

**Report No. 3579303-001, Rev. 0**

# **Celia Meteorological Report For 2014**

**November 2015**

*Prepared by*

**ABS Consulting Inc.**

*Prepared for*

**Southern Nuclear Operating Company**



# APPROVAL COVER SHEET

**Title:** Celia Meteorological Report for 2014

**Report Number:** 3579303-001

**Client:** Southern Nuclear Operating Company

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## TABLE OF REVISIONS

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<b>Revision No.</b>	<b>Date</b>	<b>Description of Revision</b>
0	November 9, 2015	Original Issue

## Executive Summary

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This report summarizes the meteorological data collection at the Celia site for the period of January 1, 2014 through August 18, 2015. The site has been retired as of August 18, 2015 and no further data will be collected or reported for this site. The data recovery for the period was very good with all parameters averaging greater than 90% except for 60m wind speed at 87.5% for 2014 and greater than 97% for all parameters for 2015. The joint frequency distributions showed some seasonal changes but overall compared well with previous years. The peak wind direction sector for the 1-year period was from the north-northwest at the 10m and 60m levels and from the south-southeast at the 97 m level on the tower.

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# 1 Introduction

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The purpose of this report is to provide a summary of the 2014 meteorological data collection at the Celia site. The report uses several calculation programs from the MET-MIDAS<sup>(1)</sup> (Meteorological Information and Dose Assessment System) and MDVDISPLAY<sup>(2)</sup> suites of programs to generate tables and figures included in the report. All of the calculations used hourly meteorological data from the Celia meteorological tower. The hourly averaged data came from the onsite data logger with the data being transferred to SNC in Birmingham, AL.

## 2 Input Data

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### 2.1 Meteorological Data

The meteorological data used in all calculations were generated by the onsite data logger located in the meteorological shelter near the Celia tower. The data are considered to be hourly averages with the exception of the rainfall data that is the total rainfall for the hour. These data were sent to ABS Consulting by SNC personnel via e-mail<sup>(3)</sup>. Once the data were received they were reviewed and edited by an ABS Consulting Meteorologist. Periods of bad or missing data were left out of all calculations.

## 3 Methodology

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### 3.1 Calculations Using MIDAS Software

The calculations performed for this report used MET-MIDAS and MDVDISPLAY programs to generate tables and figures. All calculations used a final set of hourly meteorological data generated by ABS Consulting. The MIDAS programs used in the calculations have been previously validated in the Verification and Validation of MIDAS Volumes 1 and 2, December 1988<sup>(4)</sup> and in the Met-MIDAS certification of September, 2007<sup>(1)</sup> and MDVDISPLAY (February, 2013)<sup>(2)</sup>

The MIDAS program MDVDISPLAY with the following subprograms was run to generate this report:

- MIDMT – Meteorological Trend Plot
- MIDJF – Joint Frequency Distribution Table

- MIDBD – Data Recovery Percentage Table
- MIDRO – Wind Rose Plot
- MIDME – Means and Extremes Plot
- MIDDT – Delta Temperature Plot
- MIDMA – Meteorological Average Data Table
- METSCN – Meteorological Data Scan
- MIDEM (MDSEM) – Edit Meteorological Data

## 4 Results

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### 4.1 Summary of Celia 2014-2015 Meteorological Data

The meteorological data collection at the SNC Celia site was very good during the year 2014 and eight months in 2015. All of the data were collected using the onsite Campbell Scientific data logger. The data were compared using the different levels on the tower and data from NWS sites at Pensacola, FL<sup>(5)</sup> and Mobile, AL<sup>(6)</sup>. The SNC Celia site was retired on August 18, 2015 and no longer collects data. The data collected from January 1, 2015 to August 18, 2015 are included in this report.

There were no significant data collection problems that caused outages with the Celia instrumentation during the period of 2014 and 2015. There was a problem with the 60m wind speed sensor which resulted in the sensor being out-of-service from April 29 until June 12, 2014. The dew point temperature sensor was not reporting from July 12 to July 15 2015. Table 6 summarizes the data collection over the 1-year period (2014). The data recovery percentages are shown for all parameters. Data recovery for all parameters was well above the 90% Nuclear Regulatory Commission (NRC) standard<sup>(7)</sup> except for the 60m wind speed parameter. The Celia site was retired on August 18, 2015.

Table 1A and 1B summarizes the 4-year period (2011-2014) of stability class as determined by the 60-10m and 97-10m delta temperatures, respectively. Joint Frequency Distributions (JFD) were computed for wind speeds, wind directions, and stability categories. The annual JFDs at 10 meters are presented in Table 3 while the annual JFDs at 60 and 97 meters are presented in Tables 4 and 5 for 2014. The annual JFDs at 10 meters are presented in Table 6 while the annual JFDs at 60 and 97 meters are presented in Tables 7 and 8 for 2015.



**Table 1A Occurrence of Stability Classes (DT60-10m) in Celia Meteorological Data**

Stability Class	4-Year Average Percent Occurrence (2011-2014)	2014	2015 (January – March)	2015 (April – June)	2015 (July – August)
A	16.05	9.21	2.75	0.6	0.0
B	5.45	5.70	5.83	4.4	1.31
C	7.50	9.05	6.99	10.17	8.91
D	25.81	26.58	39.72	31.71	33.36
E	19.82	19.55	24.99	26.21	25.07
F	13.09	13.88	8.9	14.99	18.08
G	12.28	16.04	10.82	11.92	13.28
Total Hours	35050	8760	2160	2184	1176

**Table 1B Occurrence of Stability Classes (DT97-10m) in Celia Meteorological Data**

Stability Class	4-Year Average Percent Occurrence (2011-2014)	2014	2015 (January – March)	2015 (April – June)	2015 (July – August)
A	2.03	1.17	0.65	0.14	0.0
B	3.53	3.5	3.68	1.28	0.35
C	5.54	7.65	7.6	7.52	3.67
D	36.20	36.3	46.01	38.27	38.43
E	26.88	22.49	23.36	28.74	26.90
F	17.36	17.92	10.49	17.78	24.37
G	8.46	10.98	8.21	6.28	6.29
Total Hours	35050	8760	2160	2184	1176

The stability data for the 4 year period in Table 1A and B were quite different. The average for 2015 is quite different than the 4 year average and 2014 due to only eight months being reported. The year-to-year differences reflect calibration changes between the first two years and latest two years. For the 60-10m delta temperature most of the difference can be accounted for in the unstable (29.0 vs. 23.9 vs.13.7) and neutral (36.2 vs. 36.3 vs. 40.9) stability classes. An adjustment was made in the way the temperatures were connected to the data logger in mid-April 2014 which has resulted in closer to expected stability class readings. This also resulted in Class A stability occurrences decreasing from 2014 to 2015. The percent of stable hours varied from 45.19 to 49.47 to 51.42 between the four years. For the one year period of 2014 unstable conditions occurred about 23.8% of the time, neutral hours 26.5% and stable hours 49.5%. For the eight month period of 2015 unstable conditions occurred about 9.1% of the time, neutral hours 41.3%, and stable hours 49.6%. The 97-10m delta temperature had about 12.2% unstable hours in 2014 and 8.3% hours in 2015 (only 8 months).

Figure 1 through Figure 27 show seasonal and annual wind roses from the 10, 60 and 97m levels on the tower. The predominant wind direction sector for 2014 and 2015 at Celia are shown in Table 2.

**Table 2 Predominant and Secondary Wind Direction Sectors by Season**

<b>SEASON</b>	<b>Tower Level (m)</b>	<b>10</b>	<b>60</b>	<b>97</b>
<b>Annual (2014)</b>	<b>Predominant</b>	NNW	NNW	SSE
	<b>Secondary</b>	N	N	S
<b>Winter (2014)</b>	<b>Predominant</b>	N	N	N
	<b>Secondary</b>	NNW	NNW	NNW
<b>Spring (2014)</b>	<b>Predominant</b>	SSE	S	SSE
	<b>Secondary</b>	S	SSE	S
<b>Summer (2014)</b>	<b>Predominant</b>	NE	WSW	SW
	<b>Secondary</b>	NNE	SW	WSW
<b>Fall (2014)</b>	<b>Predominant</b>	N	ESE	SSE
	<b>Secondary</b>	NNW	N	NNW
<b>Winter (2015)</b>	<b>Predominant</b>	N	N	N
	<b>Secondary</b>	NNW	NNW	NNW
<b>Spring (2015)</b>	<b>Predominant</b>	SSE	S	SSE
	<b>Secondary</b>	S	SSE	S
<b>Summer (2015)</b>	<b>Predominant</b>	SSW	SW	SW
	<b>Secondary</b>	NW	WSW	WSW

Figure 28, Figure 29, Figure 31, and Figure 32 are plots of the daily maximum, minimum and average temperatures and dew point temperatures for 2014 and 2015. The temperatures for 2014 averaged near normal when compared to annual averages at the nearby NWS site in Pensacola, FL. The overall average temperature for the 2014 was 64.2°F, which was about 3 degrees below the 2014 average of 67.1° F at Pensacola, FL. The maximum temperature during 2014 was 94.1° F on August 23, 2014 and the minimum temperature was 14.6° F on January 7, 2014. The overall average dew point temperature for 2014 was 55.0°F, which was about 1 degree below the 2014 average of 56.9° F at Pensacola, FL. The highest dew point reading during 2014 was 77.1° F on July 27, 2014 and the lowest reading was -2.7° F on January 7, 2014. The overall average temperature for the 2015 was 67.2°F, which was about 3 degrees below the 2015 average of 70.2° F at Pensacola, FL. The maximum temperature during 2015 was 94.5° F on August 3, 2015 and the minimum temperature was 16.4° F on January 8, 2015. The overall average dew point temperature for 2015 was 58.4°F, which was about 2 degrees below the 2015 average of 60.5° F at Pensacola, FL. The highest dew point reading during 2014 was 78.5° F on August 7, 2015 and the lowest reading was 0.57° F on January 8, 2015.

Figure 30 shows the delta temperature (DT) frequency for the delta temperatures (60-10 and 97-10m) for 2014. Figure 33 shows the delta temperature (DT) frequency for the delta temperatures (60-10 and 97-10m) for 2015. During a typical year, the DT frequency is centered near zero or slightly negative. During 2014 the 50% level of the 60-10m primary tower delta temperature and the 97-10m delta temperature was near -0.5° F. It would be expected that the 97-10m delta

temperature would be more negative than the 60-10m delta temperature because of the additional 37m in delta height. The value for the 60-10m delta temperature was near normal whereas the 97-10m delta temperature value was about a degree above normal. During 2015 both delta temperatures with 50% value for the 60-10m delta temperature near  $-0.3^{\circ}$  F and the 97-10m delta temperature near  $-0.7^{\circ}$  F.

Table 11 shows comparative data between the Celia site and nearby NWS sites at Mobile, AL and Pensacola, FL. The data for temperature, relative humidity, and dew point temperature agree well. The wind speed at the 10m level at Celia is somewhat lower (5.5 mph vs. 7.5 and 6.7) than the NWS sites for 2014 and (5.7 mph vs. 8.0 vs. 6.9) for 2015. This deviation is caused by the difference in instrumentation. At Celia low threshold wind speed instrumentation are used so that values can be measured down to 0.5 mph. At the NWS sites they are mainly interested in high wind speed so the threshold of their instrumentation is typically about 3.0 mph.

The annual rainfall total at Celia for 2014 was 60.14 inches per year and for eight months in 2015 was 35.48 inches. Table 10 shows the monthly and annual rainfall totals for the year. The average annual rainfall at the Celia site is significantly less than the annual averages from Pensacola (83.17, 45.71) and Mobile (72.71, 47.07) for 2014 and 2015. During 2014 there 16 days with one inch or more of rain. During 2015 there were 13 days with one inch or more of rain. The long-term average from Pensacola and Mobile is about 20 per year. The maximum daily rainfall occurred on April 29, 2014 with 1.89 inches during severe thunderstorms. The maximum daily rainfall occurred on July 19, 2015 with 1.29 inches during severe thunderstorms.

## 5 References

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1. Certification of Met-MIDAS (Suite of Tasks) Version 1.5.12, Revision 2, September 9, 2007, CCP-Beth-25.
2. Certification of MDVDISPLAY Version 1.5.16, Revision 0, February 9, 2013, CCP-Beth-70.
3. Meteorological data for the Celia site for the period of January 2014 through December 2014 was received by Mark Abrams via e-mail.
4. Verification and Validation of MIDAS Software Volumes 1 and 2, December 1988.
5. NOAA, NCDC, 2014 Local Climatological Data, Annual summary for Pensacola, Florida..
6. NOAA, NCDC, 2014 Local Climatological Data, Annual summary for Mobile, Alabama
7. Nuclear Regulatory Commission, Regulatory Guide 1.23 Revision 1, Meteorological Monitoring Programs for Nuclear Power Plants, March 2007.

**Table 3 Celia JOINT FREQUENCY TABLES of Wind Speed and Wind Direction 10m  
 Versus Delta Temperature 60-10m January 1, 2014 Through December 31, 2014**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class A Delta Temperature Extremely Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	1	13	50	9	0	0	73
NNE	0	19	32	2	0	0	53
NE	0	19	24	0	0	0	43
ENE	0	13	24	0	0	0	37
E	3	22	3	0	0	0	28
ESE	0	10	4	0	0	0	14
SE	0	8	8	0	0	0	16
SSE	0	27	46	13	0	0	86
S	0	29	42	11	0	0	82
SSW	0	8	18	2	0	0	28
SW	0	25	10	1	0	0	36
WSW	1	17	10	0	0	0	28
W	0	12	17	0	0	0	29
WNW	0	11	21	2	0	0	34
NW	2	28	33	35	1	0	99
NNW	0	14	48	51	0	0	113
<b>Total</b>	<b>7</b>	<b>275</b>	<b>390</b>	<b>126</b>	<b>1</b>	<b>0</b>	<b>799</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period 0</b>
<b>Variable Direction Hours for:</b>							<b>Total Period 0</b>
<b>Invalid Hours for:</b>							<b>Total Period 12</b>
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period 799</b>
<b>Total Hours for Period</b>							<b>8760</b>

**Table 3 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class B Delta Temperature Moderately Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	12	45	7	0	0	64
NNE	2	6	17	1	0	0	26
NE	0	11	16	0	0	0	27
ENE	1	16	15	0	0	0	32
E	0	14	5	0	0	0	19
ESE	1	13	1	0	0	0	15
SE	2	9	5	0	0	0	16
SSE	0	13	44	7	0	0	64
S	1	19	28	1	0	0	49
SSW	0	8	4	4	0	0	16
SW	1	3	6	1	0	0	11
WSW	0	10	1	0	0	0	11
W	2	13	17	1	0	0	33
WNW	1	11	12	0	0	0	24
NW	0	17	27	5	0	0	49
NNW	1	10	25	5	1	0	42
<b>Total</b>	12	185	268	32	1	0	498
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 12
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 498
<b>Total Hours for Period</b>							<b>8760</b>

**Table 3 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class C Delta Temperature Slightly Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	34	45	6	0	0	85
NNE	1	39	26	0	0	0	66
NE	0	37	7	0	0	0	44
ENE	2	33	7	0	0	0	42
E	0	25	7	0	0	0	32
ESE	0	17	8	0	0	0	25
SE	0	14	8	0	0	0	22
SSE	1	44	41	5	0	0	91
S	2	27	24	1	0	0	54
SSW	2	30	6	2	0	0	40
SW	0	29	9	0	0	0	38
WSW	0	26	3	0	0	0	29
W	0	32	5	0	0	0	37
WNW	0	39	14	0	0	0	53
NW	2	39	14	4	0	0	59
NNW	1	30	31	12	1	0	75
<b>Total</b>	11	495	255	30	1	0	792
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 12
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 792
<b>Total Hours for Period</b>							<b>8760</b>

**Table 3 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class D Delta Temperature Neutral

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	10	114	107	10	0	0	241
NNE	12	91	51	2	0	0	156
NE	15	84	20	0	0	0	119
ENE	17	87	27	0	0	0	131
E	26	88	12	1	0	0	127
ESE	16	63	19	0	0	0	98
SE	11	59	28	1	0	0	99
SSE	14	114	100	4	0	0	232
S	14	113	70	20	0	0	217
SSW	5	69	17	8	0	0	99
SW	7	59	15	3	0	0	84
WSW	13	61	14	0	0	0	88
W	9	62	11	0	0	0	82
WNW	10	83	25	0	0	0	118
NW	14	105	43	8	0	0	170
NNW	6	88	135	35	0	0	264
<b>Total</b>	199	1340	694	92	0	0	2325
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 12
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 2325
<b>Total Hours for Period</b>							<b>8760</b>

**Table 3 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class E Delta Temperature Slightly Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	18	100	20	0	0	0	138
NNE	19	68	6	0	0	0	93
NE	26	49	0	0	0	0	75
ENE	33	52	3	0	0	0	88
E	35	43	2	0	0	0	80
ESE	29	46	3	0	0	0	78
SE	32	70	7	0	0	0	109
SSE	47	128	12	0	0	0	187
S	44	102	6	0	0	0	152
SSW	35	91	5	0	0	0	131
SW	22	72	7	0	0	0	101
WSW	24	56	1	0	0	0	81
W	21	30	4	1	0	0	56
WNW	26	49	5	0	0	0	80
NW	14	69	9	0	0	0	92
NNW	18	122	31	1	0	0	172
<b>Total</b>	<b>443</b>	<b>1147</b>	<b>121</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1713</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 12
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1713
<b>Total Hours for Period</b>							<b>8760</b>



**Table 3 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class F Delta Temperature Moderately Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	37	85	0	0	0	0	122
NNE	50	43	0	0	0	0	93
NE	47	22	0	0	0	0	69
ENE	36	23	1	0	0	0	60
E	30	13	0	0	0	0	43
ESE	27	10	0	0	0	0	37
SE	45	10	0	0	0	0	55
SSE	66	28	1	0	0	0	95
S	69	28	0	0	0	0	97
SSW	35	32	0	0	0	0	67
SW	35	30	1	0	0	0	66
WSW	40	22	0	0	0	0	62
W	59	14	0	0	0	0	73
WNW	48	28	0	0	0	0	76
NW	40	39	0	0	0	0	79
NNW	44	77	1	0	0	0	122
<b>Total</b>	<b>708</b>	<b>504</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1216</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 12
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1216
<b>Total Hours for Period</b>							<b>8760</b>

**Table 3 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class G Delta Temperature Extremely Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	132	38	0	0	0	0	170
NNE	76	21	0	0	0	0	97
NE	69	12	0	0	0	0	81
ENE	60	5	0	0	0	0	65
E	46	2	0	0	0	0	48
ESE	33	2	0	0	0	0	35
SE	49	3	0	0	0	0	52
SSE	109	11	0	0	0	0	120
S	85	4	0	0	0	0	89
SSW	61	8	0	0	0	0	69
SW	43	7	0	0	0	0	50
WSW	53	1	0	0	0	0	54
W	92	7	0	0	0	0	99
WNW	70	9	0	0	0	0	79
NW	97	19	0	0	0	0	116
NNW	151	30	0	0	0	0	181
<b>Total</b>	1226	179	0	0	0	0	1405
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 12
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1405
<b>Total Hours for Period</b>							<b>8760</b>

**Table 3 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Summary of All Stability Classes**

**Total Period**

Period of Record =

1/1/2014 00:00 - 12/31/2014 23:00

Elevation: Speed: SPD10M

Direction: WD10M

Lapse: DT60-10M

Delta Temperature

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	198	396	267	32	0	0	893
NNE	160	287	132	5	0	0	584
NE	157	234	67	0	0	0	458
ENE	149	229	77	0	0	0	455
E	140	207	29	1	0	0	377
ESE	106	161	35	0	0	0	302
SE	139	173	56	1	0	0	369
SSE	237	365	244	29	0	0	875
S	215	322	170	33	0	0	740
SSW	138	246	50	16	0	0	450
SW	108	225	48	5	0	0	386
WSW	131	193	29	0	0	0	353
W	183	170	54	2	0	0	409
WNW	155	230	77	2	0	0	464
NW	169	316	126	52	1	0	664
NNW	221	371	271	104	2	0	969
<b>Total</b>	<b>2606</b>	<b>4125</b>	<b>1732</b>	<b>282</b>	<b>3</b>	<b>0</b>	<b>8748</b>

**Calm Hours not Included above for :**

**Total Period** 0

**Variable Direction Hours for:**

**Total Period** 0

**Invalid Hours for:**

**Total Period** 12

**Valid Hours for this Stability Class for:**

**Total Period** 8748

**Total Hours for Period**

**8760**

**Table 4 Celia JOINT FREQUENCY TABLES of Wind Speed and Wind Direction 60m Versus Delta Temperature 60-10m January 1, 2014 Through December 31, 2014**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class A Delta Temperature Extremely Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	7	32	25	3	0	67
NNE	0	9	30	15	0	0	54
NE	1	11	15	3	0	0	30
ENE	0	11	18	1	0	0	30
E	1	21	17	3	0	0	42
ESE	0	3	16	4	0	0	23
SE	0	8	7	4	0	0	19
SSE	0	14	33	22	8	0	77
S	0	12	36	22	7	0	77
SSW	0	6	16	9	1	0	32
SW	0	17	20	6	2	0	45
WSW	0	13	9	3	0	0	25
W	0	9	11	9	0	0	29
WNW	2	13	11	12	1	0	39
NW	0	18	39	14	28	6	105
NNW	0	6	29	41	21	1	98
<b>Total</b>	<b>4</b>	<b>178</b>	<b>339</b>	<b>193</b>	<b>71</b>	<b>7</b>	<b>792</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 1096
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 792
<b>Total Hours for Period</b>							<b>8760</b>

**Table 4 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class B Delta Temperature Moderately Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	3	27	23	4	0	57
NNE	0	5	14	4	0	0	23
NE	0	3	9	3	0	0	15
ENE	0	6	22	2	0	0	30
E	1	9	10	2	0	0	22
ESE	1	11	13	0	0	0	25
SE	0	4	7	3	0	0	14
SSE	0	6	19	9	0	0	34
S	0	1	24	9	1	0	35
SSW	0	4	13	1	3	0	21
SW	1	1	14	6	1	0	23
WSW	0	4	13	1	0	0	18
W	1	8	13	2	1	0	25
WNW	0	4	18	2	0	0	24
NW	0	5	30	5	3	2	45
NNW	0	3	17	14	2	0	36
<b>Total</b>	<b>4</b>	<b>77</b>	<b>263</b>	<b>86</b>	<b>15</b>	<b>2</b>	<b>447</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 1096
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 447
<b>Total Hours for Period</b>							<b>8760</b>

**Table 4 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class C Delta Temperature Slightly Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	16	21	34	4	1	76
NNE	0	13	29	6	0	0	48
NE	0	15	14	1	0	0	30
ENE	0	19	19	1	0	0	39
E	0	23	18	3	0	0	44
ESE	0	18	4	2	0	0	24
SE	0	12	6	5	0	0	23
SSE	0	7	29	5	0	0	41
S	1	16	18	6	1	0	42
SSW	2	12	13	1	1	0	29
SW	0	14	16	5	1	1	37
WSW	0	16	13	1	0	0	30
W	0	17	11	1	0	0	29
WNW	0	24	17	4	0	0	45
NW	1	25	16	6	3	2	53
NNW	1	15	29	13	8	1	67
<b>Total</b>	<b>5</b>	<b>262</b>	<b>273</b>	<b>94</b>	<b>18</b>	<b>5</b>	<b>657</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 1096
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 657
<b>Total Hours for Period</b>							<b>8760</b>

