

Antarctic Automatic Weather Station Data
for the calendar year
1983

by

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Cover: Locations of the Automatic Weather Stations operating in Antarctica during 1983.

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I. Introduction

Automatic Weather Stations (AWS) provide surface weather observations at a number of locations in Antarctica. Data consist of air temperature (degrees Celsius), wind speed (meters per second), and wind direction (true degrees) at approximately three meters above the surface. Data are telemetered via polar-orbiting satellite to McMurdo, Antarctica, and to New Zealand, Australia, and the United States. Data storage design and the geometry of the satellite orbit result in 50 minutes of data at ten minute intervals for each 100 minute orbit of the satellite, yielding between 70 and 144 observations per station per day depending on the number of operational satellites.

Data have been selected at three-hourly intervals (plus or minus one hour) to produce a one page monthly summary for each station. Maximum and minimum values have been selected from the complete data set. It is likely that the AWS underestimate the true maximum winds due to discrete sampling.

Data and further information concerning the AWS program may be obtained by contacting:

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II. Locations and Deployment Summary

New Installations

AWS ID	Location or Name	Lat (deg)	Long (deg)	Elev (m)	Start	Stop	Notes
8900	D-80	70.02 S	134.72 E	2500	14 Jan 83	20 Oct 83	1
8908	Nancy	77.91 S	168.17 E	25	17 Jan 83	25 Nov 83	2
8918	Windless Bight	77.70 S	167.70 E	40	09 Feb 83	21 Mar 83	3

Continuing Stations

AWS ID	Location or Name	Lat (deg)	Long (deg)	Elev (m)	Start	Stop	Notes
8901	D-10	66.70 S	139.80 E	240	01 Jan 83		
8903	Byrd	80.00 S	120.00 W	1530	05 Feb 80		
8905	Manning	78.77 S	166.85 E	66	01 Dec 80		
8906	Marble Point	77.43 S	163.75 E	121	05 Feb 80		
8907	Ferrell	78.02 S	170.80 E	44	10 Dec 80		
8909/8910	Siple	75.90 S	84.00 W	1054	01 Jan 82		4
8910/8911	Laurie	77.55 S	170.09 E	27	24 Jan 83	29 Mar 83	5
8913	Whitlock	76.24 S	168.66 E	274	23 Jan 82		
8914	D-47	67.38 S	138.72 E	1560	24 Jan 83		6
8915	Meeley	78.52 S	170.18 E	49	04 Dec 80		
8916	D-57	68.18 S	137.52 E	2103	16 Jan 81		6

1. Failed for unknown reasons.
2. Wind data missing beginning 22 August 83.
3. Failed due to frequency drift. Restarted 12 Dec 83.
4. 8909 removed from Siple 26 Nov 83. 8910 started at Siple 1 Dec 83.
5. Some data reported for Oct-Dec 83. Failed due to bad multiplexer.
6. Intermittent operation throughout year.



