

Appendix F

Ship Drift Analysis *West Coast of North America: Alaska to Southern California* HAZMAT Report 2000-2; April 2000

2.2 Drift Factors

When its propulsion or steering device fails, a ship will drift due to the combined effects of the wind, waves, current, trim, and ballast. Tanker drift data has been studied with theory and models (Holder et al. 1981; Lewison et al. 1981; Smeaton 1981). These models can be quite complicated with a large scatter in predictions based upon variations in ship size, shape, orientation, list, degree of loading, and other parameters. Ship drift factors are also important in U.S. Coast Guard search and rescue operations (USCG 1991), where tables relating drift speed and angles for different vessels and environmental conditions are tabulated.

In addition to theoretical and test tank studies, industry records and questionnaires provide solid empirical information for defining bounds to the problem. For example, Holder et al. (1981) summarized an Oil Companies International Marine Forum study that sent a questionnaire to member companies and members of the International Chamber of Shipping. A total of 196 evaluation periods using 47 ships were used in the study. From the questionnaire returns, the direction and rate of the ship drift could be determined. Then, by subtracting current vectors, the drift due to wind and wave forces for up to six hours at a stretch could be estimated. The ships were divided into categories by size and load type. Smaller vessels were considered less than 200,000 tons summer dead weight (SDWT). Larger vessels or very large carrying capacity (VLCC) are greater than 200,000 SDWT. The vessels were considered fully loaded or carrying ballast.

Figures 2 and 3 show the results for a fully loaded and ballasted VLCC (> 200,000 SDWT). There is a loose linear relationship between ship drift speed and wind speed, with the ship drift generally bounded between 2 percent to 10 percent of the wind speed.

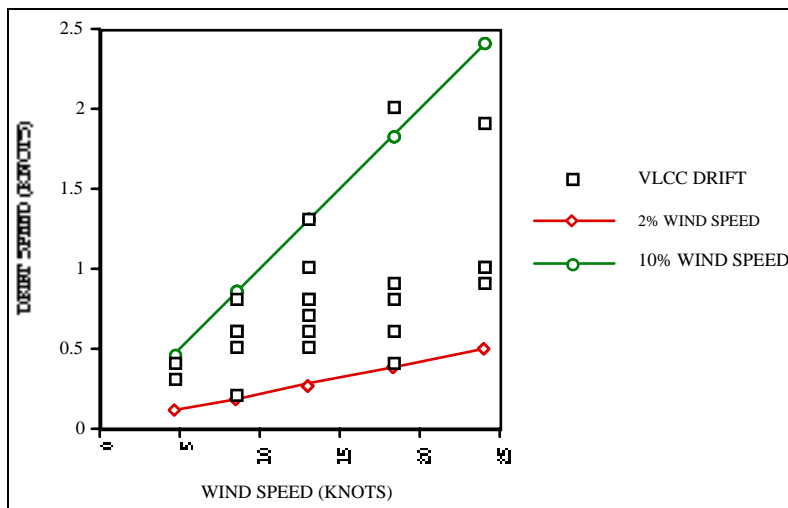


Figure 2. Plot of drift speed and wind speed for loaded VLCC.

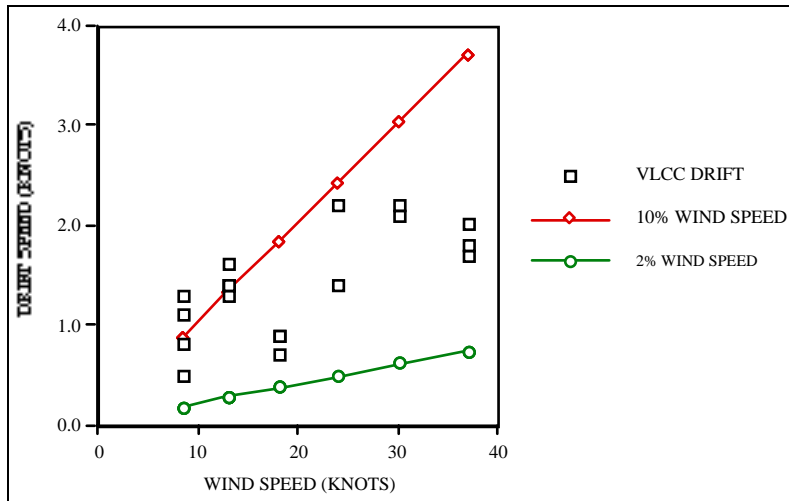


Figure 3. Plot of drift speed and wind speed for ballasted VLCC.

Figures 4 and 5 show the plot of the drift speed and wind speed for small vessels (< 200,000 SDWT). Again, the ship drift is generally bounded between 2 percent to 10 percent of the wind speed.

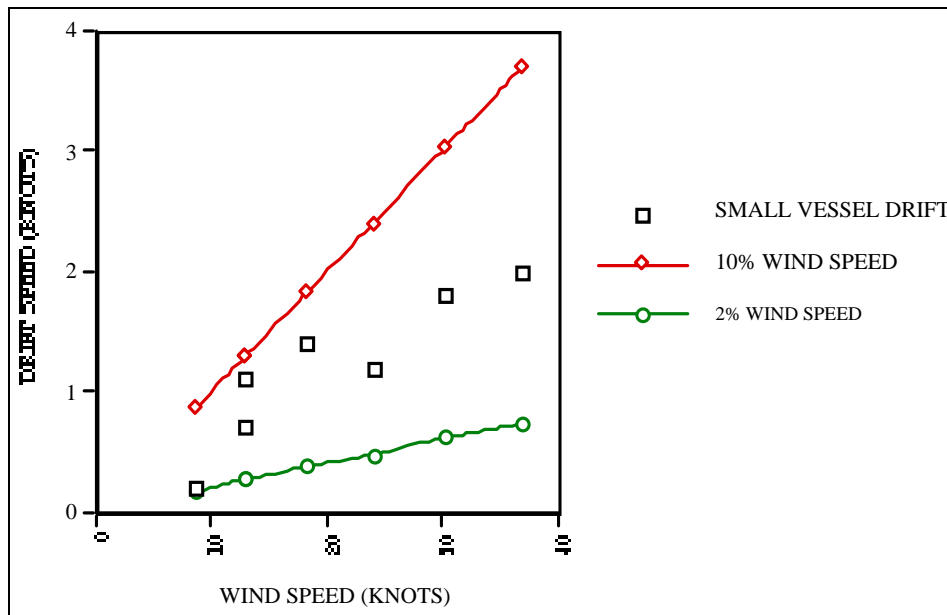


Figure 4. Plot of drift speed and wind speed for loaded small vessel.

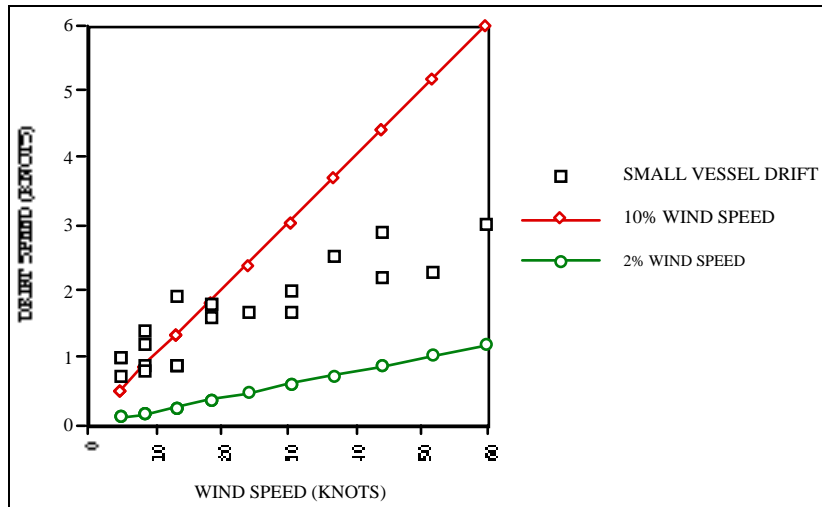


Figure 5. Plot of drift speed and wind speed for ballasted small vessel.

The ships do not generally drift straight downwind, but show a drift angle to the wind. This drift angle can vary 60 degrees or more to the right or left. A similar maximum drift angle is reported in USCG (1991). Based on data from Holder et al. (1981), there does not seem to be a clear relationship between the choice of drift angle and wind speed, ship size or degree of loading. Figures 6 and 7 show a plot of the absolute value of the drift angle and wind speeds for both large and small loaded vessels and ballasted vessels.

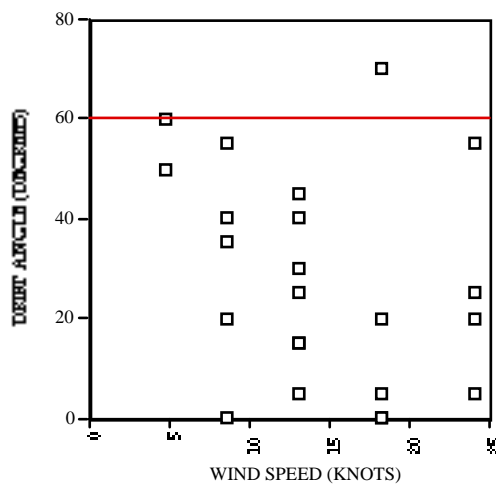


Figure 6. Plot of drift angle (absolute value) and wind speed for loaded vessel.

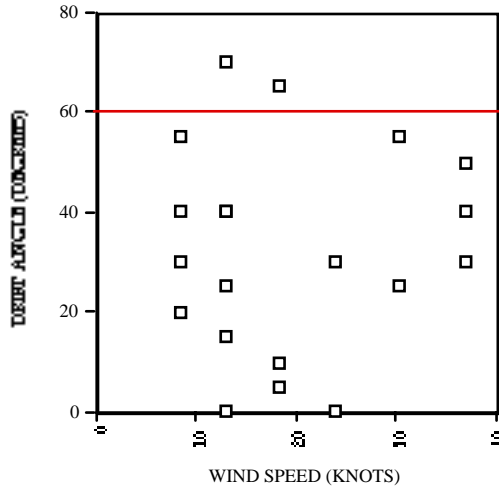


Figure 7. Plot of drift angle (absolute value) and wind speed for ballasted vessel.

Since this study is not designed for any particular ship or configuration, it seemed best to consider a range of choices for drift factors. Lacking specific knowledge of a particular ship configuration, the entire set of results can be used. Where the drift factors are known for a specific case, the appropriate subset can be selected.

SHIP DRIFT TABLES

The final ship drift tables were computed by assuming that the ship would drift at a percentage of the wind speed. For example, if the average onshore wind speed is 11 knots and the windage on the ship is 10 percent, then the wind would move the ship toward shore at 10 percent of 11 knots or 1.1 knots.

The onshore ship drift tables for the five representative wind stations are presented as follows.

Middleton Island, Alaska (61° 9.5' N, 150° 6.8' W)

Windage ¹	Average Drift ² (knots)	Worst Case Drift ³ (knots)
10%	1.1	4.0
8%	.8	3.2
6%	.7	2.4
4%	.4	1.6
2%	.2	.8

North of Vancouver Island, Canada (50° 52.0' N, 129° 55.0' W)

Windage ¹	Average Drift ² (knots)	Worst Case Drift ³ (knots)
10%	1.3	3.3
8%	1.0	2.6
6%	.9	2.0
4%	.5	1.3
2%	.3	.7

Columbia River Mouth, Washington-Oregon (46° 7.0' N , 124° 30.0'W)

Windage ¹	Average Drift ² (Knots)	Worst Case Drift ³ (knots)
10%	.8	4.0
8%	.6	3.2
6%	.5	2.4
4%	.3	1.6
2%	.2	.8

Off San Francisco, Northern California (37° 45.0' N, 122° 50.0' W)

Windage ¹	Average Drift ² (knots)	Worst Case Drift ³ (knots)
10%	1.3	3.3
8%	1.0	2.6
6%	.9	2.0
4%	.5	1.3
2%	.3	.7

Off Pt. Arguello, Southern California (34° 42.0' N , 120 58.0' W)

Windage ¹	Average Drift ² (knots)	Worst Case Drift ³ (knots)
10%	1.3	2.7
8%	1.0	2.2
6%	.9	1.6
4%	.5	1.1
2%	.3	.5

The columns in the table represent the percent of drift:

- 1 Percent of the wind used for computing the speed of drift
 - 2 Speed of drift for the average onshore wind condition
 - 3 Speed of draft for the worst case onshore wind condition
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References

Holder, L.A., J. Werkhoven, and G.F. Williams. 1981. Research on disabled tankers-operational and training implications. *Proceedings of the Symposium on the Behavior of Disabled Large Tankers*, held jointly by The Royal Institution of Naval Architects, The Royal Institute of Navigations, and The Nautical Institute, London, June 9 and 10, 1981, pp. 73-83.

Lewison, G.R.G. 1981. Experimental determination of wind, wave and drift forces on large tankers. *Proceedings of the Symposium on the Behavior of Disabled Large Tankers*, held jointly by The Royal Institution of Naval Architects, The Royal Institute of Navigations and The Nautical Institute, London, June 9 and 10, 1981, pp. 35-54.

NOAA. 1997. HAZMAT Report 97-3: Ship Drift Analysis for the Northwest Olympic Peninsula and the Strait of Juan de Fuca. Seattle: National Oceanic and Atmospheric Administration, Hazardous Materials Response and Assessment Division.

Smeaton, G.P. 1981. A mathematical model of the drift of disabled large tankers. Proceedings from the *Symposium on the Behavior of Disabled Large Tankers*, held jointly by The Royal Institution of Naval Architects, The Royal Institute of Navigations and The Nautical Institute, London, June 9 and 10, 1981, pp. 65-72.

U.S. Coast Guard. 1991. National Search and Rescue Manual, Volume I: National Search and Rescue System. Joint Pub 3-50 COMDTINST M16120.5A.

Please contact the Pacific States/BC Oil Spill Task Force office for copies of NOAA's statistical wind data in support of this material. Either write Jean Cameron at PO Box 1032, Neskowin, OR 97149-1032, or call 503-392-5860, or email JeanRCameron@oregoncoast.com.

