

Will Integrated Ecosystem Assessments be reflected in integration between sectorial management?

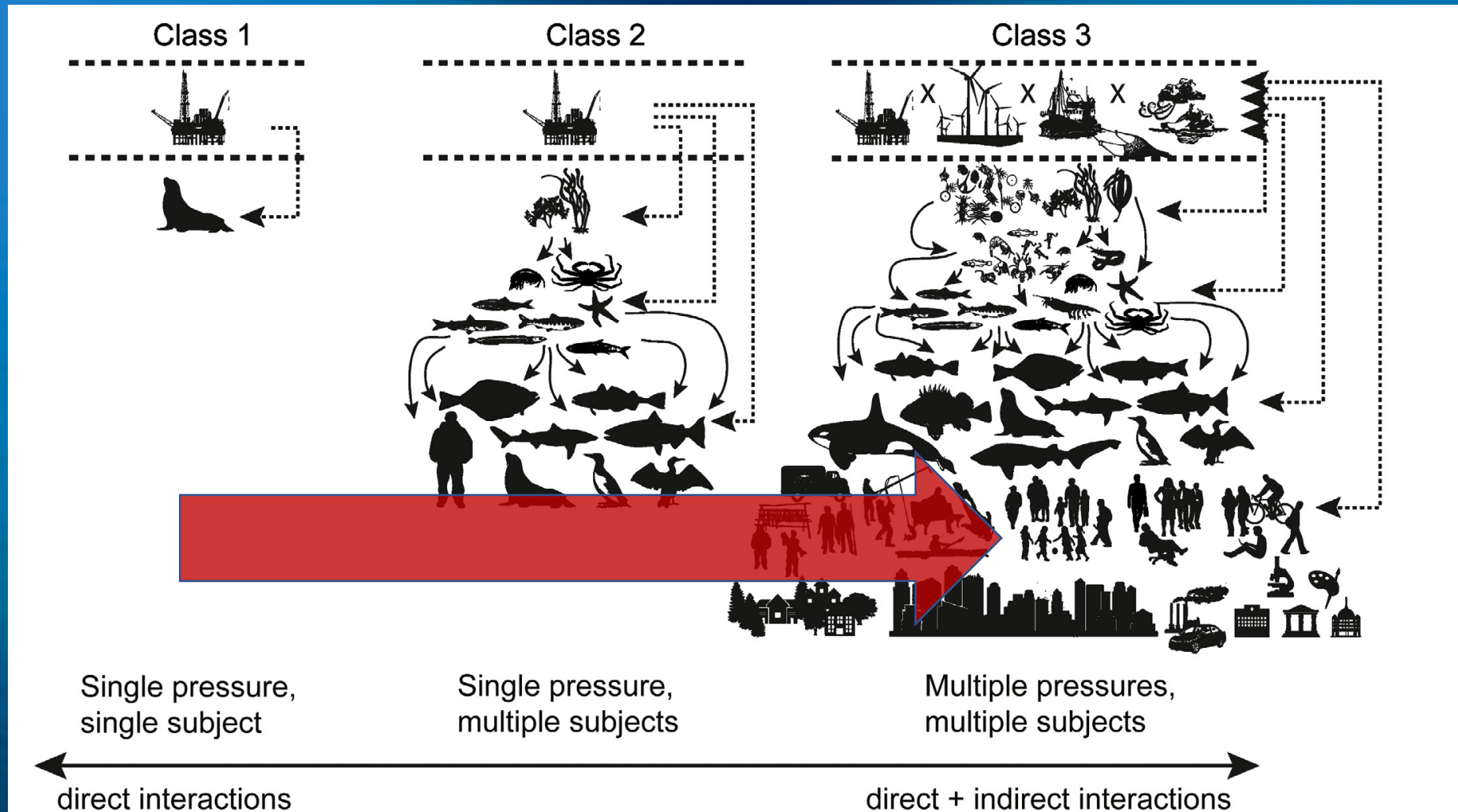
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Institute of Marine Research
Norway

Action Points

- Develop guiding principles on Integrated Ecosystem Assessment (IEA) frameworks to support ecosystem based management across global oceans
- Secure the use of regional expertise in ocean assessments
- Develop ecosystem management objectives, in addition to sector specific objectives
- Support the FAIR principles for data and information sharing



