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An Ecosystem Approach to the Sustainability of Urbanizing Watersheds

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Abstract
Political boundaries make watershed planning difficult despite the influence of many state and federal programs. Broad, top-down, watershed initiatives fail to reach many municipalities due to human resources, time and legalities. Thus, a watershed ecosystem based approach to city planning should be utilized in order to integrate a holistic and scientific foundation for land use decisions. However, there is a need for research for developing and applying a watershed approach to urbanizing watersheds.

The goal of this study is to provide a series of science based transferable recommendations upon which municipalities can make land use planning decisions. These recommendations are informed by a watershed modeling and prioritization study conducted with the community of Northampton,

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Massachusetts. Analyses of water resource planning options were made concerning future development scenarios using an approach which links water quality and quantity, land use and government. A required component of the ecosystem approach, stakeholder participation, applied the Deliberative Attribute Prioritization Procedure (DAPP) for the first time in this context to assess the relative of different environmental concerns. The results of these stakeholder focus groups showed the importance of several key attributes including land use, water quality, water quantity, and impacts to neighboring communities that were utilized in the watershed models.

This thesis provides an integrated tool for water resource planning at the municipal level. However, without the effective transfer of these recommendations into existing policies like zoning, the results of the study have limited use. Therefore implementation of recommendations within municipal planning documents is an important component. This information will be utilized to evaluate priority water resource protection overlays by providing quantitative information and decision making within a community. A citywide watershed model and analysis used to guide policy-making and decision-making will assist in fulfilling the community of Northampton's continuing commitment to work toward economic, environmental, and equitable sustainability, as well as provide a model for other communities.

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