

**New Mexico State University
Agricultural Science Center at Clovis**

**Wind Performance Monitoring Summary
*2007 & 2008***



February 2009

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**Wind Performance Monitoring Summary
2007 & 2008**

Prepared for:

New Mexico State University
Agricultural Science Center at Clovis
2346 State Road 288
Clovis, NM 88011-9998

Prepared by:

Institute for Energy & Environment
New Mexico State University
PO Box 30001, MSC 3SOL
Las Cruces, NM 88003-8001

Martin Gomez
(575) 646-2943
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**50 Meter Tower at New Mexico State University
Agricultural Science Center at Clovis**

**Wind Performance Monitoring Summary
2007 & 2008**

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1 Introduction

This document provides the annual wind performance summaries for 2007 and 2008 for the Clovis Agricultural Experiment Station of New Mexico State University. The tower was installed in November 2006, and since then data has been collected. Overall, the site has shown an average annual wind speed of **7.2 m/s** for 2007, and **7.6 m/s** for 2008 at 50 meters.

The report will present the following information:

- ***Monthly Average Wind Speed***
- ***Hourly Average Wind Speed***
- ***Average Speed: Day vs. Night***
- ***Maximum Gust***
- ***Wind Shear***
- ***Turbulence Intensity***
- ***Data Recover;***
- ***Temperature***
- ***Yearly Wind Direction***

The summary report provides the **hourly average wind speed** results, this information could be used to estimate the annual energy production using a wind turbine power curve. The long term average speed differences between day and night are also presented; the values with negative percentage indicate that the wind speed during night is less than during the day for 2007 data. The wind direction for 2007 and 2008 for the wind roses at 40 m and 50 m, show that wind blows more frequently from the ***Southwest Quadrant*** (180 to 270 Degrees).

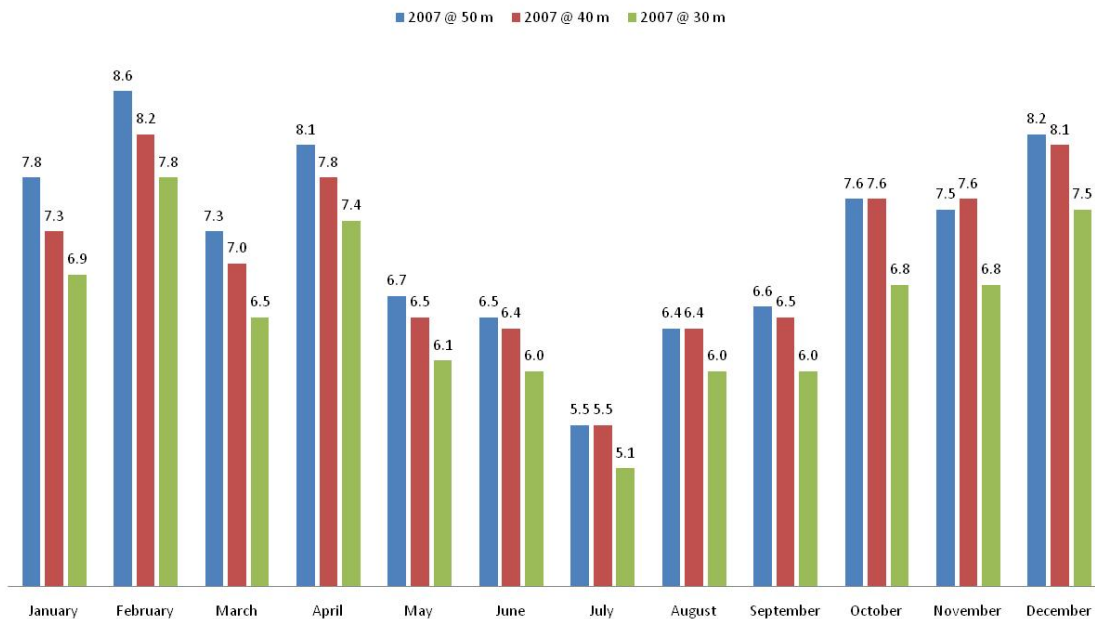
2 Monthly Average Wind Speed

The wind speed is the most important factor for the amount of energy a wind turbine can convert into electricity; the energy that wind has varies with the cube (third power) of the average wind speed. Thus, the filtered raw data results for average wind speed are provided for all three-measurement levels.

Monthly Average Wind Speed for 2007

Month	50 m		40 m		30 m	
	m/s	mph	m/s	mph	m/s	mph
January	7.8	17.4	7.3	16.3	6.9	15.4
February	8.6	19.2	8.2	18.3	7.8	17.4
March	7.3	16.3	7.0	15.7	6.5	14.5
April	8.1	18.1	7.8	17.4	7.4	16.6
May	6.7	15.0	6.5	14.5	6.1	13.6
June	6.5	14.5	6.4	14.3	6.0	13.4
July	5.5	12.3	5.5	12.3	5.1	11.4
August	6.4	14.3	6.4	14.3	6.0	13.4
September	6.6	14.8	6.5	14.5	6.0	13.4
October	7.6	17.0	7.6	17.0	6.8	15.2
November	7.5	16.8	7.6	17.0	6.8	15.2
December	8.2	18.3	8.1	18.1	7.5	16.8
Average	7.2	16.2	7.1	15.8	6.6	14.7

