



Linking Marine Futures across Scales: Offshore Windfarms and Ecosystem Services

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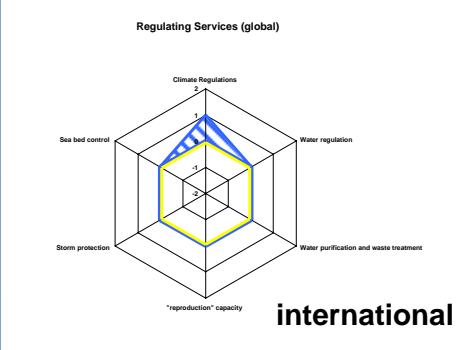
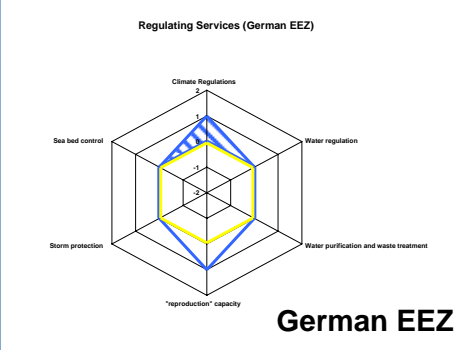
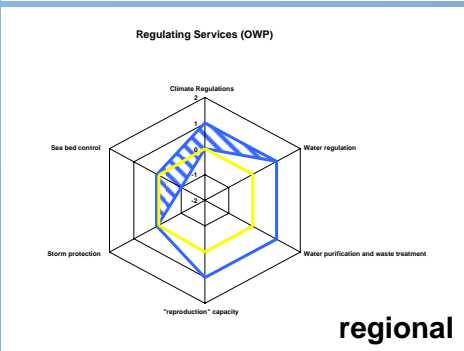
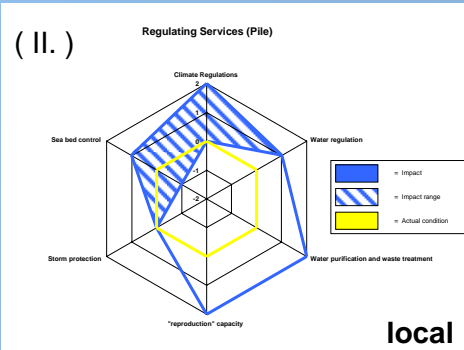
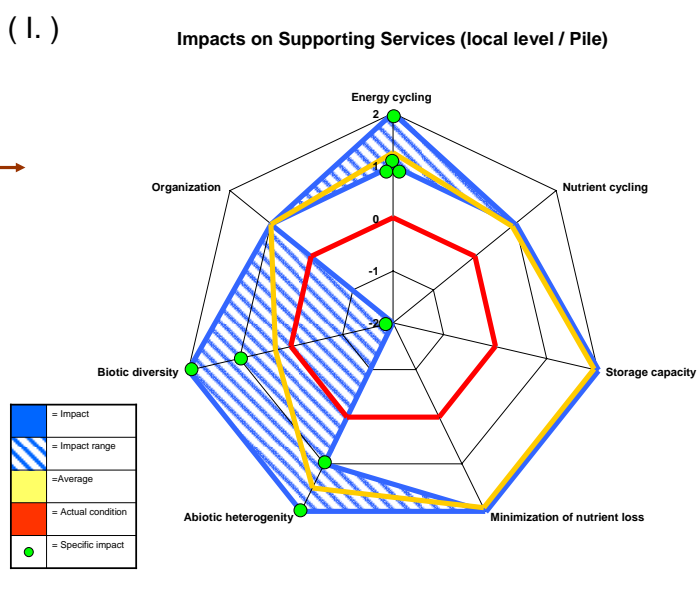
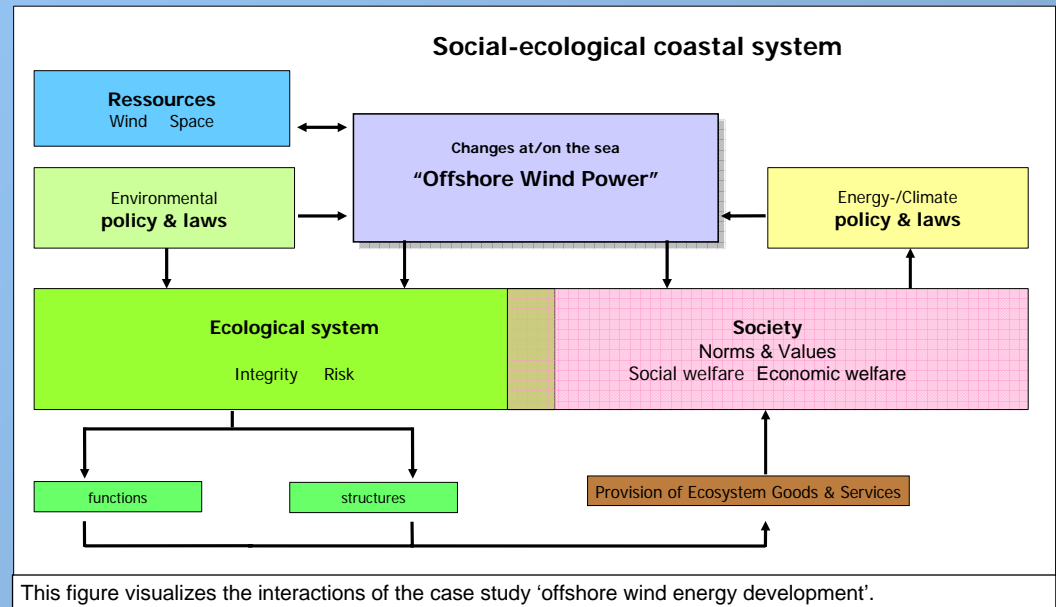
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Introduction: The project cluster "Zukunft Küste - Coastal Futures" (2004 - 2010) assesses the ecological and socio-economic impacts of wind farming off the German North Sea coast of Schleswig-Holstein. The DPSIR (Driver-Pressure-State-Impact-Response) approach serves as a framework for an inte-

