

WIND FEASIBILITY STUDY FOR MASSACHUSETTS

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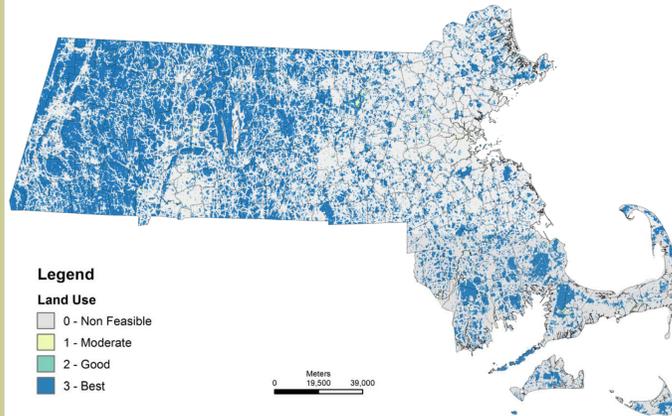


Vestas V100-2.0MW Gridstreamer

The Vestas V100-2.0MW Gridstreamer has been chosen for this analysis. The Turbine is specified for low wind IEC class IIA wind speeds between 6 to 8.5 m/s. The maximum capacity of 2 Mega Watts for a wind speed of 11m/s.

Turbine Specifications:
Capacity: 2MW
Rotor Diameter: 100m
Hub Height: 95m

Land Use



The land use is reclassified into 4 categories ranging from non-feasible to the Most feasible.

0 - Non feasible areas include:

Residential, Commercial & industrial areas

1- Moderate areas include:

Orchards and Greenhouse areas associated with small farms

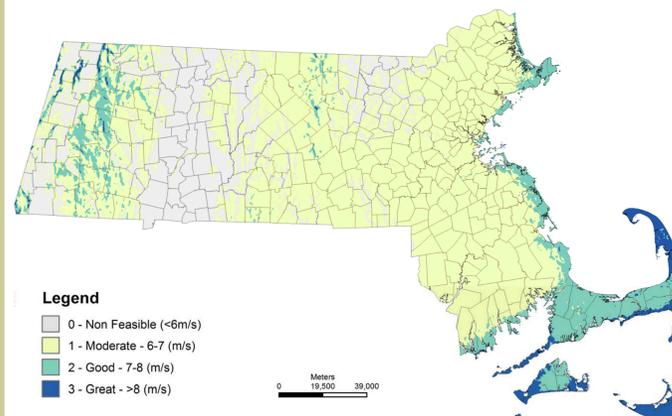
2- Good areas include:

Waste Disposal Facilities, urban open land and public recreation areas (such as fields)

3- Great areas include:

Forests, Cropland, Pastures & Open Land

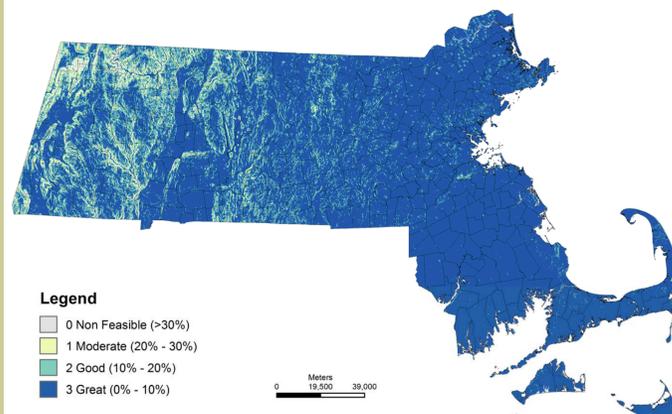
Average Sustained Wind Speed at 100m



The average sustained wind speed potential is measured at the hub height of the turbine. The Hub height is the distance from the ground to Nacelle where the blades attach. For the Vestas V100-2.0MW this distance is 95m. The Map has been reclassified with the with the power ratings of the turbine.