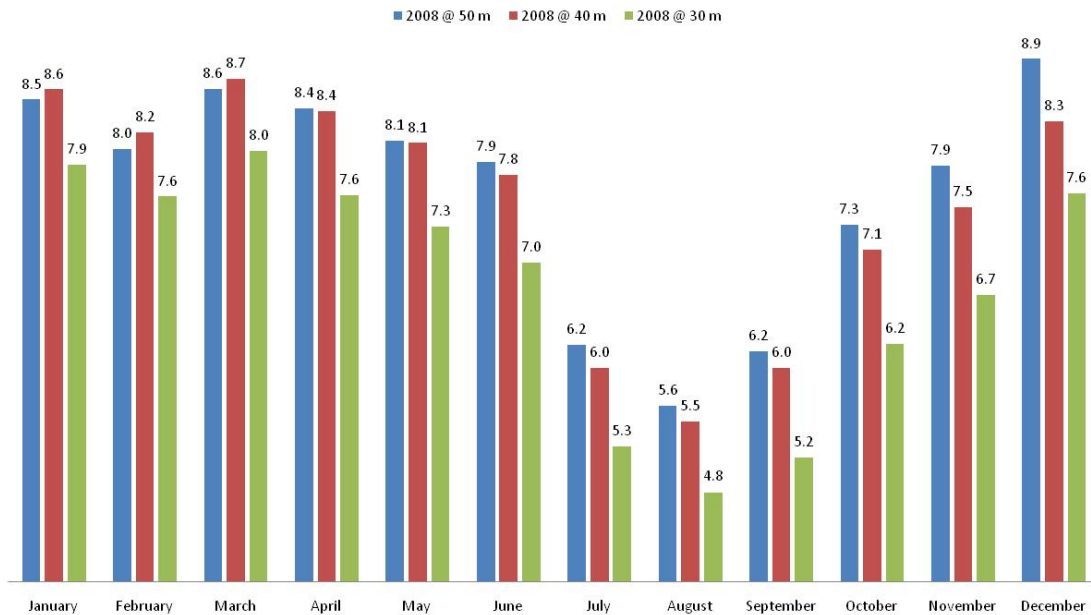
Monthly Average Speed 2007



Monthly Average Wind Speed for 2008

Month	50 m		40 m		30 m	
	m/s	mph	m/s	mph	m/s	mph
January	8.5	19.0	8.6	19.2	7.9	17.7
February	8.0	18.0	8.2	18.3	7.6	17.0
March	8.6	19.2	8.7	19.5	8.03	18.0
April	8.4	18.8	8.4	18.8	7.61	17.0
May	8.1	18.2	8.1	18.1	7.32	16.4
June	7.9	17.7	7.8	17.4	6.98	15.6
July	6.2	13.9	6.0	13.4	5.27	11.8
August	5.6	12.6	5.5	12.3	4.84	10.8
September	6.2	13.8	6.0	13.4	5.16	11.5
October	7.3	16.4	7.1	15.9	6.22	13.9
November	7.9	17.6	7.5	16.8	6.68	14.9
December	8.9	19.9	8.3	18.6	7.63	17.1
Average	7.6	17.1	7.5	16.8	6.8	15.1

Monthly Average Speed 2008



3 Hourly Average Wind Speed

Hourly Average Wind Speed for 2007

Hour	January	February	March	April	May	June	July	August	September	October	November	December
00:00 - 1:00	8.6	8.8	7.6	7.9	6.9	7.1	5.3	6.5	6.6	7.9	7.8	8.7
1:00 - 2:00	8.5	9.2	7.5	7.8	6.7	6.3	5.4	6.4	6.4	7.6	7.6	9
2:00 - 3:00	8.5	9.1	7.5	7.8	6.2	6.1	5.5	6.1	6.3	7.3	7.3	8.8
3:00 - 4:00	8.4	9.1	6.9	7.5	5.9	6	5.4	5.8	6.1	7.2	7.3	8.8
4:00 - 5:00	8.4	9.2	6.7	7.5	5.8	6.2	5.1	5.6	6.0	7.3	7.8	8.7
5:00 - 6:00	7.7	9.2	6.9	7.3	5.8	5.8	4.8	5.6	5.8	7.5	7.7	8.7
6:00 - 7:00	7.8	9.9	6.7	7	6	5.7	4.3	5.2	5.7	7.4	7.8	8.6
7:00 - 8:00	7.8	9.1	6.3	7	6.5	6	4.7	5.6	6.0	6.8	7	8.4
8:00 - 9:00	7.2	8.7	7.1	7.1	6.4	6.1	4.7	5.7	6.4	7.2	6.9	8.1
9:00 - 10:00	7.0	8.3	6.9	7.3	6.2	5.9	4.6	5.3	6.5	7.3	7.3	8.5
10:00 - 11:00	7.3	8.9	7.2	7.6	6.2	5.8	4.5	5.3	6.4	7.2	7.5	8.4
11:00 - 12:00	7.4	8.5	7.1	8	6	5.8	4.9	5.6	6.2	7.3	7.6	8.0
12:00 - 13:00	7.2	8.3	7.3	8.7	6.4	6.1	5.3	5.7	6.2	7.5	7.7	7.9
13:00 - 14:00	6.9	8.1	7.4	8.7	6.8	6.1	5.5	6.1	6.3	7.8	7.6	7.2
14:00 - 15:00	7.0	8.2	7.5	9.1	7	6.3	5.9	6.7	6.4	7.4	7.6	7.1
15:00 - 16:00	7.2	8.1	7.4	9.2	7.4	6.5	6.0	6.9	6.5	7.6	7.3	7.2
16:00 - 17:00	6.7	7.7	7.3	9.4	7.6	6.5	5.9	7.1	7.0	7.8	6.8	6.9
17:00 - 18:00	7.2	7.8	7.5	8.9	7.3	6.9	6.2	7.6	7.4	8.0	7.1	7.2
18:00 - 19:00	7.3	8.0	7.3	8.5	7.2	7.8	6.5	7.6	7.8	8	7.4	7.5
19:00 - 20:00	7.7	8.5	7.9	8.5	7.3	8	6.6	7.7	7.5	8.3	7.5	8.0
20:00 - 21:00	8.2	8.4	7.5	8.3	7	7.7	6.3	7.5	7.1	8.4	7.6	8.6
21:00 - 22:00	8.5	8.5	7.2	8.4	7.2	7.9	6.2	7.1	7.3	8.4	7.9	8.7
22:00 - 23:00	8.9	8.8	7.2	7.9	7	7.3	5.8	7.0	7.1	8.3	7.8	8.8
23:00 - 24:00	8.8	8.5	7.4	7.9	7	7.2	5.7	7.0	6.7	8.3	8.1	8.8
Average	7.8	8.6	7.3	8.1	6.7	6.5	5.5	6.4	6.6	7.6	7.5	8.2