**Table 4 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class D Delta Temperature Neutral

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	4	29	72	89	4	0	198
NNE	8	39	68	34	1	0	150
NE	7	37	50	15	0	0	109
ENE	5	40	46	11	0	0	102
E	6	45	41	7	1	0	100
ESE	6	42	64	10	0	0	122
SE	5	23	36	9	1	0	74
SSE	7	27	79	43	2	0	158
S	8	25	60	36	21	1	151
SSW	3	29	42	15	7	0	96
SW	3	37	43	11	4	1	99
WSW	2	31	26	6	2	0	67
W	4	40	28	7	0	0	79
WNW	8	51	29	15	0	0	103
NW	6	67	40	34	9	2	158
NNW	3	43	58	83	31	0	218
<b>Total</b>	<b>85</b>	<b>605</b>	<b>782</b>	<b>425</b>	<b>83</b>	<b>4</b>	<b>1984</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 1096
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1984
<b>Total Hours for Period</b>							<b>8760</b>

**Table 4 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class E Delta Temperature Slightly Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	1	15	51	33	1	0	101
NNE	0	9	53	22	0	0	84
NE	0	13	41	10	0	0	64
ENE	5	12	39	4	0	0	60
E	2	18	25	7	0	0	52
ESE	2	27	40	13	0	0	82
SE	4	23	38	8	0	0	73
SSE	3	30	74	9	0	0	116
S	2	18	71	16	0	0	107
SSW	4	29	48	21	0	0	102
SW	3	15	98	23	1	0	140
WSW	2	31	81	7	0	0	121
W	4	20	22	4	1	0	51
WNW	1	24	37	11	1	0	74
NW	2	17	36	28	0	0	83
NNW	2	12	68	62	1	0	145
<b>Total</b>	<b>37</b>	<b>313</b>	<b>822</b>	<b>278</b>	<b>5</b>	<b>0</b>	<b>1455</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 1096
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1455
<b>Total Hours for Period</b>							<b>8760</b>



**Table 4 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class F Delta Temperature Moderately Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	2	9	58	45	0	0	114
NNE	2	2	23	23	0	0	50
NE	3	9	27	9	0	0	48
ENE	1	10	30	13	0	0	54
E	2	15	30	22	0	0	69
ESE	3	9	25	7	0	0	44
SE	2	12	37	5	0	0	56
SSE	3	15	36	5	0	0	59
S	6	20	42	8	0	0	76
SSW	2	16	33	11	0	0	62
SW	1	14	44	16	0	0	75
WSW	1	21	43	28	0	0	93
W	3	25	30	16	0	0	74
WNW	1	12	34	11	0	0	58
NW	3	16	24	12	0	0	55
NNW	0	12	61	9	0	0	82
<b>Total</b>	<b>35</b>	<b>217</b>	<b>577</b>	<b>240</b>	<b>0</b>	<b>0</b>	<b>1069</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 1096
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1069
<b>Total Hours for Period</b>							<b>8760</b>

**Table 4 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class G Delta Temperature Extremely Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	1	6	41	26	0	0	74
NNE	3	7	41	18	0	0	69
NE	1	7	33	19	0	0	60
ENE	3	9	27	15	0	0	54
E	2	17	24	10	0	0	53
ESE	4	19	25	17	0	0	65
SE	4	29	32	10	0	0	75
SSE	5	23	21	10	0	0	59
S	5	17	46	9	0	0	77
SSW	3	29	59	8	0	0	99
SW	3	27	63	20	1	0	114
WSW	8	26	78	16	0	0	128
W	6	33	51	11	0	0	101
WNW	3	29	48	22	0	0	102
NW	3	11	38	12	0	0	64
NNW	1	12	37	16	0	0	66
<b>Total</b>	<b>55</b>	<b>301</b>	<b>664</b>	<b>239</b>	<b>1</b>	<b>0</b>	<b>1260</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 1096
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1260
<b>Total Hours for Period</b>							<b>8760</b>

**Table 4 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Summary of All Stability Classes**

**Total Period**

Period of Record =

1/1/2014 00:00 - 12/31/2014 23:00

Elevation: Speed: SPD60M

Direction: WD60M

Lapse: DT60-10M

Delta Temperature

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	8	85	302	275	16	1	687
NNE	13	84	258	122	1	0	478
NE	12	95	189	60	0	0	356
ENE	14	107	201	47	0	0	369
E	14	148	165	54	1	0	382
ESE	16	129	187	53	0	0	385
SE	15	111	163	44	1	0	334
SSE	18	122	291	103	10	0	544
S	22	109	297	106	30	1	565
SSW	14	125	224	66	12	0	441
SW	11	125	298	87	10	2	533
WSW	13	142	263	62	2	0	482
W	18	152	166	50	2	0	388
WNW	15	157	194	77	2	0	445
NW	15	159	223	111	43	12	563
NNW	7	103	299	238	63	2	712
<b>Total</b>	<b>225</b>	<b>1953</b>	<b>3720</b>	<b>1555</b>	<b>193</b>	<b>18</b>	<b>7664</b>

**Calm Hours not Included above for :**

**Total Period** 0

**Variable Direction Hours for:**

**Total Period** 0

**Invalid Hours for:**

**Total Period** 1096

**Valid Hours for this Stability Class for:**

**Total Period** 7664

**Total Hours for Period**

**8760**

**Table 5 Celia JOINT FREQUENCY TABLES of Wind Speed and Wind Direction 97m  
 Versus Delta Temperature 97-10m January 1, 2014 Through December 31, 2014**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class A Delta Temperature Extremely Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	0	1	7	0	0	8
NNE	0	1	3	1	0	0	5
NE	0	0	4	2	0	0	6
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	2	2	1	0	5
SSE	0	0	3	6	2	0	11
S	0	1	4	1	0	0	6
SSW	0	0	0	2	0	0	2
SW	0	0	3	4	0	0	7
WSW	0	1	1	0	0	0	2
W	0	1	0	1	0	0	2
WNW	0	0	2	2	3	1	8
NW	0	0	1	6	6	3	16
NNW	0	0	3	7	11	1	22
<b>Total</b>	0	5	27	41	23	5	101
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 33
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 101
<b>Total Hours for Period</b>							<b>8760</b>

**Table 5 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class B Delta Temperature Moderately Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	1	7	9	1	0	18
NNE	0	2	9	8	0	0	19
NE	0	0	16	4	0	0	20
ENE	0	1	13	5	0	0	19
E	0	1	3	0	0	0	4
ESE	0	2	5	1	0	0	8
SE	0	0	5	2	1	0	8
SSE	0	5	14	11	3	0	33
S	0	2	11	9	6	1	29
SSW	0	1	5	2	2	0	10
SW	0	3	6	2	1	0	12
WSW	0	3	5	0	0	0	8
W	0	3	11	6	0	0	20
WNW	0	5	7	4	4	1	21
NW	0	1	16	8	7	3	35
NNW	0	0	6	20	14	0	40
<b>Total</b>	0	30	139	91	39	5	304
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 33
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 304
<b>Total Hours for Period</b>							<b>8760</b>

**Table 5 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class C Delta Temperature Slightly Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	1	8	22	11	2	0	44
NNE	0	10	19	10	0	0	39
NE	0	5	22	3	0	0	30
ENE	0	9	19	3	0	0	31
E	0	14	11	2	0	0	27
ESE	0	5	7	0	0	0	12
SE	0	7	9	2	1	0	19
SSE	0	15	37	22	2	0	76
S	0	8	36	18	6	1	69
SSW	0	1	15	7	3	0	26
SW	0	15	21	3	0	0	39
WSW	0	12	13	1	0	0	26
W	0	15	23	8	0	0	46
WNW	0	21	21	9	0	1	52
NW	0	18	42	5	2	2	69
NNW	0	6	31	14	11	1	63
<b>Total</b>	<b>1</b>	<b>169</b>	<b>348</b>	<b>118</b>	<b>27</b>	<b>5</b>	<b>668</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 33
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 668
<b>Total Hours for Period</b>							<b>8760</b>

**Table 5 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class D Delta Temperature Neutral

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	7	46	86	122	33	0	294
NNE	4	60	81	63	9	1	218
NE	9	64	66	35	4	0	178
ENE	5	49	63	51	2	0	170
E	7	58	67	30	3	0	165
ESE	9	46	39	15	2	0	111
SE	6	33	44	44	15	0	142
SSE	2	50	123	120	16	1	312
S	10	37	80	83	20	4	234
SSW	5	44	56	26	10	2	143
SW	4	50	57	29	5	1	146
WSW	2	66	31	11	3	0	113
W	11	68	48	18	8	1	154
WNW	6	83	57	27	5	2	180
NW	4	85	77	44	42	32	284
NNW	6	56	68	111	70	9	320
<b>Total</b>	<b>97</b>	<b>895</b>	<b>1043</b>	<b>829</b>	<b>247</b>	<b>53</b>	<b>3164</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 33
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 3164
<b>Total Hours for Period</b>							<b>8760</b>

**Table 5 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class E Delta Temperature Slightly Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	1	12	25	85	11	0	134
NNE	2	5	9	55	5	0	76
NE	1	15	22	39	5	0	82
ENE	3	8	33	52	6	0	102
E	1	15	41	49	1	0	107
ESE	2	25	52	34	2	0	115
SE	0	24	43	56	4	0	127
SSE	3	25	55	111	8	0	202
S	4	18	60	109	18	1	210
SSW	3	10	36	78	10	1	138
SW	2	21	51	80	6	2	162
WSW	4	15	51	32	3	0	105
W	1	12	29	14	7	0	63
WNW	2	13	26	41	12	1	95
NW	0	13	26	49	19	0	107
NNW	1	6	24	84	24	0	139
<b>Total</b>	<b>30</b>	<b>237</b>	<b>583</b>	<b>968</b>	<b>141</b>	<b>5</b>	<b>1964</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 33
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1964
<b>Total Hours for Period</b>							<b>8760</b>



**Table 5 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class F Delta Temperature Moderately Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	4	4	23	70	24	0	125
NNE	6	8	14	50	10	0	88
NE	1	5	14	39	10	0	69
ENE	3	4	17	31	5	0	60
E	3	20	17	29	12	0	81
ESE	2	13	29	13	5	0	62
SE	5	23	42	26	3	0	99
SSE	3	17	49	38	3	0	110
S	2	12	50	61	8	0	133
SSW	4	14	46	48	8	0	120
SW	2	14	55	63	27	3	164
WSW	7	36	60	32	15	2	152
W	3	33	38	28	15	1	118
WNW	1	9	28	32	5	0	75
NW	5	6	21	20	5	0	57
NNW	0	4	21	25	4	0	54
<b>Total</b>	<b>51</b>	<b>222</b>	<b>524</b>	<b>605</b>	<b>159</b>	<b>6</b>	<b>1567</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 33
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1567
<b>Total Hours for Period</b>							<b>8760</b>

**Table 5 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class G Delta Temperature Extremely Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	1	9	20	23	16	0	69
NNE	0	7	26	30	9	0	72
NE	1	9	15	16	7	0	48
ENE	2	4	13	10	1	0	30
E	2	17	16	12	14	0	61
ESE	1	8	18	8	12	0	47
SE	1	13	15	19	1	0	49
SSE	2	19	24	22	3	0	70
S	6	13	22	33	4	0	78
SSW	2	15	28	22	6	0	73
SW	2	8	26	32	9	7	84
WSW	2	24	24	11	8	1	70
W	3	12	24	24	5	3	71
WNW	0	7	21	25	3	0	56
NW	1	6	18	16	0	0	41
NNW	3	3	24	9	1	0	40
<b>Total</b>	<b>29</b>	<b>174</b>	<b>334</b>	<b>312</b>	<b>99</b>	<b>11</b>	<b>959</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 0
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 33
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 959
<b>Total Hours for Period</b>							<b>8760</b>

**Table 5 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Summary of All Stability Classes**

**Total Period**

Period of Record = 1/1/2014 00:00 - 12/31/2014 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M

Delta Temperature

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	14	80	184	327	87	0	692
NNE	12	93	161	217	33	1	517
NE	12	98	159	138	26	0	433
ENE	13	76	158	152	14	0	413
E	13	125	155	122	30	0	445
ESE	14	99	150	71	21	0	355
SE	12	100	160	151	26	0	449
SSE	10	131	305	330	37	1	814
S	22	91	263	314	62	7	759
SSW	14	85	186	185	39	3	512
SW	10	111	219	213	48	13	614
WSW	15	157	185	87	29	3	476
W	18	144	173	99	35	5	474
WNW	9	138	162	140	32	6	487
NW	10	129	201	148	81	40	609
NNW	10	75	177	270	135	11	678
<b>Total</b>	<b>208</b>	<b>1732</b>	<b>2998</b>	<b>2964</b>	<b>735</b>	<b>90</b>	<b>8727</b>

<b>Calm Hours not Included above for :</b>	<b>Total Period</b>	<b>0</b>
<b>Variable Direction Hours for:</b>	<b>Total Period</b>	<b>0</b>
<b>Invalid Hours for:</b>	<b>Total Period</b>	<b>33</b>
<b>Valid Hours for this Stability Class for:</b>	<b>Total Period</b>	<b>8727</b>
<b>Total Hours for Period</b>		<b>8760</b>

**Table 6 Celia JOINT FREQUENCY TABLES of Wind Speed and Wind Direction 10m Versus Delta Temperature 60-10m January 1, 2015 Through August 18, 2015**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class A Delta Temperature Extremely Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	0	7	3	0	0	10
NNE	0	0	4	1	0	0	5
NE	0	0	2	0	0	0	2
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	4	0	0	0	4
S	0	0	4	1	0	0	5
SSW	0	0	1	0	0	0	1
SW	0	0	5	0	0	0	5
WSW	0	0	3	0	0	0	3
W	0	0	3	0	0	0	3
WNW	0	0	1	0	0	0	1
NW	0	0	4	13	0	0	17
NNW	0	0	6	11	0	0	17
<b>Total</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>73</b>

<b>Calm Hours not Included above for :</b>	<b>Total Period</b>	1
<b>Variable Direction Hours for:</b>	<b>Total Period</b>	0
<b>Invalid Hours for:</b>	<b>Total Period</b>	35
<b>Valid Hours for this Stability Class for:</b>	<b>Total Period</b>	73
<b>Total Hours for Period</b>		5520

**Table 6 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class B Delta Temperature Moderately Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>	
N	0	2	16	4	0	0	22	
NNE	0	2	5	0	0	0	7	
NE	0	3	7	0	0	0	10	
ENE	0	0	3	0	0	0	3	
E	0	4	6	0	0	0	10	
ESE	0	7	4	0	0	0	11	
SE	0	1	10	1	0	0	12	
SSE	0	1	12	5	0	0	18	
S	1	8	19	4	0	0	32	
SSW	0	3	16	0	0	0	19	
SW	0	2	7	2	0	0	11	
WSW	0	4	10	0	0	0	14	
W	0	2	8	0	0	0	10	
WNW	0	1	4	0	0	0	5	
NW	0	0	18	10	0	0	28	
NNW	0	1	17	7	0	0	25	
<b>Total</b>	<b>1</b>	<b>41</b>	<b>162</b>	<b>33</b>	<b>0</b>	<b>0</b>	<b>237</b>	
<b>Calm Hours not Included above for :</b>							<b>Total Period</b>	<b>1</b>
<b>Variable Direction Hours for:</b>							<b>Total Period</b>	<b>0</b>
<b>Invalid Hours for:</b>							<b>Total Period</b>	<b>35</b>
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b>	<b>237</b>
<b>Total Hours for Period</b>								<b>5520</b>

**Table 6 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class C Delta Temperature Slightly Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	14	18	1	0	0	33
NNE	0	16	9	0	0	0	25
NE	0	14	5	0	0	0	19
ENE	0	9	0	0	0	0	9
E	0	26	4	0	0	0	30
ESE	0	20	5	0	0	0	25
SE	0	12	12	0	0	0	24
SSE	1	13	35	3	0	0	52
S	1	19	26	5	1	0	52
SSW	0	17	13	0	0	0	30
SW	0	11	20	1	0	0	32
WSW	0	11	9	0	0	0	20
W	0	15	9	0	0	0	24
WNW	0	15	11	0	0	0	26
NW	0	13	13	1	0	0	27
NNW	0	11	29	9	0	0	49
<b>Total</b>	<b>2</b>	<b>236</b>	<b>218</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>477</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 477
<b>Total Hours for Period</b>							<b>5520</b>

**Table 6 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class D Delta Temperature Neutral

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	8	114	95	26	0	0	243
NNE	4	89	31	1	0	0	125
NE	8	69	8	4	0	0	89
ENE	11	75	14	0	0	0	100
E	11	75	12	0	0	0	98
ESE	18	74	11	0	0	0	103
SE	9	78	40	0	0	0	127
SSE	6	106	65	12	0	0	189
S	6	90	49	8	0	0	153
SSW	4	63	23	0	0	0	90
SW	5	45	30	2	0	0	82
WSW	3	45	13	0	0	0	61
W	6	39	15	0	0	0	60
WNW	3	35	18	2	0	0	58
NW	6	96	48	7	0	0	157
NNW	3	99	67	23	1	0	193
<b>Total</b>	111	1192	539	85	1	0	1928
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1928
<b>Total Hours for Period</b>							<b>5520</b>

**Table 6 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class E Delta Temperature Slightly Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	18	92	24	0	0	0	134
NNE	11	55	9	0	0	0	75
NE	22	34	9	0	0	0	65
ENE	29	34	4	0	0	0	67
E	25	43	1	0	0	0	69
ESE	35	55	2	0	0	0	92
SE	30	67	2	0	0	0	99
SSE	25	71	6	0	0	0	102
S	45	85	7	0	0	0	137
SSW	22	92	6	0	0	0	120
SW	19	83	8	0	0	0	110
WSW	18	48	1	0	0	0	67
W	13	37	1	1	0	0	52
WNW	10	36	8	0	0	0	54
NW	18	41	5	0	1	0	65
NNW	11	60	21	0	0	0	92
<b>Total</b>	<b>351</b>	<b>933</b>	<b>114</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1400</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1400
<b>Total Hours for Period</b>							<b>5520</b>



**Table 6 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class F Delta Temperature Moderately Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>	
N	21	56	0	0	0	0	77	
NNE	28	35	0	0	0	0	63	
NE	26	14	0	0	0	0	40	
ENE	15	9	1	0	0	0	25	
E	33	12	0	0	0	0	45	
ESE	13	9	0	0	0	0	22	
SE	23	9	0	0	0	0	32	
SSE	43	17	2	0	0	0	62	
S	40	9	0	0	0	0	49	
SSW	38	25	0	0	0	0	63	
SW	29	17	0	0	0	0	46	
WSW	25	18	0	0	0	0	43	
W	37	5	1	0	0	0	43	
WNW	21	11	0	0	0	0	32	
NW	16	23	0	0	0	0	39	
NNW	24	20	0	0	0	0	44	
<b>Total</b>	<b>432</b>	<b>289</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>725</b>	
<b>Calm Hours not Included above for :</b>							<b>Total Period</b>	<b>1</b>
<b>Variable Direction Hours for:</b>							<b>Total Period</b>	<b>0</b>
<b>Invalid Hours for:</b>							<b>Total Period</b>	<b>35</b>
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b>	<b>725</b>
<b>Total Hours for Period</b>								<b>5520</b>

**Table 6 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD10M Direction: WD10M Lapse: DT60-10M  
 Stability Class G Delta Temperature Extremely Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	71	21	0	0	0	0	92
NNE	52	11	0	0	0	0	63
NE	35	5	0	0	0	0	40
ENE	22	4	0	0	0	0	26
E	11	1	0	0	0	0	12
ESE	14	1	0	0	0	0	15
SE	8	1	0	0	0	0	9
SSE	32	5	0	0	0	0	37
S	19	1	0	0	0	0	20
SSW	26	4	0	0	0	0	30
SW	25	0	0	0	0	0	25
WSW	27	3	0	0	0	0	30
W	37	6	0	0	0	0	43
WNW	51	10	0	0	0	0	61
NW	55	6	0	0	0	0	61
NNW	64	16	0	0	0	0	80
<b>Total</b>	<b>549</b>	<b>95</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>644</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 644
<b>Total Hours for Period</b>							<b>5520</b>

**Table 6 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Summary of All Stability Classes**

**Total Period**

Period of Record =

1/1/2015 00:00 - 8/18/2015 23:00

Elevation: Speed: SPD10M

Direction: WD10M

Lapse: DT60-10M

Delta Temperature

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	118	299	160	34	0	0	611
NNE	95	208	58	2	0	0	363
NE	91	139	31	4	0	0	265
ENE	77	131	22	0	0	0	230
E	80	161	23	0	0	0	264
ESE	80	166	22	0	0	0	268
SE	70	168	64	1	0	0	303
SSE	107	213	124	20	0	0	464
S	112	212	105	18	1	0	448
SSW	90	204	59	0	0	0	353
SW	78	158	70	5	0	0	311
WSW	73	129	36	0	0	0	238
W	93	104	37	1	0	0	235
WNW	85	108	42	2	0	0	237
NW	95	179	88	31	1	0	394
NNW	102	207	140	50	1	0	500
<b>Total</b>	<b>1446</b>	<b>2786</b>	<b>1081</b>	<b>168</b>	<b>3</b>	<b>0</b>	<b>5484</b>

**Calm Hours not Included above for :**

**Total Period**

1

**Variable Direction Hours for:**

**Total Period**

0

**Invalid Hours for:**

**Total Period**

35

**Valid Hours for this Stability Class for:**

**Total Period**

5484

**Total Hours for Period**

5520

**Table 7 Celia JOINT FREQUENCY TABLES of Wind Speed and Wind Direction 60m Versus Delta Temperature 60-10m January 1, 2015 Through August 18, 2015**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class A Delta Temperature Extremely Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	0	0	9	0	0	9
NNE	0	0	2	3	0	0	5
NE	0	0	3	0	0	0	3
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	2	2	0	0	4
S	0	0	0	4	0	0	4
SSW	0	0	1	1	0	0	2
SW	0	0	0	4	0	0	4
WSW	0	0	2	1	0	0	3
W	0	0	0	4	0	0	4
WNW	0	0	1	0	0	0	1
NW	0	0	1	9	4	1	15
NNW	0	0	0	15	4	0	19
<b>Total</b>	0	0	12	52	8	1	73
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 73
<b>Total Hours for Period</b>							<b>5520</b>

**Table 7 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class B Delta Temperature Moderately Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	0	5	14	0	0	19
NNE	0	1	8	1	0	0	10
NE	0	1	10	0	0	0	11
ENE	0	0	2	1	0	0	3
E	0	0	6	1	0	0	7
ESE	0	3	10	0	0	0	13
SE	0	0	10	1	1	0	12
SSE	0	0	4	10	3	0	17
S	0	3	14	7	3	1	28
SSW	1	2	11	4	0	0	18
SW	0	0	8	10	0	0	18
WSW	0	0	12	0	0	0	12
W	0	1	8	3	0	0	12
WNW	0	1	3	2	0	0	6
NW	0	0	7	15	1	0	23
NNW	0	1	11	12	4	0	28
<b>Total</b>	<b>1</b>	<b>13</b>	<b>129</b>	<b>81</b>	<b>12</b>	<b>1</b>	<b>237</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 237
<b>Total Hours for Period</b>							<b>5520</b>

