



Marine Spatial Planning (MSP): A practical approach to ecosystem- based management

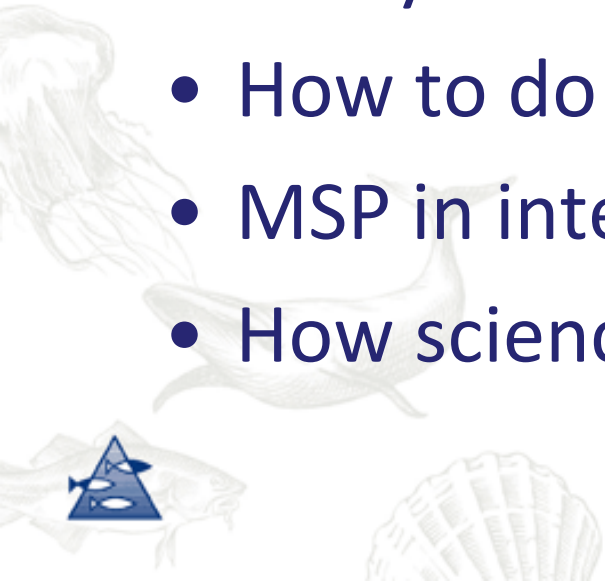
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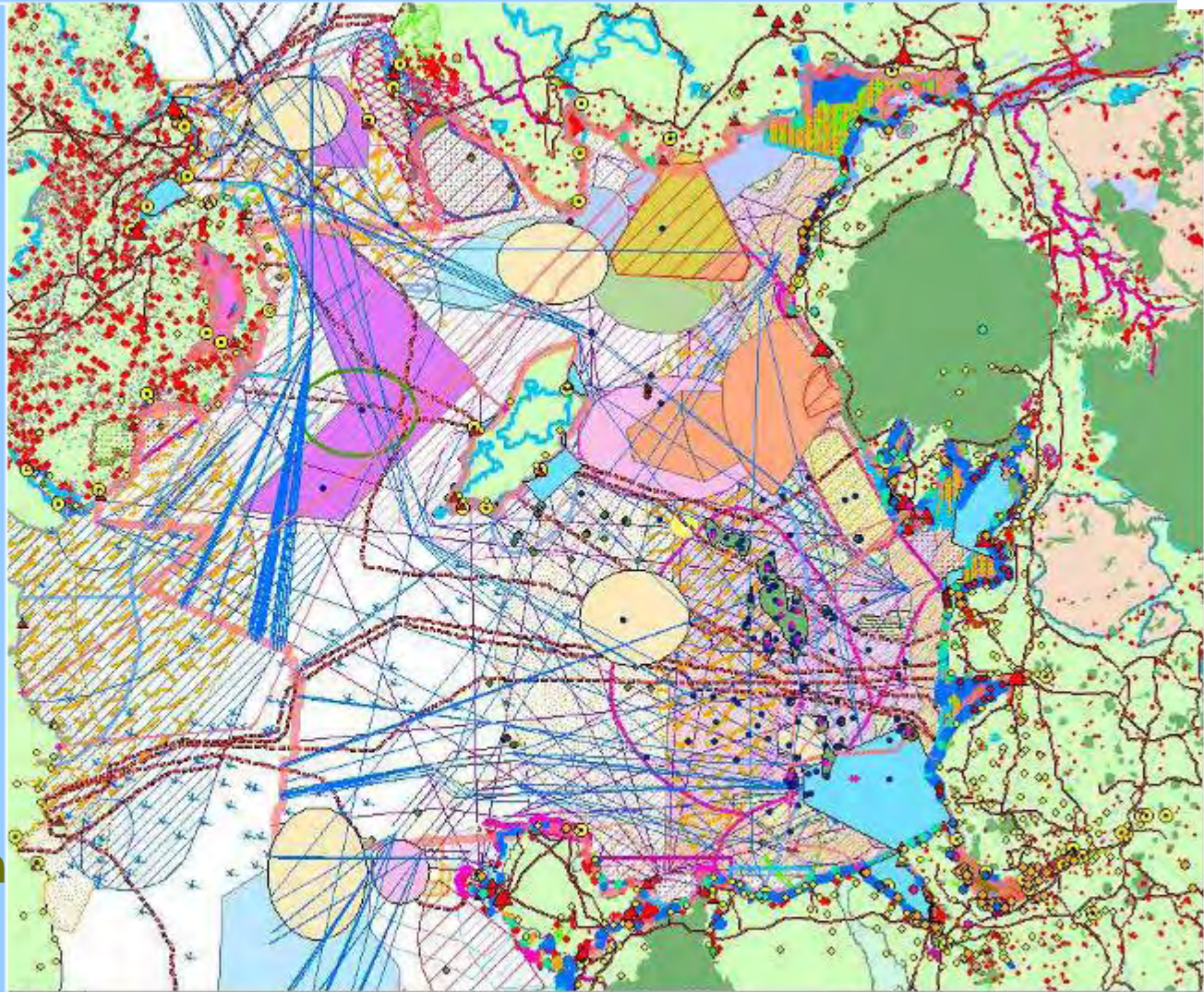
Overview

- Why we need MSP
- What is MSP (what isn't MSP)
- Why MSP is useful to implement the ecosystem approach
- How to do MSP – a step-by-step approach
- MSP in intergovernmental organizations
- How science can contribute to MSP



Competing claims – why we need MSP

- Land use
- Tourism
- Oil & Gas
- Mariculture
- Coastal Defence
- Ports & Navigation
- Military Activities
- Culture
- Conservation
- Dredging & Disposal
- Submarine Cables



▪ Fishing

▪ Renewable
Energy

▪ Marine
Recreation

▪ Mineral
Extraction

Why do we need MSP?

- Resolving conflicts in area-use
 - Between human users
 - Between human uses and the marine environment
- Proactive, future-oriented
- Holistic and integrative: a support for EBM



