

Wind Resource Summary for Benedict Site

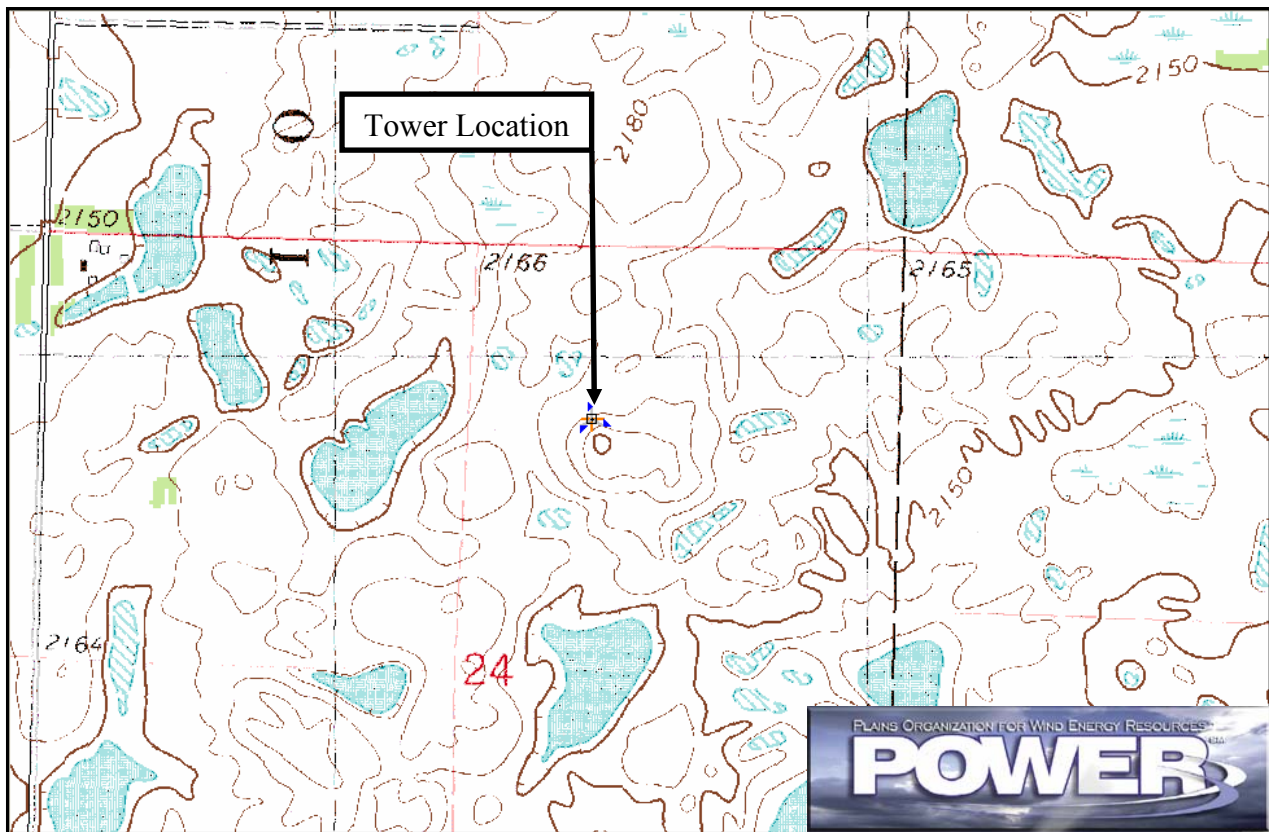
North Dakota Utility Study

Summers^a 1995, 1996 & 1997

Site Description:

Latitude: N 47° 53' 20"	Township: 151 N
Longitude: W 101° 6' 25"	Range: 82 W
Elevation: 2185 feet	Section: 24
Tower Type: NRG Tilt-Up	Tower Height: 131 feet

The monitoring site was located on the Missouri Escarpment roughly 4.2 miles north-northwest of the town of Benedict, North Dakota. The tower was instrumented at three levels: 33 feet (10 m), 82 feet (25 m), and 131 feet (40 m). The land around the site was primarily cultivated fields with several small ponds and lakes in the area.



Summary Wind Data:	33 ft AGL^b	82 ft AGL	131 ft AGL
Mean Wind Speed	12.7 mph	14.9 mph	16.5 mph
Maximum, 60-min Mean Wind Speed	46.2 mph at 131 ft AGL – 8/14/1995 12:00 a.m.		
Estimated Wind Power Class^c	Class 3 (359 W/m ² at 131 ft AGL)		

^a Summer is defined as the months of June, July and August. Summer 1995 begins with June 1995. Data recovery rates at 33, 82, and 131 feet were 56%, 71%, and 71%, respectively.

