

First-Year Research in Earth Sciences: Dunes

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Abstract: Few dunes have direct measurements of dune advance rates and directions. Our research explores whether it is possible to estimate dune advance through investigating patterns of vegetation. Our study focused on an active blowout in the Kitchel-Lindquist-Hartger Dunes Preserve north of Grand Haven, Michigan, that was believed to be advancing toward an outdoor learning facility. Sand movement, erosion, and deposition were measured with sand traps and erosion pins over two weeks to determine sand transport rates and common directions of movement. In order to assess blowout activity, vegetation communities were mapped with handheld GPS units and species were recorded with random quadrat sampling. We mapped dune boundaries and compared them to previous measurements. Our results show little dune advance from September to December. There was active sand transport over the dune crest towards the northeast, away from the outdoor learning center. The least sand movement was observed in stable dune areas with dense *Ammophila breviligulata*. Our results show that patterns of vegetation can be a possible indicator of rates and directions of dune advance.