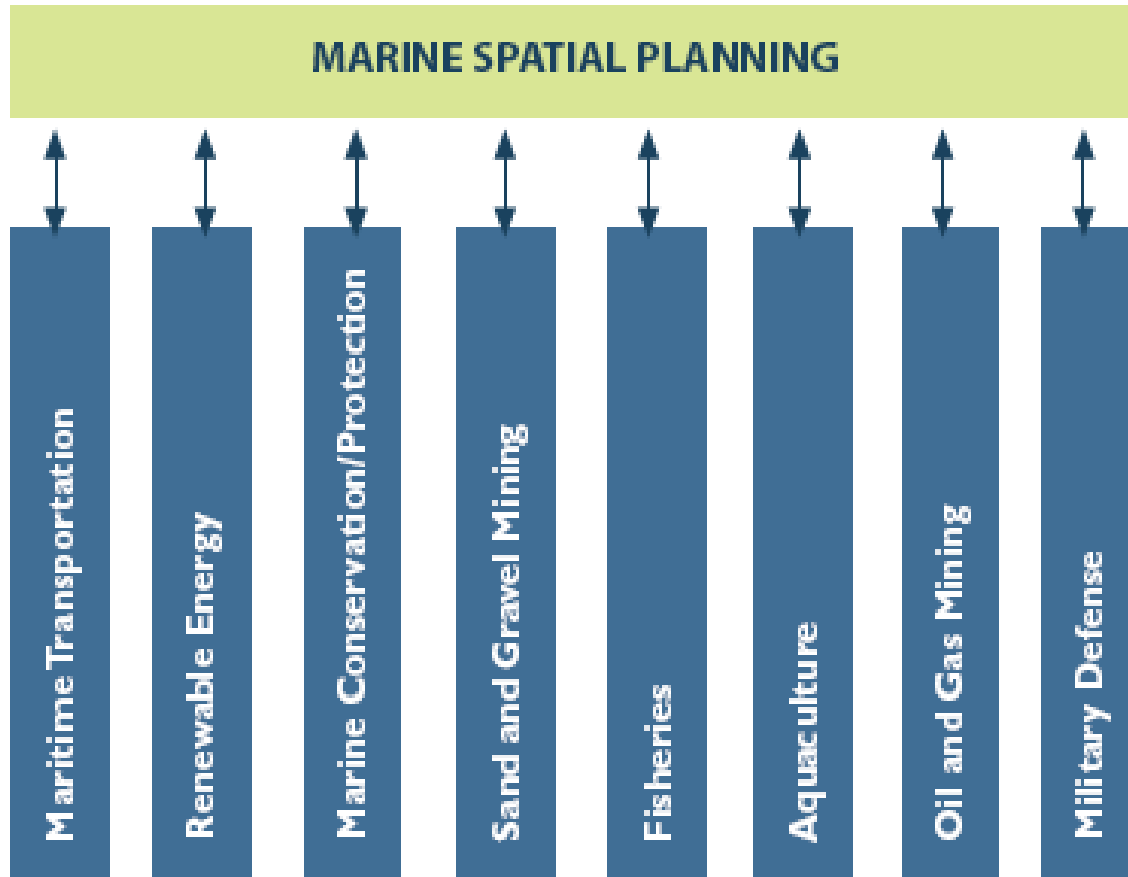
Definition of MSP

- MSP is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process

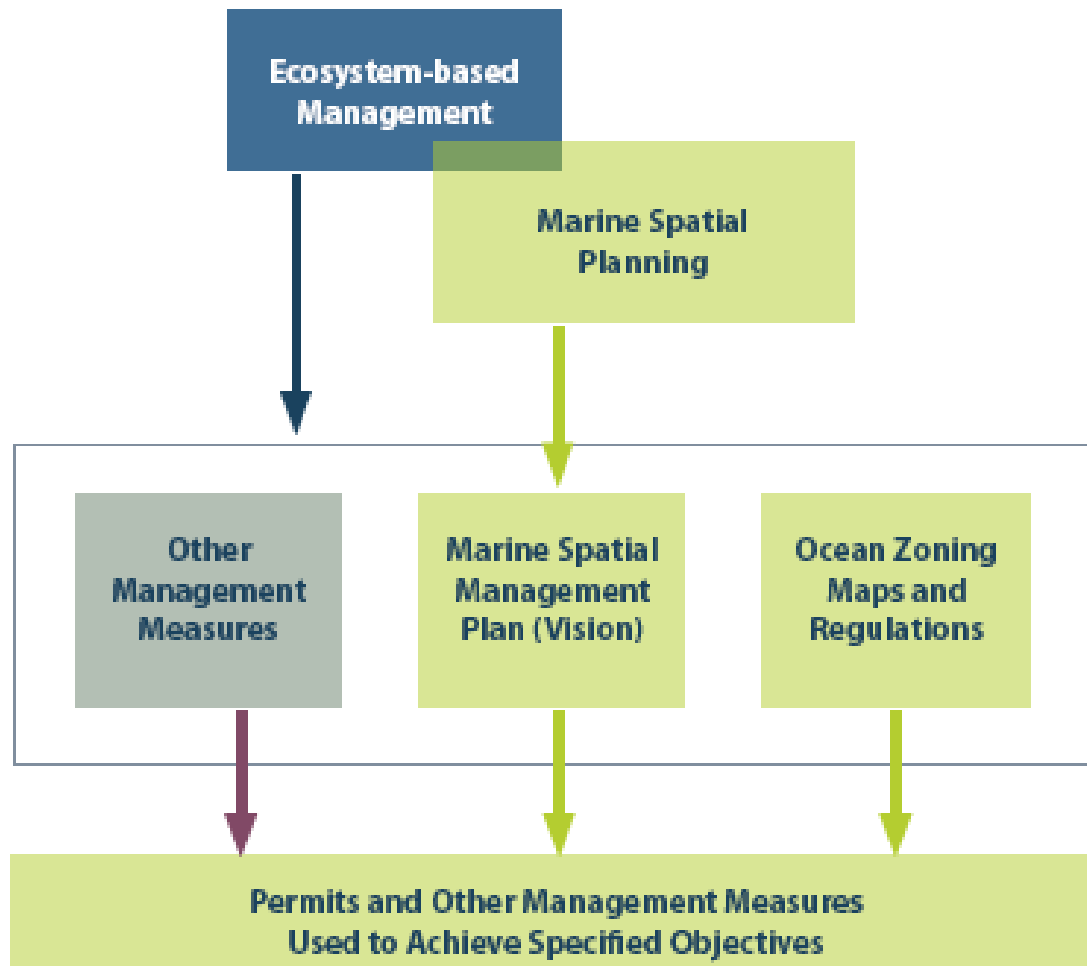
*MSP is **not** science,
but can integrate scientific input!*



MSP vs single sector planning



MSP as a part of EBM



Effective MSP is:

- **Ecosystem-based:** Balancing ecological, economic and social goals
- **Integrated:** Across sectors and agencies and among levels of government
- **Area-based**
- **Adaptive:** Capable of learning from experience
- **Strategic and anticipatory:** Focused on the long-term
- **Participatory:** Stakeholders actively involved in the process



Website: ioc3.unesco.org/marinesp

Intergovernmental Oceanographic Commission

Manual and Guides No. 53, KAM Dossier No. 6

MARINE SPATIAL PLANNING

A Step-by-Step Approach toward Ecosystem-based Management

Developed with the financial support of

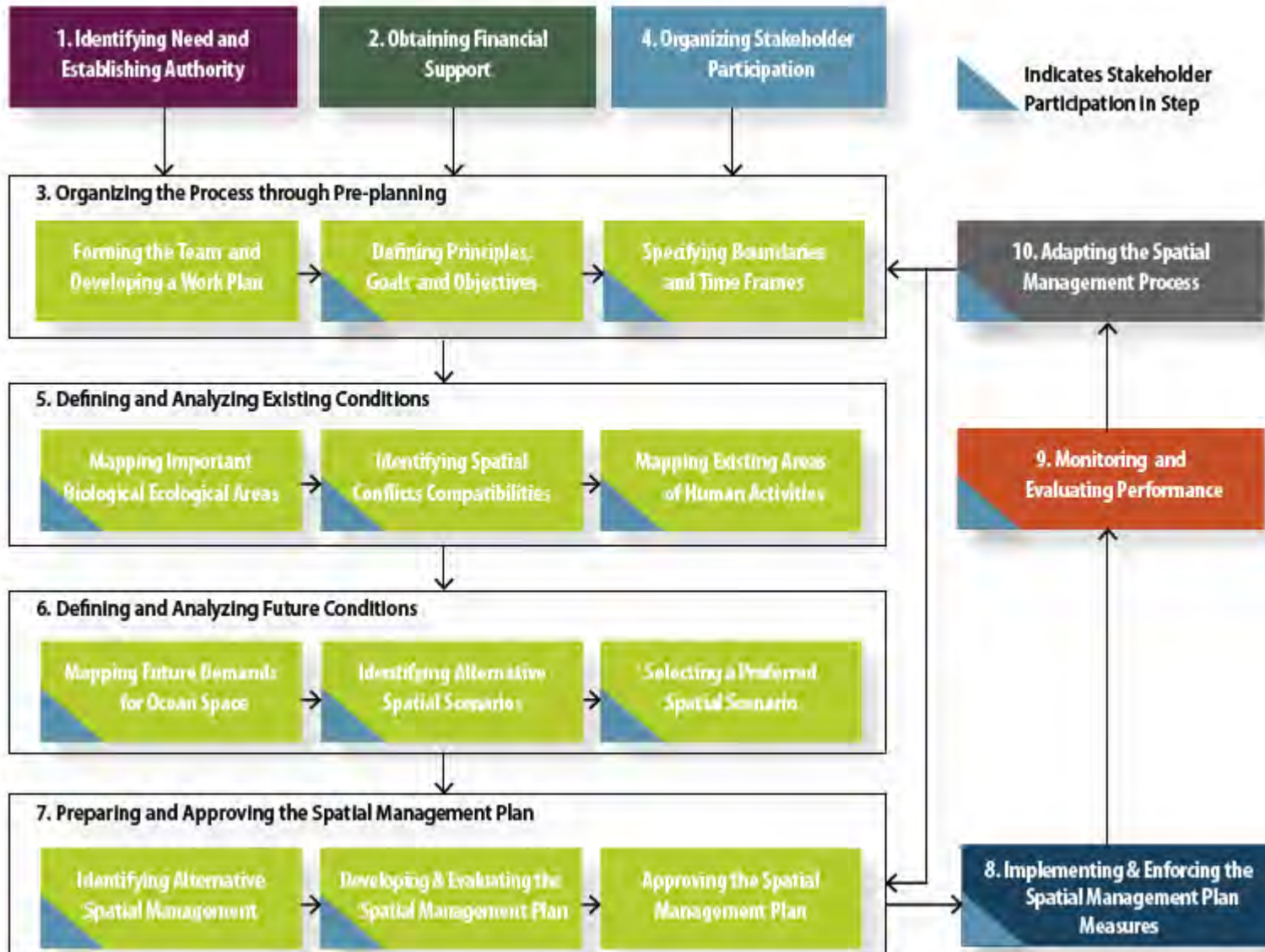
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Additional support was provided by WWF International and the government of Belgium.



