ABSTRACT

CONCRETE TRUTH OR URBAN LEGEND: THRESHOLDS USED IN CHARACTERIZATION OF THE DEGRADATION OF NATURAL SYSTEMS IN RESPONSE TO URBANIZATION

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Degradation of natural systems occurs in response to urbanization. As the portion of impervious area increases, impacts to the receiving stream become ever more apparent. Resource managers strive to combat negative effects of urbanization with finite resources. Management decisions must be made to apply limited resources to locations that would experience the greatest degree of improvement for each hour and dollar spent. Questions arise on the relative effectiveness of similar efforts on streams of varying degrees of urbanization. Much of the literature suggests that stream integrity degrades significantly beyond approximately 10% total impervious surface area. This implies a threshold within which urbanization has minimal effects on stream ecosystem health and beyond which effects are dramatically different. This scenario calls for a management strategy, which targets catchments with less than 10% total impervious surface area. However, studies can also be found in the literature, which point to no clear threshold at any degree of urbanization, indicating a linear relationship between extent of urbanization and stream integrity. If this is the case, resources spent on streams with catchments of varying degrees of urbanization provide equal benefits. A review of the literature and analysis of measured biological, physical, and chemical data from watersheds of varying degrees of urbanization from a variety of geographical areas indicate a management strategy which may be most appropriate.