STATISTICAL WIND DATA

Middleton Island Station

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7156
 WIND DIRECTION vs SPEED from raw station data

JAN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED	
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56			
N	.3	.3	.7	.9	.3	.3	.1	0.0	.0	.0	.0	.0	2.9	12.3
NNE	.4	.4	1.1	1.0	.2	.1	.0	.0	.0	.0	.0	.0	3.3	9.7
NE	.2	1.1	1.8	1.6	.4	.2	0.0	.0	.0	.0	.0	.0	5.4	10.3
ENE	.3	.9	1.6	1.7	.9	.3	.1	.1	.0	.0	.0	.0	5.9	12.1
E	.4	1.4	2.6	3.8	3.2	3.2	1.6	.9	.1	.0	.0	.0	17.2	17.7
ESE	.3	.6	1.4	3.7	2.5	2.6	1.3	.7	0.0	.0	.0	.0	13.1	18.5
SE	.3	.7	1.1	2.4	1.6	1.2	.3	.1	.0	.0	.0	.0	7.7	15.5
SSE	.3	.8	1.3	1.7	.8	.6	.2	.1	.0	.0	.0	.0	5.7	13.5
S	.3	1.4	2.1	2.4	.6	.3	.1	0.0	.0	.0	.0	.0	7.3	10.9
SSW	.3	.8	1.6	1.3	.2	.1	.0	.0	.0	.0	.0	.0	4.1	9.5
SW	.3	.9	1.3	1.2	.2	.1	.0	.0	.0	.0	.0	.0	4.0	9.4
WSW	.3	.9	1.5	1.3	.8	.4	.1	.0	.0	.0	.0	.0	5.2	11.8
W	.3	.6	2.0	2.6	1.6	.8	.4	.1	.0	.0	.0	.0	8.6	14.4
WNW	.2	.4	.9	1.0	.4	.2	.1	.1	.0	.0	.0	.0	3.3	13.0
NW	.1	.3	.5	.8	.2	.2	.1	0.0	.0	.0	.0	.0	2.2	12.9
NNW	.1	.4	.5	.9	.3	.4	.2	.1	.1	0.0	.0	.0	2.9	15.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	0	1.2	0
ALL	4.4	11.9	21.9	28.2	14.3	11.0	4.6	2.2	.3	0.0	.0	100.0	14.0	

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 6682
 WIND DIRECTION vs SPEED from raw station data

FEB

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED	
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56			
N	.5	.7	1.3	1.5	.8	.7	.2	.1	.0	.0	.0	.0	5.8	13.2
NNE	.4	1.1	2.1	2.2	.7	.2	0.0	0.0	.0	.0	.0	.0	6.8	10.8
NE	.5	1.8	3.0	2.5	1.2	.2	0.0	.0	.0	.0	.0	.0	9.1	10.4
ENE	.6	1.5	2.0	2.0	.9	.5	.1	.0	.0	.0	.0	.0	7.6	11.1
E	.5	1.6	2.9	3.6	2.2	2.5	1.0	.6	0.0	.0	.0	.0	14.9	15.9
ESE	.4	1.0	1.2	2.5	2.7	2.2	1.1	.3	0.0	.0	.0	.0	11.4	17.6
SE	.4	.5	1.2	2.4	1.1	.7	.3	.0	.0	.0	.0	.0	6.5	13.7
SSE	.3	.4	.8	1.1	.4	.3	.1	0.0	.0	.0	.0	.0	3.3	12.2
S	.6	1.0	1.8	1.5	.5	.2	0.0	.0	.0	.0	.0	.0	5.6	10.1
SSW	.4	.6	.9	1.1	.4	.1	.0	.0	.0	.0	.0	.0	3.4	10.2
SW	.3	.6	.7	.5	.2	.1	0.0	.0	.0	.0	.0	.0	2.6	9.5
WSW	.3	.4	.8	1.0	.5	.3	0.0	.0	.0	.0	.0	.0	3.4	11.8
W	.5	1.2	1.9	2.8	1.3	1.1	.5	.1	0.0	.0	.0	.0	9.4	14.1
WNW	.3	.3	.8	.9	.6	.3	.0	0.0	0.0	.0	.0	.0	3.3	12.6
NW	.2	.4	.4	.6	.3	.2	0.0	0.0	.0	.0	.0	.0	2.2	12.3
NNW	.2	.3	.7	1.0	.6	.5	.1	.1	0.0	.0	.0	.0	3.5	14.9
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	0	1.1	0
ALL	6.5	13.4	22.4	27.1	14.5	10.0	3.6	1.3	.1	.0	.0	100.0	13.1	

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7264
 WIND DIRECTION vs SPEED from raw station data

MAR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	.9	1.3	1.6	.4	.5	0.0	0.0	.0	.0	.0	5.5	11.1
NNE	.2	.9	1.1	1.4	.5	.3	0.0	0.0	.0	.0	.0	4.5	11.1
NE	.3	1.3	2.1	2.1	.9	.4	.1	.0	.0	.0	.0	7.2	11.5
ENE	.2	.7	2.0	2.3	.8	.5	.1	0.0	.0	.0	.0	6.7	12.4
E	.5	1.2	2.9	4.5	2.4	1.6	1.3	.4	0.0	.0	.0	14.8	15.6
ESE	.3	.6	1.5	3.1	2.2	1.7	1.4	.3	0.0	.0	0.0	11.2	17.6
SE	.4	.7	1.4	2.8	1.3	.7	.3	.1	.0	.0	.0	7.7	14.0
SSE	.3	.9	1.4	1.7	.6	.3	.1	.0	.0	.0	.0	5.3	11.4
S	.3	1.5	2.4	2.0	.4	.1	0.0	.0	.0	.0	.0	6.8	9.9
SSW	.2	.7	1.4	1.0	.2	0.0	0.0	.0	.0	.0	.0	3.6	9.2
SW	.3	.7	1.0	.7	.1	0.0	.0	.0	.0	.0	.0	2.9	9.0
WSW	.2	.7	.9	1.1	.5	.2	0.0	.0	.0	0.0	.0	3.6	11.3
W	.4	1.2	2.3	2.1	1.4	.6	.1	0.0	.1	0.0	.0	8.1	12.2
WNW	.3	.7	1.4	1.0	.5	.1	.1	0.0	0.0	0.0	.0	4.1	11.6
NW	.2	.4	.8	.4	.3	.3	.4	.3	.1	.0	.0	3.2	16.6
NNW	.4	.6	.6	.6	.7	.5	.2	0.0	.0	.0	.0	3.6	13.4
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	1.4	0
ALL	5.2	13.8	24.5	28.6	13.1	7.7	4.1	1.2	.2	0.0	0.0	100.0	12.9

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7386
 WIND DIRECTION vs SPEED from raw station data

APR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.4	1.0	1.1	.8	.1	0.0	.0	.0	.0	.0	.0	3.3	8.3
NNE	.3	.7	.8	.2	0.0	0.0	.0	.0	.0	.0	.0	2.0	7.4
NE	.3	1.0	1.8	1.4	.2	.1	0.0	.0	0.0	.0	.0	4.8	9.7
ENE	.3	1.1	2.3	2.3	.7	.3	.1	0.0	.0	.0	.0	7.2	11.2
E	.6	2.2	4.3	5.8	3.9	3.1	1.7	.5	.0	.0	.0	22.1	15.6
ESE	.3	1.3	2.6	4.8	3.7	2.1	1.2	.2	.0	.0	.0	16.2	15.9
SE	.4	.9	2.4	2.9	1.0	.6	.2	0.0	.0	.0	.0	8.4	12.5
SSE	.4	1.1	1.7	1.3	.3	.1	0.0	0.0	.0	.0	.0	5.0	9.6
S	.5	1.4	1.5	.9	.1	0.0	.0	.0	.0	.0	.0	4.4	7.9
SSW	.3	.9	.6	.3	.1	.0	.0	.0	.0	.0	.0	2.1	6.7
SW	.2	.4	.4	.2	.1	0.0	.0	.0	.0	.0	.0	1.3	7.7
WSW	.3	.6	.8	.6	.4	.2	.1	.0	.0	.0	.0	3.0	11.2
W	.8	2.1	3.2	3.3	.8	.3	.1	0.0	.0	.0	.0	10.7	10.2
WNW	.2	.8	1.3	.9	.5	.1	0.0	.0	.0	.0	.0	3.8	10.1
NW	.3	.5	.6	.4	.1	.0	0.0	0.0	.0	.0	.0	2.1	8.6
NNW	.3	.6	.7	.6	.2	.1	0.0	.0	0.0	.0	.0	2.5	9.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	1.0	0
ALL	5.9	16.8	26.0	26.7	12.3	7.2	3.4	.7	0.0	.0	.0	100.0	12.1

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7539
 WIND DIRECTION vs SPEED from raw station data

MAY

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	.7	.6	.1	.0	.0	.0	.0	.0	.0	.0	2.0	5.6
NNE	.2	.4	.3	.1	.0	.0	.0	.0	.0	.0	.0	1.0	6.1
NE	.2	.5	.7	.3	0.0	.0	.0	.0	.0	.0	.0	1.6	7.5
ENE	.2	1.2	1.5	1.1	.3	.1	.1	.0	.0	.0	.0	4.5	9.6
E	.9	3.2	5.7	6.2	2.9	1.1	.3	.1	.0	.0	.0	20.4	11.8
ESE	.6	1.9	4.4	6.4	2.8	1.6	.6	.1	.0	.0	.0	18.4	13.4
SE	.5	1.5	2.8	3.2	1.0	.3	.0	.0	.0	.0	.0	9.3	10.8
SSE	.5	1.6	2.0	1.4	.3	.1	.0	.0	.0	.0	.0	6.0	8.7
S	.8	2.0	1.7	.5	0.0	.0	.0	.0	.0	.0	.0	5.1	6.7
SSW	.5	.9	.6	.1	.0	.0	.0	.0	.0	.0	.0	2.1	5.6
SW	.3	.8	.6	.1	.0	.0	.0	.0	.0	.0	.0	1.9	6.3
WSW	.6	1.3	1.4	.9	0.0	.0	.0	.0	.0	.0	.0	4.2	7.5
W	1.0	3.2	4.4	3.3	.7	.1	0.0	.0	.0	.0	.0	12.7	8.8
WNW	.5	1.5	1.4	1.3	.3	0.0	.0	.0	.0	.0	.0	5.1	8.7
NW	.3	.9	.8	.4	.2	0.0	.0	.0	.0	.0	.0	2.7	8.0
NNW	.4	.9	.5	.3	.2	.1	.0	.0	.0	.0	.0	2.3	7.7
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.8	0
ALL	8.1	22.7	29.5	25.7	8.8	3.2	1.0	.1	.0	.0	.0	100.0	9.9

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7372
 WIND DIRECTION vs SPEED from raw station data

JUN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	.8	.5	.1	.0	.0	.0	.0	.0	.0	.0	2.0	5.2
NNE	.1	.4	.2	0.0	0.0	.0	.0	.0	.0	.0	.0	.7	6.1
NE	.3	.7	.6	.2	0.0	.1	.0	.0	.0	.0	.0	2.0	7.2
ENE	.2	1.4	1.8	1.6	.5	.2	.0	.0	.0	.0	.0	5.6	10.0
E	1.0	4.2	6.7	8.8	3.8	1.5	.2	.1	.0	.0	.0	26.3	11.9
ESE	.7	2.5	3.8	4.1	1.6	.3	0.0	.0	.0	.0	.0	13.0	10.6
SE	.8	1.9	2.1	1.5	.4	.0	.0	.0	.0	.0	.0	6.5	8.3
SSE	.8	1.8	1.1	.3	0.0	.0	.0	.0	.0	.0	.0	3.9	5.9
S	.9	1.9	1.2	.3	.0	.0	.0	.0	.0	.0	.0	4.2	5.7
SSW	.6	1.1	.4	.1	.0	.0	.0	.0	.0	.0	.0	2.2	5.0
SW	.4	1.1	.7	.1	.0	.0	.0	.0	.0	.0	.0	2.4	5.8
WSW	.4	2.6	3.3	1.4	.1	0.0	.0	.0	.0	.0	.0	7.9	7.8
W	.7	4.1	6.9	5.3	.5	0.0	.0	.0	.0	.0	.0	17.5	9.1
WNW	.4	1.1	.9	.6	0.0	.0	.0	.0	.0	.0	.0	3.0	7.1
NW	.3	.4	.2	.1	.0	.0	.0	.0	.0	.0	.0	1.0	5.3
NNW	.3	.4	.1	.1	.0	.0	.0	.0	.0	.0	.0	.9	5.2
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.8	0
ALL	8.7	26.3	30.6	24.4	6.9	2.0	.2	.1	.0	.0	.0	100.0	9.1

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7662
 WIND DIRECTION vs SPEED from raw station data

JUL

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	.8	.5	0.0	.0	.0	.0	.0	.0	.0	.0	1.8	4.8
NNE	.5	.4	.2	.1	.0	.0	.0	.0	.0	.0	.0	1.2	4.6
NE	.3	.5	.5	.2	0.0	.0	.0	.0	.0	.0	.0	1.5	7.0
ENE	.5	1.4	1.5	.8	.2	.0	.0	.0	.0	.0	.0	4.5	8.0
E	1.7	5.5	4.6	3.3	1.2	.2	.1	.0	.0	.0	.0	16.6	8.6
ESE	1.0	3.6	4.9	2.8	.5	0.0	.1	.0	.0	.0	.0	12.9	8.6
SE	.9	2.2	2.4	1.2	.1	.0	.0	.0	.0	.0	.0	6.8	7.4
SSE	.6	1.7	1.6	.5	0.0	.0	.0	.0	.0	.0	.0	4.4	6.7
S	1.1	1.9	1.1	.2	.0	.0	.0	.0	.0	.0	.0	4.2	5.3
SSW	.9	1.4	.4	.2	.0	.0	.0	.0	.0	.0	.0	2.7	4.8
SW	.9	2.0	.7	.1	.0	.0	.0	.0	.0	.0	.0	3.8	5.1
WSW	1.4	3.9	4.1	1.9	.1	.0	.0	.0	.0	.0	.0	11.4	7.3
W	1.3	5.2	7.7	5.9	.5	.1	.0	.0	.0	.0	.0	20.6	8.8
WNW	.6	1.3	1.1	.6	0.0	.1	.0	.0	.0	.0	.0	3.7	7.2
NW	.5	.7	.3	.1	0.0	.0	.0	0.0	.0	.0	.0	1.7	5.9
NNW	.4	.6	.2	.0	0.0	0.0	0.0	.0	.0	.0	.0	1.3	5.1
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.9	0
ALL	13.1	33.1	31.6	17.9	2.8	.4	.2	0.0	.0	.0	.0	100.0	7.6

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7199
 WIND DIRECTION vs SPEED from raw station data

AUG

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	.6	.6	.2	0.0	.0	.0	.0	.0	.0	.0	1.8	6.4
NNE	.3	.3	.2	0.0	.0	.0	.0	.0	.0	.0	.0	.9	5.4
NE	.3	.9	.8	.6	0.0	.0	.0	.0	.0	.0	.0	2.6	7.6
ENE	.3	1.3	1.5	1.2	.3	.1	0.0	.0	.0	0.0	.0	4.8	9.3
E	1.1	3.5	4.9	4.3	1.3	.4	.1	0.0	.0	.0	.0	15.7	10.0
ESE	.7	3.0	4.9	3.5	1.3	.9	.1	.0	.0	.0	.0	14.3	10.6
SE	.7	2.3	3.2	2.2	.6	.2	0.0	.0	.0	.0	.0	9.1	9.3
SSE	.5	1.4	1.7	1.3	.2	0.0	.0	.0	.0	.0	.0	5.1	8.3
S	.9	1.9	1.9	.9	0.0	.0	.0	.0	.0	0.0	.0	5.6	7.1
SSW	.5	1.6	1.0	.3	0.0	.0	.0	.0	.0	.0	.0	3.5	6.4
SW	.7	1.2	.9	.4	.0	.0	.0	.0	.0	.0	.0	3.2	6.3
WSW	.9	2.5	2.8	1.3	.1	.0	.0	.0	.0	.0	.0	7.7	7.4
W	1.5	3.7	5.6	4.5	.5	0.0	.0	.0	.0	.0	.0	15.8	8.7
WNW	.6	1.7	1.5	1.0	0.0	0.0	.0	.0	.0	.0	.0	4.9	7.4
NW	.7	.8	.6	.2	0.0	.0	.0	.0	.0	.0	.0	2.3	5.8
NNW	.5	.6	.4	.3	0.0	0.0	.0	.0	.0	.0	.0	1.8	7.0
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.9	0
ALL	10.5	27.4	32.4	22.2	4.5	1.8	.2	0.0	.0	0.0	.0	100.0	8.5

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7357
 WIND DIRECTION vs SPEED from raw station data

SEP

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.3	.9	.8	.4	.1	0.0	.0	.0	.0	.0	.0	2.5	7.7
NNE	.2	.5	.5	.1	.1	0.0	.0	.0	.0	.0	.0	1.4	7.6
NE	.2	.6	.8	.3	.1	.1	.0	.0	.0	.0	.0	2.1	8.2
ENE	.2	.9	1.1	.7	.2	.1	0.0	0.0	.0	.0	.0	3.3	9.4
E	.5	1.6	1.9	2.2	1.4	1.1	.5	.3	0.0	.0	.0	9.6	14.0
ESE	.4	1.2	1.7	2.7	2.0	1.7	.9	.1	.0	.0	.0	10.7	15.7
SE	.7	1.7	2.3	2.9	.8	.6	.1	.0	.0	.0	.0	8.9	10.9
SSE	.3	1.8	2.3	1.9	.7	.1	0.0	.0	.0	.0	.0	7.1	9.6
S	.9	2.6	2.9	2.1	.6	.1	.0	.0	.0	.0	.0	9.1	8.7
SSW	.4	2.1	2.2	.8	.1	0.0	.0	.0	.0	.0	.0	5.7	7.5
SW	.4	1.7	1.9	.7	.1	0.0	.0	.0	.0	.0	.0	4.8	7.4
WSW	.7	2.3	2.9	2.2	.4	.1	0.0	0.0	0.0	.0	.0	8.7	9.0
W	.9	2.8	4.7	4.3	1.2	.6	.1	0.0	0.0	0.0	.0	14.7	10.5
WNW	.4	1.1	1.4	1.3	.3	.2	0.0	0.0	0.0	.0	.0	4.7	10.0
NW	.3	.5	.8	.8	.4	.1	.1	.1	.2	0.0	0.0	3.5	14.4
NNW	.2	.6	.5	.7	.2	.2	.1	0.0	.1	.1	.0	2.7	13.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.6	0
ALL	7.3	23.0	28.5	24.0	8.8	5.1	1.8	.5	.4	.1	0.0	100.0	10.7

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7529
 WIND DIRECTION vs SPEED from raw station data