A step-by-step approach



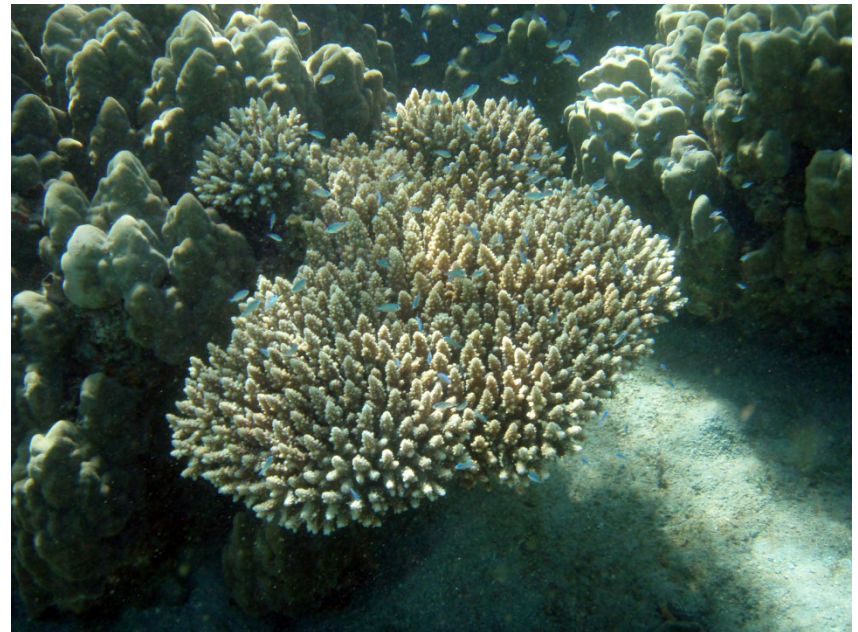
Step 1: Identifying need and establishing authority

- Need for MSP
 - Identify the problems of current ocean management that needs a **spatial** and **holistic approach**, eg:
 - Incompatible uses
 - Infringement on biologically valuable areas
- Establishing appropriate authority
 - To plan, eg:
 - New MSP specific legislation
 - Establish authority through existing structures
 - Add to relevant legislations under development
 - To implement, eg:
 - Centralized organization
 - Existing institutional arrangements



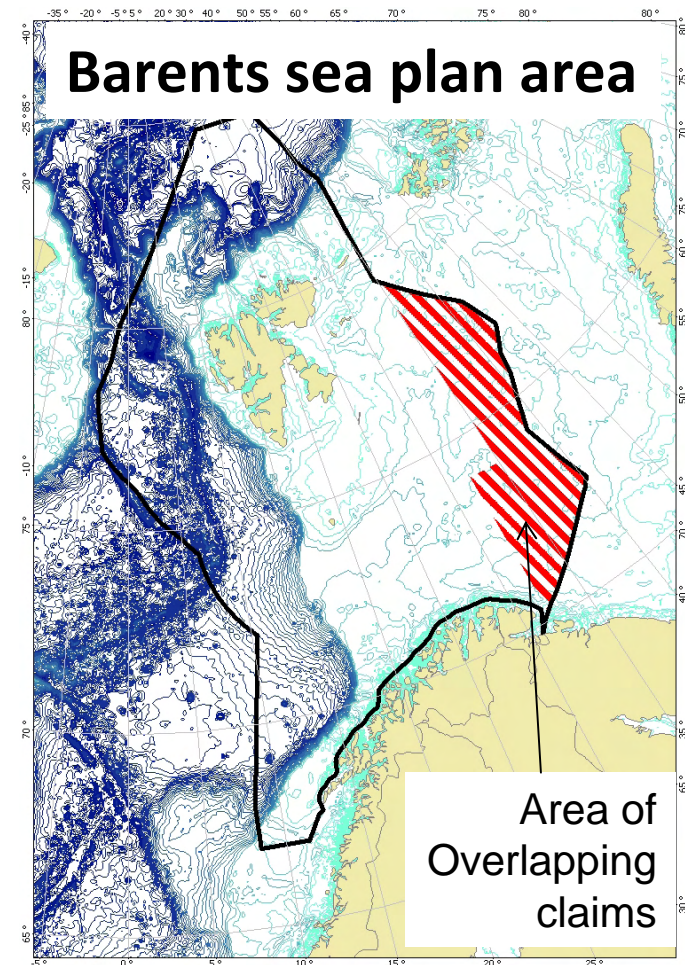
Step 2: Obtaining financial support

- Identifying alternative funding mechanisms
- Defining feasibility of alternative funding mechanisms
 - Financial
 - Legal
 - Administrative
 - Social
 - Political
 - Environmental



Step 3: Organizing the process through pre-planning

- Creating marine spatial planning team
- Developing a work plan
- Set boundaries
- Defining time-frame
- Defining principles
- Setting goal and objectives



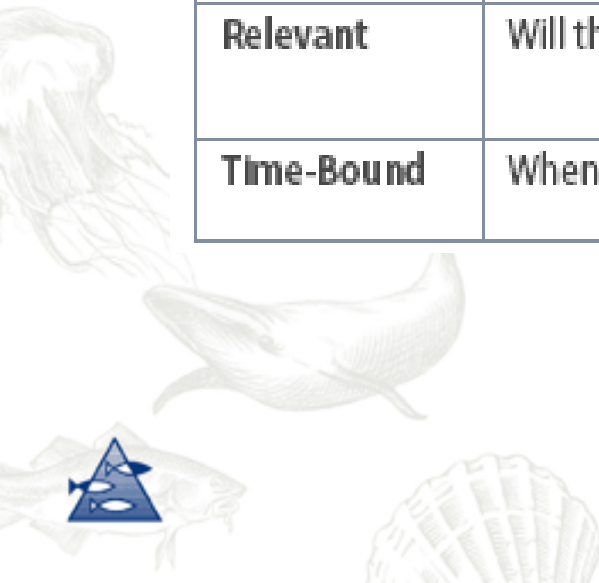
Needed skills of MSP practitioners

Functional Role	Skill Types		
	Knowledge & General Aptitudes	Programmatic Skills	Administrative Skills
Program Management	Strategic Thinking about Space and Time	Strategic Planning Financing Project Implementation	Organizational Management
Authority	Knowledge of Spatial Implications of Legislation	Legal Analysis	
Analysis	Analytical Thinking about Space and Time	Spatial Database Management Geographic Information Systems	
Planning	Conceptualization Spatial Systems Thinking	Problem Assessment Strategy Design Plan Development	Coordination
Implementation	Conflict Resolution	Negotiation	
Monitoring and Evaluation	Cause-and-Effect Thinking	Monitoring Planning Assessment Methods	Evaluation
Communications	Strategic Communications	Product Planning Product Development	Routine Communications



