Realm: Marine, Coast | **Biodiversity threat:** Fisheries, Offshore wind | **Stakeholders/ sectors:** Fisheries, renewable energy, maritime spatial planning | **Highlights:** Identifying EBM responses: risk assessment; Qualitative and quantitative evaluation; Linkage framework

Case Study 1 Trade-offs in ecosystem-based management in the North Sea aimed at achieving Biodiversity Strategy targets

Balancing fish, wind power, and biodiversity:

There is a need for a more integrated perspective for managing the many activities in the North Sea that impact biodiversity and hence compromise the achievement of societal goals. Management decisions are often taken without adequate knowledge of the associated risks. Our aim: to determine what scientific knowledge is needed in the North Sea to guide decision-making toward the (balanced) achievement of societal goals, whilst involving important societal actors, including (national) government, fishing industry, the offshore wind energy sector, and Non-Governmental Organisations.

Where and what are the challenges?

The North Sea is one of the busiest seas with many (often growing or newly emerging) sectors laying claim to a limited amount of space. The main human activities include fishing, shipping, oil and gas extraction, and newly emerging activities such as the renewable energy sector. These combined human activities and their associated pressures on the environment and biodiversity have hindered the achievement of the environmental goals for the North Sea. Management of often multiple competing interests is complex and requires novel, more integrated approaches such as Maritime Spatial Planning or Ecosystem-based Management, which come with additional requirements for the scientific knowledge base.

What was done?

In collaboration with stakeholders,

- we assessed the current state of the North Sea ecosystem using a risk-based approach and the AQUACROSS linkage framework;
- to provide further guidance to decision-makers, we developed an integrated risk-based approach that linked the impacts on biodiversity to the supply of ecosystem services;
- we identified a number of likely ecosystem-based management measures for the North Sea;
- we evaluated the effectiveness of these EBM measures to contribute to the conservation of biodiversity, i.e. achievement of the "healthy marine ecosystem" societal goal, while also considering potential management initiatives toward achieving other societal goals, i.e. a "sustainable food supply" and "clean energy".

Local results:

We show that integrated ecosystem-based scientific advice can provide a new and complementary perspective to the conventional science advice, which can often remain confined within institutional silos. We need considerably more scientific knowledge about the North Sea to support integrated management. We show that risk-based approaches are promising for integrated assessments of cumulative effects and management of biodiversity.

General lessons learned for managing biodiversity:

This work represents a first attempt to provide a more integrated, ecosystem-based approach that considers diverse societal goals, includes several sectors, and considers their impacts on the ecosystem and all relevant components. A risk assessment was applied to assess the effectiveness of a suite of management measures.

Local impact:

"What I have found really inspiring about the AQUACROSS project is the way it demonstrates how ecosystem based approaches can provide new and important insights for decision makers... (and) that ecosystem based management has moved beyond being a scientific concept to become a powerful management tool for decision makers." - Finlay Bennet, Marine Scotland.

Learn more about Case Study 1 at aquacross.eu or the AQUACROSS Information Platform

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