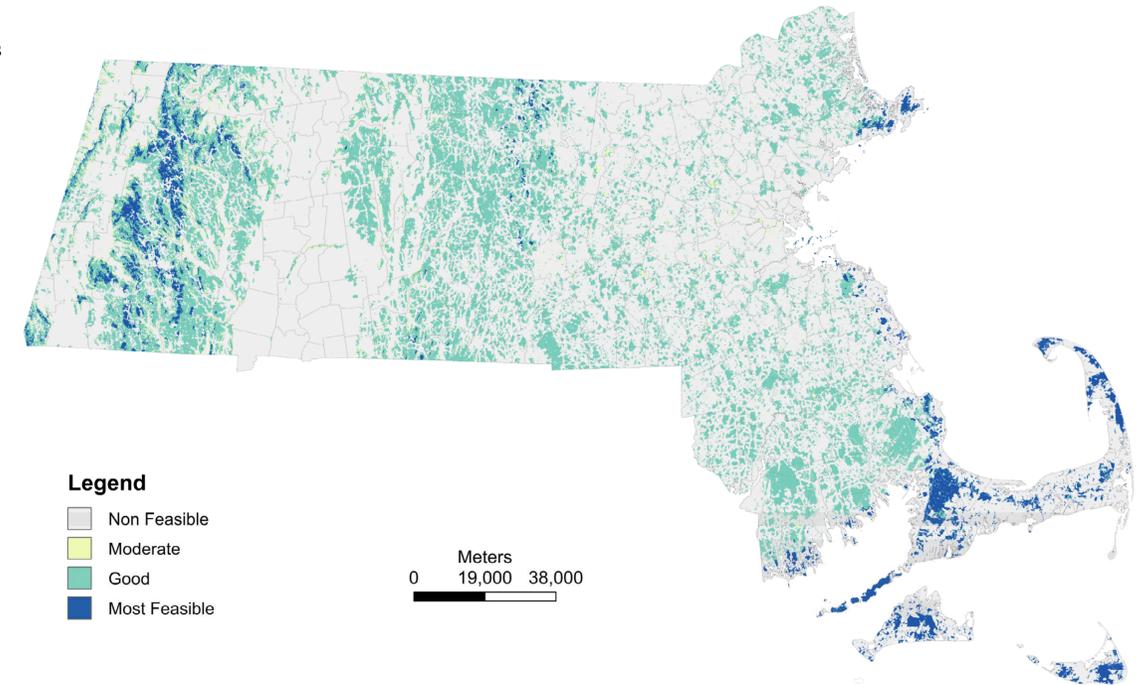
| KW output at specified Wind Speed (m/s) | | | | | |
|---|-----|-----|-----|------|------|
| 6 | 6.5 | 7 | 7.5 | 8 | 11 |
| 400 | 500 | 625 | 900 | 1100 | 2000 |

Slope



Wind turbine construction requires relatively shallow slopes. For this analysis the maximum slope is 30-percent or 16.5 degrees over the 100m diameter footprint of the turbine. Slope was analyzed as an interpolation of points from a digital terrain model for the state. Grading values based on ease of construction and cost were assigned to the raster to allow for a comparison between non feasible and acceptable cells.

Potential Wind Development Sites



Procedure:

This project uses a series of raster's to spatially analyze the feasibility of wind farm locations in the state of Massachusetts. For this analysis, constraints and evaluation criteria are developed for 3 sets of data: Land Use, Wind Speed and Slope. Each of the data sets are converted into raster's and reclassified to the fit the design criteria. The cells are then multiplied by each other to create a hierarchy of suitable areas base on their constraints and evaluation criteria. The constraints represent a Boolean relationship (true/false) and are indicated by the zero valued objects in all three models. The evaluation criteria form a graded ranking from 1 to 3 based on the specific turbine selected. For this analysis that turbine is the Vestas V100-2.0MW Gridstreamer. The cell size for the raster has been chosen based on the footprint of the turbine with a Rotor diameter of 100m.