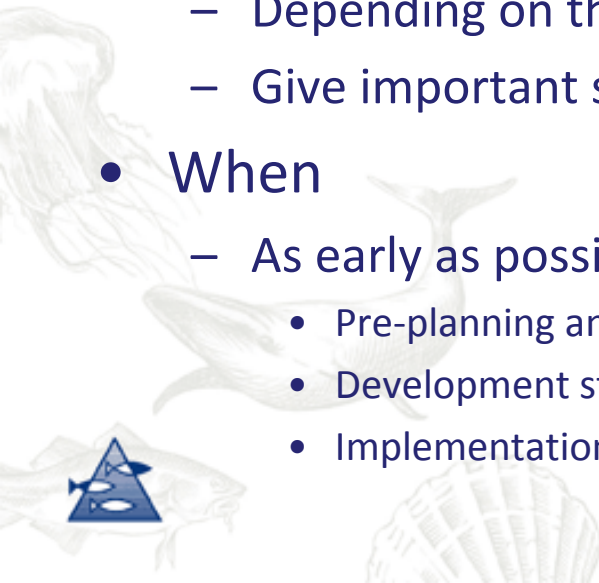
Good objectives

Specific	Is the objective concrete, detailed, focused, and well-defined?	Does the objective define an outcome?
Measurable	Can we measure what we want to do?	Can the objective be expressed as a quantity?
Achievable	Can the objective be attained with a reasonable amount of effort and resources?	Can we get it done? Do we have or can we get the resources to attain the objective?
Relevant	Will this objective lead to a desired goal?	Does sufficient knowledge, authority and capability exist?
Time-Bound	When will we accomplish the objective?	Is a finish and start date clearly defined?

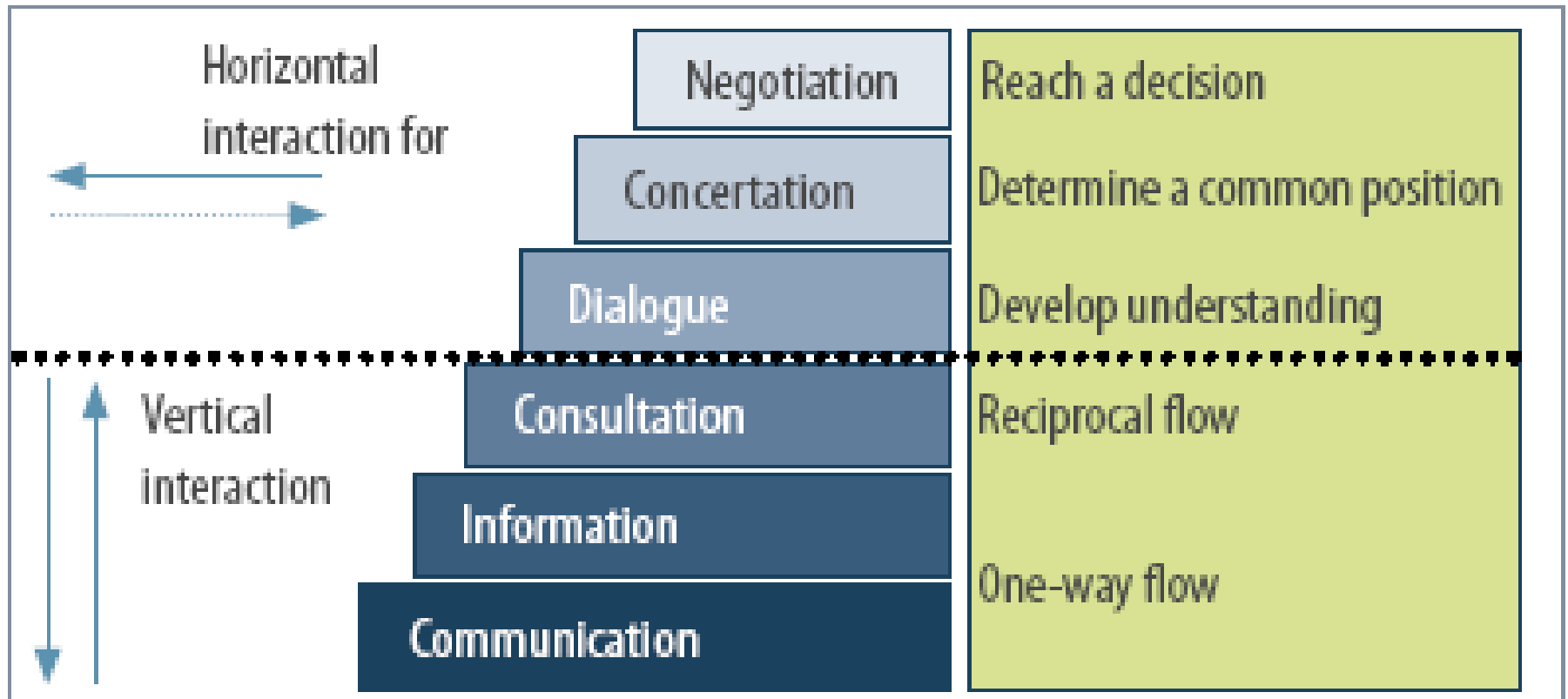


Step 4: Organizing stakeholder participation

- Why
 - Ownership of plan and to better understand the complexity of the plan
 - To make planners better understand the human uses and multiple use conflicts
 - To improve mutual understanding of problems and challenges in the management area and to understand stakeholder perceptions
- Who
 - Depending on the area, complexity of plan and number of stakeholders
 - Give important stakeholders more weight
- When
 - As early as possible in the process to ensure success.
 - Pre-planning and planning stage to be able to impact goals and boundary setting
 - Development stage
 - Implementation stage