Ecosystem approach to risk assessment



Ecosystem approach to risk assessment in the Barents Sea

3. Quantitative

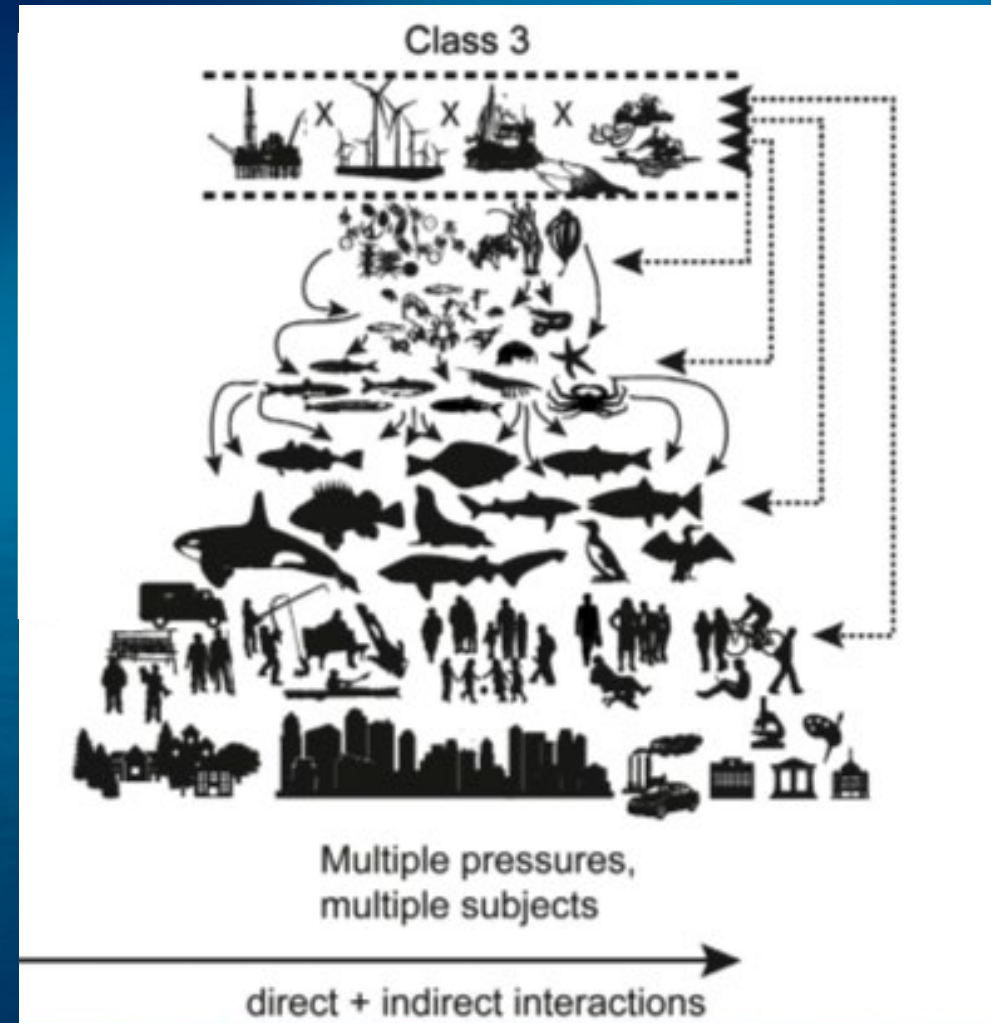
Ecosystem models
Multispecies models
Statistical models

2. Semi-quantitative

Trait based approaches
Food web topologies

1. Qualitative

Expert opinions
Trait based approaches

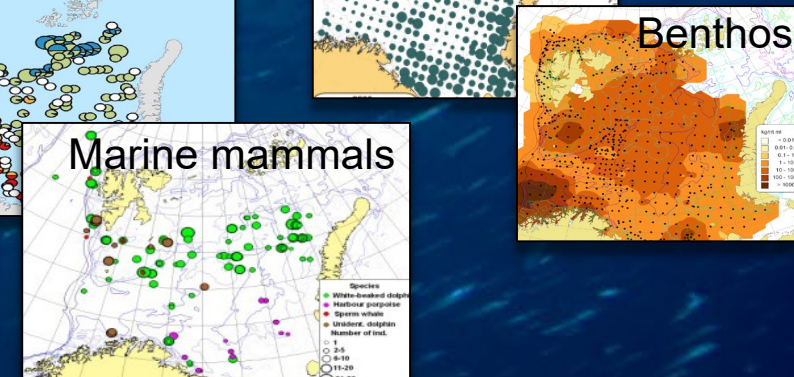
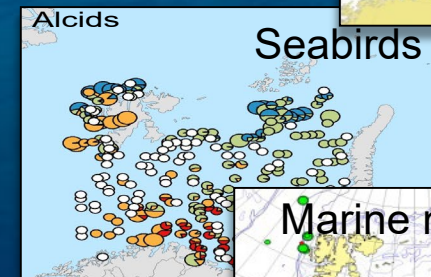
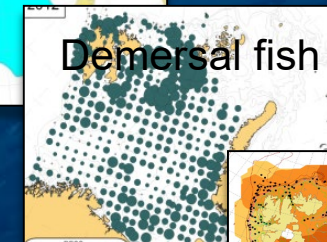
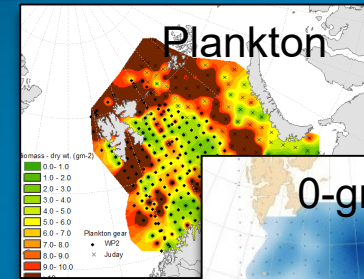
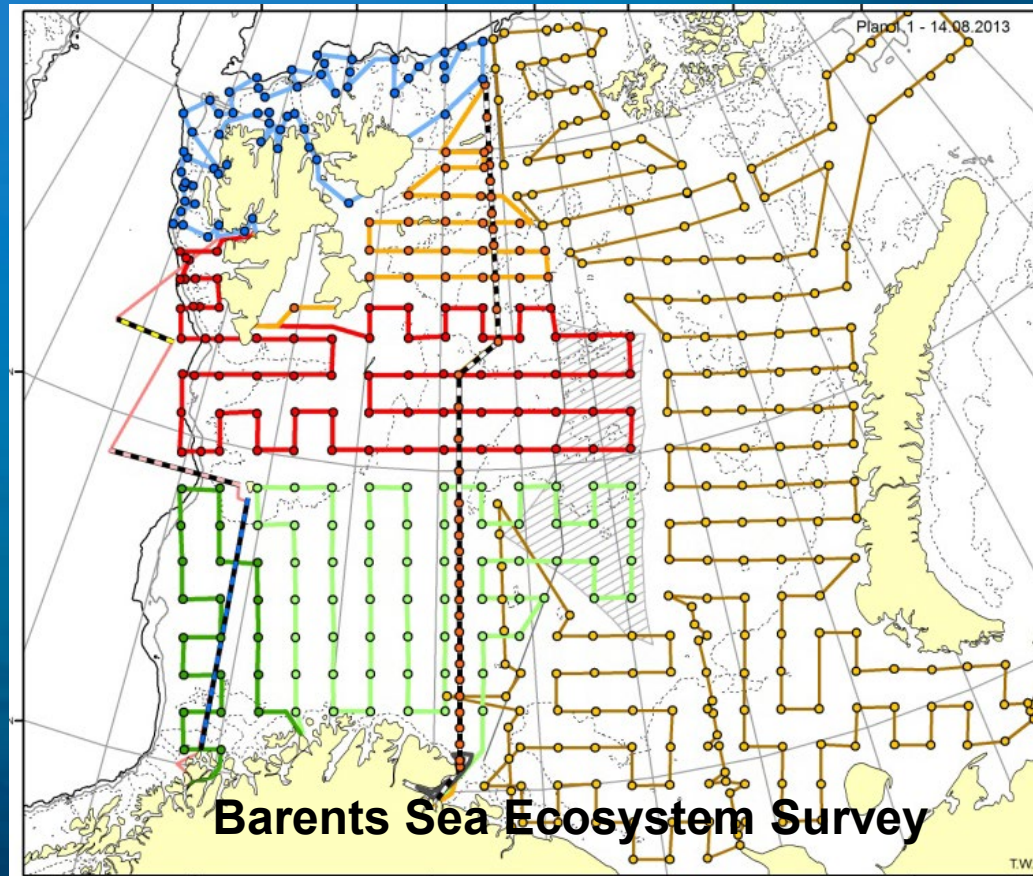