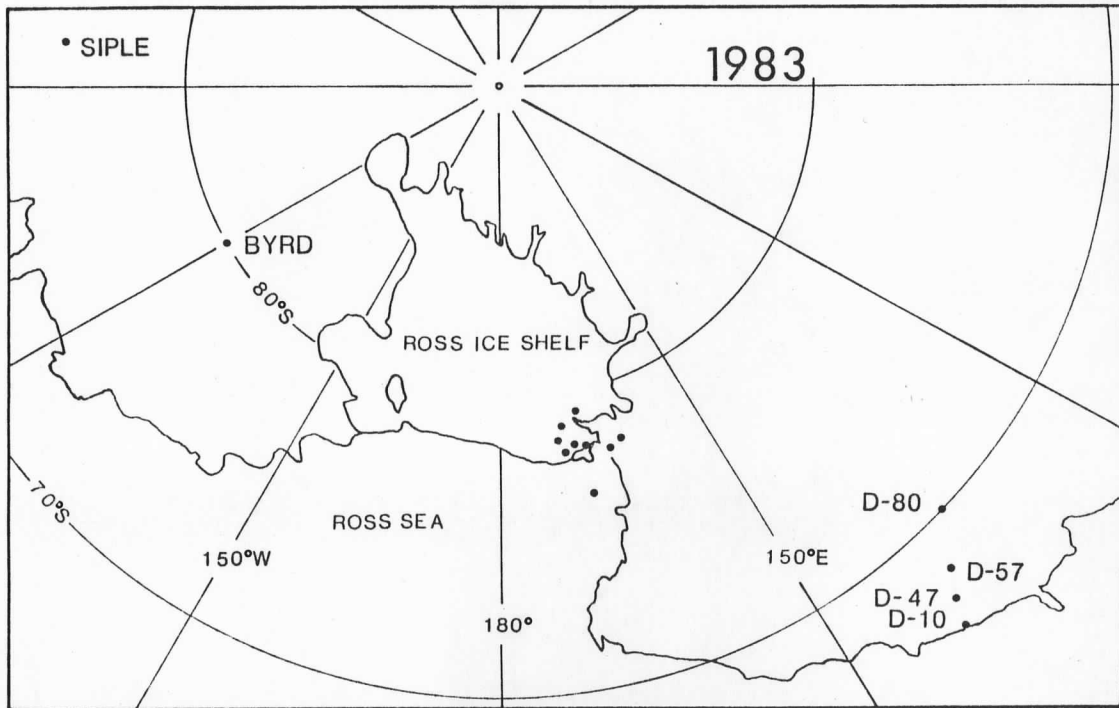


Fig. 1. Pacific sector of Antarctica. AWS units are at Siple (8909), Byrd (8903), D-10 (8901), D-47 (8914), D-57 (8916) and D-80 (8900). The AWS units deployed in the Ross Island area are shown in Fig. 2.

