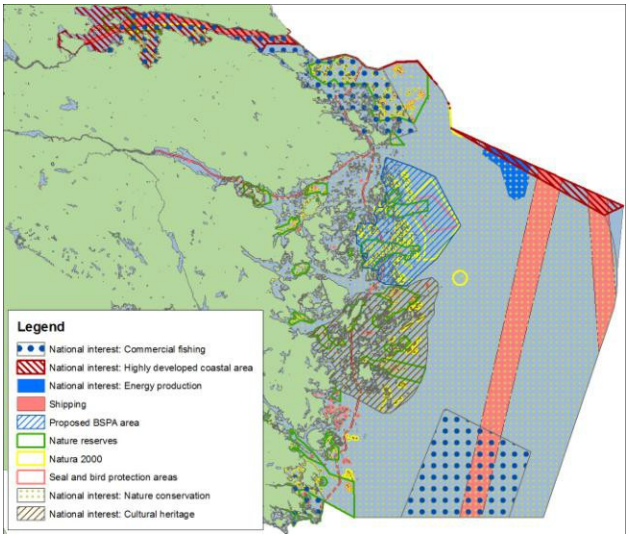


Figure 17. National and regional sectoral interests in Östergötland County.

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).

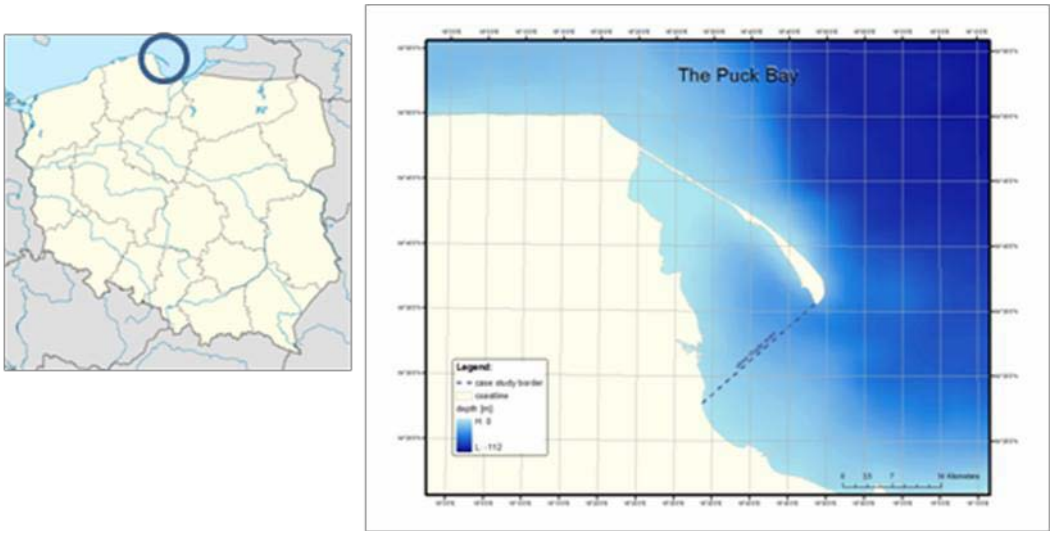


Figure 18. Location of the Puck Bay CS area within the Gulf of Gdansk

For the purpose of the MESMA project, the Puck Bay area was defined following the first draft marine spatial plan developed under the PlanCoast Project9. 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 km2 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) defense 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.

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	(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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4. MESMA: Ecosystem-based marine spatial management: review of concepts, policies, tools, and critical issues.

Published as: *Katsanevakis, S., Stelzenmüller, V., South, A., Sorensen, T. K., Jones, P. J. S., Kerr, S., . . . ter Hofstede, R. (2011). Ecosystem-based marine spatial management: review of concepts, policies, tools, and critical issues. Ocean & Coastal Management(0).*

Conventional sectoral management and piecemeal governance are considered less and less appropriate in pursuit of sustainable development. Ecosystem based marine spatial management (EB-SM) is an approach that recognizes the full array of interactions within an ecosystem, including human uses, rather than considering single issues, species, or ecosystem services in isolation. Marine spatial planning and ocean zoning are emerging concepts that can support EB-MSM. EB-MSM is driven by high-level goals that managers aim to achieve through the implementation of measures. High-level goals and objectives need to be translated into more operational objectives before specific targets, limits and measures can be elaborated.

5. MESMA: Assessing uncertainty associated with the monitoring and evaluation of spatially managed areas.

Published as: Stelzenmüller, V., Vega Fernández, T., Cronin, K., Röckmann, C., Pantazi, M., Vanaverbeke, J., . . . van Hoof, L. (2015). Assessing uncertainty associated with the monitoring and evaluation of spatially managed areas. Marine Policy, 51(0), 151-162. doi: http://dx.doi.org/10.1016/j.marpol.2014.08.001

Marine spatial planning (MSP) is advocated to support an ecosystem approach to marine management, as it allows consideration of multiple management objectives including marine conservation. The monitoring and evaluation of both implemented marine plans and the planning process itself is susceptible to various uncertainties. Here, uncertainties related to a stepwise monitoring and evaluation framework for spatially managed areas were characterised and quantified with the help of two modified and developed tools. In particular, Walker-type and pedigree matrices were utilised to assess both the sources and respective relative levels of uncertainty present in the assessment of nine European case studies that conducted a stepwise monitoring and evaluation process applying a common framework. Across the southern and northern European case studies major sources of uncertainty were found in relation to the knowledge base, management scenarios with related objectives and data availability. Although case studies made flexible use of the framework to account for the particularities of the local realms, the revealed pattern of associated uncertainty was highly consistent across the case studies. The scored pedigree matrices showed that the criteria 'stakeholder engagement' and 'cross validation' had greatest influence on the overall robustness of the case study assessments. The observed distribution of median pedigree scores was within acceptable ranges with respect to simulated possible score distributions. In addition, a sensitivity analysis revealed that the scoring of the pedigree criteria by five or more experts would result in less variable interquartile ranges of respective median scores. In conclusion, the developed complementary tools showed great flexibility in characterising and assessing uncertainty despite context-dependent differences among case studies such as geographical area, quality of available data, level of spatial management implementation or management objectives. Moreover, the obtained findings allow prioritising efforts and future research to support an iterative monitoring and evaluation of marine spatial plans.

6. JAKFISH: The added value of participatory modeling in fisheries management – what have we learnt?

Published as: Röckmann C. et al. The added value of participatory modelling in fisheries management – what has been learnt? Marine Policy 36 (2012) pp. 1072-1085. doi:10.1016/j.marpol.2012.02.027.

How can uncertain fisheries science be linked with good governance processes, thereby increasing fisheries management legitimacy and effectiveness? Reducing the uncertainties around scientific models has long been perceived as the cure of the fisheries management problem. There is however increasing recognition that uncertainty in the numbers will remain. A lack of transparency with respect to these uncertainties can damage the credibility of science. The EU Commission's proposal for a reformed Common Fisheries Policy calls for more self-management for the fishing industry by increasing fishers' involvement in the planning and execution of policies and boosting the role of fishers' organisations. One way of higher transparency and improved participation is to include stakeholders in the modelling process itself. The JAKFISH project (Judgment And Knowledge in Fisheries Involving Stakeholders) invited fisheries stakeholders to participate in the process of framing the management problem, and to give input and evaluate the scientific models that are used to provide fisheries management advice. JAKFISH investigated various tools to assess and communicate uncertainty around fish stock assessments and fisheries management. Here, a synthesis is presented of the participatory work carried out in four European fishery case studies (Western Baltic herring, North Sea Nephrops, Central Baltic Herring and Mediterranean swordfish), focussing on the uncertainty tools used, the stakeholders' responses to these, and the lessons learnt. We conclude that participatory modelling has the potential to facilitate and structure discussions between scientists and stakeholders about uncertainties and the quality of the knowledge base. It can also contribute to collective learning, increase legitimacy, and advance scientific understanding. However, when approaching real-life situations, modelling should not be seen as the priority objective. Rather, the crucial step in a science-stakeholder collaboration is the joint problem framing in an open, transparent way.

7. JAKFISH: Policy brief: institutions, practices and tools to address complexity, uncertainty and ambiguity in participatory fisheries management. An attempt to redefine the institutional role of science in EU fisheries policies.

M.A. Pastoors, C.M. Ulrich, D.C. Wilson, C. Röckmann, D. Goldsborough, D. Degnbol, L. Berner, T. Johnson, P. Haapasaari, M. Dreyer, E. Bell, E. Borodzicz, , K. Hiis Hauge, D. Howell, S. Mäntyniemi, D. Miller, R. Aps, G. Tserpes, S. Kuikka, J. Casey.

Fisheries management in the European Union appears to face a substantial crisis in the legitimacy of the scientific underpinning of policy. Feelings of distrust exist among different groups of actors: fishers don't believe the scientists, scientists don't believe the fishers, policy makers don't believe the fishers etc. Fisheries science is acknowledged to be fundamentally uncertain and findings are often open to alternative interpretations. The history of fisheries policy in Europe has shown a development that has been termed the "TAC machine" by authors: an annual cycle of stock assessment and TAC (Total Allowable Catch) decisions which create an interlocked system of mutual dependencies mainly between policy makers and fisheries scientists. Recently, there have been many attempts to redefine the role of fisheries science in fisheries management. One of these attempts can be characterised as "participatory fisheries modelling": a process of joint model development between stakeholders and scientists with the aim to inform future management decisions.

The JAKFISH project (Judgement and Knowledge in Fisheries Management involving Stakeholders) has specifically looked at participatory modelling as a potential tool to enhance mutual understanding and increase legitimacy. A dual approach was followed: on the one hand several case studies of participatory modelling were carried out and monitored and on the other hand an analysis of institutions and social networks was conducted to inform future arrangements.

A key findings are that participatory modelling appears to be most instrumental when already a clear and agreed methodology exists and that participants (stakeholders, scientists) to some extent have aligned expectations of the possible outcomes. The inverse situation where such an agreed methodology did not exists or when expectations were diverging, did not generate really instrumental results. The participatory modelling case studies have shown that they can achieve certain results but that they require a substantial investment in time and resources. Therefore, there needs to be prioritization of which cases should or could enter a full participatory modelling process. A pre-evaluation of probability of success could screen for: network involved (legitimacy of scientists and stakeholders, previous linkages between stakeholders), availability of data and methods, purpose and timing of stakeholders involvements and inks to a decision making process.

A major finding from the social network analysis is that networks where individuals within groups are in frequent interaction, through participatory decision-making, does not necessarily lead to more agreement on facts or values. At the start of the JAKFISH project we hypothesized that who people actually talk to, how frequently they talk to them, and the qualities of those discussions can have an impact on how much they agree on facts when they disagree on values and interests. Given that such controversy is the norm in participatory approaches to management, what are the potential tools that can lead to increased agreement on facts by those who disagree on values and interests? The experiments with participatory modelling have shown that that can – in some cases – be used to get agreements on facts. The detailed study on the Dogger Bank decision-making, has further shown that when science is produced to directly underpin policy (even backed up by European law), participation will be constituted very differently compared to a more exploratory role of science. An important distinction to be made is between scientific proof- making, which is evaluated against set of internal scientific criteria, and scientific justification, which is evaluated by a broader audience consisting of scientific peers,

government officials, industry stakeholders and environmental NGOs) next to the scientific peers. In the Dogger Bank case, this has added a number of quality criteria to those which count among scientific peers. These additional quality criteria depend on and vary with the particular policy issue, the stakes involved, and the particular extended audience that are to evaluate the justification.

Whether scientific uncertainty becomes an issue in a policy making context, not only depends on the amount of uncertainty, but also on the stakes involved and the burden of proof placed on the science. The claim in the European Habitats Directive that site designation is an exclusively scientific exercise, which places all the burden of proof on the science, can trigger disproportionate attention to scientific complexity and uncertainty, particularly where stakes are high, as they are in the UK case.

The JAKFISH project has shown that participatory modelling requires an effective facilitation strategy where scientists, stakeholders and policy-makers actively connect and discuss.

There is a need to train the participants in these process. It needs the realization that participatory modelling both builds trust and is built on trust, that it takes time and effort and that the outcome is more than the individual parts.

1 Context of scientific advice, stakeholder participation and fisheries management

The European Common Fisheries Policy (CFP) is a policy that is set out to achieve ecological, economic and social sustainability supported by sound science (EC, 2003). However, the CFP is widely criticized for not delivering on the ecological sustainability (Daw and Gray, 2005), on the economic sustainability (REF) and on social sustainability (refs) (Symes, 2009). In addition the scientific underpinning of the actual decision-making has been under heavy debate for many years already (Sissenwine and Symes, 2007, Piet et al., 2010, Degnbol et al., 2006)[more refs].

Many authors have pointed to the legitimacy crisis in European fisheries management (Wilson, 2009, Mikalsen and Jentoft, 2008, Van Hoof et al., 2005, EC, 2009). Fisheries science and fisheries management in Europe have to a large extend co-developed. In a paper produced under the Policy Knowledge and Fisheries Management project (PKFM), Holm and Nielsen have introduced the concept "TAC machine" to describe "the cyclical routine it builds around the construction and certification of annual TACs"(Nielsen and Holm, 2007, Holm and Nielsen, 2004). In the TAC machine, there is a clear division of work between scientists (carrying out VPAs and producing short term predictions) and policy makers (deciding on TACs). Alcock argues that institutional structures affects perceptions of salience, credibility and legitimacy of science and found that "fisheries stock assessment processes that are embedded within policymaking organizations are more influential within those organizations than outside of them" (Alcock, 2004). Recently there have been several attempts to redefine the role of science in fisheries policy (Schwach et al., 2007, Degnbol et al., 2006, Mackinson et al., 2011) and to change decision-making from short term to long term (EC, 2009).

So how can the science for European fisheries management be characterized. A small excursion into the philosophy of science is appropriate here. Scientific support for fisheries management is often justified by the independent and objective position that the scientists have in the policy domain (ICES, 2008). This often refers back to classical notions and norms about science (Merton, 1968). However, even in the domain of so-called "pure science" these norms have come to be challenged. Thomas Kuhn introduced the concept of "normal science" which described the normal activity of "puzzle solving" and which has the important property that it would stay within the currently accepted paradigm. Translated back into the European science for fisheries management, this would equate to activities in the paradigm of stock assessment and fisheries advice: the scientific components of the TAC machine.

Several authors have challenged the concept of normal science when it comes to applied sciences that have a direct societal impacts. Concept like regulatory science and boundary work (Jasanoff, 1990, Yearley, 2006), Mode II science (Gibbons et al., 1994), epistemic communities (Haas, 1989), post-normal science (Funtowicz and Ravetz, 1994). Within the JAKFISH project, we have used the concept of post-normal science as a key concept in describing the changing role of scientists and stakeholders in

the fisheries management debate. Post-normal science is thought to apply when stakes are high, scientific knowledge uncertain and decisions urgent, which often is the case for fisheries. A central element of post-normal science is "extended peer review", where the scientific peer community is extended to include stakeholders (Funtowicz and Ravetz, 1993) and where the review process extends beyond ensuring the scientific credibility to ensuring the relevance of the results for the policy process.

The process of the extended peer review is already visible in the European fisheries management process. Clearly, a more formal role of stakeholders in fisheries policy has been institutionalized through the formation of Regional Advisory Councils in the Common Fisheries Policy of 2002. Stakeholder have gained a formal advisory status in policy making. With the advisory role of stakeholders, also came a need to develop an understanding of the meaning of the scientific work underpinning the fisheries policy and a need to be actively involved in improving the scientific knowledge. At the same time the ICES advisory process experienced a change process which opened up the previous closed advisory process to involve stakeholders as observers to the advisory meeting (Stange et al., 2012). Participation became a new keyword in European fisheries policy. But how was the new role of stakeholders constituted and how could they actually participate in the process of knowledge generation and application?

