

Wind Resource Temporal Variability Report

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

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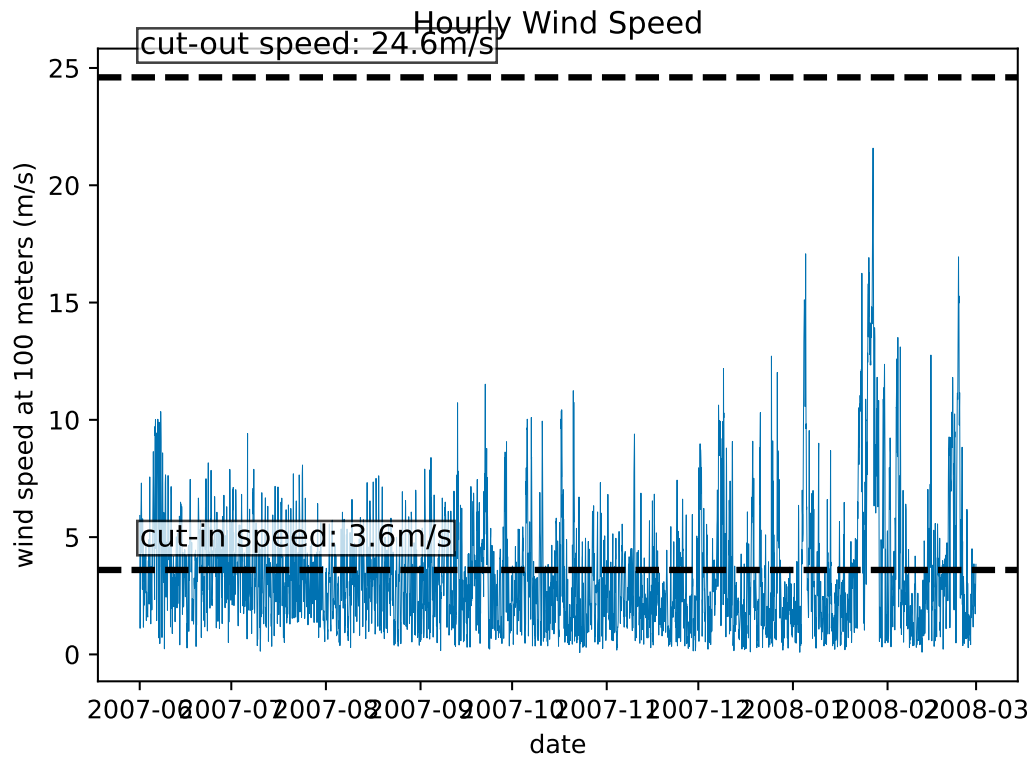
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Introduction

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

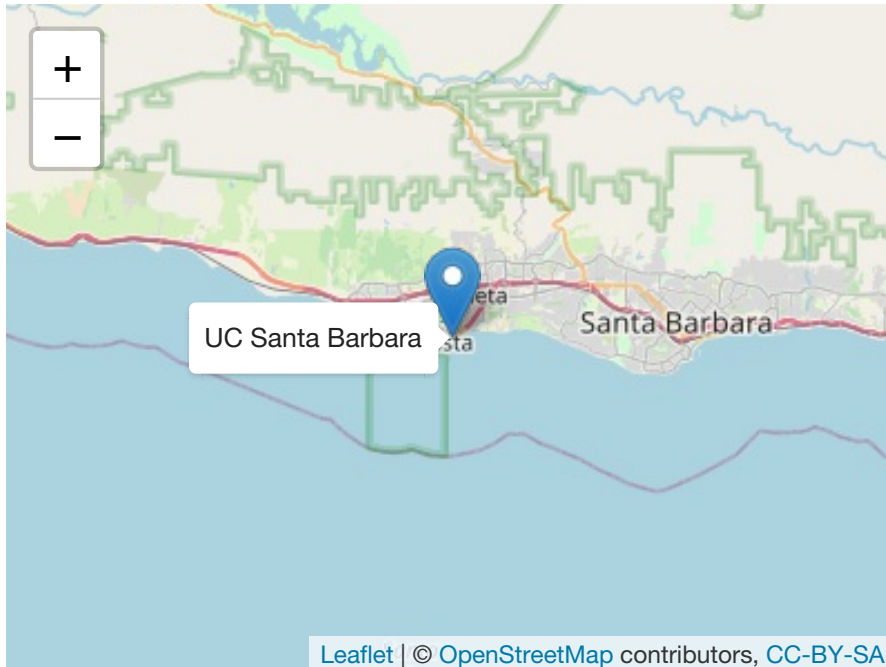
The graph below shows hourly wind speed for UC Santa Barbara and the selected time range. Wind speed values are shown in relation to the specified turbine cut-in and cut-out speeds.



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>.