Wind Resource Temporal Variability Report

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

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Contents


```
def indicesForCoord(f, lat_index, lon_index):
    dset_coords = f['coordinates']
    projstring = """+proj=lcc +lat_1=30 +lat_2=60
                    +lat_0=38.47240422490422 +lon_0=-96.0
                    +x_0=0 +y_0=0 +ellps=sphere
                    +units=m +no_defs """
    projectLcc = Proj(projstring)
    origin_ll = reversed(dset_coords[0][0])  # Grab origin directly from database
    origin = projectLcc(*origin_ll)

    coords = (lon_index,lat_index)
    coords = projectLcc(*coords)
    delta = np.subtract(coords, origin)
    ij = [int(round(x/2000)) for x in delta]
    return tuple(reversed(ij))
```

```
nearest_site = indicesForCoord(f, site_coords[0], site_coords[1] )
nearest_site_lat = f["coordinates"][nearest_site[0]][nearest_site[1]][0]
nearest_site_lon = f["coordinates"][nearest_site[0]][nearest_site[1]][1]

print("y,x indices for", site_name, ": \t\t {}".format(nearest_site))
```

```
y,x indices for Mount Washington :       (1258, 2422)
```

```
print("Coordinates of", site_name, ": \t {}".format(site_coords))
```

```
Coordinates of Mount Washington :    ('44.2705', '-71.30325')
```

```
print("Coordinates of nearest point: \t {}".format(f["coordinates"][nearest_site[0]][neare
```

```
Coordinates of nearest point:    (44.270775, -71.305176)
```

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 NREL Wind Toolkit.

xxx...add more text about the data

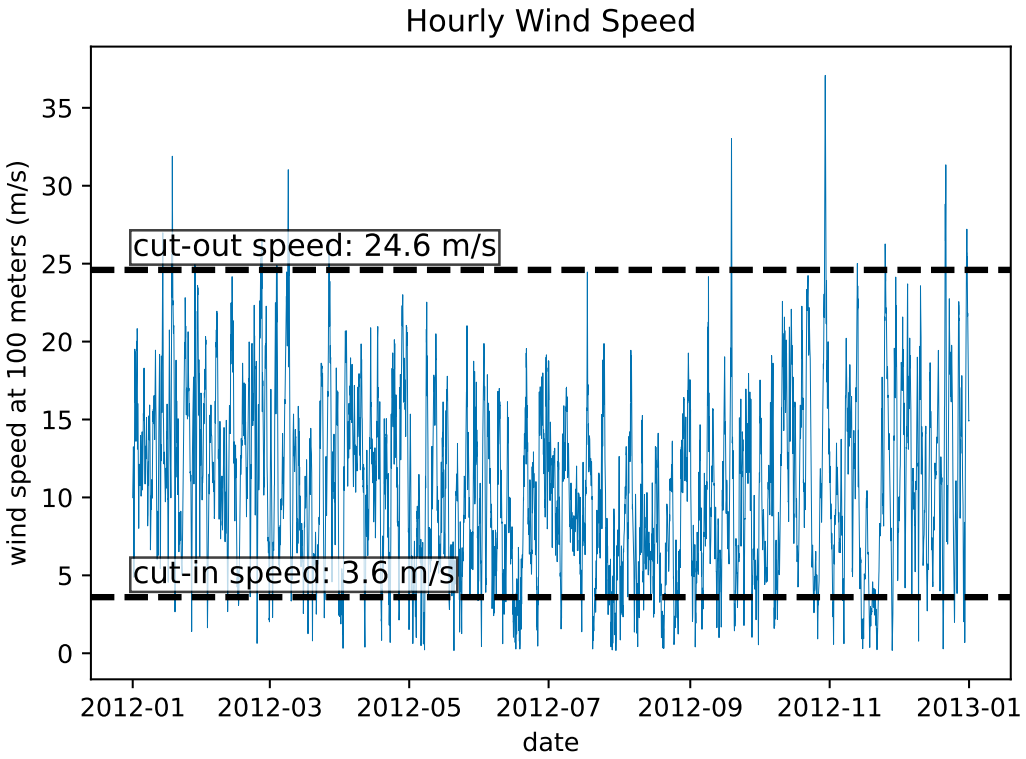
Site Map

The map below shows the location of Mount Washington.

Analysis

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

xxx…update hline to use param values



The annual average wind speed for Mount Washington was 10.79 m/s. This is ABOVE the value of 5.8 m/s (13 mph) 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 strong 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.

- does the diurnal pattern match daily electricity demands
- does the monthly pattern match seasonal electricity demands

Limitations

Citations