Wind Resource Temporal Variability Report

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

Marie Rivers

2022-10-11

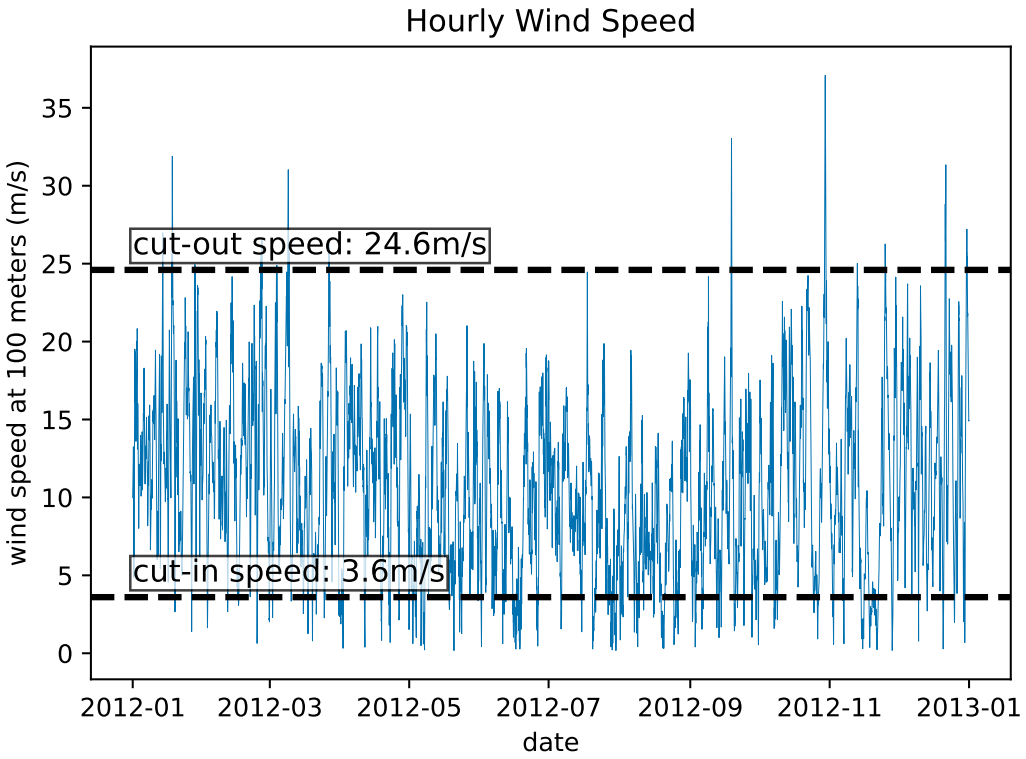
Contents

Introduction

This report provides an overview of wind resources for Mount Washington from 2012-01-01 to 2013-01-01. This analysis is based on the wind speed at 100 meters dataset within the National Renewable Energy Laboratory (NREL) Wind Integration National Dataset (WIND) Toolkit.

Analysis

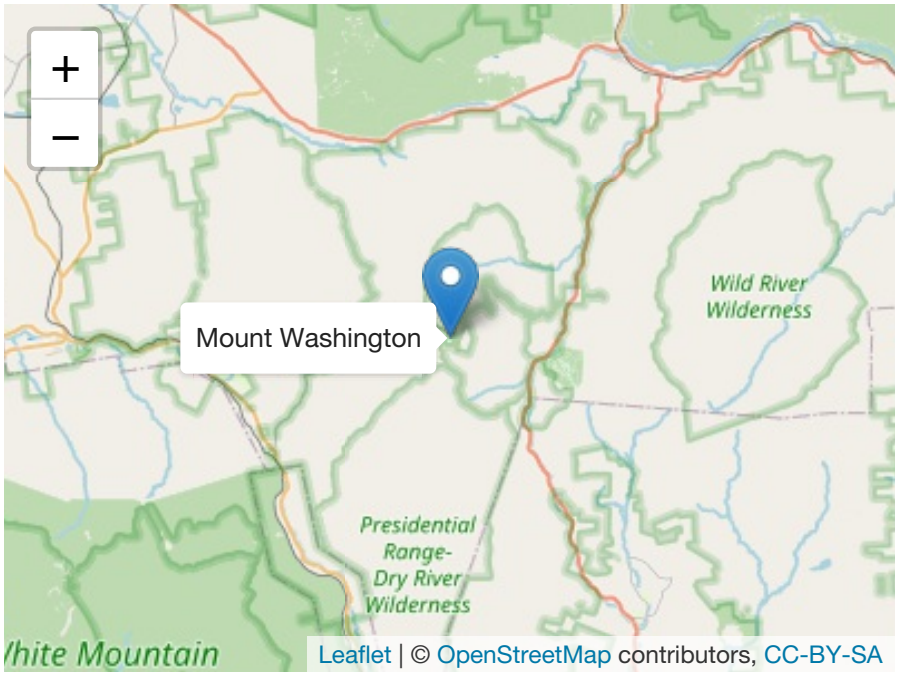
The graph below shows hourly wind speed for Mount Washington and the selected time range. Wind speed values are show in relation to the specified turbine cut-in and cut-out speeds.



The annual average wind speed for Mount Washington was 10.79 m/s. This is ABOVE 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 820 hours. Therefore, wind turbines could not operate 9.34 percent of the time due to lack of wind. Wind speed exceeded the cut-out speed of 24.6 m/s for 84 hours. Therefore, wind turbines could not operate 0.96 percent of the time due to stong wind. Between 2012-01-01 to 2013-01-01, wind speeds at this location were within the acceptable operating range of 3.6 m/s to 24.6 m/s for 7,880 hours. Therefore, turbines could operate 89.7 percent of the time.

Site Map

The map below shows the location of Mount Washington.



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.