The JAKFISH project (Judgement and Knowledge in Fisheries Management involving Stakeholders) is one of a few projects that has experimented with forms of participation of stakeholders in fisheries management. JAKFISH has specifically looked at participatory modelling as a potential tool to enhance mutual understanding and increase legitimacy. In this project, we followed a number of different strategies to investigate the role of participatory knowledge development. We looked at participatory approaches in other domains on the management of natural resources (e.g. forestry, river basins etc.) (Dreyer and Renn, 2011), we initiated concrete participatory modelling case studies in which we assessed uncertainties and jointly developed potential management strategies (Ulrich et al., 2010, Tserpes et al., 2011, Haapasaari et al., 2011), and we studied the institutional aspects of participatory science for management.

In this policy brief we intend to summarize the JAKFISH results with a specific focus on the potential policy implications of these findings.

2 How participatory modelling helps (or not)

2.1 Participatory modelling in natural resource management

The review of participatory modelling in natural resource management made a conceptual and empirical contribution to the growing field of research on participatory modelling in natural resource governance. There is a recent trend in the scientific literature to discuss participatory modelling as the multifarious ways in which a modelling exercise can be linked to stakeholder involvement. It is important to design the participatory modelling exercise with a clear purpose in mind (emphasizing collective decision-making on policy or management options and social learning as two distinct purposes). A challenge in this process is dealing with the complexity of simulation models for stakeholder involvement and uptake of participatory simulation modelling by policy-makers and managers in actual policy and management decision-making.

Key conclusions that are drawn:

- Be upfront and precise about purpose, timing, type and level of involvement
- Define what is sought to be achieved
  - Collective learning for consensus-building and / or conflict reduction
  - Knowledge incorporation and quality control for better management decisions
  - Higher levels of legitimacy of and compliance with management decisions

- Advancing scientific understanding of potential and implementation requirements of participatory modelling
- Define when to involve stakeholders and their particular contribution sought
- Direct involvement: Providing input to model construction
- Indirect involvement I: Providing input to framing the modelling endeavour
- Indirect involvement II: Providing input to evaluating modelling steps
- Indirect involvement III: Providing input to using the model

When designing a participatory modelling process, it is essential to reflect and decide on which professionals to include in the exercise. There is general agreement that there is a need for both modelling expertise and facilitation expertise. Careful choice is required between the option to have these two types of expertise provided by a single person, and the alternative option to have the facilitator and modeller roles segregated and fulfilled by different individuals. If special expertise in modelling was deemed indispensable for successful facilitation, the first option might be regarded as the best choice.

2.2 Participatory modelling (short description of the cases and the overall results; taken from D6.1):

The four JAKFISH case studies shed light on possible ways, their pros and cons to put the concept into practice. A variety of types, forms and tools of participatory modelling were identified and tested in case studies over a one to three year time frame. Thanks to the available project funds and scientific working time, the case studies could maturate and develop within their own context. Some stakeholders had only limited time available. It is likely that lack of time and money limits any operational version of the participatory modelling methodologies.

The details of how the uncertainties were addressed varied by case study, but in all cases extensive discussions between scientists and RAC/ ICCAT stakeholders were found to be an important precursor to creating the atmosphere of goodwill required to openly address the uncertainties in a participatory, transparent, clear and understandable manner. The Western Baltic Herring and the Mediterranean case studies developed along fairly similar, pragmatic tracks, while the central Baltic herring and the Nephrops cases followed their own paths. The models used (standard as well as the non-standard approaches) were open for modifications based on stakeholder input but each model contained some core elements that had been pre-framed by scientists.

A final reflection about successes and failures based on our participatory modelling experiences: we consider transparent two-way communication a key factor for an effective extended peer review process where scientists and stakeholders acknowledge uncertainties, mutually reflect on knowledge gaps that may really matter, and take into account a realistic time frame. We conclude that participatory modelling has the potential to facilitate and structure discussions between scientists and stakeholders about uncertainties and the quality of the knowledge base; it can contribute to collective learning, increase legitimacy, and advance scientific understanding. However, when approaching real life problems, modelling should not be seen as the priority objective. Rather, the crucial step in a science- stakeholder collaboration is the joint problem framing in an open, transparent way, in order to ensure that the relevant problems are tackled.

Based on our experiences and the stakeholders' feedback received through the extended peer review, we note that the stakeholders' purposes of participating in modelling are likely to diverge from scientist' objectives (Jacobsen et al., 2011). This needs to be realized and acknowledged when entering a participatory modelling process. Scientists need to be aware of the broader political and societal processes in which the modelling takes place and stakeholder need to be aware of the limitations and possibilities of the modelling process.

The Western Baltic Herring and Mediterranean swordfish case studies were examples where the modelling efforts were closely linked with actual developments of harvest control rules (often called

Long Term Management Plans). In these cases we simulated and helped develop realistic management scenarios that addressed the issues important for stakeholders and policy makers. The case studies objectives were discussed in meetings with the key stakeholders at the start of the project.

In contract, the central Baltic herring case study had mostly an academic motivation: studying and modelling different stakeholder views on herring population dynamics and fisheries management. Here there was no pressing management issue that was being addressed. Nevertheless, the timing and level of stakeholder involvement was carefully planned at the beginning of the study. Stakeholders were well informed from the start but already during the process they raised their concerns over the practicalities of incorporating such an approach into a possible management framework. So even though the case study did not aim to have a direct impact on a fisheries management framework, to many of the stakeholders this was an important (implicit) motivation to participate.

The North Sea Nephrops case study stood out as a very different process compared to the other three case studies. Here, scientists and stakeholders had completely different agendas in mind and could not find a way to bridge the gap between science and stakeholders. What was supposed to develop as a participatory modelling exercise, ended up being mainly used for improving communication to clarify this situation and establishing long-term goals.

Taking on a "facilitation" strategy, as proposed by Hanssen et al. (2009), could have been much more rewarding, as scientists would have focused on reducing societal dissent from the beginning of the case study instead of initially focussing on modelling and uncertainties only.

The review of the literature on participatory modelling has pointed out the importance of early stakeholder involvement in order to achieve the purpose of increasing legitimacy of and compliance with resulting management measures. This can now be confirmed through the four JAKFISH case study experiences.

Timing

The JAKFISH case studies pointed out the challenges of time and timing and the issue of financial resources to sustain the participatory modelling which implies working with a group of people with different background and knowledge. The modelling process confronts the participants with the steps of forming (get to know each other), storming (frame the problem, express ideas, map conflicts and misunderstandings etc.) and norming (develop common understanding and agree on main objectives) before it can reach the performing step of the modelling phase itself (Tuckman 1965, Mackinson et al. 2009). Depending on the context, the initial phases of getting acquainted can be very time-demanding. In most cases, this time can hardly be reduced because it also covers the time for deliberation and maturation of the issues being discussed. The inclusion of the participatory modelling process within a broader political and scientific agenda, such as in the pelagic and Mediterranean cases, helps to manage the overall time requirements. Regular milestones and political requests for advice by external parties, forced the scientists and stakeholders to keep on track and deliver operational outcomes and maintain motivation and commitment to the participatory modelling project at a high level.

Model complexity

Participatory modelling techniques in fisheries management are considered as a way forward in developing transparent procedures for generating and using knowledge. However, computer-based models are becoming increasingly large and complex. The quest for more holistic, integrated approaches that take into account different uncertainties conflicts with the ambition for greater transparency. The four JAKFISH case studies illustrate different ways of handling this conflict. The pelagic and Mediterranean case studies used a fairly standard management strategy evaluation approach based on single-stock projections with available stock assessment data. In these cases the assumptions and issues in the models could be explained in relatively simple terms. In contrast, the Nephrops and Baltic case studies represent situations where the standard modelling approaches were

not suited and where new, non-standard approaches would be needed. In the Baltic case, the integrative model development had been the explicit objective but the usefulness was questioned by the stakeholders involved. In the Nephrops case, the scientists focused on developing an innovative model that would fit the specific Nephrops biology and fisheries but only to find that the stakeholders were already questioning the standard model, let alone the potentially new, and more complex model. Discussing the trade-off between model complexity and transparency at the start of the participatory modelling process seems a prerequisite to develop an effective participatory process.

Integrating different forms of knowledge

Participatory modelling is sometimes expected to "integrate all types of knowledge (empirical, technical and scientific) from a variety of disciplines and sources" (Voinov and Bousquet 2010). However, practical implementation is difficult. The Investinfish South West (IiFSW) project faced methodological difficulties when trying to integrate stakeholders' non- scientific knowledge into a bio-economic model at the model development stage (Squires 2009). The Baltic case study pushed forward this exercise of knowledge integration successfully by developing formalized approaches (mental modelling and conditioning of stakeholder-models on various sources of available data (Mäntyniemi et al. 2009)), but the stakeholder appreciation of the final outcome was relatively low and the costs in terms of scientific time and skills were high.

In the Western Baltic herring and the Mediterranean swordfish case studies, the main differences in perception among stakeholders and scientists were not accounted for as structural uncertainty but rather as irreducible sources of uncertainties. These were translated into larger confidence intervals around the corresponding biological parameters in the simulation models. This resulted in lower target fishing mortalities to maintain pre- agreed stock levels with a certain probability (Ulrich et al. 2010, Tserpes et al. 2009, 2011). These approaches brought probabilities about biological issues at the heart of the modelling and management discussions but could not address the uncertainties associated with decision-making, implementation of measures or adaptation strategies by fishermen. The net effect is that the modelling reinforced the traditional view of science for fisheries management through stock assessment and biological processes.

Communication tools and user-friendliness

Van der Sluijs (2001, 2002) found that the usefulness of complex computer-based models was rated higher by non-scientific stakeholders if the following information and communication tools were used: (i) a comprehensible and detailed user manual; (ii) an understandable model presentation; (iii) an interactive and attractive user interface; (iv) a comprehensible account of uncertainties; and (v) an adequate model moderation. This checklist seems appropriate if the stakeholders are expected to be directly involved in the model development and use. However, none of our four cases provided all of these five requirements. All communication processes in the case studies were articulated around points (ii), (iv) and (v).

Good examples of the development of user-friendly interfaces for non-technical (expert) users are models such as Investinfish South West (IiFSW 2007), TEMAS (Sparre 2003, Ulrich et al. 2007, Andersen et al. 2010) or ISIS-Fish (Mahévas and Pelletier 2004). However, stakeholders did never use these models on their own, often due to lack of time and capacity. In reality, stakeholders mostly asked the scientists to provide the answers to their requests. The usefulness of an interactive and attractive user interface (iii) will increase, if it is tailored to the potential user group and their needs.

If many scenarios and hypotheses are to be explored, it seems more adequate to have a model interface friendly for the scientists rather than for the stakeholders, i.e., it should be flexible, generic, compute fast, and generate synthetic and clear output. A model interface with buttons, menus, etc. obliges the modelling to follow some fixed and pre-defined lines set up by the original model developer, and this may come at costs in terms of flexibility to

address new thoughts and ideas, and may create parameterization issues if data is lacking to fit the model frame (Andersen et al. 2010).

2.3 Who participated in the participation?

The participatory modelling case studies in JAKFISH were approached from a rather pragmatic point of view: how can JAKFISH help to address an issue that is raised by stakeholders and that could be amenable to participatory modelling. The results of the case studies have been described above.

In this section we will provide a reflection on the participatory nature of the participation. Unfortunately a formal social network analysis has not been carried out for the participatory modelling case studies (except for the Mediterranean swordfish case study), and therefore we merely attempt to reflect on the case studies taking into account the lessons we have drawn from the institutional analyses

The social networks in the four participatory modelling case studies have very different properties.

- The pelagic case study involved a network with a relatively limited number of people who were reasonably familiar with each other and with the scientific methodologies applied in fisheries modelling. One main research institute, one dominating industry organization with long experience, and historical good collaboration between the two of them. There were a small number of key-informants that were able to cross the science- stakeholder domains effectively.
- The Baltic case represented a small but broad network of people originating from different backgrounds and professional roles. There was no real key-informants in the system and this is reflected by the rather widely different perspectives that resulted from the mental modelling process.
- The Nephrops case was a very broad and diffuse network of which some of the network members has substantial experience in science-stakeholder collaboration but where also a substantial number of members had no prior engagement or were even sceptical of the ambition for participatory modelling. In this case there were no leading key-informants that were driving the process.
- The swordfish case was a rather hierarchical social network with a lot of focus on science and management. In this case there was a key person in the network who easily crossed the border between science and policy and who, from the social network analysis was shown to attract most of the relationships with other members of the network.

It appears that the success of a participatory process can be related to a certain extent to individual personal skills: is there a key “informant”, a person that is willing and able to communicate with stakeholders and scientists and who understands both the basic scientific background and main drivers and interests for different stakeholders?

Another important explanatory factor for the performance of the social networks in the participatory modelling cases is the role that stakeholders perceive to have and their assessment on the potential to influence actual policy decision. If there is a real scope for action (pelagic case, swordfish case) there is commitment and determinacy to „solve the issue“ whereas in situations where the role of the end product is less clearly defined (nephrops case, Baltic case) the impact of participatory modelling is lower.

2.4 Paradigms and the distinction between normal science and post-normal science.

So will participatory modelling only work when there is an agreed method? Of the four participatory modelling case studies that were carried out in JAKFISH, two were relatively successful in the sense that they generated actual participatory modelling work and conclusions from them (pelagic case, swordfish case). In those two cases the basic scientific method was not disputed (age-based approach in Management Strategy Evaluation framework) and was based on state of the art in the field. It did not require new developments or techniques, but mainly focussed on scenarios and outcomes. This is almost a description of the puzzle solving properties of „normal science“ within the dominant „paradigm“ as described in the classic work by Thomas Kuhn (Kuhn, 1962).

The two case studies that did not result in clear recommendations (nephrops case, Baltic case) proved to be examples where the normal science paradigm had not been established. Nephrops is a species that is currently not assessed using age-based techniques that are underlying the dominant Management Strategy Evaluation frameworks. Therefore this could not be an issue of puzzle solving and instead the focus had to be on devising an acceptable paradigm. So this could be an example of post-normal science. Stakes are high (nephrops presents an important economic component for several north sea fisheries), scientific knowledge is uncertain (many unknowns on these short-lived, bottom inhabiting animals and about the dynamics in fisheries) and decisions urgent (in order to develop a management plan and obtain MSC accreditation). So this is were post-normal science should apply and deliver new mechanisms for bridging the science-policy divide. Yet, what we observe is that in this situation the JAKFISH approach to participatory modelling as not been able to bridge the gap. Whether this is dependent on the particular arrangement in the nephrops case study or that is a more systematic feature of participatory modelling is not known at this stage but it does provide a challenging idea to the notions of normal science and post-normal science.

2.5 Can participatory modelling make a difference?

So after carrying out the four participatory modelling case studies, we ask the question: has it made a difference? What changes can be observed in the social networks that are underlying the case studies or in the fisheries management processes that aim to regulate the fisheries.

In terms of direct impacts on fisheries management decisions, it is still too early to judge. The pelagic case has contributed to the development of a management plan that was proposed to the European Commission. However, to date, the European Commission has not drawn up the management plan that they intend to submit to the European Council of Ministers for approval.

The task division in the pelagic and swordfish cases has been that the scientists in the process presented windows for decision making (range of acceptable scenarios based on overall policy objectives) and trade-offs between the various options. Stakeholders would then interact with scientists to determine optimal scenarios and required outputs.

The added value of involving an “extended peer community” in the process of participatory modelling has lead to a mutual learning on the framing of issues (both in the scientific

domain and the stakeholder domain) and thereby we can infer that the results obtained in those cases have greater legitimacy compared to a closed scientific process.

However, in the nephrops case the participatory modelling never really materialized and the mutual learning experience was less developed. This clearly shows that for participatory modelling to develop, there is a need for a shared understanding of what the key challenges are and an understanding of the ambitions and motivation of the scientists and the stakeholders.

3 How institutions help (or not)

3.1 Social networks and institutions

What impact does the organization and interactions of the science policy network have on patterns of agreement about biological and economic facts? This is the research question that was at the heart of the JAKFISH deliverable 5.1 "A social network analysis of a marine management science policy community for six case studies". Using social network analysis techniques we assessed the implications of different ways that scientists, managers and other stakeholders organise their common work within an overall fisheries management framework in four EU case studies and two case studies outside the EU. Each case study was carried using a uniform sequential procedure: discourse analysis, survey design, online survey, social network analysis, interpretation of the results in the context of the discourse analysis.