grated system perspective. Within this framework the Ecosystem Services Approach, as defined in the Millennium Ecosystem Assessment (2003), was applied to assess the impacts of offshore wind farming on relevant ecosystem services on the coast and in the sea. This poster presents first results of an ongoing study.

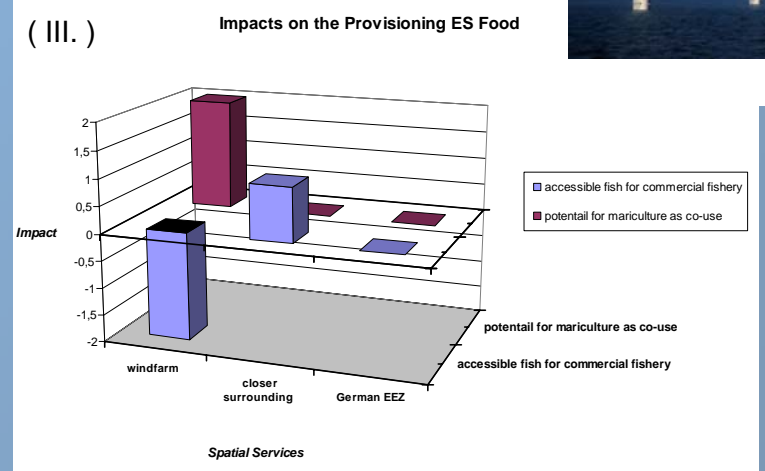
What are we aiming for: The overall perspective of the Coastal Futures approach is to pay attention to system changes by applying an overarching approach. This leads to an overall system analysis and helps to develop a conceptual model for a specific social-ecological coastal systems.

Concerning the Ecosystem Services (ES) Approach the first aim is to identify relevant marine ES that can be affected by offshore wind farming at all. This includes all four categories of supporting, regulating, provisioning and cultural ES, and considers the sea as well as the mainland. The second aim is to separate out the specific impacts of offshore wind farming on these services based on ecological modeling and socio-economic analysis. The third aim is to link this impact analysis to effects on human well-being.



Amoeba diagrams visualize impacts within ES categories (I.) and across scales (II.)

Example for impact on a specific ES (III.)



How we use the ES Approach: The holistic ES approach was used to analyze the specific case of offshore wind farming as one particular human activity causing changes in the marine environment. Information on all relevant ES was brought together in a comprehensive table, serving as a structural tool. A detailed description of each impact and a rating (ranging from -2 to +2) provided an initial overview and made the outcomes traceable. This was especially important for ES which consist of more than one component (e.g. "Biotic diversity"). In a second step the impact rating was conducted for several spatial scales ranging from local, across regional level and German EEZ, up to international level. After evaluating the impacts of offshore wind farming on all relevant ES, these data were visualized in amoeba diagrams to summarize the results and compare the various spatial scales.

Discussion and outlook:

- Average values were identified as a critical point when impacts on a single ES consist of several components differing in force and direction.
- The distinction between the service (offshore) and the benefits generated onshore (by using ES) appeared to be difficult, especially within the categories provisioning and cultural ES.
- Moreover, the connection of observed changes of ES with impacts on human well-being were identified as a topic that needs further discussion.

An idea within the project is to apply human well-being indicators to describe effects of changing ES on benefits people obtain from those services.