

First-Year Research in Earth Sciences: Dunes

FYRES: Dunes Research Report: Gerber, Kathryn E., Melanie A. Compagner, Rachel L. DeHaan, Jessica A. Petrie, and Jen-Lyn Sin (2015). "Efficacy of Planted Vegetation and a Sand Fence at Castle Park Dune Preserve." FYRES: Dunes Research Report #15. Grand Rapids (MI): Department of Geology, Geography and Environmental Studies, Calvin College. 17 p.

Abstract: Lake Michigan coastal dunes are dynamic environments often requiring management strategies to mitigate human impacts. This study investigates the efficacy of a sand fence and planted vegetation as management techniques at Castle Park Dune Preserve in Michigan. The vegetation and sand fence were established on the windward slope of the dune between 2012 and 2014. During the fall of 2014, we documented dune features by measuring slope angles and using GPS to map boundaries between bare sand and vegetation. We set up and monitored erosion pins upwind and downwind of three areas of planted vegetation to gauge sand deposition. We also measured vegetation characteristics in five randomly-selected quadrats within each of the three planted areas. Results show that although *Ammophila breviligulata* was the species introduced initially, one or two additional species were present in all of the planted areas. The greatest rate of aeolian movement occurs upwind of the fence and in unvegetated regions downwind of the fence. Vegetated areas experienced less transport, with areas of greater average density and number of stems experiencing the least movement. This suggests that increasing vegetation density, coupled with the current sand fence, would be most effective for stabilizing the surface.