

# South Dakota's Wind Classifications



Credit to NREL for their Wind Classification Data

Credit to Microsoft Office Online for the Wind Turbine Template.

Cartographic Designs by Shanon R. Conley

## Site description:

Site elevation: 528 m (1733 ft)

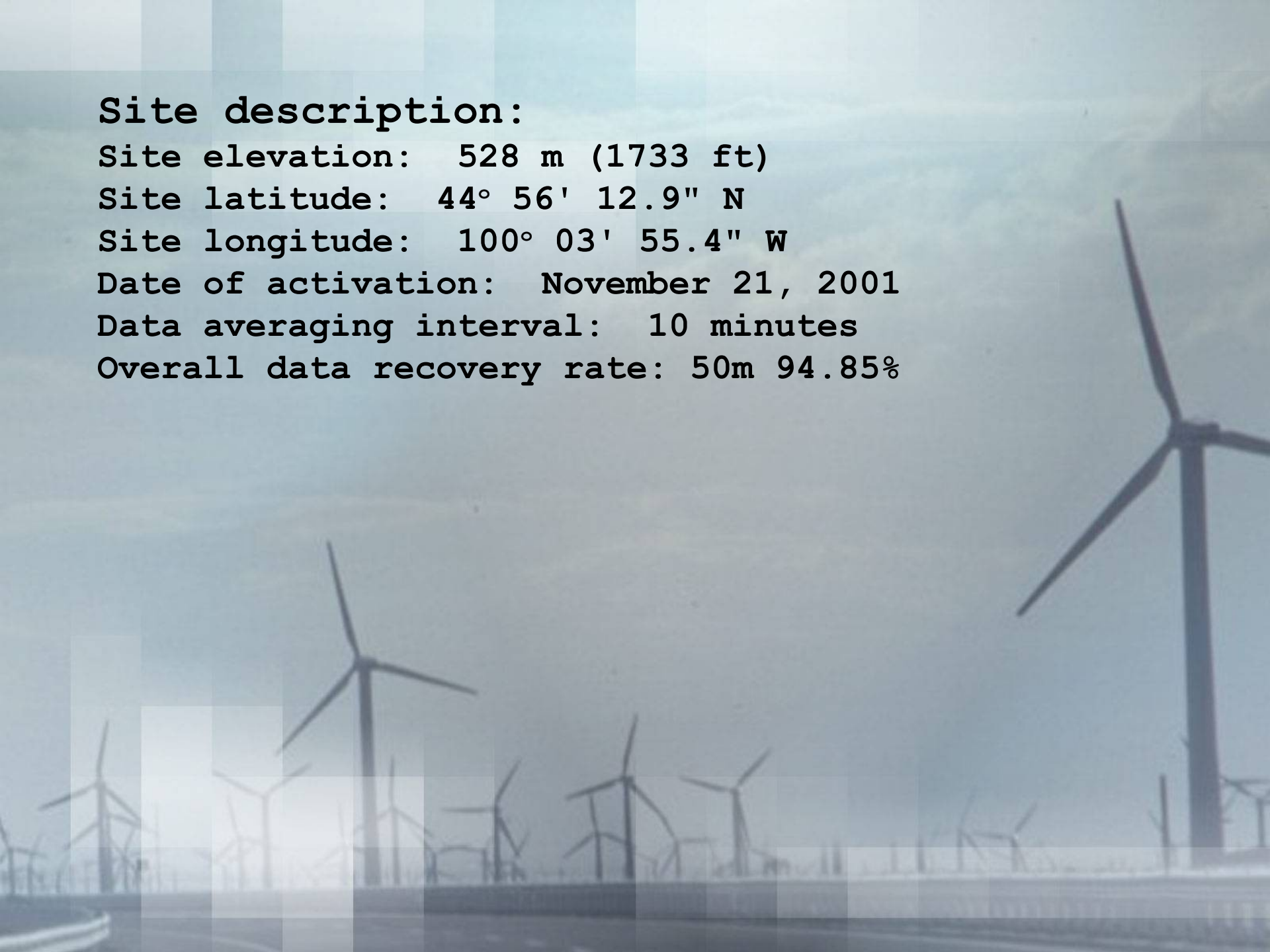
Site latitude: 44° 56' 12.9" N

Site longitude: 100° 03' 55.4" W