Hourly Average Wind Speed for 2008

Hour	January	February	March	April	May	June	July	August	September	October	November	December
00:00 - 1:00	8.6	8.5	8.4	8.7	7.8	8.5	6	5.7	6.1	7.3	7.7	8.6
1:00 - 2:00	8.2	8.4	8.4	9	7.5	8.4	6.2	5.2	6	7.2	7.8	8.3
2:00 - 3:00	8.4	8	8.4	8.7	7.4	7.7	6.3	5.4	6.3	7.0	7.6	8.1
3:00 - 4:00	8.5	7.6	8.3	8.7	7.5	7.2	6.1	5.3	6.0	7.1	8.0	8.1
4:00 - 5:00	8.3	7.8	8.3	9.2	7	7.2	5.9	5.1	5.4	7.1	8.2	8.0
5:00 - 6:00	8.9	7.7	8.8	8.9	6.9	7.1	5.5	5.0	5.4	7.5	7.9	8.3
6:00 - 7:00	8.8	7.9	8.8	8.1	7	6.6	5.4	4.7	5.1	7.7	7.8	8.4
7:00 - 8:00	8.5	8.2	8.6	8.5	7.6	7.2	6	5.0	5.3	7.1	7.5	8.6
8:00 - 9:00	7.4	7.9	9.2	9.2	7.6	7.2	5.8	5.1	5.6	7.1	7.2	8.0
9:00 - 10:00	7.7	8.2	9.4	8.9	7.3	7.1	5.8	5.0	5.9	7.3	7.7	9.0
10:00 - 11:00	8.7	7.8	9.2	8.2	7.4	6.9	5.6	5.2	6.0	7.2	7.9	10.1
11:00 - 12:00	8.8	7.9	9.2	8.3	8.1	7	5.8	5.6	5.9	7.2	8.0	10.8
12:00 - 13:00	8.8	7.7	8.7	8.3	8.6	7.1	5.9	5.6	5.6	7.5	8.2	10.4
13:00 - 14:00	8.8	8.1	8.6	8.2	8.9	7.4	6.2	5.5	5.6	7.7	8.5	10.4
14:00 - 15:00	8.5	8.1	8.8	8.4	8.8	8.1	6.5	5.8	5.8	7.6	8.3	9.7
15:00 - 16:00	8.4	8.6	8.9	8.5	8.9	8.5	6.7	5.9	6.4	7.2	7.9	9.0
16:00 - 17:00	8.0	8.4	9.0	8.4	9.2	8.8	7.1	6.5	6.9	7.1	7.4	8.4
17:00 - 18:00	7.9	8.1	8.6	8.2	9.5	8.8	7.0	6.5	7.0	7.3	7.9	8.7
18:00 - 19:00	7.9	8.0	8.7	8.2	9.0	9.0	7.0	6.4	7.1	7.4	8.2	8.9
19:00 - 20:00	8.6	8.5	8.7	8.1	9.0	8.7	7.2	6.8	7.5	7.6	8.6	8.7
20:00 - 21:00	9.2	8.7	8.8	8.1	9.0	8.5	7.0	6.5	7.1	7.8	8.4	8.9
21:00 - 22:00	9.3	8.3	8.7	7.9	8.8	9.3	6.8	6.3	6.8	7.5	8.4	9.2
22:00 - 23:00	9.1	8.1	8.6	8.3	8.6	8.6	6.4	5.9	6.7	7.3	8.3	9.0
23:00 - 24:00	9.3	7.9	8.4	8.5	8.1	8.8	6.4	6.1	6.5	7.1	7.7	8.7
Average	8.5	8.0	8.6	8.4	8.1	7.9	6.2	5.6	6.2	7.3	7.98	8.9

4 Average Speed: Day vs. Night

Average Speed: Day vs. Night for 2007

		50 m (1)	50 m (2)	40 m	30 m
January	Day	8.22	8.01	7.87	7.39
	Night	7.34	7.19	7.18	6.87
Average Difference Day vs. Night	-10%	-12%	-11%	-10%	-8%
February	Day	10.02	9.92	9.86	9.60
	Night	9.59	9.48	9.10	8.53
Average Difference Day vs. Night	-8%	-5%	-5%	-8%	-13%
March	Day	9.20	9.29	9.26	6.10
	Night	8.68	8.76	8.37	5.27
Average Difference Day vs. Night	-10%	-6%	-6%	-11%	-16%
April	Day	7.51	7.45	7.46	7.16
	Night	7.11	7.14	6.78	6.17
Average Difference Day vs. Night	-9%	-6%	-4%	-10%	-16%
May	Day	6.64	6.50	6.57	6.36
	Night	6.52	6.43	6.12	5.55
Average Difference Day vs. Night	-6%	-2%	-1%	-7%	-15%
June	Day	8.38	8.22	8.39	8.23
	Night	8.07	7.93	7.79	7.20
Average Difference Day vs. Night	-7%	-4%	-4%	-8%	-14%
July	Day	7.54	7.38	7.69	7.58
	Night	6.64	6.49	6.52	5.98
Average Difference Day vs. Night	-18%	-14%	-14%	-18%	-27%
August	Day	8.63	8.60	8.88	8.70
	Night	7.85	7.82	7.73	7.09
Average Difference Day vs. Night	-14%	-10%	-10%	-15%	-23%
September	Day	8.48	8.35	8.58	8.31
	Night	7.69	7.58	7.47	6.85
Average Difference Day vs. Night	-14%	-10%	-10%	-15%	-21%
October	Day	9.79	9.62	9.90	9.47
	Night	8.99	8.83	8.75	7.78
Average Difference Day vs. Night	-13%	-9%	-9%	-13%	-22%
November	Day	8.87	8.77	9.00	8.57
	Night	8.07	7.93	7.97	7.14
Average Difference Day vs. Night	-13%	-10%	-11%	-13%	-20%
December	Day	7.46	7.24	7.56	7.13
	Night	8.17	7.93	7.92	7.09
Average Difference Day vs. Night	5%	9%	9%	5%	-1%
Annual Average Difference	-10%				

