

First-Year Research in Earth Sciences: Dunes

Conference Presentation: Dillon, Jesse, Robin Gelderloos, Kathryn Mollison, and Kaitlyn E. Westra (2018). "Investigation of Sediment Cells in a Michigan Dune System." Annual Meeting of the Michigan Academy of Science, Arts, and Letters, Central Michigan University (Mount Pleasant, MI), 9 March 2018; poster.

Abstract: Determining the sources and sinks for sediments in a coastal system is an important part of calculating sediment budgets, but this analysis has not been extended from the shoreline into Michigan dune systems. Our study explores the patterns of sediment movement on a parabolic dune system in P.J. Hoffmaster State Park to identify cells of sediment movement. We made predictions of erosion, deposition, and stable areas based on the presence of vegetation, spatial patterns and topography, and evidence of sediment disturbance; we mapped our predicted areas using GPS. We measured sand movement over a two-week sample period using erosion pins, and the data was compared to the predicted areas. Two clear cells of sediment movement were suggested by the data: 1) from the beach and scarp to the windward foredune and 2) from the windward side of the parabolic dune crest to the slipface. In general, predictions were consistent with the collected data. Some anomalies did occur, such as deposition occurring on the windward side of the foredune. Our results indicated erosion areas were easy to predict from the bare sand, but deposition and stable areas were more difficult to predict because of the vegetation.