

# First-Year Research in Earth Sciences: Dunes

**FYRES: Dunes Research Report:** Madrid, Maia, James Byker, Claire C. Costello, and Gabriela R. Lantinga. 2018. "Measurement of Alongshore Dune Sediment Budgets and Movement" FYRES: Dunes Research Report #32. Grand Rapids (MI): Department of Geology, Geography and Environmental Studies, Calvin College. 13 p.

**Abstract:** Studies investigating the relationship of dune interactions with beach sediment budgets along Lake Michigan have been sparse. This study examines the characteristics and sediment exchanges of the foredune-beach system at three locations along the east Lake Michigan coast: Rosy Mound Natural Area, P.J. Hoffmaster State Park, and Muskegon State Park. In Nov-Dec 2017, roughly 800 meters of beach in each location were mapped using GPS units; mapped features included the shoreline and beach-foredune boundary. The beach-foredune boundary was delineated into stretches of no, low, medium, and high scarp, and mapped as such. Measurements taken at each beach-foredune section included beach width, scarp height, and scarp slope angle. Results showed that Rosy Mound Natural Area primarily had high scarps, while the two other parks showed a distinct mix of scarp heights. This, along with other measurements, suggests that Rosy Mound is experiencing more dune erosion than the other two study locations, where several cases of wave deposition of sediments onto the foredune were identified. While results varied throughout the three locations, overall more sand was being contributed to the beach from the foredune than the converse.