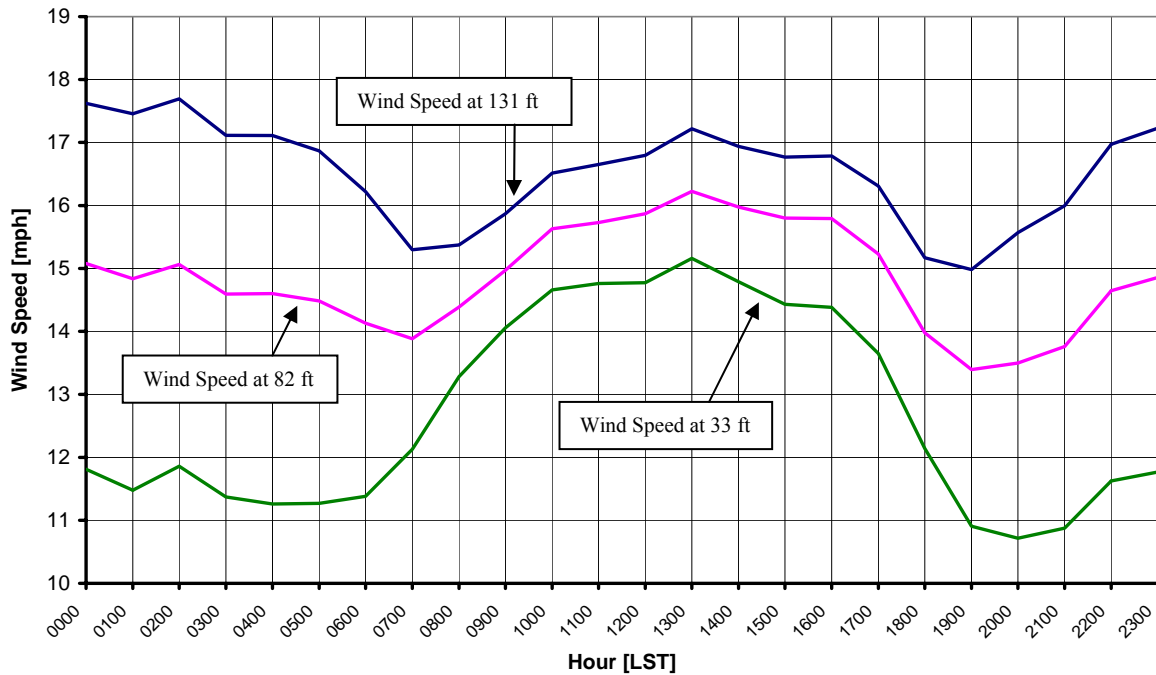
^b Above ground level.

^c Air temperature was not factored into calculations.

Average Hourly Wind Speeds

LST ^d	131 ft AGL		82 ft AGL		33 ft AGL	
	mph	m/s	mph	m/s	mph	m/s
0000	17.6	7.88	15.1	6.74	11.8	5.28
0100	17.5	7.80	14.8	6.63	11.5	5.13
0200	17.7	7.91	15.1	6.73	11.9	5.30
0300	17.1	7.65	14.6	6.52	11.4	5.08
0400	17.1	7.65	14.6	6.53	11.3	5.03
0500	16.9	7.54	14.5	6.47	11.3	5.04
0600	16.2	7.25	14.1	6.32	11.4	5.09
0700	15.3	6.84	13.9	6.21	12.1	5.42
0800	15.4	6.87	14.4	6.43	13.3	5.94
0900	15.9	7.09	15.0	6.69	14.1	6.28
1000	16.5	7.38	15.6	6.99	14.7	6.55
1100	16.7	7.44	15.7	7.03	14.8	6.60
1200	16.8	7.51	15.9	7.09	14.8	6.60
1300	17.2	7.70	16.2	7.25	15.2	6.78
1400	16.9	7.57	16.0	7.14	14.8	6.61
1500	16.8	7.50	15.8	7.06	14.4	6.45
1600	16.8	7.50	15.8	7.06	14.4	6.43
1700	16.3	7.29	15.2	6.81	13.6	6.10
1800	15.2	6.78	14.0	6.25	12.1	5.43
1900	15.0	6.70	13.4	5.99	10.9	4.88
2000	15.6	6.96	13.5	6.03	10.7	4.79
2100	16.0	7.15	13.8	6.15	10.9	4.86
2200	17.0	7.59	14.6	6.55	11.6	5.20
2300	17.2	7.70	14.9	6.64	11.8	5.26

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^d Local standard time.