Date of activation: November 21, 2001

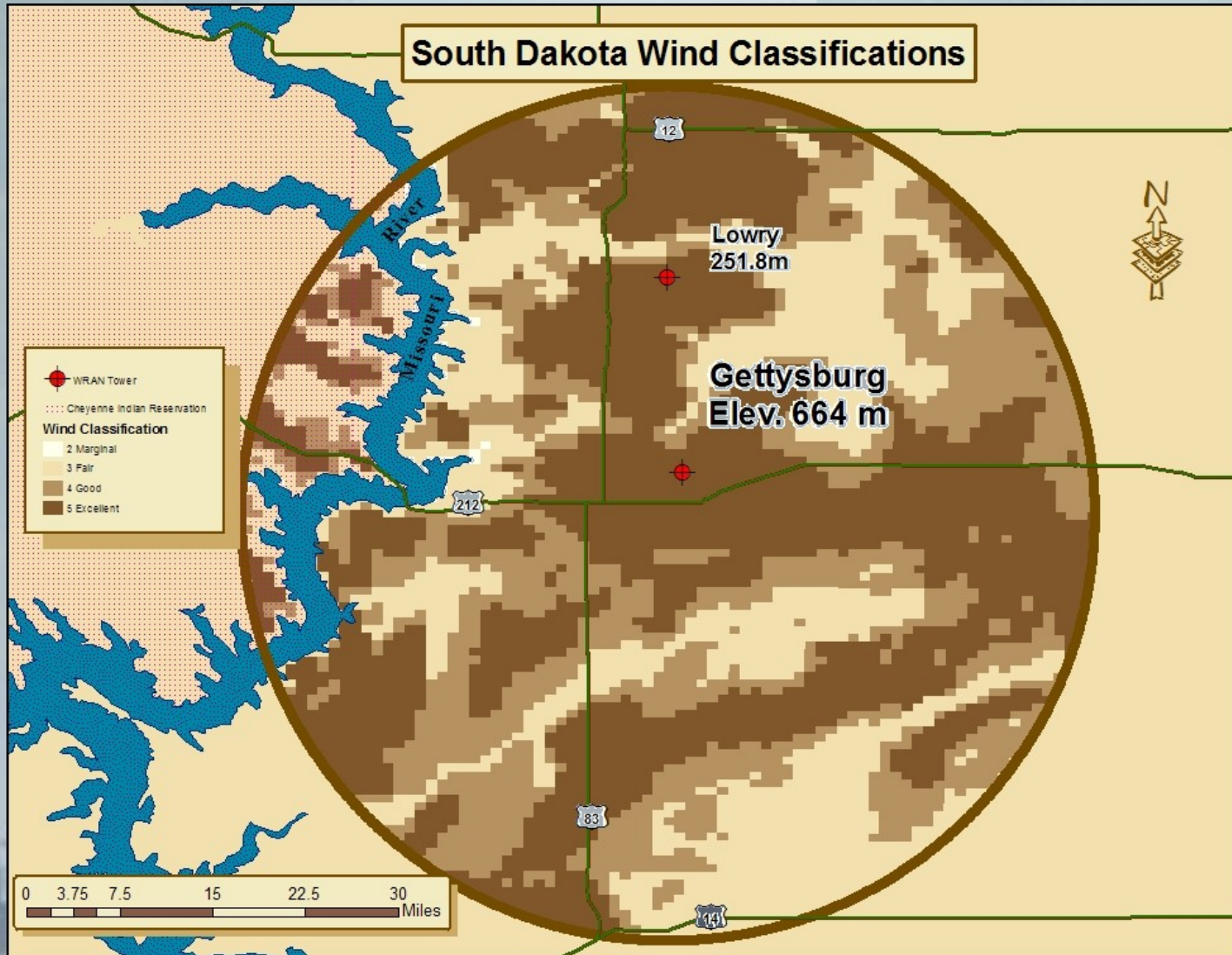
Data averaging interval: 10 minutes

Overall data recovery rate: 50m 94.85%

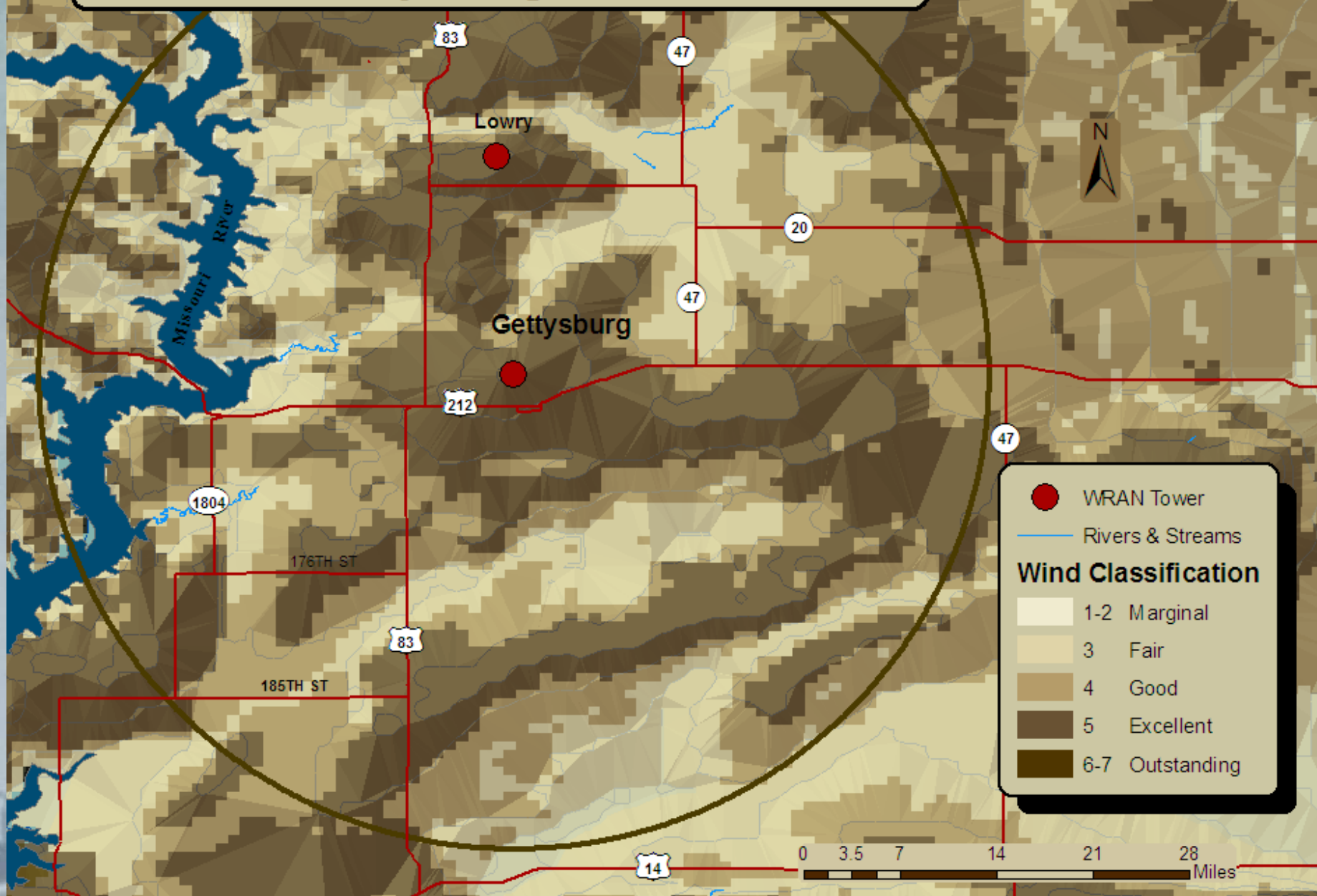


