First-Year Research in Earth Sciences: Dunes

Conference Presentation: Brinks, Linden, Kathryn Gerber, Jen-Li Sin, Jacob Swineford, Alek Zapata (2013). "The effects of two fall storms on a Lake Michigan foredune." North-Central Section of the Geological Society of America (Kalamazoo, MI), 2-3 May 2013.

Abstract: Storms have an effect in shaping beach-dune systems but few studies describe specific effects of storms on a foredune environment. We studied changes that autumn storms made to a foredune located at P.J. Hoffmaster State Park on the east coast of Lake Michigan. We used a number of methods including on-site anemometers and a wind vane, erosion pins, GPS, photos, observations, and storm data from the National Weather Service. Two storms were observed during our study period with a week of lower wind speeds between them. The first storm, remnants of Hurricane Sandy, lasted several days with very strong winds and little precipitation. The second storm had more precipitation, was shorter in duration, and had higher maximum wind speeds. During the storms, high waves reduced the wind's access to loose sand on the beach. Nevertheless, there were large amounts of sand transport from the backbeach to the foredune with deposition occurring on the windward slope of the dune. Both storms were responsible for a significant amount of dune change, whereas very little change took place in the week between the storms.