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## Cost and Performance Analysis of a Sediment Removal and Processing System for the Lower Susquehanna River Dams

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**Abstract:** A series of three major dams and reservoirs located along the Lower Susquehanna River have historically acted as a system of sediment and nutrient pollution traps. However, episodic pulses of these pollution loads are released following short-term extreme storm events, affecting subaquatic vegetation, benthic organisms, and the overall water quality in the Upper Chesapeake Bay. In addition, all reservoirs have reached a state of near maximum storage capacity termed as dynamic equilibrium. Based on prior research, this study seeks to regain the trapping capacity of the dams through a sediment removal and processing operation, and thereby reduce the ecological impact of major storms. A set of regression curves and a stochastic lifecycle cost model were used to evaluate the resulting effect on storm scour and the economic feasibility of processing and dredging amount alternatives. Results indicate that a Cement-Lock processing plant at moderate dredging is the most cost-performance effective solution.

**Keywords:** Lower Susquehanna River, Environment Restoration, Decision Analysis, Life-cycle Cost Analysis