OCT

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	.9	1.7	1.4	.4	.1	.1	.0	.0	.0	.0	5.1	10.0
NNE	.2	1.0	1.2	1.0	.2	.1	0.0	.0	.0	.0	.0	3.6	9.2
NE	.2	1.3	2.1	1.4	.3	.1	.1	0.0	.0	.0	.0	5.4	9.5
ENE	.3	1.2	1.8	1.2	.4	.3	.3	.1	.0	.0	.0	5.5	11.4
E	.5	1.7	2.5	3.4	2.0	2.0	1.2	.7	.1	.0	.0	14.1	16.3
ESE	.4	1.0	1.7	2.4	2.0	1.6	.8	.2	0.0	.0	.0	10.1	15.9
SE	.4	.8	1.6	2.1	1.5	1.0	.4	0.0	.0	.0	.0	7.8	14.4
SSE	.3	1.2	1.5	1.6	.5	.3	.1	.0	.0	.0	.0	5.5	10.8
S	.8	2.0	2.8	1.6	.3	.1	0.0	.0	.0	.0	.0	7.6	8.5
SSW	.4	1.4	2.0	.7	0.0	.0	.0	.0	.0	.0	.0	4.5	7.4
SW	.7	1.1	1.6	.9	.3	0.0	.0	.0	.0	.0	.0	4.7	8.1
WSW	.3	.9	1.0	1.5	.7	.2	0.0	0.0	.0	.0	.0	4.6	11.4
W	.7	1.5	1.9	2.4	1.5	.9	.4	.1	0.0	0.0	.0	9.3	13.1
WNW	.3	.7	.9	1.1	.7	.2	.1	.1	0.0	.0	.0	4.2	12.5
NW	.3	.5	.7	.7	.3	.1	.1	0.0	.0	.0	.0	2.9	11.4
NNW	.3	.6	1.1	1.5	.3	.3	.1	0.0	.0	.0	.0	4.2	12.1
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.7	0
ALL	6.8	17.8	26.0	24.8	11.1	7.5	3.7	1.3	.2	0.0	.0	100.0	12.1

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7035
 WIND DIRECTION vs SPEED from raw station data

NOV

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.3	.5	1.1	1.8	1.0	.3	.1	0.0	.0	.0	.0	5.2	12.9
NNE	.3	1.0	1.4	1.2	.4	.1	.0	.0	.0	.0	.0	4.3	9.6
NE	.5	1.4	3.1	2.5	.6	.2	.0	.0	.0	.0	.0	8.2	10.1
ENE	.4	1.2	2.4	1.9	.9	.4	.1	0.0	.0	.0	.0	7.2	11.2
E	.6	1.3	2.1	3.0	2.0	2.2	1.6	.6	.1	0.0	.0	13.5	17.4
ESE	.3	.7	1.6	2.9	1.5	.9	.7	.4	.2	.0	.0	9.1	16.4
SE	.2	.7	1.5	2.3	1.0	.7	.3	.1	.0	.0	.0	6.9	14.1
SSE	.3	.8	1.2	1.4	.6	.5	.1	0.0	.0	.0	.0	4.7	12.3
S	.4	1.5	1.3	1.4	.5	.1	.1	.0	.0	.0	.0	5.3	10.0
SSW	.3	.8	1.3	.8	.1	.1	.0	.0	.0	.0	.0	3.4	8.7
SW	.2	.8	1.2	.9	.3	0.0	0.0	0.0	.0	.0	.0	3.4	9.4
WSW	.1	.5	.9	1.3	.6	.5	.1	.1	0.0	.0	.0	4.1	14.4
W	.3	.6	1.4	2.2	2.0	2.0	1.3	.3	.1	0.0	.0	10.2	18.3
WNW	.2	.3	.5	.9	.6	.5	.4	.1	0.0	.0	.0	3.6	16.6
NW	.2	.2	.7	1.0	.7	.4	.4	.2	.1	0.0	.0	3.8	17.5
NNW	.2	.4	.6	1.6	1.5	1.3	.7	.4	.1	0.0	.0	6.8	19.2
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.4	0
ALL	4.7	12.6	22.2	27.2	14.1	10.0	5.9	2.3	.6	.1	.0	100.0	14.3

Middleton Island
 LAT 61 9.5 LONG 150 6.8 : Total number of data points = 7412
 WIND DIRECTION vs SPEED from raw station data

DEC

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.4	.8	1.0	.4	.4	.2	.1	.0	.0	.0	3.3	14.2
NNE	.2	.6	.7	.5	.1	.1	.0	.0	.0	.0	.0	2.2	9.0
NE	.3	.8	1.4	1.1	.5	.1	0.0	.0	.0	.0	.0	4.3	10.2
ENE	.4	1.3	1.6	1.4	.8	.5	.1	0.0	.0	.0	.0	6.2	11.7
E	.7	.9	1.6	2.8	3.4	3.4	1.8	.8	.2	.0	0.0	15.6	19.1
ESE	.4	.7	1.4	3.2	2.9	2.9	1.8	.9	.2	.0	.0	14.4	19.6
SE	.3	.7	1.6	3.0	2.4	1.7	.5	.1	.0	.0	.0	10.4	16.0
SSE	.3	.7	1.7	1.9	1.3	.9	.2	0.0	.0	.0	.0	7.0	13.8
S	.3	1.6	2.2	2.3	.7	.4	.1	.0	.0	.0	.0	7.5	10.7
SSW	.4	.9	1.6	1.4	.4	.1	0.0	.0	.0	.0	.0	4.9	9.8
SW	.3	.7	1.1	1.1	.1	0.0	.0	.0	.0	.0	.0	3.4	8.9
WSW	.1	.6	.8	.9	.7	.3	0.0	0.0	.0	.0	.0	3.5	12.6
W	.2	.4	1.0	2.3	1.6	1.1	.5	.2	0.0	.0	.0	7.3	16.5
WNW	.1	.1	.6	.8	.5	.3	.1	.1	.0	.0	.0	2.8	15.3
NW	.1	.3	.5	.6	.6	.2	.2	.1	.1	.0	.0	2.7	15.9
NNW	.1	.1	.5	1.0	.9	.6	.4	.2	.1	.0	.0	3.8	18.8
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.6	0
ALL	4.7	10.9	19.2	25.3	17.3	12.9	6.0	2.6	.5	.0	0.0	100.0	15.1

CANADIAN STATION 46207

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5625
 WIND DIRECTION vs SPEED from raw station data

JAN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.3	.4	.8	1.9	.6	.3	.1	.0	.0	.0	.0	4.5	12.8
NNE	.1	.3	.9	1.9	.5	.2	.1	.0	.0	.0	.0	3.9	12.8
NE	.3	.3	1.2	2.5	1.1	.6	.1	.0	.0	.0	.0	6.0	13.8
ENE	.1	.5	.8	2.1	1.5	.7	.2	.0	.0	.0	.0	5.9	15.1
E	.2	.3	.5	2.2	1.3	1.0	0.0	.0	.0	.0	.0	5.5	15.6
ESE	.1	.3	.8	1.9	1.0	.6	.1	.0	.0	.0	.0	4.7	14.5
SE	.1	.3	.7	1.8	1.1	.2	.1	.0	.0	.0	.0	4.2	14.0
SSE	.2	.1	.5	1.8	1.0	.4	.1	0.0	.0	.0	.0	4.1	15.0
S	.1	.2	.7	1.8	1.0	.5	.1	0.0	.0	.0	.0	4.4	14.6
SSW	.1	.3	1.2	2.0	1.5	.6	.1	.0	.0	.0	.0	5.8	14.6
SW	.1	.3	.9	1.7	2.1	.9	.1	0.0	.0	.0	.0	6.2	15.6
WSW	.1	.3	.9	2.3	2.4	1.5	.3	0.0	.0	.0	.0	7.9	16.6
W	.1	.5	1.2	3.1	3.0	1.0	.2	.1	.0	.0	.0	9.0	15.7
WNW	.2	.4	1.1	2.7	3.2	3.2	1.2	.2	.0	.0	.0	12.2	18.9
NW	.1	.3	1.0	2.0	2.2	2.3	1.6	1.2	.0	.0	.0	10.6	21.2
NNW	.2	.4	.8	1.2	1.5	.7	.2	0.0	.0	.0	.0	5.0	15.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.1	0
ALL	2.4	5.2	13.8	32.8	25.1	14.6	4.4	1.5	.0	.0	.0	100.0	16.1

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5320
 WIND DIRECTION vs SPEED from raw station data

FEB

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.2	.5	.6	.3	.3	.1	.0	.0	.0	.0	2.1	13.0
NNE	.1	.3	.8	.7	.4	.2	.0	.0	.0	.0	.0	2.4	11.6
NE	.2	.5	.6	1.3	.5	.8	0.0	.0	.0	.0	.0	3.8	14.2
ENE	.2	.5	1.1	2.7	.9	.3	.3	.0	.0	.0	.0	6.0	13.5
E	.2	.7	1.3	1.8	1.4	1.1	.0	.0	.0	.0	.0	6.4	14.0
ESE	.2	.3	.8	1.4	.9	.4	.0	.0	.0	.0	.0	4.1	13.4
SE	.2	.4	.9	1.5	.9	.3	.0	.0	.0	.0	.0	4.2	13.3
SSE	.1	.3	.9	1.1	.8	.2	.1	.1	.0	.0	.0	3.6	13.6
S	.2	.3	.7	1.6	1.1	.4	.1	0.0	.0	.0	.0	4.5	14.4
SSW	.1	.3	.7	1.8	1.5	.5	.1	0.0	.0	.0	.0	4.9	15.0
SW	.1	.4	1.3	2.5	1.1	.5	.0	.0	.0	.0	.0	5.9	13.4
WSW	.1	.5	1.2	2.4	2.1	1.4	.1	.0	.0	.0	.0	7.8	15.6
W	.2	.4	1.7	3.4	3.4	2.4	.2	0.0	.0	.0	.0	11.7	16.5
WNW	.1	.5	1.1	3.5	3.4	3.2	1.9	.7	.2	.0	.0	14.5	20.1
NW	.3	.5	1.1	3.0	2.3	4.0	2.1	.9	.4	.0	.0	14.6	21.2
NNW	.2	.4	.7	1.1	.4	.3	.1	0.0	.0	.0	.0	3.4	12.8
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.1	0
ALL	2.6	6.4	15.6	30.5	21.3	16.2	5.0	1.8	.6	.0	.0	100.0	16.2

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5082
 WIND DIRECTION vs SPEED from raw station data

MAR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.4	.9	.8	.9	.7	.1	.0	.0	.0	.0	.0	3.7	10.5
NNE	.2	.4	.5	.7	.4	.1	0.0	.0	.0	.0	.0	2.2	11.2
NE	.2	.5	1.0	1.2	.8	.9	.3	.0	.0	.0	.0	4.9	14.9
ENE	.3	.7	.9	1.8	1.0	.3	.0	.0	.0	.0	.0	5.0	12.6
E	.3	.6	.8	3.5	1.5	.2	.0	.0	.0	.0	.0	6.9	13.2
ESE	.2	.6	1.3	3.2	.8	.2	0.0	.0	.0	.0	.0	6.3	12.2
SE	.3	.7	1.6	2.3	.8	.3	.3	.0	.0	.0	.0	6.2	12.5
SSE	.2	.9	1.5	1.4	.3	.2	0.0	.0	.0	.0	.0	4.6	10.2
S	.2	.5	1.2	1.4	.8	.3	.1	.0	.0	.0	.0	4.5	12.4
SSW	.2	.7	1.0	1.5	.5	.2	.1	.0	.0	.0	.0	4.3	11.7
SW	.2	.4	1.2	2.5	.7	.2	0.0	.0	.0	.0	.0	5.2	12.2
WSW	.3	.5	1.1	2.9	1.4	.5	.1	.0	.0	.0	.0	6.7	13.4
W	.3	.7	1.7	3.0	2.4	1.0	.2	.0	.0	.0	.0	9.3	14.4
WNW	.5	.8	1.7	3.0	2.8	2.9	.6	0.0	.0	.0	.0	12.3	16.4
NW	.5	1.0	1.6	2.9	2.4	2.8	1.2	.1	0.0	.0	.0	12.4	17.3
NNW	.4	.5	.6	1.5	.6	.9	.3	.2	.0	.0	.0	5.1	15.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.3	0
ALL	4.7	10.4	18.5	33.7	17.8	11.0	3.3	.3	0.0	.0	.0	100.0	13.8

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5074
 WIND DIRECTION vs SPEED from raw station data

APR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.3	.4	.9	.6	.2	0.0	.0	.0	.0	.0	2.5	13.2
NNE	.1	.3	.5	.3	.1	.0	.0	.0	.0	.0	.0	1.2	9.3
NE	.2	.2	.5	.3	.1	.0	.0	.0	.0	.0	.0	1.2	8.3
ENE	.3	.3	.7	.8	.2	.0	.0	.0	.0	.0	.0	2.3	9.5
E	.2	.3	.9	1.5	.7	.3	.0	.0	.0	.0	.0	3.9	12.8
ESE	.3	.5	1.4	2.9	1.8	.1	.0	.0	.0	.0	.0	7.0	13.0
SE	.3	.5	1.2	3.2	1.8	.3	.0	.0	.0	.0	.0	7.3	13.5
SSE	.3	.8	1.3	2.2	1.1	.2	.0	.0	.0	.0	.0	5.9	12.0
S	.3	1.0	1.4	2.1	.8	.2	.0	.0	.0	.0	.0	5.8	11.0
SSW	.4	1.0	1.9	2.2	.6	.1	0.0	.0	.0	.0	.0	6.2	10.5
SW	.4	1.0	1.8	2.1	.8	.3	.1	0.0	.0	.0	.0	6.5	11.2
WSW	.3	1.3	1.8	3.0	.9	.1	0.0	0.0	.0	.0	.0	7.6	11.4
W	.3	.8	2.2	5.5	2.0	.5	0.0	0.0	.0	.0	.0	11.3	13.0
WNW	.4	.7	1.8	4.1	4.6	2.4	.9	.2	.0	.0	.0	15.0	16.8
NW	.1	.3	.9	2.6	3.2	3.3	1.4	.1	.0	.0	.0	11.9	19.1
NNW	.2	.4	.3	1.3	.8	.8	.1	.0	.0	.0	.0	3.9	15.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.5	0
ALL	3.9	9.7	19.0	35.0	20.3	8.8	2.5	.3	.0	.0	.0	100.0	13.6

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5722
 WIND DIRECTION vs SPEED from raw station data

MAY

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.1	.3	.7	.9	.6	.2	.0	.0	.0	.0	.0	2.9	12.7
NNE	.1	.3	.5	.3	.2	.1	.0	.0	.0	.0	.0	1.5	10.2
NE	.2	.3	.4	.3	0.0	.0	.0	.0	.0	.0	.0	1.2	8.0
ENE	.2	.3	.6	.5	0.0	.0	.0	.0	.0	.0	.0	1.6	8.5
E	.2	.4	1.2	3.5	1.5	0.0	.0	.0	.0	.0	.0	6.7	12.8
ESE	.1	.5	1.4	7.3	3.4	.1	.0	.0	.0	.0	.0	13.0	14.1
SE	.3	.8	2.3	8.9	3.9	.1	.0	.0	.0	.0	.0	16.2	13.4
SSE	.4	.8	2.7	4.5	1.3	.2	.0	.0	.0	.0	.0	9.8	11.9
S	.3	.9	1.6	1.6	.4	.2	.0	.0	.0	.0	.0	5.0	10.4
SSW	.3	.6	1.0	1.0	.2	.1	.0	.0	.0	.0	.0	3.4	9.9
SW	.3	.4	1.7	1.7	0.0	.1	.0	.0	.0	.0	.0	4.1	9.8
WSW	.2	.7	1.5	2.0	.5	0.0	.0	.0	.0	.0	.0	5.0	10.5
W	.3	.9	1.4	3.2	1.2	.2	.0	.0	.0	.0	.0	7.3	12.1
WNW	.3	.9	1.6	4.5	2.0	1.4	.2	.0	.0	.0	.0	10.9	14.4
NW	.3	.7	1.4	2.5	1.5	.7	.3	.0	.0	.0	.0	7.4	13.9
NNW	.1	.2	.8	1.0	.7	.7	.2	.0	.0	.0	.0	3.8	15.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.3	0
ALL	3.8	9.1	20.8	43.8	17.4	4.1	.7	.0	.0	.0	.0	100.0	12.6

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5845
 WIND DIRECTION vs SPEED from raw station data