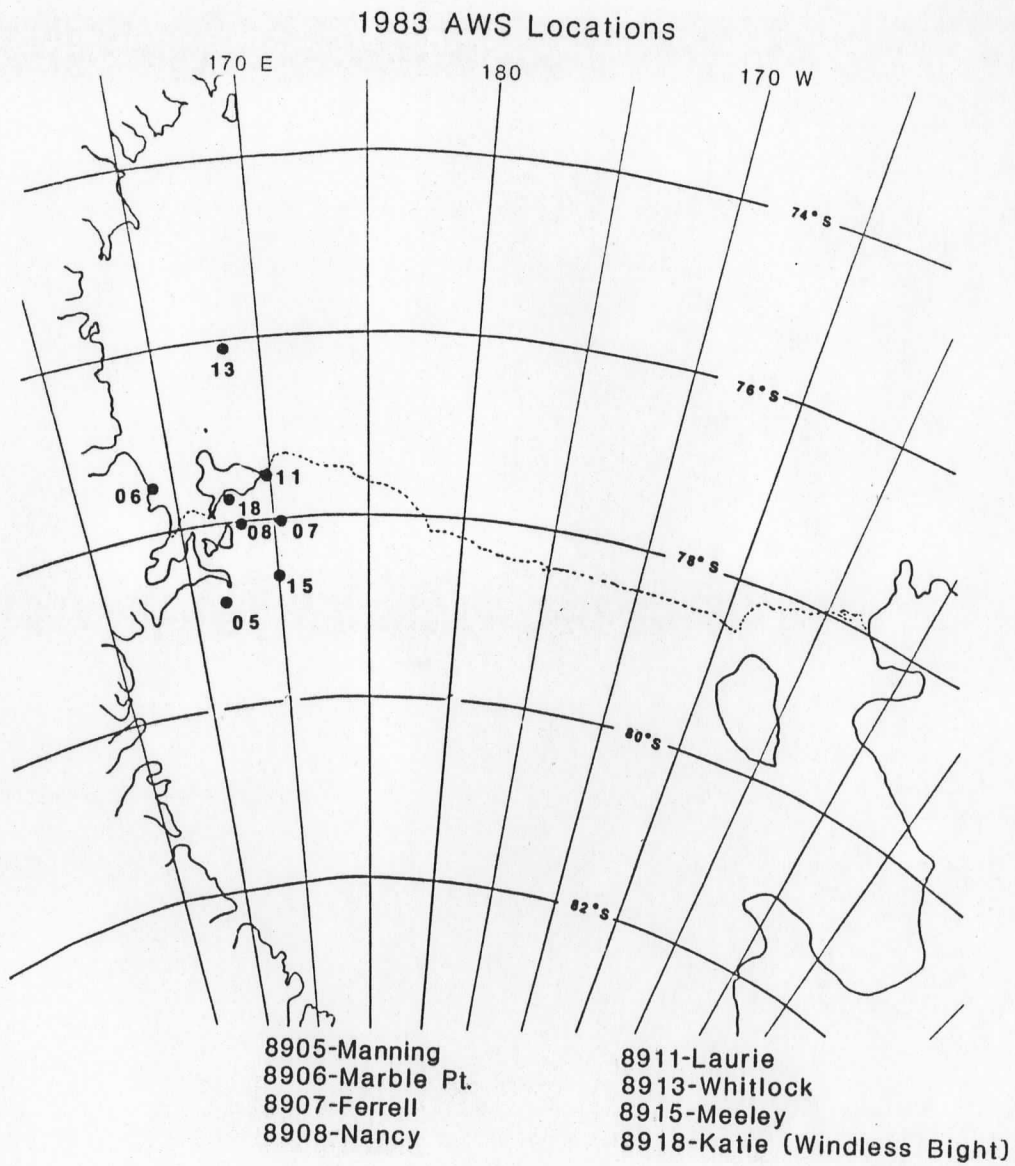


Fig. 2. Ross Island area of Antarctic AWS units. The last two digits of the AWS identification number are by the site. Since the AWS unit may be moved from one site to another the sites are named.



III. 1983 - MONTHLY CLIMATE SUMMARY

Mon	Mean Air Temp (C)	Max Air Temp (C)	Min Air Temp (C)	Mean Wind Speed (m/s)	Resultant Wind Direction (dg true)	Con	Maximum Wind Speed (dir/vv)	Mean Air Press (mb)	Max Air Press (mb)	Min Air Press (mb)
D-80 (8900)				2500 M			70.02 S 134.72 E			
Jan	-23.0	-16.6	-34.2	7.1	133	.93	134/14	721.7	728.4	713.9
Feb	-29.5	-11.2	-48.9	7.0	141	.90	113/19	717.6	732.7	706.2
Mar	-43.3	-25.5	-55.0	6.2	164	.94	163/15	707.7	724.9	693.1
Apr	-49.0	-23.0	-58.0	6.4	176	.98	167/14	708.4	722.1	697.9
May	-47.6	-31.1	-60.0	6.8	177	.99	165/17	713.2	743.4	697.1
Jun	-44.3	-28.0	-58.2	6.2	170	.84	174/16	712.0	746.3	691.9
Jul	-55.1	-28.2	-69.7	6.8	168	.83	145/15	678.8	714.2	669.4
Aug	-50.0	-32.1	-60.6	7.8	170	.96	158/19	705.4	723.8	681.3
Sep	-43.5	-24.4	-58.7	7.1	155	.90	114/20	704.6	729.8	684.3
Oct	-49.3	-34.2	-64.7	7.0	172	.97	156/17	697.5	722.9	671.2
Nov										
Dec										
D-10 (8901)				240 M			66.70 S 139.80 E			
Jan	-2.2	6.1	-10.0	7.9	141	.93	141/25	959.6	968.9	941.1
Feb	-5.5	8.2	-16.7	9.9	146	.91	127/31	955.5	969.7	937.8
Mar	-13.2	-4.4	-21.1	10.4	167	.96	165/28	950.0	967.8	926.2
Apr	-15.9	-5.9	-23.5	10.2	165	.95	165/10 ²⁷	951.8	966.5	936.3
May	-15.6	-1.4	-26.7	11.7	164	.93	149/30	956.2	985.2	930.5
Jun	-15.4	-.1	-29.0	8.3	161	.90	184/28	958.1	991.8	927.6
Jul	-22.6	-4.0	-35.0	9.0	159	.89	146/27	947.9	968.8	924.2
Aug	-20.7	-10.1	-32.9	9.0	155	.92	177/30	952.7	979.1	922.0
Sep	-15.5	-4.0	-26.0	11.4	156	.91	136/33	949.7	977.5	925.3
Oct	-18.3	-10.2	-29.1	9.4	160	.93	163/21	941.6	971.8	914.9
Nov	-10.0	1.9	-21.9	7.4	152	.79	141/20	949.4	972.0	934.2
Dec	-4.9	2.9	-11.5	8.1	149	.91	146/22	950.2	964.7	936.9

