

## Appendix S

### Justification for Use of 15 Years of Scottsbluff's Meteorological Data

The regression analyses for wind parameters at the Scottsbluff meteorological station are repeated below with p-values as requested in NRC Comment #4 a). As seen in **Figure S-1**, the wind direction correlation produced a very high coefficient of determination, or  $R^2$ . In the wind direction regression analysis below, the p-value of 0.000 indicates virtually no chance that this  $R^2$  value is accidental. In other words, the 1-year distribution of wind directions is strongly correlated with the 15-year distribution, to a high degree of confidence.

#### Scottsbluff Regression Analysis: 15-Year Directions versus 1-Year Directions

The regression equation is:

$$15\text{-Year Directions} = 0.006077 + 0.9028 \quad 1\text{-Year Directions}$$

$$S = 0.00689141 \quad R\text{-Sq} = 97.5\% \quad R\text{-Sq(adj)} = 97.4\%$$

##### Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	0.0262411	0.0262411	552.54	0.000
Error	14	0.0006649	0.0000475		
Total	15	0.0269060			

In similar fashion, the wind speed correlation produced a very high coefficient of determination (**Figure S-2**). The p-value of 0.001 shown in the regression analysis below indicates a 99.9% confidence that this  $R^2$  value is not accidental. In other words, the 1-year distribution of wind speeds is strongly correlated with the 15-year distribution, to a high degree of confidence.

#### Scottsbluff Regression Analysis: 15-Year Speeds versus 1-Year Speeds

The regression equation is:

$$15\text{-Year Speeds} = 0.00959 + 0.9425 \quad 1\text{-Year Speeds}$$

$$S = 0.0321279 \quad R\text{-Sq} = 94.8\% \quad R\text{-Sq(adj)} = 93.5\%$$

##### Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	0.0748612	0.0748612	72.53	0.001
Error	4	0.0041288	0.0010322		
Total	5	0.0789900			

In response to NRC Comment #4 b), hourly wind data were retrieved from the Chadron airport meteorological station. **Figures S-3 and S-4** illustrate strong similarities between the baseline year and the 12-year period from 2001 through 2012.

The similarities in **Figures S-5 and S-6** are further illustrated by comparing the bar graphs of wind direction and wind speed distributions between the baseline year and the 12-year period (**Figures S-5 and S-6**).

The regression analyses for wind parameters at the Chadron meteorological station are presented below with p-values as requested in NRC Comment #4 a). **Figure S-7** shows the wind direction correlation produced a very high coefficient of determination, or  $R^2$ . As seen in the regression analysis below, the p-value of 0.000 indicates virtually no chance that this  $R^2$  value is accidental. In other words, the 1-year distribution of wind directions is strongly correlated with the 12-year distribution, to a high degree of confidence.

### **Chadron Regression Analysis: 12-Year Directions versus 1-Year Directions**

The regression equation is:

$$12\text{-Year Directions} = 0.002237 + 0.9618 \quad 1\text{-Year Directions}$$

$$S = 0.00685647 \quad R\text{-Sq} = 95.8\% \quad R\text{-Sq}(\text{adj}) = 95.5\%$$

#### Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	0.0160024	0.0160024	340.39	0.000
Error	15	0.0007052	0.0000470		
Total	16	0.0167075			

In similar fashion, the wind speed correlation for Chadron produced a very high coefficient of determination (**Figure S-8**). The p-value of 0.000 shown in the regression analysis below indicates virtual certainty that this  $R^2$  value is not accidental. In other words, the 1-year distribution of wind speeds is strongly correlated with the 12-year distribution, to a high degree of confidence.

### **Chadron Regression Analysis: 12-Year Speeds versus 1-Year Speeds**

The regression equation is:

$$12\text{-Year Speeds} = - 0.00580 + 1.04 \quad 1\text{-Year Speeds}$$

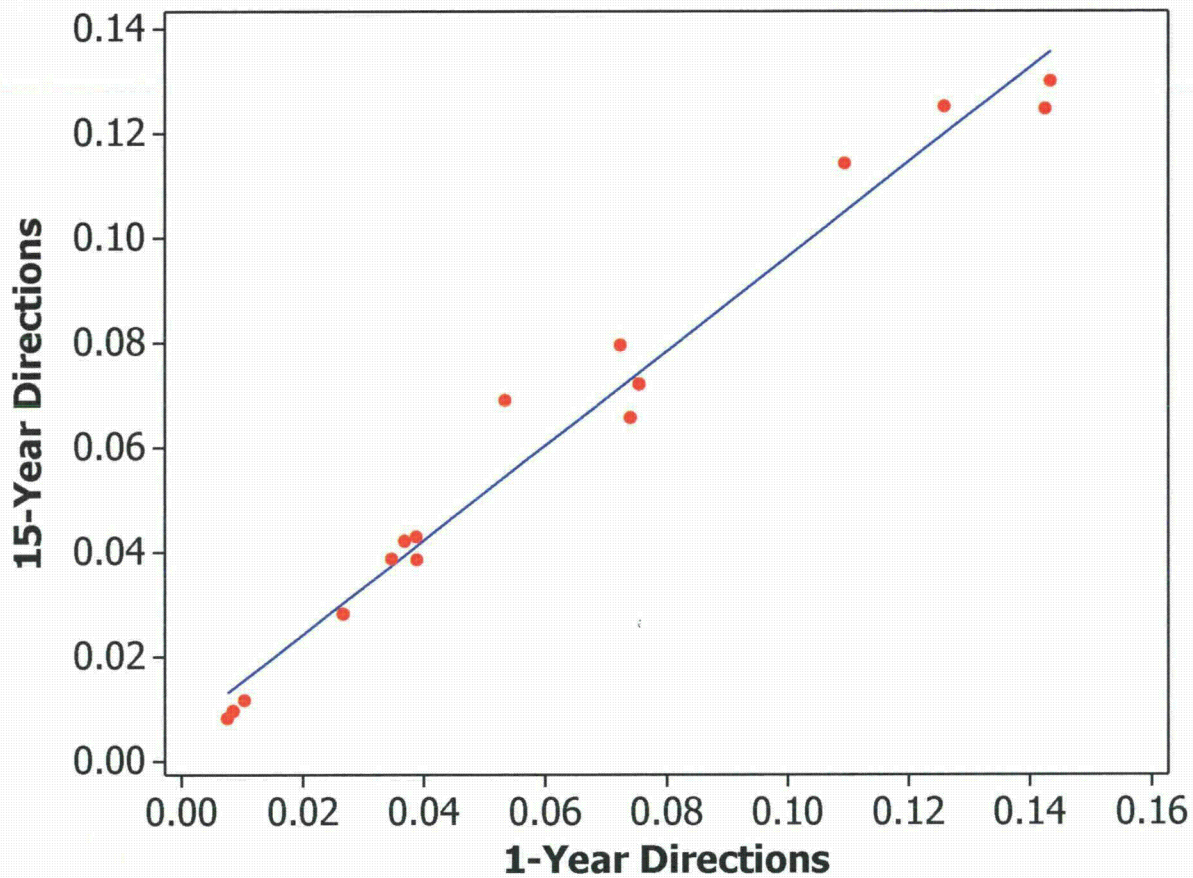
$$S = 0.0146045 \quad R\text{-Sq} = 98.2\% \quad R\text{-Sq}(\text{adj}) = 97.9\%$$

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	0.0590527	0.0590527	276.86	0.000
Error	5	0.0010665	0.0002133		
Total	6	0.0601191			