The case studies with high participation (in decision-making) tended to have negative network autocorrelation (hence more disagreement). This result suggests that in a more participatory management system, there is higher disagreement among experts possibly because they result from discussion relations among experts with different values, interests, and knowledge.

Two important network characteristics used in the analysis were Network Heterogeneity1 and Input Degree Centralization2 were found to not fully describe participation. The two measures show some correlation. Input degree centralization appears to be positively related to heterogeneity. This suggests that active stakeholder interaction requires the organizing efforts of a few central actors. If this is so, then the idea of "participation" would need "unpacking" from a network perspective because it shows how different participatory roles are played out in real-life situations where decisions are being made and how leadership and participation are connected.

1 Indicator (between 0 and 1) that describes the proportion of links between actors with different personal characteristics. A low heterogeneity (e.g. .45) indicates that the actors tend to discuss with partners with the same characteristics as their most frequent discussion partners. For example fishermen that have many links with other fishermen. A high network heterogeneity (e.g. .75) indicates that the actors tend to discuss with partners with different characteristics as/from their most frequent discussion partners.

2 Indicator (between 0 and 1) for the distribution of nominations by respondents. A low input degree centralization (.e.g. .35) indicates that a few experts are mentioned by many as their most frequent communication partners while many are not mentioned at all.

When experts discuss matters more with colleagues from other stakeholder groups, their values, interests, opinions, and knowledge are less similar. Consensus within a stakeholder group seems to be higher if the most important discussion partners are selected within the group. So more participation (in science, in policy-making) does not (necessarily) mean more agreement on facts or values. Management systems with low participation might show more agreement because stakeholders lack opportunities to discuss controversial ideas. Higher participatory systems may, however, succeed in establishing discussion relations among experts with different values, interests, and knowledge.

The original design of D5.1 was driven by the underlying hypothesis: who people actually talk to, how frequently they talk to them, and the qualities of those discussions can have an impact on how much they agree on facts when they disagree on values and interests. This is directly linked to the question of how formal institutions are expressed in actual interactions. It is clearly evident and important that proper forms of communication express controversies over both facts and values and that these two kinds of assertions are tightly related because people interpret facts to defend values.

The edge question that JAKFISH was meant to address follows from this: given that such controversy is the norm in participatory approaches to management what are the potential tools that can lead to increased agreement on facts by those who disagree on values and interests? We addressed this question both by experimenting with participatory modelling as a method for getting people to focus the conversation on facts and what a "fact" is and by analysing the same question from the broader institutional perspective, i.e. how scientists were dealing with uncertainties in the midst of controversy and the different ways that participation is organized as expressed in the actual interactions of the people involved.

3.2 Scientific proof-making vs. scientific justification

A dedicated study was carried out within the JAKFISH project to analyse how scientists interact with decision makers and stakeholders in dealing with complexity and uncertainty. The basic assumption was that scientists "help other stakeholders to … understand complexity and uncertainty ". We carried out an in-depth study of the scientific justification of boundaries for marine protected areas on the

Dogger Bank. This may seem like a very different topic than participatory modelling but there are clear relationships between the two in terms of understanding the role of scientists, knowledge and uncertainty in decision- making processes. The study focussed on the parallel processes in the UK and Germany for defining where the boundaries are of the sandbank habitat type.

Two important findings from the study discount the traditional image that scientists help others to understand complexity and uncertainty.

1) Communicating complexity and uncertainty is not a one-way process. Instead, the dynamics can go both ways. In the UK case some of the main stakeholders also informed the scientists about the concerns they wanted to have addressed, which kind of justification they would find appropriate and which kinds of uncertainties they would find acceptable. In that way some of the stakeholders have taken part in formulating the quality criteria for science and these criteria have actually directed some of the scientists' choices.

2) Communicating complexity and uncertainty is something that does not only happen after the research process but is essentially something that is produced during the research process. In both of the cases studied, an integrated part of the researchers' scientific

decision-making has been to consider which uncertainties and complexities they wanted to produce, reduce or accept and how these would be understood and perceived by stakeholders. Public communication of scientific complexity and uncertainty was not something that came after the research process but was an integrated part of the scientific process.

In the German and UK designation processes on the Dogger Bank, scientists have considered the stakeholders in their scientific decision making during the research process. In the UK case they have interacted more directly with the government stakeholders and to a lesser degree with other stakeholders. In the German case, scientists' considerations were mainly based on their assumptions about what stakeholders might perceive as proper justification. The type of considerations scientists and stakeholders have had about the science in the two cases has illustrated an important difference between scientific proof-making, which is evaluated against set of internal scientific criteria, and scientific justification, which is evaluated by a broad audience (government officials, industry stakeholders, environmental NGOs and the European Commission) next to the scientific peers. In the Dogger Bank case, this has added a number of quality criteria to those which count among scientific peers.

These additional quality criteria depend on and vary with the particular policy issue, the stakes involved, and the particular extended audience that are to evaluate the justification.

Whether scientific uncertainty becomes an issue in a policy making context, not only depends on the amount of uncertainty, but also on the stakes involved and the burden of proof placed on the science. The claim in the EU Habitats Directive that site designation is an exclusively scientific exercise, which places all the burden of proof on the science, can trigger disproportionate attention to scientific complexity and uncertainty, particularly where stakes are high. The study shows that what counts as scientific justification for the boundaries of the areas depends on the particular publics, stakeholders, governmental departments and other institutions for whom the sites should be justified.

Translating these results to the topic of participatory modelling we could hypothesize that participatory modelling reflects a case of scientific justification where it is not just the scientific review process that should be evoked, but also an extended peer review community to make sense of the results and their applicability to solve real world problems. The Dogger Bank case showed that the stakeholder interest in the science and uncertainties depended on the kind and amount of stakes the particular stakeholders had in the policy issue: the more stakes, the more concerns for the science and for the uncertainty. In the Dogger Bank case stakeholders were concerned about the kind of data used, the way it was analysed, the way the analysis then led to the definition of boundaries on the Dogger Bank.

4 Way forward

4.1 When and how to participate?

The need for participatory research and participatory modelling has been observed in situations where science has had an important role to play in policymaking, like in fisheries management. But this is seldom where participatory research is carried out. It tends to be carried out in situations where science plays a more explorative and less politically important

role (like in the Central Baltic herring case). This is where stakeholder's interests in the details of the scientific methodology are perhaps least outspoken.

In the Dogger Bank study the stakeholders were very interested in the details of the scientific decision-making for the boundaries of the Natura 2000 areas. In the participatory modelling processes in JAKFISH, the stakeholders seem to be less concerned with the scientific decision-making and more interested in the outcome of the modelling process. This can probably be explained by the differences in the role that science plays in the two situations. In the Dogger Bank case, science is produced to directly underpin policy (even backed up by European law). In the participatory modelling processes the science is used to explore different management scenarios which the stakeholders would like to know the effect of. In the former case stakeholders would often like particular conclusions to come out of it. In the latter case they just want to explore some issues in order for them to reflect on the kind of management they want.

The participatory modelling case studies have shown that they can achieve certain results but that they require a substantial investment in time and resources. Therefore, there needs to be prioritization of which cases should or could enter a full participatory modelling process. A pre-evaluation of probability of success could screen the following items:

- network involved (previous linkages between scientists, stakeholders and policy makers)
- Availability of "science facilitators" to guide the process
- availability of data and methods
- purpose and timing of stakeholders involvements,
- links to a decision making process.

4.2 Role of science: facilitator of pacificator?

Hansen et al (2009) have distinguished between two main roles for scientists in decision- making process: facilitator or pacificator. Translating this to participatory modelling, one first needs to establish whether the participatory modelling would be aspiring for positive changes or not. Is the management issue dealing with an unsatisfactory management that could be improved (e.g. Western Baltic Herring) or is it dealing with unpopular changes that will undermine the current situation or create more constraints (e.g. Dogger Bank, North Sea Nephrops). If positive changes could be achieved, the legitimacy of the final political decision could be less disputed and therefore there will be less pressure on the scientists. If negative changes are likely, then the science will be disputed unless the political decision making is also democratic and transparent.

In any case, the JAKFISH work has shown that for participatory modelling to work well, there is a need to train scientists in making connections between scientific and stakeholder communities (Dankel et al., 2011). And it needs a realization that participatory modelling is build on trust, and that takes time.

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8. ODEMM: An exposure-effect approach for evaluating ecosystem-wide risks from human activities

Published as: Knights, A. M., Piet, G. J., Jongbloed, R. H., Tamis, J. E., White, L., Akoglu, E., . . . Robinson, L. A. (2015). An exposure-effect approach for evaluating ecosystem-wide risks from human activities. ICES Journal of Marine Science: Journal du Conseil. doi: 10.1093/icesjms/fsu245

Ecosystem-based management (EBM) is promoted as the solution for sustainable use. An ecosystem-wide assessment methodology is therefore required. In this paper, we present an approach to assess the risk to ecosystem components from human activities common to marine and coastal ecosystems. We buildon: (i) a linkage framework that describes how humanactivitiescan impact the ecosystem through pressures, and (ii) a qualitative expert judgement assessment of impact chains describing the exposure and sensitivity of ecological components to those activities. Using case study examples applied at European regional sea scale, we evaluate the risk of an adverse ecological impact from current human activities to a suite of eco- logical components and, once impacted, the time required for recovery to pre-impact conditions should those activities subside. Grouping impact chains by sectors, pressure type, or ecological components enabled impact risks and recovery times to be identified, supporting resource managers in their efforts to prioritize threats for management, identify most at-risk components, and generate time frames for ecosystem recovery.

9. ODEMM: Evaluation of ecosystem-based management strategies based on risk assessment

Gerjan J. Piet, Ruud H. Jongbloed, Antony M. Knights, Jacqueline E. Tamis, Anneke J. Paijmans, Marieken T. van der Sluis, Pepijn de Vries, Leonie A. Robinson

Abstract

This study presents a comprehensive and generic framework that provides a typology for the identification and selection of consistently defined ecosystem-based management measures and allows a coherent evaluation of these measures based on their performance to achieve policy objectives. The performance is expressed in terms of their reduction of risk of an adverse impact on the marine ecosystem. This typology consists of two interlinked aspects of a measure, i.e. the "Focus" and the "Type". The "Focus" is determined by the part of the impact chain (Driver-Pressure-State) the measure is supposed to mitigate or counteract. The "Type" represents the physical measure itself in terms of how it affects the impact chain directly; we distinguish Spatio-temporal distribution controls, Input and Output controls, Remediation and Restoration measures. The performance of these measures in terms of their reduction in risk of adverse impacts was assessed based on an explicit consideration of three time horizons: past, present and future. Application of the framework in an integrated management strategy evaluation of a suite of measures, shows that depending on the time horizon, different measures perform best. "Past" points to measures targeting persistent pressures (e.g. marine litter) from past activities. "Present" favours measures targeting a driver (e.g. fisheries) that has a high likelihood of causing adverse impacts. "Future" involves impacts that both have a high likelihood of an adverse impact, as well as a long time to return to pre-impacted condition after the implementation of appropriate management, e.g. those caused by permanent infrastructure or persistent pressures such as marine litter or specific types of pollution.

10. ODEMM: Regional cooperation for European seas: Governance models in support of the implementation of the MSFD.

Published as: van Tatenhove, J., Raakjaer, J., van Leeuwen, J., & van Hoof, L. (2014). Regional cooperation for European seas: Governance models in support of the implementation of the MSFD. Marine Policy. doi: dx.doi.org/10.1016/j.marpol.2014.02.020

During the implementation process of the Marine Strategy Framework Directive (MSFD), Member States are expected to cooperate and coordinate at the regional sea level as wells as arrange stakeholder involvement. However, the MSFD does not specify any governing structures to do so. The aim of this paper is to address these key challenges of the MSFD by developing four governance models for regional cooperation and assess their impact on governance performance. The four models are based on the building blocks of stakeholder involvement (low or high) and decision-making power (binding or non- binding decisions): (1) Cross-border platforms; (2) Regional Sea Convention-PLUS; (3) Advisory Alliance and (4) Regional Sea Assembly. Secondly, the paper will do an ex ante assessment on how the alternative models will have an impact on governance performance. The assessment criteria for governance performance are: (a) costs to set up and run a model; (b) capacity to cooperate; (c) policy coordination; (d) institutional ambiguity; and (e) implementation drift. In addition to this assessment of the performance based on expert judgement (i.e. scientists of WP7 of the ODEMM project), 4 roundtable discussions have been undertaken in which stakeholders from the four regional seas did an assessment of the four models. The main conclusion is that increasing stakeholder participation, a much desired development in regional organisation of marine management as expressed by the stakeholder community, will increase the costs of the policy making process. If stakeholder participation is not embedded in a wider institutional setting in which the participation of stakeholders is directly related to the policy process and the degree to which decisions taken are binding, the increase of costs does not lead to a more smoothly running model.

11. ODEMM: Regional cooperation for European seas: Governance models in support of the implementation of the MSFD.

Published as: van Leeuwen, J., Raakjear, J., van Tatenhove, J., Long, R., van Hoof, L., Ounanian, K., & Delaney, A. (2014). Legal, institutional, and stakeholder obstacles in implementing the Marine Strategy Framework Directive. Marine Policy.

The implementation of the European Union (EU) Marine Strategy Framework Directive (MSFD) requires EU Member States to draft a program of measures to achieve Good Environmental Status (GES). Central argument of this paper, based on an analysis of the unique, holistic character of the MSFD, is that social and political factors are having a major influence on this MSFD implementation process. More specifically, four potential impediments have been identified that are curtailing the drive towards the effective implementation of the scheme advanced by the Directive. First, scientific uncertainty about aggregated ecological pressure and drivers in relation to the different sectors clouds the definition of national programmes of measures and this in turn may lead to implementation-drift in achieving GES. Second, the scale of the ecosystem is different from the political and socio-economic scales of individual, sectoral decision-making and activities. Third, policy coordination is required on several levels, i.e. at the EU level, within the Regional Sea Conventions, at national level and between these three levels. Finally, the coming together of both stakeholder involvement organized for the MSFD and those of existing, sectoral policy domains makes fair and efficient stakeholder involvement challenging. This paper concludes that more attention should be rendered to establishing appropriate coordination and communication structures, which facilitate greater engagement with the different Directorates-General in the European Commission, the European Council and the Parliament, the Member States, sectoral decision making institutions as well as stakeholder interest groups.

12. ODEMM: Sometimes you cannot make it on your own; drivers and scenarios for regional cooperation in implementing the EU Marine Strategy Framework Directive

Published as: van Hoof L., Hendriksen, A., & Bloomfield, H. J. (2014). Sometimes you cannot make it on your own; drivers and scenarios for regional cooperation in implementing the EU Marine Strategy Framework Directive. Marine Policy. doi: dx.doi.org/10.1016/j.marpol.2014.03.031

Implementing the EU Marine Strategy Framework Directive explicitly calls for regional cooperation between the EU Member States in the different regional seas. This regional cooperation, although set in a general framework of EU Member States and non-EU states utilising existing Regional Sea conventions as focal point, develops along different tracks. Based on a series of interviews with different stakeholder groups in the different regional seas the drivers for this regional cooperation were determined. These drivers were used to develop a set of scenarios to depict possible ways and structures for cooperation at the different regional seas. In this paper the result of this analysis and the different scenarios developed are presented. The five scenarios developed were very helpful in elaborating alternative governance models for regional cooperation. From the validation by the stakeholders it became clear that both the drivers used, as the scenarios developed were found to be relevant. There is no single solution that is going to fit all regional seas, or that is going to appeal to all stakeholders within a regional sea. Especially in this setting the scenario approach does help people to explore the full range of possibilities that exists for the development of alternative governance models that address two issues raised but not detailed in the MSFD: cooperation and participation.