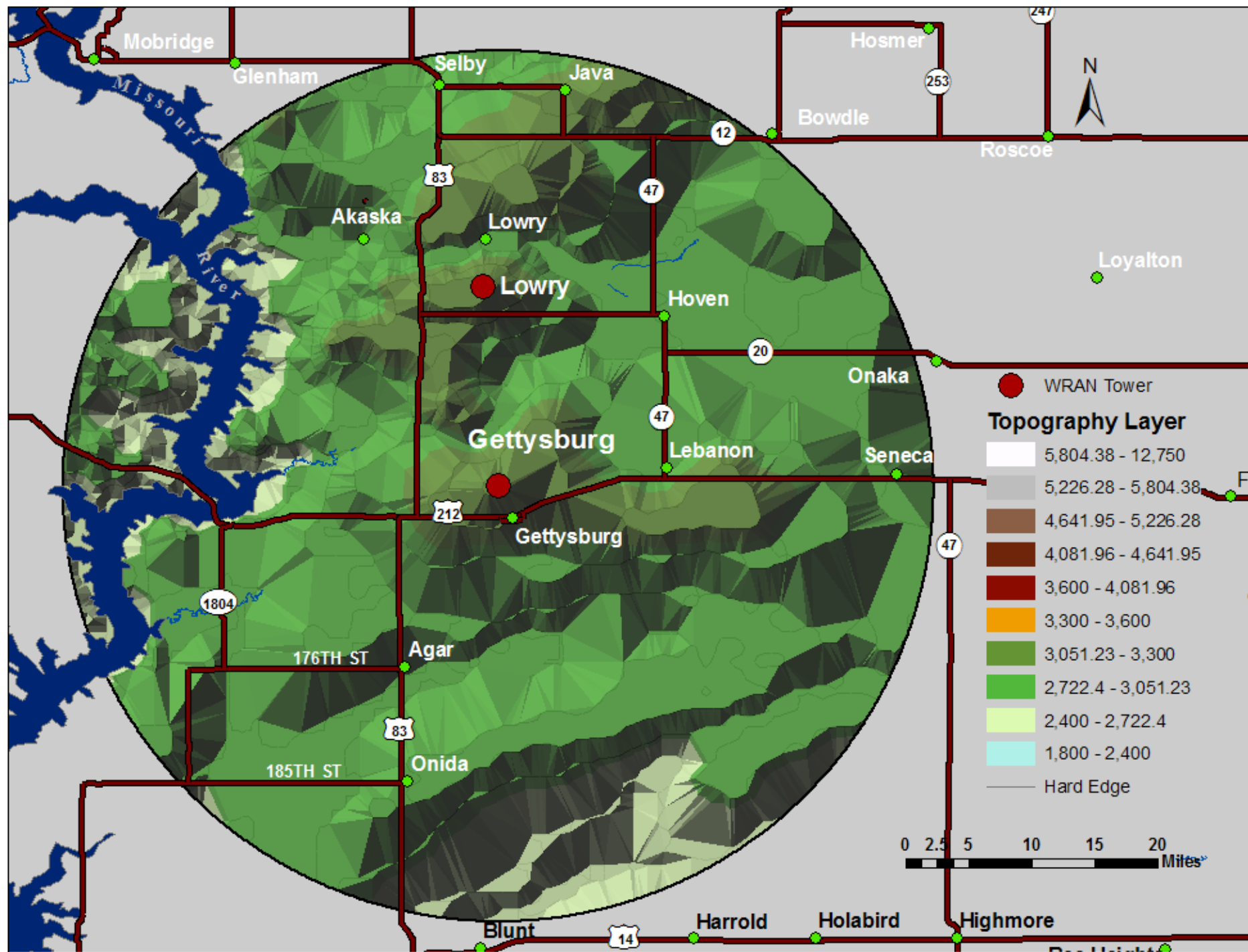
**South Dakota State University  
Electrical Engineering Department  
Wind Resource Assessment Network Project  
Site: Gettysburg**