**Table 7 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class C Delta Temperature Slightly Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	8	11	14	2	0	35
NNE	0	11	13	2	0	0	26
NE	0	13	7	1	0	0	21
ENE	0	11	1	0	0	0	12
E	0	16	7	1	0	0	24
ESE	0	17	10	0	0	0	27
SE	0	8	17	2	0	0	27
SSE	1	6	24	7	2	0	40
S	1	8	32	11	4	2	58
SSW	0	10	17	4	0	0	31
SW	0	7	18	8	0	0	33
WSW	0	6	17	1	0	0	24
W	0	5	15	0	0	0	20
WNW	0	8	19	1	0	0	28
NW	0	9	23	0	1	0	33
NNW	0	4	25	6	3	0	38
<b>Total</b>	<b>2</b>	<b>147</b>	<b>256</b>	<b>58</b>	<b>12</b>	<b>2</b>	<b>477</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 477
<b>Total Hours for Period</b>							<b>5520</b>

**Table 7 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class D Delta Temperature Neutral

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	2	50	101	70	17	0	240
NNE	1	51	56	17	1	0	126
NE	1	47	36	7	4	0	95
ENE	7	51	33	10	0	0	101
E	4	50	38	7	0	0	99
ESE	7	41	43	11	0	0	102
SE	4	40	62	18	0	0	124
SSE	3	35	91	32	3	0	164
S	0	40	79	34	11	1	165
SSW	3	27	49	11	1	0	91
SW	2	23	49	22	2	0	98
WSW	4	15	44	5	0	0	68
W	5	13	37	3	0	0	58
WNW	2	30	30	7	1	0	70
NW	3	48	57	32	5	0	145
NNW	3	53	69	43	10	4	182
<b>Total</b>	<b>51</b>	<b>614</b>	<b>874</b>	<b>329</b>	<b>55</b>	<b>5</b>	<b>1928</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1928
<b>Total Hours for Period</b>							<b>5520</b>

**Table 7 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class E Delta Temperature Slightly Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	2	11	58	48	0	0	119
NNE	2	5	34	26	0	0	67
NE	0	13	25	21	0	0	59
ENE	1	20	32	11	0	0	64
E	0	16	46	4	0	0	66
ESE	4	22	73	5	0	0	104
SE	3	23	61	5	0	0	92
SSE	3	20	75	9	0	0	107
S	2	17	73	13	1	0	106
SSW	2	17	89	16	0	0	124
SW	2	17	77	31	0	0	127
WSW	3	15	68	19	0	0	105
W	3	10	43	8	1	0	65
WNW	3	8	28	12	0	0	51
NW	1	10	34	17	0	1	63
NNW	1	16	28	36	0	0	81
<b>Total</b>	<b>32</b>	<b>240</b>	<b>844</b>	<b>281</b>	<b>2</b>	<b>1</b>	<b>1400</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1400
<b>Total Hours for Period</b>							<b>5520</b>



**Table 7 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class F Delta Temperature Moderately Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	2	18	20	0	0	40
NNE	1	5	22	24	0	0	52
NE	1	5	23	12	0	0	41
ENE	1	8	17	9	0	0	35
E	2	9	17	2	0	0	30
ESE	1	11	24	5	0	0	41
SE	1	15	21	2	0	0	39
SSE	1	9	28	3	0	0	41
S	2	7	40	1	0	0	50
SSW	5	5	35	7	0	0	52
SW	1	15	40	16	0	0	72
WSW	4	18	37	14	0	0	73
W	2	13	29	5	0	0	49
WNW	2	6	21	10	0	0	39
NW	1	10	17	10	0	0	38
NNW	0	8	20	5	0	0	33
<b>Total</b>	<b>25</b>	<b>146</b>	<b>409</b>	<b>145</b>	<b>0</b>	<b>0</b>	<b>725</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 725
<b>Total Hours for Period</b>							<b>5520</b>

**Table 7 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD60M Direction: WD60M Lapse: DT60-10M  
 Stability Class G Delta Temperature Extremely Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	2	14	21	11	0	0	48
NNE	2	8	24	17	0	0	51
NE	3	4	24	5	0	0	36
ENE	1	3	12	4	0	0	20
E	1	10	17	6	0	0	34
ESE	2	12	7	0	0	0	21
SE	2	15	7	2	0	0	26
SSE	3	14	10	3	0	0	30
S	3	13	21	7	0	0	44
SSW	3	6	26	6	0	0	41
SW	5	12	21	4	0	0	42
WSW	3	18	32	16	0	0	69
W	3	16	25	10	0	0	54
WNW	3	4	15	12	0	0	34
NW	2	14	29	7	0	0	52
NNW	0	11	24	7	0	0	42
<b>Total</b>	<b>38</b>	<b>174</b>	<b>315</b>	<b>117</b>	<b>0</b>	<b>0</b>	<b>644</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 644
<b>Total Hours for Period</b>							<b>5520</b>

**Table 7 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Summary of All Stability Classes**

**Total Period**

Period of Record =

1/1/2015 00:00 - 8/18/2015 23:00

Elevation: Speed: SPD60M

Direction: WD60M

Lapse: DT60-10M

Delta Temperature

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	6	85	214	186	19	0	510
NNE	6	81	159	90	1	0	337
NE	5	83	128	46	4	0	266
ENE	10	93	97	35	0	0	235
E	7	101	131	21	0	0	260
ESE	14	106	167	21	0	0	308
SE	10	101	178	30	1	0	320
SSE	11	84	234	66	8	0	403
S	8	88	259	77	19	4	455
SSW	14	67	228	49	1	0	359
SW	10	74	213	95	2	0	394
WSW	14	72	212	56	0	0	354
W	13	58	157	33	1	0	262
WNW	10	57	117	44	1	0	229
NW	7	91	168	90	11	2	369
NNW	4	93	177	124	21	4	423
<b>Total</b>	<b>149</b>	<b>1334</b>	<b>2839</b>	<b>1063</b>	<b>89</b>	<b>10</b>	<b>5484</b>

**Calm Hours not Included above for :**

**Total Period**

1

**Variable Direction Hours for:**

**Total Period**

0

**Invalid Hours for:**

**Total Period**

35

**Valid Hours for this Stability Class for:**

**Total Period**

5484

**Total Hours for Period**

5520

**Table 8 Celia JOINT FREQUENCY TABLES of Wind Speed and Wind Direction 97m  
 Versus Delta Temperature 97-10m January 1, 2015 Through August 18, 2015**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class A Delta Temperature Extremely Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	0	0	2	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	2	0	0	2
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	1	0	0	1
W	0	0	0	1	0	0	1
WNW	0	0	0	0	1	0	1
NW	0	0	0	3	3	2	8
NNW	0	0	0	0	2	0	2
<b>Total</b>	0	0	0	9	6	2	17
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 17
<b>Total Hours for Period</b>							5520

**Table 8 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class B Delta Temperature Moderately Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	0	0	15	0	0	15
NNE	0	2	3	3	0	0	8
NE	0	0	0	1	0	0	1
ENE	0	0	1	0	0	0	1
E	0	0	2	0	0	0	2
ESE	0	0	0	0	0	0	0
SE	0	0	1	0	1	0	2
SSE	0	0	2	5	0	0	7
S	0	0	2	6	2	1	11
SSW	0	1	3	4	0	0	8
SW	0	0	1	3	0	0	4
WSW	0	0	3	2	0	0	5
W	0	0	3	3	0	0	6
WNW	0	0	2	2	0	0	4
NW	0	0	2	11	6	1	20
NNW	0	0	1	13	4	1	19
<b>Total</b>	0	3	26	68	13	3	113
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 113
<b>Total Hours for Period</b>							<b>5520</b>

**Table 8 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class C Delta Temperature Slightly Unstable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>	
N	0	4	15	13	1	0	33	
NNE	0	1	9	3	0	0	13	
NE	0	0	9	1	0	0	10	
ENE	0	0	0	2	0	0	2	
E	0	2	7	2	0	0	11	
ESE	0	2	12	1	0	0	15	
SE	0	1	11	4	0	0	16	
SSE	0	3	19	20	6	0	48	
S	0	4	32	6	3	0	45	
SSW	0	4	11	11	0	0	26	
SW	1	3	14	6	3	0	27	
WSW	0	1	16	0	0	0	17	
W	0	2	12	3	0	0	17	
WNW	0	6	7	1	1	0	15	
NW	0	2	20	11	7	0	40	
NNW	0	1	10	16	9	0	36	
<b>Total</b>	<b>1</b>	<b>36</b>	<b>204</b>	<b>100</b>	<b>30</b>	<b>0</b>	<b>371</b>	
<b>Calm Hours not Included above for :</b>							<b>Total Period</b>	<b>1</b>
<b>Variable Direction Hours for:</b>							<b>Total Period</b>	<b>0</b>
<b>Invalid Hours for:</b>							<b>Total Period</b>	<b>35</b>
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b>	<b>371</b>
<b>Total Hours for Period</b>								<b>5520</b>

**Table 8 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class D Delta Temperature Neutral

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	2	49	78	93	20	4	246
NNE	0	52	51	27	0	0	130
NE	3	46	39	13	3	2	106
ENE	5	50	36	15	2	0	108
E	2	48	51	13	1	0	115
ESE	6	41	53	24	3	0	127
SE	3	38	71	42	6	0	160
SSE	3	23	96	58	19	0	199
S	1	39	59	51	20	6	176
SSW	2	24	47	34	5	0	112
SW	4	19	43	50	9	0	125
WSW	3	21	52	6	2	1	85
W	1	23	37	12	2	0	75
WNW	3	22	41	18	10	0	94
NW	3	51	68	35	15	5	177
NNW	3	48	76	63	34	7	231
<b>Total</b>	<b>44</b>	<b>594</b>	<b>898</b>	<b>554</b>	<b>151</b>	<b>25</b>	<b>2266</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 2266
<b>Total Hours for Period</b>							<b>5520</b>

**Table 8 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class E Delta Temperature Slightly Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	5	19	62	15	0	101
NNE	2	5	7	37	14	0	65
NE	1	6	14	36	6	0	63
ENE	1	7	11	27	8	0	54
E	2	11	24	24	1	0	62
ESE	2	12	42	52	0	0	108
SE	2	12	57	51	1	0	123
SSE	1	9	52	53	5	0	120
S	3	9	43	62	5	0	122
SSW	2	7	27	73	6	0	115
SW	1	9	38	89	10	0	147
WSW	2	13	40	40	4	0	99
W	3	5	19	23	4	0	54
WNW	3	8	24	17	11	0	63
NW	1	11	14	36	6	0	68
NNW	0	5	22	36	13	0	76
<b>Total</b>	<b>26</b>	<b>134</b>	<b>453</b>	<b>718</b>	<b>109</b>	<b>0</b>	<b>1440</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 1440
<b>Total Hours for Period</b>							<b>5520</b>



**Table 8 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class F Delta Temperature Moderately Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	0	7	11	20	14	0	52
NNE	1	6	11	14	13	0	45
NE	0	6	9	24	7	0	46
ENE	1	3	10	8	7	0	29
E	1	6	17	11	7	0	42
ESE	2	7	5	14	3	0	31
SE	1	12	19	20	2	0	54
SSE	3	15	15	16	2	0	51
S	1	12	16	38	1	0	68
SSW	2	8	18	33	2	0	63
SW	3	14	27	49	12	0	105
WSW	3	23	37	26	3	0	92
W	0	6	23	29	9	0	67
WNW	0	9	25	22	6	0	62
NW	0	9	23	16	4	0	52
NNW	0	5	8	17	3	0	33
<b>Total</b>	<b>18</b>	<b>148</b>	<b>274</b>	<b>357</b>	<b>95</b>	<b>0</b>	<b>892</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 892
<b>Total Hours for Period</b>							<b>5520</b>

**Table 8 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M  
 Stability Class G Delta Temperature Extremely Stable

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	1	7	8	2	11	0	29
NNE	2	1	17	9	2	0	31
NE	0	2	9	16	0	0	27
ENE	0	2	9	6	2	0	19
E	0	1	9	9	0	0	19
ESE	1	7	4	0	1	0	13
SE	0	6	6	1	3	0	16
SSE	0	3	5	3	0	0	11
S	2	1	6	10	4	0	23
SSW	2	0	6	4	2	0	14
SW	3	4	11	14	1	0	33
WSW	2	7	6	8	1	0	24
W	1	1	15	14	9	0	40
WNW	3	5	7	10	3	0	28
NW	6	5	9	6	2	0	28
NNW	1	9	9	10	1	0	30
<b>Total</b>	<b>24</b>	<b>61</b>	<b>136</b>	<b>122</b>	<b>42</b>	<b>0</b>	<b>385</b>
<b>Calm Hours not Included above for :</b>							<b>Total Period</b> 1
<b>Variable Direction Hours for:</b>							<b>Total Period</b> 0
<b>Invalid Hours for:</b>							<b>Total Period</b> 35
<b>Valid Hours for this Stability Class for:</b>							<b>Total Period</b> 385
<b>Total Hours for Period</b>							<b>5520</b>

**Table 8 Continued**

**Joint Frequency Distribution**

Hours at Each Wind Speed and Direction

**Summary of All Stability Classes**

**Total Period**

Period of Record = 1/1/2015 00:00 - 8/18/2015 23:00  
 Elevation: Speed: SPD97M Direction: WD97M Lapse: DT97-10M

Delta Temperature

**Wind Speed (mph)**

<u>Wind Direction</u>	<u>1 - 4</u>	<u>4 - 8</u>	<u>8 - 13</u>	<u>13 - 19</u>	<u>19 - 25</u>	<u>≥ 25</u>	<u>Total</u>
N	3	72	131	207	61	4	478
NNE	5	67	98	93	29	0	292
NE	4	60	80	91	16	2	253
ENE	7	62	67	58	19	0	213
E	5	68	110	59	9	0	251
ESE	11	69	116	91	7	0	294
SE	6	69	165	118	13	0	371
SSE	7	53	189	155	32	0	436
S	7	65	158	175	35	7	447
SSW	8	44	112	159	15	0	338
SW	12	49	134	211	35	0	441
WSW	10	65	154	83	10	1	323
W	5	37	109	85	24	0	260
WNW	9	50	106	70	32	0	267
NW	10	78	136	118	43	8	393
NNW	4	68	126	155	66	8	427
<b>Total</b>	<b>113</b>	<b>976</b>	<b>1991</b>	<b>1928</b>	<b>446</b>	<b>30</b>	<b>5484</b>

<b>Calm Hours not Included above for :</b>	<b>Total Period</b>	<b>1</b>
<b>Variable Direction Hours for:</b>	<b>Total Period</b>	<b>0</b>
<b>Invalid Hours for:</b>	<b>Total Period</b>	<b>35</b>
<b>Valid Hours for this Stability Class for:</b>	<b>Total Period</b>	<b>5484</b>
<b>Total Hours for Period</b>		<b>5520</b>

**Table 9 Celia Meteorological Tower 2014 and 2015 DATA RECOVERY (Percent)**

<b>Parameter</b>	<b>Percent Data Recovery 2014</b>	<b>Percent Data Recovery 2015</b>
Wind Speed 10m	99.9	99.4
Wind Speed 60m	87.5	99.4
Wind Speed 97m	99.6	99.4
Wind Direction 10m	99.9	99.4
Wind Direction 60m	99.9	99.4
Wind Direction 97m	99.9	99.4
Delta Temperature 60-10m	99.9	99.4
Delta Temperature 97-10m	99.9	99.4
Temperature 10m	99.9	99.4
Temperature 60m	99.9	99.4
Temperature 97m	99.8	99.4
Dew Point Temperature 10m	99.9	99.4
Dew Point Temperature 60m	99.9	99.4
Dew Point Temperature 97m	97.4	97.0
Precipitation	99.9	99.4
<u>Composite</u>		
10m Wind Speed and Direction, Delta Temperature 60-10m	99.9	99.4
60m Wind Speed and Direction, Delta Temperature 60-10m	87.5	99.4
97m Wind Speed and Direction, Delta Temperature 97-10m	99.6	99.4

**Table 10 Celia PRECIPITATION January 1, 2014 through August 18, 2015**

	<b>2014</b>	<b>2015</b>
<b>January</b>	3.31	4.71
<b>February</b>	5.97	2.34
<b>March</b>	6.05	3.73
<b>April</b>	10.39	10.23
<b>May</b>	8.99	3.96
<b>June</b>	3.52	2.49
<b>July</b>	8.40	7.66
<b>August</b>	1.90	0.36
<b>September</b>	1.13	
<b>October</b>	4.18	
<b>November</b>	1.07	
<b>December</b>	5.23	
<b>Total</b>	60.14	35.48

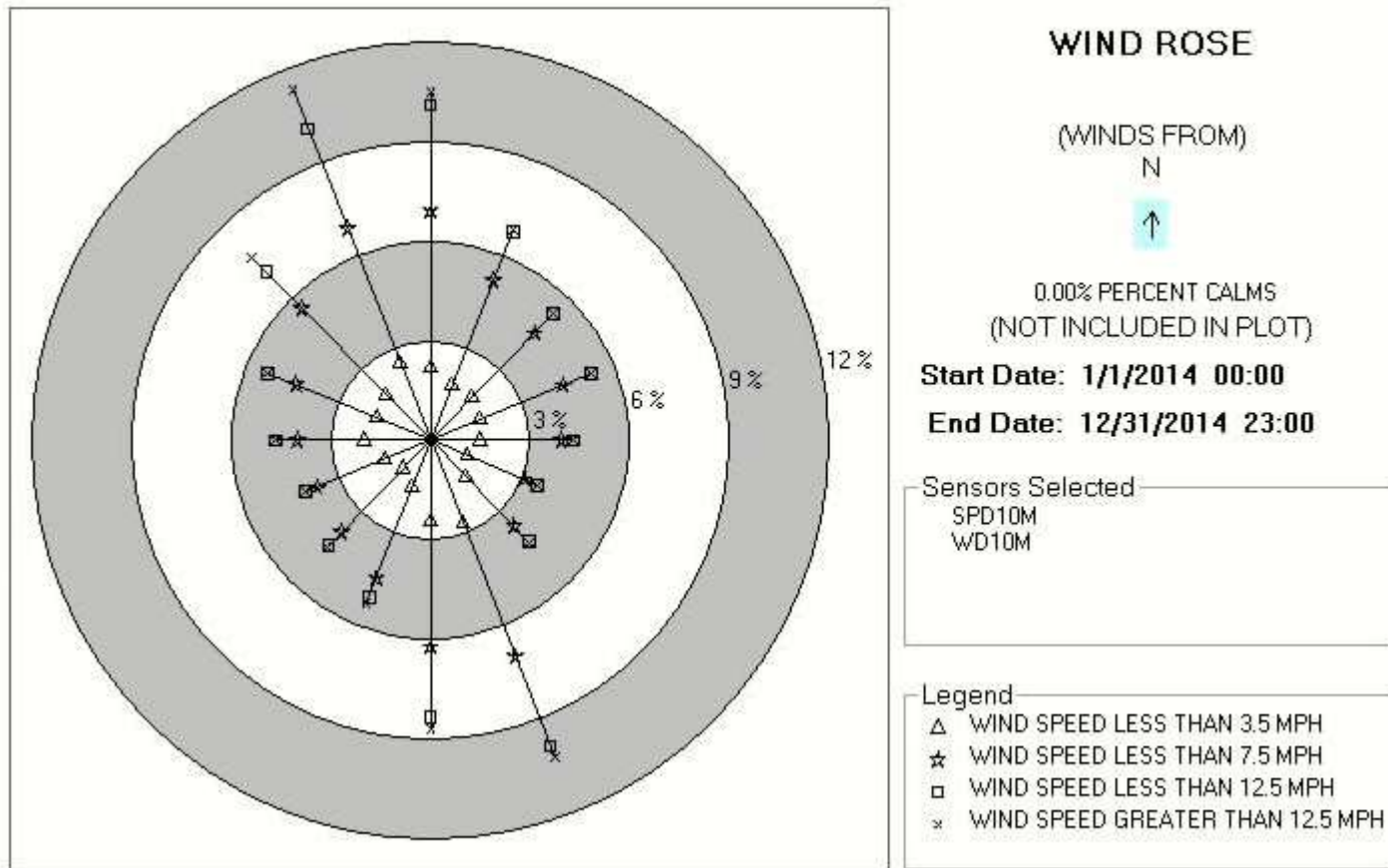
**Table 11 Comparing Celia Site Data With Nearby NWS Sites**

2014			
	Celia+	Pensacola, Florida+	Mobile, AL+
Wind Speed (MPH)	5.5	7.5	6.7
Temperature (° F)	64.2	67.1	65.3
Dew Point (° F)	55.0	56.9	
Relative Humidity (%)	75	73	79
Rainfall (Inches)	60.14	83.17	72.71
2015			
	Celia*	Pensacola, Florida*	Mobile, AL*
Wind Speed (MPH)	5.7	8.0	6.9
Temperature (° F)	67.3	70.2	69.0
Dew Point (° F)	58.5	60.5	59.6
Relative Humidity (%)	76.2	73.8	74.8
Rainfall (Inches)	35.48	45.71	47.07