### Fitted Line Plot

$$15\text{-Year Directions} = 0.006077 + 0.9028 \text{ 1-Year Directions}$$



S	0.0068914
R-Sq	97.5%
R-Sq(adj)	97.4%

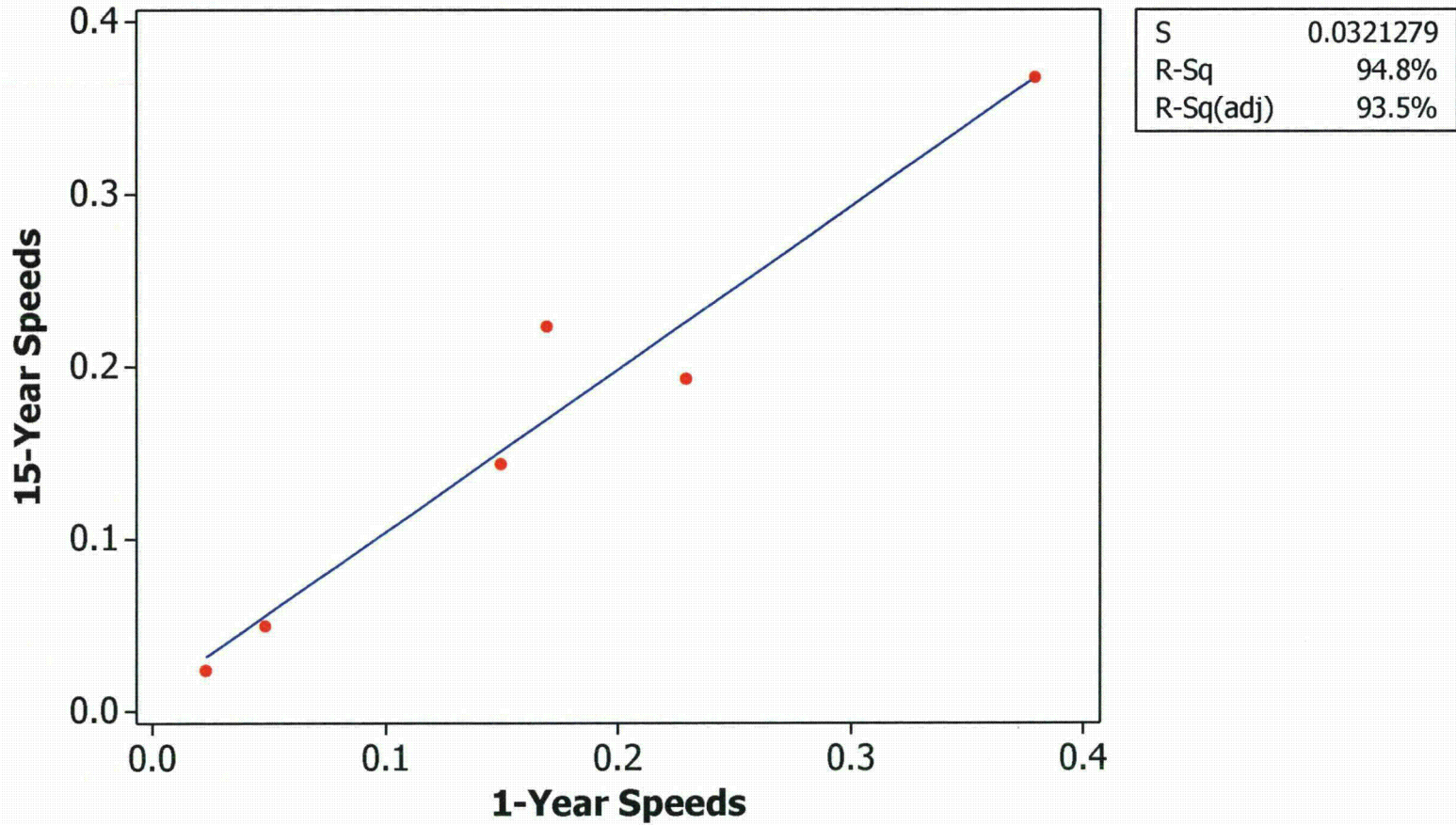


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**FIGURE S-1**  
**FIGURE TITLE?**