13. ODEMM: How to dance? The tango of stakeholder involvement in marine governance research.

Published as: Kraan, M., Hendriksen, A., van Hoof, L., van Leeuwen, J., & Jouanneau, C. (2014). How to dance? The tango of stakeholder involvement in marine governance research. [Marine Governance of European Seas]. Marine Policy, 50, Part B(0), 347-352.
doi: http://dx.doi.org/10.1016/j.marpol.2014.05.010

The added value of involving stakeholders in research, especially related to marine governance, seems to be understood today by many researchers and policy makers. This is clearly reflected by the many (EU) research calls explicitly asking for stakeholder involvement. The way in which to involve stakeholders in a meaningful way is however not all that clearly defined. In the EU funded project Options for Delivering Ecosystem-Based Marine Management (ODEMM) an explicit question was the development of options for alternative governance settings, including stakeholder involvement, to implement the Marine Strategy Framework Directive in the EU. In order to arrive at these possible alternative governance set-ups the ODEMM project developed a layered methodology, including structured and unstructured interviews, a survey and roundtable discussions to develop diverse governance options for future ecosystem based models at the regional seas. This paper describes the methodologies used, compares them with best practice from literature, and finally classifies the approach as a joint knowledge production, a tango, in which scientists take the lead but need the stakeholders to come to a dance.

14. ODEMM: Institutional ambiguity in implementing the European Union Marine Strategy Framework Directive

Published as: Van Leeuwen, J., van Hoof, L., & van Tatenhove, J. (2012). Institutional ambiguity in implementing the European Union Marine Strategy Framework Directive. Marine Policy, 36(3), 636-643. doi: 10.1016/j.marpol.2011.10.007

This article addresses the institutional ambiguity that exists between the European, Regional and Member State levels in the implementation of the Marine Strategy Framework Directive (MSFD). The two main reasons for the emergence of institutional ambiguity are (1) the MSFD being a framework directive and (2) Member States are required to coordinate the implementation of the MFSD through the Regional Sea Conventions. Institutional ambiguity refers to the interference zone between different institutional settings that come together in new policy practices. New rules of the game are needed to bring these institutional settings together and the room to manoeuvre for the actors who negotiate these rules is a defining feature of institutional ambiguity. This article analyses the institutional ambiguity associated with MSFD implementation on the European and regional level for four European Seas: the North Sea, the Baltic Sea, the Mediterranean Sea and the Black Sea. The results indicate different levels of institutional ambiguity in each of the four regions, with the lowest level of ambiguity in the Baltic Sea and the highest in the Mediterranean Sea. Institutional ambiguity also exists on the European level, as coordination efforts have not resulted in clear directions for the implementation of the MSFD as yet. The level of institutional ambiguity is influenced by the relative number of EU member states bordering the particular sea and whether they consider implementation of the MFSD to be urgent. Member States bordering the Mediterranean and the Black Seas lack the support of Regional Sea Conventions in addition to receiving limited direction from the European level.

15. ODEMM: All at Sea; Regionalisation and Integration of Marine Policy in Europe

Published as: van Hoof, L., van Leeuwen, J., & van Tatenhove, J. (2012). All at Sea; Regionalisation and Integration of Marine Policy in Europe. MAST.

A major challenge of future EU fisheries management is the integration of fisheries management with broader marine management. The focus on ecosystem based management is both a driver for regionalisation as for integration of policy to cover all sectors and activities at the scale of the marine ecosystem. The central question of this paper is: how are regionalisation and integration discourses in EU management of marine resources influencing the Integrated Maritime Policy, the Marine Strategy Framework Directive and the Common Fisheries Policy differently and which challenges arise because of these differences? We will look at the current model of governance applied and see whether this is durable in the longer term and analyse specifically the implications of integrated regional marine management. We will conclude that the process of regionalisation and integration of policy requires a further development of the marine governance system, positioning the regional level into the multi-level governance system.

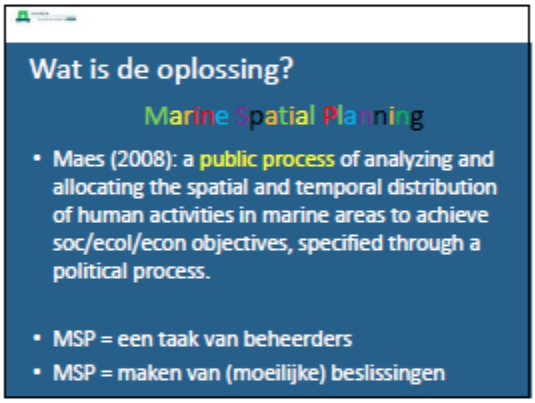
Inzicht; bijeenkomst 4 december 2014

Inzicht in Zee op Zicht

Programma Inzicht in Zee op Zicht

09:30 – 10:00	**Ontvangst met koffie/thee en zoete lekkernijen** *Inschrijven voor de discussiegroepen*
10:00 -10:15	**Opening & Welkom** *Tammo Bult, Directeur IMARES*
10:15 - 11:00	**Zee op Zicht: Inzicht in visie en uitkomst.** *Dagvoorzitter: Luc van Hoof, projectleider Zee op Zicht*
11:00 – 11:30	**PAUZE**
11:30 – 12:30	**Parallelle discussies ronde 1: Zee op Zicht resultaten** **De principes achter governance en participatie in planning** *Marloes Kraan, IMARES* **De rol van wetenschap en kennis in beheer van de zee** *Christine Röckmann, IMARES* **De mythe van Decision Support Systems** *Bas Bolman, LEI* **Concurrentie en de mogelijkheden voor meervoudig gebruik van de zee** *Josien Steenbergen, IMARES*
12:30 – 13:30	**LUNCH**
13:30 – 14:30	**Parallelle discussies ronde 2: Uitdagingen** **Plannen op basis van het ecosysteem; hoe doe je dat?** *Christine Röckmann, IMARES* **Blauwe groei; hoe gaan we dat doen?** *Bas Bolman, LEI* **Regionale samenwerking, liever vandaag dan morgen?** *Marloes Kraan, IMARES* **Energie-eiland in zee; toch maar doen?** *Floris Groenendijk, IMARES*
14:30 – 15:15	**Wim Derksen - Reflectie van buitenaf.** *Wim Derksen is socioloog, hoogleraar bestuurskunde, docent, schrijver, voorzitter, hardloper, fagot & cello speler*
15:15 – 16:15	**Ronde tafel discussie: Als we de hele Noordzee opnieuw zouden inrichten hoe zouden we dat doen; zouden we het anders doen?**
16:15 – 16:45	**Afsluitend woord en opening van de borrel** *Tammo Bult*
16:45 - 18:00	**Borrel & Netwerkbijeenkomst**

16. Principes van Governance



Dus … besteed aandacht aan principes

Principes / wereldbeeld vormen het debat

Kader van beoordeling staat van 't ecosysteem

… veelal impliciet / onbenoemd

- Proberen om een gedeelde set van principes te krijgen
- Als dat te moeilijk is…. Tenminste gedeeld begrip van vertrekpunt van elk van de deelnemers (op basis waarvan ze discussiëren, onderhandelen)

Wat gebeurd er als we dat niet doen?

Dynamisch

Divers

Complex

Wat gebeurd er als we dat niet doen?

- Werkt (gezamenlijk?) naar verschillende doelen toe
- Kennis delen kan alleen in klimaat van vertrouwen en gemeenschappelijke doelen

Voorbeeld: Doggerbank

Stelling 1

- Als je samen iets gaat doen, dan moet je eerst gezamenlijk verkennen wat je wilt bereiken, hoe en op basis waarvan.

Stelling 2

- Heel leuk zo'n theoretisch verhaal over principes; maar daar hebben we geen tijd voor.

Stelling 3

- De NL overheid doet toch alleen maar consultatie, dan hoeven we toch niet de principes te bediscussiëren?

Stelling 4

- Eigenlijk zouden de principes juist geschetst moeten worden door de politiek, dan hoeven we dat toch niet over te doen met de belanghebbenden?

Stelling 5

- Hoe kunnen we van te voren stakeholder processen beter inrichten, in plaats van achteraf constateren dat het weer niet werkte?
- En wie heeft daarin welke verantwoordelijkheid?

Stelling 6

- Als overheid willen we graag het proces beheersen, onderhandelen met de buurlanden is al moeilijk genoeg, we willen daar niet ook nog eens allemaal open-einde processen met stakeholders bij.

De deelnemers herkenden dat het eerst bespreken van principes (maar ook doelen) zijn nut kan hebben voor het proces; opbouwen vertrouwen. Vooraleer men kennis wil delen, het eens kan worden over 'feiten', hoop je dat 'men over zijn eigen schaduw heen springt'. Dat wordt herkend als een opgave. Wat stuurt mensen, niet alleen belangen maar ook het normatief kader. Tammo reflecteerde dat bij organisatieverandering ook benoemd werd dat je mensen vaak in beweging krijgt door dat in te steken via normen en waarden. Wel is van belang om hier in het proces duidelijk te hebben wat benoemt wordt als "principe" of uitgangspunt, en wat een speler heeft als belang.

Ook werd herkend dat het veel uitmaakt hoe een stakeholder proces ingestoken wordt. Benoemd werd dat niet alle beleidsambtenaren dat belang herkennen, ofwel ze herkennen het wel maar weten niet hoe ze een proces anders zouden moeten voeren. Tammo gaf aan dat IMARES ook een rol kan spelen in zulke processen begeleiden, als de expertise er bij het ministerie niet is.

Het zoeken naar wat hindert een proces, en daar de tijd voor nemen is nuttig. Dat hoeft niet altijd te gaan over principes overigens. Als dat zo snel mogelijk gebeurd, kan het een proces ten goede beïnvloeden.

Politieke realiteit is wel dat de overheid over het algemeen een 'open' proces niet snel aandurft. De overheid wil geen afbreukrisico lopen, wil graag sturing houden. Dat wil nog wel eens botsen met wat stakeholders motiveert.

Uit het gesprek kwam naar voren dat participatie veelal een taak is die omschreven is in een richtlijn. Maar dat niet veel nagedacht wordt over hoe zo'n proces georganiseerd moet worden (type participatie, level van participatie). Beetje 'checklist' activiteit. Daarnaast geeft men aan dat participatie ook kenmerken heeft van een mythisch ideaal, maar dat het geen hard principe is; oftewel in theorie een mooi uitgangspunt maar in de weerbarstige praktijk van alle dag lastig te realiseren. Enerzijds speelt hier in mee dat de overheid geen 'card blanche' voor een proces kan geven: beleid heeft zich te committeren aan de vigerende politieke realiteit dus lastig om je á priori te committeren aan een uitkomst. En aan de andere kant ook de vraag van het commitment van de andere participanten: in praktijk wil het nog al eens zo zijn dat als een sector in het inspraakproces haar gelijkt niet weet te halen, de issue vakmatig wordt geëscaleerd naar ministerie, parlement, politiek en Europa.

Vanuit EZ werd aangegeven dat onderzoeksinstituten meer tijd en ruimte zouden moeten inbouwen in projecten voor EZ om te komen tot een goede vraag. Zo'n eerste fase kan best wat langer duren, zodat steeds bijgestuurd kan worden alvorens er een goede vraag ligt.

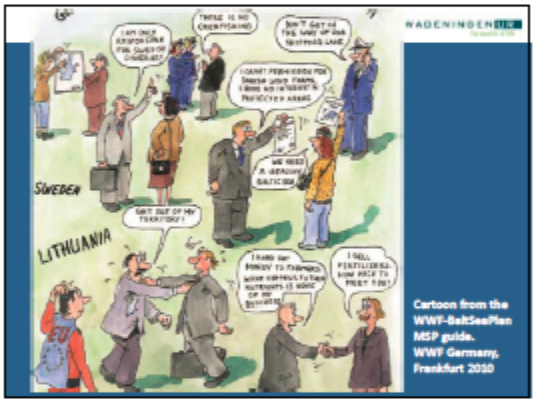
Het plaatje van de toren van Babel, leidde ook tot reflectie over hoe men soms in een gemengde groepen lang kan praten over iets, en dat achteraf blijkt dat men een heel ander beeld heeft bij een onderwerp ofwel een andere definitie van een concept.

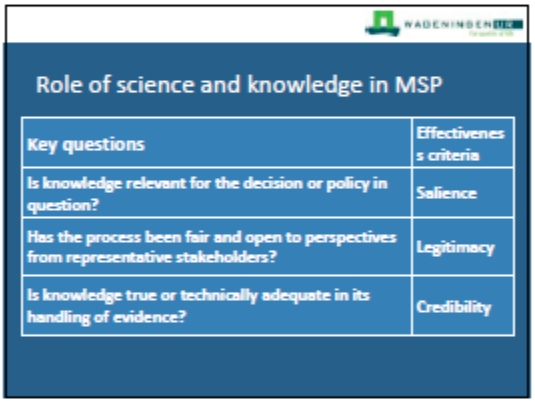
Lastige punten aan participatieprocessen: wie zit aan tafel, wat is mandaat, wie wordt wel en niet gerepresenteerd, wat levert het op in verhouding tot wat kost het (ook in relatie tot parallelle processen – via beleid, via kamer).

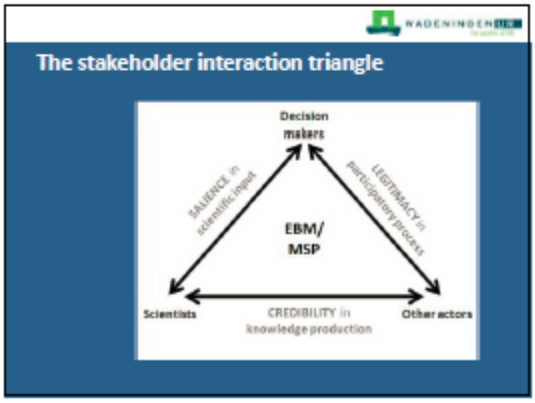
Samen tot gedeelde besluiten komen, onder invloed van belangen, principes maar kunnen ook persoonlijke dingen onder zitten of 'politiek geheugen' (als tussen MS is).

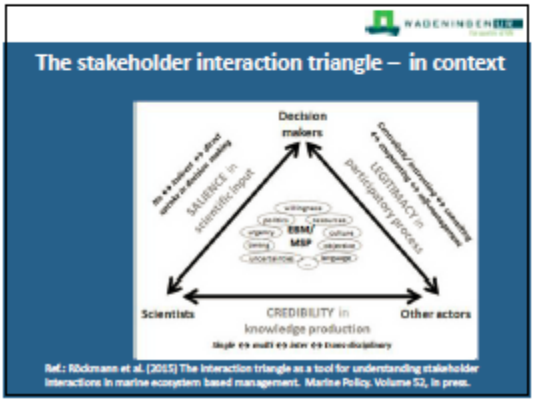
Reflectie Loes: in NL taal goed benoemen waar we het over hebben bij 'goveners' – beheer, beleid, politiek; zij die besluiten nemen (politiek), zij die beleid ontwikkelen, zij die uitvoerder van beleid zijn (vb wegen aanleggen), zij die wetten controleren (toezicht). Scherper verschil maken tussen principes en doelen; loopt in verhaal wat dooreen.

17. De Rol van Wetenschap en Kennis in beheer van de zee









Operationalization – salience

- Is the knowledge provided relevant or valuable for the decision or policy in question?
- Does it fit into the policy challenge behind the question?
- Was the knowledge presented at a scale useable for policy-making?
- Was the timing of the knowledge product in line with the requirement for policy-making?
- ..

Operationalization – legitimacy

- Has the knowledge process been open to perspectives from different stakeholders? It is fair, unbiased, and respectful of stakeholders? Did all stakeholders have an equal/balance amount of resources during the knowledge production process?
- Has the knowledge been derived while considering all relevant sources of information?
- Does the knowledge produced show a preference for certain types of data or information?
- ...

Operationalization – credibility

- Has the knowledge been produced according to the scientific standards? It is technically adequate in its handling of evidence? Has the knowledge been adequately (peer) reviewed?
- Did the researchers carrying out the research have the expertise to do the analyses?
- Has the knowledge produced (results) included the needed expertise? (Different disciplines)
- Quality of data & information, transparency of procedures.
- ...

- MSP and maps:

  Hoe omgaan met kaarten?
  Wat zie je (niet) ?
  ... Zekerheid van gegevens? ...