+ Based on 1-year of data 2014

\* Based on 8 months of data 2015

Run Date: 8/21/2015 2:01:24 PM



**Figure 1 Celia 10m Level WIND ROSE January 1, 2014 through December 31, 2014**

Season/Month: Winter (Dec, Jan, Feb)  
Run Date: 8/21/2015 2:02:26 PM

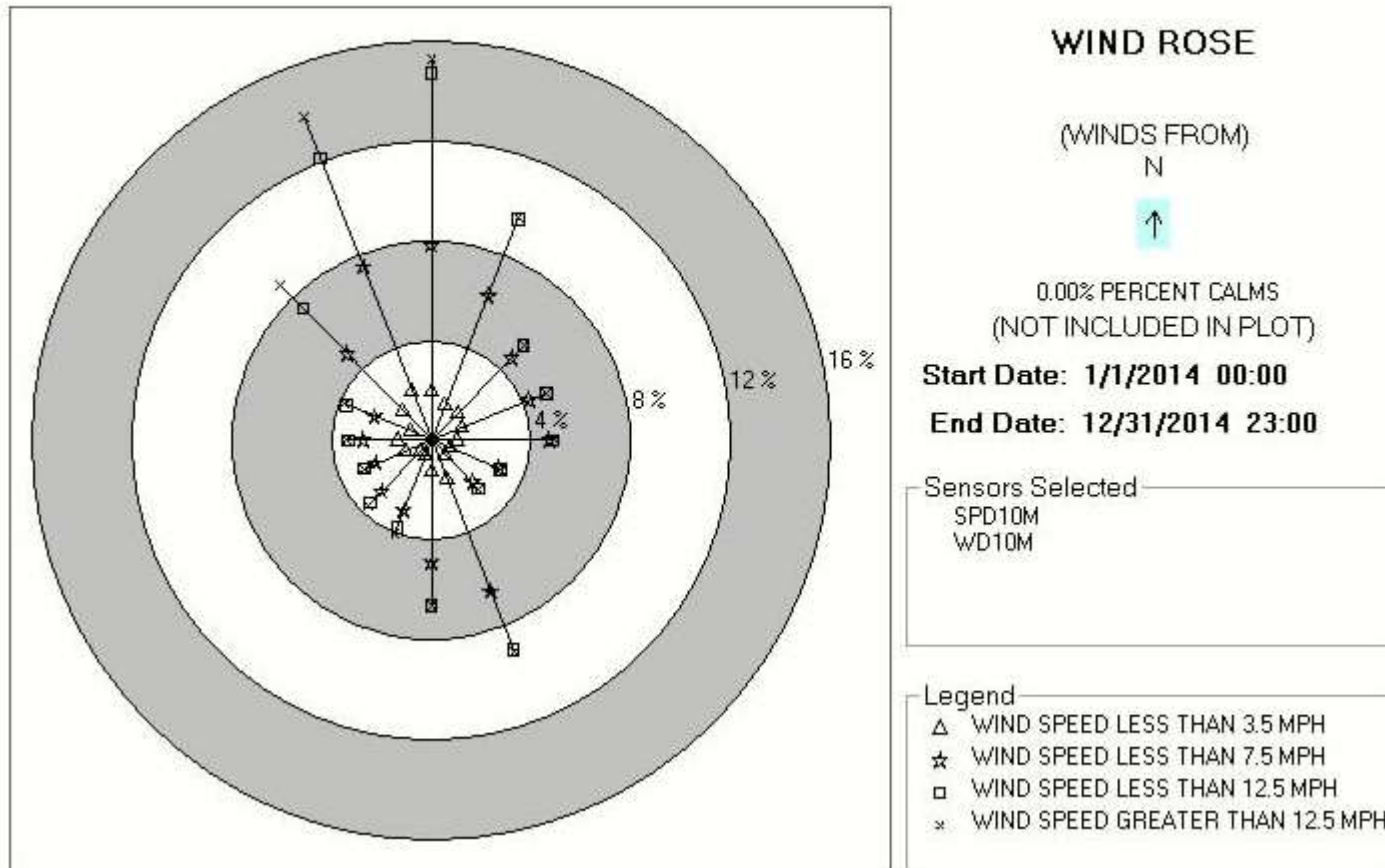


Figure 2 Celia 10m Level WIND ROSE Winter 2014



Season/Month: Spring (Mar, Apr, May)  
Run Date: 8/21/2015 2:02:55 PM

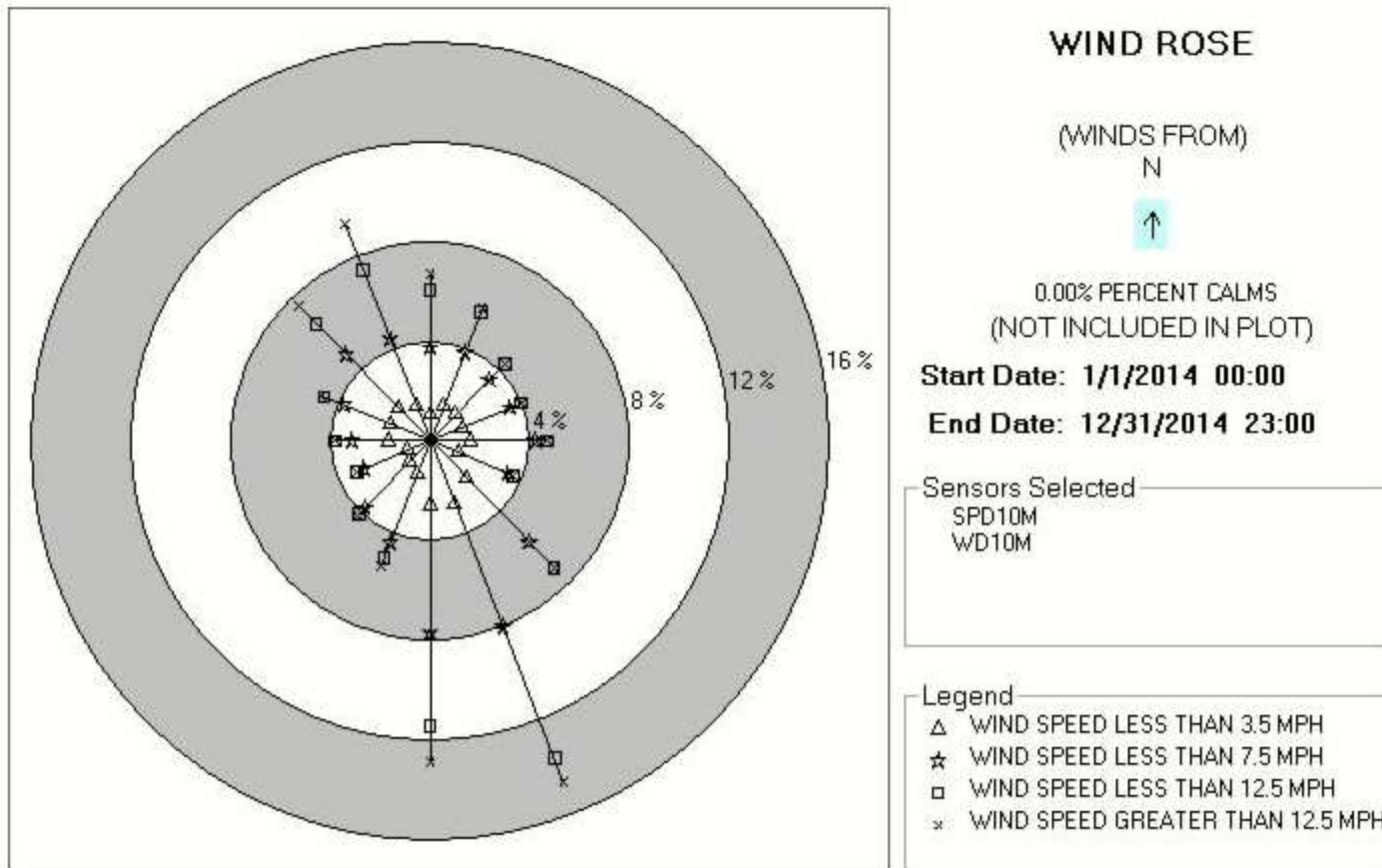
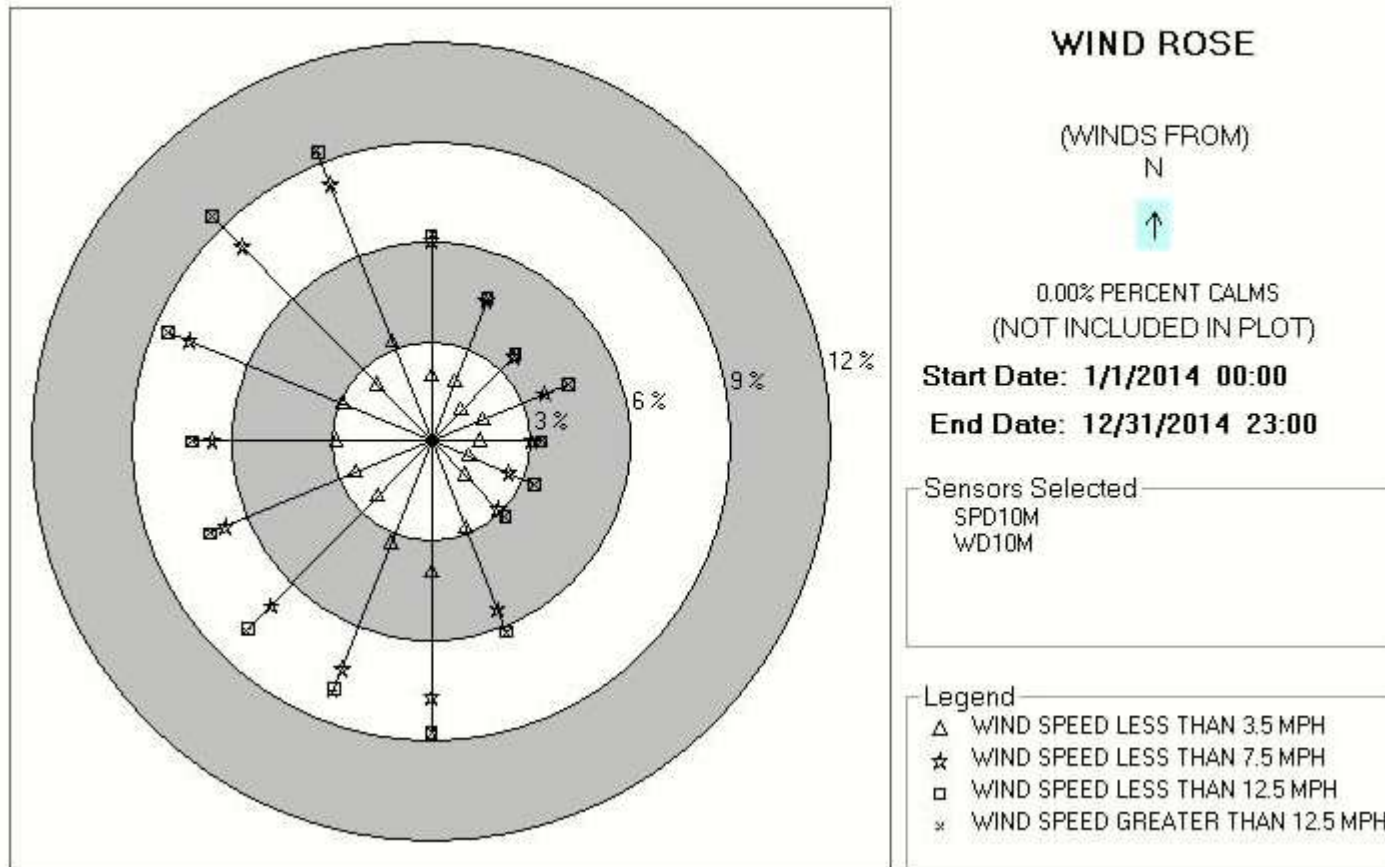


Figure 3 Celia 10m Level WIND ROSE Spring 2014

Season/Month: Summer (June, July, Aug)  
Run Date: 8/21/2015 2:03:50 PM



**Figure 4 Celia 10m Level WIND ROSE Summer 2014**

Season/Month: Fall (Sep, Oct, Nov)  
Run Date: 8/21/2015 2:04:19 PM

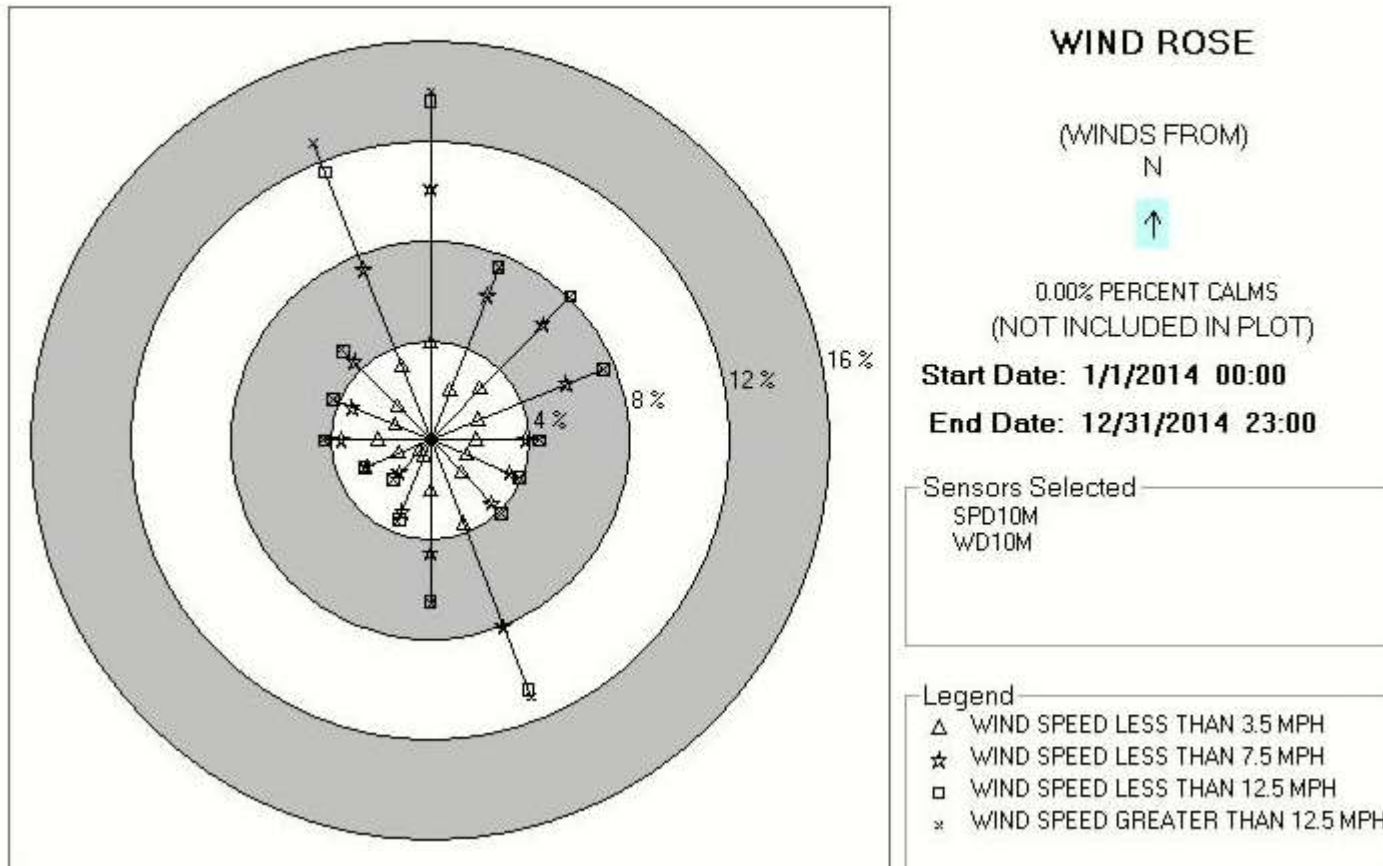
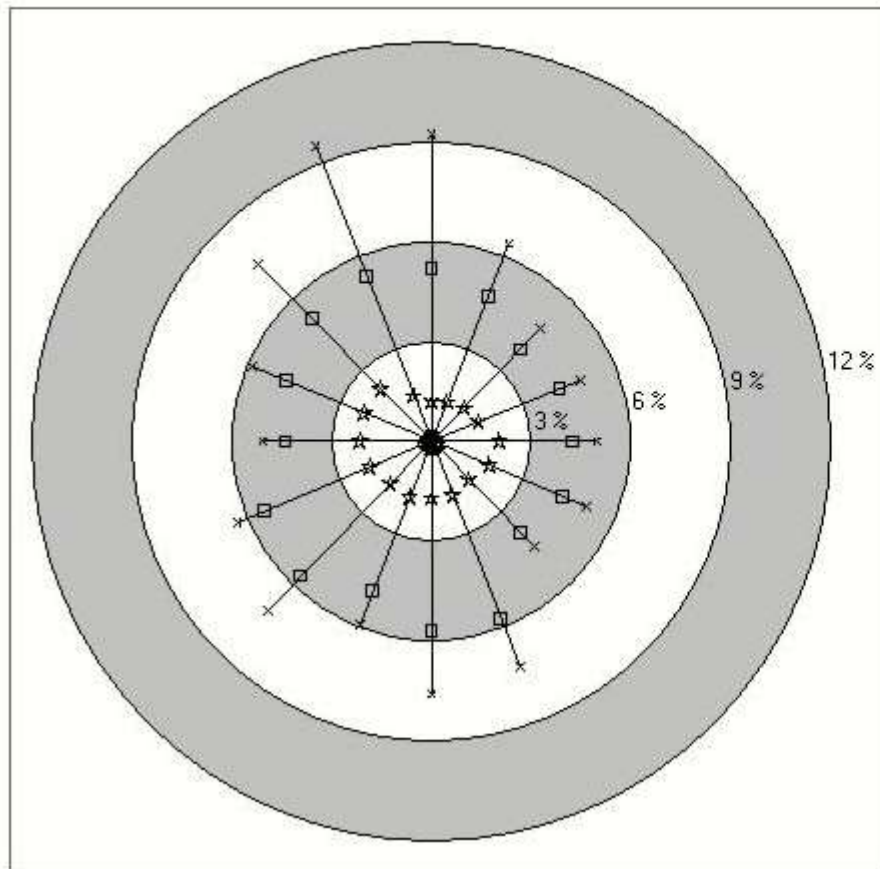


Figure 5 Celia 10m Level WIND ROSE Fall 2014

Season/Month: Total Period  
Run Date: 8/21/2015 2:12:54 PM



### WIND ROSE

(WINDS FROM)

N



0.00% PERCENT CALMS  
(NOT INCLUDED IN PLOT)

**Start Date: 1/1/2014 00:00**

**End Date: 12/31/2014 23:00**

Sensors Selected

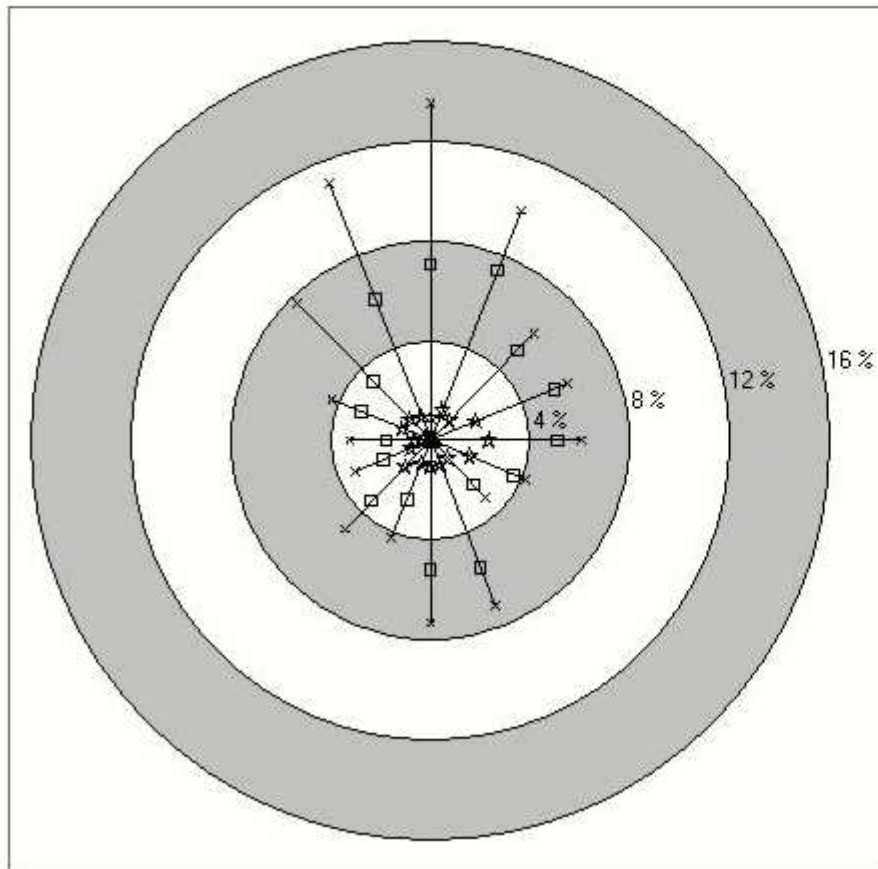
SPD60M  
WD60M

Legend

- △ WIND SPEED LESS THAN 3.5 MPH
- ☆ WIND SPEED LESS THAN 7.5 MPH
- WIND SPEED LESS THAN 12.5 MPH
- × WIND SPEED GREATER THAN 12.5 MPH

**Figure 6 Celia 60m Level WIND ROSE January 1, 2014 through December 31, 2014**

Season/Month: Winter (Dec, Jan, Feb)  
Run Date: 8/21/2015 2:10:32 PM



### WIND ROSE

(WINDS FROM)

N



0.00% PERCENT CALMS  
(NOT INCLUDED IN PLOT)

**Start Date: 1/1/2014 00:00**

**End Date: 12/31/2014 23:00**

Sensors Selected

SPD60M  
WD60M

Legend

- △ WIND SPEED LESS THAN 3.5 MPH
- ☆ WIND SPEED LESS THAN 7.5 MPH
- WIND SPEED LESS THAN 12.5 MPH
- × WIND SPEED GREATER THAN 12.5 MPH

**Figure 7 Celia 60m Level WIND ROSE Winter 2014**

Season/Month: Spring (Mar, Apr, May)  
Run Date: 8/21/2015 2:09:13 PM

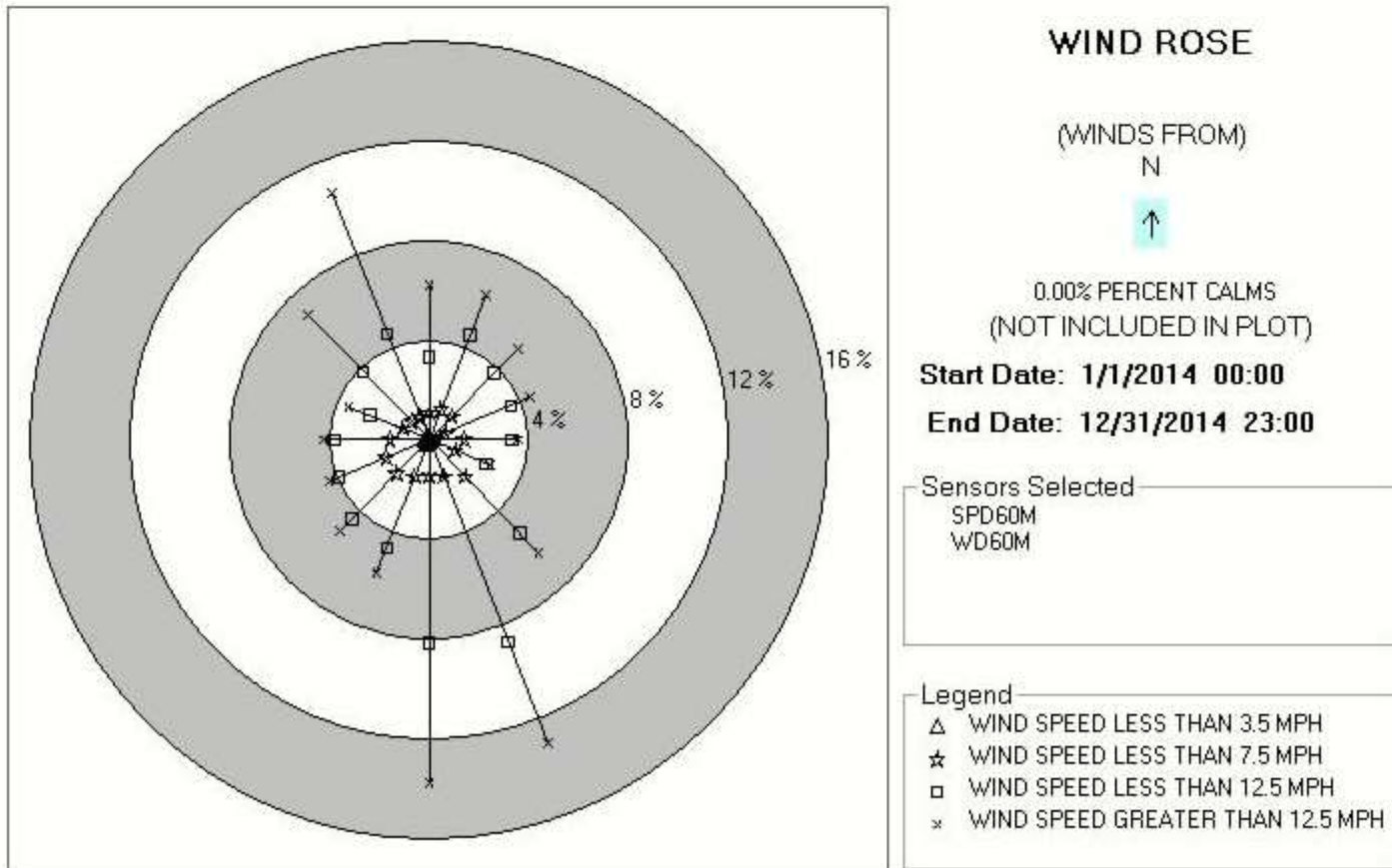
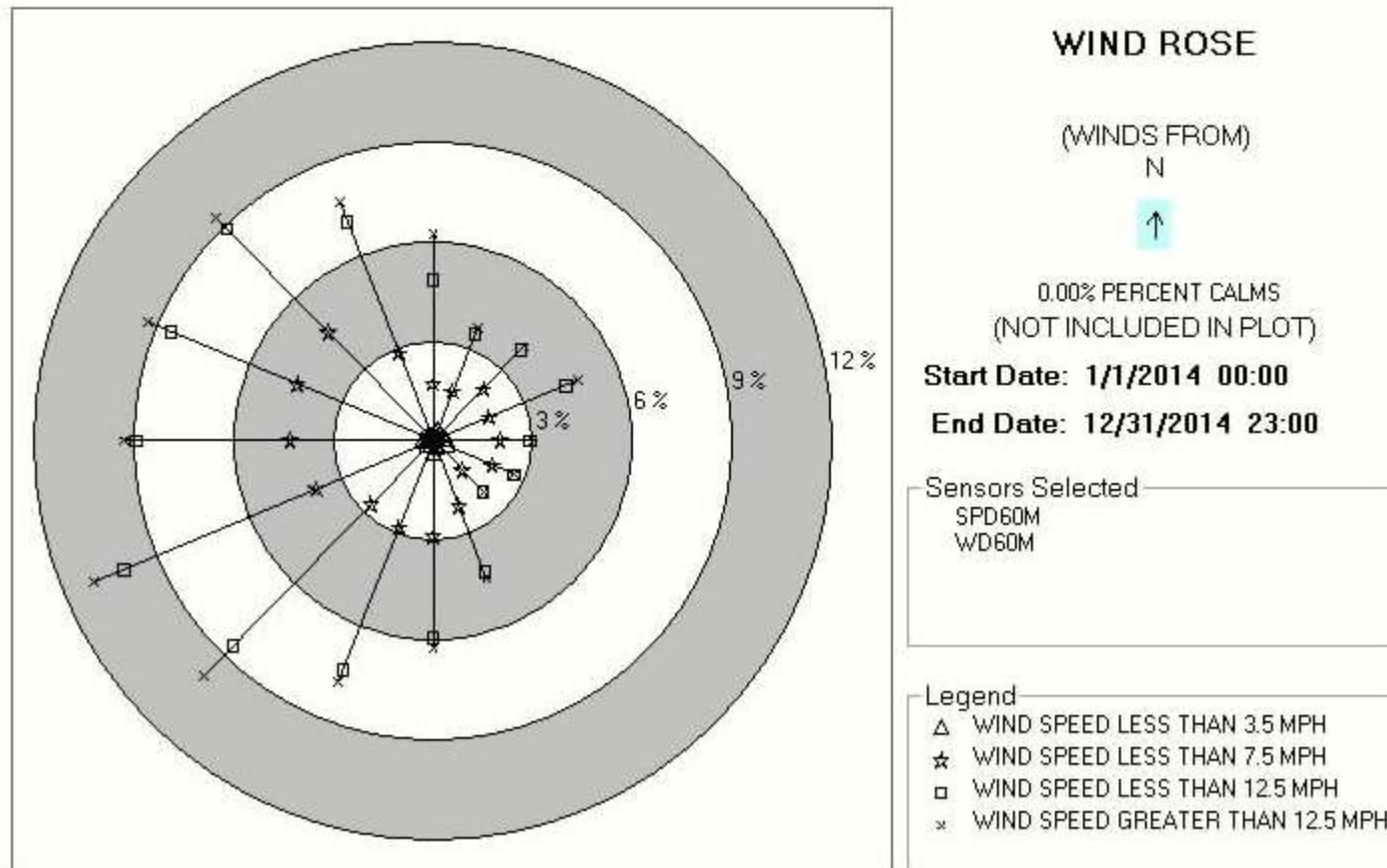