### Fitted Line Plot

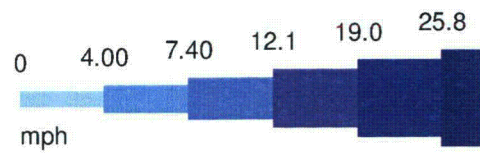
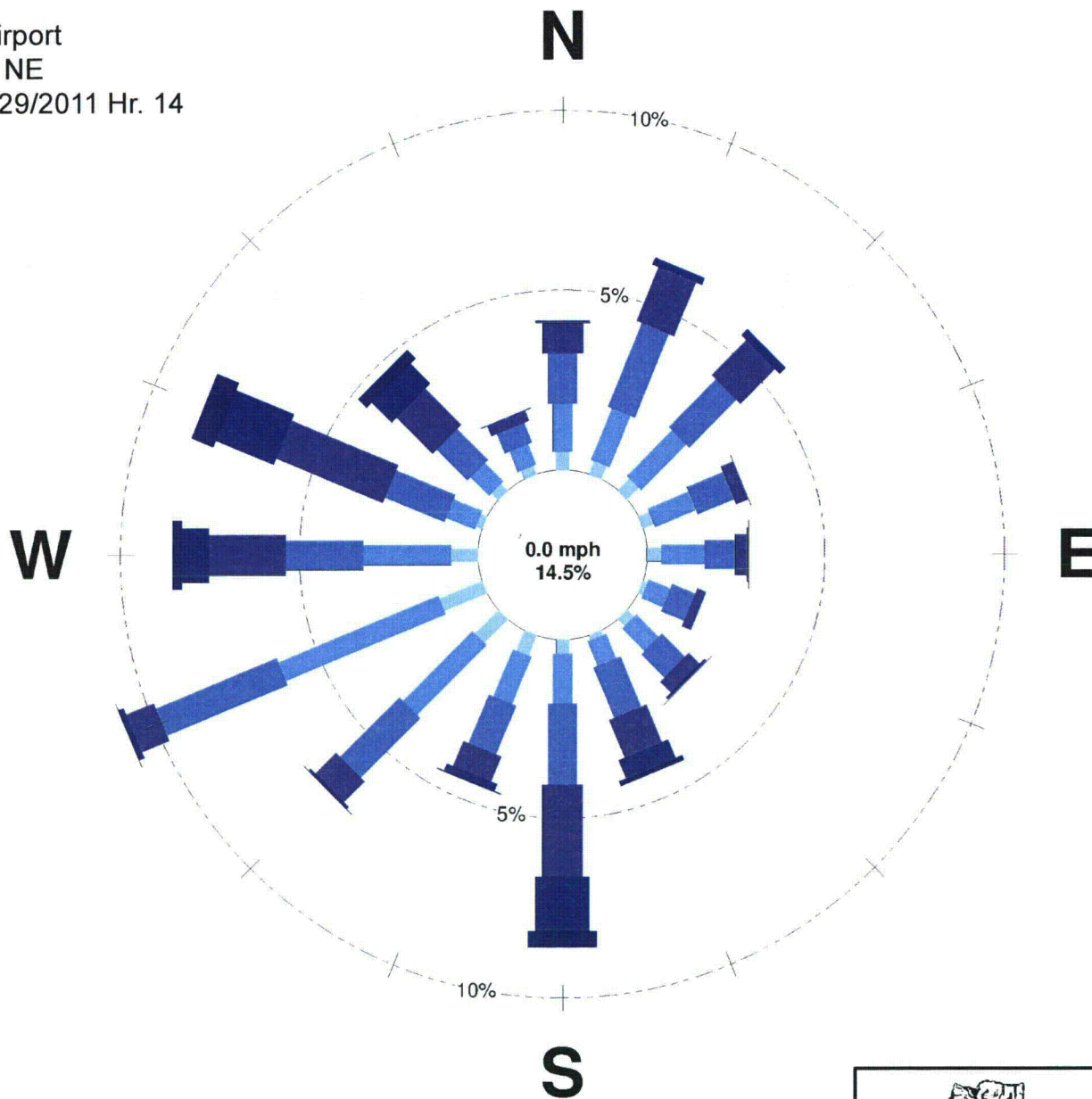
$$15\text{-Year Speeds} = 0.00959 + 0.9425 \text{ 1-Year Speeds}$$



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**FIGURE S-2**  
**FIGURE TITLE?**