- Wat moet je (nog?) weten?

Monsters in het Voordelta:
- weinig replica's uit vergelijkbare periode
- ongunstige tijd van bemonsteren (februari)
  → weinig voedsel
  → slechte kwaliteit

→ redenen, dat voordelta een 4 heeft op de kaart, maar het zegt niets uit, of die locatie echt minder geschikt is dan de anderen

- Feiten lossen geen problemen op

- Salience is afhankelijk van een goede vraagfacilitatie.

  Garbage in – garbage out

- Nieuwe rol van kennisinstituten:

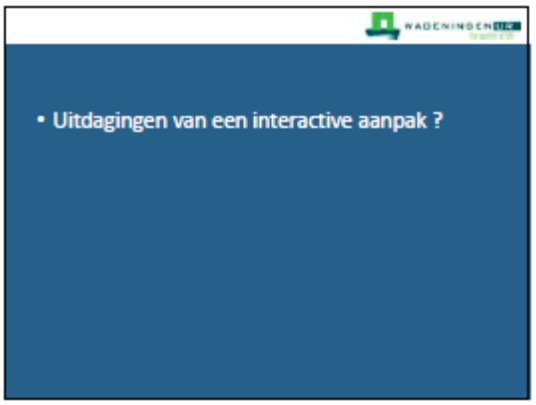
  IMARES moet niet alleen op credibility letten, maar ook op salience en legitimacy

- Het is een afweging:

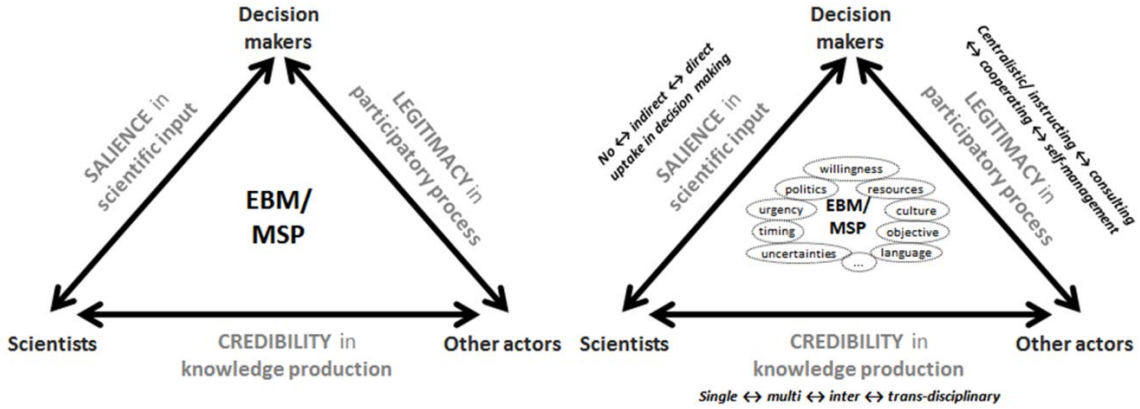
  Door meer salience en legitimacy neemt credibility van een wetenschappelijk instituut af.

- Interacteren / participeren – hoe doe je dat ?

- Welke omstandingheden zijn bepalend of/ hoe veel interactie mogelijk is?



- Ecosysteem benadering
    - Trade offs needed
- 3 effectiveness criteria (salience, credibility, legitimacy = SCL) + key questions
- Stakeholder interaction triangle
    - Alle 3 aspecten niet eerder samen, in ZOZ wel.
    - Mate van interactie hangt van type probleem af
- Decision maker staat boven. Daar ligt het initiatief voor planning en management. Iemand moet beslissen. Maar kan ook de verantwoordelijkheid aan anderen delegeren.



De discussie is voornamelijk langs de assen van de figuren verlopen, en in dit verslag ook zo opgedeeld.

Algemeen:

- Triangle is een heel herkenbaar plaatje- ook in andere werkvelden van toepassing. Het is daarbij interessant om te weten wat er gebeurd op elk hoekpunt tussen actoren.
- De vraag is hoe participatie is geregeld per land. Is immers door EU opgelegd in bv de KRM. Kan deze figuur/raamwerk daaraan bijdragen? --> De invulling is per land afhankelijk. Criteria liggen wel vast, maar invulling niet. De punten in het midden van de driehoek spelen dan een grote rol.
- Wie aan tafel zit rondom een kennisvraag of beleidsopgave is vaak bepaald door urgentie en keuze van methoden

Salience / Credibility

Onvolledige/foute kennis obv data leidt tot misvattingen, als kennis uit andere toepassing wordt gepresenteerd voor andere doeleinden, of onvolledig is (voorbeeld gebruik van bestaande kaart voor een ander doeleinde/ andere interpretatie).

- niet alles willen vatten in cijfers, als het nog niet bekend is. Een vraagteken kan ook
- Kaarten zijn nuttig, maar wel met de juiste uitleg--> rol wetenschap
- Kaarten en advies nuanceren, wel al in de kop.
- Rol van de samenleving speelt grote rol en perceptie hangt af van berichtgeving
- "Zo blijven we in NL doorpolderen"

Credibility

- Stakeholders worden niet genoemd in credibility sheet. Verbazend. De black box moet open. Zijn stakeholders überhaupt wel betrokken bij doen van onderzoek is de vraag.
  --> To do: nog vragen over stakeholders toevoegen aan tabel!!!
- Aspect van timing in het proces: wanneer wordt iemand belanghebbend/betrokken. Andere vraag daarbij is wie wordt door wie betaald voor deelname/tijd/inbreng.

Legitimacy:

- In de driehoek staat "samenleving niet". Antwoord: Ja, maar wel andere woorden die met samenleving te maken hebben. Die staan binnen in de driehoek, bv. cultuur, politiek. Wordt gemengd ontvangen, moet prominenter? Is nogal bepalende rol. Samenleving agendeert, niet alleen via politiek.
- Waar in het proces zit kennis in de besluitvorming? Veel vragen zijn nu nog procesvragen. Wat niet strookt is in de uitvoering of dat de wetenschap iets moet vinden van dat proces. Je levert immers aan, aan het proces. Je bent geen procesbegeleider.
- Vorige punt vinden andere deelnemers een ouderwetse benadering. Het is tegenwoordig niet meer zo dat je als wetenschapper alleen maar data levert.
  - Er volgt een miscommunicatie over data/informatie/kennis. Onderscheid tussen kennis/informatie. *(Intermezzo door Diana: onderscheid kennis/data/informatie, houd de discussie zuiver)*
- Wetenschappers gaan bedoelt of onbedoeld het "proces doen". Is niet wenselijk. Plotseling aangewezen, of andersinds in die rol gekomen. Wetenschap MOET niet betrokken zijn bij implementatie. Wetenschap moet niet verantwoordelijk worden gesteld voor de te maken keuzes.
- Een tegenhangende inbreng vanuit de overheid: Overheid zoekt diverse kennispartners, ook in het perspectief van stakeholders die kunnen aandragen, om vragen in beeld te brengen die nog niet bekend zijn. Dat hangt af van mens en organisatie (interpretatie: wie je bent, wie je kent en waar je werkt). Wetenschappers zijn dus ook betrokken in proces.
- Er volgt een discussie over de rol van wetenschapper. Is de wetenschapper wel of niet stakeholder. Als onderzoeker heb je geen belang bij een *gezonde* zee, wel als persoon, niet als wetenschapper. Deze stelling wordt verdeeld opgepakt in de groep. Meeste mensen zien wetenschapper wel als stakeholder, hebben immers een belang bij de zee (het is werk).

- De missie van IMARES impliceert dat je bijdraagt aan *duurzaam* gebruik van de zee. Dat zou als je puur wetenschap doet, er niet moeten staan, maar bv wel: kennis van zee. In het woord "duurzaam" wordt een waarde toegekend. Maar is dat de rol van wetenschap niet om daaraan bij te dragen, als je uitgaat van de pure definitie van "waardevrije" wetenschap.
- Onderzoek wordt betaald door partij x, dat kan de conclusie/advies beïnvloeden. Door het woord duurzaam maakt IMARES zich onduidelijk in de missie (integer, beïnvloed, interpretatie).

- In de loop van de jaren wisten beleidsmedewerkers de kennisvragen niet meer te stellen, en beleidsmakers vragen aan wetenschappers wat de vragen zijn. Onder meer door het bezuinigen. Dus de rol van toegepaste wetenschap is zeker te verdedigingen, los van de missie van een instituut.
- Stelling door deelnemer: Probleem ligt bij de overheid, die ervan uit gaat dat kennis vrij is van waarde.
- Goed om spiegel voor te houden, zoals in project ZOZ, maar dat had eigenlijk de overheid moeten doen (opdracht geven)
- De wetenschap moet eigenlijk de overheid een spiegel voor houden.

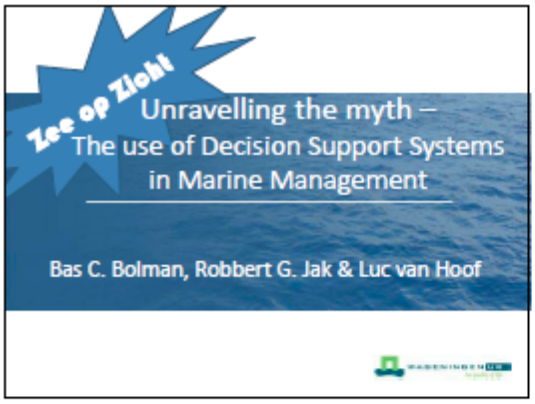
- Er zijn legio voorbeelden dat wetenschap wordt aangewend om politieke keuzes te verantwoorden, is niet zuiver.

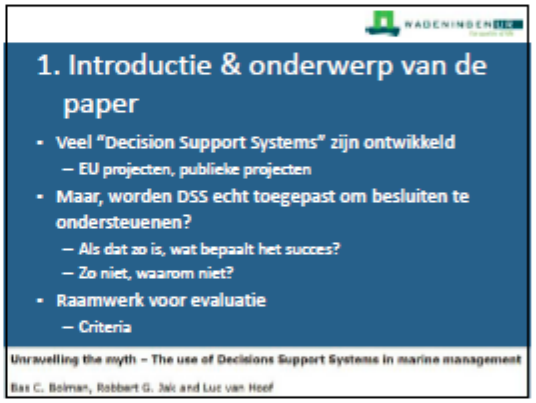
- Vraag aan de overheid is welke rol je zelf moet spelen in de legitimering van kennis.
- Overheid betaalt kennis instituten. Geeft een lastige positie want je bent afh van de geldstroom, en wilt deze continueren. Een framwoek van programma gelden geeft meer vrijheden en minder afhankelijkheden.
- Handel commerciëler (als kennisinstituut), maak allianties. Daar is ruimte voor.

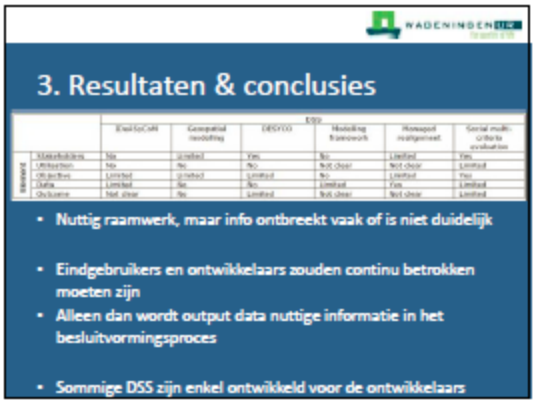
- Wat de overheid vraagt, de klant oplevert, en in stakeholder meetings wordt gepresenteerd, is NIET wat er in de buiten wereld als perceptie leeft, kan een groot verschil in zitten. KRM als voorbeeld genomen (gebiedsluiting), hoe kan dat aangepakt worden. Legitimiteit zit er dan vooral in HOE het onderzoek tot stand komt. (voorbeeld keuze model, of workshop, of anders.
  vraag is vervolgens is dat erg? Wel als onderzoekers de proces rol krijgt, en dat de overheid zegt "zo gaan we het doen".
- Verwachtingsmngt is van belang. Vraag is dan cruciaal: bv alleen WAAR, en niet het "WAT" . En meer nog: het WAAROM. Dan wordt het belang duidelijker. Rol voor overheid.
- Bekijk eens wat cases (scheepvaart, olie gas etc), hoe verhoud de 3-hoek zich tot die cases. Driehoek kan als evaluatie tool dienen. Kan ook tot keuzes leiden om bv in bepaalde gevallen stakeholders minder te betrekken, of keuzes te maken

- Opvallend dat science hoek tegenover de Legitimacy as staat, terwijl hier de meeste discussie over bestaat in deze groep
- Als kennisinstituten wordt door de situaties in een hoek gezet (niet goed genoeg, rol verkeerd, etc), door duidelijk te zijn over waar de legitimacy zit, kan dit beter???--> wees als instituut bewust van rol, vraag.
- Hoe manage je percepties
- Stakeholders zitten er ook wel in (in het proces/aan tafel) als "niet willen". Een doel op zich is rekken en strekken, en hoeft niets te maken te hebben met kennisdiscussie.

18. De Mythe van DSS







Waaraan moeten DSS voldoen om te worden gebruikt door end-users?

Als mensen hebben we een brein op basis waarvan we met informatie (aangedragen door anderen) beslissingen nemen. Een DSS kan helpen bij het ondersteunen en nemen van beslissingen.

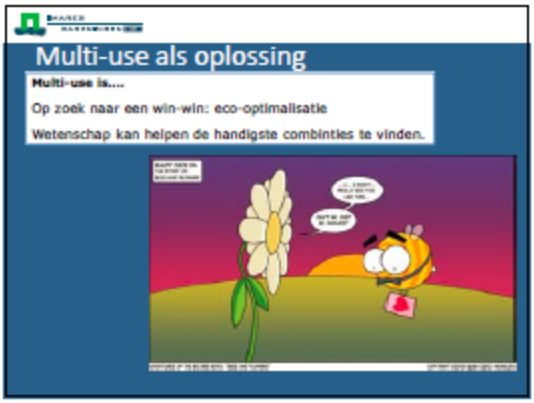
Bij het nemen van besluiten speelt “beleven” een rol. Om informed decision making mogelijk te maken kan je DSS toepassen. De output van een DSS ondersteunt het “beleven”.

Kennis speelt hierin een rol: kennis is betekenis geven aan feiten. Deze kennis kan in een systeem vastgelegd worden. Om een goed totaal beeld van bv, de Noordzee te krijgen moet zoveel mogelijk kennis verwerkt worden (compleet) en de uitkomsten gevisualiseerd.
Kenmerken: digitaal, integraal (compleet; biologisch, fysisch), geografisch, visueel, transparant.

Ideaal zou zijn een soort back-office waar kennis/wetenschap/keuzes wordt opgeslagen in modules, met een front-office als interface voor de gebruiker (engine). Op dit moment wordt aan een dergelijk systeem gewerkt (The Digital Aquarium).

Een DSS moet helpen in de toekomst te kijken.

19. Meervoudig ruimtegebruik op zee



Problemen voor de integratie

- (Gebrek aan) prikkels grote spelers (OWE)
  - Winstgevendheid
  - Innovatieve karakter van tooegevoegd gebruiken
- Risico's
  - Financieel
  - Verzekering(en)
- Wetten / Regelgeving

Wie heeft of wat is een probleem?

- Techniek?
- Operationeel?
- Governance?
  - Wie is de eigenaar?
  - Wie is verantwoordelijk? En waarvoor dan?
  - Wie kan beslissen?
  - En waarover dan?
  - Wie bepaalt/bepalen dit allemaal.

$$m\frac{d^2\vec{x}}{dt^2} = -k\vec{x} - b\frac{d\vec{x}}{dt}$$

$$m\frac{d^2\vec{x}}{dt^2} + b\frac{d\vec{x}}{dt} + k\vec{x} = 0$$

Technologische mogelijkheden…

& prikkels ontwikkelen:
- Maatschappelijk Verantwoord
- Ondernemen
- Kosten reduceren

Bron: MCN-Blauwdruk final report, in prep.

