Recovery of Sediment from the Conowingo Reservoir: A Circular Model of Finance, Technology, Policy, and Innovation for End Users

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Background/Objectives. Approximately 250 MCY of sediment have accumulated behind the Conowingo Dam since its construction in 1928. The Reservoir is now at equilibrium, meaning increased sediment and associated nutrients from the Susquehanna River is entering the Chesapeake Bay – increasing eutrophication and associated ecological impacts. Additionally, given climate change impacts – specifically the anticipated increase in frequency and intensity of storm surges – catastrophic mobilization of sediment and nutrients into Chesapeake Bay is a distinct possibility. Decades of research culminating in a 2015 multi-agency report suggested that dredging the Reservoir is likely too expensive. However, since then, the State of Maryland issued a dredged material reuse guidance (2017), launched a Maryland-specific water quality nutrient credit market (2019), and funded a pilot project to characterize sediment and evaluate potential markets for a dozen innovative reuses (2019). This presentation reports on an effort that integrates 1) the new water quality credit opportunities to finance dredging at scale with, 2) pilot project research on innovative reuse markets for dredged sediment, and 3) policy and regulatory shifts that could support a market-based solution to help Maryland and neighboring states meet federally-mandated water quality goals. Dredged sediment could also provide a local source of material for construction of wetlands, berms, dikes, and other coastal resiliency elements, additionally combatting the anticipated threats of sea level rise and storm surge.

Approach/Activities. In 2020, leaders from the State of Maryland and mitigation bankers with experience in dredging began to explore how to accomplish these goals in parallel with actions the State may take. These activities are establishing the economic and ecological foundations for dredging, sediment processing, and commoditization of innovative reuse products derived from the sediment, as well as forwarding needed policy enhancements to ensure the water quality credit sales system can help meet regional water quality goals. Activities have included modeling the ecological benefits of dredging; studies on bioavailability of nutrients in the sediment; engineering and design for sediment dredging, transport, and handling; bench-scale research on a diversity of potential products made from the sediment (e.g., concrete, agricultural soil, cement clinker); and economic analysis of market saturation rates and cost-efficiency for the State of each innovative reuse.

Results/Lessons Learned. These activities have clarified that for an environmental dilemma of this scale, policy innovation is required along with long-term commitments to enhanced environmental and economic outcomes. The effort has also clarified that conventional risk-taking and debt-sharing roles between public and private sector groups can be revisited in support of a “partnership for public purpose” where it is understood that solutions large enough to address the problem are likely larger than any one sector can address alone.