Holsman *et al.* 2017. *Ecosyst Health & Sustain.*



1. Qualitative assessment

Mapping of ecosystem components



1. Qualitative => 2. Semiquantitative

Trait based approaches: Species => system vulnerability

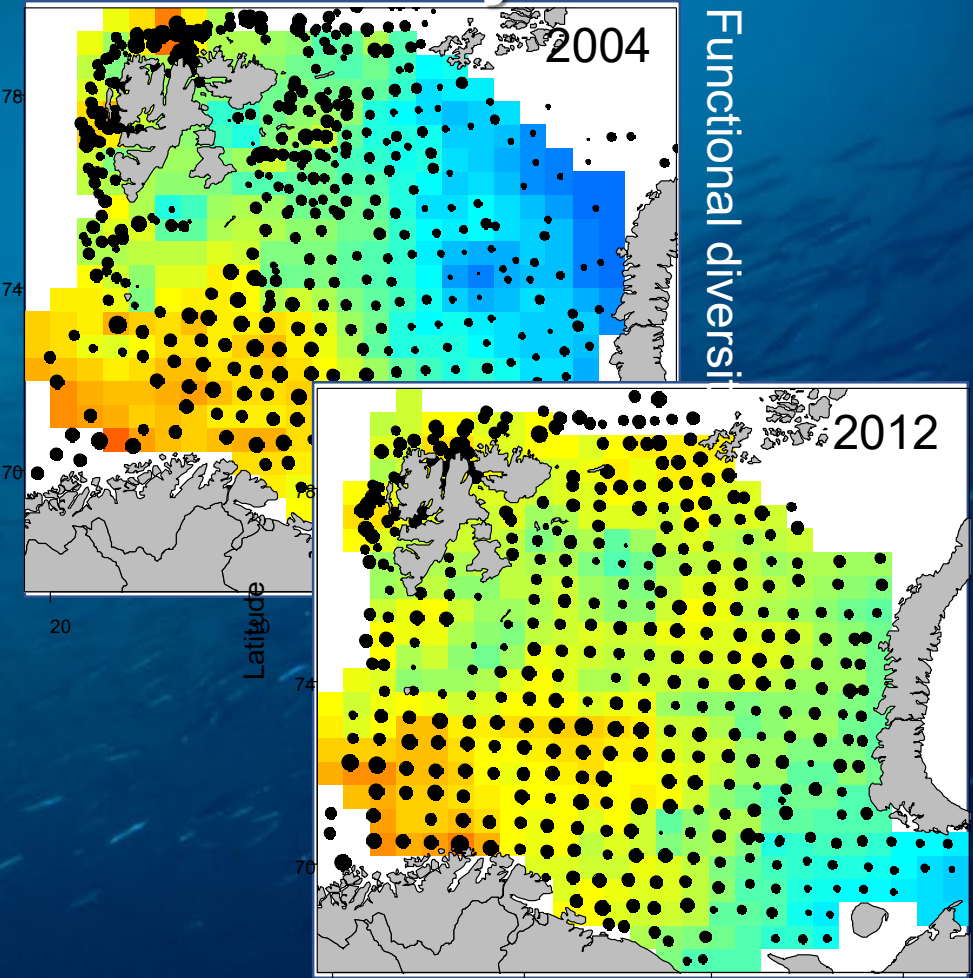
SPECIES TRAITS

- Size
- Ind. growth
- Longevity
- Fecundity
- Natural mortality
- Diet specialist / generalist
- Habitat specialist / generalist
- Pelagic / Demersal / Benthic
- Mobile / sedentary
-