How to involve stakeholders

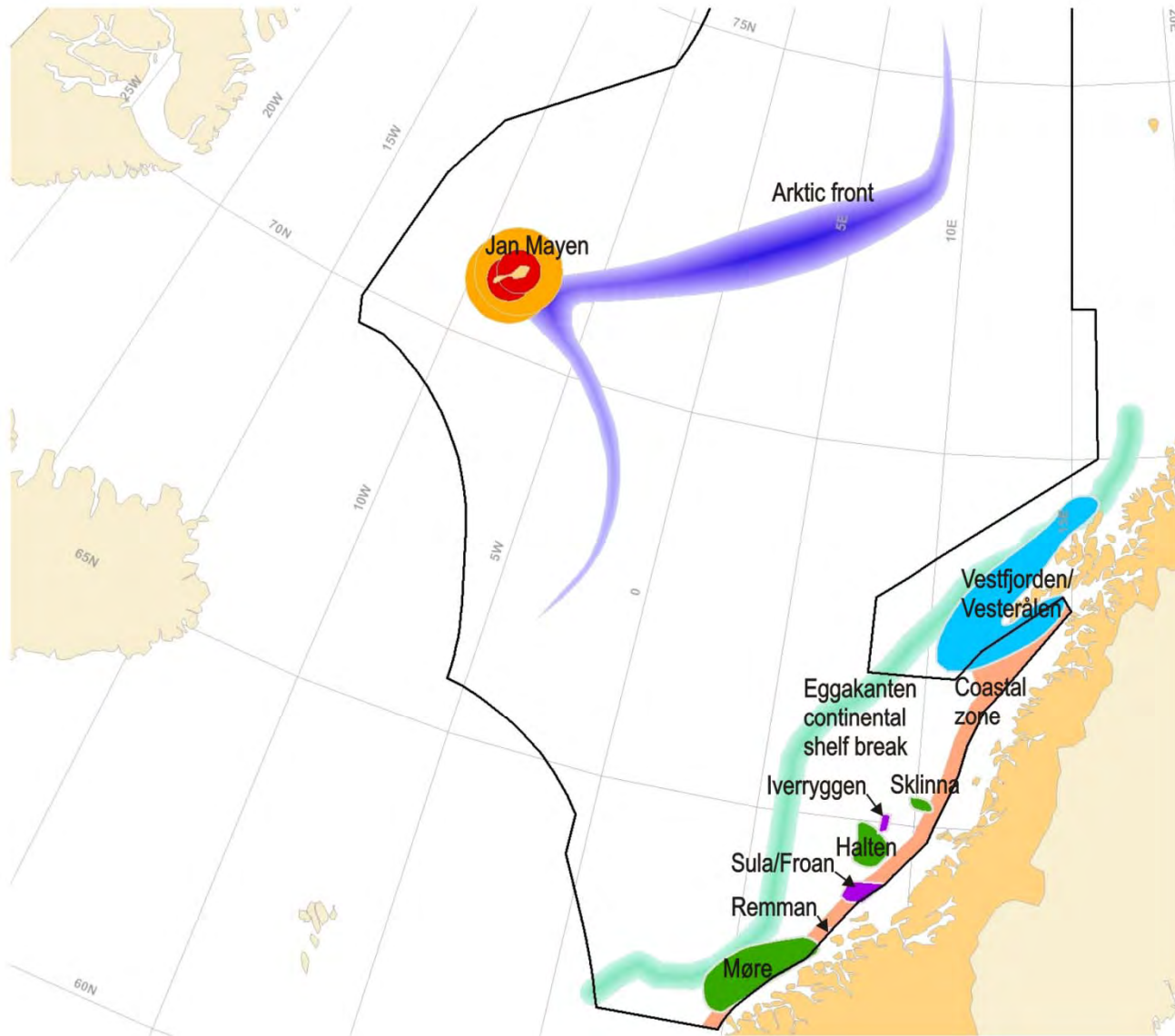


Step 5: Defining and analyzing existing conditions

- Collecting and mapping the ecology, oceanography and environment
 - Bioregionalization
 - Identifying areas of special biological value
- Collecting and mapping human activities
 - Their effect on the environment and ecosystem (incl. vulnerability)
- Identifying current conflicts and compatibilities
- Identify gaps in current knowledge

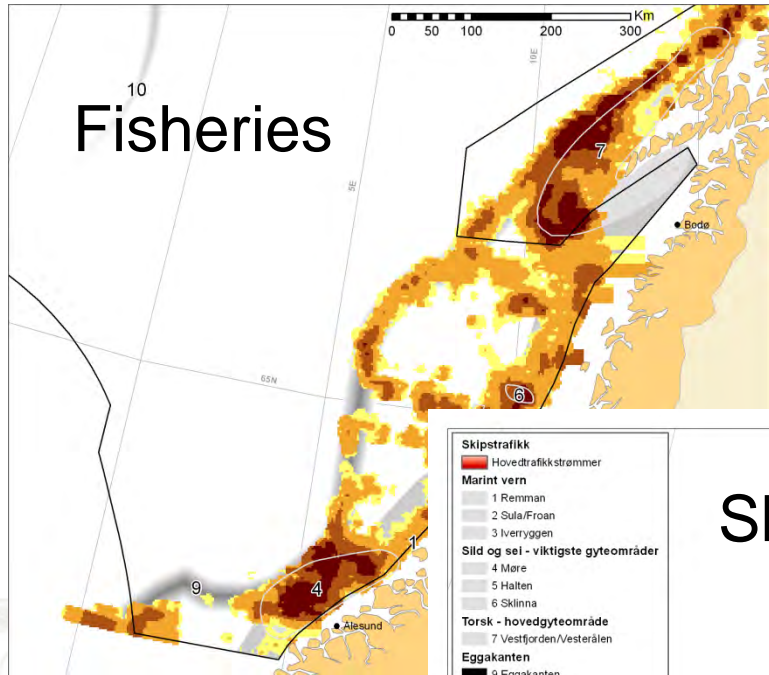


Valuable areas

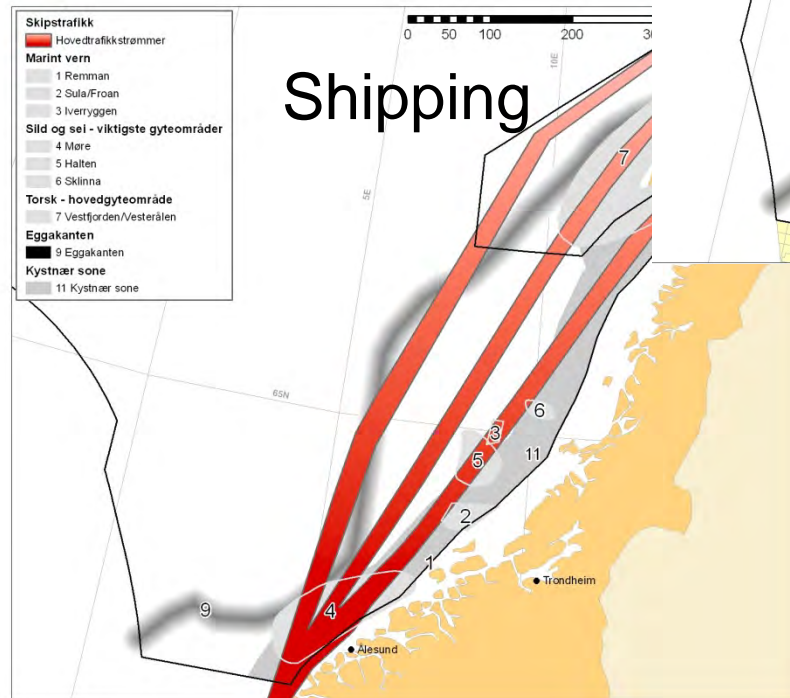


Human activities

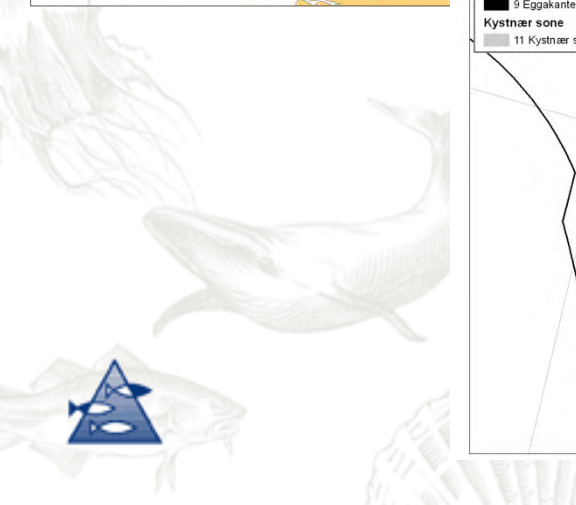
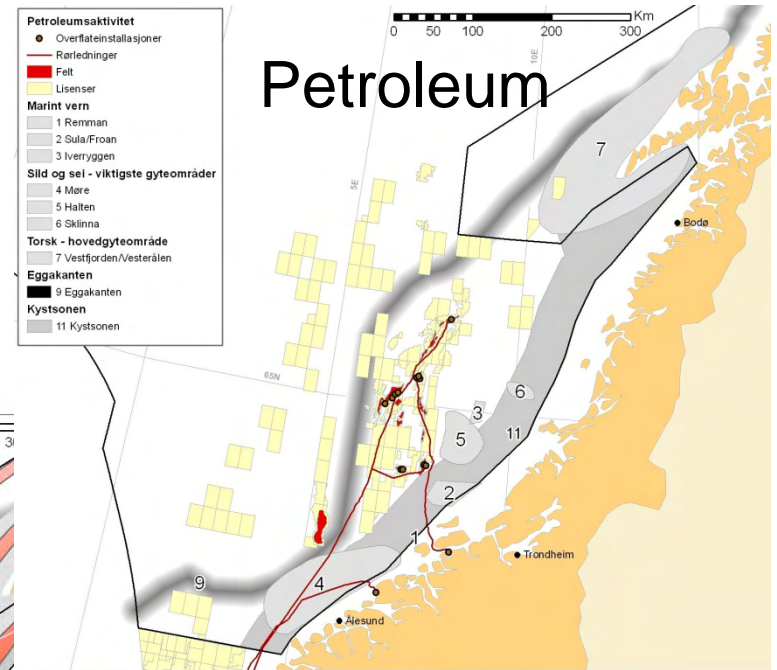
10 Fisheries