**Data collection period:  
July 13, 2004 –  
July 31, 2007  
Site down between  
March 2006-April 2006**

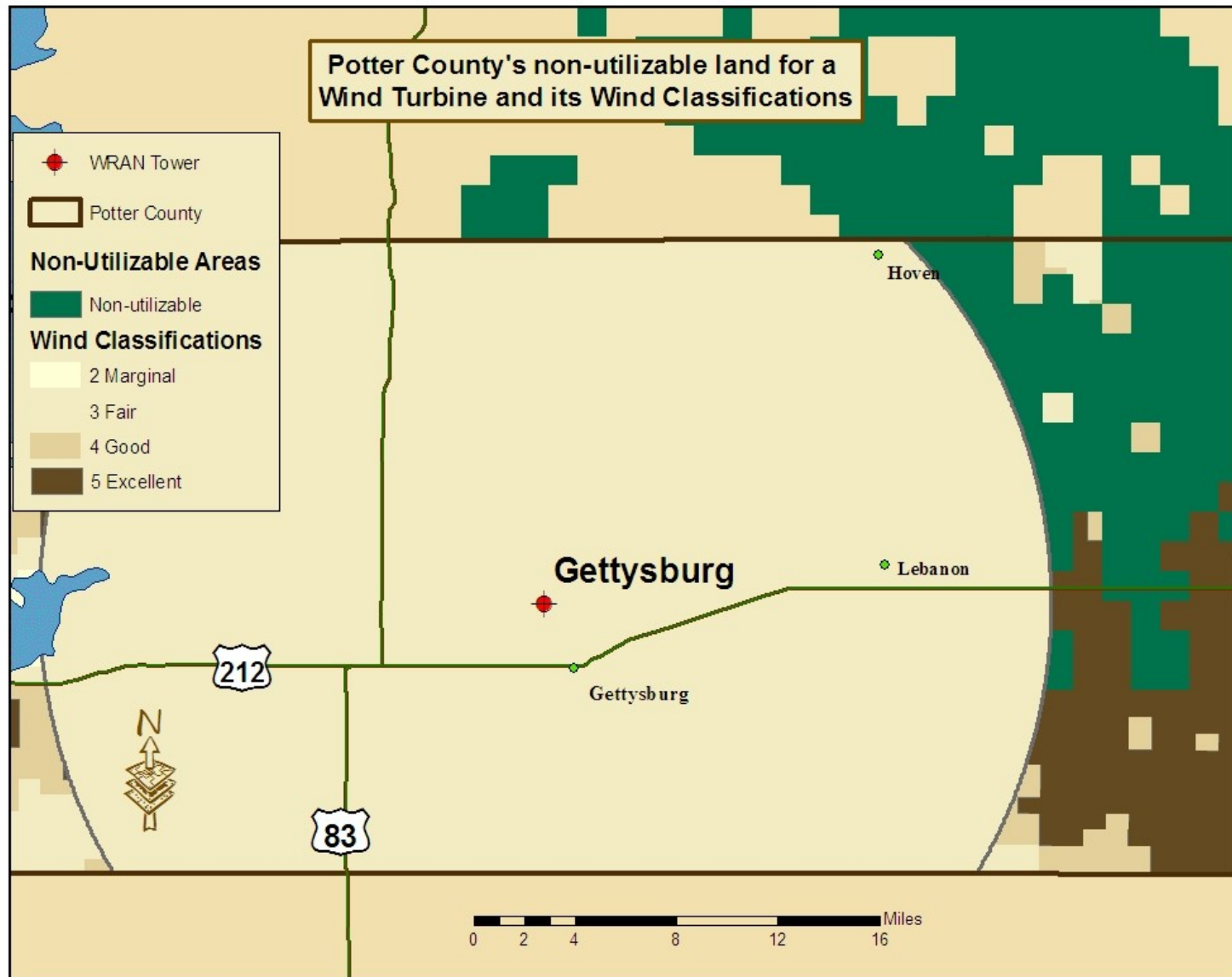


# NREL's Wind Classification around the Gettysburg Tower





# The FAA radar near Gettysburg may cause problems for future Wind Turbines



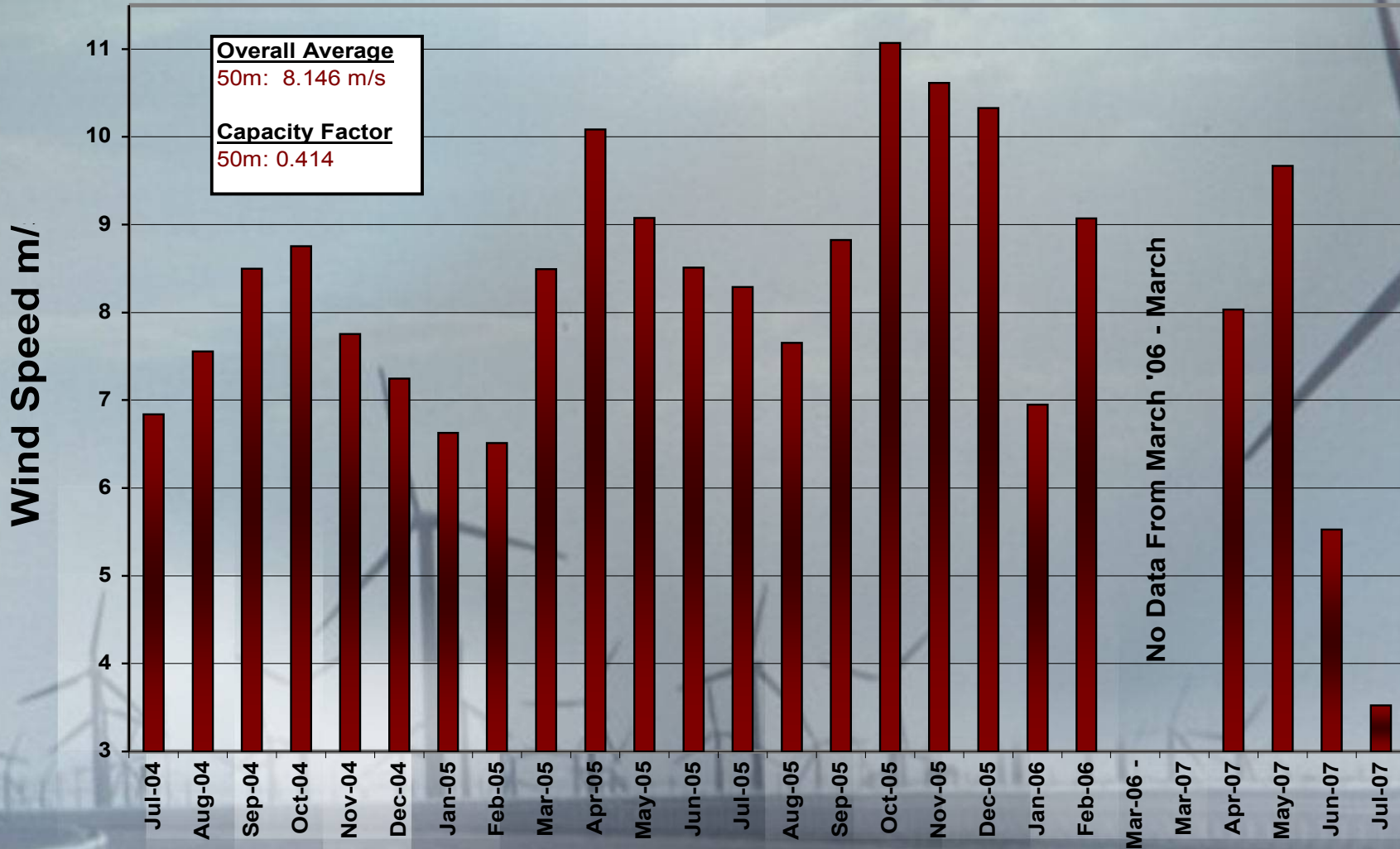
2. A tan 20 mile buffer surrounding the Gettysburg WRAN tower. The buffer was placed there because a wind turbine cannot be placed within 20 miles of a FAA Radar for National Security reasons.
2. The radar is located  $\frac{1}{4}$  mile northeast of the tower.
3. Just past the tan 20 mile buffer the radar's beam should have a view, also called a clear line of site, as far as possible.
4. The dark brown area is the best area for a wind turbine because it is out of the line of site and has the most consistent high wind speeds.

