

First-Year Research in Earth Sciences: Dunes

FYRES: Dunes Research Report: Lindemulder, Carolyn R., Jamie E. Atkinson, Araceli Eikenberry, Liam M. O. Ferraby, Taylor M. Grasman, Taylor Hartman, and Erick Westphal. 2017. "Characteristics of a Partially-Vegetated Slipface as Indicators of Dune Advance." FYRES: Dunes Research Report #24. Grand Rapids (MI): Department of Geology, Geography and Environmental Studies, Calvin College. 21 p.

Abstract: There are few direct measurements of advance rates of large parabolic dunes in Michigan. However, spatial characteristics of the dune slipface may indicate its advance patterns. This study investigated the characteristics of the partially-vegetated slipface of a large parabolic dune: Mt. Baldy in P.J. Hoffmaster State Park. Monitoring posts placed along the slipface edge were measured over two years to find the dune advance rate. Surface changes were measured to find amounts of erosion or deposition and slope angles at different sites on the slipface. The vegetation of the slipface was mapped, and plant cover and species richness were measured using quadrats in each distinct area of vegetation. The slipface had two different areas of vegetation: an upper grassy area in which both density and species richness increased further down the slope and a lower wooded area that was partially buried by the dune's advance. Measured dune advance rates were low and variable in the two years of the study, with greater rates of advance observed where buried wooded area made up a greater proportion of the slipface. These results show that spatial characteristics of this parabolic dune are related to advance rates and have the potential to be used as indicators of advance on similar dunes.