JUN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	.4	.7	.7	.2	.1	.1	.0	.0	.0	.0	2.7	10.0
NNE	.3	.3	.3	.1	0.0	.0	.0	.0	.0	.0	.0	1.0	6.6
NE	.2	.4	.4	.1	0.0	.0	.0	.0	.0	.0	.0	1.2	6.5
ENE	.2	.2	.5	.3	0.0	.0	.0	.0	.0	.0	.0	1.2	7.8
E	.2	.4	1.5	1.2	.1	.0	.0	.0	.0	.0	.0	3.5	9.8
ESE	.2	.7	1.4	5.0	1.3	0.0	.0	.0	.0	.0	.0	8.6	12.5
SE	.3	.7	2.1	9.6	4.5	.3	.0	.0	.0	.0	.0	17.4	13.9
SSE	.4	1.2	2.7	5.0	1.1	.1	.0	.0	.0	.0	.0	10.6	11.4
S	.2	1.5	2.5	3.4	.5	0.0	.0	.0	.0	.0	.0	8.2	10.1
SSW	.2	1.1	2.8	1.6	.2	.1	.0	.0	.0	.0	.0	6.0	9.2
SW	.4	1.3	2.3	1.8	.1	0.0	.0	.0	.0	.0	.0	6.0	8.8
WSW	.6	1.0	2.2	2.5	.6	.2	.0	.0	.0	.0	.0	7.1	10.4
W	.5	1.1	1.9	2.5	1.3	.3	.0	.0	.0	.0	.0	7.5	11.6
WNW	.4	.7	2.0	2.5	1.1	.7	0.0	.0	.0	.0	.0	7.6	12.3
NW	.4	.8	1.3	1.9	1.3	1.0	.2	.0	.0	.0	.0	6.9	13.6
NNW	.3	.6	.7	1.0	.9	.8	.2	.0	.0	.0	.0	4.5	14.8
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.2	0
ALL	5.4	12.3	25.5	39.3	13.2	3.6	.5	.0	.0	.0	.0	100.0	11.6

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5514
 WIND DIRECTION vs SPEED from raw station data

JUL

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.1	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.3	4.4
NNE	.3	.1	.1	.1	.1	.1	0.0	.0	.0	.0	.0	.6	9.4
NE	.1	0.0	.1	.1	.1	.0	.0	.0	.0	.0	.0	.4	9.4
ENE	.2	.1	.1	.2	0.0	.0	.0	.0	.0	.0	.0	.7	7.5
E	.3	.4	.4	1.3	1.1	.1	.0	.0	.0	.0	.0	3.4	12.9
ESE	.4	.6	1.7	7.3	4.6	.3	.0	.0	.0	.0	.0	14.9	14.1
SE	.4	1.1	4.4	17.7	10.0	.3	.0	.0	.0	.0	.0	33.8	14.1
SSE	.2	1.4	5.8	6.1	.6	.1	.0	.0	.0	.0	.0	14.3	10.5
S	.6	1.5	3.0	1.2	0.0	.0	.0	.0	.0	.0	.0	6.2	7.8
SSW	.5	1.4	2.3	.9	.0	.0	.0	.0	.0	.0	.0	5.0	7.6
SW	.4	1.2	1.8	1.5	.2	.0	.0	.0	.0	.0	.0	5.1	8.8
WSW	.4	.9	1.6	1.4	.3	.1	.0	.0	.0	.0	.0	4.8	9.5
W	.2	.7	1.8	1.6	.2	.0	.0	.0	.0	.0	.0	4.4	9.7
WNW	.2	.6	1.2	1.5	.3	.1	.0	.0	.0	.0	.0	3.8	10.7
NW	.2	.2	.3	.3	.1	.4	0.0	.0	.0	.0	.0	1.7	13.1
NNW	.1	.1	.1	.1	0.0	0.0	.0	.0	.0	.0	.0	.5	7.4
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.1	0
ALL	4.5	10.3	24.6	41.4	17.7	1.4	0.0	.0	.0	.0	.0	100.0	11.8

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5623
 WIND DIRECTION vs SPEED from raw station data

AUG

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.3	.6	1.1	.1	.0	.0	.0	.0	.0	.0	2.2	9.6
NNE	.4	.3	.5	.3	.1	.0	.0	.0	.0	.0	.0	1.5	7.8
NE	.3	.6	.5	.2	.0	.0	.0	.0	.0	.0	.0	1.6	6.4
ENE	.3	.7	.8	.3	0.0	.0	.0	.0	.0	.0	.0	2.1	7.0
E	.4	.6	1.7	1.8	.7	.1	.0	.0	.0	.0	.0	5.4	10.8
ESE	.4	1.1	3.0	6.8	1.7	.2	.0	.0	.0	.0	.0	13.2	11.9
SE	.5	1.8	4.9	10.4	2.9	.3	.0	.0	.0	.0	.0	20.7	12.1
SSE	.3	1.7	3.6	3.7	.8	.2	.0	.0	.0	.0	.0	10.2	10.3
S	.5	1.4	2.2	1.5	.5	.1	.0	.0	.0	.0	.0	6.2	9.3
SSW	.4	1.9	1.7	.8	.2	.1	.0	.0	.0	.0	.0	5.2	8.1
SW	.4	1.4	1.5	1.2	.1	.0	.0	.0	.0	.0	.0	4.7	8.0
WSW	.8	1.3	2.0	1.3	.1	.0	.0	.0	.0	.0	.0	5.5	7.7
W	.7	1.7	2.0	2.2	.6	.1	.0	.0	.0	.0	.0	7.2	9.5
WNW	.4	1.5	1.6	2.1	1.4	.5	0.0	.0	.0	.0	.0	7.5	11.8
NW	.3	1.3	1.1	1.1	.4	.3	0.0	.0	.0	.0	.0	4.4	10.0
NNW	.3	.5	.8	.4	.0	.0	.0	.0	.0	.0	.0	2.0	7.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.3	0
ALL	6.5	18.0	28.6	35.2	9.4	1.9	0.0	.0	.0	.0	.0	100.0	10.3

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 5721
 WIND DIRECTION vs SPEED from raw station data

SEP

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.4	.4	.3	.1	0.0	0.0	0.0	.0	.0	.0	.0	1.2	6.4
NNE	.3	.4	.1	.2	0.0	0.0	.0	.0	.0	.0	.0	1.1	7.0
NE	.2	.5	.4	.3	.1	.0	.0	.0	.0	.0	.0	1.5	8.0
ENE	.3	.3	.6	.8	.2	0.0	0.0	0.0	.0	.0	.0	2.1	10.0
E	.2	.6	2.0	3.7	1.0	.1	.0	.0	.0	.0	.0	7.5	11.9
ESE	.2	1.0	3.5	7.3	3.6	.7	.0	.0	.0	.0	.0	16.3	13.2
SE	.3	1.5	4.5	9.4	1.6	.1	.0	.0	.0	.0	.0	17.5	11.5
SSE	.4	1.3	2.6	2.5	.6	.1	0.0	.0	.0	.0	.0	7.5	9.8
S	.6	1.4	1.5	1.5	.3	.1	0.0	.0	.0	.0	.0	5.2	9.0
SSW	.2	1.0	1.8	1.1	.2	.1	0.0	.0	.0	.0	.0	4.4	9.3
SW	.3	1.2	2.1	1.6	.3	0.0	.0	.0	.0	.0	.0	5.5	9.2
WSW	.2	1.0	2.2	2.8	.8	.2	.0	.0	.0	.0	.0	7.2	11.0
W	.2	1.1	1.6	2.6	1.3	.6	.1	.0	.0	.0	.0	7.7	12.9
WNW	.5	.8	2.1	2.0	1.4	.7	.4	.0	.0	.0	.0	8.0	13.5
NW	.3	.7	1.7	.8	.6	.3	.1	.0	.0	.0	.0	4.6	11.2
NNW	.3	.8	.7	.2	.1	.1	0.0	.0	.0	.0	.0	2.3	8.0
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.3	0
ALL	4.9	14.1	27.6	37.0	12.0	3.1	.8	0.0	.0	.0	.0	100.0	11.2

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 6723
 WIND DIRECTION vs SPEED from raw station data

OCT

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.6	.6	.2	.2	.3	.1	.0	.0	.0	.0	2.2	11.7
NNE	.3	.4	.7	.2	.1	.1	.0	.0	.0	.0	.0	1.9	8.1
NE	.4	.5	.5	.4	0.0	0.0	.1	.0	.0	.0	.0	2.0	8.4
ENE	.2	.5	.6	1.1	.2	.1	.0	.0	.0	.0	.0	2.6	10.8
E	.4	.5	1.6	1.9	1.1	.1	0.0	.0	.0	.0	.0	5.6	11.7
ESE	.4	.6	1.9	3.4	1.5	.4	0.0	.0	.0	.0	.0	8.2	12.5
SE	.2	.5	1.4	3.4	1.4	.4	0.0	.0	.0	.0	.0	7.5	13.3
SSE	.2	.8	1.4	3.2	1.5	.5	.0	.0	.0	.0	.0	7.6	13.0
S	.4	.9	1.9	3.2	1.7	.4	0.0	0.0	.0	.0	.0	8.5	12.7
SSW	.4	.5	1.5	2.6	1.4	.6	0.0	0.0	.0	.0	.0	7.2	13.0
SW	.4	.9	1.6	2.5	1.1	.5	0.0	.0	.0	.0	.0	7.1	12.1
WSW	.5	.7	1.6	2.8	1.6	.6	.1	0.0	.0	.0	.0	7.9	13.0
W	.3	.9	1.3	3.2	2.3	1.2	.2	0.0	.0	.0	.0	9.4	14.8
WNW	.2	.6	1.1	3.6	2.1	2.6	.9	.1	0.0	.0	.0	11.3	17.4
NW	.3	.4	.8	1.6	1.5	1.7	1.4	.4	0.0	0.0	.0	8.0	19.8
NNW	.2	.4	.4	.6	.4	.4	.1	.1	0.0	0.0	.0	2.7	15.7
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.2	0
ALL	5.2	9.6	19.0	34.1	18.2	9.9	3.0	.8	.1	.1	.0	100.0	13.8

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 6806
 WIND DIRECTION vs SPEED from raw station data

NOV

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	0.0	.3	.3	.6	.2	0.0	0.0	.0	.0	.0	.0	1.6	11.7
NNE	.1	.3	.3	.5	.2	.1	.1	0.0	.0	.0	.0	1.6	13.0
NE	.1	.4	.5	.5	.2	.1	0.0	.0	.0	.0	.0	1.8	10.4
ENE	.1	.4	.5	.9	.3	.1	0.0	.0	.0	.0	.0	2.3	11.8
E	.2	.3	.9	1.7	1.2	1.1	.2	.0	.0	.0	.0	5.5	15.8
ESE	.1	.5	.7	1.9	1.2	.8	.3	.0	.0	.0	.0	5.5	15.4
SE	.1	.3	1.2	2.5	1.3	1.4	.1	.0	.0	.0	.0	7.0	15.4
SSE	.2	.4	1.5	2.8	2.0	.9	0.0	.0	.0	.0	.0	7.8	14.4
S	.2	.4	1.2	3.1	1.8	.7	0.0	.0	.0	.0	.0	7.5	14.3
SSW	.2	.5	1.1	2.5	1.5	.8	0.0	.0	.0	.0	.0	6.6	14.2
SW	.2	.5	1.4	3.1	1.7	.8	0.0	0.0	.0	.0	.0	7.8	14.1
WSW	.3	.6	1.6	2.7	1.9	1.7	.1	0.0	.0	.0	.0	9.0	15.3
W	.1	.4	1.5	3.2	2.4	1.8	.4	0.0	.0	.0	.0	9.9	16.2
WNW	.2	.4	1.0	2.4	2.3	2.7	1.7	.3	.0	.0	.0	11.1	19.6
NW	.1	.2	.5	2.0	2.8	3.8	2.1	.5	0.0	.0	.0	12.0	21.6
NNW	.1	.2	.4	.9	.5	.5	.2	.1	.0	.0	.0	2.9	17.1
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.1	0
ALL	2.3	6.2	14.5	31.3	21.6	17.4	5.5	1.1	0.0	.0	.0	100.0	16.1

STATION 46207
 LAT 50 52.0 LONG 129 55.0 : Total number of data points = 6249
 WIND DIRECTION vs SPEED from raw station data

DEC

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.2	.4	.6	.4	.1	.0	.0	.0	.0	.0	1.8	12.2
NNE	0.0	.2	.2	.4	.4	.2	.0	.0	.0	.0	.0	1.5	13.8
NE	.1	.2	.2	.6	.8	.5	.2	0.0	.0	.0	.0	2.5	17.4
ENE	.1	.1	.4	.6	.6	.7	.3	.1	.0	.0	.0	3.0	18.3
E	0.0	.2	.4	.9	.9	1.1	.3	.2	.0	.0	.0	4.0	19.3
ESE	.1	.3	.3	.8	.4	.5	.2	0.0	.0	.0	.0	2.7	16.5
SE	0.0	.4	1.0	2.2	2.2	1.8	.2	.1	.0	.0	.0	7.9	17.1
SSE	0.0	.1	.7	2.9	2.5	1.2	.1	.0	.0	.0	.0	7.6	16.5
S	.1	.4	1.4	2.3	2.1	1.6	.1	.0	.0	.0	.0	7.9	15.9
SSW	.1	.4	.9	2.2	2.9	1.6	0.0	.0	.0	.0	.0	8.1	16.6
SW	.2	.4	.8	2.9	1.8	1.0	.0	.0	.0	.0	.0	7.0	15.1
WSW	.2	.4	1.1	3.8	1.8	.9	.1	.0	.0	.0	.0	8.2	14.7
W	.1	.5	1.3	3.4	3.1	1.9	1.0	0.0	.0	.0	.0	11.3	17.4
WNW	.1	.4	1.0	2.8	3.2	3.3	3.1	.6	0.0	.0	.0	14.5	20.9
NW	.1	.4	.6	1.1	1.4	2.8	1.8	.3	.0	.0	.0	8.3	21.5
NNW	.1	.2	.4	.7	.7	.8	.5	0.0	0.0	.0	.0	3.4	18.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	.1	0
ALL	1.5	4.7	10.9	28.3	25.1	20.0	8.0	1.5	0.0	.0	.0	100.0	17.5

COLUMBIA RIVER

Columbia River Bar
 LAT 46 7.0 LONG 124 30.0 : Total number of data points = 4903
 WIND DIRECTION vs SPEED from raw station data

JAN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.4	.7	.5	.4	0.0	.0	0.0	.0	.0	.0	.0	2.0	7.6
NNE	.2	1.2	.8	.4	.1	.0	.0	.0	.0	.0	.0	2.6	7.5
NE	.3	1.2	1.0	.4	.1	.1	.0	.0	.0	.0	.0	3.2	8.3
ENE	.3	1.4	2.3	9.2	2.7	.7	.0	.0	.0	.0	.0	16.7	13.6
E	.3	2.1	6.3	10.6	2.1	.8	.0	.0	.0	.0	.0	22.4	12.2
ESE	.3	1.2	1.8	1.2	.3	0.0	.0	.0	.0	.0	.0	4.9	9.2
SE	.2	.6	.6	.4	.2	.2	0.0	.0	.0	.0	.0	2.1	10.2
SSE	.2	.7	1.6	1.6	1.4	1.7	.8	.1	.0	.0	.0	8.0	16.8
S	.2	.5	1.4	4.2	3.3	3.6	1.9	.1	.0	.0	.0	15.2	18.4
SSW	.3	.8	1.2	2.0	1.2	.7	.2	0.0	.0	.0	.0	6.4	14.0
SW	.1	.6	.7	1.2	.6	.4	.1	0.0	.0	.0	.0	3.8	13.5
WSW	.1	.7	.7	1.3	.3	.1	0.0	0.0	.0	.0	.0	3.2	11.5
W	.2	.5	.7	.9	.3	0.0	.0	.0	.0	.0	.0	2.7	10.8
WNW	.1	.4	.3	.4	.2	.1	.0	.0	.0	.0	.0	1.5	10.6
NW	.2	.4	.4	.4	.1	.1	.0	.0	.0	.0	.0	1.6	9.4
NNW	.2	.7	.4	.1	.1	0.0	.0	.0	.0	.0	.0	1.4	7.7
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.3	0
ALL	3.7	13.8	20.6	34.8	12.9	8.6	3.0	.3	.0	.0	.0	100.0	12.9

LAT 46 7.0 LONG 124 30.0 : Total number of data points = 3942
 WIND DIRECTION vs SPEED from raw station data