Figure 8 Celia 60m Level WIND ROSE Spring 2014

Season/Month: Summer (June, July, Aug)  
Run Date: 8/21/2015 2:08:43 PM



**Figure 9 Celia 60m Level WIND ROSE Summer 2014**

Season/Month: Fall (Sep, Oct, Nov)  
Run Date: 8/21/2015 2:08:14 PM

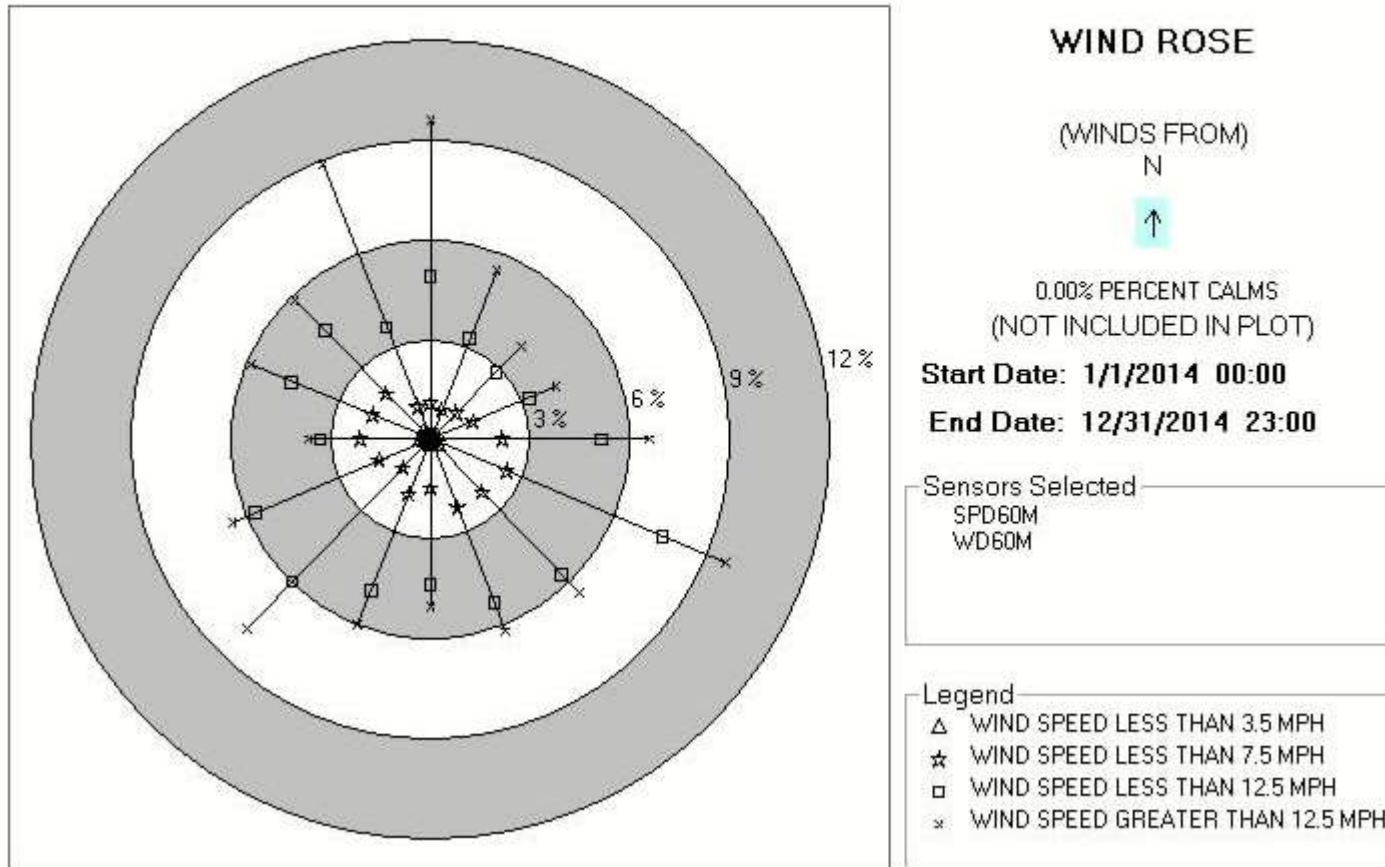
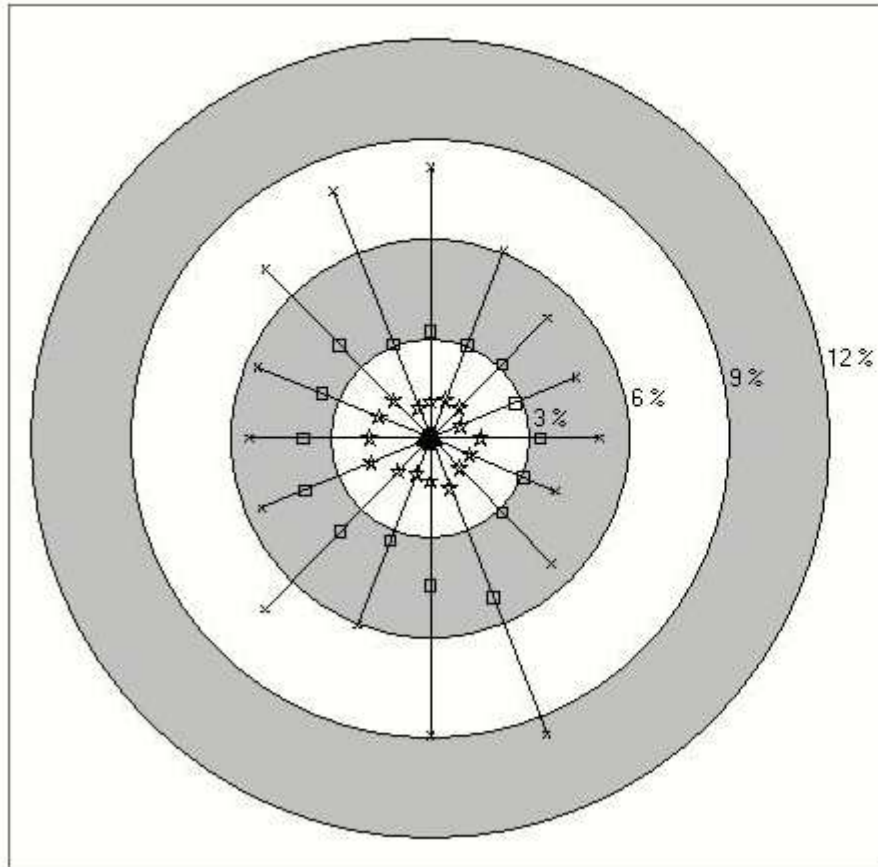


Figure 10 Celia 60m Level WIND ROSE Fall 2014



Season/Month: Total Period  
Run Date: 8/21/2015 2:15:22 PM



### WIND ROSE

(WINDS FROM)  
N



0.00% PERCENT CALMS  
(NOT INCLUDED IN PLOT)

**Start Date: 1/1/2014 00:00**  
**End Date: 12/31/2014 23:00**

#### Sensors Selected

SPD97M  
WD97M

#### Legend

- △ WIND SPEED LESS THAN 3.5 MPH
- ☆ WIND SPEED LESS THAN 7.5 MPH
- WIND SPEED LESS THAN 12.5 MPH
- × WIND SPEED GREATER THAN 12.5 MPH

**Figure 11 Celia 97m Level WIND ROSE January 1, 2014 through December 31, 2014**

Season/Month: Winter (Dec, Jan, Feb)  
Run Date: 8/21/2015 2:15:45 PM

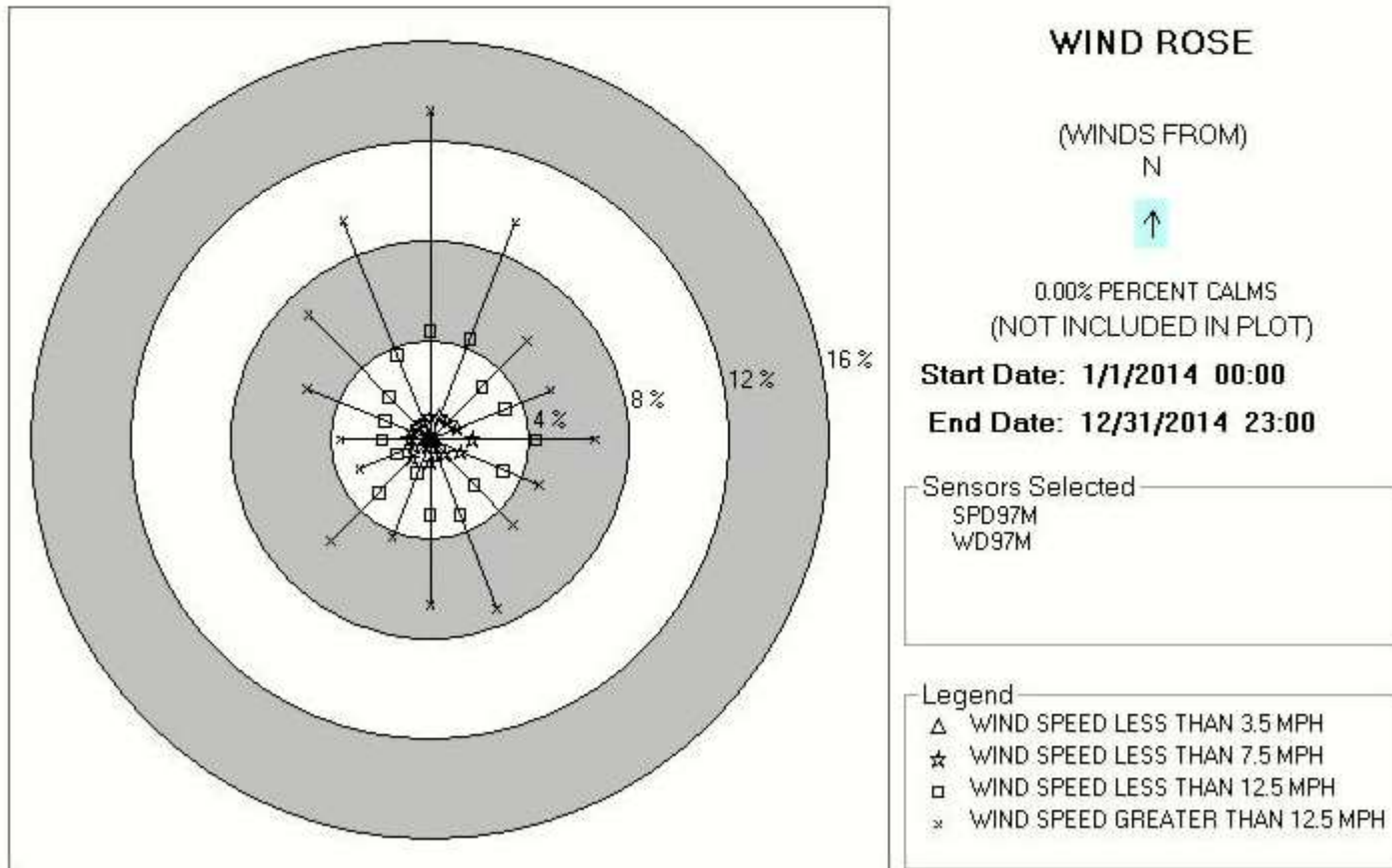
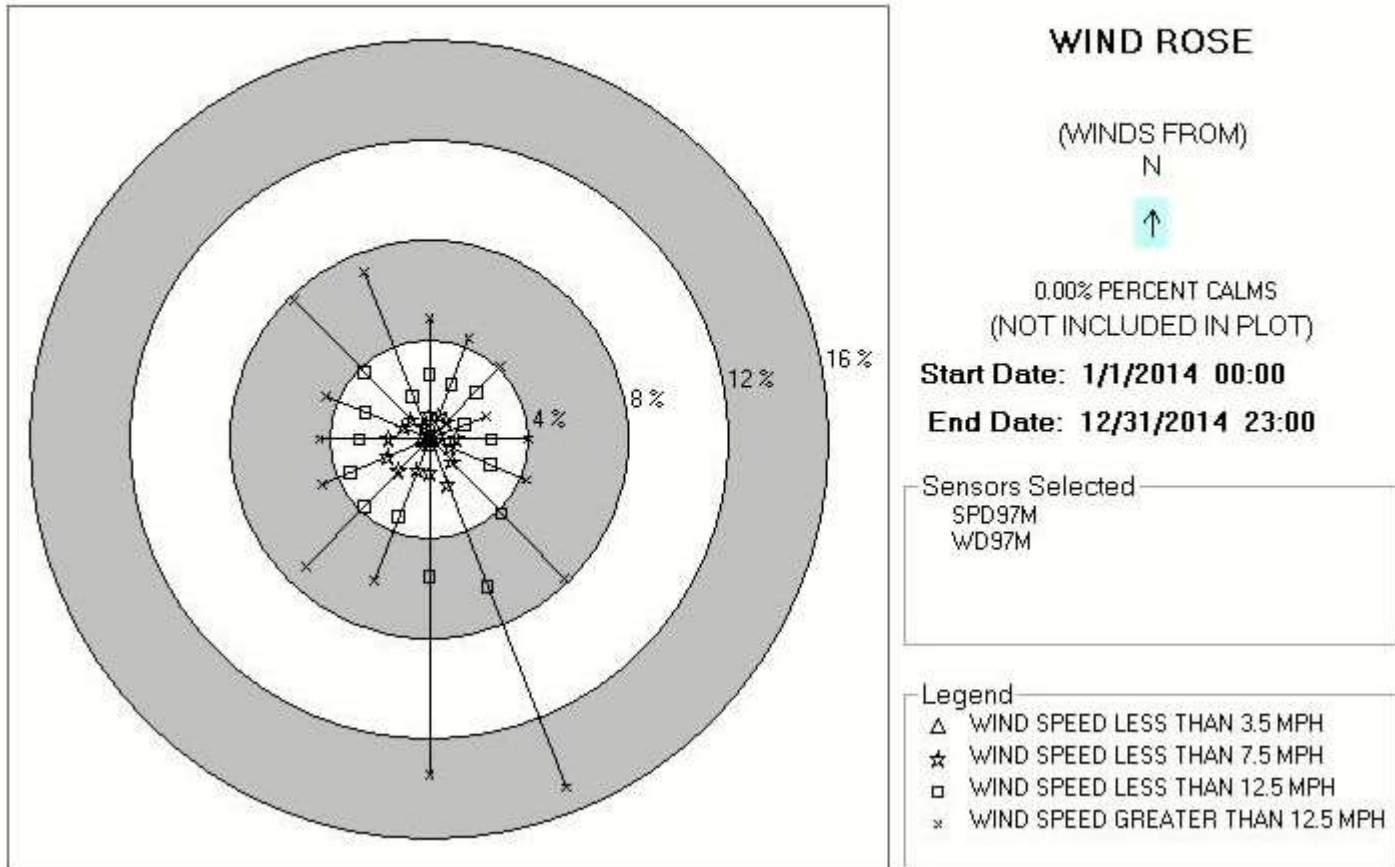


Figure 12 Celia 97m Level WIND ROSE Winter 2014

Season/Month: Spring (Mar, Apr, May)  
Run Date: 8/21/2015 2:16:14 PM



**Figure 13 Celia 97m Level WIND ROSE Spring 2014**

Season/Month: Summer (June, July, Aug)  
Run Date: 8/21/2015 2:36:54 PM

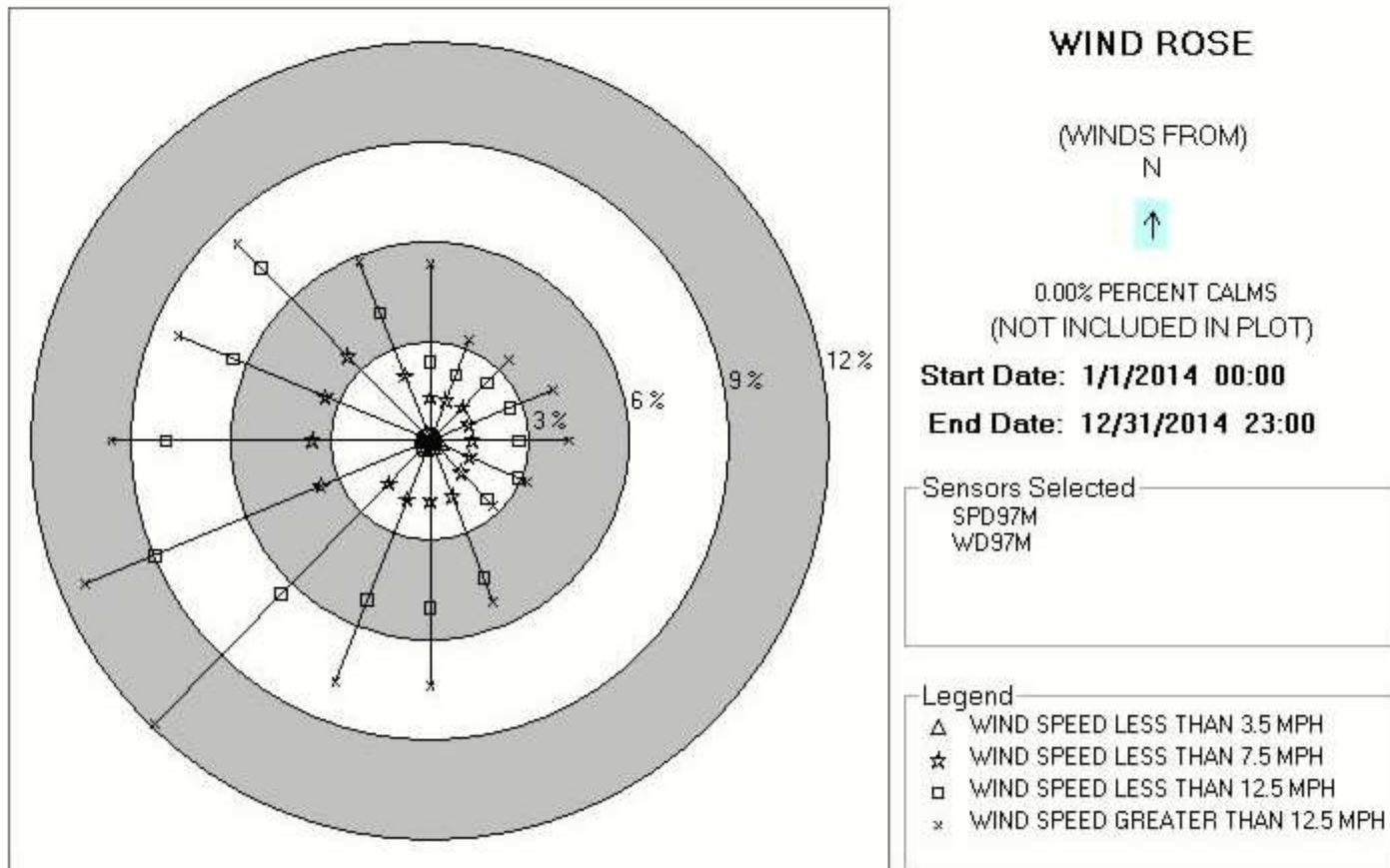
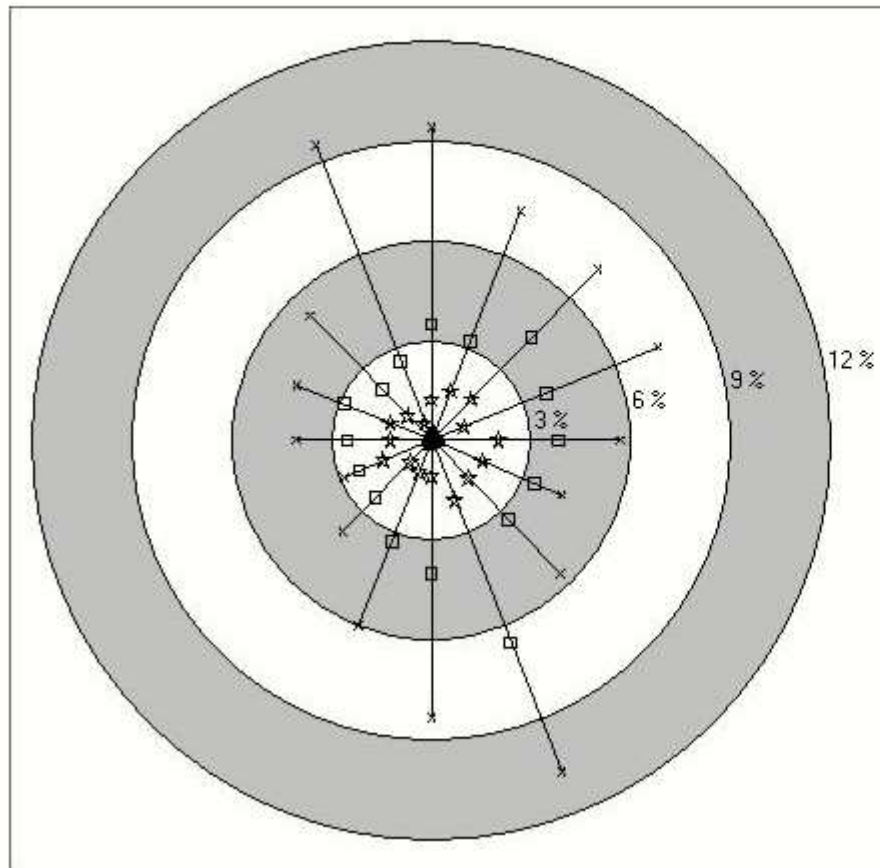