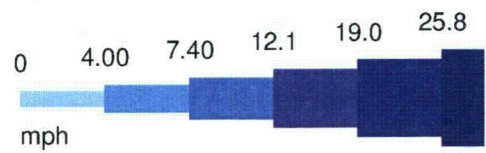
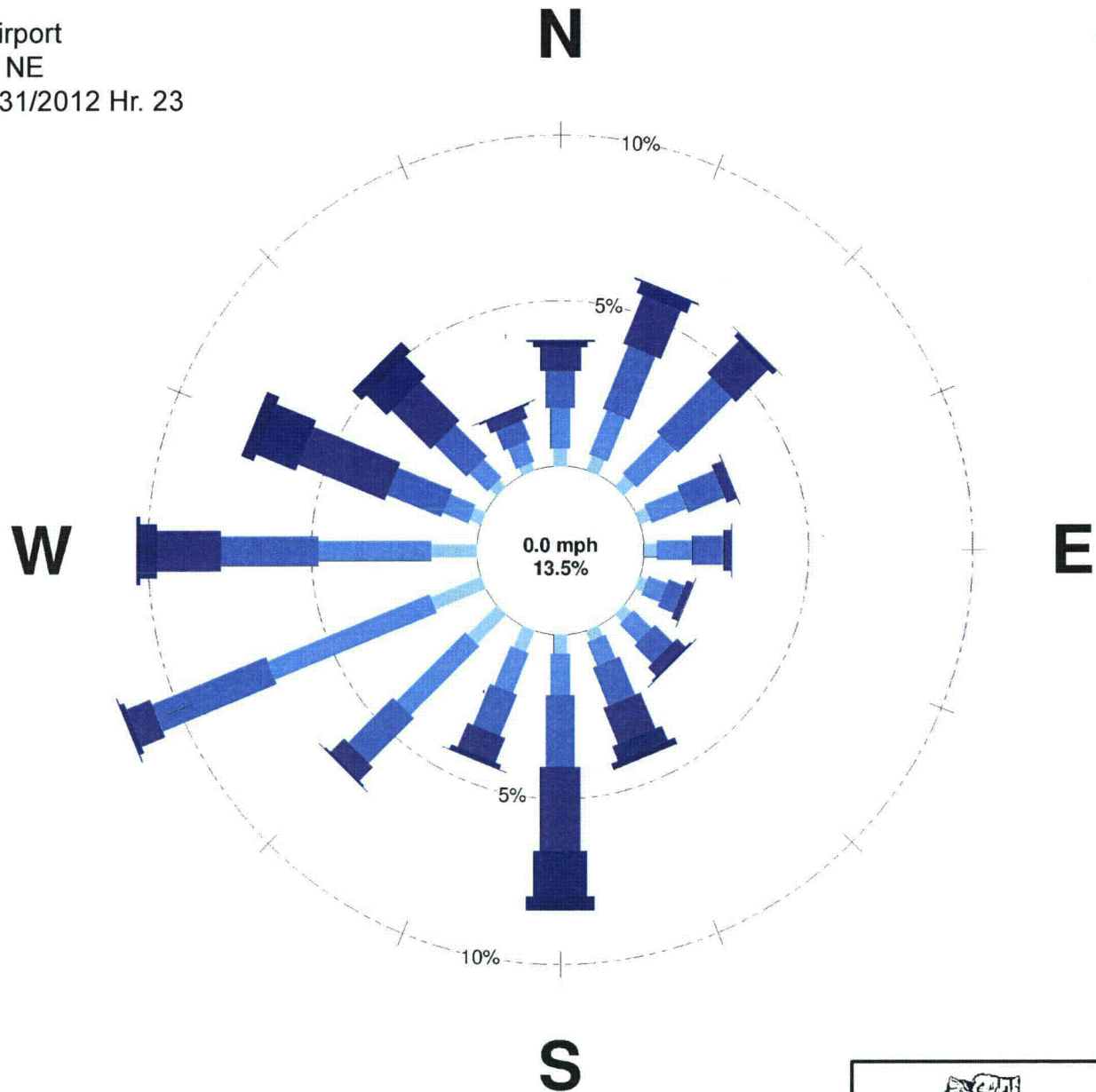
Chadron Airport  
 Chadron, NE  
 8/24/2010 Hr. 2 to 8/29/2011 Hr. 14



