

MOUNT BALDY DUNE IN THE INDIANA DUNES NATIONAL LAKESHORE; MOST ACTIVE DUNE IN GREAT LAKES REGION

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Mount Baldy dune in the IDNL



1927

Courtesy: NPS

- ⦿ Largest active blowout along the southern shore of Lake Michigan
- ⦿ ~ 600 m long, ~ 300 m wide, ~ 40 m high



2009

Mount Baldy dune and beach, IDNL

1938-1973 Beach erosion = 2.7 m/year; Dune migration inland = 2.3 m/year

1938



1951



1961



1973



1958



7-15-65 1965



Lower lake levels, wetter climate and cooler temperatures: dune advanced inland 0.25 m /year



1973



Higher lake levels, warmer lake s. water, and warmer air temp.: dune advanced inland 3.3 m/year.

Beach nourishment at Lake Michigan

- US Army Corps of Engineers began beach nourishment in October 1973 by adding ~ 340,000 tons of sand and gravel



Mount Baldy dune and beach, IDNL

1973-2008 Beach erosion = 0.14 m/year; Dune migration inland = 1.5 m/year

1983



1993



1999

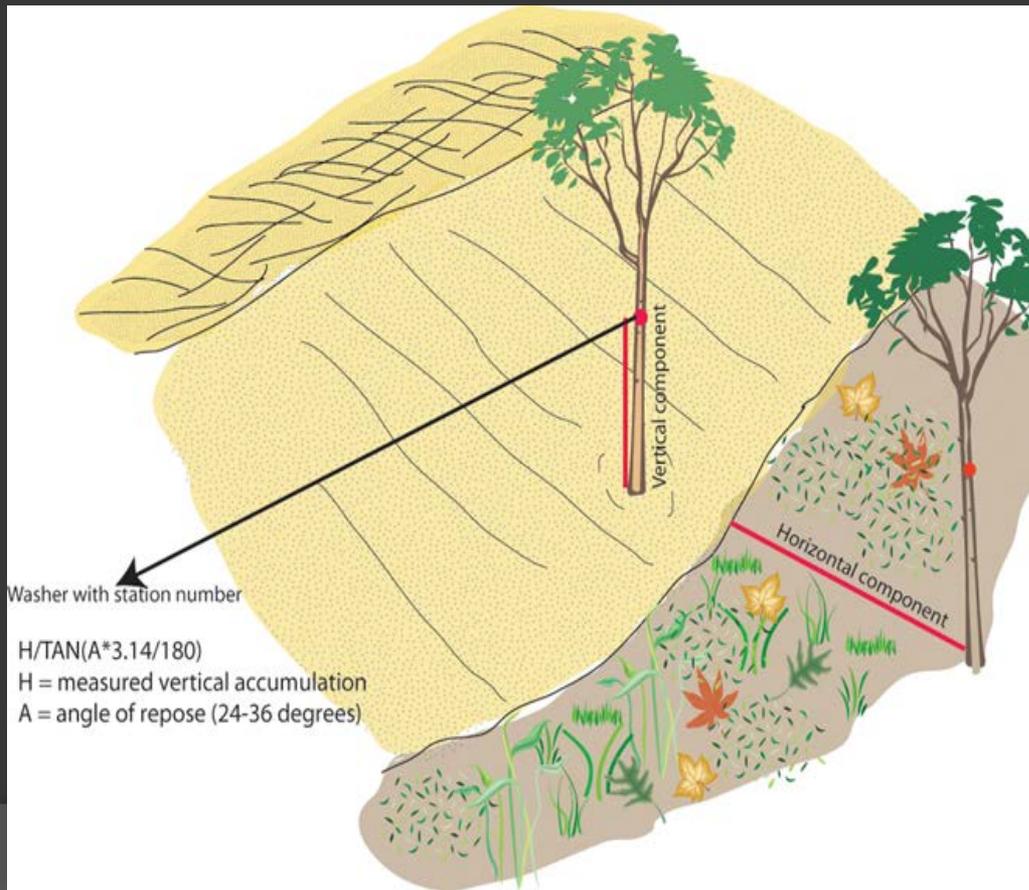


2008



Monitoring sand accretion rates and dune advance inland

- Began in May 2007 with 26 stations (metal stakes)
- Reduced number of stations to 13 in May 2010



Mount Baldy and IDSP dune



Monitoring period	Summer (Jun-Aug)	Fall (Sep-Nov)	Winter (Dec-Feb)	Spring (Mar-May)	Average Vertical Accretion (in cm)	Average Horizontal Advance (in cm)	Maximum Horizontal Advance (in cm)
June 2009 – June 2010	Vertical accretion (in cm)						
Mt. Baldy dune	10.1	39.5	18.5	61.3	129.4	199.4	401.2
% of annual	7.8	30.5	14.3	47.4			
B1 dune	3.1	4.5	-1.2	2.5	9.0	15.6	45.1
% of annual	34.8	50.5	-13.0	27.7			