Figure 14 Celia 97m Level WIND ROSE Summer 2014

Season/Month: Fall (Sep, Oct, Nov)  
Run Date: 8/21/2015 2:37:21 PM

**Figure 15**  
**Celia 97m**  
**Level WIND**  
**ROSE Fall**  
**2014**



### WIND ROSE

(WINDS FROM)  
N



0.00% PERCENT CALMS  
(NOT INCLUDED IN PLOT)

**Start Date: 1/1/2014 00:00**

**End Date: 12/31/2014 23:00**

Sensors Selected

SPD97M  
WD97M

Legend

- △ WIND SPEED LESS THAN 3.5 MPH
- ☆ WIND SPEED LESS THAN 7.5 MPH
- WIND SPEED LESS THAN 12.5 MPH
- \* WIND SPEED GREATER THAN 12.5 MPH

Run Date: 10/14/2015 8:54:01 AM

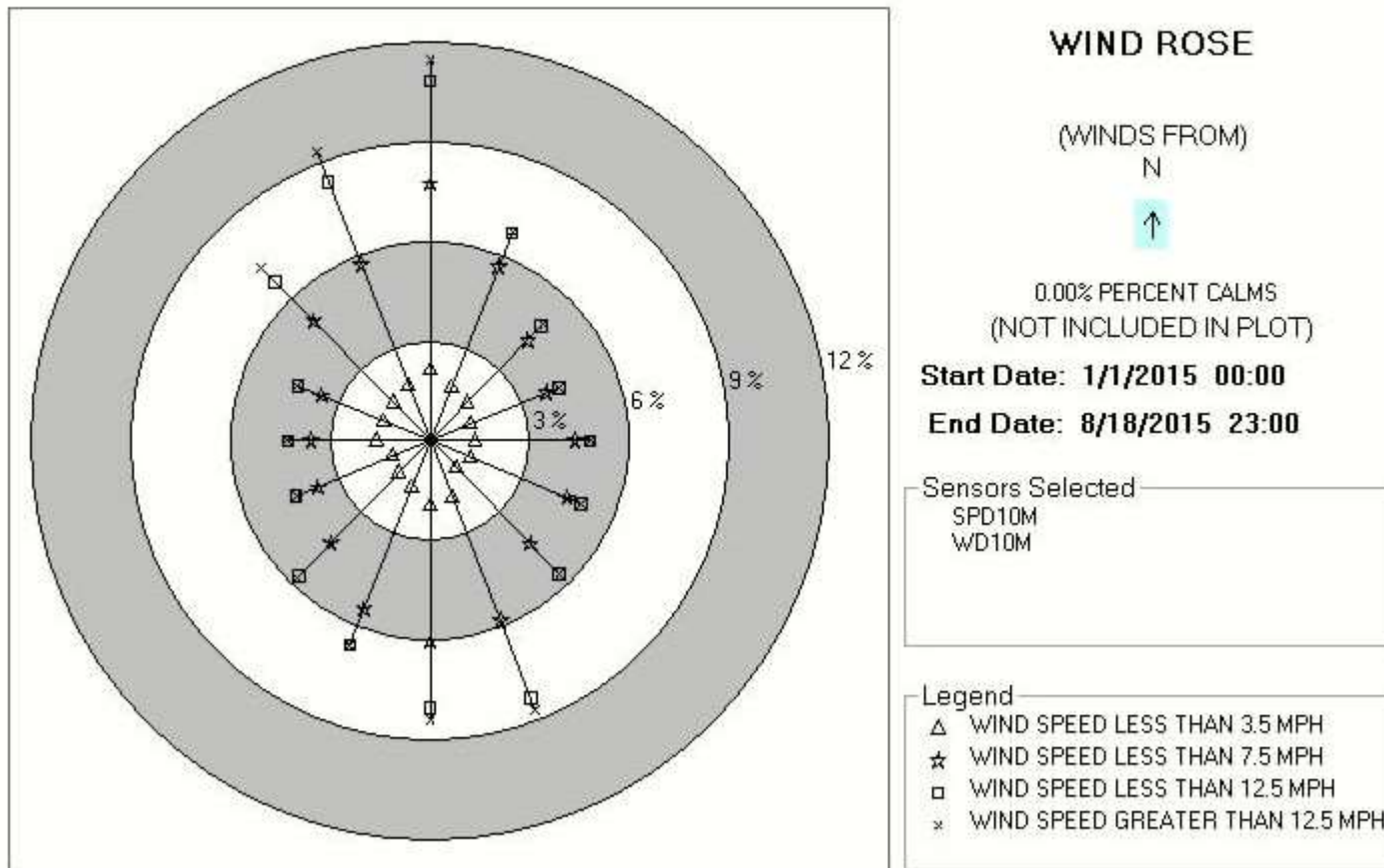
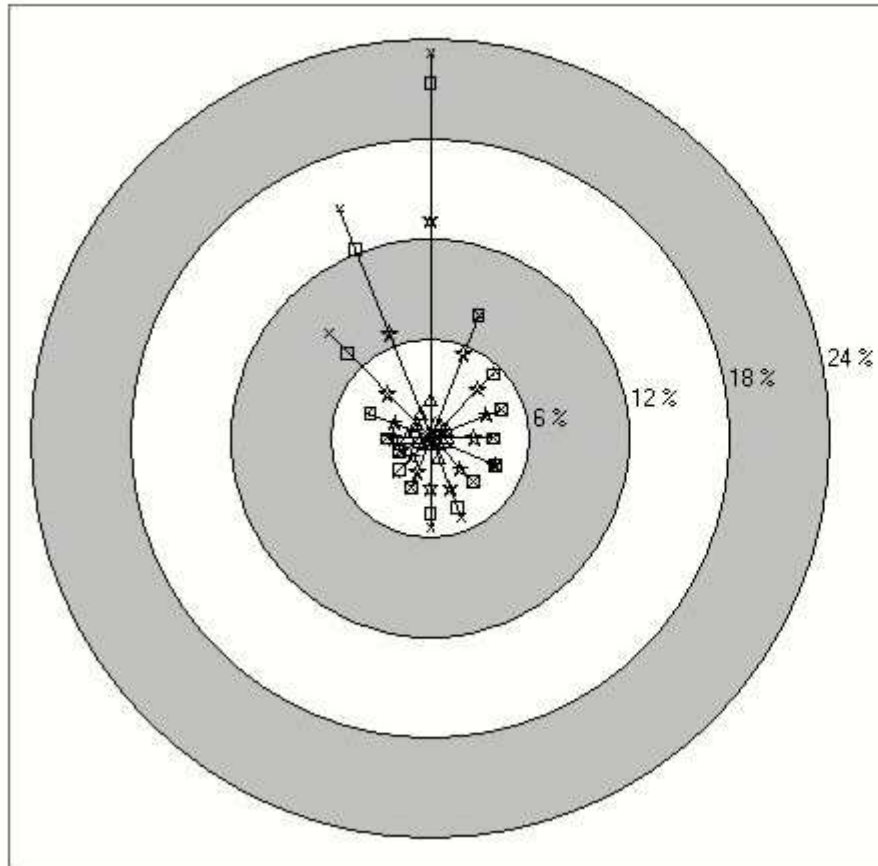


Figure 166 Celia 10m Level WIND ROSE January 1, 2015 through August 18, 2015

Season/Month: Winter (Dec, Jan, Feb)  
Run Date: 10/14/2015 8:56:50 AM



### WIND ROSE

(WINDS FROM)  
N



0.00% PERCENT CALMS  
(NOT INCLUDED IN PLOT)

**Start Date: 1/1/2015 00:00**  
**End Date: 8/18/2015 23:00**

#### Sensors Selected

SPD10M  
WD10M

#### Legend

- △ WIND SPEED LESS THAN 3.5 MPH
- ☆ WIND SPEED LESS THAN 7.5 MPH
- WIND SPEED LESS THAN 12.5 MPH
- × WIND SPEED GREATER THAN 12.5 MPH

**Figure 17 Celia 10m Level WIND ROSE Winter 2015**

Season/Month: Spring (Mar, Apr, May)  
Run Date: 10/14/2015 8:57:17 AM

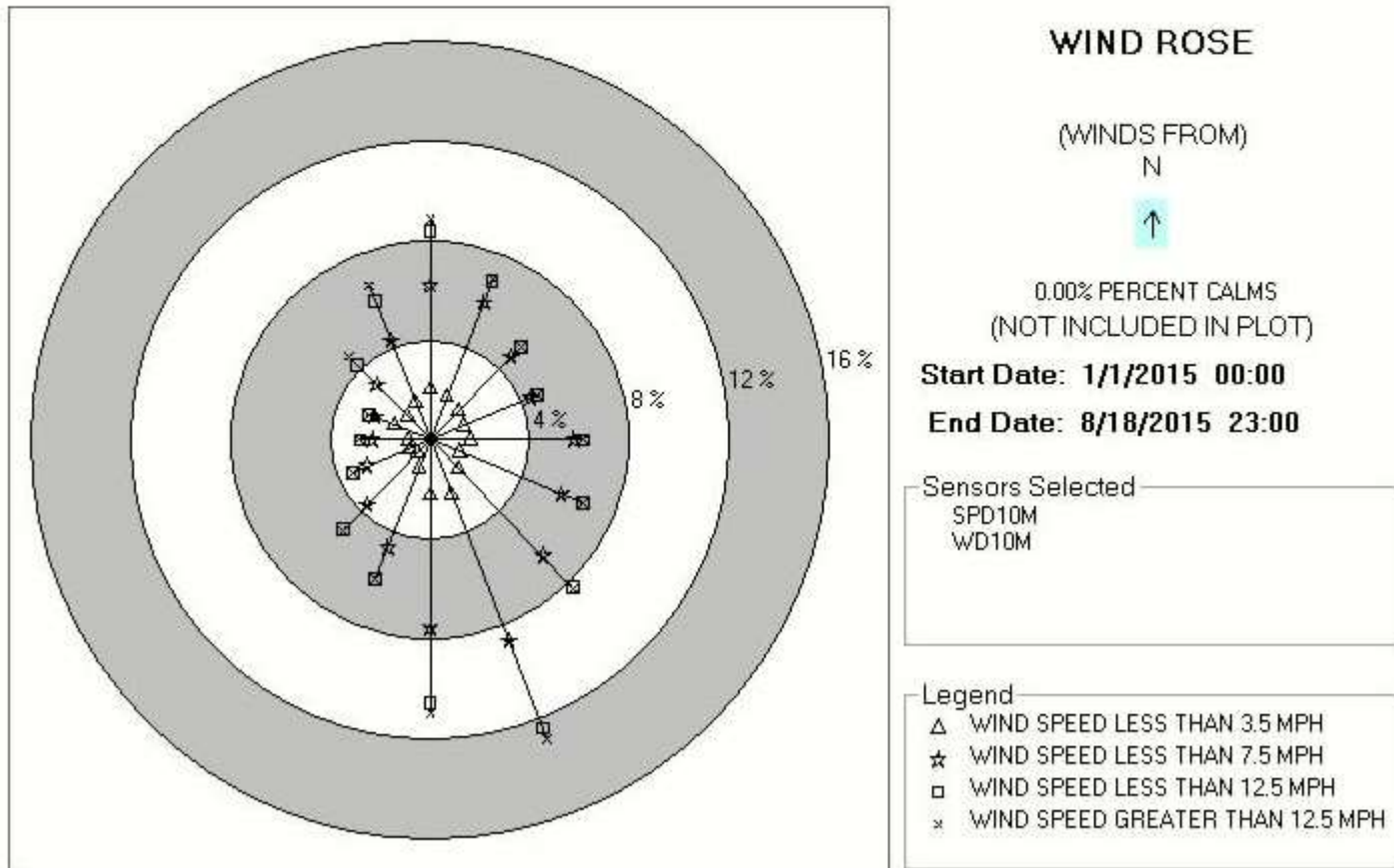


Figure 18 Celia 10m Level WIND ROSE Spring 2015



Season/Month: Summer (June, July, Aug)  
Run Date: 10/14/2015 8:57:56 AM

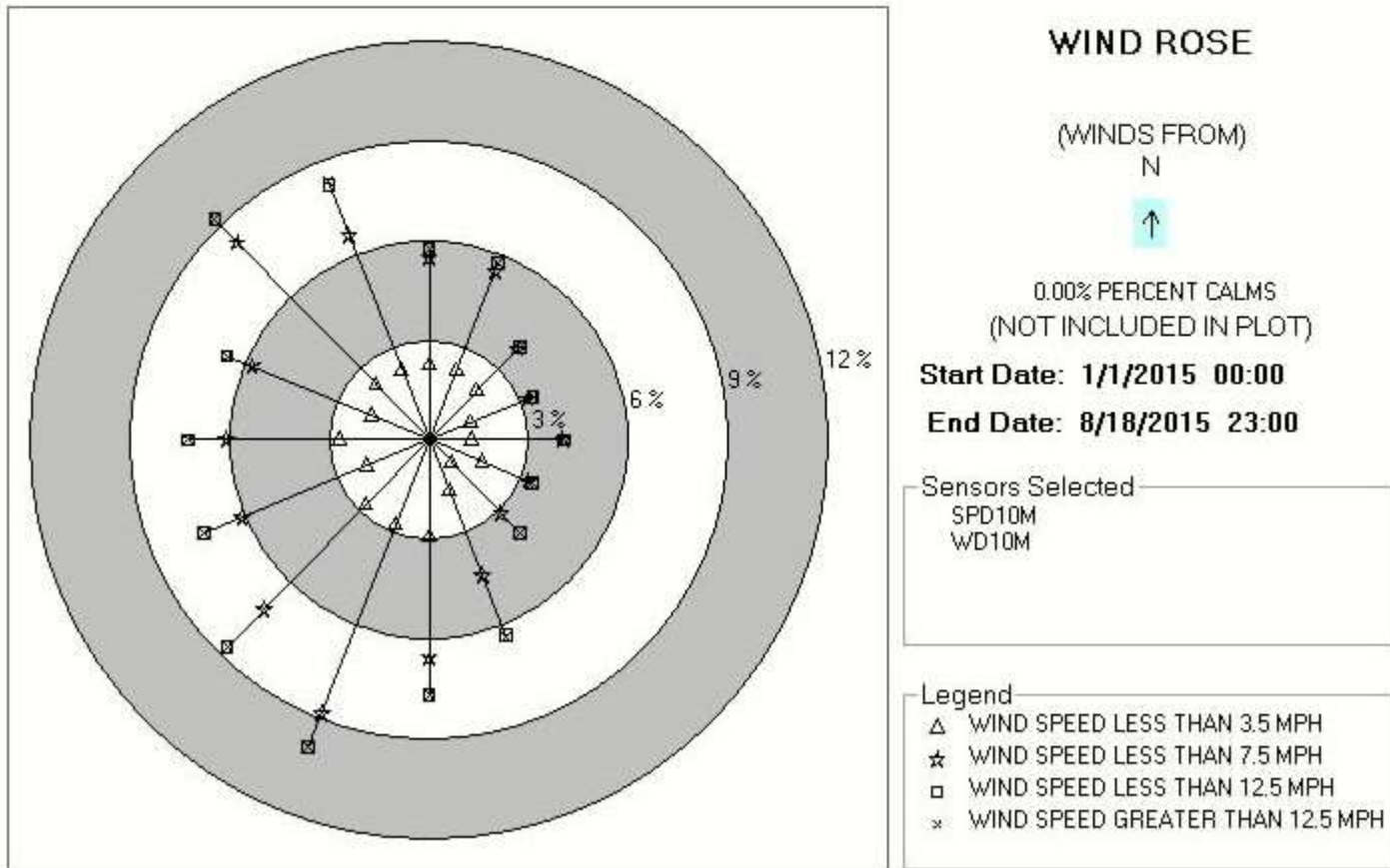
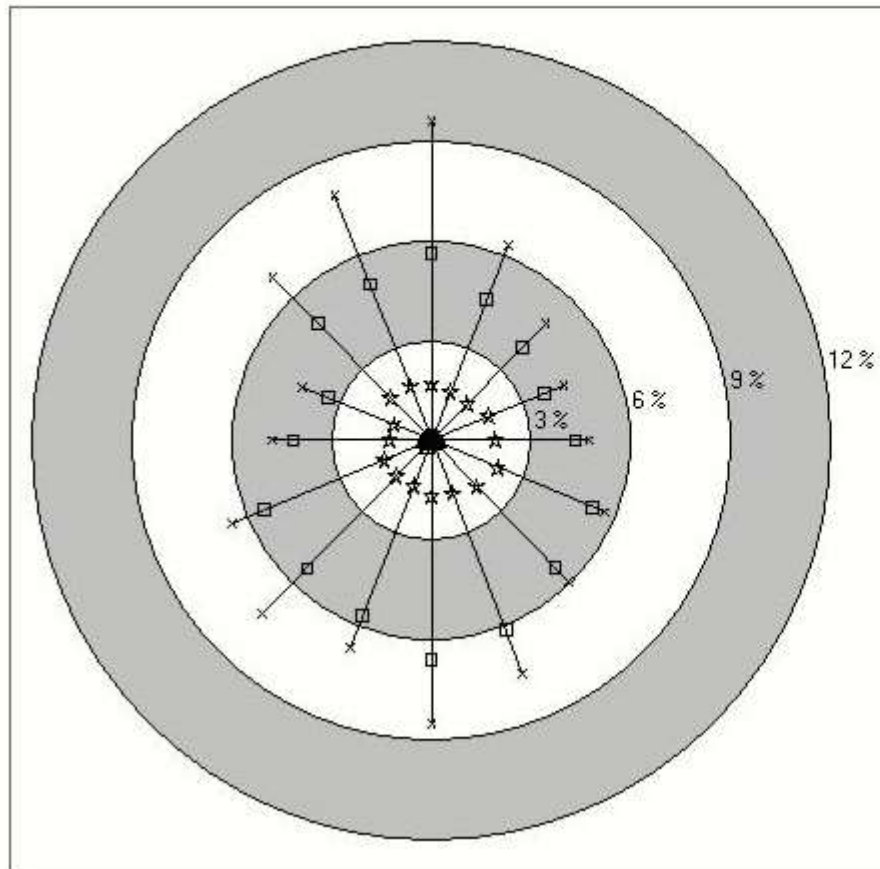


Figure 19 Celia 10m Level WIND ROSE Summer 2015

Season/Month: Total Period  
Run Date: 10/14/2015 9:01:07 AM



### WIND ROSE

(WINDS FROM)  
N



0.00% PERCENT CALMS  
(NOT INCLUDED IN PLOT)

**Start Date: 1/1/2015 00:00**  
**End Date: 8/18/2015 23:00**

Sensors Selected

SPD60M  
WD60M

Legend

- △ WIND SPEED LESS THAN 3.5 MPH
- ☆ WIND SPEED LESS THAN 7.5 MPH
- WIND SPEED LESS THAN 12.5 MPH
- \* WIND SPEED GREATER THAN 12.5 MPH

