

# **Designing Sustainable Landscapes: Wind exposure settings variable**

## ***A project of the University of Massachusetts Landscape Ecology Lab***

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### *With support from:*

- North Atlantic Landscape Conservation Cooperative (US Fish and Wildlife Service, Northeast Region)
- Northeast Climate Science Center (USGS)
- University of Massachusetts, Amherst



### *Reference:*

McGarigal K, Compton BW, Plunkett EB, DeLuca WV, and Grand J. 2017. Designing sustainable landscapes: wind exposure settings variable. Report to the North Atlantic Conservation Cooperative, US Fish and Wildlife Service, Northeast Region.

## General description

Wind exposure is one of several ecological settings variables that collectively characterize the biophysical setting of each 30 m cell at a given point in time (McGarigal et al 2017). Wind exposure gives the mean sustained wind speed (m/s) at 50 m height (**Fig. 1**). High wind speeds can shape natural communities, especially on exposed high peaks.

## Use and interpretation of this layer

This ecological settings variable is used for the similarity and connectedness ecological integrity metrics (see technical document on integrity, McGarigal et al 2017).

This layer carries the following assumptions:

- The wind model from NREL applies to areas with low surface roughness (such as grassy plains) and areas with a slope of less than 20%.

## Derivation of this layer

### Data source

- National Renewable Energy Lab (NREL), [http://www.nrel.gov/gis/data\\_wind.html](http://www.nrel.gov/gis/data_wind.html).

### Algorithm

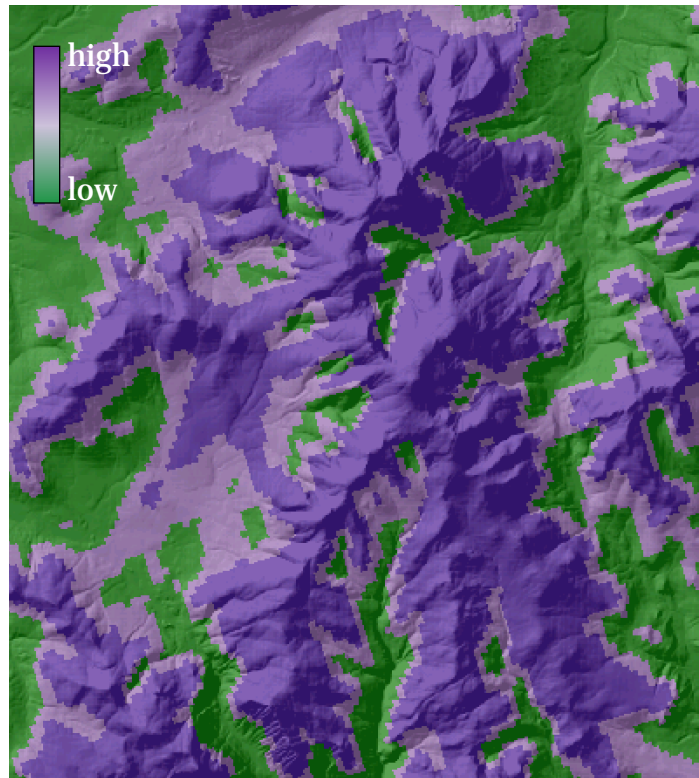
We simply resampled the wind speed grid from NREL to 30 m.

## GIS metadata

This data product is distributed as a geoTIFF raster (30 m cells). The cell values range from 2.2 m/s to 8.2 m/s. This data product can be found at McGarigal et al (2017).

## Literature Cited

McGarigal K, Compton BW, Plunkett EB, DeLuca WV, and Grand J. 2017. Designing sustainable landscapes products, including technical documentation and data products. [https://scholarworks.umass.edu/designing\\_sustainable\\_landscapes/](https://scholarworks.umass.edu/designing_sustainable_landscapes/)



**Figure 1.** Wind exposure in the Presidential Range, New Hampshire.