* Con = vector avg speed/scalar avg speed

Mon	Mean Air Temp (C)	Max Air Temp (C)	Min Air Temp (C)	Mean Wind Speed (m/s)	Resultant Wind Direction (dg true)	Con	Maximum Wind Speed (dir/vv)	Mean Air Press (mb)	Max Air Press (mb)	Min Air Press (mb)
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1983

Byrd (8903) 1530 M 80.00 S 120.00 W

Jan	-15.1	-3.0	-23.3	5.5	347	.50	018/22	820.8	830.8	830.8
Feb	-26.6	-15.4	-37.1	4.2	004	.84	030/11	816.7	830.8	800.3
Mar	-27.9	-16.2	-45.0	7.4	008	.96	360/23	812.0	824.1	799.6
Apr	-28.3	-13.4	-42.9	10.5	018	.94	010/28	808.0	828.9	785.3
May	-29.4	-17.7	-45.6	8.3	026	.92	032/23	813.1	831.1	794.7
Jun	-39.6	-20.5	-59.4	8.1	006	.92	044/23	804.9	829.2	781.4
Jul	-40.0	-23.6	-53.0	7.8	012	.95	015/19	799.4	814.5	782.4
Aug	-42.5	-17.4	-62.9	9.5	027	.94	046/28	795.4	816.9	773.7
Sep	-34.1	-15.2	-51.1	7.8	009	.90	027/31	803.5	834.5	774.3
Oct	-31.1	-17.3	-57.1	9.7	025	.91	060/23	794.5	818.9	766.9
Nov	-22.8	-14.8	-35.7	7.6	014	.94	360/19	803.0	813.8	789.6
Dec	-15.7	-8.5	-26.5	5.6	024	.62	046/21	813.0	821.8	805.8
Avg	-29.4	-15.2	-45.0	7.7	015	.86		807.0	824.6	788.5
S.D.	8.8	5.3	12.6	1.8		.15		8.3	7.2	13.3
Max	-15.1	-3.0	-23.3	10.5	027	.96	/31	820.8	834.5	807.7
Min	-42.5	-23.6	-62.9	4.2	347	.50	/11	794.5	813.8	766.9

Manning (8905) 66 M 78.77 S 166.85 E

Jan	-7.7	6.0	-16.7	2.7	282	.55	273/10	988.4	999.8	975.1
Feb	-18.3	-6.4	-35.4	2.7	283	.72	066/09	992.2	1006.4	979.1
Mar	-24.5	-10.6	-39.2	4.9	264	.77	252/21	983.8	1003.7	966.7
Apr	-22.1	-8.4	-45.5	6.3	251	.91	236/19	978.2	995.9	956.2
May	-22.1	-9.1	-45.2	6.2	249	.87	235/19	984.3	1005.5	958.6
Jun	-33.9	-12.9	-50.6	4.4	263	.70	239/20	986.3	1022.2	963.3
Jul	-35.1	-17.7	-53.5	3.9	262	.77	240/21	978.9	999.6	962.2
Aug	-32.4	-11.9	-52.9	6.4	245	.84	218/24	976.7	997.5	949.9
Sep	-33.3	-13.5	-51.1				236/19	981.2	1015.2	947.4
Oct	-24.8	-8.8	-51.1				252/15	968.4	997.6	944.4
Nov	-14.6	-4.7	-25.9	4.8	256	.84	260/16	971.0	984.2	953.6
Dec	-8.2	4.0	-19.9	-3.1	259	.68	249/14	981.3	994.5	965.4
Avg	-23.1	-7.8	-40.6					980.9	1001.8	960.2
S.D.	9.6	6.9	13.2					6.8	9.9	10.6
Max	-7.7	6.0	-16.7				218/24	992.2	1022.2	944.4
Min	-35.1	-17.7	-53.5				066/09	968.4	984.2	979.1