**Figure 20 Celia 60m Level WIND ROSE January 1, 2015 through August 18, 2015**

Season/Month: Winter (Dec, Jan, Feb)  
Run Date: 10/14/2015 9:00:37 AM

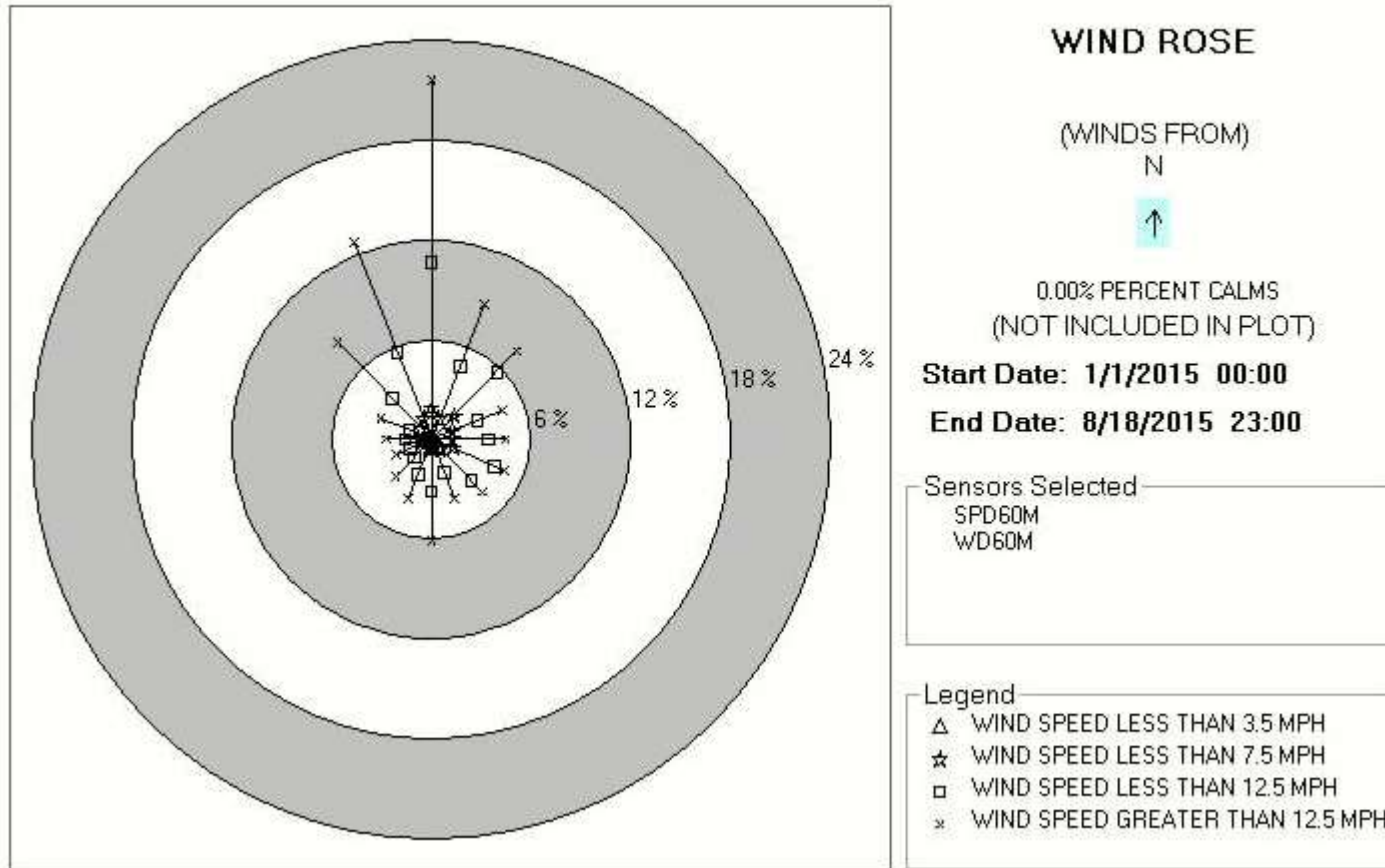


Figure 21 Celia 60m Level WIND ROSE Winter 2015

Season/Month: Spring (Mar, Apr, May)  
Run Date: 10/14/2015 9:00:12 AM

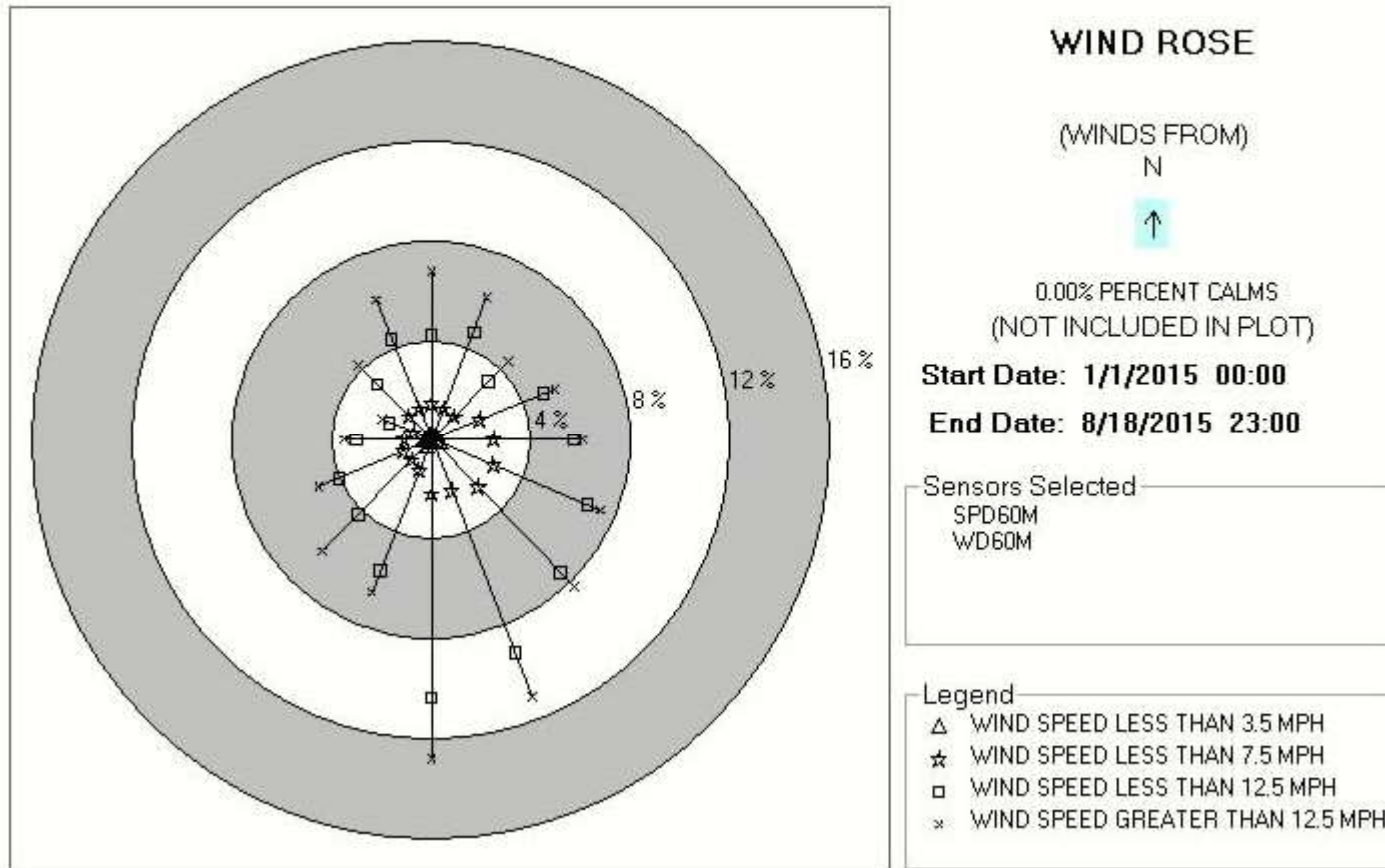


Figure 22 Celia 60m Level WIND ROSE Spring 2015

Season/Month: Summer (June, July, Aug)  
Run Date: 10/14/2015 8:58:24 AM

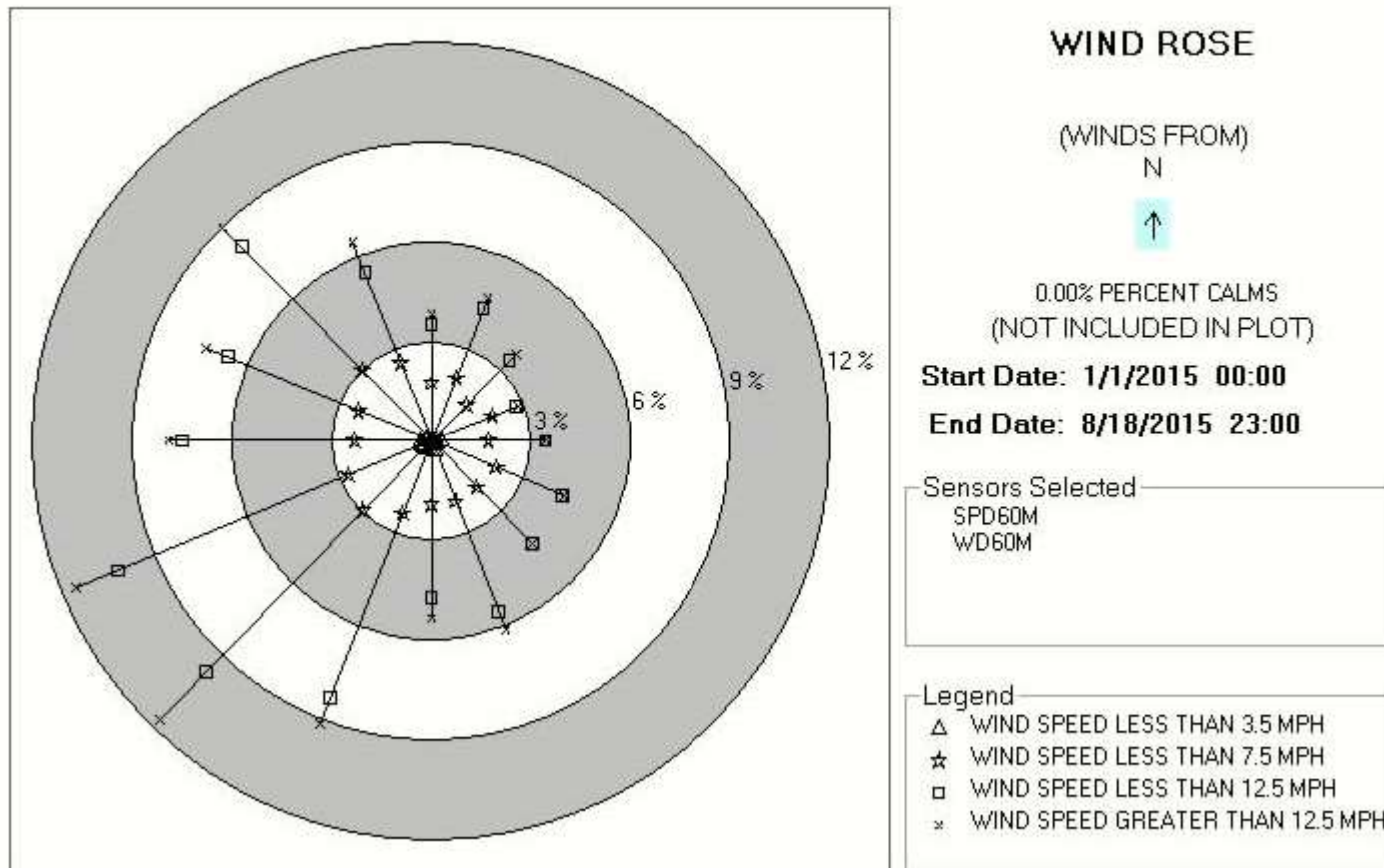
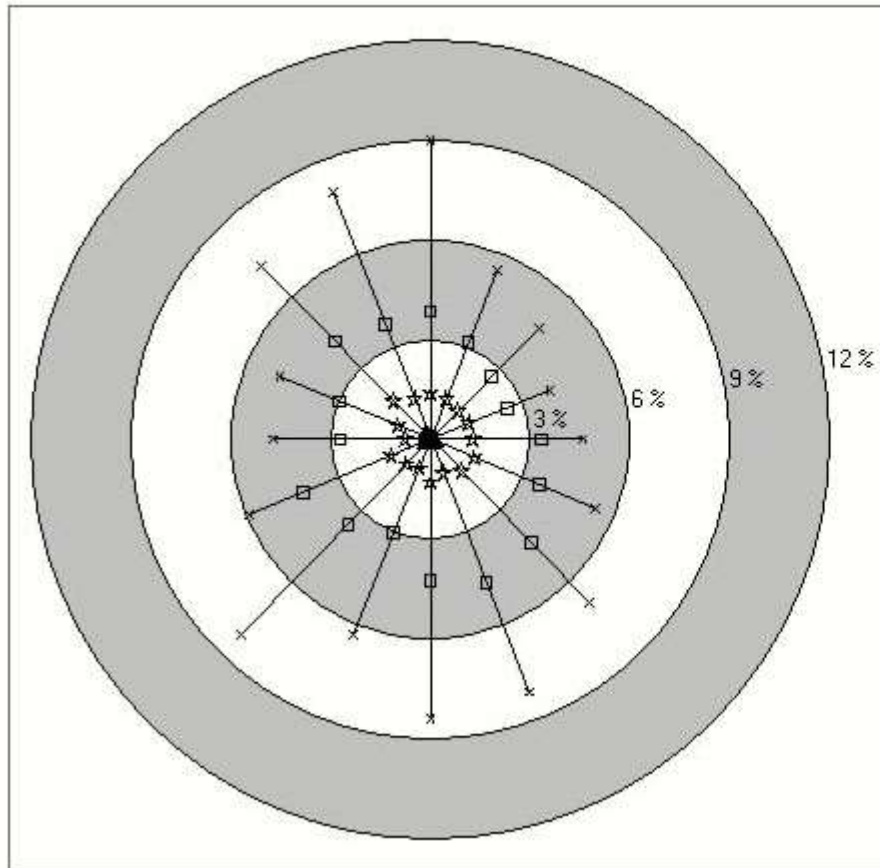


Figure 23 Celia 60m Level WIND ROSE Summer 2015

Season/Month: Total Period  
Run Date: 10/14/2015 9:02:46 AM



### WIND ROSE

(WINDS FROM)

N



0.00% PERCENT CALMS  
(NOT INCLUDED IN PLOT)

**Start Date: 1/1/2015 00:00**

**End Date: 8/18/2015 23:00**

Sensors Selected

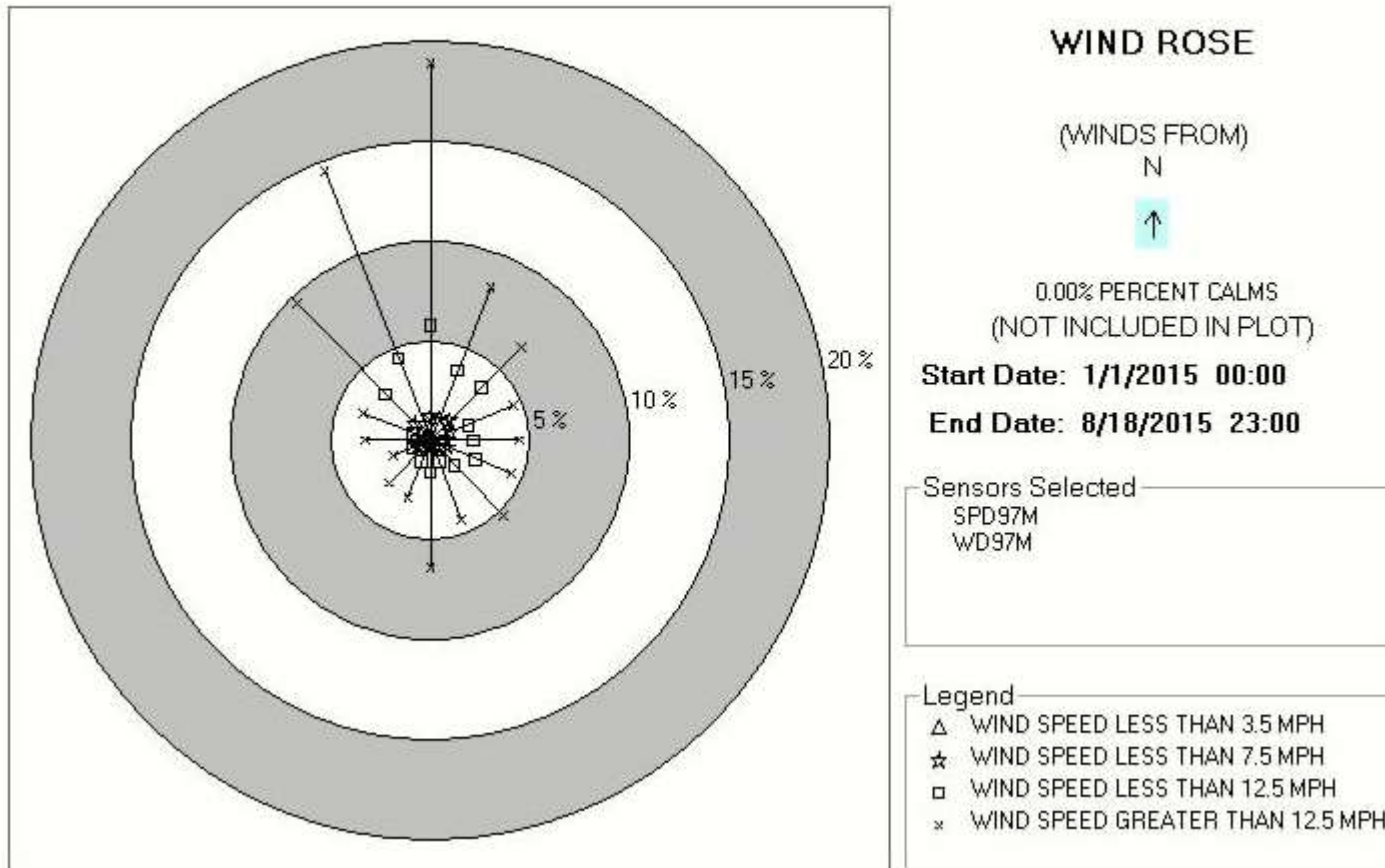
SPD97M  
WD97M

Legend

- △ WIND SPEED LESS THAN 3.5 MPH
- ☆ WIND SPEED LESS THAN 7.5 MPH
- WIND SPEED LESS THAN 12.5 MPH
- × WIND SPEED GREATER THAN 12.5 MPH

**Figure 24 Celia 97m Level WIND ROSE January 1, 2015 through August 18, 2015**

Season/Month: Winter (Dec, Jan, Feb)  
Run Date: 10/14/2015 9:04:23 AM



**Figure 25 Celia 97m Level WIND ROSE Winter 2015**

Season/Month: Spring (Mar, Apr, May)  
Run Date: 10/14/2015 9:04:50 AM

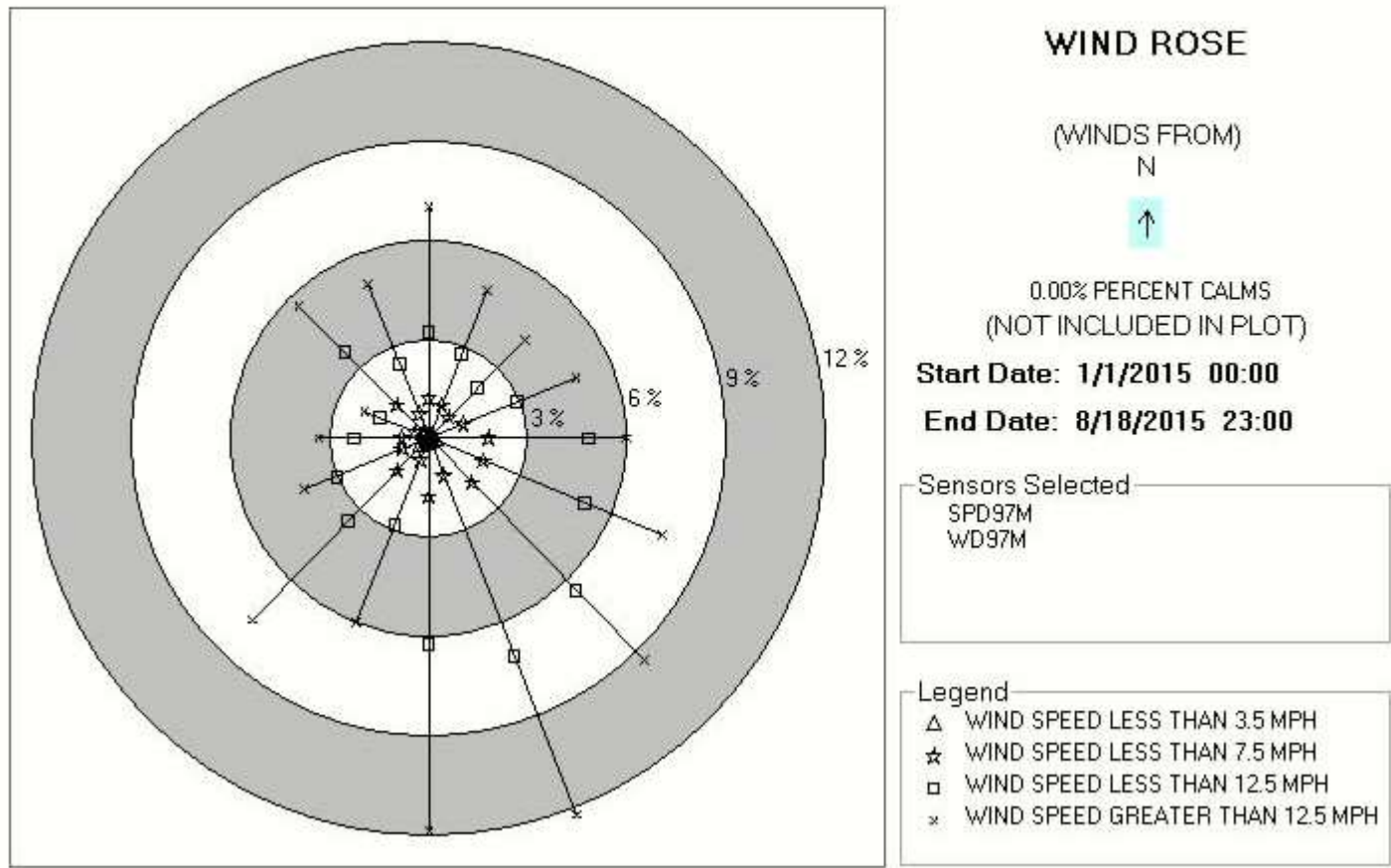
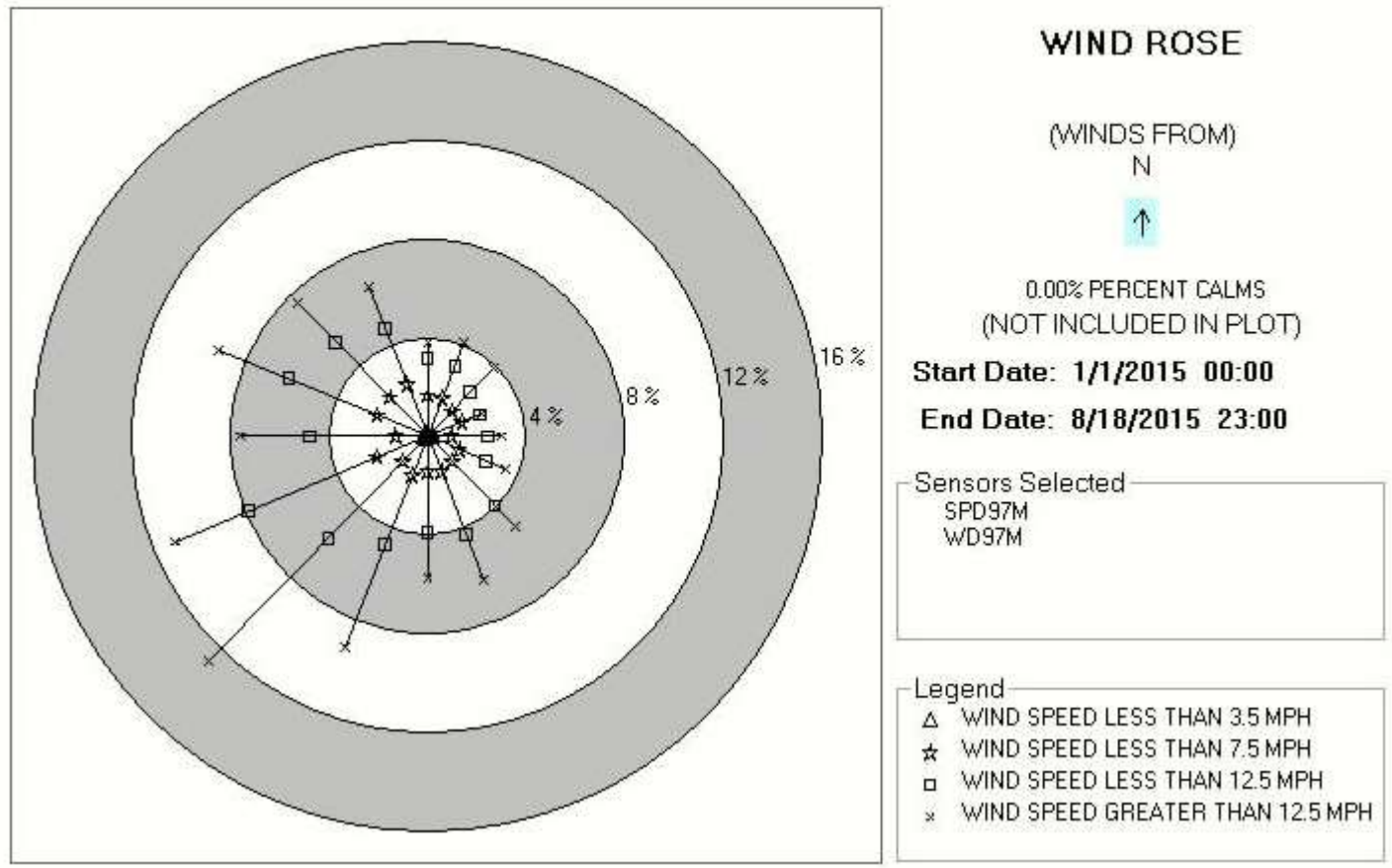


