

## **Engaging Multiple Disciplines in Ecosystem Services Research and Assessment: A Reply to Orenstein**

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### More than Language Is Needed in Valuing Ecosystem Services

Raymond and colleagues (2013) have contributed an insightful response and partial remedy to address diverse critiques about the way scientists and managers represent and value ecosystem services (ES). Their call for broadening the discourse on the human–environment relationship beyond the economic discussion should be heeded, and the integration of their multiple metaphors is a positive step toward this goal.

But to salvage the utility of the ES approach, more fundamental change is needed than just teaching ecologists and managers to speak the language of their respective target groups. What is not discussed in any of the critical work on ES valuation is the historical development of ES research that has led to the shortcomings in the assessment process. Since the 1990s, including the writing of the Millennium Ecosystem Assessment, the field has been dominated by ecologists and economists. Although this has led to productive research and effective integration of economic tools into conservation, it has also led to the problems outlined by Raymond and colleagues and threatens to make the ES conceptual framework irrelevant for policy.

For the ES framework to maintain its relevancy, the reservoir of scholars working in the field must be broadened to include more (noneconomist) social scientists. This is true for three reasons.

First, by emphasizing improving life for humans, the ES framework is anthropocentric. ES assessment should also be. As Jax (2010) notes, “To assess ecosystem services in a particular region, we have to work our way backwards from society and its specific needs to ecosystem processes—and not vice versa, as scientists mostly do” (p. 70). If ES assessment is conducted to understand how to inform and guide human behavior, who is better equipped to study how humans perceive and respond to ES than those whose profession is human centered?

Second, an explicit goal of ES assessment is to advise policy. Policymaking is primarily a social process (Cohen 2006). Ecologists should have a role in environmental policymaking, but they are only one of many stakeholder groups involved. The ecological community is beginning to realize this humbling truth and is engaged in soul searching regarding how to strengthen its role in civil discourse and policymaking (Groffman et al. 2010). Social scientists of all stripes (e.g., political scientists, sociologists, anthropologists, historians, planners) can help navigate the policy process, provide socially relevant data for policymakers, and assist ecologists in understanding and communicating with people. Rogers and Schmidt (2011) suggest that social scientists can contribute to ES assessment particularly in the realm of stakeholder integration, including identifying stakeholders (non-social scientists tend to identify the most prominent stakeholders or those most easy to work with), their values, and the impact of ES management scenarios on stakeholders.

Finally, integrating social scientists into ES assessment can help remedy the chronic undervaluation of cultural services (Spangenberg and Settele 2010). Cultural services are the perennial last-on-the-list ES, following provisioning, regulating, and supporting services, presented as a potpourri of intangible benefits. Cultural services rank high in public consciousness in their importance (Sagie et al. 2013) and may be one of the most effective vehicles with which to communicate the importance of protecting ecosystems. Economists employ numerous methods to estimate their monetary value; the constraints of these methods are well known. Since cultural services are valued in spiritual, aesthetic, ideological, and educational (i.e., nonmonetary) currency, their valuation is best expressed in the lexicon of the (noneconomic) social sciences.

Opening up ES research and assessment to a broader array of disciplines has the potential to fundamentally

change the discourse around valuation (including the promotion of the multiple metaphors advocated by Raymond and colleagues); to provide better social knowledge to conservation discourse; and, ultimately, to strengthen land-use and natural resource policy.

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### Engaging Multiple Disciplines in Ecosystem Services Research and Assessment: A Reply to Orenstein

We thank Orenstein for discussing our recent article in *BioScience* (Raymond et al. 2013). His central argument is that social scientists need to be better engaged in ES assessment if the concept is to be mainstreamed into policy and practice. We agree. Along those lines, we called for a deliberative approach to ecosystem management that actively engages multiple stakeholder groups in meaningful dialogues in order to understand the ways

that people relate to nature before adopting a specific metaphor a priori to portray human–environment interactions. Such a deliberative approach requires an interdisciplinary approach to ES assessment. Our article, which was the result of a workshop that invited a broad suite of social scientists (many new to the concept of ecosystem services) to think seriously about what their disciplines and methods could offer to the study of cultural values and social change in ecosystem services. Furthermore, many of the authors of this article are trained in the social sciences. We therefore extend Orenstein's argument in that social and natural scientists of all stripes have an important role in navigating the policy process, in providing relevant social and ecological data for policymakers, for the communication of results, and for stakeholder integration.

We also agree that cultural services deserve more attention, as some of us have argued extensively elsewhere (e.g., Chan et al. 2012a, Daniel et al. 2012, Klain and Chan 2012). Some of us have helped pioneer approaches “to study how humans perceive and respond to ES” (Raymond et al. 2009, Klain and Chan 2012). Others have also built novel participatory approaches for mapping cultural and social values that complement our work (e.g., Sherrouse et al. 2011, Brown et al. 2012). We heartily agree, again, that ecosystem-service valuation merits some critique, as we have also argued previously (e.g., Chan 2011, Chan et al. 2012b). Orenstein charges that these points weren't discussed in the article. That is true. Not all points belong in all papers.

Orenstein calls for a historical account of the development of ES research. Toward this end, we appreciated existing contributions (Mooney and Ehrlich 1997, Gómez-Baggethun et al. 2010).

Finally, Orenstein encourages ES assessments to be anthropocentric, citing the need to work backward from society and its specific needs to the ecosystem processes that support

these needs. Our focus was not only on ES assessments but on ecological management and intervention in general. In this context, we argued and we still maintain that, although utilitarian anthropocentric approaches are valuable in some contexts, there can be great gains from also considering approaches that don't emphasize what ecosystems do for people but, rather, a diversity of human–environment relationships. For example, the closed-loop production metaphor showed the importance of valuing not only the services that ecosystems provide to humans but also the ways in which humans guide environmental interactions. The web of life metaphor was then used to highlight the importance of valuing ecological patterns and processes. The challenge for researchers and policymakers is to develop deliberative approaches that, first, allow multiple metaphors (e.g., economic production, closed-loop production, web of life, stewardship, and ecocultural community) to be heard and that, second, allow chosen metaphors to be included in valuation approaches that account for both human and non-human needs.

In conclusion, we support Orenstein's call for the inclusion of a broader array of disciplines in ES research and assessment. We argue that this should be done in a way that enables deliberation on a diversity of metaphors representing human–environment relationships, toward greater harmony in such relationships.

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