FEB

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	1.5	1.6	1.4	.0	.0	.0	.0	.0	.0	.0	5.0	8.1
NNE	.4	.8	1.1	.5	0.0	.0	.0	.0	.0	.0	.0	2.8	7.7
NE	.6	1.1	1.0	.5	.1	.0	.0	.0	.0	.0	.0	3.3	7.1
ENE	.3	1.5	3.6	5.4	1.5	.5	.0	.0	.0	.0	.0	12.7	12.0
E	.6	2.6	5.7	8.8	2.4	1.1	.0	.0	.0	.0	.0	21.1	12.2
ESE	.3	.8	1.6	.7	0.0	0.0	.0	.0	.0	.0	.0	3.3	8.7
SE	.2	.5	.6	.5	.2	.1	.0	.0	.0	.0	.0	2.2	9.6
SSE	.2	.5	1.0	1.5	1.0	.5	.3	.0	.0	.0	.0	4.9	14.5
S	.2	1.4	1.8	3.3	2.6	2.9	.3	.1	.0	.0	.0	12.6	15.8
SSW	.4	.9	1.3	2.2	1.0	.9	.2	.0	.0	.0	.0	7.0	13.8
SW	.1	1.0	.9	2.0	.7	.2	.0	.0	.0	.0	.0	4.8	12.0
WSW	.2	.5	.7	1.3	.6	.5	0.0	.0	.0	.0	.0	3.8	13.5
W	.4	.8	.9	1.2	.1	.3	.0	.0	.0	.0	.0	3.6	10.5
WNW	.6	.7	.8	.9	.4	.1	.0	.0	.0	.0	.0	3.5	9.6
NW	.5	.7	.8	.5	.2	.0	.0	.0	.0	.0	.0	2.6	8.2
NNW	.3	1.0	1.2	1.3	.1	.0	.0	.0	.0	.0	.0	3.9	8.8
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.8	0
ALL	5.6	16.4	24.5	31.9	10.8	7.1	.8	.1	.0	.0	.0	100.0	11.5

Columbia River Bar
 LAT 46 7.0 LONG 124 30.0 : Total number of data points = 3621
 WIND DIRECTION vs SPEED from raw station data

MAR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	1.5	2.8	1.5	.2	.0	.0	.0	.0	.0	.0	6.7	8.8
NNE	.4	1.3	1.4	.8	.1	.0	.0	.0	.0	.0	.0	3.9	8.2
NE	.5	1.5	.9	.3	.0	.0	.0	.0	.0	.0	.0	3.1	6.2
ENE	.5	1.4	2.3	1.7	.1	.0	.0	.0	.0	.0	.0	5.9	8.9
E	.4	1.7	3.1	3.0	.4	0.0	.0	.0	.0	.0	.0	8.5	10.0
ESE	.3	.7	1.0	.8	.3	.0	.0	.0	.0	.0	.0	3.1	9.5
SE	.2	.5	.3	.7	.1	.0	.0	.0	.0	.0	.0	1.8	9.2
SSE	.2	.6	1.2	1.8	1.4	.7	.1	.0	.0	.0	.0	5.9	14.2
S	.2	1.4	2.5	3.3	2.2	1.8	1.5	.5	.0	.0	.0	13.5	16.6
SSW	.4	1.6	1.5	2.8	1.2	1.2	.3	.1	.0	.0	.0	9.1	13.6
SW	.2	1.1	1.7	1.8	.8	.6	.2	.1	.0	.0	.0	6.5	12.9
WSW	.4	.9	1.3	1.6	.6	.4	0.0	.0	.0	.0	.0	5.1	11.4
W	.4	.8	.8	1.6	.6	.1	0.0	.0	.0	.0	.0	4.3	11.4
WNW	.4	1.1	.9	.9	.1	.1	.0	.0	.0	.0	.0	3.4	8.6
NW	.6	2.1	2.3	1.6	.1	.0	.0	.0	.0	.0	.0	6.9	8.3
NNW	.8	1.6	2.8	3.5	.3	0.0	.0	.0	.0	.0	.0	9.0	9.8
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.3	0
ALL	6.6	19.7	26.7	27.6	8.5	4.9	2.1	.6	.0	.0	.0	100.0	10.9

LAT 46 7.0 LONG 124 30.0 : Total number of data points = 3339
 WIND DIRECTION vs SPEED from raw station data

APR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.4	1.6	1.2	1.9	.1	.0	.0	.0	.0	.0	.0	5.2	9.0
NNE	.4	.8	.6	.1	.0	.0	.0	.0	.0	.0	.0	1.9	6.2
NE	.4	.5	.3	.1	.0	.0	.0	.0	.0	.0	.0	1.3	5.3
ENE	.2	.7	.5	1.3	.1	.0	.0	.0	.0	.0	.0	2.8	9.3
E	.6	1.0	1.9	2.2	.1	.0	.0	.0	.0	.0	.0	5.7	9.5
ESE	.6	1.5	1.2	.2	.0	.0	.0	.0	.0	.0	.0	3.5	6.2
SE	.2	.8	.6	.1	.1	0.0	.0	.0	.0	.0	.0	2.0	7.3
SSE	.3	.9	1.2	2.1	1.7	1.0	.4	.0	.0	.0	.0	7.5	14.8
S	.4	1.4	2.4	5.1	2.2	1.9	.2	0.0	.0	.0	.0	13.7	14.2
SSW	.2	1.3	2.9	3.4	.9	.2	.0	.0	.0	.0	.0	8.8	11.4
SW	.5	1.3	2.2	2.7	.5	.2	.0	.0	.0	.0	.0	7.4	10.5
WSW	.4	2.1	1.6	1.4	.3	.2	.0	.0	.0	.0	.0	6.0	9.3
W	.6	1.7	2.0	1.0	.1	.1	.0	.0	.0	.0	.0	5.5	8.2
WNW	.3	1.6	2.4	1.8	.1	0.0	0.0	.0	.0	.0	.0	6.4	9.3
NW	.2	1.8	2.5	3.7	1.0	0.0	.0	.0	.0	.0	.0	9.2	11.0
NNW	.3	1.6	3.1	3.5	.6	.0	.0	.0	.0	.0	.0	9.1	10.7
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.9	0
ALL	6.0	20.8	26.5	30.6	7.8	3.7	.6	0.0	.0	.0	.0	100.0	10.3

Columbia River Bar
 LAT 46 7.0 LONG 124 30.0 : Total number of data points = 4986
 WIND DIRECTION vs SPEED from raw station data

MAY

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.3	1.6	2.6	5.6	1.1	.0	.0	.0	.0	.0	.0	11.3	11.5
NNE	.4	1.0	.8	.5	0.0	0.0	.0	.0	.0	.0	.0	2.8	7.7
NE	.2	.6	.3	.1	.0	.0	.0	.0	.0	.0	.0	1.2	5.8
ENE	.2	.6	.3	.2	.1	.0	.0	.0	.0	.0	.0	1.4	7.0
E	.3	.7	.6	.5	.1	.0	.0	.0	.0	.0	.0	2.2	8.3
ESE	.2	.7	.5	.2	0.0	.0	.0	.0	.0	.0	.0	1.7	7.2
SE	.2	.7	.2	.2	0.0	.0	.0	.0	.0	.0	.0	1.4	6.4
SSE	.3	.5	.7	1.4	.5	.2	0.0	.0	.0	.0	.0	3.7	11.9
S	.2	1.0	1.4	2.3	1.2	.8	.1	.0	.0	.0	.0	7.1	13.2
SSW	.5	1.4	1.8	2.8	.8	.2	.0	.0	.0	.0	.0	7.5	10.8
SW	.6	1.3	1.4	2.3	.1	.0	.0	.0	.0	.0	.0	5.8	9.1
WSW	.5	1.5	1.2	1.5	.1	.0	.0	.0	.0	.0	.0	4.9	8.6
W	.8	2.1	2.1	1.5	.1	0.0	.0	.0	.0	.0	.0	6.7	8.2
WNW	.6	2.8	2.9	2.5	.1	.0	.0	.0	.0	.0	.0	8.9	8.5
NW	.5	3.3	5.1	4.8	.2	.0	.0	.0	.0	.0	.0	14.0	9.5
NNW	.3	2.4	5.0	7.1	1.7	.1	.0	.0	.0	.0	.0	16.5	11.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.1	0
ALL	6.4	22.3	27.1	33.6	6.2	1.3	.1	.0	.0	.0	.0	100.0	9.7

LAT 46 7.0 LONG 124 30.0 : Total number of data points = 5230
 WIND DIRECTION vs SPEED from raw station data

JUN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	1.9	3.4	4.8	.6	.0	.0	.0	.0	.0	.0	11.2	10.6
NNE	.2	.8	.6	.5	.0	.0	.0	.0	.0	.0	.0	2.1	7.7
NE	.2	.6	.1	.0	.0	.0	.0	.0	.0	.0	.0	.8	4.7
ENE	.1	.4	.2	0.0	.0	.0	.0	.0	.0	.0	.0	.7	5.7
E	.1	.3	.2	.1	.0	.0	.0	.0	.0	.0	.0	.8	7.0
ESE	.2	.3	.4	.1	.0	.0	.0	.0	.0	.0	.0	1.0	6.4
SE	.2	.4	.2	.1	0.0	.0	.0	.0	.0	.0	.0	.9	6.4
SSE	.2	.4	.9	1.1	.5	0.0	.0	.0	.0	.0	.0	3.2	11.3
S	.4	1.2	2.5	2.5	.9	.2	.0	.0	.0	.0	.0	7.8	11.2
SSW	.4	1.4	1.7	1.7	.1	0.0	.1	.0	.0	.0	.0	5.4	9.2
SW	.6	2.2	2.1	1.2	.2	.0	.0	.0	.0	.0	.0	6.3	8.2
WSW	.5	2.1	1.6	1.2	.2	.1	.0	.0	.0	.0	.0	5.7	8.3
W	.6	2.4	1.5	1.0	.1	0.0	.0	.0	.0	.0	.0	5.6	7.4
WNW	.6	3.2	2.7	1.5	.3	.0	.0	.0	.0	.0	.0	8.2	8.1
NW	.7	4.3	6.3	4.3	1.0	0.0	.0	.0	.0	.0	.0	16.6	9.4
NNW	.6	3.9	5.8	8.9	2.2	.2	.0	.0	.0	.0	.0	21.6	11.2
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.0	0
ALL	6.2	25.7	30.2	29.1	6.0	.7	.1	.0	.0	.0	.0	100.0	9.4

Columbia River Bar
 LAT 46 7.0 LONG 124 30.0 : Total number of data points = 6602
 WIND DIRECTION vs SPEED from raw station data

JUL

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	3.8	5.7	6.9	1.1	0.0	.0	.0	.0	.0	.0	18.1	10.4
NNE	.3	.6	.7	.4	0.0	.0	.0	.0	.0	.0	.0	2.1	7.4
NE	.2	.3	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.5	3.7
ENE	.2	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.3	3.5
E	.3	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	2.7
ESE	.2	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	3.3
SE	.4	.5	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	1.0	4.4
SSE	.4	1.0	1.1	.9	.2	.1	.0	.0	.0	.0	.0	3.7	9.2
S	.7	1.7	1.7	1.6	.3	.1	.0	.0	.0	.0	.0	6.0	8.9
SSW	.7	2.0	1.3	.8	.1	0.0	.0	.0	.0	.0	.0	4.9	7.4
SW	.9	1.6	.5	.2	.0	.0	.0	.0	.0	.0	.0	3.2	5.3
WSW	1.0	1.6	.3	.2	.0	.0	.0	.0	.0	.0	.0	3.1	4.9
W	1.0	3.0	1.1	.3	.0	.0	.0	.0	.0	.0	.0	5.3	5.6
WNW	1.0	3.1	2.1	.6	.0	.0	.0	.0	.0	.0	.0	6.7	6.5
NW	.7	4.0	4.8	2.9	.2	.0	.0	.0	.0	.0	.0	12.7	8.5
NNW	.6	3.9	8.4	12.6	2.1	0.0	.0	.0	.0	.0	.0	27.7	11.2
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.9	0
ALL	9.1	27.3	28.0	27.4	4.1	.3	.0	.0	.0	.0	.0	100.0	8.6

LAT 46 7.0 LONG 124 30.0 : Total number of data points = 6648
 WIND DIRECTION vs SPEED from raw station data

AUG

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.8	3.2	4.2	5.2	.9	0.0	.0	.0	.0	.0	.0	14.3	10.1
NNE	.7	1.4	1.6	.8	.1	.0	.0	.0	.0	.0	.0	4.6	8.0
NE	.3	.7	.4	.2	.0	.0	.0	.0	.0	.0	.0	1.6	6.3
ENE	.3	.3	.2	0.0	.0	.0	.0	.0	.0	.0	.0	.8	4.8
E	.3	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.8	4.7
ESE	.5	.8	.3	0.0	.0	.0	.0	.0	.0	.0	.0	1.6	4.6
SE	.6	1.0	.2	.1	.0	.0	.0	.0	.0	.0	.0	2.0	4.8
SSE	.7	1.8	1.6	1.3	.2	0.0	.0	.0	.0	.0	.0	5.6	8.2
S	1.1	4.0	2.5	2.1	.6	.2	0.0	.0	.0	.0	.0	10.6	8.6
SSW	1.0	3.4	1.6	.4	0.0	.0	.0	.0	.0	.0	.0	6.4	6.0
SW	1.1	2.3	.6	.2	.0	.0	.0	.0	.0	.0	.0	4.2	5.1
WSW	.9	1.7	.4	.2	.0	.0	.0	.0	.0	.0	.0	3.2	5.0
W	1.2	1.5	.6	.2	.0	.0	.0	.0	.0	.0	.0	3.5	4.9
WNW	1.0	2.4	1.1	.3	.0	0.0	.0	.0	.0	.0	.0	4.8	5.7
NW	1.0	3.6	3.7	1.5	.1	.0	.0	.0	.0	.0	.0	9.8	7.6
NNW	1.1	4.5	5.6	6.6	2.5	0.0	.0	.0	.0	.0	.0	20.3	10.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	5.7	0
ALL	12.6	33.1	24.6	19.1	4.5	.3	0.0	.0	.0	.0	.0	100.0	7.6

Columbia River Bar
 LAT 46 7.0 LONG 124 30.0 : Total number of data points = 5950
 WIND DIRECTION vs SPEED from raw station data

SEP

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	2.8	4.9	4.8	.7	.0	0.0	0.0	.0	.0	.0	13.8	10.2
NNE	.7	2.1	1.6	1.2	.3	0.0	.0	.0	.0	.0	.0	6.0	8.1
NE	.4	1.3	1.1	1.4	.1	.0	.0	.0	.0	.0	.0	4.3	9.0
ENE	.3	.8	1.1	2.1	.2	.0	.0	.0	.0	.0	.0	4.4	10.5
E	.5	1.2	.9	.7	.1	.0	.0	.0	.0	.0	.0	3.4	7.8
ESE	.2	1.0	.5	.1	.1	.0	.0	.0	.0	.0	.0	1.9	7.1
SE	.3	1.1	.4	.3	.2	0.0	.0	.0	.0	.0	.0	2.3	7.4
SSE	.8	1.6	1.5	1.5	.5	.3	.1	0.0	.0	.0	.0	6.3	9.9
S	.9	3.3	3.0	3.0	.9	.3	.1	0.0	.0	.0	.0	11.4	9.9
SSW	1.0	2.1	1.7	1.1	.3	.3	.1	.0	.0	.0	.0	6.5	8.7
SW	.8	1.5	1.4	1.2	.2	.3	0.0	.0	.0	.0	.0	5.5	8.9
WSW	.6	1.2	1.0	.8	.1	.1	.0	.0	.0	.0	.0	3.8	8.0
W	.8	1.3	.9	.2	.1	.1	.0	.0	.0	.0	.0	3.3	6.2
WNW	.6	1.6	1.0	.5	0.0	.0	0.0	.0	.0	.0	.0	3.8	6.9
NW	.7	2.1	1.3	1.2	.1	.0	.0	.0	.0	.0	.0	5.5	7.8
NNW	.5	2.6	4.2	5.5	.6	0.0	0.0	.0	.0	.0	.0	13.3	10.4
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	4.3	0
ALL	9.6	27.6	26.9	25.6	4.3	1.3	.3	.1	.0	.0	.0	100.0	8.7

LAT 46 7.0 LONG 124 30.0 : Total number of data points = 5906
 WIND DIRECTION vs SPEED from raw station data

