

A SOCIOECONOMIC FRAMEWORK FOR INCORPORATING STAKEHOLDER PREFERENCES IN THE OPTIMIZATION OF DISTRIBUTED BEST MANAGEMENT PRACTICES

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Modifications of the hydrologic cycle, including changes in flood and drought patterns, intensity, and impairment of rivers and streams due to pollutants, are consequences of land use alteration. Eagle Creek Watershed (ECW) is a typical Midwestern agricultural watershed with a growing urban land-use that has been affected by these problems. Structural solutions have helped in the past to reduce the flooding problem in the upland agricultural area, but also led to intensive flooding and water quality problems downstream. It has been suggested elsewhere that re-naturalization of watershed hydrology via a spatially-distributed implementation of non-structural practices, such as wetlands, riparian buffers, grassed waterways, etc. will help to reduce these problems by improving the upland storage of runoff in watersheds. However, spatial implementation can be a challenge due to the large number of possible alternatives offered by physical models. Additionally, social attitudes and behavior of communities living in these watershed, as well as the economic factors, can constrain which alternatives are adopted and implemented. This study investigates how stakeholder attitudes can affect the design of “optimized” alternatives for spatial identification of best management practices. By using multiple scenarios of socio-economic objectives and constraints, each of which is built on a typical stakeholder attitude and preference in the watershed, the study investigates how these attitudes can affect the multi-objective spatial design of restoration strategies and the quality of the ecosystem services provided by the watershed.