Average Speed: Day vs. Night for 2008

		50 m (1)	50 m (2)	40 m	30 m
January	Day	8.35	8.27	8.56	7.98
	Night	8.59	8.45	8.49	7.53
Average Difference Day vs. Night	0%	3%	2%	-1%	-6%
February	Day	7.44	7.28	7.71	7.26
	Night	7.45	7.29	7.41	6.61
Average Difference Day vs. Night	-3%	0%	0%	-4%	-10%
March	Day	8.92	8.62	9.14	8.61
	Night	8.42	8.23	8.28	7.34
Average Difference Day vs. Night	-10%	-6%	-5%	-10%	-17%
April	Day	8.14	8.03	8.35	7.78
	Night	8.12	8.04	7.87	6.84
Average Difference Day vs. Night	-5%	0%	0%	-6%	-14%
May	Day	8.25	8.26	8.43	7.82
	Night	7.92	7.84	7.71	6.70
Average Difference Day vs. Night	-9%	-4%	-5%	-9%	-17%
June	Day	7.33	7.32	7.49	6.89
	Night	7.87	7.92	7.58	6.52
Average Difference Day vs. Night	2%	7%	7%	1%	-6%
July	Day	6.13	6.06	6.15	5.55
	Night	6.29	6.18	5.88	4.91
Average Difference Day vs. Night	-3%	3%	2%	-5%	-13%
August	Day	5.51	5.50	5.57	5.04
	Night	5.72	5.68	5.42	4.57
Average Difference Day vs. Night	-2%	4%	3%	-3%	-10%
September	Day	5.73	5.69	5.75	5.12
	Night	6.11	6.10	5.78	4.78
Average Difference Day vs. Night	2%	6%	7%	0%	-7%
October	Day	7.33	7.33	7.28	6.51
	Night	7.23	7.26	6.84	5.84
Average Difference Day vs. Night	-5%	-1%	-1%	-6%	-12%
November	Day	7.62	7.48	7.45	6.75
	Night	7.65	7.52	7.02	6.06
Average Difference Day vs. Night	-4%	0%	1%	-6%	-11%
December	Day	9.30	9.23	8.97	8.35
	Night	8.44	8.32	7.66	6.82
Average Difference Day vs. Night	-15%	-10%	-11%	-17%	-22%
Annual Average Difference	-4%				

5 Maximum Gust

The maximum wind speeds at the 50 meters level, and is an indication of the possible high wind speeds that could bring the turbines to stop; depending on their design, wind turbines have different cut-out-out wind speed, that is the highest at which a wind turbine stops producing power.

Maximum Gust at 50 m level for 2007 and 2008

2007			2008		
Month	m/s	mph	Month	m/s	mph
January	17.4	38.9	January	22.6	50.6
February	21.7	48.5	February	20.4	45.6
March	19.3	43.2	March	20.4	45.6
April	25	55.9	April	25.8	57.7
May	16.8	37.6	May	19.1	42.7
June	20.5	45.9	June	19.5	43.6
July	12.4	27.7	July	14.1	31.5
August	13.7	30.6	August	11.9	26.6
September	14.3	32.0	September	16.1	36.0
October	19.4	43.4	October	15.5	34.7
November	16.1	36.0	November	19.3	43.2
December	16.6	37.1	December	25.7	57.5
Average	17.8	39.7	Average	19.2	42.9

6 Wind Shear Exponent

The wind shear exponent represents the degree to which wind speed increases with height. The wind shear exponent was calculated for the 30 to 50-m height. For wind energy farm development, this parameter is used to determining the appropriate wind turbine hub height.

Wind Shear Exponent for 2007 and 2008

	30-50m Shear 2007	30-50m Shear 2008
<i>January</i>	<i>0.20</i>	<i>0.16</i>
<i>February</i>	<i>0.18</i>	<i>0.13</i>
<i>March</i>	<i>0.22</i>	<i>0.16</i>
<i>April</i>	<i>0.18</i>	<i>0.21</i>
<i>May</i>	<i>0.16</i>	<i>0.21</i>
<i>June</i>	<i>0.16</i>	<i>0.25</i>
<i>July</i>	<i>0.12</i>	<i>0.32</i>
<i>August</i>	<i>0.13</i>	<i>0.29</i>
<i>September</i>	<i>0.17</i>	<i>0.35</i>
<i>October</i>	<i>0.20</i>	<i>0.32</i>
<i>November</i>	<i>0.16</i>	<i>0.35</i>
<i>December</i>	<i>0.14</i>	<i>0.33</i>
Average	0.17	0.26

7 Turbulence Intensity 2007 & 2008

Wind turbulence is the rapid disturbances or irregularities in the wind speed, direction, and vertical component, and it is a relative indicator of turbulence with low levels indicated by values less than or equal to 0.10, moderate levels to 0.25, and high levels greater than 0.25. It is an important site characteristic, because high turbulence levels may decrease power output and cause extreme loading on wind turbine components.

