

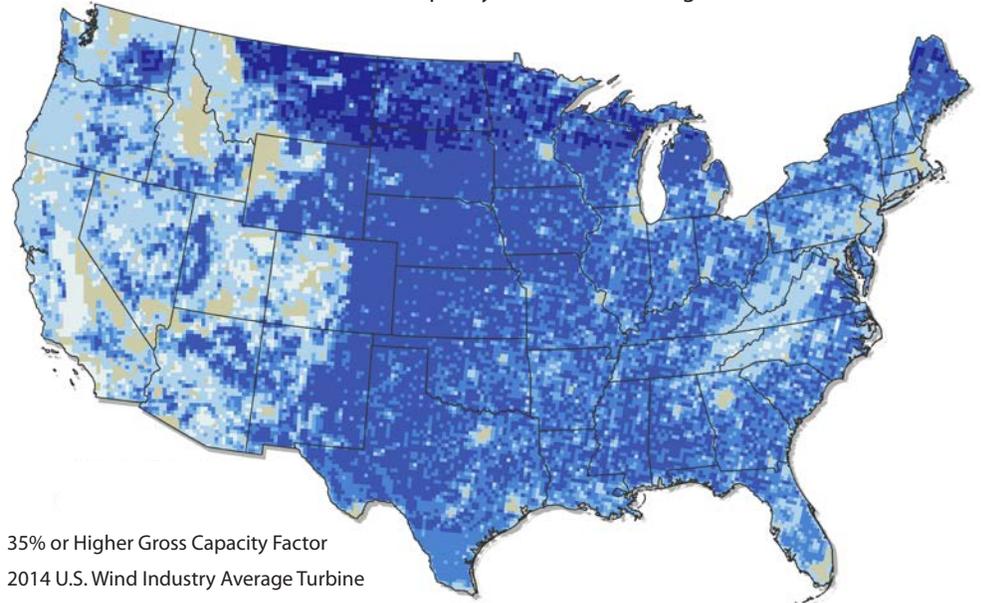
## NWTC Helps Chart the World's Wind Resource Potential

Researchers at the National Renewable Energy Laboratory's (NREL's) National Wind Technology Center (NWTC) provide the wind industry, policy-makers, and other stakeholders with applied wind resource data, information, maps, and technical assistance. These tools, which emphasize wind resources at ever-increasing heights, help stakeholders evaluate the wind resource and development potential for a specific area.

All markets for wind turbines require an estimate of how much wind energy is available at potential development sites. Correctly estimating the energy available in the wind can make or break the economics of wind plant development. Wind maps developed from the late 1970s to the early 1990s provided reasonable estimates of areas in which good wind resources could be found. Now, new computing tools and new meteorological data sets allow researchers to create even more accurate and detailed wind maps of the world.

Wind mapping and validation techniques developed by NREL and industry are being used to produce high-resolution maps of the U.S., foreign countries, and other regions. These maps are painting a new picture of the world's wind resource potential. They were created using highly accurate geographic information system mapping tools and an array of

Potential Wind Capacity at 140-m Hub Height



This map illustrates general wind resource potential only and is not suitable as a siting tool. More detailed site and wind speed data, as well as coordination with relevant authorities, are needed to thoroughly evaluate appropriate wind energy development at any given location.  
Data sources: AWS Truepower, National Renewable Energy Laboratory  
This map was produced by the National Renewable Energy Laboratory for the Department of Energy, February 2015

The potential wind capacity of the United States at a hub height of 140 meters. This resource map represents near-future technology options. It shows land area with a gross capacity factor of 35% and higher, which may be suitable for wind energy development. The darker the color, the larger the potentially developable area.

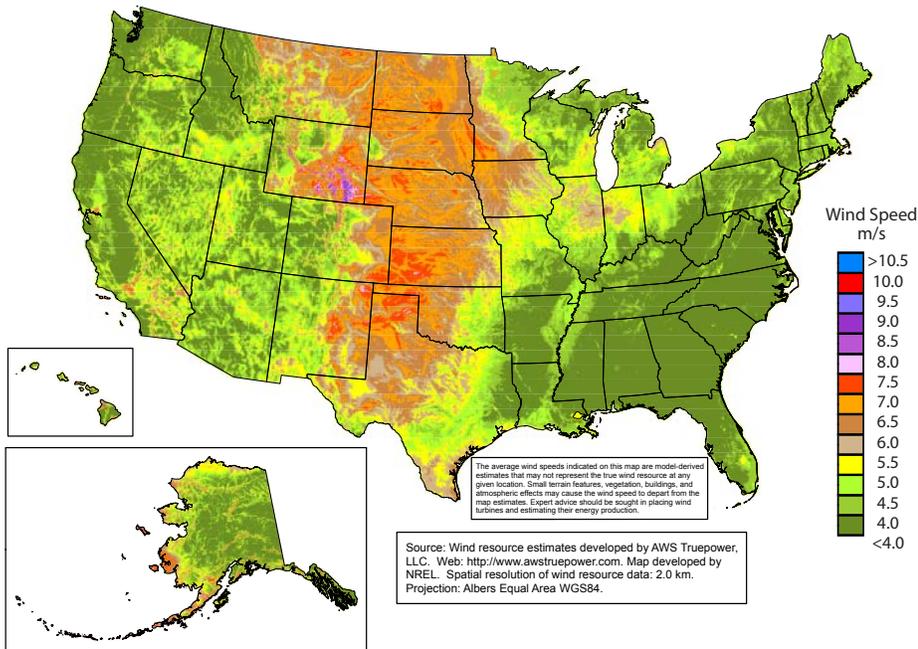
satellite, weather balloon, and meteorological tower data, combined with much-improved numerical computer models. The higher horizontal resolution of these maps allows for more accurate depictions of the overall wind resource and has helped identify new wind development areas where the wind resource was previously considered unsuitable.