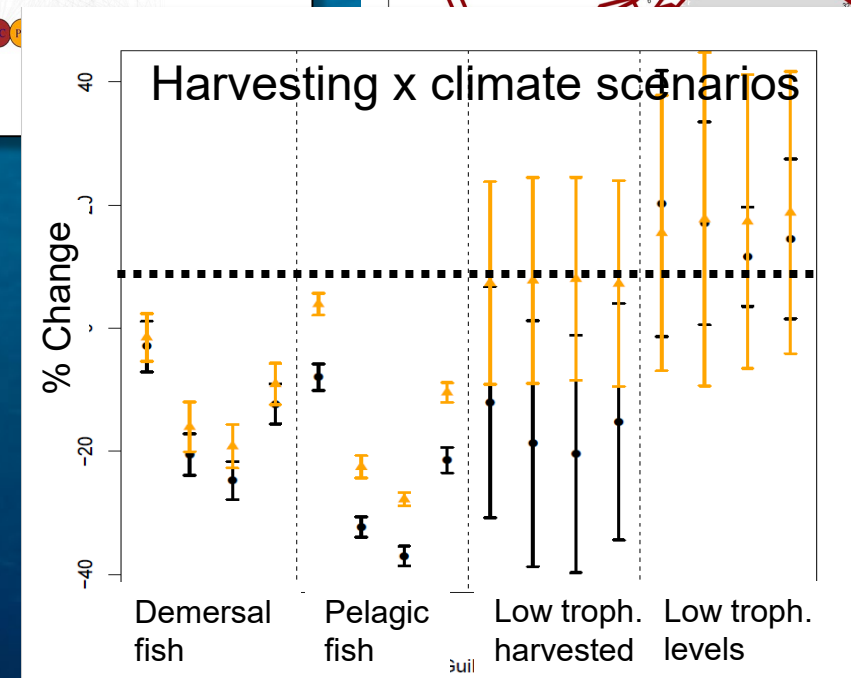
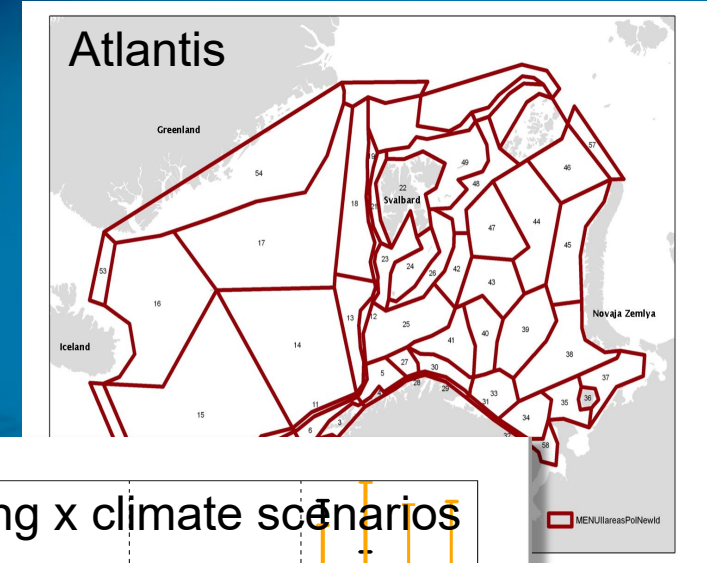
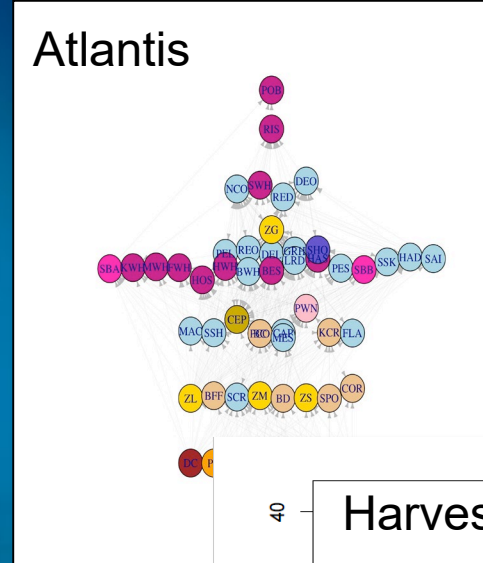
COMMUNITY / SYSTEM VULNERABILITY

- Functional diversity
- Functional redundancy
- Functional dispersion
- Changes in functional biogeography



3. Quantitative assessment

- Ecosystem models
 - Multispecies models
 - Statistical models
-
- Multi-model approach;
 - ⇒ Formulating scenarios
 - ⇒ Run time
 - ⇒ Compare output