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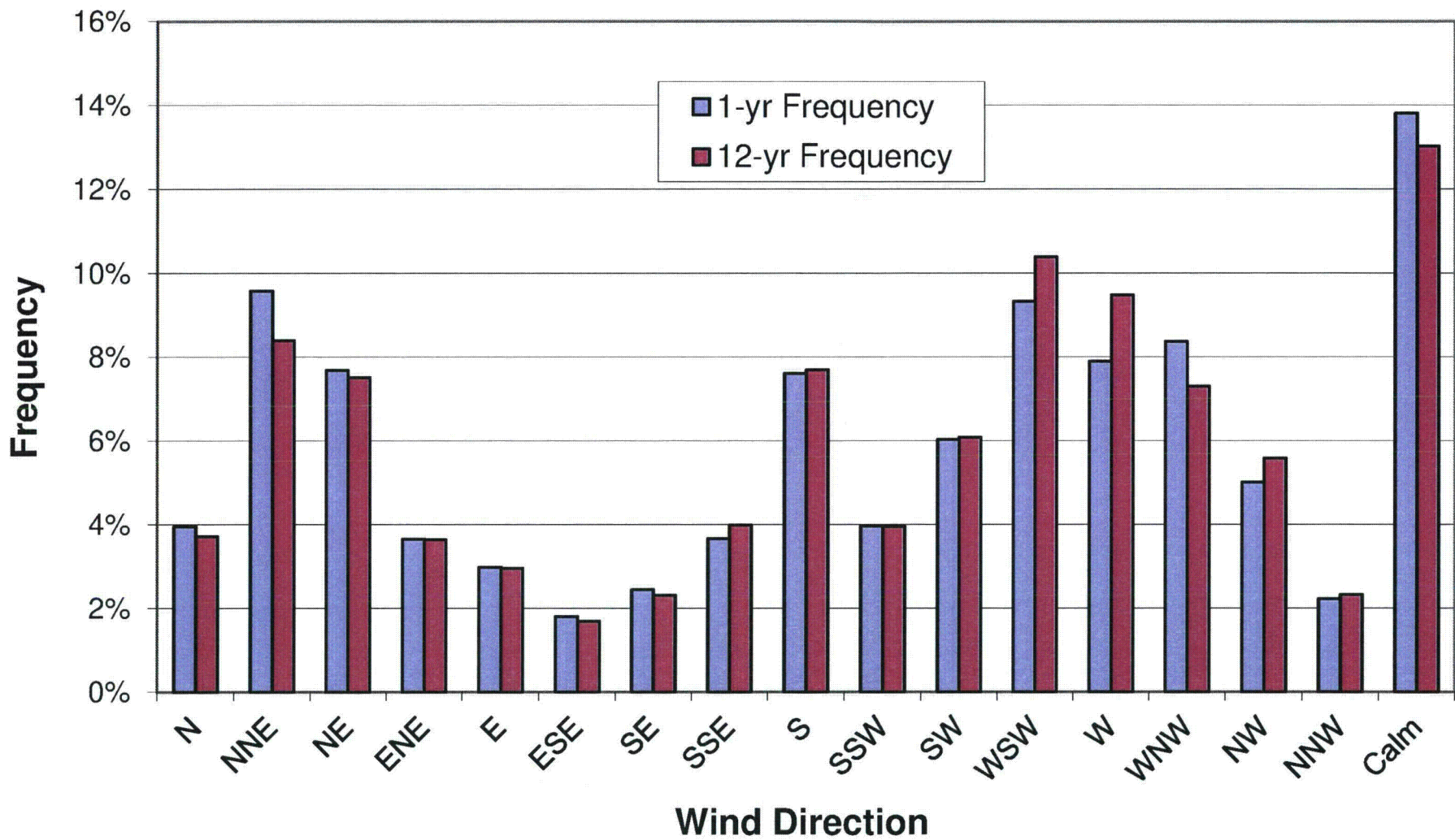
**FIGURE S-3**  
**BASELINE-YEAR WIND ROSE**  
**CHADRON AIRPORT**