### Removing Wind-Energy Development Barriers

NREL researchers work with federal, state, and private organizations to

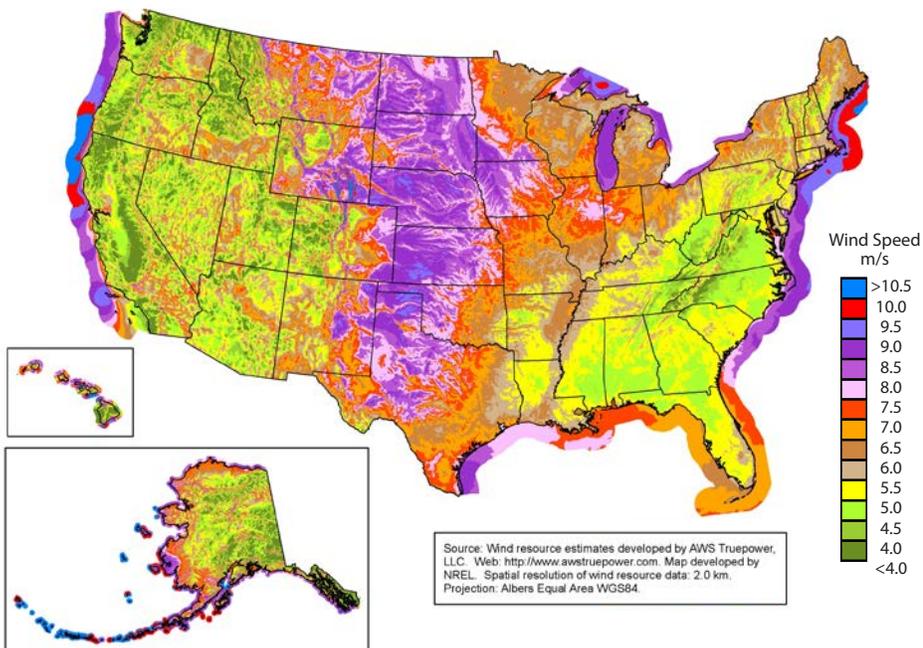
validate estimates of the nation's wind resources and support advances in wind forecasting techniques and dissemination. The ability to accurately predict when the wind will blow will help remove barriers to wind energy development by allowing the smooth integration of wind-generated energy onto the nation's electricity grid. Development of high-resolution (1 to 4 hours) forecasting tools will help energy producers proceed with new wind plants and minimize costs associated with wind generation.

## United States – Annual Average Wind Speed at 30 m



Residential-scale 30-meter wind map. Small wind turbines are typically installed between 15 and 40 meters high. Businesses, farms, and homeowners use residential-scale wind resource maps to identify wind sites appropriate for small-scale wind projects.

## United States – Land-Based and Offshore Annual Average Wind Speed at 100 m



The combined land-based and offshore wind potential in the United States at a height of 100 meters. Offshore wind resources are abundant, stronger, and blow more consistently than land-based wind resources.

The U.S. Department of Energy provides wind maps and anemometer data to help homeowners, communities, states, and regions learn more about their available wind resources and plan wind energy projects. For more information on this project, see: [www.wind.energy.gov/windexchange](http://www.wind.energy.gov/windexchange).

## Partner With Us

The NWTC welcomes collaborators. Our mapping, modeling, and analysis capabilities are available to assist in the planning and siting of wind plants.

Past collaborators include:

- Government agencies
- Universities
- Other national laboratories.

## Contact

Andrew Clifton,  
[Andrew.Clifton@nrel.gov](mailto:Andrew.Clifton@nrel.gov)

Suzanne Tegen,  
[Suzanne.Tegen@nrel.gov](mailto:Suzanne.Tegen@nrel.gov)



**National Renewable Energy Laboratory**  
15013 Denver West Parkway  
Golden, CO 80401  
303-275-3000 • [www.nrel.gov](http://www.nrel.gov)

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

NREL/FS-5000-64733 • September 2015

NREL prints on paper that contains recycled content.