Mon	Mean Air Temp (C)	Max Air Temp (C)	Min Air Temp (C)	Mean Wind Speed (m/s)	Resultant Wind Direction (dg true)	Con	Maximum Wind Speed (dir/vv)	Mean Air Press (mb)	Max Air Press (mb)	Min Air Press (mb)
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1983

Marble Point (8906)				121 M			77.43 S 163.75 E			
Jan	-3.2	2.6	-12.4	2.9	121	.32	163/11	982.2	991.9	969.9
Feb	-10.3	-.3	-19.1	5.3	172	.78	141/15	984.3	998.7	970.9
Mar	-15.7	-2.9	-28.2	4.3	183	.86	210/22	975.2	991.8	960.1
Apr	-16.1	-6.1	-27.9	3.6	196	.69	111/18	970.0	987.2	949.5
May	-16.1	-3.1	-29.6	5.2	193	.74	207/22	975.2	996.9	951.6
Jun	-24.8	-.5	-35.6	4.2	192	.69	225/32	977.8	1012.6	954.5
Jul	-28.0	-15.4	-37.5	3.3	192	.71	224/16	970.5	992.2	954.9
Aug	-24.6	-5.6	-39.5	4.7	196	.71	224/25	968.4	990.1	942.6
Sep	-24.9	-8.6	-35.1	4.4	184	.77	172/25	972.8	1003.8	942.8
Oct	-18.3	-5.6	-35.7	5.0	108 180	.78	145/23	959.6	987.7	937.2
Nov	-9.5	-2.6	-17.6	3.5	175	.38	218/18	963.5	975.2	946.4
Dec	-3.7	4.2	-14.4	3.4	094	.18	118/14	975.3	986.5	960.4
Avg	-16.3	-3.7	-27.7	4.1	171	.63		972.9	992.9	953.4
S.D.	8.4	5.2	9.6	.8		.22		7.1	9.4	10.6
Max	-3.2	4.2	-12.4	5.3	196	.86	225/32	984.3	1012.6	970.9
Min	-28.0	-15.4	-39.5	2.9	094	.18	111/08	959.6	975.2	937.2

Ferrell (8907)				44 M			78.02 S 170.80 E			
Jan	-7.5	4.9	-19.0	3.2	193	.41	226/13	991.9	1002.3	978.4
Feb	-18.2	.5	-35.2	4.6	174	.60	198/17	994.6	1009.3	980.7
Mar	-24.7	-11.7	-37.5	6.7	205	.82	211/27	985.2	1002.4	967.3
Apr	-23.6	-10.2	-41.1	8.3	213	.93	213/08 22	979.4	998.0	956.7
May	-24.6	-12.9	-40.6	8.5	204	.91	212/25	985.4	1006.1	960.1
Jun	-36.3	-16.7	-49.4	4.7	206	.79	194/25	988.9	1023.8	964.3
Jul	-36.8	-19.1	-50.6	5.8	209	.87	205/20	981.2	1003.5	962.9
Aug	-39.8	-16.9	-56.9	5.0	222	.93	218/28	975.4	993.3	949.9
Sep										
Oct										
Nov										
Dec	-7.2	3.4	-15.6	4.0	222	.66	212/17	984.3	996.7	968.6

