**Comparison of Sediment Budgets of Nearshore Environment**

**for Two High Coastal Bluffs on Lake Michigan**

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Abstract

Sediment budget is critical to the dynamic evolution of coastal bluff and nearshore environments. In this talk, we report sediment budget at two high-bluff (30-45 m) sites. Historical aerial photos and topographic surveys of bluffs and beaches were conducted to obtain the recession rate of bluff crest and toe, shoreline position, and beach width. Successive nearshore substrate surveys were performed. Longshore sediment transport driven by waves and currents were measured to characterize littoral transport of cohesive bluffs. At Port Washington, WI, the bluff crest recession ranged from 0.05 to 0.6 m/yr. In contrast, the bluff toe experienced a net deposition up to 1.1 m/yr. Field observations of beach width and sediment availability agreed with calculated trends of sediment accretion. At the Wisconsin Concordia University site, no beaches existed in front of the newly-built coastal structures, suggesting that natural sediment pathways may be disrupted. Distinct spatial variation of bluff slumping occurred, which was most severe on the south bluffs, average on the north bluffs, and nonexistant within the structured area. Comparison of sediment budgets for the two sites aids in understanding the impacts of shore protection structures on the nearshore environment, leading to better regional integrated bluff management (IBM) for coastal bluffs in the Great Lakes.