OCT

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	1.7	2.5	2.5	.3	0.0	.0	.0	.0	.0	.0	7.7	9.5
NNE	.5	2.1	1.5	1.2	.1	.0	.0	.0	.0	.0	.0	5.4	7.9
NE	.4	1.5	1.8	.7	.2	.0	.0	.0	.0	.0	.0	4.5	7.9
ENE	.3	1.1	1.3	1.6	.1	.0	.0	.0	.0	.0	.0	4.4	9.3
E	.4	1.4	2.1	2.0	.4	.1	.0	.0	.0	.0	.0	6.4	9.8
ESE	.4	1.5	1.3	.6	0.0	0.0	.0	.0	.0	.0	.0	3.8	7.5
SE	.4	1.2	1.0	.7	.1	.1	.1	.0	.0	.0	.0	3.5	8.9
SSE	.5	1.3	2.0	2.4	1.8	1.5	.6	.1	.0	.0	.0	10.2	14.6
S	.6	1.9	2.1	2.6	1.7	1.2	.6	.1	.0	.0	.0	10.7	13.7
SSW	.5	1.6	1.8	1.8	.8	.5	.2	.1	.0	.0	.0	7.2	11.7
SW	.5	1.5	1.2	1.4	.5	.4	.1	.0	.0	.0	.0	5.5	10.5
WSW	.5	1.2	.9	1.4	.5	.3	.1	0.0	.0	.0	.0	5.0	11.2
W	.6	1.5	1.2	.8	.3	.1	.1	.0	.0	.0	.0	4.5	8.9
WNW	.6	1.4	1.5	1.4	.3	.1	.0	.0	.0	.0	.0	5.2	9.1
NW	.3	1.2	1.5	2.4	.4	.1	.0	.0	.0	.0	.0	5.9	10.4
NNW	.4	1.5	2.1	2.3	.5	.0	.0	.0	.0	.0	.0	6.8	10.1
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.2	0
ALL	7.6	23.5	25.9	25.7	7.8	4.4	1.7	.3	.0	.0	.0	100.0	10.3

Columbia River Bar
 LAT 46 7.0 LONG 124 30.0 : Total number of data points = 4835
 WIND DIRECTION vs SPEED from raw station data

NOV

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.5	.3	.8	0.0	.0	.0	.0	.0	.0	.0	1.8	9.2
NNE	.2	.5	.8	.6	0.0	.0	.0	.0	.0	.0	.0	2.3	9.0
NE	.4	.9	.9	.4	0.0	.0	.0	.0	.0	.0	.0	2.6	7.5
ENE	.3	.8	1.0	2.2	.3	.1	.0	.0	.0	.0	.0	4.7	10.9
E	.5	1.4	3.2	7.1	3.8	1.9	0.0	.0	.0	.0	.0	17.8	14.1
ESE	.2	1.3	2.0	1.4	.5	.2	.1	.0	.0	.0	.0	5.7	10.6
SE	.3	.8	1.2	.6	.6	.2	.1	0.0	.0	.0	.0	3.9	11.6
SSE	.2	.8	2.0	3.8	2.1	2.0	.7	.3	0.0	.0	.0	12.0	16.4
S	.3	1.3	3.2	4.5	2.2	3.1	1.2	.4	.0	.0	.0	16.4	16.3
SSW	.2	1.0	1.7	3.1	1.7	1.2	.1	.1	.0	.0	.0	9.2	14.4
SW	.2	1.0	1.2	1.4	1.1	.9	.1	.0	.0	.0	.0	6.0	13.6
WSW	.2	.6	.8	1.1	.4	.1	0.0	.0	.0	.0	.0	3.2	11.2
W	.3	.7	1.0	1.7	.5	.2	.0	.0	.0	.0	.0	4.4	11.4
WNV	.3	.5	.8	1.1	.5	.2	0.0	.0	.0	.0	.0	3.5	11.7
NW	.2	.5	1.1	1.0	.2	0.0	0.0	.0	.0	.0	.0	3.0	10.5
NNW	.2	.5	.5	.4	.1	.1	.0	.0	.0	.0	.0	1.9	9.4
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	1.5	0
ALL	4.3	13.3	21.8	31.3	14.0	10.3	2.6	.8	0.0	.0	.0	100.0	13.2

LAT 46 7.0 LONG 124 30.0 : Total number of data points = 3812
 WIND DIRECTION vs SPEED from raw station data

DEC

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.5	.5	.3	.1	0.0	.0	.0	.0	.0	.0	1.6	8.4
NNE	.2	.8	.9	.8	.1	.1	.0	.0	.0	.0	.0	2.8	9.9
NE	.3	1.1	1.3	.7	.1	0.0	.0	.0	.0	.0	.0	3.4	8.4
ENE	.3	1.2	2.3	3.6	.9	.4	0.0	.0	.0	.0	.0	8.8	12.1
E	.4	1.2	4.6	8.2	4.9	3.4	.4	.0	.0	.0	.0	23.3	15.0
ESE	.3	1.3	2.6	3.0	.6	.3	.0	.0	.0	.0	.0	8.0	11.0
SE	.2	.4	.4	.8	.2	.1	.1	.0	.0	.0	.0	2.1	11.5
SSE	.1	.5	1.0	3.0	1.5	2.0	.5	.2	0.0	.0	.0	8.7	17.5
S	0.0	.4	1.0	2.3	2.3	2.5	1.1	.8	.0	.0	.0	10.4	19.8
SSW	.1	.5	1.2	2.0	1.1	.4	.2	.1	.0	.0	.0	5.4	14.0
SW	.2	.7	1.4	2.0	1.0	.4	.1	.1	.0	.0	.0	6.0	13.8
WSW	.2	.7	1.1	1.3	.8	.2	.1	0.0	.0	.0	.0	4.5	12.6
W	.1	.9	1.5	1.3	.4	.3	.1	.0	.0	.0	.0	4.6	11.4
WNW	.1	.4	1.3	1.3	.6	.5	.1	.1	.0	.0	.0	4.3	13.6
NW	.1	.4	.9	.9	.4	.1	.0	.0	.0	.0	.0	2.8	11.9
NNW	.1	.2	.7	.4	0.0	.0	.0	.0	.0	.0	.0	1.4	9.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	1.8	0
ALL	2.6	11.3	22.7	31.8	15.0	10.9	2.6	1.2	0.0	.0	.0	100.0	13.7

SAN FRANCISCO

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 8565
 WIND DIRECTION vs SPEED from raw station data

JAN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	.8	.2	.3	.1	.0	.0	.0	.0	.0	.0	2.1	6.5
NNE	.5	.9	.4	.3	.2	0.0	0.0	0.0	.0	.0	.0	2.3	7.8
NE	.7	1.7	2.8	3.7	1.4	.4	.1	.0	.0	.0	.0	10.8	11.5
ENE	.7	2.8	4.9	8.1	2.1	.6	.2	.0	.0	.0	.0	19.3	11.8
E	.7	2.2	3.2	3.0	.9	.1	0.0	.0	.0	.0	.0	10.2	10.2
ESE	.4	.5	.6	.4	.2	0.0	.0	.0	.0	.0	.0	2.1	8.2
SE	.4	.6	.7	1.0	.5	.3	.1	0.0	.0	.0	.0	3.6	12.6
SSE	.3	.8	1.3	2.6	1.7	1.3	.7	.1	.0	.0	.0	8.7	15.7
S	.3	1.0	1.6	1.8	.8	.6	.1	.0	.0	.0	.0	6.1	12.5
SSW	.2	.7	.7	.9	.4	.2	0.0	.0	.0	.0	.0	3.0	11.4
SW	.4	.5	.6	.8	.2	0.0	.0	.0	.0	.0	.0	2.5	9.4
WSW	.3	.6	.4	.5	.1	0.0	.0	.0	.0	.0	.0	1.9	8.7
W	.4	1.0	.7	.8	.4	.1	0.0	.0	.0	.0	.0	3.4	9.8
WNW	.6	1.4	1.5	2.3	.7	.5	.1	.0	.0	.0	.0	7.0	11.4
NW	.6	1.7	2.3	2.9	1.5	.9	.2	0.0	.0	.0	.0	10.2	12.7
NNW	.5	1.1	.9	.7	.3	.1	.0	.0	.0	.0	.0	3.5	8.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.1	0
ALL	7.4	18.3	22.8	30.1	11.5	5.1	1.5	.1	.0	.0	.0	100.0	11.1

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 8917
 WIND DIRECTION vs SPEED from raw station data

FEB

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	.9	.2	.2	0.0	.0	0.0	.0	.0	.0	.0	1.8	5.2
NNE	.5	.7	.2	.2	0.0	.0	.0	.0	.0	.0	.0	1.6	5.7
NE	.6	1.2	1.1	1.1	.2	.2	0.0	.0	.0	.0	.0	4.4	9.3
ENE	.5	1.8	2.7	2.9	.5	.5	0.0	.0	.0	.0	.0	9.0	10.7
E	.6	1.6	1.5	1.2	.1	.0	.0	.0	.0	.0	.0	4.9	8.0
ESE	.4	.8	.5	.4	.1	0.0	.0	.0	.0	.0	.0	2.2	7.4
SE	.3	1.0	.8	.7	.5	.5	.1	.1	.0	.0	.0	4.0	12.7
SSE	.5	.9	1.1	1.8	1.2	1.9	.6	.2	0.0	.0	.0	8.2	16.3
S	.4	.9	1.2	1.7	.9	.6	.1	0.0	.0	.0	.0	5.8	12.8
SSW	.3	.9	.9	1.0	.5	.1	.1	0.0	.0	.0	.0	3.8	10.8
SW	.4	1.0	.9	.9	.2	.1	.0	.0	.0	.0	.0	3.6	9.3
WSW	.5	1.5	1.0	.8	.3	.1	.0	0.0	.0	.0	.0	4.2	8.9
W	.5	2.0	1.3	1.3	.4	.1	0.0	.0	.0	.0	.0	5.7	9.1
WNW	.7	3.2	3.7	4.2	1.4	1.3	.2	.0	.0	.0	.0	14.7	11.6
NW	.8	2.7	4.0	5.6	2.5	1.3	.3	.0	.0	.0	.0	17.2	12.6
NNW	.6	1.6	1.1	.6	.1	.1	.0	.0	.0	.0	.0	4.0	7.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	4.8	0
ALL	8.2	22.7	22.1	24.4	9.0	6.9	1.5	.3	0.0	.0	.0	100.0	10.5

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 10415
 WIND DIRECTION vs SPEED from raw station data

MAR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.3	.4	.1	.1	.0	.0	.0	.0	.0	.0	.0	.9	4.9
NNE	.3	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.7	6.0
NE	.3	.3	.3	.2	0.0	0.0	.0	.0	.0	.0	.0	1.1	6.6
ENE	.3	.6	.8	.5	.0	.0	.0	.0	.0	.0	.0	2.1	7.9
E	.2	.7	.6	.3	.0	.0	.0	.0	.0	.0	.0	1.8	7.2
ESE	.2	.3	.3	.1	.1	.1	.0	.0	.0	.0	.0	1.1	8.5
SE	.4	.5	.7	.8	.2	.2	0.0	.0	.0	.0	.0	2.8	11.0
SSE	.3	1.0	1.3	2.7	1.6	1.3	.6	.2	.0	.0	.0	9.1	15.7
S	.5	1.3	2.1	2.1	.7	.6	.2	.0	.0	.0	.0	7.5	11.7
SSW	.5	1.6	1.0	.7	.2	.1	0.0	.0	.0	.0	.0	4.0	8.3
SW	.6	1.6	1.0	.7	.3	.1	.0	.0	.0	.0	.0	4.3	8.0
WSW	.7	1.9	.9	.6	.2	0.0	.0	.0	.0	.0	.0	4.3	7.3
W	.7	2.6	2.5	1.7	.3	.1	.0	.0	.0	.0	.0	8.0	8.7
WNW	.6	3.0	5.6	8.4	3.2	1.9	.3	0.0	.0	.0	.0	23.0	12.9
NW	.8	2.6	3.7	7.3	5.1	2.9	.2	0.0	.0	.0	.0	22.5	14.2
NNW	.3	1.0	1.0	.7	.1	0.0	.0	.0	.0	.0	.0	3.1	8.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.6	0
ALL	7.0	19.5	21.8	27.2	12.0	7.3	1.3	.2	.0	.0	.0	100.0	11.3

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 10357
 WIND DIRECTION vs SPEED from raw station data

APR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.2	0.0	.1	.1	.0	.0	.0	.0	.0	.0	.7	6.6
NNE	.1	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.4	6.9
NE	.2	.2	0.0	0.0	0.0	.0	.0	.0	.0	.0	.0	.5	5.0
ENE	.1	.3	.2	0.0	.0	.0	.0	.0	.0	.0	.0	.6	6.7
E	.1	.2	.2	.1	.0	.0	.0	.0	.0	.0	.0	.5	6.3
ESE	.2	.2	0.0	.1	.0	.0	.0	.0	.0	.0	.0	.5	5.1
SE	.2	.4	.2	.3	.1	0.0	.0	.0	.0	.0	.0	1.3	9.4
SSE	.2	.8	1.1	1.4	.4	.1	0.0	.0	.0	.0	.0	4.0	11.0
S	.4	1.5	1.8	1.4	.3	0.0	.0	.0	.0	.0	.0	5.3	9.0
SSW	.4	1.9	1.3	.5	0.0	.0	.0	.0	.0	.0	.0	4.1	6.9
SW	.6	1.7	.8	.1	.0	.0	.0	.0	.0	.0	.0	3.3	5.6
WSW	.7	2.6	1.1	.2	.0	.0	.0	.0	.0	.0	.0	4.6	5.8
W	.9	3.4	3.6	1.6	.1	0.0	0.0	0.0	.0	.0	.0	9.6	7.8
WNW	.6	3.7	6.5	12.4	5.2	2.7	.4	0.0	.0	.0	.0	31.7	13.4
NW	.6	2.5	3.6	9.1	5.9	4.7	.6	.0	.0	.0	.0	27.1	15.4
NNW	.4	.7	.6	.6	.2	.1	.0	.0	.0	.0	.0	2.5	9.1
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.2	0
ALL	6.1	20.4	21.3	27.9	12.3	7.7	1.1	0.0	.0	.0	.0	100.0	11.4

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 10227
 WIND DIRECTION vs SPEED from raw station data

MAY

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.1	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.2	3.9
NNE	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	3.4
NE	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	3.0
ENE	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	4.6
E	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	4.1
ESE	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.4	5.2
SE	.3	.4	.3	.2	.1	0.0	.0	.0	.0	.0	.0	1.4	7.8
SSE	.3	.9	1.4	1.7	.5	.3	.0	.0	.0	.0	.0	5.1	11.2
S	.4	1.7	2.0	1.1	.1	0.0	.0	.0	.0	.0	.0	5.3	8.4
SSW	.4	2.1	1.2	.3	.0	.0	.0	.0	.0	.0	.0	4.0	6.3
SW	.7	2.0	.7	.1	0.0	.0	.0	.0	.0	.0	.0	3.6	5.5
WSW	.6	3.0	1.7	.3	.0	.0	.0	.0	.0	.0	.0	5.5	6.3
W	.6	3.6	5.0	3.7	.5	.1	.0	.0	.0	.0	.0	13.5	9.3
WNW	.5	3.5	8.0	14.4	6.0	2.7	.3	.0	.0	.0	.0	35.4	13.5
NW	.3	1.8	3.4	7.8	5.0	3.1	.3	0.0	.0	.0	.0	21.8	15.0
NNW	.1	.5	.3	.2	.1	.1	.0	.0	.0	.0	.0	1.4	9.1
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	1.7	0
ALL	4.8	20.2	24.2	29.9	12.3	6.3	.5	0.0	.0	.0	.0	100.0	11.4

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 10328
 WIND DIRECTION vs SPEED from raw station data

JUN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	2.8
NNE	0.0	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	5.0
NE	.0	.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	0.0	9.0
ENE	0.0	0.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.2	6.1
E	0.0	.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	3.0
ESE	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	3.1
SE	.2	.2	.1	.1	.0	.0	.0	.0	.0	.0	.0	.7	5.8
SSE	.3	1.0	1.0	.8	.1	0.0	.0	.0	.0	.0	.0	3.2	8.5
S	.6	2.5	2.1	.8	.1	0.0	.0	.0	.0	.0	.0	6.0	7.3
SSW	.7	3.0	1.2	.2	.0	.0	.0	.0	.0	.0	.0	5.1	5.7
SW	.8	3.2	1.0	.1	0.0	.0	.0	.0	.0	.0	.0	5.1	5.4
WSW	.7	3.2	2.3	.3	.0	.0	.0	.0	.0	.0	.0	6.6	6.4
W	.6	3.9	5.7	4.1	.4	.1	.0	.0	.0	.0	.0	14.8	9.2
WNW	.6	2.9	6.3	14.6	6.6	3.1	.1	0.0	.0	.0	.0	34.2	14.0
NW	.2	1.1	3.2	8.7	5.3	2.1	.2	.0	.0	.0	.0	20.9	15.1
NNW	.1	.3	.2	.1	.0	.0	.0	.0	.0	.0	.0	.7	7.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.1	0
ALL	5.1	21.5	23.1	29.9	12.4	5.4	.4	0.0	.0	.0	.0	100.0	11.1