Chadron Airport  
 Chadron, NE  
 1/1/2001 Hr. 1 to 12/31/2012 Hr. 23



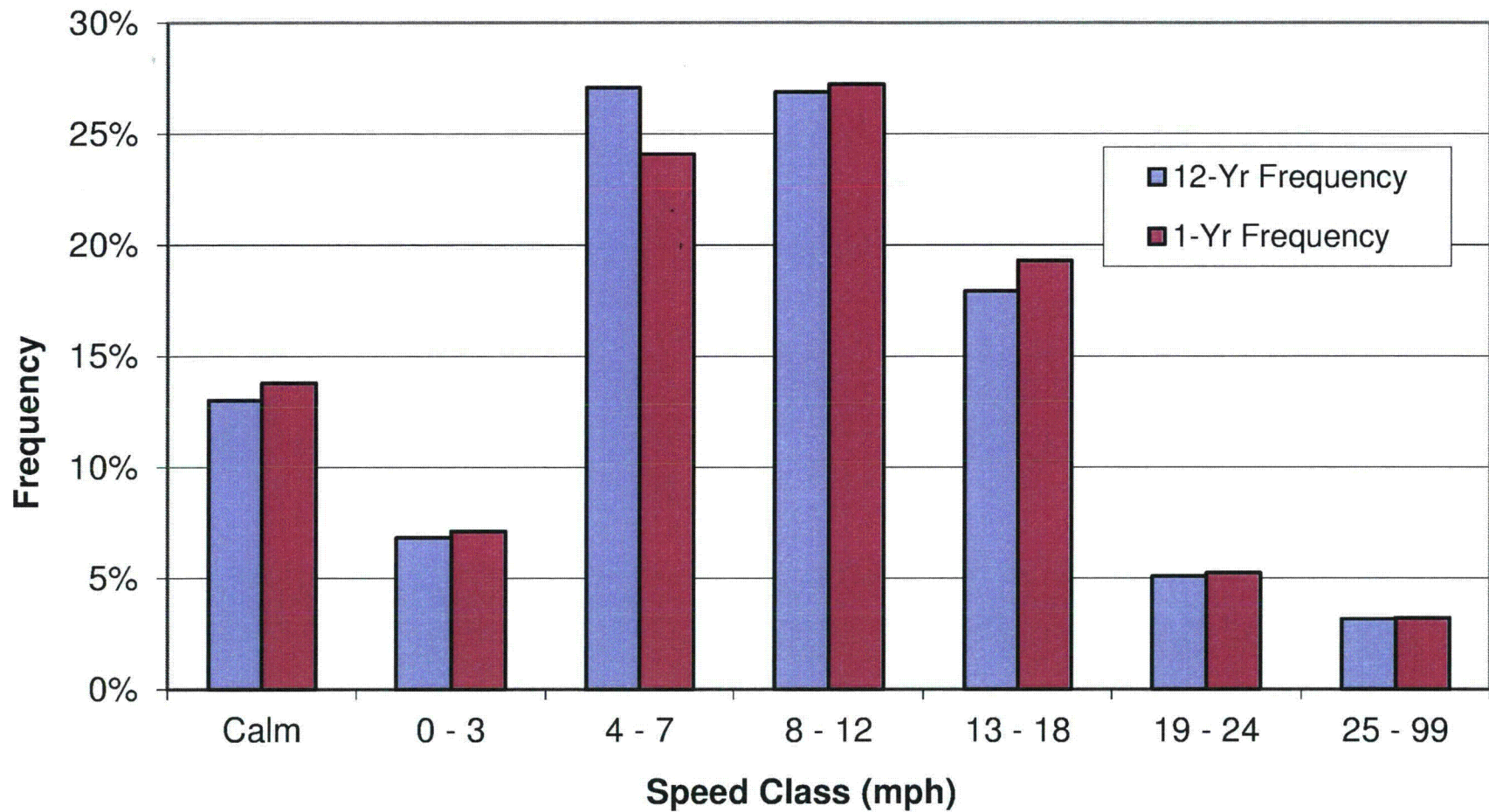
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**FIGURE S-4**  
**12-YEAR WIND ROSE**  
**CHADRON AIRPORT**



