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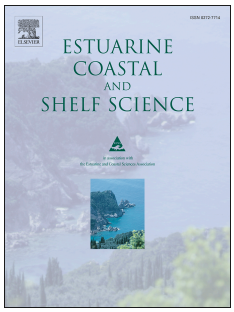

Integrating natural and social sciences to sustainably manage vectors of change in the marine environment: Dogger Bank transnational case study

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Integrating natural and social sciences to sustainably manage vectors of change in the marine environment: Dogger Bank transnational case study.

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Abstract

The management of marine resources is a complex process driven by the dynamics of the natural system and the influence of stakeholders including policy-makers. An integration of natural and social sciences research is required by policy-makers to better understand, and manage sustainably, natural changes and anthropogenic activities within particular marine systems. Given the uncertain development of activities in the marine environment, future scenarios assessments can be used to investigate whether marine policy measures are robust and sustainable. This paper develops an interdisciplinary framework, which incorporates future scenarios assessments, and identifies four main types of evaluation needed to integrate natural and social sciences research to support the integrated management of the marine environment: environmental policy and governance assessments; ecosystem services, indicators and valuation; modelling tools for management evaluations, and risk assessment and risk management. The importance of stakeholder engagement within each evaluation method is highlighted. The paper focuses on the transnational spatial marine management of the Dogger Bank, in the central North Sea, a site which is very important ecologically, economically and politically. Current management practices are reviewed, and research tools to support future management decisions are applied and discussed in relation to two main vectors of change affecting the Dogger Bank, namely commercial fisheries and offshore wind farm developments, and in relation to the need for nature conservation. The input of local knowledge through stakeholder engagement is highlighted as a necessary requirement to produce site-specific policy recommendations for the future management of the Dogger Bank. We present wider policy recommendations to integrate natural and social sciences in a global marine context.

Keywords

Dogger Bank; Integrated Marine Management; Ecosystem Services; Modelling Tools; Future Scenarios; Risk Assessment.

Research Highlights

- Integrating natural and social sciences is essential for sustainable management
- A generic conceptual framework is proposed which identifies tools for integration
- Future scenarios assessments can be used to aid future management decisions
- Four types of integrating tools have been applied to the transnational Dogger Bank
- Stakeholder engagement is essential to produce site-specific policy recommendations