

North-Central Section - 39th Annual Meeting (May 19–20, 2005)

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Presentation Time: 9:20 AM-10:00 AM

WATER RESOURCES SUSTAINABILITY: AN ECOLOGICAL ECONOMICS APPROACH

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An ecological economics framework guides us toward more sustainable water resources decisions in three important ways. First, it provides a needed theoretical revision to neo-classical economic analysis. Second, it provides better methodologies for measuring the value and marginal value of water in competing uses. Third, it helps us identify the program of institutional reform that has the best chance of delivering more sustainable water resources management practices. In contrast to neo-classical economics, ecological economics views production and consumption of marketable goods and services as only an important part of a larger process that involves interdependent relationships among manufactured, intellectual, human, social and natural capital. Water resources are natural capital that delivers both inputs to production of marketable commodities and ecosystem services directly to people.

The primary challenges of an ecological economics approach to sustainability lie in applying this theoretical approach in a field such as water resources and in measuring the effects of management options on natural capital and ecosystem services flows to people over time and space. One approach is presented based on the NSF-funded Virtual Watershed project that uses geographic information systems, genetic algorithms, and agent-based programming, combined with economic and environmental systems models, to produce ecological-economic production possibility frontiers at watershed scales. Such an analysis can show that agricultural landscapes and watersheds have the potential to produce enhanced flows of ecosystem services such as nutrient cycling, water quality, and retention of flood waters through changes in incentive structures, such as forms of agricultural subsidization, to land managers.

An ecological-economic perspective also leads toward a specific agenda for reform of water resources management. Some of these reforms are expanded programs for restoring aquatic ecosystems and for bringing potable water and basic sanitation to the billion people now lacking these services. Others include utilizing the Integrated Water Resources Management (IWRM) approach as captured by the Dublin principles and the "virtual water" strategy where water-short regions expand food imports rather than develop scarce water supplies for irrigation.

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[General Information for this Meeting](#)

Session No. 3
[Ground Water Sustainability I](#)
Radisson Metrodome: University AB Ballroom
8:00 AM-12:00 PM, Thursday, 19 May 2005

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