Assessing risks of cumulative impacts on the Barents Sea ecosystem and its services: BARENTS-RISK

OBJECTIVE:

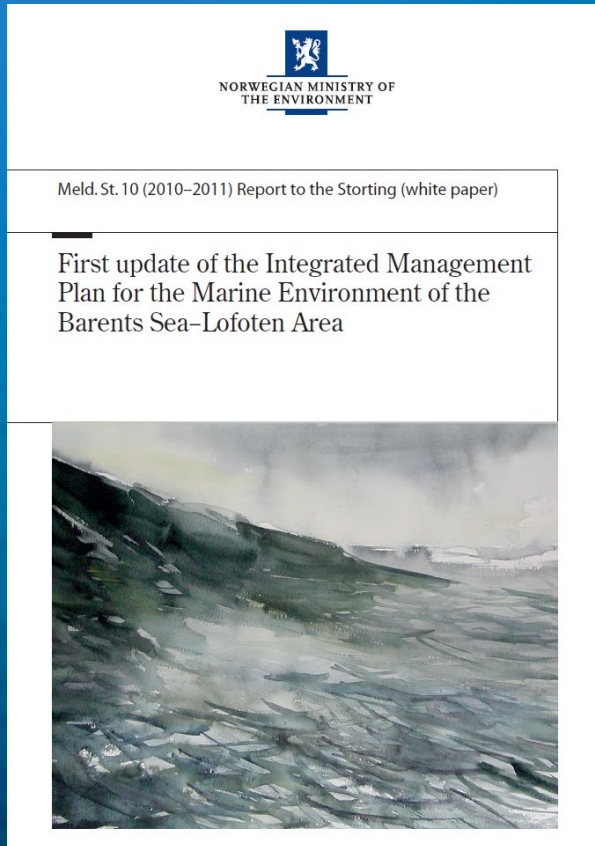
To develop and implement the first
Ecosystem Risk Assessment for the Barents Sea
ecosystem,

assess **cumulative impacts across sectors** within
one, unified framework including

direct and indirect, food-web mediated responses



Ecosystem-related monitoring, assessments and management advices for the Norwegian, Barents and North Seas



Strategic Objectives:

Sustainable Use and Maintenance of the Health of the Marine Ecosystem

INDICATORS

24 Ecosystem status, 4 Pressure and 1 Effect indicators:

82 Status parameters on biodiversity and physical-chemical states



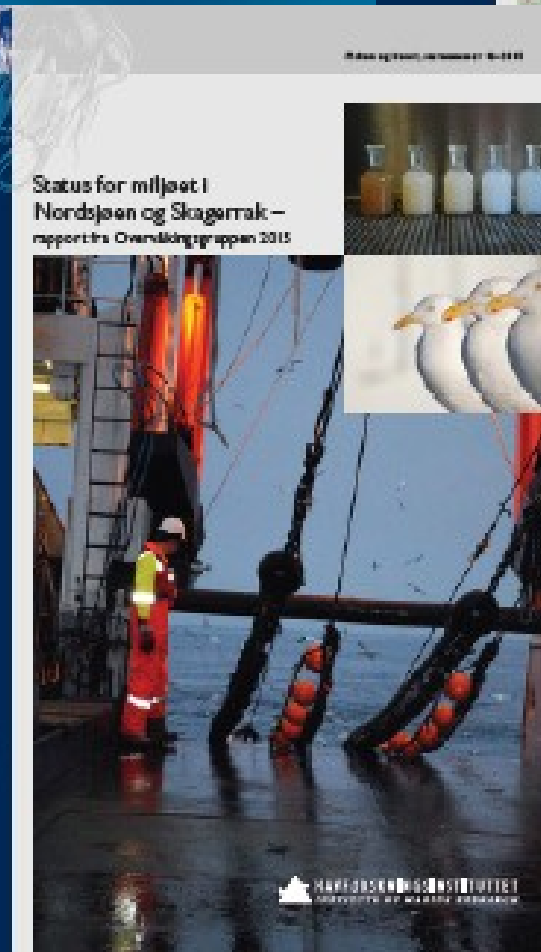
13 Activity-related indicators: 70 different parameters on pressure level

Hybrid Top-Down Approach



- Leads to decisions by the government (political decision)
- Developed and carried out by government research institutes and directorates
- Input from stakeholders
- Important zoning decisions made at political level





Annual reports, circulating with three years between each regional sea. Edited by the Surveillance group, chaired by IMR