Mon	Mean Air Temp (C)	Max Air Temp (C)	Min Air Temp (C)	Mean Wind Speed (m/s)	Resultant Wind Direction (dg true)	Con	Maximum Wind Speed (dir/vv)	Mean Air Press (mb)	Max Air Press (mb)	Min Air Press (mb)
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1983

Nancy (8908) 30 M 77.90 S 168.20 E

Jan	-8.3	2.2	-16.9	1.9	133	.53	155/09	996.5	1005.5	985.1
Feb	-16.1	-2.4	-33.0	2.6	163	.62	176/12	997.4	1012.3	984.2
Mar	-22.9	-7.6	-35.6	3.1	185	.57	194/29	988.2	1005.7	972.0
Apr	-20.5	-6.1	-38.0	3.7	208	.62	201/23	982.5	999.7	960.0
May	-20.9	-6.5	-41.6	4.0	192	.63	188/20	987.9	1010.1	963.2
Jun	-33.9	-11.7	-49.7	1.9	198	.28	191/17	985.7	1026.1	967.0
Jul	-34.9	-15.5	-52.7	1.5	210	.17	191/18	978.1	1004.4	967.0
Aug	-36.4	-18.6	-55.9	2.9	206	.65	211/28	980.5	1002.6	954.2
Sep	-	-	-	1.7	192	.30	210/19	985.4	1017.9	952.5
Oct	-	-	-	3.2	203	.57	203/21	971.7	1000.8	948.8
Nov	-	-	-	3.1	213	.64	240/21	974.8	986.8	957.4
Dec	-	-	-	-	-	-	-	-	-	-

Siple (8909) 1054 M 74.90 S 84.00 W

Jan	-13.2	-2.9	-26.1	4.2	156	.48	146/17	869.4	877.7	852.7
Feb	-17.3	-8.2	-32.2	6.4	138	.56	141/20	864.6	880.9	844.5
Mar	-25.0	-13.0	-40.4	4.8	209	.57	260/15	863.4	874.7	854.6
Apr	-25.2	-6.6	-39.4	5.7	207	.37	243/23	864.6	883.3	844.7
May	-29.0	-13.1	-45.2	4.1	142	.57	103/17	867.2	885.6	849.4
Jun	-35.9	-17.1	-51.4	4.3	219	.52	245/16	860.9	881.0	844.7
Jul	-37.4	-20.0	-49.5	4.2	155	.70	148/20	854.8	871.7	830.9
Aug ₁	-34.3	-9.7	-50.6	6.5	158	.57	146/18	850.2	878.2	819.8
Sep	-30.2	-12.1	-43.4	5.1	228	.45	049/16	858.4	883.6	831.7
Oct	-27.8	-12.6	-45.7	5.8	189	.24	075/23	849.5	876.6	823.6
Nov	-23.3	-9.7	-36.7	5.1	147	.70	145/21	854.4	861.8	845.6
Dec	-14.9	-5.6	-23.1	6.0	152	.78	157/18	861.1	873.7	850.4

1 54 hrs data missing 6,10,15 Aug

Mon	Mean Air Temp (C)	Max Air Temp (C)	Min Air Temp (C)	Mean Wind Speed (m/s)	Resultant Wind Direction (dg true)	Con	Maximum Wind Speed (dir/vv)	Mean Air Press (mb)	Max Air Press (mb)	Min Air Press (mb)
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1983