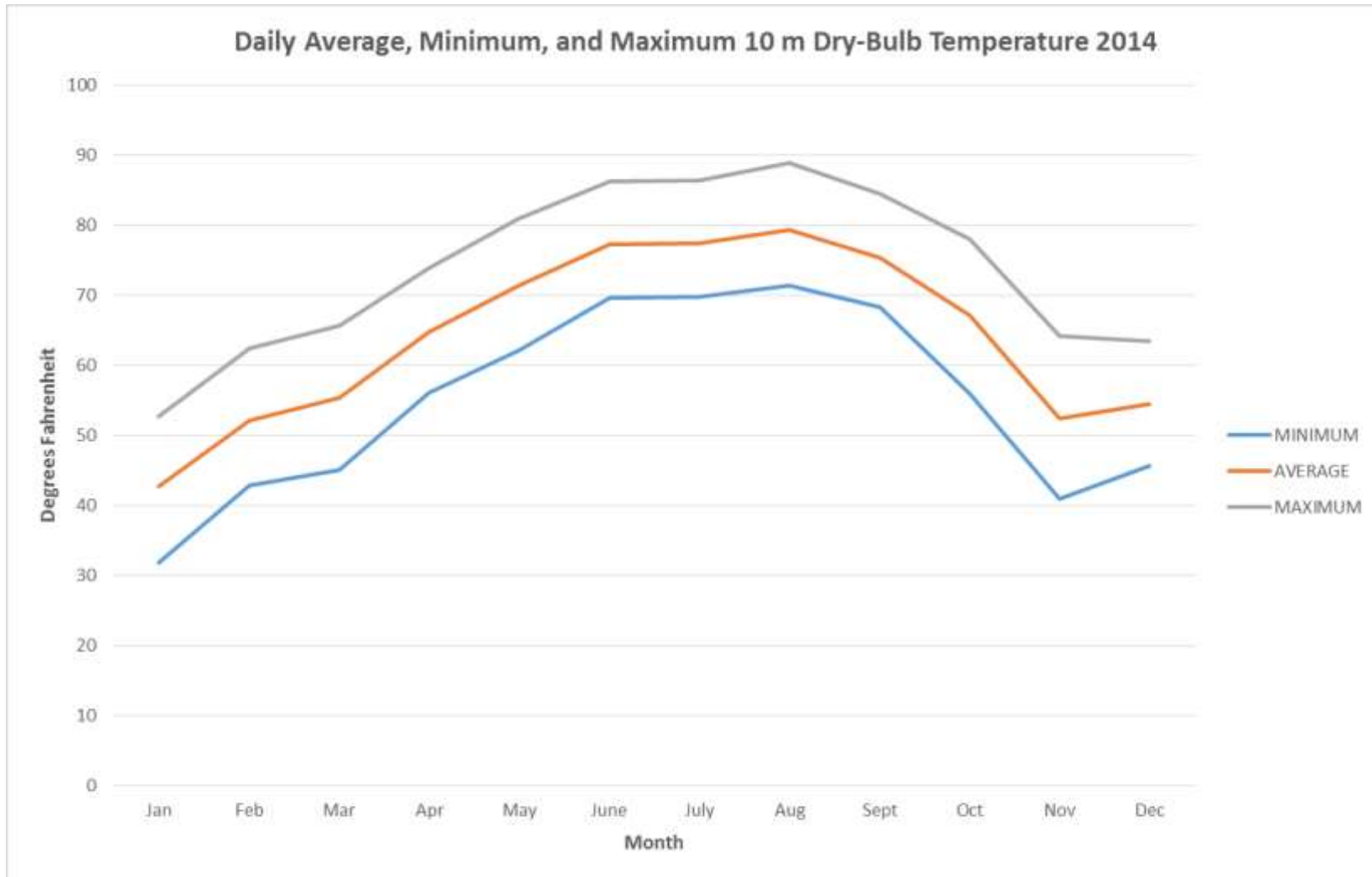
Figure 26 Celia 97m Level WIND ROSE Spring 2015



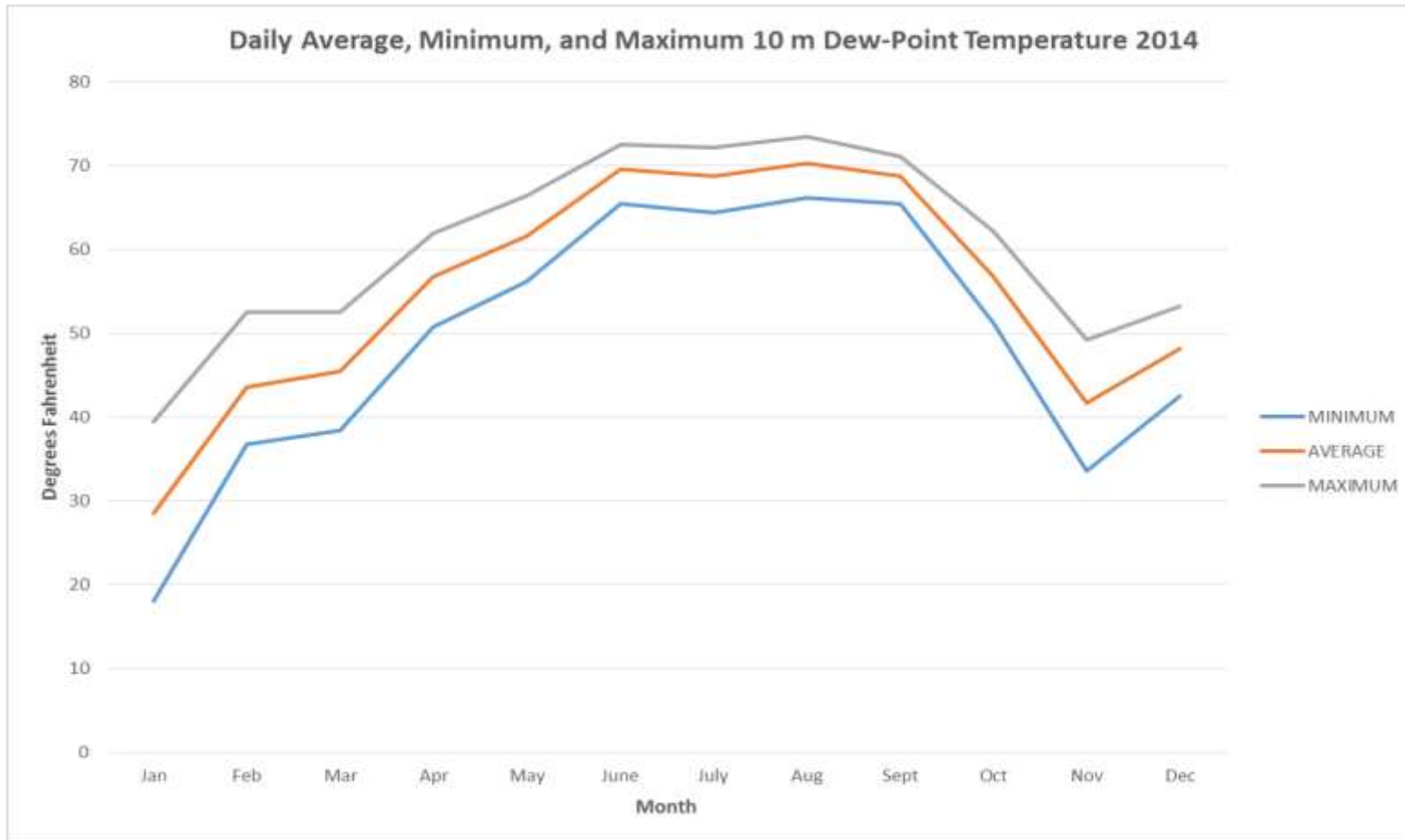
Season/Month: Summer (June, July, Aug)  
Run Date: 10/14/2015 9:07:33 AM



**Figure 27 Celia 97m Level WIND ROSE Summer 2015**



**Figure 28 Daily Average, Minimum, and Maximum 10 m Dry-Bulb Temperature 2014**



**Figure 29 Daily Average, Minimum, and Maximum 10 m Dew-Point Temperature 2014**

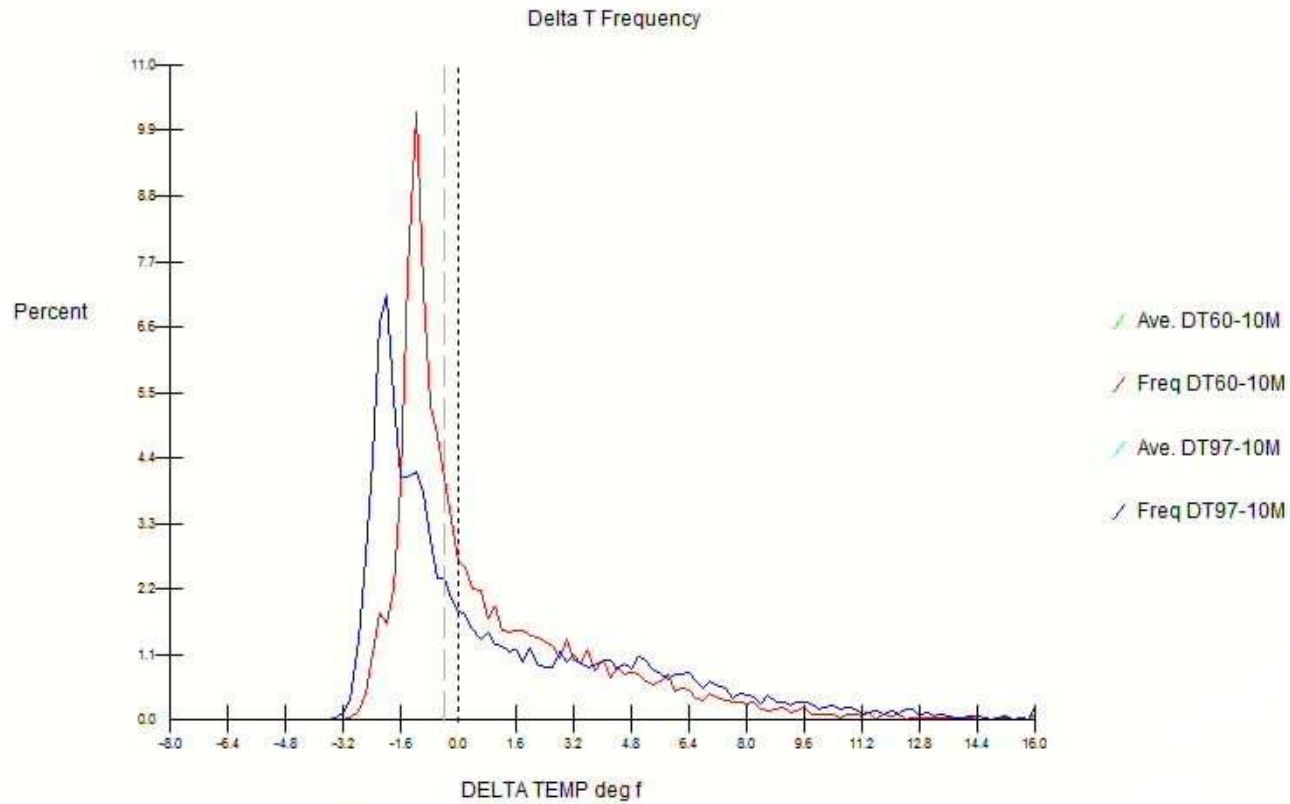
<input checked="" type="checkbox"/>	DT60-10M
<input checked="" type="checkbox"/>	DT97-10M
<input type="checkbox"/>	DT97-60M

Enter Date of Trend Plot:

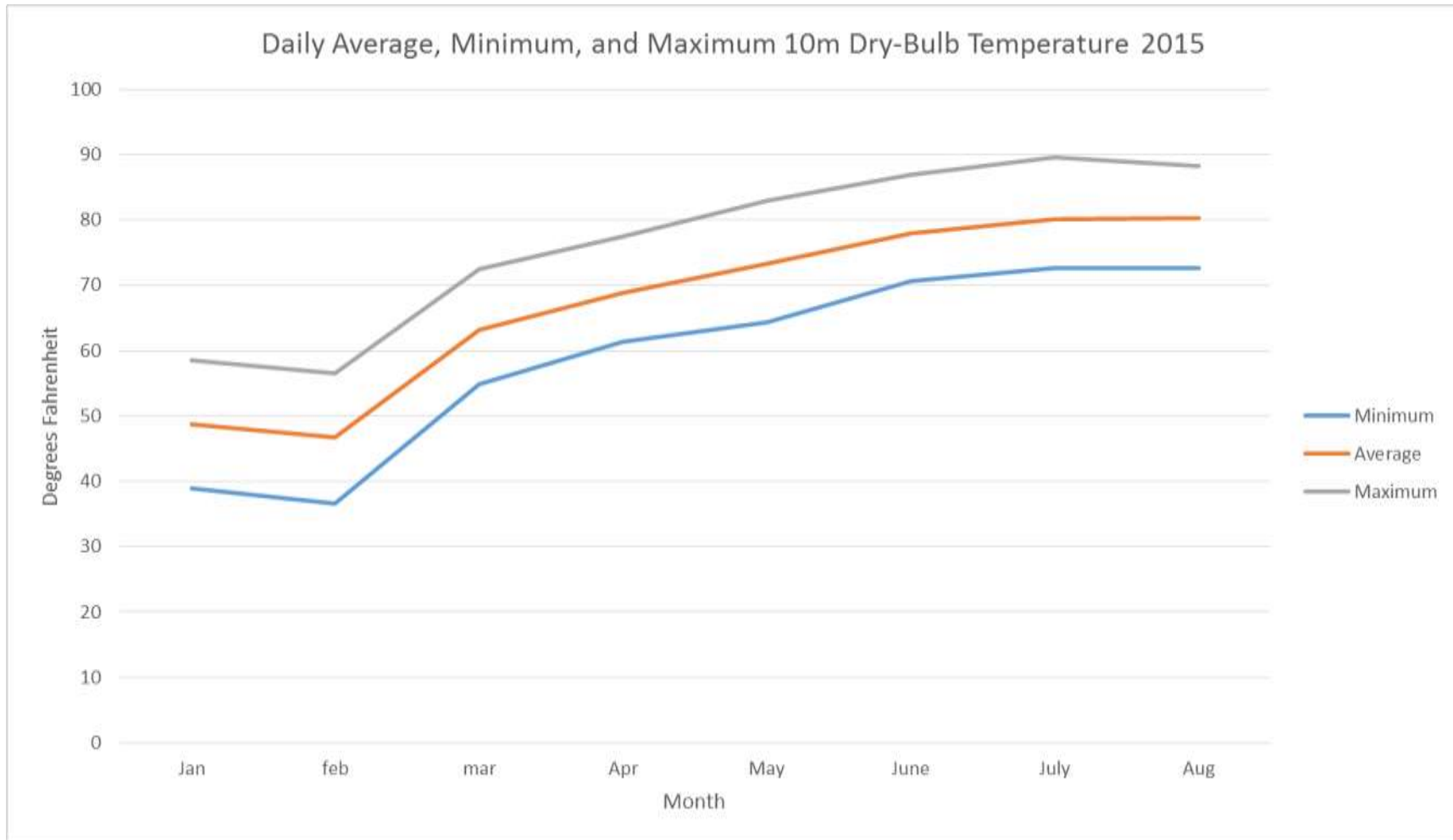
1 / 1 / 2014	00:00
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Enter End Date

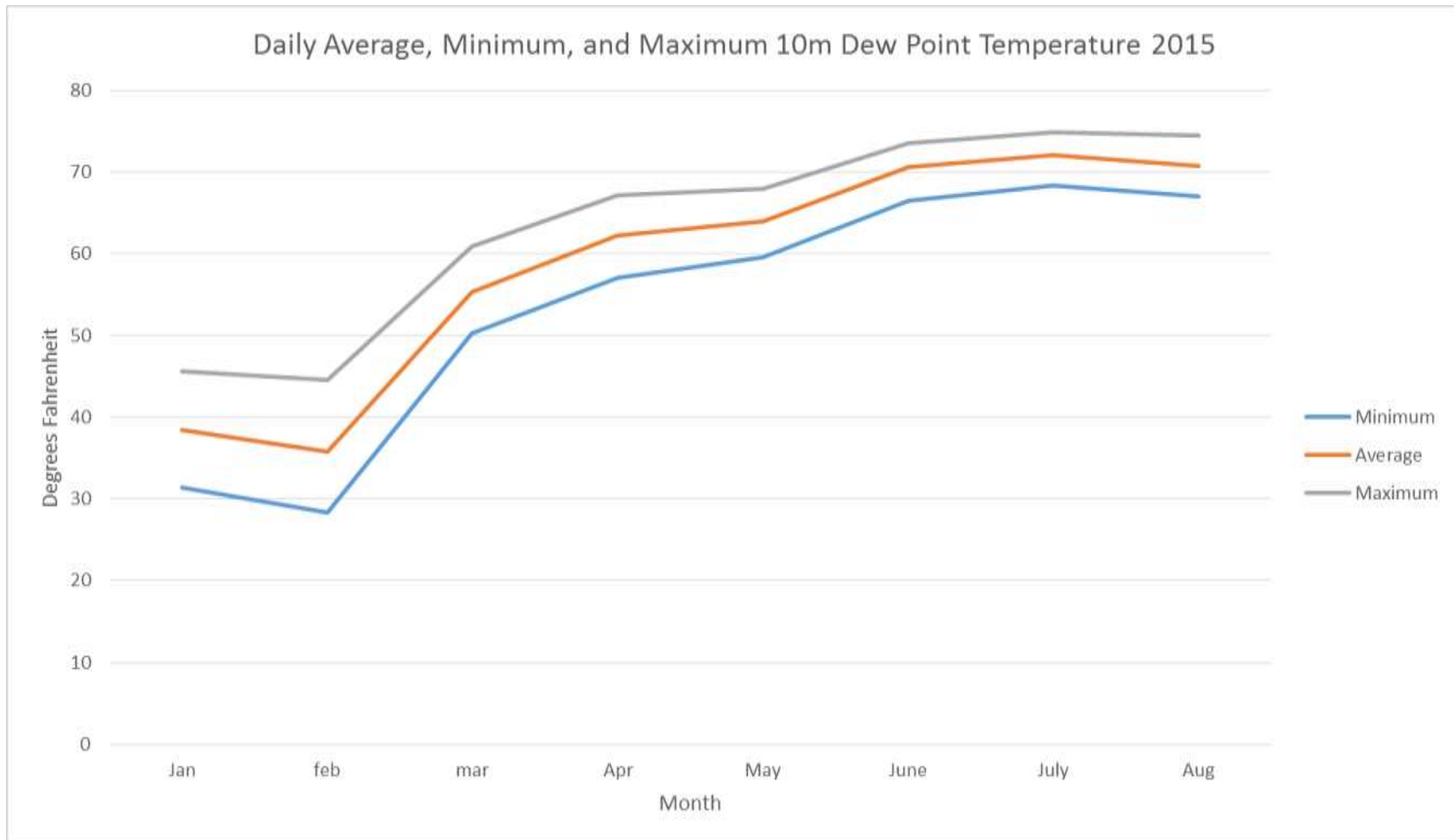
12/31/2014	23:00
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**Figure 30 Delta Temperature Frequency 60-10 m and 97-10 m, 2014**



**Figure 31 Daily Average, Minimum, and Maximum 10 m Dry-Bulb Temperature 2015**



**Figure 32 Daily Average, Minimum, and Maximum 10 m Dew-Point Temperature 2015**

<input checked="" type="checkbox"/>	DT60-10M
<input checked="" type="checkbox"/>	DT97-10M
<input type="checkbox"/>	DT97-60M

Enter Date of Trend Plot:

1 / 1 / 2015	00:00
Enter End Date	
8 / 18 / 2015	23:00

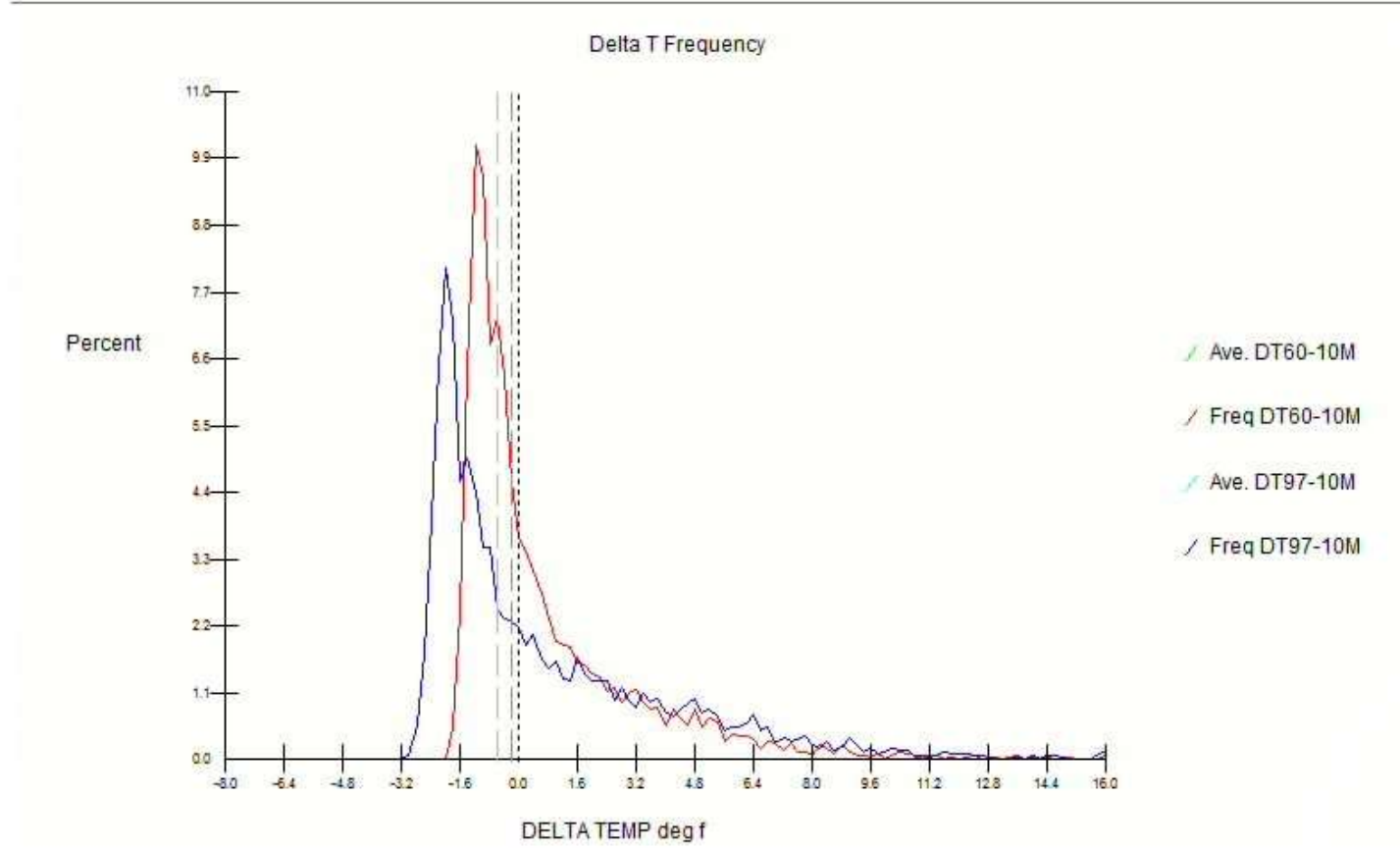


Figure 33 Delta Temperature Frequency 60-10 m and 97-10 m, 2015