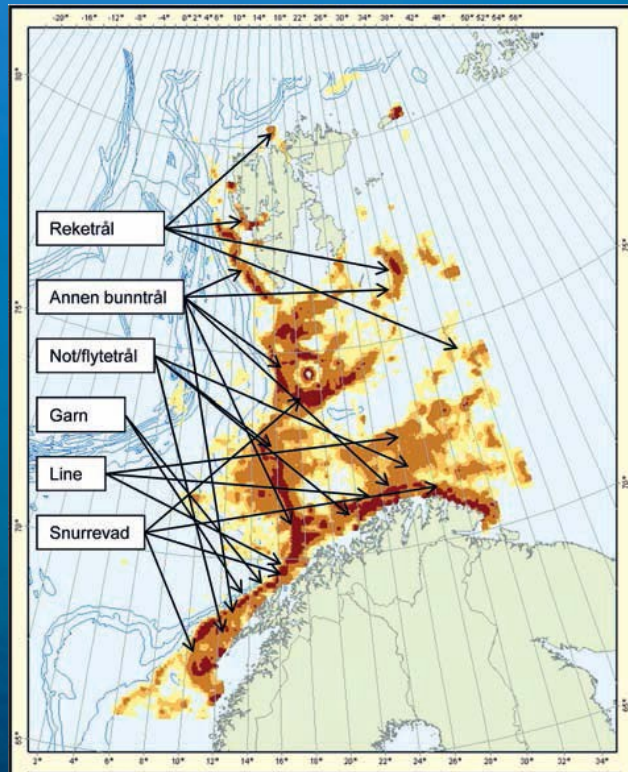
Experience after > 10 years

1. Ecosystem state and trends are reported by **natural scientists** but these advices lack inclusion of legal, social or economic research and unified measures across management bodies
2. Management are mostly run by social, juridical and economists, with different perspectives
3. Each sector run their regulatory processes differently and separate from other sectors

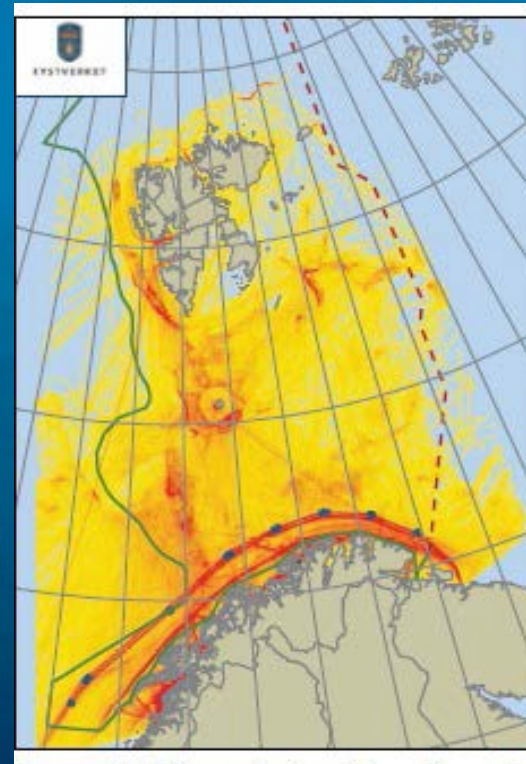


Anthropogenic activities in the Barents and Norwegian Seas

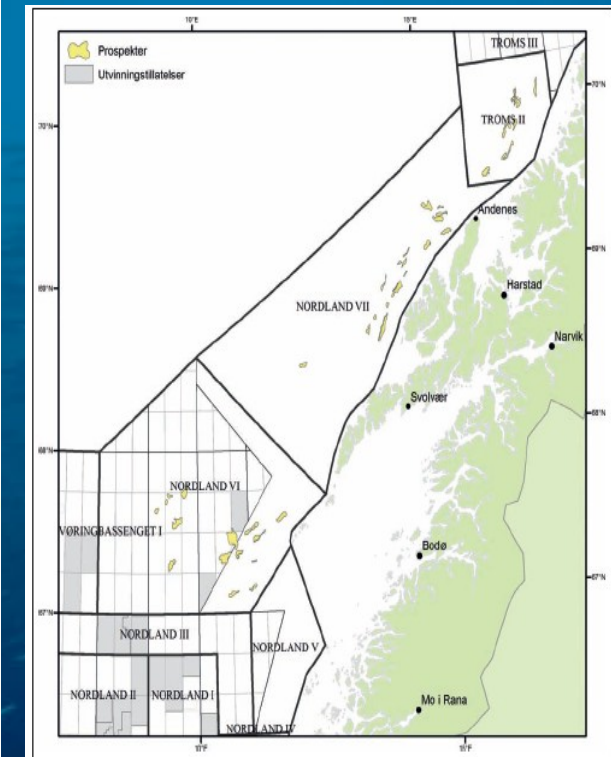
Fisheries activity
2009
(vessels > 21 m)