Turbulence Intensity for 2007 and 2008

	Turbulence Intensity 2007	Turbulence Intensity 2008
<i>January</i>	<i>0.07</i>	<i>0.07</i>
<i>February</i>	<i>0.08</i>	<i>0.08</i>
<i>March</i>	<i>0.09</i>	<i>0.09</i>
<i>April</i>	<i>0.10</i>	<i>0.11</i>
<i>May</i>	<i>0.11</i>	<i>0.11</i>
<i>June</i>	<i>0.11</i>	<i>0.12</i>
<i>July</i>	<i>0.12</i>	<i>0.11</i>
<i>August</i>	<i>0.13</i>	<i>0.12</i>
<i>September</i>	<i>0.11</i>	<i>0.10</i>
<i>October</i>	<i>0.08</i>	<i>0.09</i>
<i>November</i>	<i>0.08</i>	<i>0.07</i>
<i>December</i>	<i>0.08</i>	<i>0.08</i>
Average	0.10	0.10

8 Temperature

Air temperature is an important parameter of how a wind energy farm can perform and is normally measured either near ground level or near hub height. In most locations the average near ground level air temperature will be within 1°C of the average at hub height. It is also used to calculate air density, a variable required to estimate the wind power density and the power output of a wind turbine. Therefore, average, minimum and maximum temperature data is reported in the following tables.

Temperature Ranges for 2007

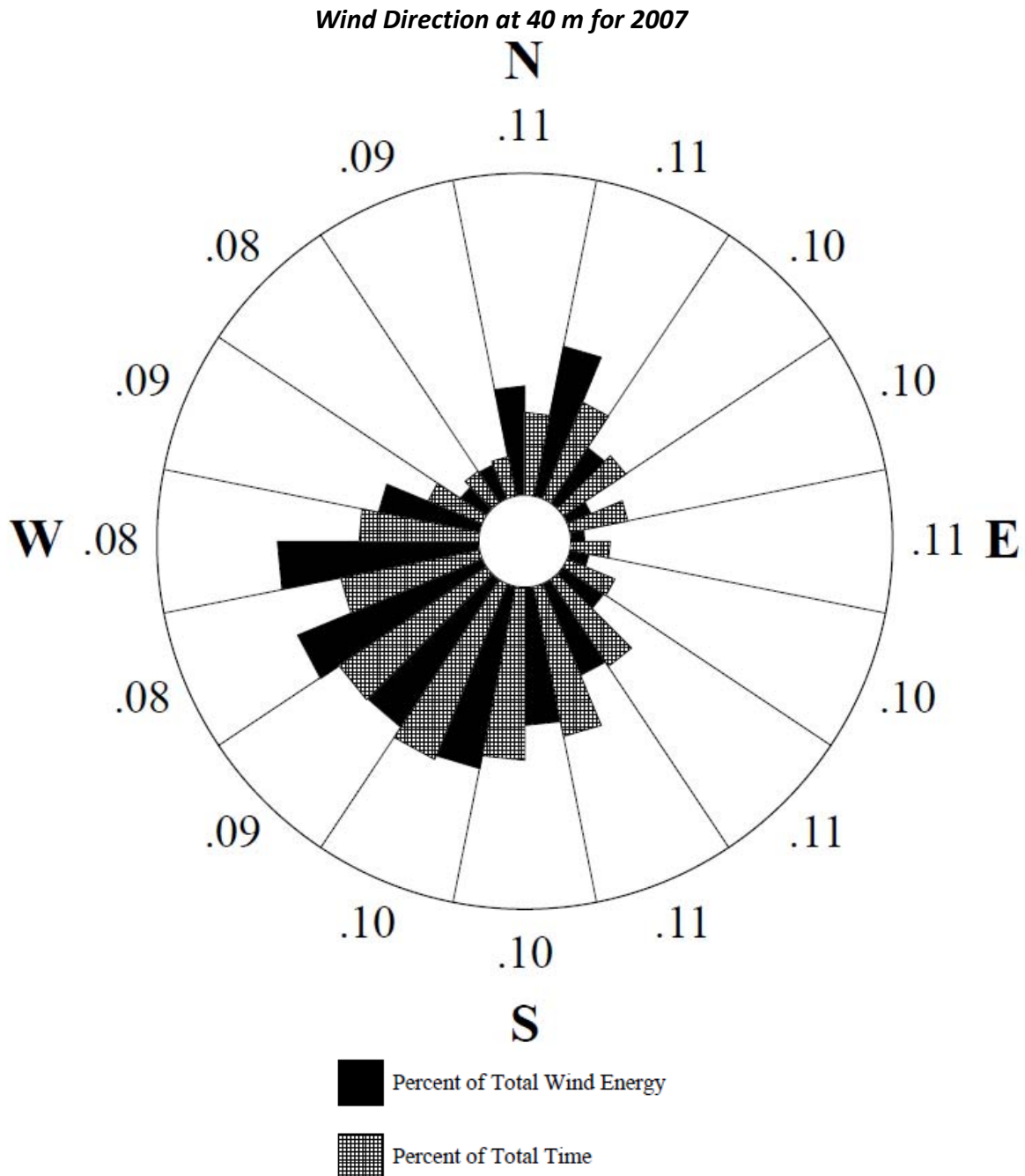
	Average		Minimum Sample		Maximum Sample	
	Celsius	Fahrenheit	Celsius	Fahrenheit	Celsius	Fahrenheit
January	0.7	33.2	-14.6	5.7	18.4	65.1
February	4.6	40.2	-16.0	3.2	23.4	74.1
March	10.4	50.7	-9.0	15.8	29.8	85.6
April	11.1	51.9	-4.7	23.5	28.2	82.8
May	16.9	62.4	3.2	37.8	31.0	87.8
June	21.8	71.3	7.2	45.0	35.9	96.6
July	24.2	75.5	15.1	59.2	35.6	96.1
August	25.5	78.0	15.9	60.6	41.0	105.8
September	21.4	70.5	10.2	50.4	34.9	94.8
October	16.1	61.0	-1.1	30.0	32.6	90.7
November	8.5	47.4	-6.4	20.5	27.6	81.7
December	3.1	37.6	-12.1	10.2	27.6	81.7
Average	13.7	56.6	-1.0	30.2	30.5	86.9