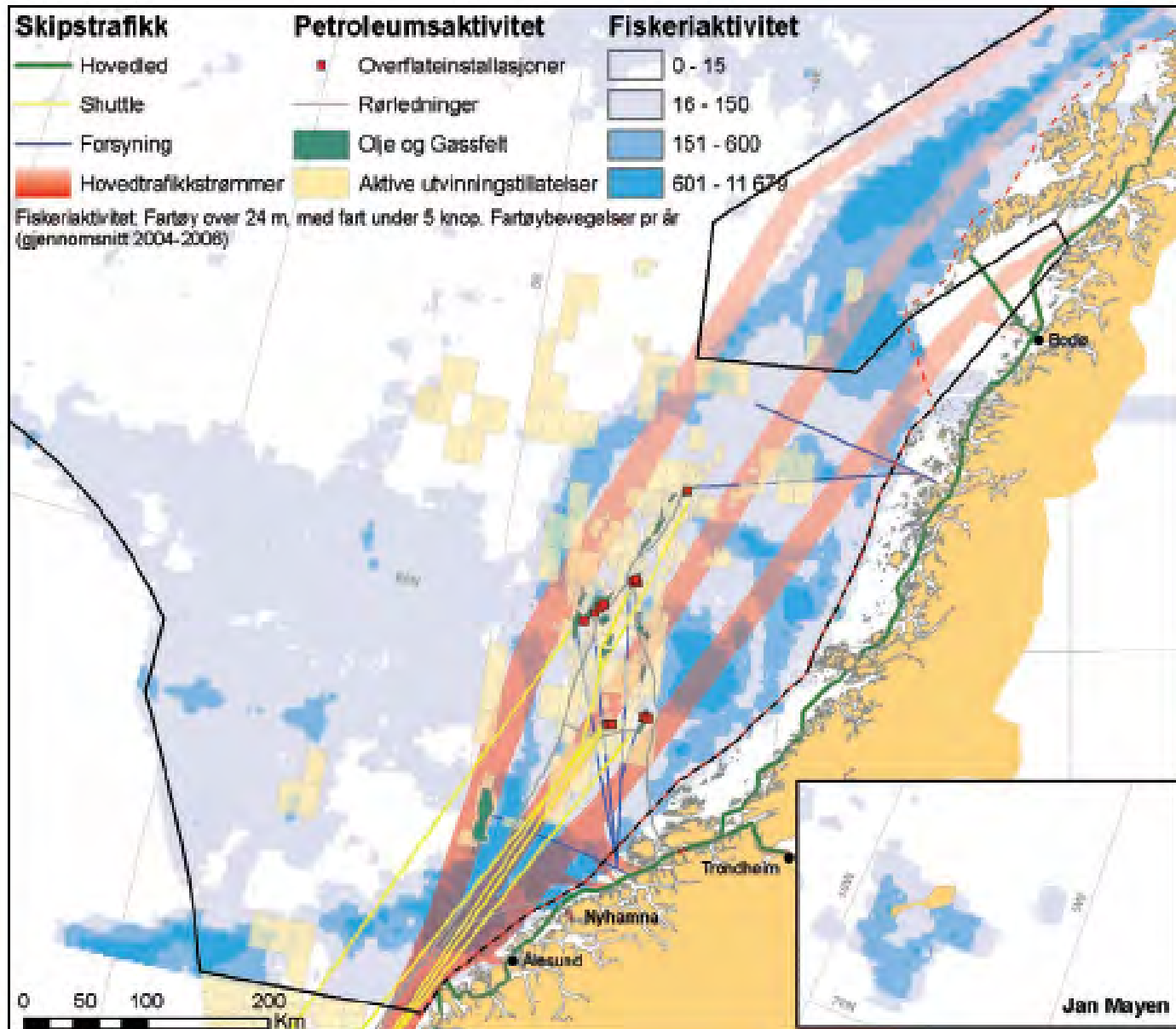
Shipping



Petroleum



Conflict of interests



Step 6: Defining and analyzing future conditions

- Projection of current trends in the spatial and temporal needs of existing human activities
- Estimating spatial and temporal requirements
 - Must differentiate between **needs** and **wishes**
- Identifying possible alternative futures
 - Continuing current trends and practices
 - Alternative scenarios for trends and management

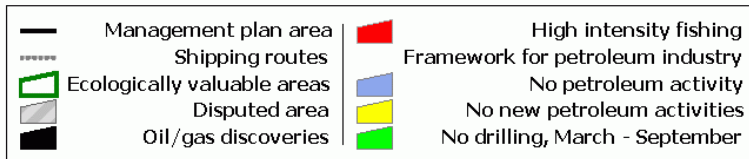
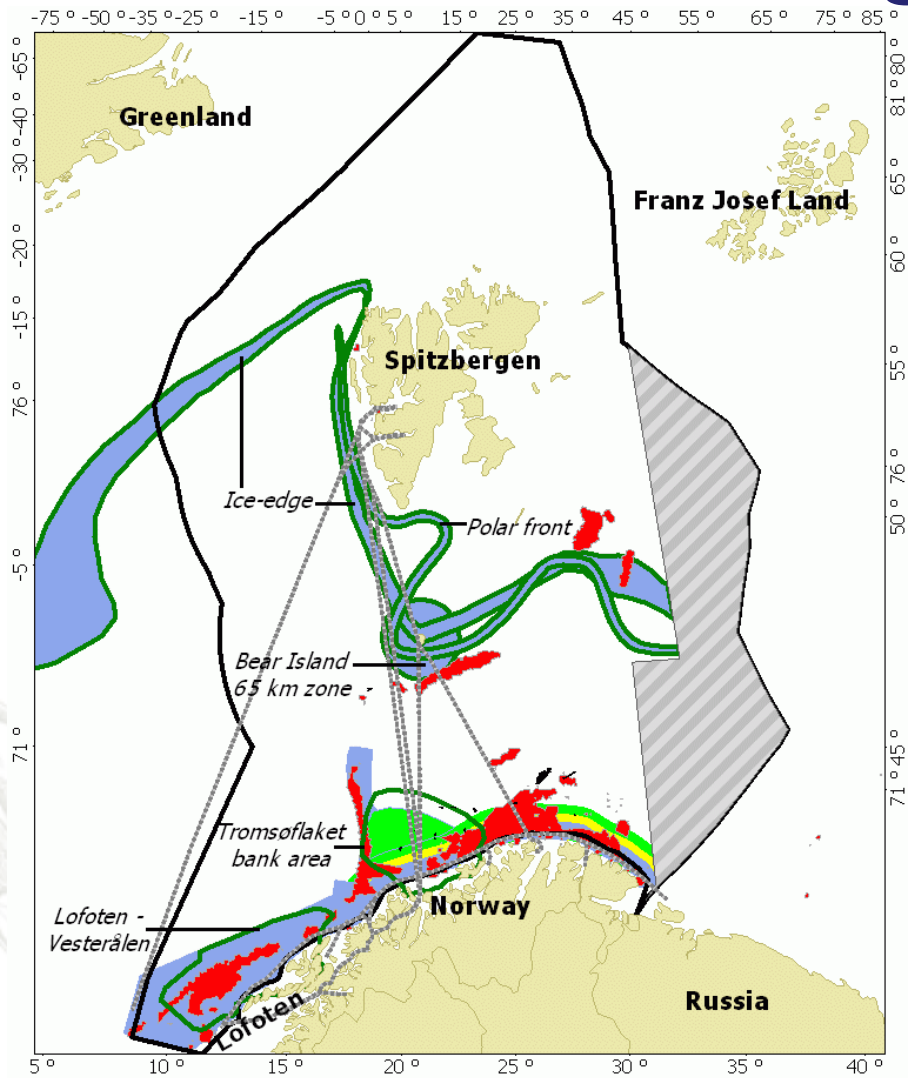


Step 7: Preparing and approving the spatial management plan

- Identify possible spatial and temporal management measures, incentives, and institutional arrangements
- Specify criteria for selecting marine spatial management measures
- **Develop the zoning plan**
- Evaluate the spatial management plan