**South Dakota State University  
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Wind Resource Assessment Network Project  
Site: Gettysburg**

**This slide shows:**

- 3) The monthly average wind speed at this site.
- 4) Overall average wind speed in the top inset box).
- 5) The Computer Predicted Maximum capacity factor.

**Last updated 8/22/2007**

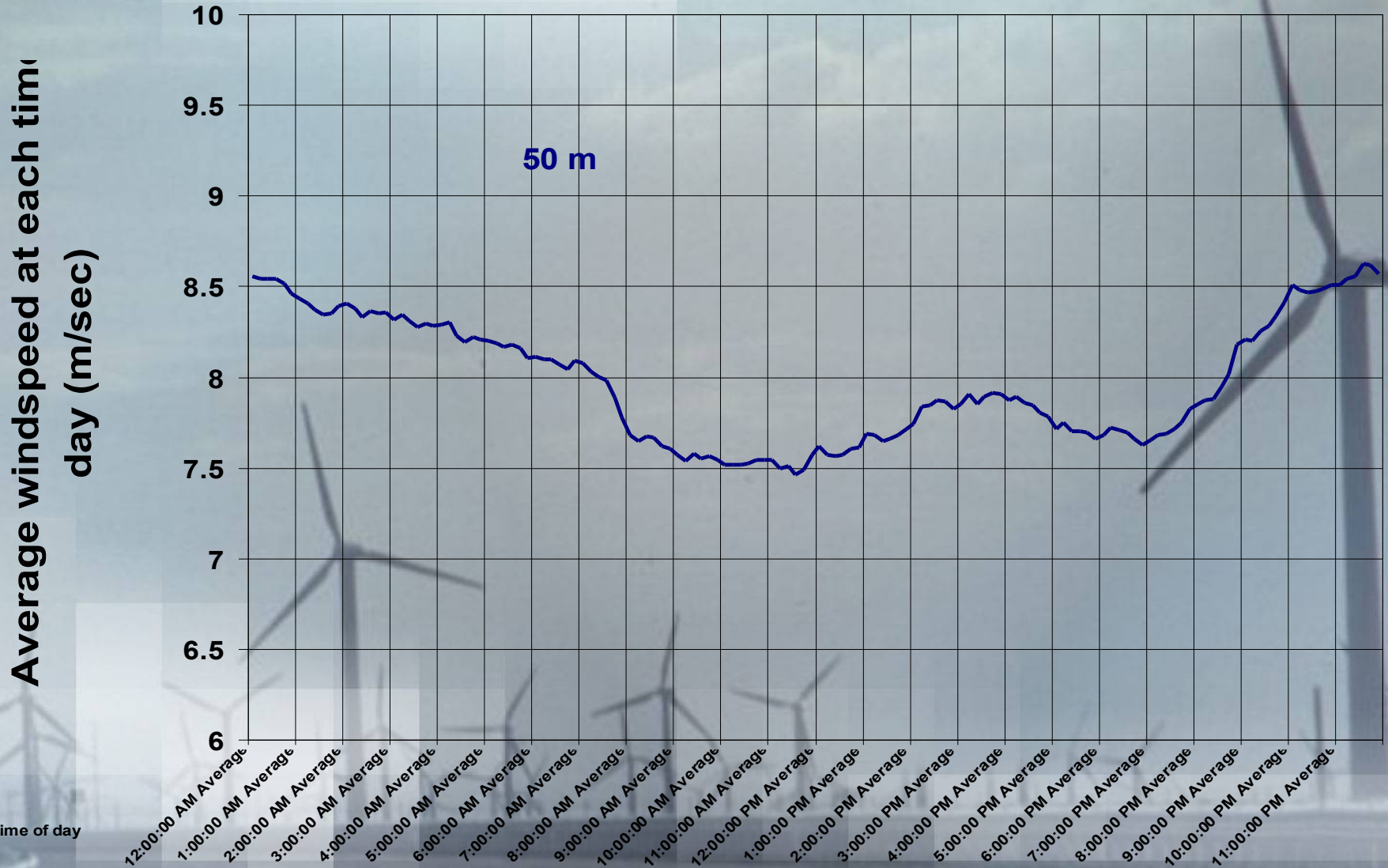


| <b>Month</b>                      | <b>Notes</b>   |
|-----------------------------------|--|
| <b>General note for this site</b> | <b>The Gettysburg site is a bit different from our other WRAN . This one is on a 50-meter tilt- up tower, as opposed to the “tall towers” used at other sites. Obviously, this installation does not include 70-meter measurements, so only the 50-meter measurements are reported here.</b> |
| <b>April 2005</b>                 | <b>A small data loss occurred at the end of the month. The exact cause for the missing data is not known, although it is suspected to be due to a communication error. The average wind speed appeared normal for April.</b>   |
| <b>May 2005</b>                   | <b>A small data loss occurred at the beginning of the month, which was a continuation of the problem encountered in April. Otherwise, the data set is complete.</b>  |
| <b>June 2005</b>                  | <b>There was a two-hour period in June where we do not have the wind vane data. The vane appeared to work before and after the void. The error most likely occurred during analysis. The average speed for June was typical.</b>   |
| <b>July 2005</b>                  | <b>The July data set was complete. Average wind speeds reflected local trends.</b>   |