Temperature Ranges for 2008

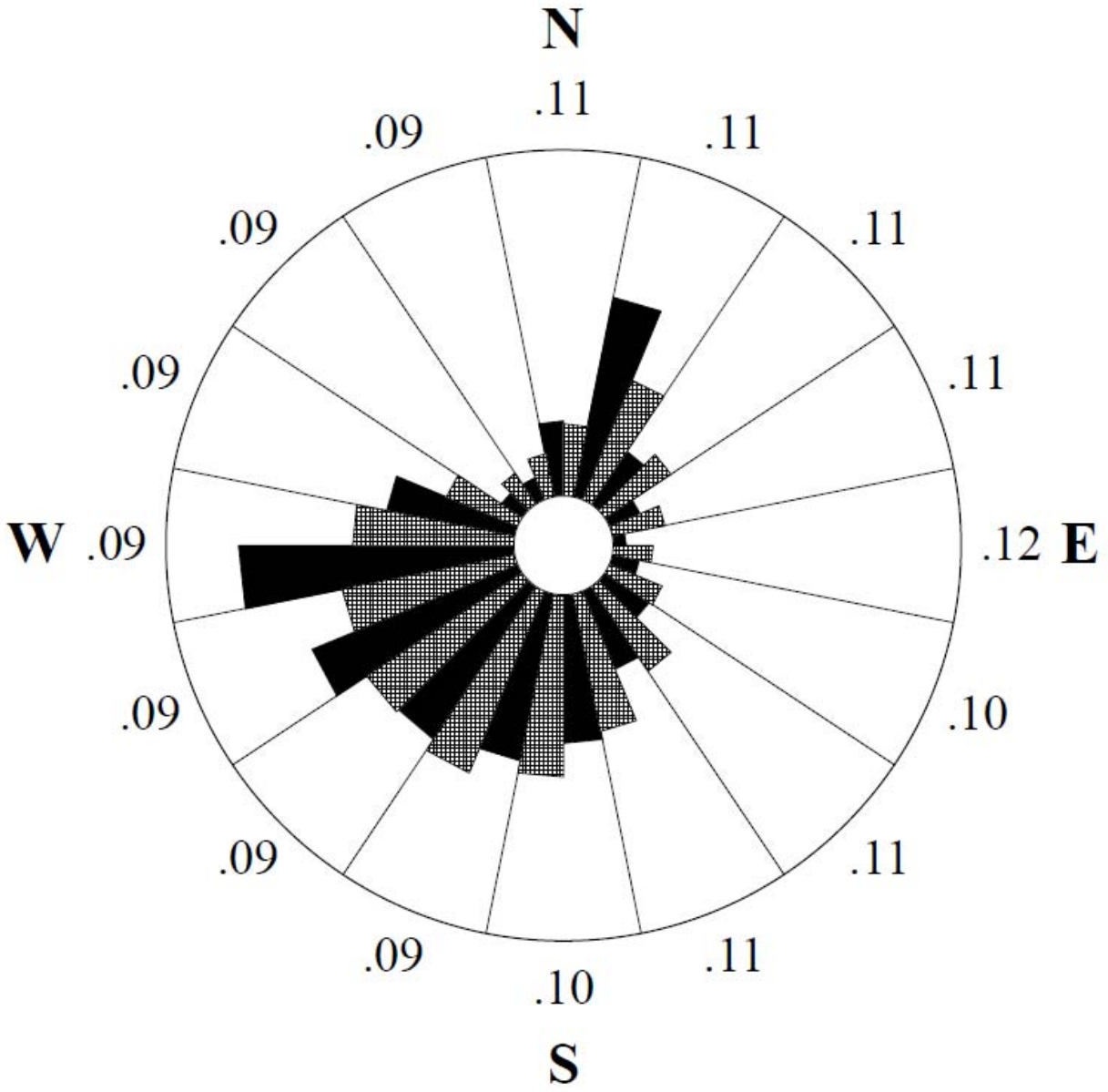
	Average		Minimum Sample		Maximum Sample	
	Celsius	Fahrenheit	Celsius	Fahrenheit	Celsius	Fahrenheit
January	2	35.6	-15.8	3.6	20.1	68.2
February	6.2	43.2	-11.9	10.6	23.7	74.7
March	9.1	48.4	-6	21.2	27.9	82.2
April	13.2	55.8	-1.5	29.3	30.7	87.3
May	18.8	65.8	-0.6	30.9	37.2	99.0
June	25.1	77.2	10	50.0	39.3	102.7
July	23.8	74.8	15.3	59.5	36.6	97.9
August	23.3	73.9	13.7	56.7	36.6	97.9
September	19.2	66.6	8.9	48.0	33.9	93.0
October	14.2	57.6	-1.8	28.8	30.1	86.2
November	8.4	47.1	-6.2	20.8	27.3	81.1
December	3.8	38.8	-11.9	10.6	24	75.2
Average	13.9	57.1	-0.7	30.8	30.6	87.1

9 Wind Direction

The wind direction information is important and a useful tool for siting wind turbines. It is important to know the distributions and the frequency of the varying wind directions. The different spots show what percentage of time the wind blows from that direction or the relative frequency of each one of the sixteen wind directions. The black spots show the energy available from the wind blowing from that direction, and the shaded areas indicate the percentage of time the wind blows from that direction.