Zoning plans



Step 8: Implementing and enforcing the spatial management plan

- Implementing the spatial management plan
 - Establish authority (should have been done in step 1)
 - Coordinate among levels of government
 - Involve single-sector management institutions (eg. directorate of fisheries, directorate of petroleum)
- Ensuring compliance
 - Define and enforce requirements, Education
 - Codes of conduct, Technical assistance, Self-regulation
 - Physical installations (buoys around important habitats)
- Enforcing the plan
 - Inspections schemes
 - Negotiations with stakeholders and managers
 - Legal action to compel compliance



Step 9: Monitoring and evaluating performance

Re-Confirm Management Objectives

Agree on Management Outcomes

Identify Key Performance Indicators

Determine Baseline Data

Select Outcome Targets

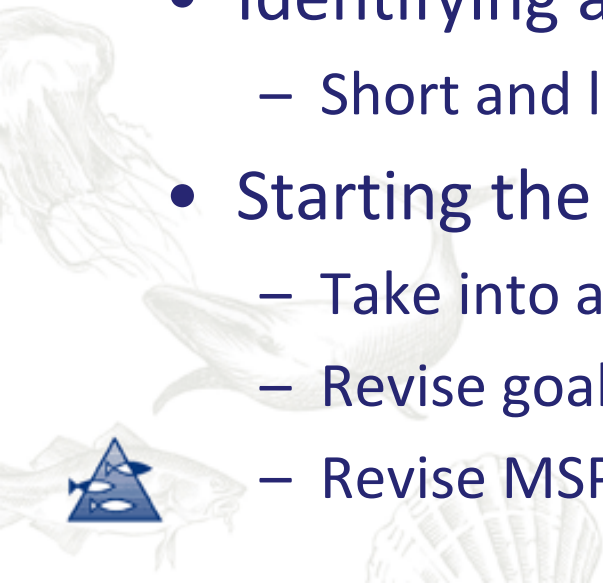
Monitor

Report Results

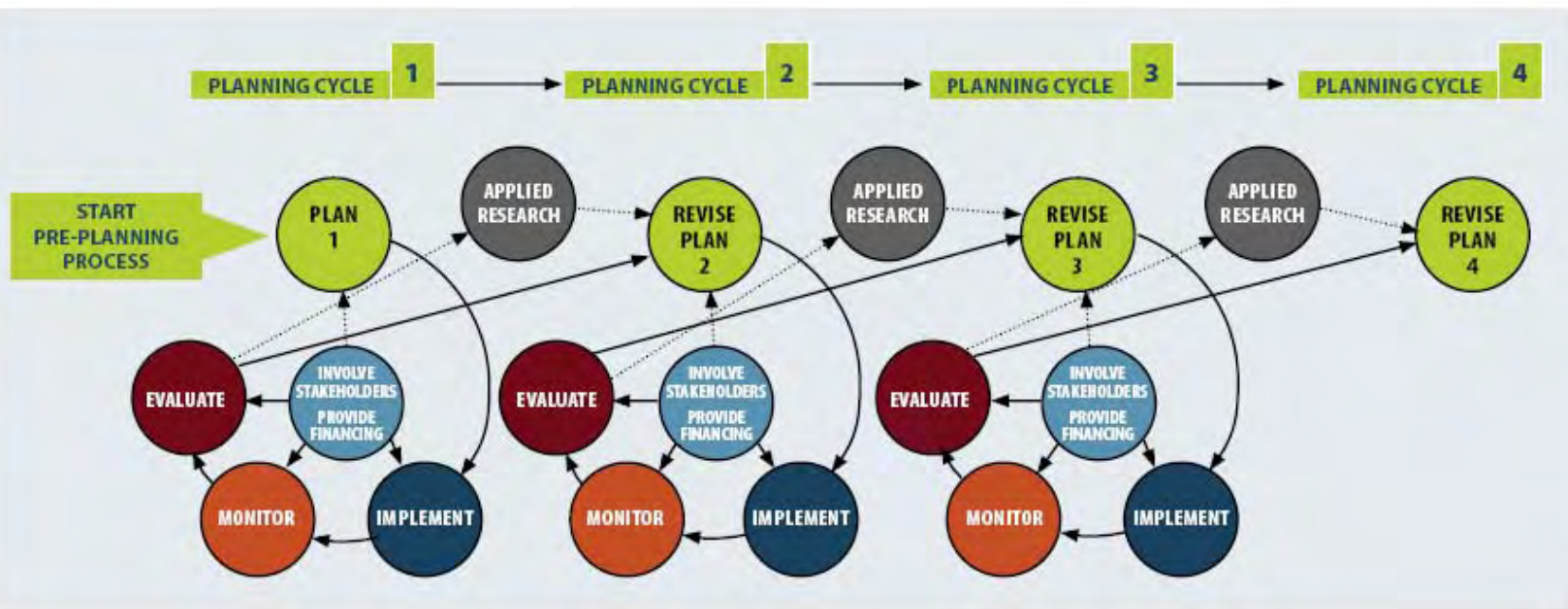
- Developing the performance monitoring program
- Evaluate performance monitoring data
 - Indicators of performance
 - Dependent on unambiguous objectives (step 3)
- Report results of performance evaluation

Step 10: Adapting the spatial management process

- Reconsidering and redesigning the MSP program (usually forgotten or omitted)
 - What has been accomplished?
 - How has the system changed?
- Identifying applied research needs
 - Short and long term data requirements
- Starting the next round of marine spatial planning
 - Take into account new knowledge
 - Revise goals, objectives and outcomes
 - Revise MSP management measures



The planning cycle



MSP in international organizations

- **UNESCO/IOC:** Guide to MSP
- **UNEP:** Adaptive Ecosystem-Based MSP in the Face of Environmental Change
- **ICES:** support the scientific foundation of MSP through the Science plan
- **EU:** Roadmap for Maritime Spatial Planning
- **Nordic Council:** Nordic Forum on MPAs in Marine Spatial Planning
- **PICES:** Theme session ASM-2009
- **IUCN:** Global Marine Programme
- ... many more....



The future of MSP

- Many countries are developing spatial plans for the marine environment
- Must avoid MSP being only associated with MPAs (MPAs are just one of many zoning options in MSP)
- International MSP processes covering cross-border issues is still a challenge and places more stress on effective **governance**

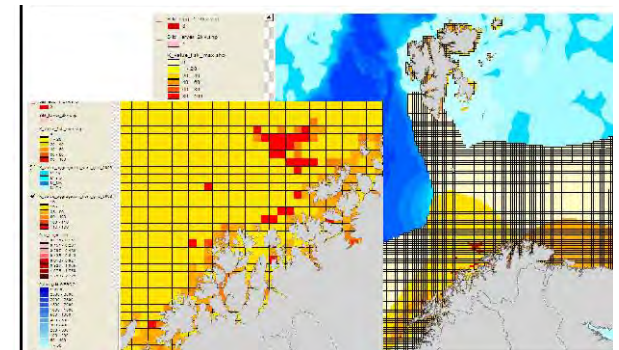
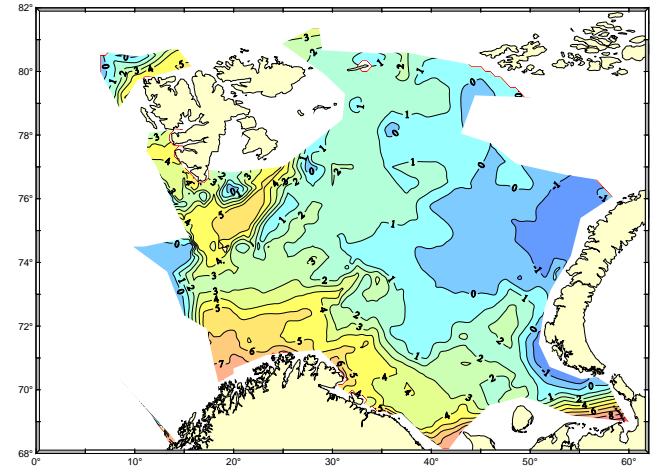


How can science contribute to MSP?



