

Advances in Ecological Research Volume 53

Ecosystem Services: From Biodiversity to Society, Part 1

This two-part Volume presents a series of papers on the theme of Ecosystem Services (ES). ES are the natural functions and processes of ecosystems that have social, economic or ecological value to humans. The ubiquity of these socioeconomic-ecological inter-relationships means that the ES framework has almost universal potential and its importance in policymaking is growing. However, a full decade after the publication of the Millennium Ecosystem Assessment (MEA 2005), which catalysed the field, there is surprisingly little empirical data that brings together social, economic and ecology thinking about ecosystems, and much of the theory is similarly embryonic. Part 1 opens by assessing the current state of the field and future prospects, in the context of the MEA, its precursors and the revolutionary changes that have occurred since its publication. This is followed by a series of papers that grapple with some of the more fundamental ecological issues that underpin service provision, but which have yet to be resolved. Amongst the papers in Part 2, we present how molecular NGS data might be used to monitor ES by reconstructing networks of interaction and function and how network-based data can improve visualisation of these complex systems, to facilitate communication and to act as tools to improve engagement, advocacy and ES management. The theme closes with papers that take us further into realms where the natural and social sciences interact, and the drivers and responses associated with human decision-making are explicitly part of an integrated socioeconomic-ecological system. The chapters in this volume provide a snapshot of ES research: illustrating the current state-of-the-art and spanning a full spectrum, from developing a mechanistic understanding of the ecological processes that ultimately deliver services, through to the implementation of policies designed to optimise service delivery. There is clearly much work to be done, but this Volume offers an important step towards developing the next generation of approaches that we will need to ensure humanity remains within a "safe operating space" in a more sustainable future.

Cover image: In a world of increasing demand for food and fibre, against the backdrop of continuing degradation of ecosystems, land managers and policy makers face significant choices. Scenarios that integrate multiple drivers of change and their ecosystem responses can be used to aid the discussion and the development of future strategies. Both scientists and non-scientists have been involved in the co-production of this 3D scenario that illustrates one plausible future for the uplands of the UK in 2050: a future where hills currently used to produce EU-subsidised meat and low quality conifer fiber would be managed sustainably for water security and carbon sequestration. *Image produced by Sinelab as part of the NERC-DURESS report card by Prosser et al. 2014.*



ACADEMIC PRESS

An imprint of Elsevier
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ISBN 978-0-12-803885-7



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