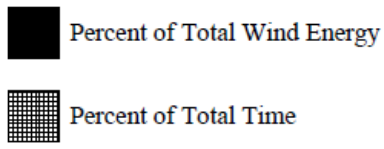
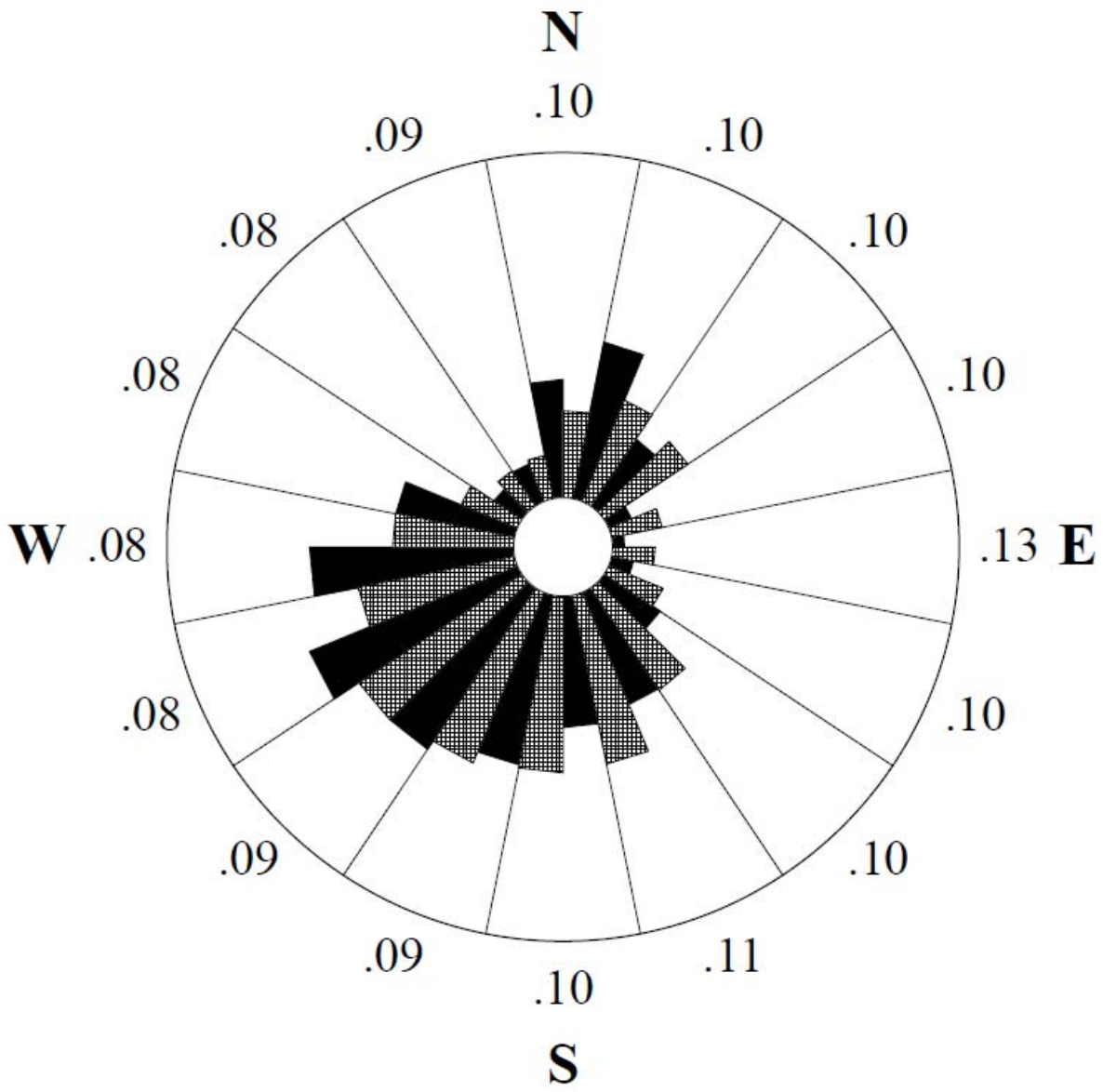