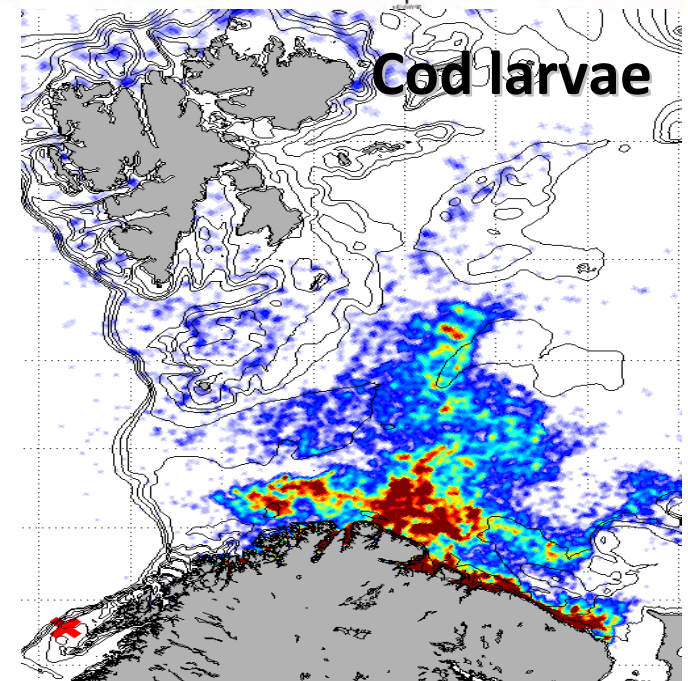
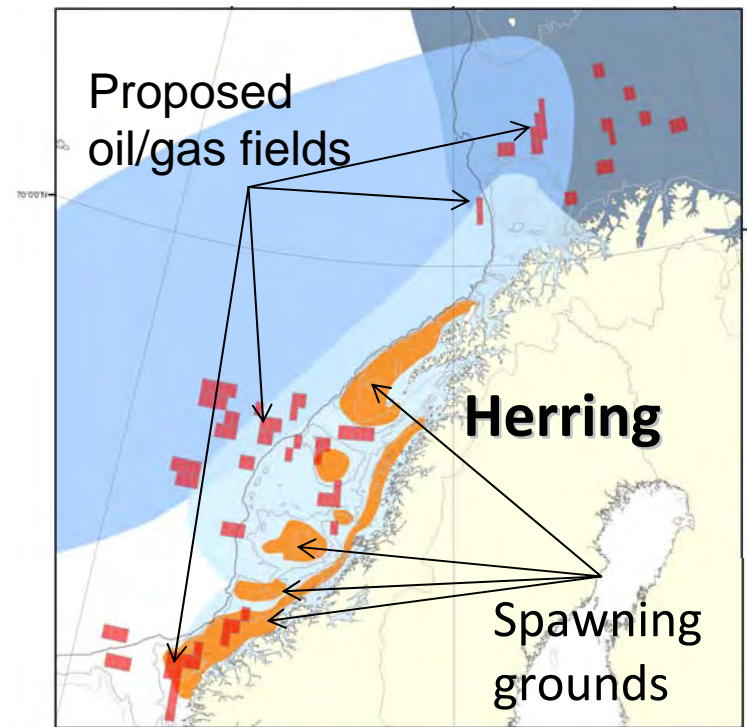
3 needs for Science in MSP

1. **Map data** precisely as well as spatially and temporally explicit
2. **Quantify** concepts like value, vulnerability and cumulative effects
3. **Testing** spatial management scenarios



Data must be mapped!

- To be useful for MSP data must be mapped!
- Need:
 - Generalized but precise maps of eg. valuable habitats
 - Maps of biota and environment at a fine temporal scales to facilitate avoiding conflicts
- Data must be made publically available through WMS servers (or similar)
- Interpret and analyze data to pinpoint areas of highest ecological value



Quantify value, vulnerability and cumulative effects

- Quantify vulnerability of ecosystem components to each human activity
- Develop methods to integrate the vulnerability per component and between component
- Make an assessment of the cumulative effects of human impacts on the ecosystem

Vulnerability scores used in Norway:

Symbol	na	?	÷	÷÷	÷÷÷
Effect			Small	Medium	Large
Criteria used	Not relevant / No measurable effect	Major gaps in knowledge makes it impossible to assess the effect	Measurable effect	Measurable effect	Measurable effect
			Short duration	Medium term duration (one generation or one life-cycle)	Long-term, ie more than one generation or life-cycle
			Small part of population, habitat or year-class affected	Substantial part of population, habitat or year-class affected	Large part of population, habitat or year-class affected

Testing Spatial Management Scenarios

- Rigorously quantify and test different management scenarios and future outcomes
- Testing and evaluating Spatial Plans at a strategic level using end-to-end ecosystem models
 - Eg. Atlantis (Aus)
- Provide quantitative input on effects of climate change on the ecosystem

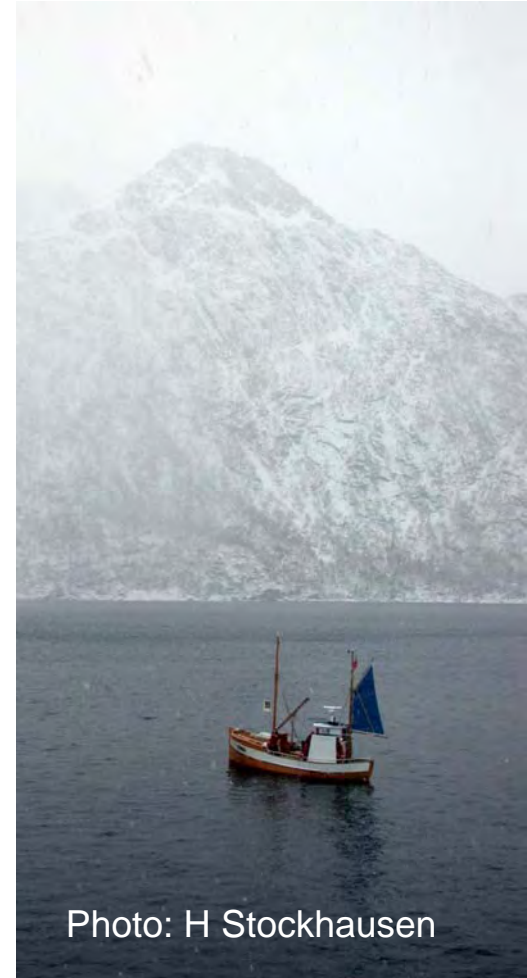
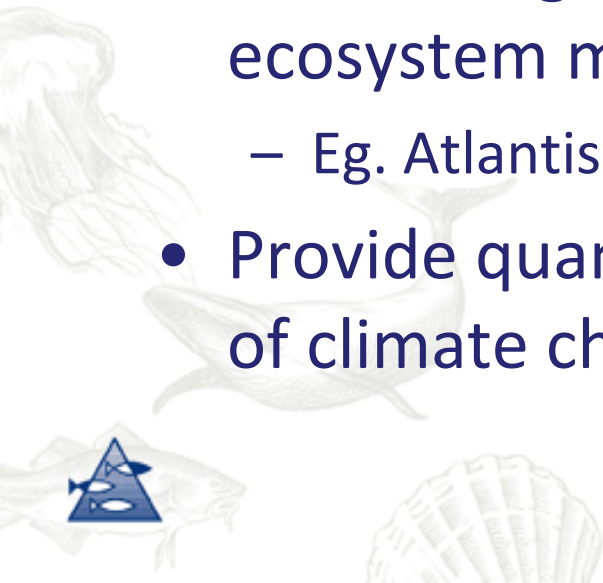


Photo: H Stockhausen



More information

- The Barents Sea plan (English):
<http://www.dep.no/md/english/topics/IntegratedManagementBarentsSea/bn.html>
- Olsen et al. 2007. The Norwegian ecosystem-based management plan for the Barents Sea: a case study. ICES Journal of Marine Science. 64(4): 599-602.
- UNESCO guidelines for marine spatial planning:
<http://ioc3.unesco.org/marinesp>

