

Geographical mapping of ecosystem services and their economic values

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Ecosystem services are the contributions which ecosystems make to human well-being. These contributions can be direct but more often they are indirect contributions. A direct contribution is when ecosystems are the sole provider of well-being (e.g. wildlife for those who enjoy experiencing nature). Indirect effects are when ecosystem services are combined with human and manufactured capital in the production of goods (e.g. in case of food production).

The Millenium Ecosystem Assessment (MA, 2005) popularized the ecosystem service concept, coined by Erlich and Erlich in 1987, and made the concept an integrating framework for understanding and communicating between diverse interests groups and disciplines; the linkages between biodiversity, ecosystem and human well-being. Since then, the framework has been refined and is increasingly being developed to turn the conceptual framework into frameworks for operational analysis and decision making.

Much attention is currently being given to the scope for developing decision making frameworks by using spatially explicit ecosystem services models. This includes spatial mapping of ecosystem services and their economic value associated with alternative policy directions (e.g. the Natural Capital project, (Kareiva et al., 2011), the UK national ecosystem assessment, (Bateman et al., 2013), the PRESS project, (Maes et al., 2012)).

This presentation reports on a pilot study conducted at Aarhus University exploring the scope for mapping and valuing ecosystem services at the national scale. To do this we select a number of services to explore a range the different types of ecosystem services and evaluate the extent to which it is possible to map the services and their associated economic values. Of the provisioning services we choose food and fodder production. We do this because agricultural production dominates the Danish landscapes. If food as a service is not included in the analysis the study would misrepresent the services provided by agricultural landscapes. Among the regulating services we selected climate regulation, pollination and water quality regulation, as they are particularly important services to assess in intensive agricultural systems. From the cultural services we select recreation services as the service is most amenable to geographical mapping and valuation.

For the selected services we define the service in terms of the CICES classification system and select methodologies for mapping and where possible map the spatial distribution of the economic values associated with changes in the ecosystem service provision.

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