ABSTRACT

TITLE:	Relationships Between Large Woody Debris and Sediment Loading of Warner Creek, NY
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ABSTRACT: The New York City (NYC) Department of Environmental Protection (DEP) is the City agency responsible for operating, maintaining and protecting NYC's water supply and distribution system which includes monitoring and maintaining water quality standards through watershed management and protection. Warner Creek, located in the Ashokan Watershed of the eastern Catskill Mountains, is an important source of water for NYC and has been identified as a contributor of sediment loading. A primary goal of the DEP is to maintain stream system stability by working with partner organizations to carry out research into understanding the cause of water quality degradation linked to the physical condition of stream watersheds. As part of the SUNY New Paltz Research Experience for Undergraduates (REU) program, students collaborated with the DEP throughout the summer of 2010 to conduct a full stream assessment of Warner Creek. At the reach scale, major stream features (natural and anthropogenic) were located and inventoried including large woody debris (LWD), bedform, fine sediment sources, bank erosion, revetments, culverts, and bridges along the length of the stream. These features were then inserted into a GIS and further analyzed using 3 meter LiDAR data. Three reaches were then chosen based on similar gradients, length, LWD occurrences, stream bedform, and bank substrate. These reaches then were then compared and contrasted to constrain LWD occurrences and its influence on geomorphic features and its overall effect on turbidity. Potential contributors to turbidity include hill slope failures, bank erosion, and anthropogenic influences such as land use. LWD was found to entrain sediment and in some cases cause scouring however, knick point migration was found to not be associated with LWD occurrences. Stream corridor width and sinuosity within the reaches were found to be important factors in LWD occurrences. Increased values of sinuosity correlated with the density of LWD occurrences. Narrow stream corridors containing LWD were associated with channel spanning and avulsion. Wider corridors had lower gradients and contained larger amounts of LWD relative to narrow corridors. These results can be of further use to the DEP in focusing their stream management efforts in certain areas of Warner Creek.