2009 Mid-Atlantic Stream Restoration
Abstract

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Presentation Type	oral presentation
Category	**4. Innovative watershed and stream restoration approaches/methods**
Abstract Title	Averaged Sediment Transport Modeling as an Adaptive Design Tool for Analysis of Geomorphic Response to Reach- and Watershed-scale Modification to Hydrologic and/or Sediment Transport Regimes
Abstract Text	Current stream restoration practices typically attempt to address impairments to geomorphic stability, water quality, and aquatic habitat at the reach scale. Increased attention is being focused on addressing impairments at the watershed scale, including fine sediment supply reduction and stormwater runoff volume reduction. Such approaches should address questions related to how much effort is necessary to obtain the desired effect and how will the channel respond if such actions are completed. This presentation focuses on methods able to provide insight into geomorphic response, specifically sediment transport, following hydrologic and/or sediment regime modification. Sediment transport analyses conducted in support of stream restoration design along the NW Branch Anacostia River will be used as a case study to highlight how such analyses can be used to guide decision making. The NW Branch Anacostia River project design focused on adding large woody debris along a 4-mile reach in order to increase channel roughness, increase aquatic habitat diversity, enhance sediment storage and transport diversity, and improve channel-floodplain interaction. A reach-averaged, one-dimensional sediment transport model was developed to predict sediment transport dynamics throughout the project reach. Computational nodes were established at 1,500-foot intervals along a 12,000-foot reach. HEC-RAS was used to calculate hydraulic conditions at each node to provide input to calculate sediment transport capacity at each node. Sediment

	transport results for each node were evaluated to calculate the change in bed elevation for each time step based on sediment supply and transport capacity. Revised hydraulic conditions were calculated for the next yearly time step based on channel change. The analysis was simulated to represent channel response over ten years following construction. Results were used as an adaptive design tool to enhance the proposed design to meet project goals.
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