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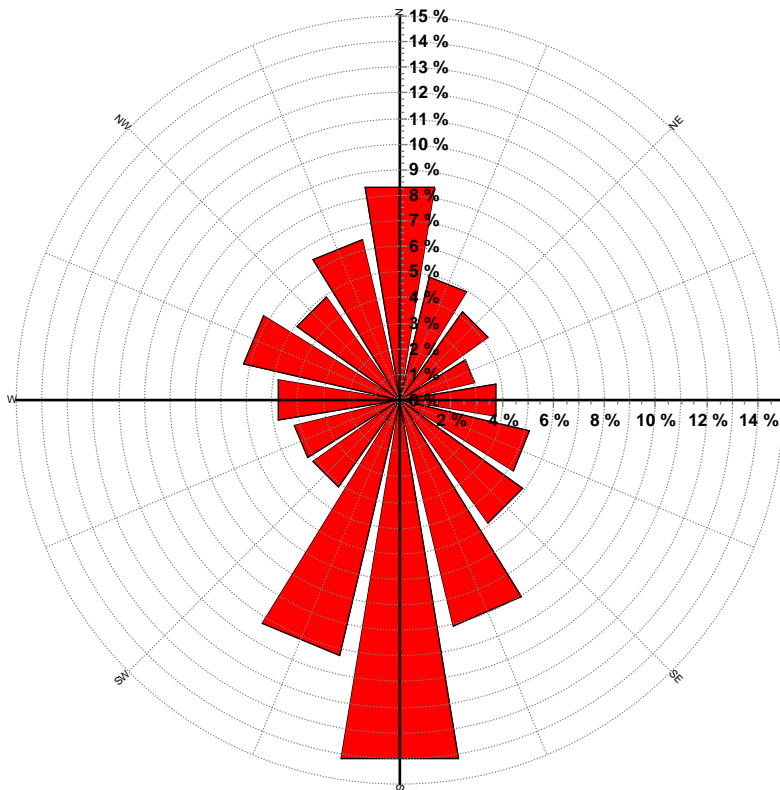
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Wind Directional Frequency

Winds from the... Frequency (%)

NNW	6.5
NW	4.9
WNW	6.3
W	4.8
WSW	4.3
SW	4.2
SSW	10.3
S	14.2
SSE	9.1
SE	5.9
ESE	5.2
E	3.8
ENE	3.0
NE	4.2
NNE	5.0
N	8.4

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Wind Rose for 131 ft AGL
Summers 1995, 1996 & 1997



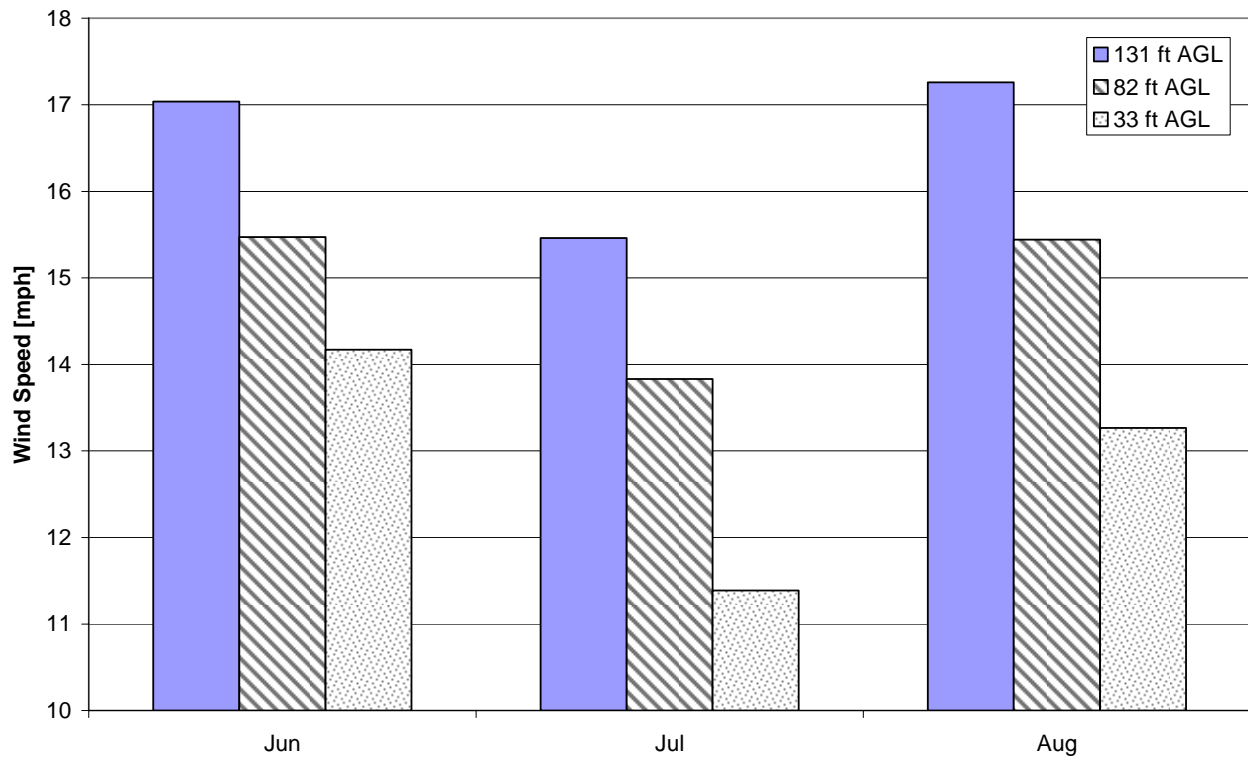
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Monthly Wind Speed Averages

Month	131 ft AGL		82 ft AGL		33 ft AGL	
	mph	m/s	mph	m/s	mph	m/s
Jun	17.0	7.62	15.5	6.92	14.2	6.34
Jul	15.5	6.91	13.8	6.18	11.4	5.09
Aug	17.3	7.72	15.4	6.90	13.3	5.93

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