Whitlock (8913) (Franklin Island) 274 M 76.24 S 168.66 E

Jan	-3.4	2.1	-7.6		083	.24	014/XX	963.1	972.3	949.0
Feb ₁	-8.0	1.0	-15.5		140	.36	162/XX	963.6	981.5	948.6
Mar ₂	-14.1	-6.1	-24.6		159	.42	152/XX	953.4	971.3	939.8
Apr	-18.2	-7.7	-27.9		288	.29	166/19	948.7	966.0	930.5
May	-17.9	-6.9	-31.5		193	.35	187/22	953.0	974.0	931.2
Jun	-24.6	-12.0	-32.9		211	.08	181/24	955.4	990.6	935.9
Jul	-28.8	-18.2	-39.2		321	.26	164/19	948.1	969.7	934.0
Aug ₃	-26.0	-10.2	-36.6		318	.56	162/19	945.6	968.7	919.6
Sep	-23.6	-12.1	-35.0		174	.07	157/28	950.0	979.2	924.3
Oct	-19.1	-7.9	-33.7		307	.16	186/22	936.9	964.0	913.4
Nov	-11.4	-4.6	-19.1		322	.19	193/17	942.6	953.3	927.5
Dec	-5.1	2.9	-12.4		082	.15	143/13	955.5	967.0	942.2
Avg	-16.7	-6.6	-26.3			.26		951.3	971.5	933.0
S.D.	8.4	6.3	10.4			.14		7.8	9.4	10.9
Max	-3.4	2.9	-7.6		352	.56		963.6	981.5	949.0
Min	-28.8	-18.2	-39.2		112	.07		942.6	953.3	913.4

Meeley (8915) 49 M 78.52 S 170.18 E

Jan	-7.9	1.4	-18.4	3.2	215	.53	234/12	991.4	1002.2	978.6
Feb	-18.7	-3.8	-35.7	4.0	191	.61	211/14	994.2	1008.6	980.9
Mar	-25.2	-10.9	-39.4	6.4	205	.86	232/25	984.8	1002.1	968.0
Apr	-23.6	-10.1	-41.2	8.0	210	.96	227/22	978.6	996.8	954.7
May	-24.3	-12.9	-38.6	7.8	206	.92	225/22	984.6	1005.5	958.8
Jun										
Jul										
Aug										
Sep	-35.2	-17.6	-48.0				200/25	982.9	1015.5	946.3
Oct										
Nov	-16.2	-7.0	-26.0	5.3	212	.88	218/19	972.3	984.8	954.6
Dec	-9.3	1.1	-18.8	3.9	216	.71	221/15	984.1	997.0	967.3

1 54 hrs data missing 25-28 Feb
 2 57 hrs data missing 4-6 Mar
 3 54 hrs data missing 6,10,15 Aug