Samenvattend

- Toenemende noodzaak tot het combineren van activiteiten
- Wetenschap kan helpen om slimme oplossingen te vinden
- Juridische randvoorwaarden zijn belangrijk en..
- Goede governance
  - Goed voorbereid planning proces
  - Noodzaak voor interactie
  - Prikkels ontwikkelen

- Een uitdaging is om elkaar vinden als belanghebbende om gezamenlijk combineren van activiteiten.
- Een verandering van denkraam om samen te werken (ook binnen een sector vb. visserij)
- Goede coördinatie en organisatie is nodig voor meervoudig gebruik van de zee en gezamenlijk activiteiten op te pakken.
- Praktische zaken regelen :
    - Verzekering
    - Materiaal
    - Kapitaal
- Veiligheid / SAR is een issue bij multi-use op zee (vb. activiteiten in windparken.) Dit moet goed geregeld zijn.
- We willen wel, maar waarom zouden we het doen? Wat levert het op? (vb. zeewier in windparken – zeewierkwekers willen locaties in de luwte, niet ver op zee met veel wind.) Eerst voordelen bekijken dan pas de nadelen.
- Internationale verschillen in activiteiten in windparken:
    - BE: medegebruik van windparken is al van begin af meegenomen
    - UK: CE -> licenseert/vergund = oud gebruik
    - DE: BSH
- Visser wordt aanbieder van multifunctionele diensten (blauwe diensten): visser, recreatie, duiken, maintenance
- Focus ligt op windparken…maar zijn er ook andere alternatieven? O&G, MPA
    - Defensie: vb. revalueren van bestaande defensie gebieden. EZ geeft aan dat hier al heel veel gespreken over zijn geweest met defensie – maar tot nu toe nog niet succesvol.
    - Scheepvaart overlappen met MPA?
    - OWE op de Klaverbank?
- Wat gebeurt er buiten Europa op dit gebied: VS, CA, Maleisië, Singapore…

20. Reflectie van buitenaf door Prof. Dr. Wim Derksen

twee benaderingen voor beleid

- rationele benadering
- politieke benadering

rationele benadering

- realiseren van heldere doelen
- finaal denken: doelen en middelen
- doelmaximalisatie door inhoudelijke rationaliteit: heldere inschatting effecten, heldere formulering doelen en criteria
- mechanistische opvatting ten aanzien van samenleving: maakbaarheid, beheersbaarheid

lineair en cyclisch beleidsproces

probleem

agendering

voorbereiding

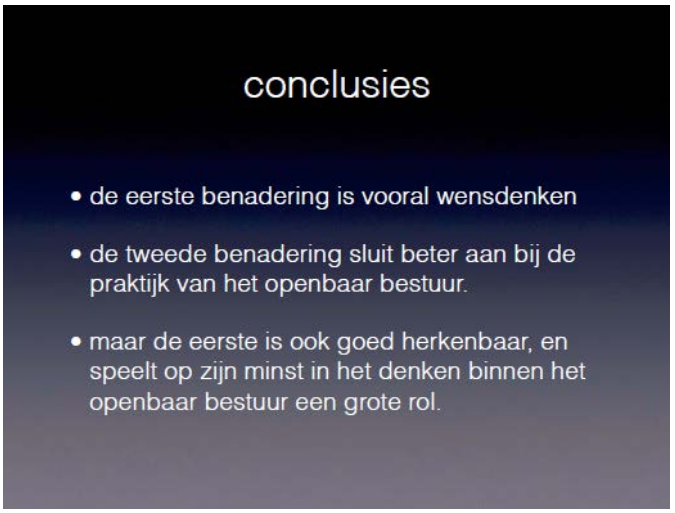
bepaling

uitvoering

evaluatie


politieke benadering
• het gaat om een permanente machtsstrijd
• poly-centrisme in plaats van mono-centrisme
• beleidsnetwerken met wederzijdse afhankelijkheden - zoeken naar draagvlak
• het gaat om politieke rationaliteit


politieke benadering (2)
• Proces: rommelig, grillig, muddling through, fasen lopen door elkaar heen
• Garbage can: probleemdefinities, oplossingen, instrumenten, keuzemomenten: onduidelijk mengsel ('oersoep')
• Kingdon: problemenstroom + beleidsstroom, politieke gebeurtenissen brengen beide stromen bij elkaar: policy window = toeval


conclusies
• de eerste benadering is vooral wensdenken
• de tweede benadering sluit beter aan bij de praktijk van het openbaar bestuur.
• maar de eerste is ook goed herkenbaar, en speelt op zijn minst in het denken binnen het openbaar bestuur een grote rol.

ruimtelijke ordening

- in het eerste model: integraal, met zorgvuldige uitvoering
- in het tweede model: sectoraal, fragmentarisch, met steeds weer nieuwe discussies

kennis in beleid

- rationele benadering: ze willen iets weten
- need-to-know kennisvragen
- passend bij de politieke context
- beleid = weten + willen

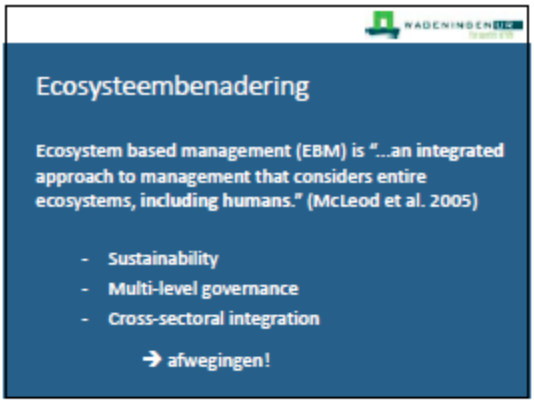
kennis in beleid (2)

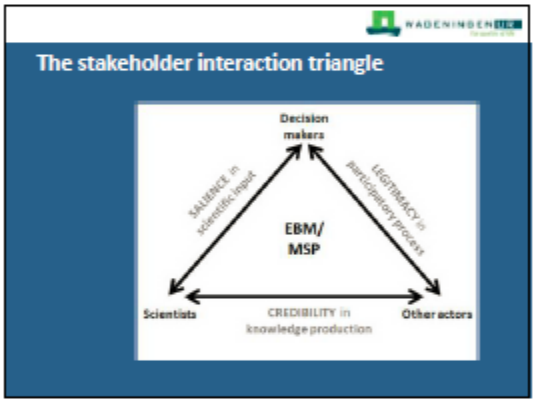
- politieke benadering: ze willen iets horen
- kennis om bepaalde probleemperceptie te ondersteunen
- en veel nice-to-know kennisvragen (ook omdat de kennisinstituten dat goed uitkomt)

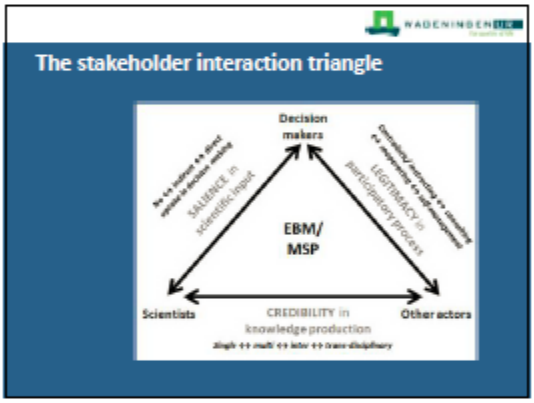

Imares
Onderzoeksinstituut Imares, kennis van mariene ecosystemen voor duurzaam gebruik en beheer van kust en zee

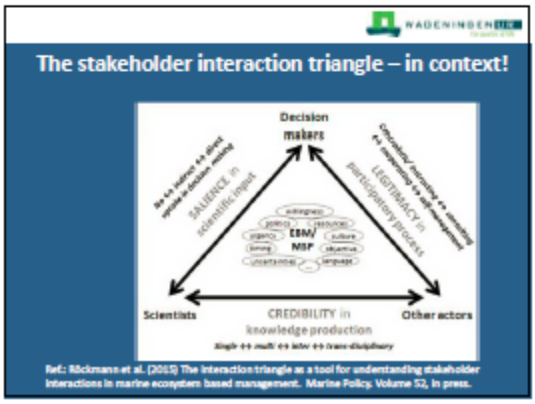

wat te doen?
• onderzoekers moeten weten dat onderzoek nooit aantoont wat je moet doen
• en ze moeten een veel groter politiek benul hebben, in plaats van in schoonheid te sterven

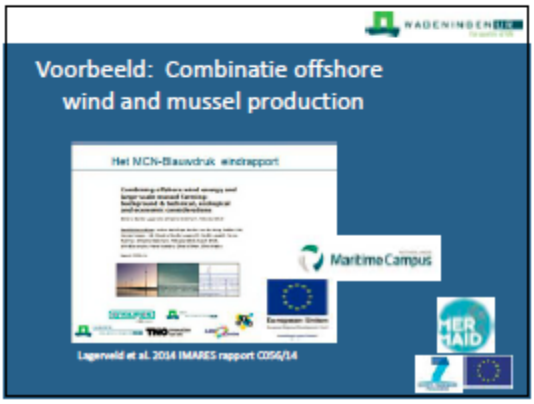
21. Plannen op basis van het Ecosysteem; hoe doe je dat?











Startpunt: Interviews met stakeholders

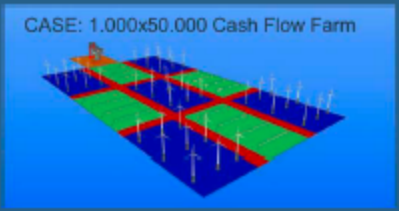
Energie/Windsector, Aquacultuur/Mosselsector, Logistiek/ Techniek (haven,scheepvaart, machines…), Overheid, NGOs

- → combinatie van activiteiten is technisch mogelijk
- → vrijwillig zal het niet gebeuren
- → wel om draagvlak te creeren

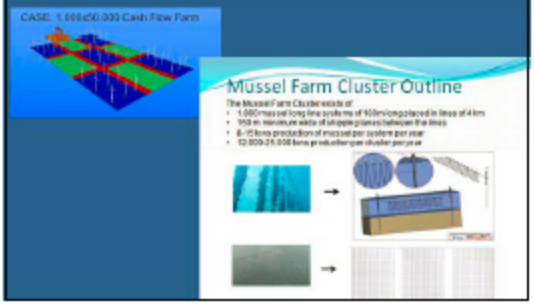
Een "Blauwdruk" voor combinatie van complexe activiteiten offshore

1. Introductie
2. Zicht op multi-use in de Noordzee
3. Offshore wind energie
4. Offshore aquacultuur
5. Technische aspecten offshore
6. Ecologische risico's en mogelijkheden
7. Business case: Scenario simulations
8. Conclusies en aanbevelingen

Virtuele offshore wind & mossel farm



Virtuele offshore wind & mossel farm

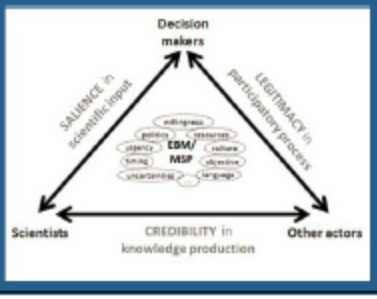


Van planning naar uitvoering

Blauwdruk aanbevelingen:

1. Klein beginnen (pilot projects), dan langzaam opschalen
2. Goede samenwerking vereist tussen de verschillende disciplines
3. Monitoring van ecologische effecten
4. Onderzoeken technolgische risico's (bv. invloed aquacultuur op zeewater/ corrosiviteit)
5. Diversificatie van aquacultuur soorten – toekomst voor oesters en zeewier

Wetgeving, vergunningen, financiering…



- Er moet een wettelijke verplichting voor multi-use komen

- Het aanbrengen van aquacultuurinstallaties aan windturbines betekend geen extra risico voor een windpark.

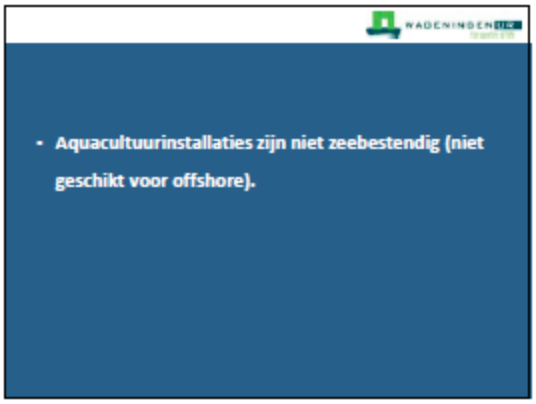
- We weten zeker waar de beste windgebieden in de Noordzee liggen.

- We weten zeker waar de beste windgebieden in de Noordzee liggen.
- Het bouwen van offshore windparken moet op schaal van de gehele Noordzee worden gepland, niet van elk land individueel.

  → alle windmolens naar Denemarken

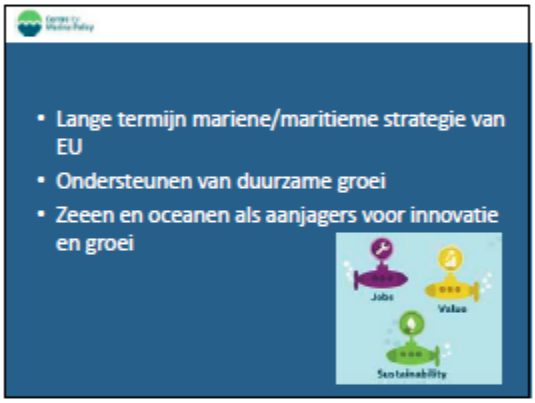
- Mosselteelt offshore kan niet:

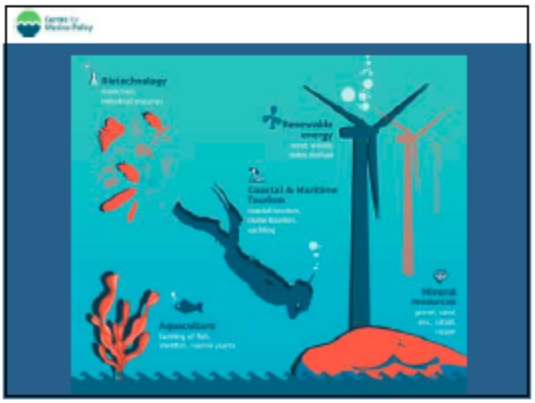
  Er zijn niet genoeg nutriënten

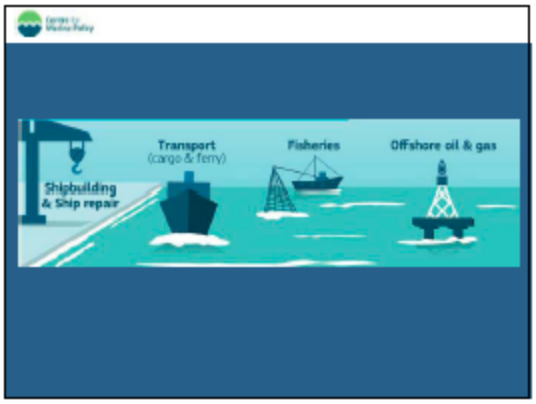


De discussiesessie heeft niet plaatsgevonden

22. Blauwe groei, hoe gaan we dat doen?







Wat is de waarde van de blauwe economie?

Banen:
5,4 miljoen

Bruto toegevoegde waarde:
500 miljard per jaar

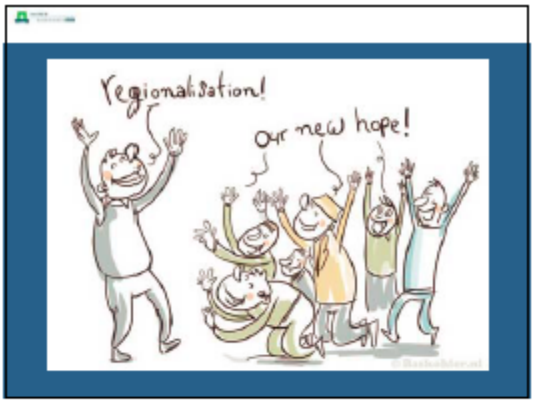
Uit welke onderdelen bestaat de strategie?

