Natural Capital and Ecosystem Services

JNCC
Joint Nature Conservation Committee

Exploring the Components and Processes of Marine Ecosystems Critical to Ecosystem Service Generation

Country/region: UK
Beneficiary: Consultants, regulators, statutory nature conservation bodies
Period of work: January – September 2016
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Summary

There is a need to better represent marine systems in terms of natural capital thinking as they are critically important to many services, goods and benefits that support human societies (EEA 2015).

Ecosystem service delivery in the marine environment is driven by a number of biotic and abiotic ecosystem components and processes. Examining how these components and processes influence ecosystem service delivery, both spatially and temporally, is crucial to understanding service delivery. In turn this understanding may help to inform marine spatial planning, ecosystem-based management, blue growth, impact assessments and wider management plans.

This project explored the marine ecosystem components and processes that influence potential ecosystem service delivery. It identified which components and processes are deemed critical in the delivery process, gathered spatial data regarding ecosystem components and processes, and mapped the potential for delivery of three ecosystem services in the UK marine environment based on these data.

The maps produced on the following services: kelp provision, bioremediation of hydrocarbons and delivery of good diving experiences, serve to test the method. They highlighted that certain ecosystem services are more amenable to mapping than others. This can also be useful information sources in informing future marine planning, management options or impact assessment decisions.

Work involved

- Three of the policies reviewed explicitly considered ecosystems services. A further eighteen, only included reference to terms related to ecosystem services.
- Extensive literature review of the components and processes that influence ecosystem service delivery.
- Analysis and assessment to identify which components and processes are critical to ecosystem service generation.
- Spatial data mining and mapping of critical components and processes for three ecosystem services to produce maps showing ecosystem service distribution.

Key outcomes

- A limited number of the policies reviewed explicitly considered ecosystem services, but many (18 out of 21) included reference to terms related to ecosystem services.
- Identification of critical components and processes underpinning ecosystem service generation in UK waters.
- Method development for the mapping of ecosystem services.
- Provisional maps for three ecosystem services.

Future work

The project offers the opportunity to build on its findings by applying this approach to other ecosystem services, developing links to conceptual ecological modelling and conservation advice.

Identified research priorities

Future efforts could concentrate on integrating three-dimensional hydrodynamic and process-based models into the mapping framework, ultimately enhancing the understanding of environmental processes driving spatial patterns of ecosystem service delivery.

Distribution of kelp provision

Distribution of bioremediation of hydrocarbons

Distribution of areas providing good diving experiences