Ship traffic
2nd half of
2010



Petroleum extraction
mapped 2007-2009

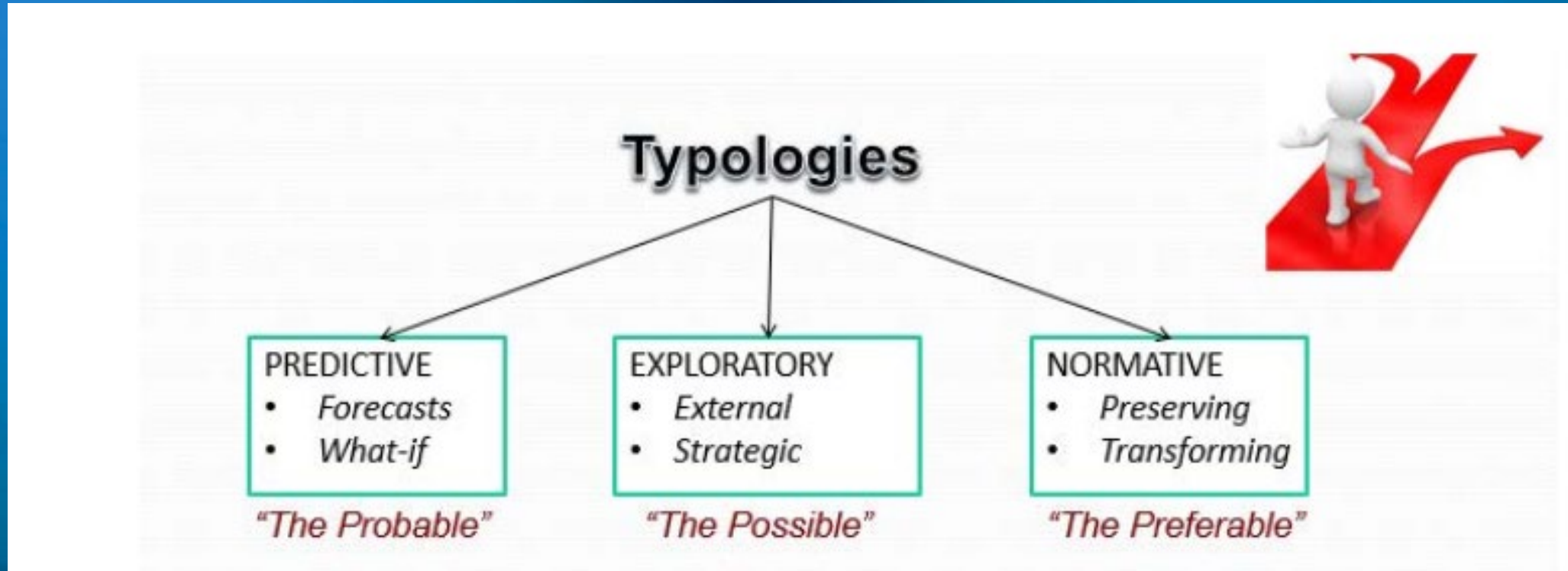


Levels to
penetrate
to achieve
actual common
Perceived
understanding



The Three Spheres of Transformation K O'Brien and L Sygna, 2013; M Sharma, 2009.

Barriers to common valuation



1. COLLABORATE

Collaborators would develop a common vision and define the problems and questions together. Laying a solid foundation is critical.

2. INTEGRATE

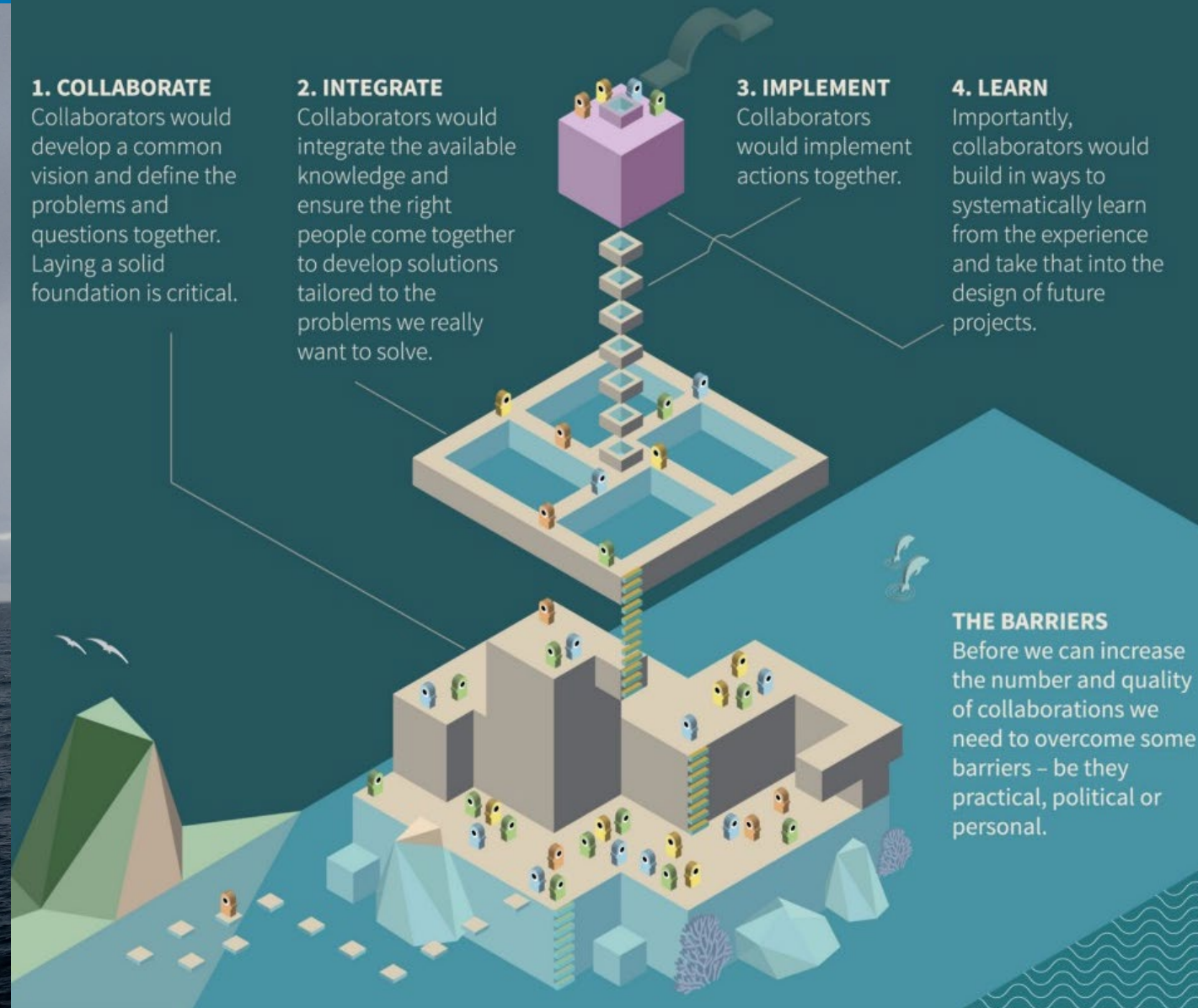
Collaborators would integrate the available knowledge and ensure the right people come together to develop solutions tailored to the problems we really want to solve.