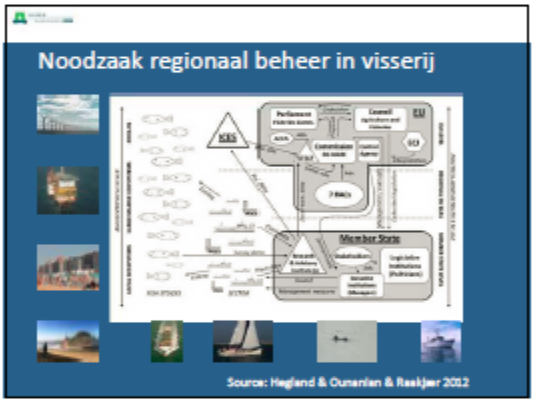
1. Ontwikkelen van sectoren met potentie
2. Leveren van kennis, juridische zekerheid, veiligheid
3. Betrekken van relevante stakeholders
4. Sea basin strategie voor op maat gemaakte maatregelen

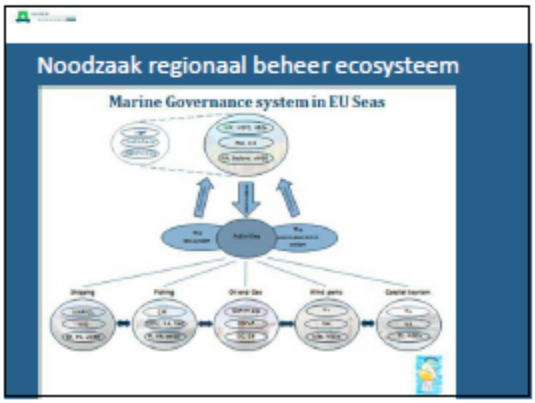
Discussie

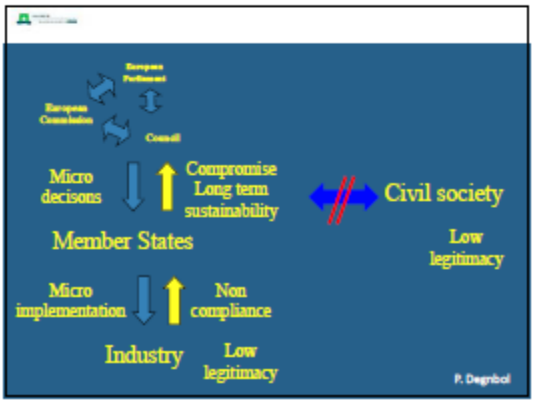
- 1 km zee is minder waard dan 1 km land?
- Vooral economie, minder op duurzaamheid
- Spanning, bijv deep sea mining. Effecten ecosysteem onduidelijk. We kennen het ecosysteem niet. Tegelijk wordt hier wel op ingezet door BG. Zowel binnen als buiten EU: niet geregeld.
- Als bepaalde sectoren ontwikkeld moeten worden dan moeten ondernemers dit oppakken.
- Overheid is ook verantwoordelijk. Aanjagen met subsidies tot dat het winstgevend wordt
- Overheid moet innovatie risico's dragen
- Veel inzet van subsidie naar onderzoek, maar inzet bedrijfsleven is cruciaal
- Gevolg: in de praktijk kort gericht onderzoek. Voor lange termijn kortzichtig.
- Is de integrale aanpak nodig voor BG? Of is dat niet nodig? Integraal = groot, heldere afspraken, wordt complexer
- Waarom is toerisme onderdeel van BG? Vooral regionale onderdelen bv Baltische zee gebruiken dit om geld uit Brussel te halen
- NL: wil zo weinig mogelijk inmenging met EU. Baltische zee juist wel, meer geld. NL: het levert toch niets op uit Brussel.
- Hoe wordt visserij gezien binnen BG? Als gesprekspartner of als indiaan?
- BG gaat om banen, dus zou goed moeten zijn voor visserij. Tegelijkertijd heeft visserij geen prio binnen BG.
- In essentie gaat het om voedsel productie. Basis behoefte. BG is vooral banen, maar voedsel komt er niet in voor.
- Groei van de ene sector kan ten koste gaan van andere sector. Komt dat wel voor in BG?
- Bijv: meer windparken = minder visserij
- Obstakels voor vissen in wind parken: (gezamenlijk)
    - Visser is individualistisch
    - Regelen van verzekering
    - Veiligheid
    - Regelgeving

23. Regionale samenwerking, liever vandaag dan morgen?









Regionalisatie – waarom eigenlijk?

- Samenwerken over de grens nodig voor de taak (visserijbeheer, ESB, KRM…)
- Diversiteit regio's
- Korte termijn (jaarcyclus)
- Geen gedragen beleid (compliance)
- Micromanagement

Regionalisatie – wat is het eigenlijk?

- Beweging naar omlaag (EU -> lager niveau)
- Beweging omhoog (MS -> hoger niveau)
- Beweging eruit (sectoren zelf)

- Stakeholder participatie

Wat levert het ons op?

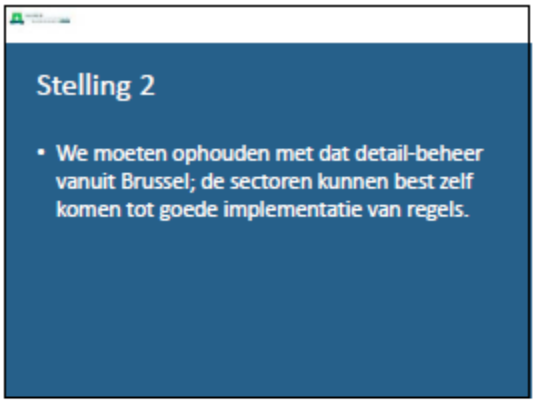
- Lange termijn perspectief
- Beslissingen dichterbij genomen hen die't aangaat
- Meer passend bij die regio
- Als participatief - ↑ legitimiteit
- Einde aan micro-management (visserij)
- MAAR -> Samen laten gaan in visserijbeheer met eigen verantwoordelijkheid (RBM, reverse burden of proof)

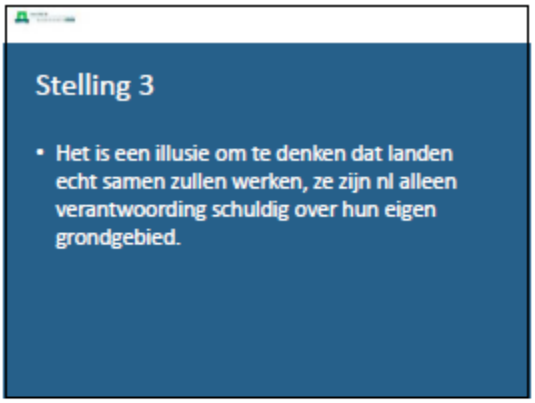
Hoe dan; waar ligt de grens?

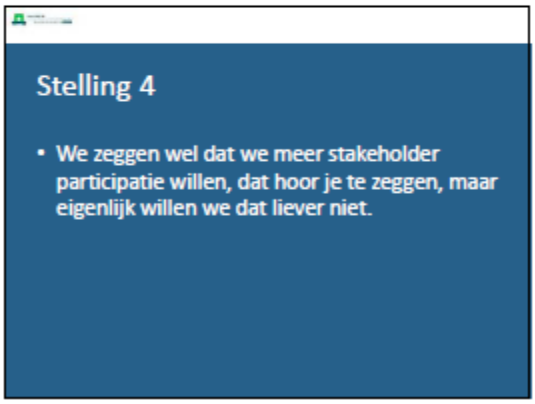
- Ecosysteem
- Beheer
- Lokaal
- Regio
- Landelijk
- Regio
- EU
- Internationaal

Stelling 1

- Regionalisatie gaat nooit werken als het aan de nationale overheden wordt overgelaten om tot samenwerking te komen.







Ondanks de herkenning van nut regionalisatie; werden voorbeelden besproken over de invloed van de politieke & juridische realiteit op processen van regionalisatie.

- Juridisch:
    - Energie is geen gedeelde markt, maar landen worden individueel daarop afgerekend. Kunt dus eigenlijk niet regionaal tot (optimalere?) afspraken daarover komen. Dat was bij N2000 ook zo.
    - Aparte regels in de Noordwestelijke wateren en de Noordzee is niet zinvol op het moment dat vissers in beide gebieden opereren.
- Politiek:
    - NL stemde voor regionalisatie, maar dat ligt ook aan insteek voorstel. Het ja zeggen is niet altijd inhoudelijk gemotiveerd, maar zit ook politieke logica achter – heb je reden om tegen te zijn? Zo ja, dan nog krijg je een voorstel alleen eruit als je voldoende landen meekrijgt die ook tegen zijn.
    - Vóór regionalisatie zijn betekent soms vooral tegen Europees niveau zijn.
    - Invoering aanlandplicht; dmv regionalisatie is de implementatie niet meer alleen het probleem van de commissie.
    - Thou shall cooperate (artikel 0) staat niet in de EU grondwet helaas; VK is de politieke realiteit dat men dat niet wil. Dan ben je als NL klaar.

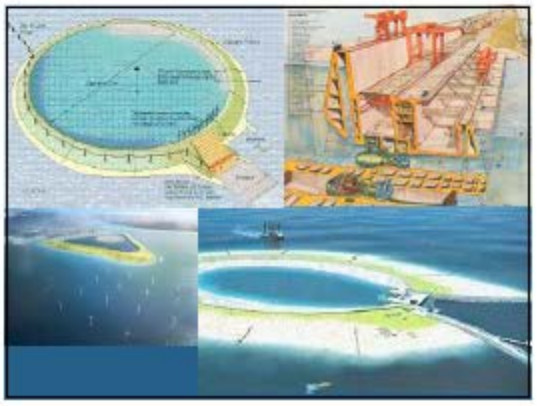
Toch sterkte conditionering vanuit land dat eigen gebied voorgaat. Te herkennen ook in spel MSP; ieder stelt toch snel eigen doelen, eigen tijdslijnen centraal. Het is ook eng om samen te werken; verliest controle. Terwijl je juridisch en politiek afgerekend wordt op eigen stuk. En dan is er nog een andere werkcultuur, andere talen, mensen wel / niet kennen wat allemaal van invloed is op samenwerken.

Tav micromanagement; is een erfenis van landbouwpolitiek EU – geprojecteerd op visserijbeleid. De politieke drijfveer achter 'results based management' is dat er sprake moet zijn van een terugtrekkende overheid. Bedrijfsleven moet zelf zorgen voor maatschappelijke en juridische license to operate. In de praktijk blijkt dat overigens wel lastig (visserij, wind).

Wellicht moeten we regionalisering niet te veel en te strak als principe proberen te implementeren, maar moeten we accepteren dat door 'muddeling trough' er over tijd vanzelf meer regionale samenwerking zal komen. Naast dat er een grote vraag ligt hoe dit regionaal institutioneel vorm te geven (waarbij een OSPAR+ niet als een reële optie wordt ervaren) ligt regionale samenwerking direct in het verlengde van het op enig moment gevoerde debat over juist meer of minder EU.

Overigens wordt ook geconstateerd dat de regionale zeeën van Europa grote verschillen kennen. Waar rondom de Noordzee bijvoorbeeld op het vlak van de visserij al snel ook samenwerking plaats vindt met de instituties uit de Westelijke wateren, wordt de Med juist opgeknipt in deelgebieden en vormt de minderheid van EU staten in de zwarte zee onvoldoende massa om de instituties daar vorm te geven richting het EU model.

24. Energie Eiland in Zee



Kansen te over

- Draagt bij aan transitie naar duurzame energie,
- Verlaagt de totale productie behoefte,
- Biedt kansen voor multifunctioneel gebruik (aquacultuur, zeewier, vlucht haven,....
- Stimuleert de Nederlandse maritieme sector (= export product)
- Natuur en biodiversiteit zijn gebaat bij gradienten en dus bij land-zee overgangen (ondiepe zee, biotopen voor kustbroedvogels, hard substraat organismen, ...),
- Biedt een impuls aan de zeegaande recreatie,
- .....

Waar wachten we op?

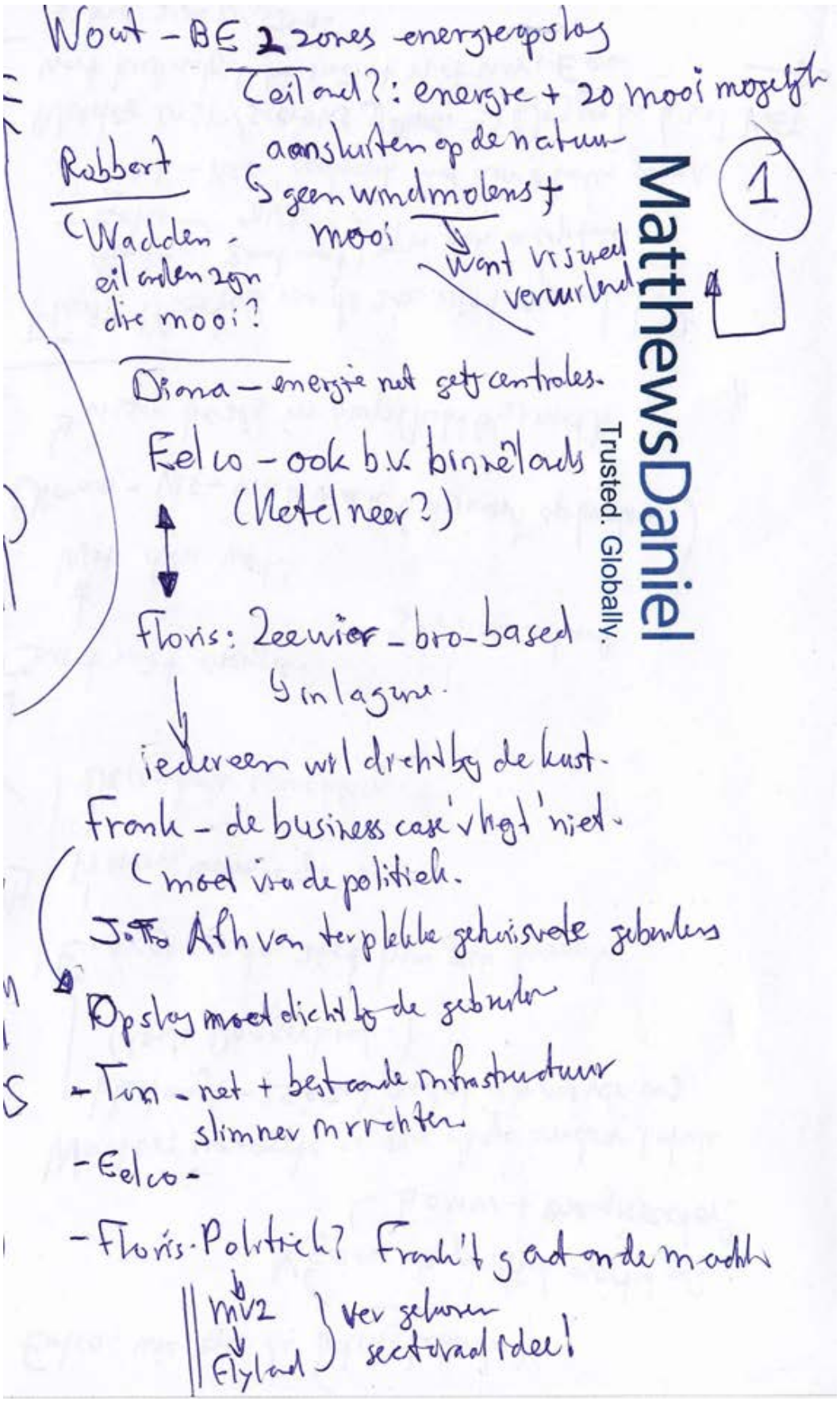
- Wie is er tegen?
- Hoe gaan we het regelen? ...
- Waar moeten we beginnen?
- ..
- ..

