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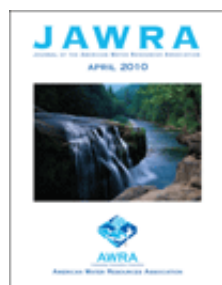
# INTEGRATED MODELING FOR WATERSHED MANAGEMENT: MULTIPLE OBJECTIVES AND SPATIAL EFFECTS<sup>†</sup>

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**ABSTRACT:** This paper presents an optimization framework for prioritizing sites for wetlands restoration on a watershed or landscape scale. The framework is designed for analyzing the potential environmental impacts of alternative management strategies while accounting for economic constraints, thereby aiding decision makers in explicitly considering multiple management objectives. The modeling strategy consists of two phases. First, relationships between the configuration of land use types in a watershed and valued ecosystem services are specified mathematically. Second, those functions are incorporated into a spatial optimization model that allows comparisons of the expected environmental impacts and economic costs of management strategies that change the configuration of land use in the watershed. By way of a stylized example, this paper develops the general structure of the framework, presents simulation results based on two production functions for ecosystem services, and discusses the potential utility of the methodology for watershed management.

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