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 9939
 WIND DIRECTION vs SPEED from raw station data

JUL

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.1	0.0	.0	0.0	.0	.0	.0	.0	.0	.0	.0	.1	3.6
NNE	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	3.0
NE	.1	.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	3.3
ENE	0.0	.0	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	0.0	6.5
E	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	2.2
ESE	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	2.5
SE	.2	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.3	3.3
SSE	.4	1.1	.9	.2	0.0	.0	.0	.0	.0	.0	.0	2.6	6.6
S	.7	3.3	2.9	.6	0.0	.0	.0	.0	.0	.0	.0	7.6	6.9
SSW	1.2	4.5	1.4	.1	.0	.0	.0	.0	.0	.0	.0	7.1	5.3
SW	1.3	4.4	.8	0.0	.0	.0	.0	.0	.0	.0	.0	6.5	4.8
WSW	1.4	5.3	1.4	.2	.0	.0	.0	.0	.0	.0	.0	8.2	5.3
W	1.1	6.7	6.1	3.5	.4	.1	.0	.0	.0	.0	.0	18.0	8.2
WNW	.7	4.2	8.5	13.1	4.9	2.0	.1	.0	.0	.0	.0	33.5	12.6
NW	.4	1.4	3.2	5.7	2.0	.3	0.0	.0	.0	.0	.0	13.0	12.4
NNW	.1	.3	.2	.1	.0	.0	.0	.0	.0	.0	.0	.6	6.4
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.2	0
ALL	7.7	31.2	25.5	23.5	7.4	2.3	.1	.0	.0	.0	.0	100.0	9.2

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 8937
 WIND DIRECTION vs SPEED from raw station data

AUG

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	3.1
NNE	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.0	2.0
NE	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.0	2.7
ENE	0.0	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	4.3
E	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.0	4.0
ESE	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	2.2
SE	.1	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.4	5.4
SSE	.2	.9	.7	.4	0.0	.0	.0	.0	.0	.0	.0	2.2	7.6
S	.6	2.4	1.9	.9	0.0	.0	.0	.0	.0	.0	.0	5.8	7.4
SSW	.9	3.1	1.3	.1	.0	.0	.0	.0	.0	.0	.0	5.4	5.6
SW	1.2	3.4	1.0	.1	.0	.0	.0	.0	.0	.0	.0	5.7	5.1
WSW	1.1	4.5	1.4	.2	.0	.0	.0	.0	.0	.0	.0	7.2	5.4
W	1.2	6.3	6.4	2.9	.1	0.0	.0	.0	.0	.0	.0	17.0	7.8
WNW	1.0	5.7	10.6	14.6	2.9	.4	.0	.0	.0	.0	.0	35.2	11.1
NW	.4	2.2	4.2	7.7	2.0	.3	.0	.0	.0	.0	.0	16.8	11.9
NNW	.2	.4	.3	0.0	.0	.0	.0	.0	.0	.0	.0	.9	5.7
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.9	0
ALL	7.2	29.1	27.9	27.1	5.0	.7	.0	.0	.0	.0	.0	100.0	8.9

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 9273
 WIND DIRECTION vs SPEED from raw station data

SEP

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.4	.2	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.7	3.1
NNE	.1	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.2	3.7
NE	.2	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.3	3.4
ENE	.2	.1	0.0	.1	.0	.0	.0	.0	.0	.0	.0	.4	4.4
E	.3	.2	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.5	3.8
ESE	.3	.3	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.6	3.5
SE	.5	.4	.2	.0	0.0	.0	.0	.0	.0	.0	.0	1.0	4.5
SSE	.8	1.4	1.2	.2	.0	.0	.0	.0	.0	.0	.0	3.5	6.1
S	1.0	3.1	1.5	.4	.1	.0	.0	.0	.0	.0	.0	6.1	6.0
SSW	1.4	3.5	1.1	.2	.0	.0	.0	.0	.0	.0	.0	6.2	5.1
SW	1.5	3.7	.7	0.0	.0	.0	.0	.0	.0	.0	.0	6.0	4.6
WSW	1.9	4.2	1.0	.1	.0	.0	.0	.0	.0	.0	.0	7.1	4.7
W	1.8	6.8	4.5	1.3	.1	.0	.0	.0	.0	.0	.0	14.4	6.6
WNW	1.3	6.3	7.8	9.0	1.5	.3	.0	.0	.0	.0	.0	26.2	10.0
NW	1.2	3.7	4.4	6.7	2.0	.4	.0	.0	.0	.0	.0	18.2	10.8
NNW	.5	1.1	.6	.4	0.0	0.0	.0	.0	.0	.0	.0	2.6	6.7
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	5.8	0
ALL	13.4	35.0	23.1	18.4	3.8	.6	.0	.0	.0	.0	.0	100.0	7.4

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 10628
 WIND DIRECTION vs SPEED from raw station data

OCT

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.4	.5	0.0	0.0	0.0	.0	.0	.0	.0	.0	.0	.9	4.4
NNE	.2	.3	0.0	.1	0.0	0.0	.0	.0	.0	.0	.0	.7	5.8
NE	.4	.3	.2	.2	.0	.0	.0	.0	.0	.0	.0	1.1	6.1
ENE	.3	.6	.8	.3	0.0	.0	.0	.0	.0	.0	.0	2.1	7.5
E	.4	.6	.5	.1	.0	.0	.0	.0	.0	.0	.0	1.6	6.2
ESE	.3	.5	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.9	4.5
SE	.4	.6	.2	.1	.0	.0	.0	.0	.0	.0	.0	1.2	4.9
SSE	.5	1.4	1.4	1.3	.3	.2	.1	0.0	.0	.0	.0	5.1	9.9
S	.9	2.1	1.3	1.0	.1	.1	.0	.0	.0	.0	.0	5.5	7.5
SSW	1.0	2.1	.6	.2	.1	0.0	.0	.0	.0	.0	.0	4.0	5.5
SW	1.0	1.7	.4	.1	0.0	0.0	.0	.0	.0	.0	.0	3.3	4.7
WSW	1.2	2.1	.3	.1	.0	.0	.0	.0	.0	.0	.0	3.7	4.4
W	1.5	3.8	1.9	.7	0.0	.0	.0	.0	.0	.0	.0	7.8	6.1
WNW	1.3	5.9	7.1	7.2	1.6	.7	0.0	.0	.0	.0	.0	23.9	10.1
NW	1.5	4.6	6.9	8.3	3.4	2.0	.2	.0	.0	.0	.0	26.8	11.9
NNW	1.1	1.6	.9	.5	.1	0.0	.0	.0	.0	.0	.0	4.3	6.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	6.9	0
ALL	12.5	28.7	22.6	20.2	5.7	3.1	.3	0.0	.0	.0	.0	100.0	8.3

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 9944
 WIND DIRECTION vs SPEED from raw station data

NOV

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	.8	.2	.2	.1	.1	.0	.0	.0	.0	.0	2.1	6.8
NNE	.6	.7	.2	.2	0.0	.0	.0	.0	.0	.0	.0	1.8	5.5
NE	.5	1.2	1.4	1.5	.3	.1	.0	.0	.0	.0	.0	5.0	9.2
ENE	.5	1.8	3.2	3.2	.7	.1	.0	.0	.0	.0	.0	9.5	10.3
E	.4	1.3	1.9	1.6	.2	0.0	.0	.0	.0	.0	.0	5.5	9.3
ESE	.4	.5	.2	.2	0.0	.0	.0	.0	.0	.0	.0	1.3	5.8
SE	.3	.6	.2	.4	.1	.2	0.0	.0	.0	.0	.0	1.9	9.9
SSE	.3	.7	1.1	2.2	1.3	.8	.3	.0	.0	.0	.0	6.6	14.5
S	.3	1.0	1.3	1.0	.5	.2	0.0	.0	.0	.0	.0	4.3	10.4
SSW	.3	.9	.7	.4	.2	0.0	0.0	.0	.0	.0	.0	2.5	8.6
SW	.3	.7	.4	.4	.1	0.0	.0	.0	.0	.0	.0	1.9	8.1
WSW	.4	.8	.5	.6	.1	.1	0.0	.0	.0	.0	.0	2.5	8.4
W	.8	1.7	1.2	.7	.1	.1	0.0	.0	.0	.0	.0	4.6	7.3
WNW	.9	3.9	4.2	4.8	1.9	.7	.2	0.0	.0	.0	.0	16.5	11.0
NW	1.1	4.3	6.0	7.4	2.9	1.6	.3	.0	.0	.0	.0	23.6	11.9
NNW	.9	2.0	1.3	1.0	.2	.1	.0	.0	.0	.0	.0	5.5	7.8
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	5.0	0
ALL	8.6	22.9	24.2	25.8	8.7	4.0	.7	0.0	.0	.0	.0	100.0	9.8

San Francisco
 LAT 37 45.0 LONG 122 50.0 : Total number of data points = 10109
 WIND DIRECTION vs SPEED from raw station data

DEC

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	1.1	.3	.3	.2	.1	0.0	0.0	.0	.0	.0	2.6	7.7
NNE	.6	.8	.3	.3	.1	.1	.1	0.0	0.0	.0	.0	2.3	8.3
NE	.8	1.8	2.7	4.0	1.3	.3	.0	0.0	.0	.0	.0	10.9	11.2
ENE	.7	3.1	5.7	9.9	2.4	.3	.0	.0	.0	.0	.0	22.2	11.7
E	.5	2.1	3.1	2.9	.7	0.0	.0	.0	.0	.0	.0	9.4	9.9
ESE	.4	.7	.4	.4	.1	0.0	.0	.0	.0	.0	.0	2.1	7.9
SE	.4	.5	.5	.6	.3	.3	.1	0.0	.0	.0	.0	2.6	12.1
SSE	.2	.6	.8	2.1	1.0	1.5	.4	.1	.0	.0	.0	6.7	16.5
S	.2	.6	.7	.9	.5	.4	.1	.0	.0	.0	.0	3.5	12.7
SSW	.2	.4	.4	.4	.2	.2	0.0	.0	.0	.0	.0	1.8	11.3
SW	.1	.5	.4	.3	.1	.1	0.0	.0	.0	.0	.0	1.6	10.4
WSW	.2	.6	.5	.3	0.0	0.0	0.0	.0	.0	.0	.0	1.6	8.1
W	.4	1.0	.6	.5	.2	.1	0.0	.0	.0	.0	.0	2.9	9.0
WNW	.4	1.8	1.8	1.7	.6	.5	.1	0.0	.0	.0	.0	6.8	11.0
NW	.8	2.5	3.2	3.9	1.9	1.3	.1	0.0	.0	.0	.0	13.9	12.2
NNW	.5	1.8	1.6	1.2	.5	.1	.0	.0	.0	.0	.0	5.7	9.3
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.5	0
ALL	7.1	19.8	23.0	29.8	10.4	5.4	.9	.1	0.0	.0	.0	100.0	10.9

PT ARUGUELLO

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 8717
 WIND DIRECTION vs SPEED from raw station data

JAN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.7	1.1	1.0	1.7	.9	.4	.1	0.0	.0	.0	.0	6.0	11.8
NNE	.4	.7	.1	.2	0.0	.0	.0	.0	.0	.0	.0	1.4	6.0
NE	.4	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.9	4.6
ENE	.4	.8	.2	.1	.0	.0	.0	.0	.0	.0	.0	1.5	5.0
E	.6	1.2	.7	.3	.3	.4	.1	.0	.0	.0	.0	3.5	9.6
ESE	.5	1.0	.7	.9	.6	.4	.1	0.0	.0	.0	.0	4.3	11.5
SE	.4	.6	.7	1.3	.5	.3	0.0	.0	.0	.0	.0	3.7	11.8
SSE	.4	.4	.5	.8	.2	.1	.0	.0	.0	.0	.0	2.4	10.1
S	.2	.4	.4	.5	.1	0.0	.0	.0	.0	.0	.0	1.7	9.4
SSW	.3	.3	.2	.3	.1	.0	.0	.0	.0	.0	.0	1.2	8.3
SW	.2	.4	.4	.4	.1	0.0	.0	.0	.0	.0	.0	1.5	9.2
WSW	.2	.7	.3	.3	.1	0.0	.0	.0	.0	.0	.0	1.7	7.9
W	.4	.9	.7	.6	.1	0.0	.0	.0	.0	.0	.0	2.7	8.2
WNW	.5	1.7	2.6	2.7	.9	.2	.0	.0	.0	.0	.0	8.6	10.7
NW	.6	3.3	5.7	11.4	6.4	2.8	.3	.0	.0	.0	.0	30.5	13.9
NNW	.6	2.5	4.1	7.8	4.8	3.3	.4	.0	.0	.0	.0	23.6	14.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	4.7	0
ALL	6.7	16.5	18.5	29.4	15.1	7.9	1.1	0.0	.0	.0	.0	100.0	11.7

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 8599
 WIND DIRECTION vs SPEED from raw station data

FEB

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	1.0	.9	.7	.5	.2	0.0	.0	.0	.0	.0	3.7	9.8
NNE	.3	.3	.2	0.0	.0	0.0	.0	.0	.0	.0	.0	.8	5.0
NE	.3	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.9	4.4
ENE	.2	.4	.2	.1	.0	.0	.0	.0	.0	.0	.0	.9	5.9
E	.2	.7	.7	.8	.3	.5	.1	.1	.0	.0	.0	3.5	13.0
ESE	.4	1.2	1.0	1.5	.8	.9	.2	.1	.1	.0	.0	6.3	14.2
SE	.3	.9	1.2	1.4	.7	.6	.2	.1	0.0	.0	.0	5.2	13.4
SSE	.2	.6	1.0	1.3	.3	.3	0.0	0.0	.0	.0	.0	3.8	11.6
S	.3	.6	.8	1.0	.3	.1	0.0	.0	.0	.0	.0	3.0	10.5
SSW	.2	.5	.4	.6	.2	0.0	.0	.0	.0	.0	.0	1.9	9.7
SW	.3	.7	.5	.5	.1	.0	.0	.0	.0	.0	.0	2.1	7.9
WSW	.5	1.1	.6	.3	.1	0.0	.0	.0	.0	.0	.0	2.7	7.3
W	.6	1.4	1.2	.7	.2	0.0	0.0	.0	.0	.0	.0	4.2	8.2
WNW	.5	1.9	2.4	2.8	.8	.6	.1	.0	.0	.0	.0	9.3	11.5
NW	.3	2.3	4.0	10.6	6.9	3.9	.5	0.0	.0	.0	.0	28.6	15.3
NNW	.5	1.8	3.0	6.5	4.6	3.5	.7	0.0	.0	.0	.0	20.7	15.5
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.4	0
ALL	5.6	15.9	18.3	29.0	15.8	10.7	1.9	.3	.1	.0	.0	100.0	12.9

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 9495
 WIND DIRECTION vs SPEED from raw station data

MAR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.3	.8	.6	.6	.2	.1	0.0	.0	.0	.0	.0	2.5	9.1
NNE	.2	.2	0.0	.1	.0	.0	.0	.0	.0	.0	.0	.5	4.8
NE	.2	.2	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.5	4.8
ENE	.2	.3	.1	.1	.0	.0	.0	.0	.0	.0	.0	.6	6.0
E	.3	.6	.3	.3	.2	.1	0.0	.0	.0	.0	.0	1.9	9.7
ESE	.2	.6	.7	1.2	.3	.3	.1	.0	.0	.0	.0	3.3	12.7
SE	.2	.5	.7	1.2	.4	.2	.1	.0	.0	.0	.0	3.3	12.1
SSE	.2	.5	.5	.7	.2	.1	0.0	.0	.0	.0	.0	2.3	10.7
S	.2	.6	.5	.4	.2	.1	.0	.0	.0	.0	.0	2.0	9.4
SSW	.3	.7	.3	.3	.1	0.0	.0	.0	.0	.0	.0	1.7	7.6
SW	.3	.8	.5	.4	.1	.0	0.0	.0	.0	.0	.0	1.9	7.8
WSW	.3	.9	.6	.6	.1	0.0	0.0	.0	.0	.0	.0	2.5	8.6
W	.3	.9	1.1	.9	.1	.1	0.0	.0	.0	.0	.0	3.4	9.5
WNW	.5	1.4	2.2	3.2	1.4	1.2	.1	.0	.0	.0	.0	9.9	12.9
NW	.4	1.9	4.7	13.2	9.2	8.0	1.3	.1	.0	.0	.0	38.8	16.6
NNW	.3	1.5	2.8	6.9	5.9	4.5	.6	0.0	.0	.0	.0	22.6	16.3
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.3	0
ALL	4.1	12.4	15.7	30.0	18.3	14.7	2.2	.1	.0	.0	.0	100.0	14.0

