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Mapping and Valuing Ecosystem Services as an Approach for Conservation and Natural-Resource Management

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Article first published online: 21 APR 2009

DOI: 10.1111/j.1749-6632.2009.04152.x

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Issue



Annals of the New York Academy of Sciences

Volume 1162, The Year in Ecology and Conservation Biology 2009 (/doi/10.1111/nyas.2009.1162.issue-1/issuetoc) pages 265–283, April 2009

Additional Information

How to Cite

Tallis, H. and Polasky, S. (2009), Mapping and Valuing Ecosystem Services as an Approach for Conservation and Natural-Resource Management. *Annals of the New York Academy of Sciences*, 1162: 265–283. doi: 10.1111/j.1749-6632.2009.04152.x

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Publication History

1. Issue published online: 21 APR 2009
2. Article first published online: 21 APR 2009

- Abstract
- [Article \(/doi/10.1111/j.1749-6632.2009.04152.x/full\)](https://doi.org/10.1111/j.1749-6632.2009.04152.x/full)
- [References \(/doi/10.1111/j.1749-6632.2009.04152.x/references\)](https://doi.org/10.1111/j.1749-6632.2009.04152.x/references)
- [Cited By \(/doi/10.1111/j.1749-6632.2009.04152.x/citedby\)](https://doi.org/10.1111/j.1749-6632.2009.04152.x/citedby)

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Keywords:

production function; benefit transfer; valuation; conservation; win-win; poverty; trade-off

Current approaches to conservation and natural-resource management often focus on single objectives, resulting in many unintended consequences. These outcomes often affect society through unaccounted-for ecosystem services. A major challenge in moving to a more ecosystem-based approach to management that would avoid such societal damages is the creation of practical tools that bring a scientifically sound, production function-based approach to natural-resource decision making. A new set of computer-based models is presented, the Integrated Valuation of Ecosystem Services and Tradeoffs tool (InVEST) that has been designed to inform such decisions. Several of the key features of these models are discussed, including the ability to visualize relationships among multiple ecosystem services and biodiversity, the ability to focus on ecosystem services rather than biophysical processes, the ability to project service levels and values in space, sensitivity to manager-designed scenarios, and flexibility to deal with data and knowledge limitations. Sample outputs of InVEST are shown for two case applications; the Willamette Basin in Oregon and the Amazon Basin. Future challenges relating to the incorporation of social data, the projection of social distributional effects, and the design of effective policy mechanisms are discussed.

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