

Non-Monetary Benefits Without Apology: The Economic Theory and Practice of Ecosystem Service Benefit Indicators

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Values for changes in ecosystem services (ES) are required or desired in many policy and management decision contexts, although appropriate monetary values often are not available or are infeasible to estimate. Fortunately, in many contexts—e.g., cost-effectiveness analysis of programmatic mandates, discourse-based decisions, advocacy or educational efforts—monetized values are not required. In other contexts, such as benefit-cost analysis, while monetized values are preferred, it is not always possible to monetize all benefits and costs. In these instances, systematically-collected information on public preferences, demand, and values can support decisions and contribute to a more comprehensive accounting, particularly when determining how to allocate scarce collective resources among competing priorities and uses.

We present a framework, based on economic theory and concepts, for developing and compiling non-monetary indicators of ES benefits (or costs), and provide examples of applications for decision making. Using this framework, decision makers can develop sound benefit indicators to evaluate the ES benefits (or costs) of policies and management decisions. The benefit indicator framework is grounded in empirically-based factors that contribute to the relative scarcity, and therefore economic value, of ecosystem goods and services. Indicators should be developed and selected based on a theoretically-sound link between the indicator and the aspect of the system that it represents, rather than more ad-hoc metrics. Thus, the framework uses economic models of supply, demand, and value to systematically develop and select indicators based on their ability to predict changes in benefits across policy options. These indicators can also be used in conjunction with standard monetary valuation as an initial step in analysis, or in benefit transfer applications to facilitate transfer of values across locations, by providing modifying factors for transferred values. A set of economic benefit indicators would include indicators of quantity and quality of valued ecological outputs and the expected reliability of provision over time; the number of beneficiaries and strength of preferences; substitutes, complements and the elasticity of demand; and overall supply relative to demand.

Decision makers can benefit in several ways from using theoretically-sound and practically-relevant ES benefit indicators. Indicators frequently can be more easily compiled than monetary measures, and are amenable to telling a theoretically consistent and understandable story about benefits and costs of policies or actions that affect ES. Indicators can remain disaggregated, thus allowing individual aspects of tradeoffs that may be masked in a single money metric to remain transparent. Indicators can be useful in systems models where many important aspects of the system must be included, but acceptable money measures are not readily available for all of the important benefits and costs. If evaluations include only those monetary measures that are readily available, the resulting incomplete assessment of the system can lead to poorly informed decisions. Thus, benefit indicators may allow ES benefits to be included in more decisions and can support more complete assessments of those decisions.

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