Mount Baldy stoss (winward) side

- Note landward (right) shift in paleosol (dark line – arrows) position and lowering the blowout



Mount Baldy lee (south) side

- Note position of two trees and volume of sand accumulated in 4.2 years
- Both trees were in front of (south of) advancing dune in May 2007

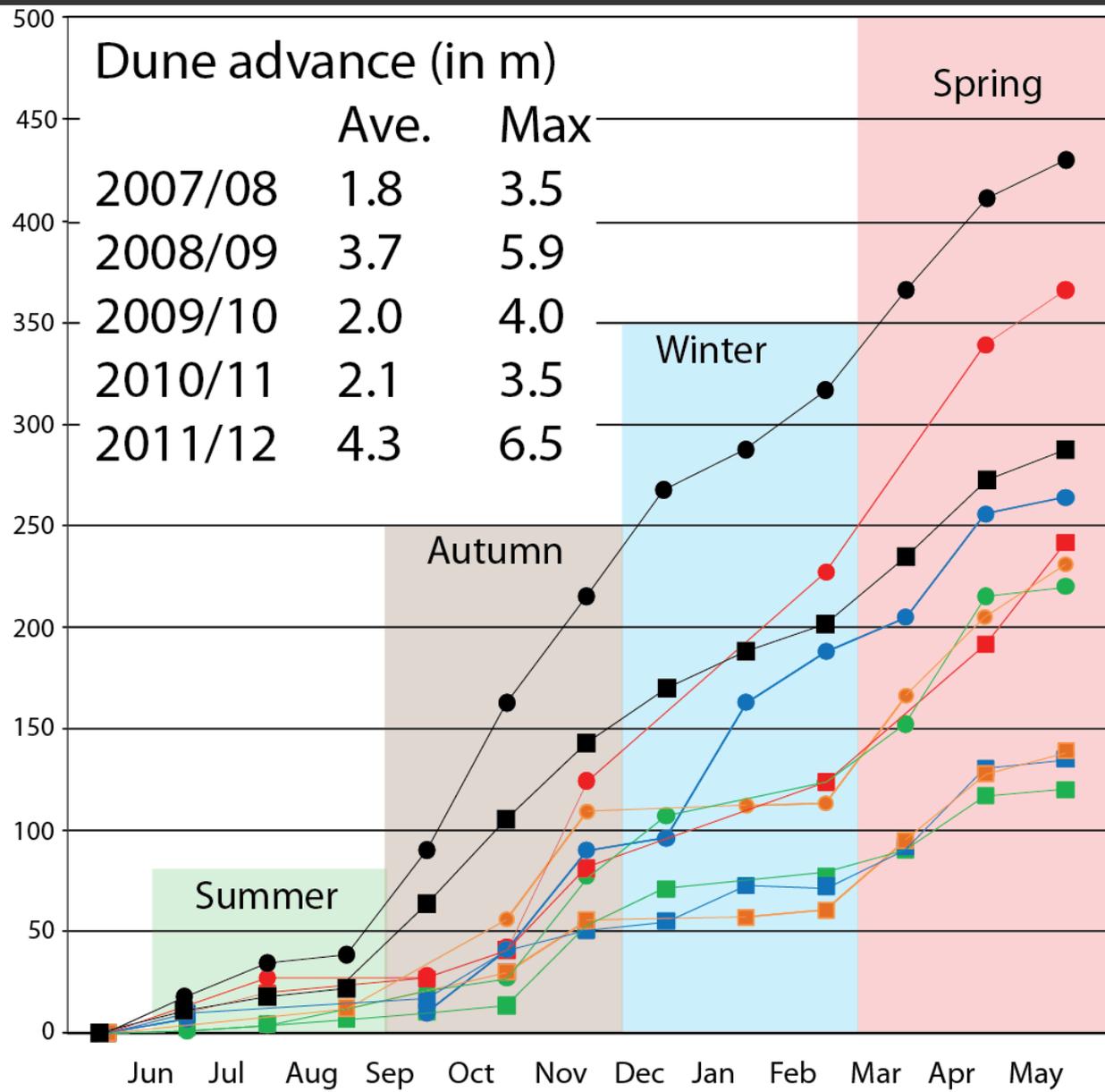


Dune advance (in m)

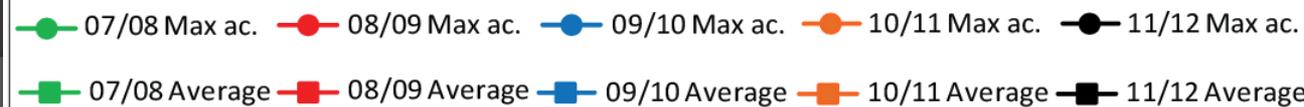
Ave. Max

2007/08	1.8	3.5
2008/09	3.7	5.9
2009/10	2.0	4.0
2010/11	2.1	3.5
2011/12	4.3	6.5

Sand accretion (in cm)



Summary



October 21, 2011 storm



Hurricane Sandy



October 29, 2012 – Hurricane Sandy