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 9162
 WIND DIRECTION vs SPEED from raw station data

APR

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.3	.6	.5	.3	0.0	.1	.0	.0	.0	.0	.0	1.7	7.9
NNE	.1	.2	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.3	5.3
NE	.1	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.3	5.2
ENE	.1	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.3	5.0
E	.2	.3	.3	.1	.0	.0	.0	.0	.0	.0	.0	.8	6.3
ESE	.2	.6	.5	.5	.1	0.0	.0	.0	.0	.0	.0	1.9	9.0
SE	.2	.4	.5	.7	.1	0.0	.0	.0	.0	.0	.0	2.0	9.8
SSE	.2	.6	.5	.3	0.0	.0	.0	.0	.0	.0	.0	1.7	7.6
S	.2	.5	.4	.1	.0	0.0	.0	.0	.0	.0	.0	1.3	6.6
SSW	.3	.5	.2	.1	.0	.0	.0	.0	.0	.0	.0	1.1	5.6
SW	.2	.6	.3	.1	0.0	.0	.0	.0	.0	.0	.0	1.2	6.1
WSW	.2	.7	.3	.1	.0	.0	.0	.0	.0	.0	.0	1.2	6.1
W	.3	1.0	.8	.3	0.0	.0	.0	.0	.0	.0	.0	2.5	7.2
WNW	.4	1.2	1.9	2.4	.9	.9	.2	.0	.0	.0	.0	7.8	12.8
NW	.3	1.8	4.6	13.7	12.9	10.7	3.2	.5	.0	.0	.0	47.6	17.9
NNW	.3	1.5	3.0	7.4	7.3	5.6	1.3	0.0	.0	.0	.0	26.4	17.0
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	1.9	0
ALL	3.5	10.7	13.9	26.0	21.5	17.3	4.7	.5	.0	.0	.0	100.0	15.2

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 8675
 WIND DIRECTION vs SPEED from raw station data

MAY

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.1	.4	.4	.2	0.0	0.0	.0	.0	.0	.0	.0	1.2	8.2
NNE	.1	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.2	5.2
NE	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.3	5.1
ENE	.1	.1	.0	0.0	.0	.0	.0	.0	.0	.0	.0	.2	3.9
E	.1	.2	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.4	5.3
ESE	.1	.4	.1	.2	.1	.1	0.0	.0	.0	.0	.0	1.1	11.5
SE	.2	.5	.3	.3	0.0	.0	.0	.0	.0	.0	.0	1.3	7.7
SSE	.1	.5	.3	.1	.0	.0	.0	.0	.0	.0	.0	1.1	6.7
S	.1	.3	.3	.1	.0	.0	.0	.0	.0	.0	.0	.9	6.8
SSW	.1	.2	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.5	5.2
SW	.2	.2	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.6	5.3
WSW	.1	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.7	5.5
W	.2	.8	.7	.2	0.0	.0	.0	.0	.0	.0	.0	2.0	6.9
WNW	.2	1.3	2.4	4.1	1.5	1.3	0.0	.0	.0	.0	.0	10.9	13.4
NW	.3	2.1	6.1	16.9	13.2	10.5	1.8	.4	.0	.0	.0	51.4	16.9
NNW	.1	1.4	3.5	7.6	6.8	5.7	.8	0.0	.0	.0	.0	25.9	16.7
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	1.3	0
ALL	2.5	9.1	14.8	29.8	21.7	17.7	2.7	.4	.0	.0	.0	100.0	15.3

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 11145
 WIND DIRECTION vs SPEED from raw station data

JUN

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.5	.4	.4	.1	.1	0.0	.0	.0	.0	.0	1.6	9.8
NNE	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	4.4
NE	.1	.2	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.3	5.1
ENE	.2	.2	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	3.3
E	.1	.2	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.4	5.1
ESE	.2	.5	.2	.1	.0	.0	.0	.0	.0	.0	.0	1.0	5.8
SE	.2	.7	.3	.2	.0	.0	.0	.0	.0	.0	.0	1.4	6.6
SSE	.2	.5	.2	.1	.0	.0	.0	.0	.0	.0	.0	1.0	6.3
S	.2	.4	.2	0.0	.0	.0	.0	.0	.0	.0	.0	.8	5.5
SSW	.4	.6	.1	.0	.0	.0	.0	.0	.0	.0	.0	1.1	4.1
SW	.2	.4	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.7	4.5
WSW	.3	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.9	4.4
W	.4	1.3	.6	.2	0.0	0.0	.0	.0	.0	.0	.0	2.6	6.1
WNW	.6	2.3	3.3	3.5	1.6	.8	.1	.0	.0	.0	.0	12.2	11.7
NW	.6	2.6	6.1	14.1	14.8	11.5	1.4	0.0	.0	.0	.0	51.0	16.9
NNW	.3	1.6	3.2	6.7	5.6	4.3	.5	0.0	.0	.0	.0	22.2	16.0
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.1	0
ALL	4.2	12.5	15.0	25.4	22.1	16.7	2.0	0.0	.0	.0	.0	100.0	14.3

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 11512
 WIND DIRECTION vs SPEED from raw station data

JUL

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.3	.3	.4	.2	.1	.1	.0	.0	.0	.0	.0	1.3	9.2
NNE	.1	.1	.1	.0	0.0	0.0	.0	.0	.0	.0	.0	.4	7.1
NE	.1	.1	0.0	.0	.0	0.0	.0	.0	.0	.0	.0	.2	6.1
ENE	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.3	4.8
E	.2	.2	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.6	5.0
ESE	.2	.3	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.6	4.0
SE	.2	.3	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.6	4.3
SSE	.3	.4	.1	.0	.0	.0	.0	.0	.0	.0	.0	.8	4.1
S	.3	.3	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.6	3.7
SSW	.3	.4	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.7	3.6
SW	.4	.5	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.9	3.5
WSW	.6	.7	.1	0.0	.0	.0	.0	.0	.0	.0	.0	1.4	3.8
W	.6	1.4	.7	.1	0.0	0.0	.0	.0	.0	.0	.0	2.9	5.6
WNW	.6	2.6	3.3	4.2	1.5	.6	0.0	.0	.0	.0	.0	12.9	11.3
NW	.5	2.4	6.4	19.8	14.7	6.2	.3	.0	.0	.0	.0	50.3	15.6
NNW	.3	1.6	2.8	7.9	7.0	3.6	.1	.0	.0	.0	.0	23.4	15.8
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.3	0
ALL	5.1	11.7	14.1	32.3	23.4	10.6	.5	.0	.0	.0	.0	100.0	13.6

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 10339
 WIND DIRECTION vs SPEED from raw station data

AUG

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.1	.5	.4	.2	.0	.0	.0	.0	.0	.0	.0	1.2	7.1
NNE	.2	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	3.5
NE	.1	0.0	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.2	3.2
ENE	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.2	5.6
E	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.3	5.6
ESE	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.4	5.3
SE	.1	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.3	5.0
SSE	.1	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.3	4.4
S	.1	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.4	4.6
SSW	.1	.3	0.0	0.0	.0	.0	.0	.0	.0	.0	.0	.5	4.7
SW	.2	.3	0.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	4.2
WSW	.2	.3	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.6	4.6
W	.3	1.1	.5	.1	.0	0.0	.0	.0	.0	.0	.0	2.0	6.1
WNW	.5	1.5	2.7	3.8	1.4	.5	.0	.0	.0	.0	.0	10.5	11.9
NW	.3	2.1	7.3	21.8	18.6	7.7	.3	0.0	.0	.0	.0	58.0	16.0
NNW	.2	1.8	4.0	8.4	5.6	2.5	.2	0.0	.0	.0	.0	22.7	14.7
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	1.7	0
ALL	2.8	8.8	15.4	34.4	25.6	10.7	.5	0.0	.0	.0	.0	100.0	14.2

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 10665
 WIND DIRECTION vs SPEED from raw station data

SEP

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.2	.6	.6	.3	0.0	.0	.0	.0	.0	.0	.0	1.7	8.0
NNE	.2	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.4	4.5
NE	0.0	.1	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.2	5.4
ENE	.1	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.4	4.6
E	.2	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.7	5.0
ESE	.3	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.8	5.0
SE	.2	.3	.2	.1	.0	.0	.0	.0	.0	.0	.0	.8	6.0
SSE	.3	.4	.2	0.0	.0	.0	.0	.0	.0	.0	.0	1.1	5.1
S	.2	.7	.4	.1	.0	.0	.0	.0	.0	.0	.0	1.4	6.0
SSW	.4	.4	.2	0.0	.0	.0	.0	.0	.0	.0	.0	1.1	4.6
SW	.4	.4	.2	.1	0.0	.0	.0	.0	.0	.0	.0	1.0	5.1
WSW	.3	.4	.1	.0	.0	.0	.0	.0	.0	.0	.0	.8	4.3
W	.3	1.1	.4	.1	.0	.0	.0	.0	.0	.0	.0	1.9	5.8
WNW	.6	2.2	3.1	4.4	1.2	.5	.1	.0	.0	.0	.0	12.0	11.5
NW	.5	2.4	6.2	20.9	14.0	6.3	.3	.0	.0	.0	.0	50.6	15.5
NNW	.4	1.6	4.0	8.9	5.0	2.3	0.0	.0	.0	.0	.0	22.2	14.3
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.9	0
ALL	4.4	11.7	16.2	35.0	20.3	9.1	.3	.0	.0	.0	.0	100.0	13.1

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 10665
 WIND DIRECTION vs SPEED from raw station data

OCT

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.4	1.4	.8	.4	.2	.1	.0	.0	.0	.0	.0	3.3	7.9
NNE	.3	.4	.2	0.0	.0	.0	.0	.0	.0	.0	.0	.9	4.6
NE	.3	.4	.1	.0	0.0	.0	.0	.0	.0	.0	.0	.9	4.3
ENE	.3	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.9	4.7
E	.2	.6	.1	0.0	0.0	.0	.0	.0	.0	.0	.0	.9	5.1
ESE	.3	.7	.3	.2	0.0	.0	.0	.0	.0	.0	.0	1.5	6.6
SE	.3	.8	.5	.3	0.0	.0	.0	.0	.0	.0	.0	2.0	7.1
SSE	.2	.7	.4	.4	.0	.0	.0	.0	.0	.0	.0	1.7	7.6
S	.2	.5	.3	.1	0.0	.0	.0	.0	.0	.0	.0	1.2	6.6
SSW	.2	.5	.1	.1	.0	.0	.0	.0	.0	.0	.0	.8	5.5
SW	.3	.4	.1	.1	.0	.0	.0	.0	.0	.0	.0	.9	5.0
WSW	.2	.5	.2	0.0	0.0	0.0	.0	.0	.0	.0	.0	.9	5.3
W	.5	1.1	.5	.1	0.0	.0	.0	.0	.0	.0	.0	2.2	5.8
WNW	.5	2.3	3.1	3.3	1.0	.9	.2	.1	.0	.0	.0	11.4	11.8
NW	.7	3.4	7.3	14.9	9.5	6.0	.8	.0	.0	.0	.0	42.6	15.0
NNW	.6	2.7	4.3	8.4	5.9	3.3	.6	.0	.0	.0	.0	25.7	14.6
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	2.3	0
ALL	5.5	16.6	18.5	28.4	16.7	10.4	1.5	.1	.0	.0	.0	100.0	12.6

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 9226
 WIND DIRECTION vs SPEED from raw station data

NOV

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.6	1.3	1.1	1.2	.3	.3	0.0	.0	.0	.0	.0	4.8	9.9
NNE	.4	.4	.2	.1	.0	.0	.0	.0	.0	.0	.0	1.1	5.2
NE	.4	.4	.1	0.0	.0	.0	.0	.0	.0	.0	.0	.8	4.2
ENE	.3	.6	.1	0.0	0.0	0.0	.0	.0	.0	.0	.0	1.0	4.9
E	.4	.6	.4	.2	.1	.0	.0	.0	.0	.0	.0	1.7	7.2
ESE	.3	.6	.5	.5	.2	.2	0.0	.0	.0	.0	.0	2.3	10.1
SE	.2	.6	.4	.4	.4	.4	.0	.0	.0	.0	.0	2.4	12.1
SSE	.2	.6	.5	.5	.2	.1	.0	.0	.0	.0	.0	2.1	9.4
S	.3	.7	.6	.3	.1	0.0	.0	.0	.0	.0	.0	2.0	7.6
SSW	.2	.5	.4	.3	.2	0.0	.0	.0	.0	.0	.0	1.6	8.6
SW	.2	.4	.2	.2	0.0	0.0	.0	.0	.0	.0	.0	1.2	7.9
WSW	.2	.4	.3	.2	.2	.1	0.0	.0	.0	.0	.0	1.4	9.6
W	.5	1.1	.7	.5	.1	.1	0.0	.0	.0	.0	.0	2.9	7.5
WNW	.6	2.0	2.5	2.5	.9	.5	.1	.0	.0	.0	.0	9.2	11.1
NW	.7	3.3	5.9	11.5	7.2	5.1	1.0	.0	.0	.0	.0	34.6	15.0
NNW	.7	2.6	4.4	9.0	6.2	4.3	.6	.0	.0	.0	.0	27.8	15.0
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.2	0
ALL	6.2	16.2	18.1	27.5	16.0	11.0	1.8	.0	.0	.0	.0	100.0	12.6

Pt Argeullo
 LAT 34 42.0 LONG 120 58.0 : Total number of data points = 9002
 WIND DIRECTION vs SPEED from raw station data

DEC

16 PT. DIR.	SPEED (KNOTS)											TOTAL PERCNT	MEAN WIND SPEED
	1 - 3	4 - 6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	>=56		
N	.5	1.2	1.2	2.2	1.4	.4	0.0	.0	.0	.0	.0	7.0	12.2
NNE	.5	.5	.5	.6	.4	.1	.0	.0	.0	.0	.0	2.6	9.9
NE	.4	.7	.3	.1	0.0	.0	.0	.0	.0	.0	.0	1.5	5.5
ENE	.4	.6	.4	.1	.1	0.0	.0	.0	.0	.0	.0	1.5	6.7
E	.5	.8	.5	.3	.2	.2	.1	.0	.0	.0	.0	2.6	9.6
ESE	.4	.9	.7	1.0	.6	.7	.5	.1	.0	.0	.0	4.9	14.5
SE	.4	1.0	.9	1.3	.7	.6	.1	.0	.0	.0	.0	4.9	12.3
SSE	.3	.7	.5	.8	.2	0.0	0.0	.0	.0	.0	.0	2.6	9.6
S	.4	.6	.4	.3	.1	0.0	.0	.0	.0	.0	.0	1.8	7.5
SSW	.4	.4	.3	.4	.1	0.0	.0	.0	.0	.0	.0	1.6	8.2
SW	.3	.5	.2	.1	.1	0.0	.0	.0	.0	.0	.0	1.3	6.7
WSW	.4	.8	.2	.2	.1	.0	.0	.0	.0	.0	.0	1.6	6.2
W	.7	.9	.4	.2	.1	0.0	.0	.0	.0	.0	.0	2.5	6.7
WNW	.8	2.0	1.6	1.6	1.1	.9	.1	.0	.0	.0	.0	8.2	11.5
NW	.9	3.3	4.6	8.9	5.9	4.4	.4	0.0	.0	.0	.0	28.3	14.5
NNW	.6	2.6	4.6	7.1	4.7	3.3	.2	.0	.0	.0	.0	23.2	14.2
VAR	0	0	0	0	0	0	0	0	0	0	0	0	0
CLM	0	0	0	0	0	0	0	0	0	0	0	3.9	0
ALL	8.0	17.6	17.3	25.2	15.8	10.8	1.4	.1	.0	.0	.0	100.0	12.1