

# Wind Resource Temporal Variability Report

Diurnal and monthly variability of wind resources based on data from the NREL  
Wind Toolkit

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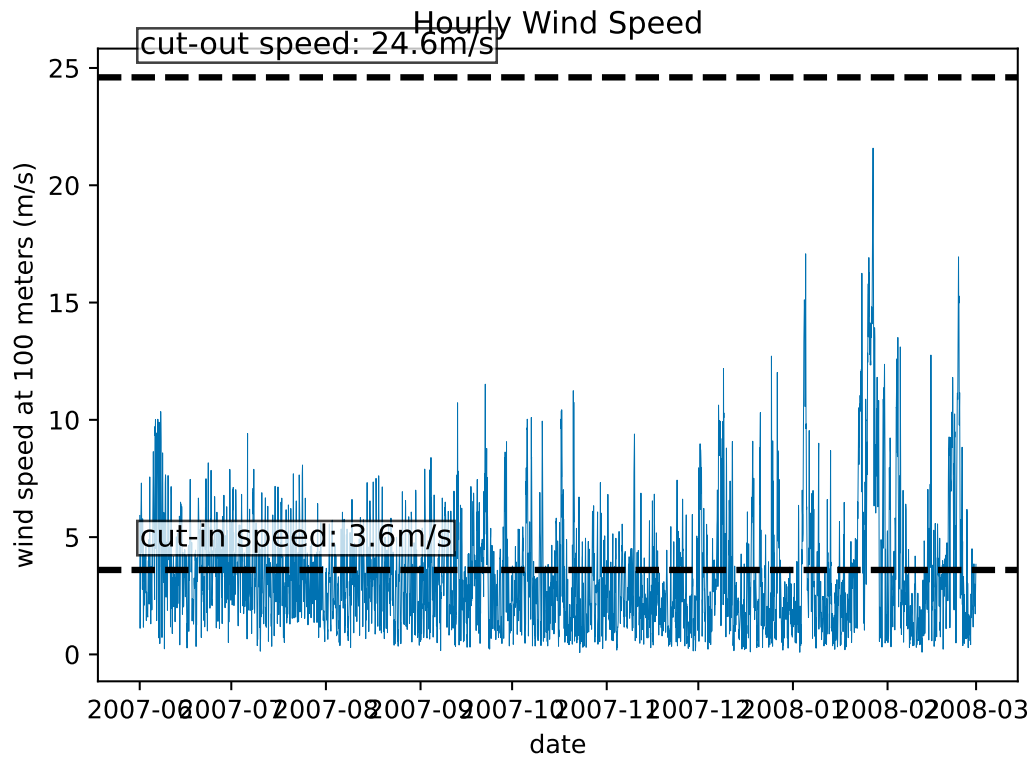
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## Introduction

This report provides an overview of wind resources for UC Santa Barbara from 2007-06-01 to 2008-03-01. This analysis is based on the dataset of wind speed at 100 meters within the National Renewable Energy Laboratory (NREL) Wind Integration National Dataset (WIND) Toolkit.

## Analysis

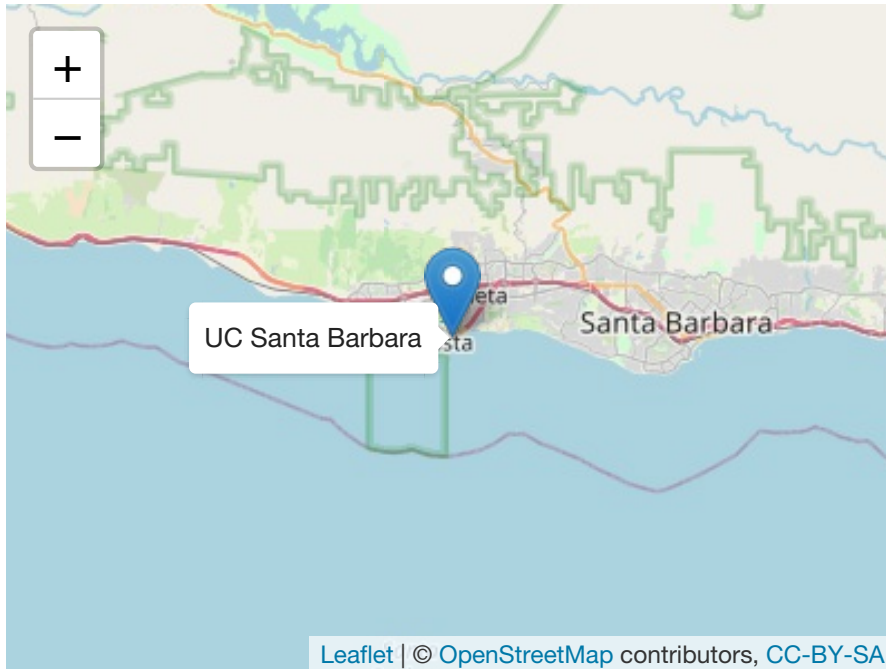
The graph below shows hourly wind speed for UC Santa Barbara and the selected time range. Wind speed values are show in relation to the specified turbine cut-in and cut-out speeds.



The annual average wind speed for UC Santa Barbara was 3.48 m/s. This is BELOW the value of 5.8 m/s recommended by the U.S. Energy Information Administration. Wind speed was below the cut-in speed of 3.6 m/s for 4,101 hours. Therefore, wind turbines could not operate 62.36 percent of the time due to lack of wind. Wind speed exceeded the cut-out speed of 24.6 m/s for 0 hours. Therefore, wind turbines could not operate 0 percent of the time due to strong wind. Between 2007-06-01 to 2008-03-01, wind speeds at this location were within the acceptable operating range of 3.6 m/s to 24.6 m/s for 2,475 hours. Therefore, turbines could operate 37.64 percent of the time.

## Site Map

The map below shows the location of UC Santa Barbara.



## Citations

Draxl, C., B.M. Hodge, A. Clifton, and J. McCaa. 2015. [Overview and Meteorological Validation of the Wind Integration National Dataset Toolkit \(Technical Report, NREL/TP-5000-61740\)](#). Golden, CO: National Renewable Energy Laboratory.

Draxl, C., B.M. Hodge, A. Clifton, and J. McCaa. 2015. “[The Wind Integration National Dataset \(WIND\) Toolkit](#).” *Applied Energy* 151: 355366.

Energy.gov. “How Do Wind Turbines Survive Severe Storms?” Accessed October 11, 2022. <https://www.energy.gov/eere/articles/how-do-wind-turbines-survive-severe-storms>.

King, J., A. Clifton, and B.M. Hodge. 2014. [Validation of Power Output for the WIND Toolkit \(Technical Report, NREL/TP-5D00-61714\)](#). Golden, CO: National Renewable Energy Laboratory.

“Where Wind Power Is Harnessed - U.S. Energy Information Administration (EIA).” Accessed October 11, 2022. <https://www.eia.gov/energyexplained/wind/where-wind-power-is-harnessed.php>.