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**FIGURE S-5**  
**CHADRON AIRPORT**  
**WIND DIRECTION DISTRIBUTION**

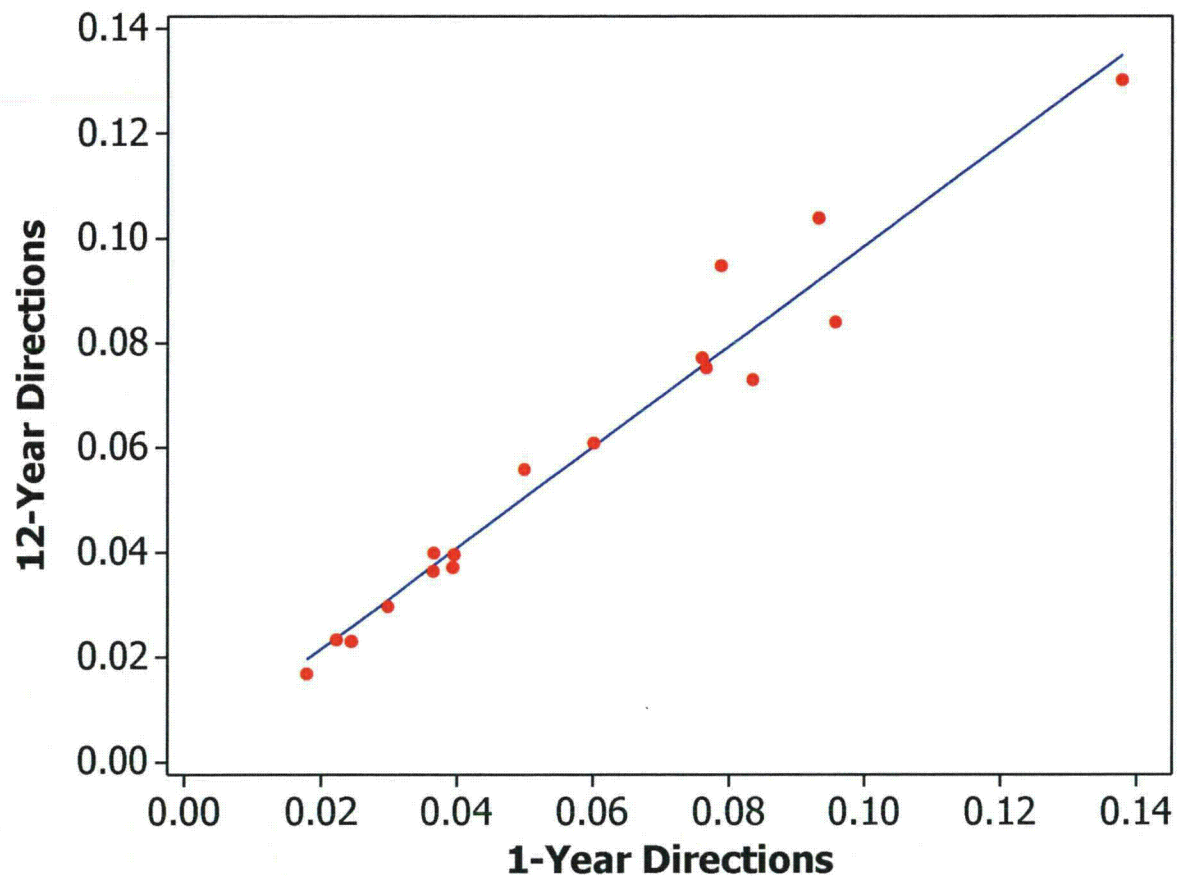


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**FIGURE S-6**  
**CHADRON AIRPORT**  
**WIND SPEED DISTRIBUTION**

### Fitted Line Plot

$$12\text{-Year Directions} = 0.002237 + 0.9618 \text{ 1-Year Directions}$$



S	0.0068565
R-Sq	95.8%
R-Sq(adj)	95.5%

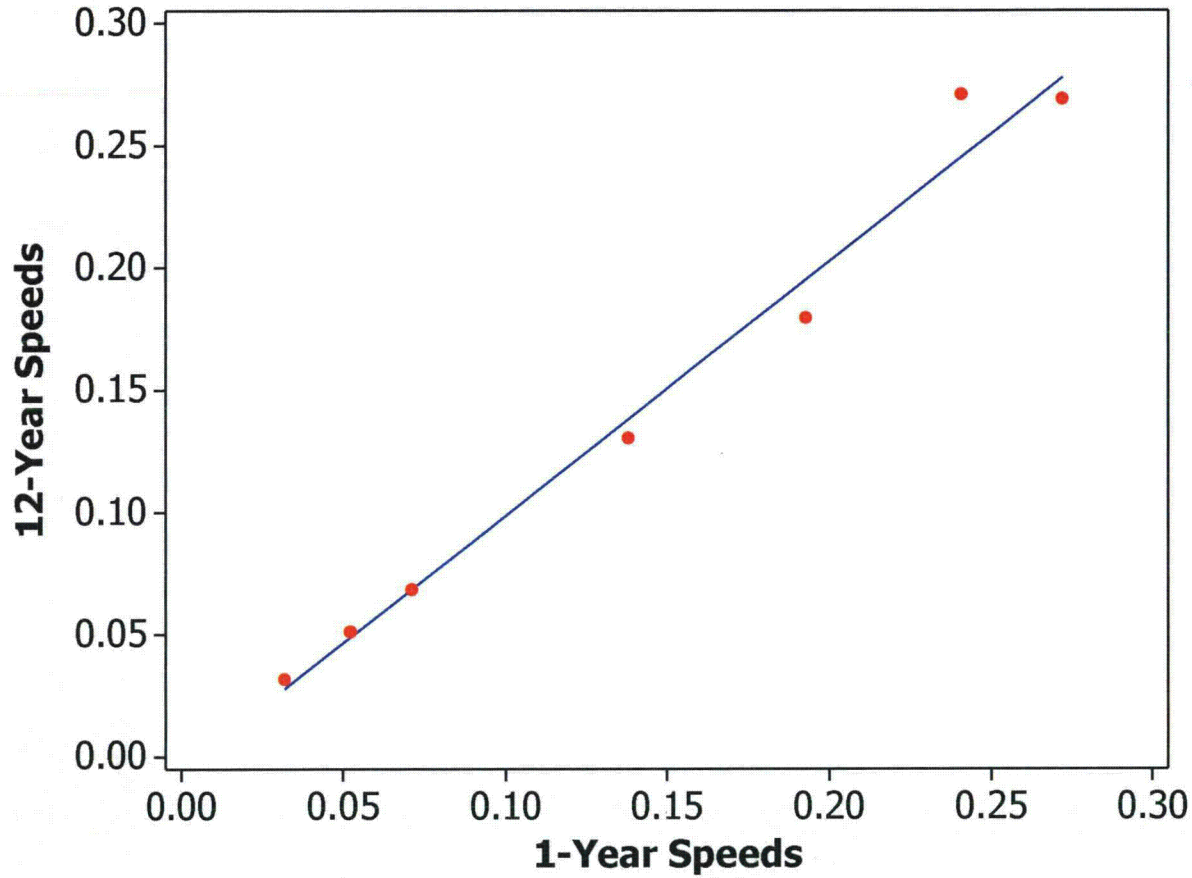


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**FIGURE S-7**  
**FIGURE TITLE?**

### Fitted Line Plot

$$12\text{-Year Speeds} = -0.00580 + 1.041 \text{ 1-Year Speeds}$$



S	0.0146045
R-Sq	98.2%
R-Sq(adj)	97.9%



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**FIGURE S-8**  
**FIGURE TITLE?**