1. Specifieke stellingen

- Een energie eiland is absoluut nodig; had al gebouwd moeten zijn....Opslag van energie is nu belangrijker dan energiewinning.
- Het is voor de naam van Nederland (waterland, Maritiem land) nodig dat er een (overheids) impuls komt in de aanleg van kunstmatige eilanden.

2. Algemene stellingen (ZoZ)

- Wij mensen zijn land-'dieren'. Als we écht de zee willen benutten voor de wereldvragen (voedsel en energie), dan moet dat in de vorm van eilanden.
- De grens land-zee biedt de beste kansen voor natuur; rijke biodiversiteit en grote productiviteit. Eilanden passen in een actief natuurontwikkelingsbeleid
- We moeten ophouden dogmatisch te denken over de zee. Het archetype woeste zee, vrij uitzicht, ongeschonden wildernis is achterhaald. Zo goed mogelijk benutten.


Wout - BE 2 zones energieopslag
Eiland?: energie + 20 mooi mogelijk
aansluiten op de natuur
↳ geen windmolens +
mooi
want vrijwel verwaarloosd
1
Robbert
(Wadden - eilanden zijn die mooi?
Diana - energie net getf controles.
Eelco - ook b.v. binnenlands (Ketelmeer?)
Floris: Zeeuwse - bro-based
↳ inlagune.
iedereen wil dichtbij de kust.
Frank - de business case 'vhgt' niet.
(moet via de politiek.
Afh van terplekke gehuisveste gebruikers
Opslag moet dichtbij de gebruiker
- Tom - net + bestaande infrastructuur slimmer inrichten.
- Eelco -
- Floris - Politiek? Frank't gaat om de middelen
mV2
Flyland
} Ver gelopen sectoraal idee!
MatthewsDaniel
Trusted. Globally.

Floris || Energie eiland op Zee

Zee op Zicht 2012-12-02

bv. Plimlerendst

(LCA meervoudig ruimte gebruik.

Energie-opslag (> opwekking) als functie.

Eelco Leemans,
Wouter _ (DME)
Wouter Gufe
Ton Berendsen (Fugro)
Frank Zoop (RWS)
Diana
Sashia Hommes (Deltares)
Robbert, JT., Christine.

Stelling 1: Land-dieren (eilanden faciliteren)

Water: te duur? Smart-Grid (warmte-opslag

eenvoudig - alleen energie.

meervoudig - ook voedsel.

Eelco = te veel verspilling - bij productie, verwerking, transport, gebruik

besparen

- Ton: groeiend aandeel zon & wind (& water)

veel opwekking, hoe het te verdelen?

Vaak nog te duur om nu al op te pakken.

Ja ook, maar opslag gecombineerd kan't kansrijker maken.

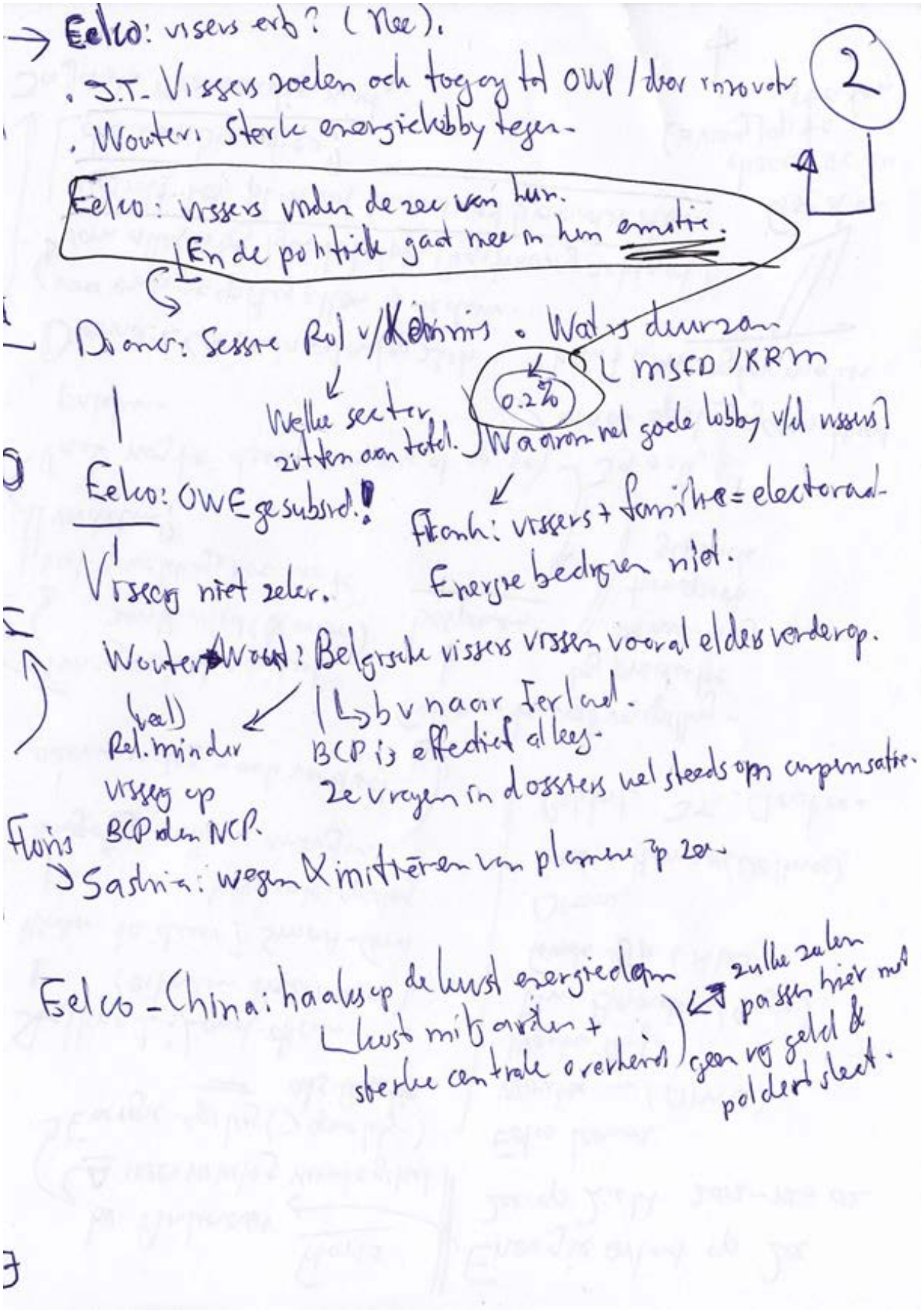
Diana: LCA: zo'n eiland op zich voor energie opslag alleen is te duur.

Van alles erbij lijkt te helpen (legitimering achteraf).

Wordt het plan wel levensvatbaarder door die combinaties?

Ja juist. Meervoudig moet,

Goed om discussie nu (= vraag) op te starten.


Eelco: vissers erf? (Nee).
. J.T. Vissers zoeken och toegang tot OWP / door innovatie
. Wouter: Sterke energie/lobby tegen.
2
Eelco: vissers vinden de zee van hun.
En de politiek gaat mee in hun emotie.
Diane: Sessie Rol v/ Kennis . Wat is duurzaam
MSFD / KRM
0.2%
Welke sector, zitten aan tafel.
Waarom niet goede lobby v/d vissers?
Eelco: OWE gesubsid.!
Frank: vissers + familie = electoraal
Vissers niet zeker.
Energie bedrijven niet.
Wouter/Wout: Belgische vissers vissen vooral elders verderop.
(bv naar Ierland.
(bell)
Rel. minder vissers op BCP's dan NCP.
BCP is effectief alleen.
Ze vragen in dossiers wel steeds om compensatie.
Floris
Sabrina: wegen & minimaliseren van plannen op zee.
Eelco - China: haalbaar op de kust energie/olie
kust mijnarbeiders + sterke centrale overheid
zulke zaken passen hier niet
geen vg geld &
polderstaat.

Eelco: wie zijn de belanghebbenden?

↳ gaan de politiek overtuigen?
↳ bouw + energiesector?

Wouter: vereerste is een diepe corridor tot de kleilaag (-25 à -30) en dat is er pas vér wg (denk Doggerbank.)

Energie sector ziet hier geen brood in

↳ Waar warmte opslag

↳ Decentrale opwekking.

↳ Juist niet energie?

↳ Wat dan wel?

Service-eiland

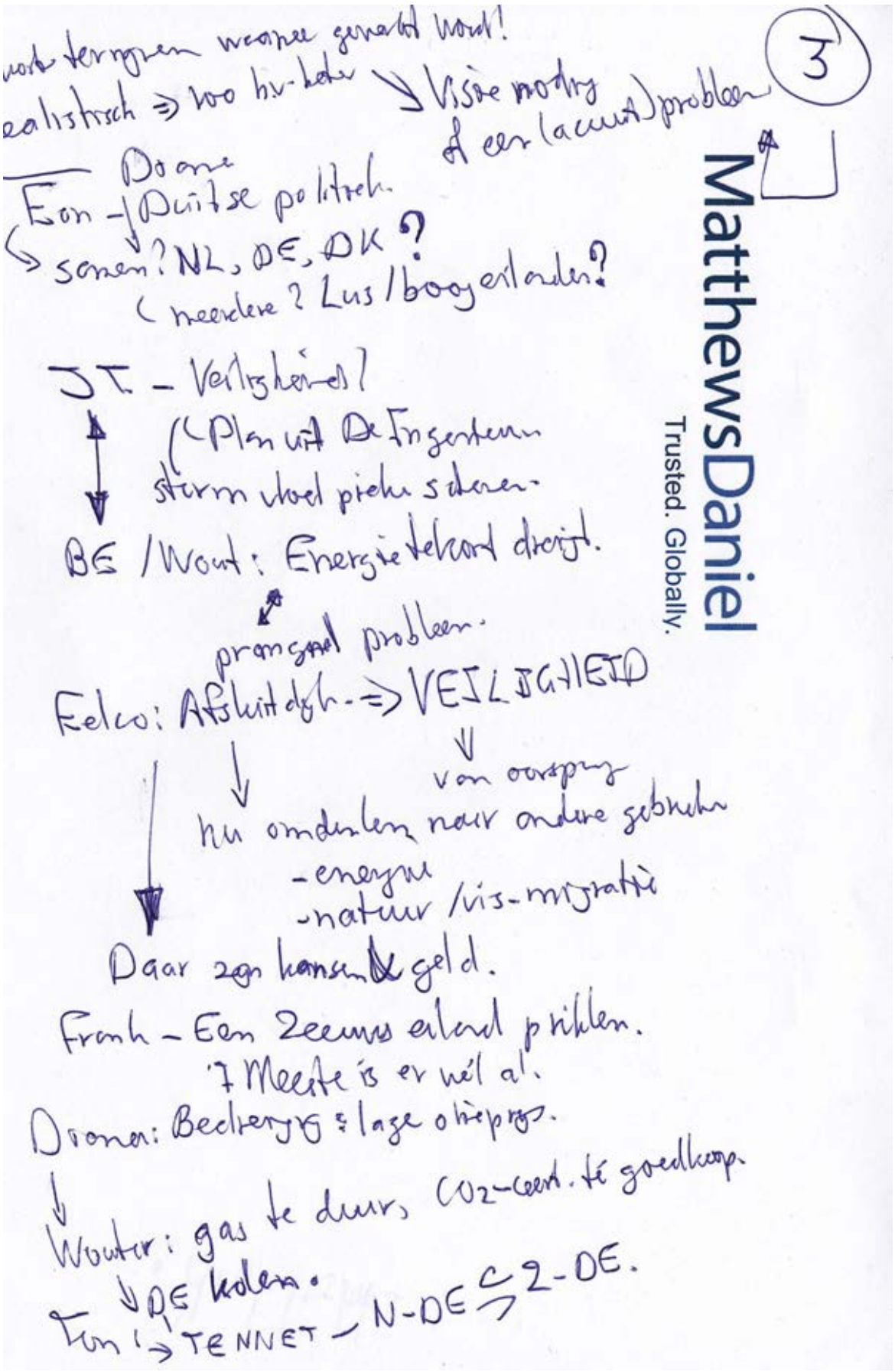
Diana - vis - nakweek (discard optimalen?)

↳ visser bezig in owp (lucht (wg) niet).

Floris Moeten we de zee niet open laten?

- Bleu- 2nd mat) zijn ook acceptabel
- Eelco - nV2
- Frank - Nee 'ecologisch' wel naar erboden gaven

Wouter MSP/serious game. ⇒ Doggerbank vol WET wat hoe met lucht wel + natuur. Een eiland zou passen.


MatthewsDaniel
Trusted. Globally.

Zeegebruik – land/of boot
└ vissers uit/en zee.

Floris: veel v/d wereldbevolking bevind kustnabij!

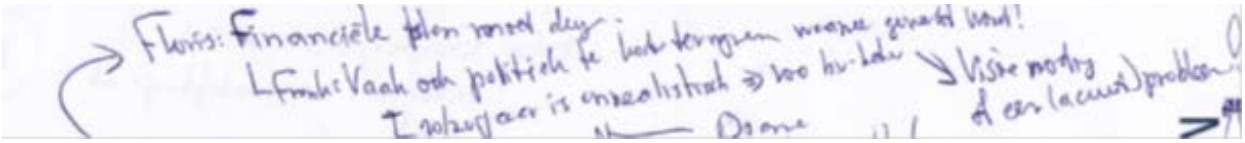
Nodig voor behoud van NL?
Wouter
Als wij het niet doen, doen ze het.
Taiwan er wel mee aan de haal
Ton: Die gaan ons wel vragen.

Frank: Durf hebben!
Prestige.
Lange termijn visie

Ton: Nietmee eens.
't Verkoopt niet.
Wouter Dubai ed zijn door NL gebouwd.
Tom Waardoor deugt het plan qua functies.

Zee: Stellen we de juiste vragen?
└ Tom Kracht energie = public-private initiatieven
synergie zoeken.
Diana in gezamenlijkheid → ontwikkelen / exploiteren

Tapas + gov.
Geen balans met andere zeeën
geen kabel met China.


Floris: Financiële
Vaak ook politiek

4

Edco: Energieopslag is vitaal,
maar niet noodzakelijk ijs als eiland.

Floris: Onmate[illegible] hoge invloed vissen i/d politiek.

Tom: NL Waterpartnership ≤ publ. / pps / priv. / S

- Probleem accuut of
- Visie nodig

Diana: plastic soep / ≠ eiland.

een probleem kun je 'creëren' neerzetten.

Edw: Rol NGO
probleem verwoorden & doen agenderen

Natuur & Milieu is een groot NGO speler qua ervaring.

Elementen in de Mix

Tom ook bij de Ingenieurs

meerdere pylons.

Aanmeldingen:

Achternaam	Voornaam	Organisatie
Abspoel	Lodewijk	Ministerie I & M
Berendsen	Ton	Fugro GeoServices BV
Bolman	Bas	LEI Wageningen UR
Broekhoven van	Wouter	Visned
Bult	Tammo	IMARES Wageningen UR
Burg van den	Sander	LEI Wageningen UR
Derksen	Wim	
Gotje	Wouter	IMARES Wageningen UR
Groenendijk	Floris	IMARES Wageningen UR
Hommes	Saskia	Deltares
Hoof van	Luc	IMARES Wageningen UR
Hotsma	Piebe	Ministerie EZ
Huygens	Marc	DEME
Jak	Robert	IMARES Wageningen UR
Kock	Hetty	Ministerie I & M
Kraan	Marloes	IMARES Wageningen UR
Lauwers	Geert	DEME
Leemans	Eelco	Stichting De Noordzee
Meier	Astrid	Hydriade
Mertens	Geert	Power@Sea
Prent	Okke Jaap	Fugro Geoservices BV
Prins	Theo	Deltares
Rockmann	Christine	IMARES Wageningen UR
Smith	Sarah	IMARES Wageningen UR
Steenbergen	Josien	IMARES Wageningen UR
Svoboda	Anne-Marie	Rijkswaterstaat
Toonen	Hilde	Environmental Policy Group Wageningen Universiteit
Vrees de	Leo	RWS Zee en Delta
Zevenboom	Wanda	
Zijp	Frank	RWS-Dienst WVL