| <b>August 2005</b>                | <b>The August set was complete. Average wind speeds reflected local trends.</b>  |

| <b>Month</b>                      | <b>Notes</b>   |
|-----------------------------------|--|
| <b>General note for this site</b> | <p>In November 2005 a large ice storm ruined most of the sensors on Gettysburg's tall tower. They were replaced by new wind measurement equipment within a few weeks. Permanent damage to their ISP line caused the data to stop coming in to the WRAN internet account. An employee of Gettysburg's Economic and Development Coop manually changed out the MMC card and sent it to the lab where the data was read. Unfortunately as icy and snowy conditions made it harder to get to the tower, and job duties of manually retrieving the data was overturned, data was not sent in to the WRAN Laboratory. It was discovered upon inspection of the site the Datalogger batteries were dead and the old MMC card was not configured to collect data.</p> |
| <b>April 2007</b>                 | <p>A local from Gettysburg Economic Development Coop took over duties. New batteries were inserted with a newly configured MMC card. In Mid April the data was manual downloaded from Gettysburg's Datalogger and sent to the Laboratory to be analyzed. The data appeared normal with no missing data points.</p>   |
|                                   |  |
|                                   |  |

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This slide shows the diurnal variation of the wind speed. Here the average wind speed is a function of the time of day at 50m. The data is all inclusive; Ranging from the initiation of Gettysburg's tower data collection to December 15, 2004.



Time of day