3. IMPLEMENT

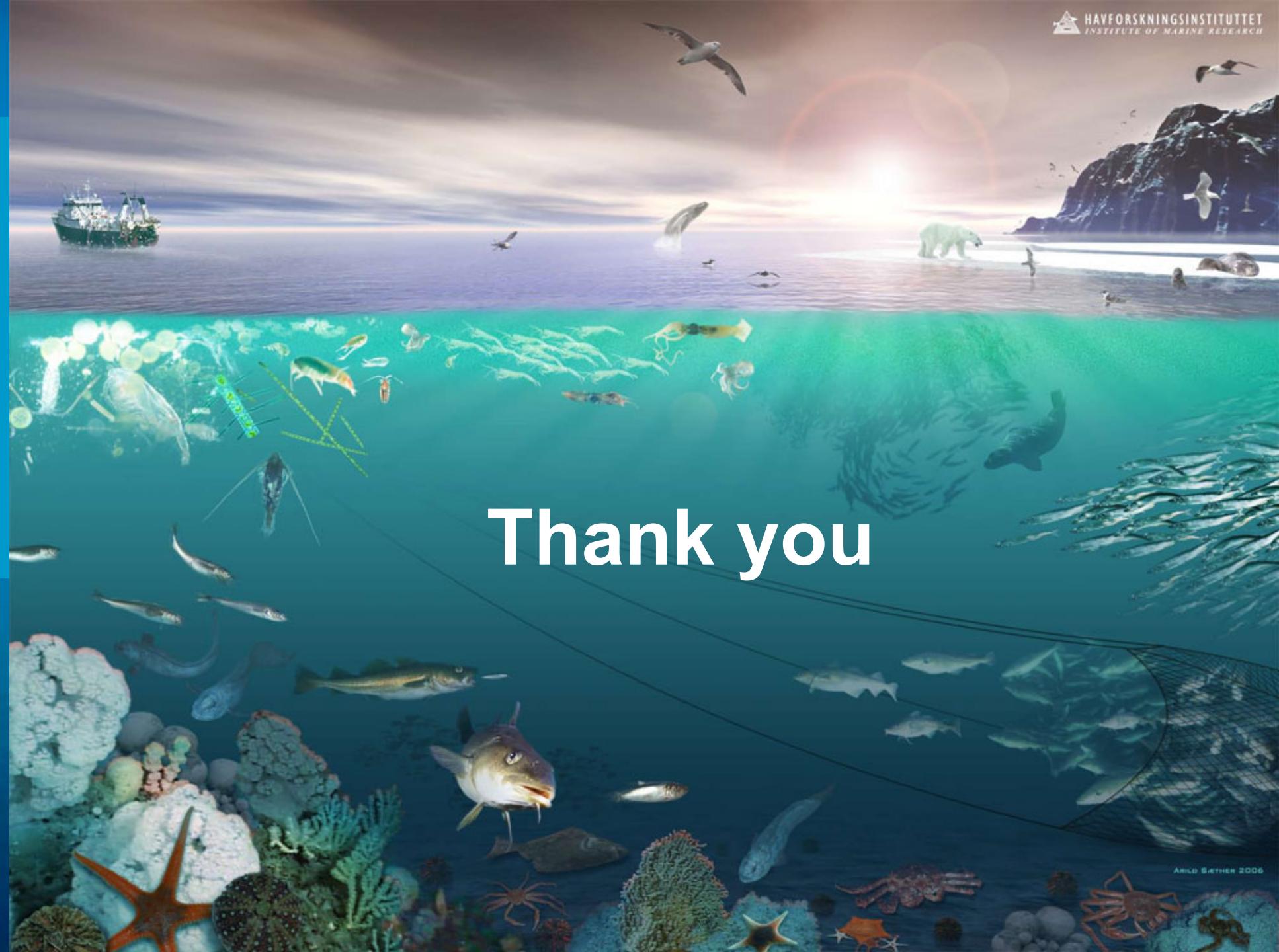
Collaborators would implement actions together.

4. LEARN

Importantly, collaborators would build in ways to systematically learn from the experience and take that into the design of future projects.



Everything is integrated in the ocean. We need to step up on cross-sectorial integration



Thank you