Wind Direction at 40 m for 2008

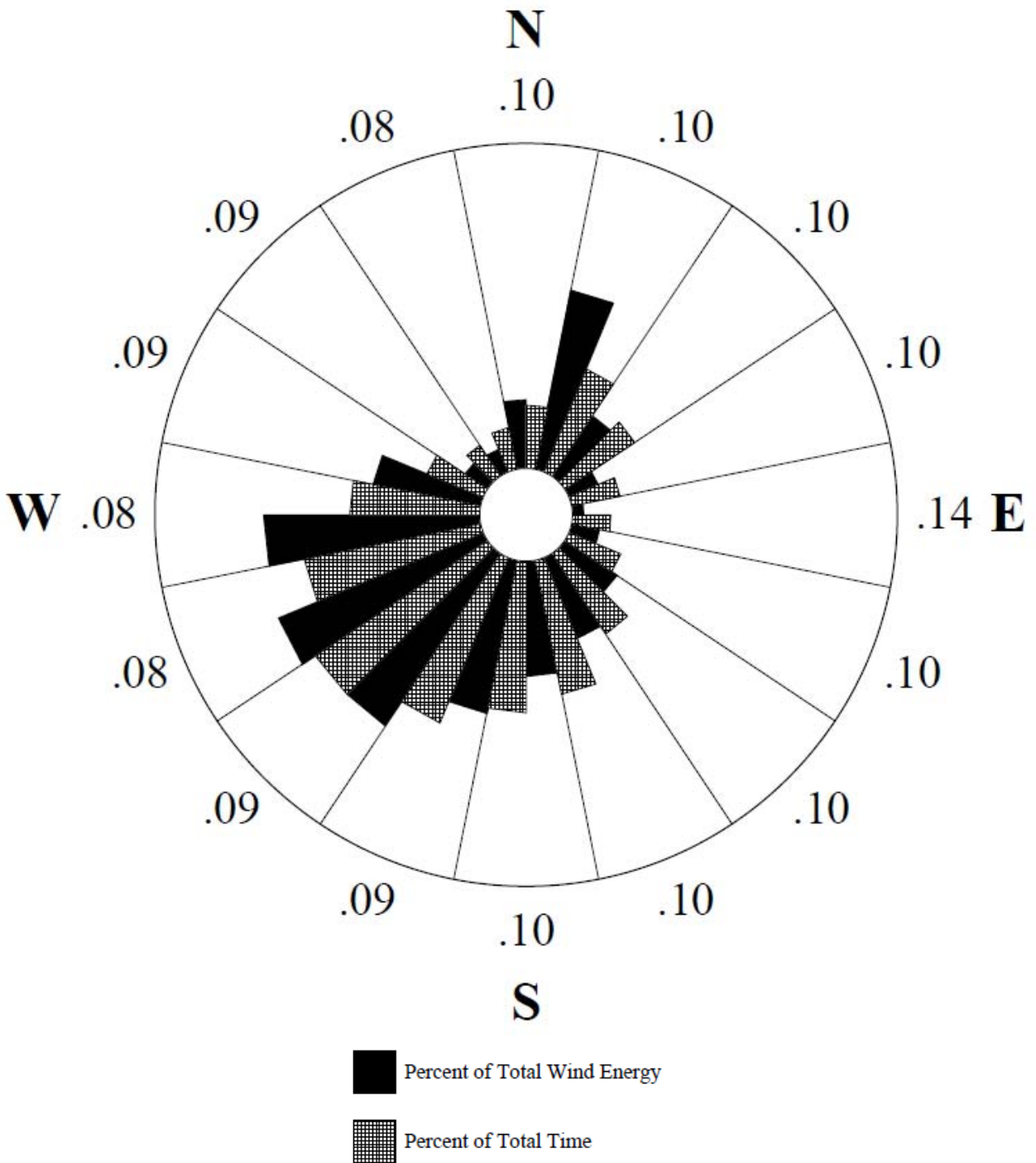


■ Percent of Total Wind Energy
▨ Percent of Total Time

Wind Direction at 50 m for 2007



Wind Direction at 50 m for 2008



10 Data Recovery

Recovery rates for wind speed data are calculated at all heights. The “Hours Lost” column indicates the number of hourly data points that were missing or removed during the data validation process for each monitoring height. The “Recovery Rate” represents the remaining data expressed as a percentage of total sensor hours in the period. The purpose of installing redundant sensors at the highest level is to ensure that even in the event of a sensor failure, data are still being collected.

Data Recovery Rates for 2007

	Total Hours in period	Hours Lost			Recovery Rate All Heights	Upper Level
		50 m	40 m	30 m		
<i>January</i>	744	110	110	110	85%	85%
<i>February</i>	672	27	27	27	96%	96%
<i>March</i>	744	4	4	4	99%	99%
<i>April</i>	720	41	41	41	94%	94%
<i>May</i>	744	4	4	4	99%	99%
<i>June</i>	720	1	1	1	99%	99%
<i>July</i>	744	4	4	4	99%	99%
<i>August</i>	744	4	4	4	99%	99%
<i>September</i>	720	0	0	0	100%	100%
<i>October</i>	744	0	0	0	100%	100%
<i>November</i>	720	10	10	10	98%	98%
<i>December</i>	744	31	31	31	96%	96%
Average	730.0	19.7	19.7	19.7	97%	97%

Data Recovery Rates for 2008

	Total Hours in period	Hours Lost			Recovery Rate All Heights	Upper Level
		50 m	40 m	30 m		
<i>January</i>	744	2.7	4.2	6.0	99.4%	99.5%
<i>February</i>	696	9	7.5	8.8	98.6%	98.5%
<i>March</i>	744	0	0.0	0.0	100.0%	100.0%
<i>April</i>	720	1.7	1.2	1.2	99.8%	99.8%
<i>May</i>	744	0	0.0	0.0	100.0%	100.0%
<i>June</i>	720	0	0.0	0.0	100.0%	100.0%
<i>July</i>	744	0	0.0	0.0	100.0%	100.0%
<i>August</i>	744	0	0.0	0.0	100.0%	100.0%
<i>September</i>	720	0	0.0	0.0	100.0%	100.0%
<i>October</i>	744	0	0.0	0.0	100.0%	100.0%
<i>November</i>	720	0	0.0	0.0	100.0%	100.0%
<i>December</i>	744	0	0.0	0.0	100.0%	100.0%
Average		1.1	1.1	1.3	99.8%	99.8%

11 Standard Deviation

Average Internal Standard Deviation for 2007

	50 m (1)	50 m (2)	40 m	30 m
January	0.52	0.55	0.55	0.56
February	0.67	0.72	0.70	0.71
March	0.68	0.71	0.70	0.72
April	0.85	0.86	0.85	0.87
May	0.78	0.77	0.79	0.80
June	0.82	0.82	0.85	0.86
July	0.70	0.68	0.72	0.73
August	0.76	0.76	0.79	0.80
September	0.74	0.73	0.76	0.78
October	0.71	0.72	0.73	0.75
November	0.58	0.60	0.60	0.63
December	0.67	0.71	0.70	0.72
Average	0.71	0.72	0.73	0.74

Average Internal Standard Deviation for 2008

	50 m (1)	50 m (2)	40 m	30 m
January	0.69	0.74	0.71	0.74
February	0.72	0.77	0.76	0.78
March	0.83	0.86	0.86	0.89
April	0.86	0.91	0.91	0.92
May	0.88	0.91	0.92	0.93
June	0.96	0.99	0.99	0.99
July	0.69	0.68	0.70	0.67
August	0.69	0.68	0.71	0.66
September	0.64	0.65	0.67	0.64
October	0.68	0.69	0.71	0.70
November	0.62	0.65	0.66	0.66
December	0.69	0.73	0.73	0.73
Average	0.75	0.77	0.78	0.78