STATION : 8900 D-80 LAT : 70.0 S LONG : 134.7E ELEVATION : 2500 M

HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD
00	X	X	X	X	721	-28	11	141	726	-25	8	141	728	-17	5	113	726	-22	8	134	726	-22	8	134
03	720	-25	10	141	722	-26	11	145	726	-23	11	128	727	-14	8	90	726	-21	8	163	726	-21	8	163
06	719	-24	10	141	723	-23	11	136	728	-20	7	128	727	-14	8	101	726	-21	6	180	726	-21	6	180
09	719	-24	10	124	723	-21	7	141	728	-22	8	145	726	-15	7	141	727	-22	4	158	727	-22	4	158
12	719	-24	9	104	724	-23	8	131	722	-27	8	161	725	-19	8	152	727	-28	3	180	727	-28	3	180
15	719	-25	7	115	724	-24	8	129	722	-30	8	110	724	-22	7	180	727	-31	5	166	727	-31	5	166
18	720	-24	7	141	724	-24	8	141	721	-32	8	160	724	-22	5	180	728	-33	5	180	728	-33	5	180
21	721	-24	5	141	724	-25	6	141	721	-31	9	170	725	-27	6	141	728	-33	5	180	728	-33	5	180
					722	-23	13	141	726	-13	15	82	733	-16	12	141	725	-23	5	145	728	-33	5	180
00	728	-29	8	141	722	-21	15	111	727	-12	12	90	732	-14	7	105	717	-22	5	141	715	-30	8	139
03	727	-25	7	141	722	-21	15	111	727	-12	12	90	732	-14	7	105	717	-21	6	125	715	-27	8	124
06	727	-24	9	138	722	-21	16	135	728	-12	11	90	730	-14	8	141	717	-22	6	117	715	-25	9	118
09	726	-25	7	141	722	-21	13	110	729	-12	11	90	729	-15	8	141	716	-23	5	124	716	-26	9	141
12	725	-28	10	141	722	-20	16	110	730	-13	10	58	729	-15	8	117	716	-26	5	141	716	-27	10	124
15	724	-29	13	141	722	-19	14	90	731	-14	8	54	726	-16	7	122	716	-30	5	141	717	-29	9	135
18	723	-28	12	141	723	-18	12	90	732	-16	2	69	725	-16	7	121	715	-35	7	153	718	-30	8	141
21	723	-27	14	129	724	-15	11	79	733	-16	5	90	723	-17	9	141	715	-34	6	149	718	-30	8	131
					717	-29	8	141	710	-28	12	141	712	-33	8	141	709	-39	8	180	709	-41	8	180
00	719	-29	8	141	716	-27	10	141	710	-26	8	141	712	-30	8	141	709	-36	8	162	708	-38	7	158
03	719	-26	10	141	715	-27	9	141	710	-26	11	141	713	-28	8	141	708	-33	7	161	708	-35	8	159
06	719	-25	8	141	713	-27	12	141	710	-27	11	141	713	-29	6	136	708	-34	5	180	709	-35	5	170
09	719	-27	8	135	712	-27	12	141	710	-30	8	143	714	-32	7	131	708	-39	4	180	709	-41	3	180
12	719	-29	8	128	711	-28	12	141	710	-33	8	149	713	-34	7	141	708	-42	4	179	710	-44	4	180
15	719	-29	8	128	710	-28	10	129	711	-35	7	170	713	-37	7	149	708	-44	5	174	710	-45	5	174
18	718	-32	7	141	710	-28	10	129	711	-35	7	170	713	-37	7	149	708	-44	5	174	710	-45	5	174
21	718	-30	8	141	710	-29	12	141	711	-36	6	153	713	-38	7	180	708	-43	6	180	710	-45	7	180
					709	-42	7	180	707	-44	7	160	715	-44	6	180	714	-36	6	148	715	-43	6	159
00	710	-42	7	180	708	-36	5	180	706	-40	8	141	716	-40	5	141	714	-33	4	165	715	-40	5	180
03	709	-39	6	170	708	-33	3	180	707	-39	7	149	717	-38	3	158	713	-32	3	141	714	-37	4	180
06	709	-36	6	170	708	-35	2	183	708	-39	4	156	717	-38	1	161	715	-31	5	141	714	-37	4	180
09	709	-36	6	170	708	-35	2	183	708	-39	4	156	717	-38	1	161	715	-32	4	148	713	-32	2	141
12	709	-41	3	189	707	-42	3	191	709	-44	3	180	718	-43	1	205	714	-35	3	165	715	-42	2	180
15	709	-44	5	180	707	-45	3	180	710	-46	4	180	718	-45	2	180	714	-35	3	180	714	-44	2	197
18	709	-44	5	180	706	-47	4	180	712	-48	3	172	718	-41	2	149	714	-37	4	180	714	-44	2	197
21	709	-44	4	180	707	-47	4	167	713	-48	5	180	718	-39	3	149	714	-37	4	180	714	-47	2	228
					713	-48	5	180	713	-48	5	180	718	-39	3	149	714	-37	4	156	715	-46	3	189

MONTHLY SUMMARY

* TEMPERATURE (C) * MEAN = -29.5 STD DEV = 9.1 MAX = -11.2 AT 632 GMT ON DAY 10 MIN = -48.9 AT 1943 GMT ON DAY 24

* PRESSURE (MB) * MEAN = 717.6 STD DEV = 6.9 MAX = 732.7 AT 2332 GMT ON DAY 10 MIN = 706.2 AT 1828 GMT ON DAY 23

* WINDS (M/S) * MEAN = 7.0 STD DEV = 3.0 RESULTANT = 6.3 FROM 141. CONSTANCY = 18.9 FROM 113. AT 1343 GMT DAY 9

* MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: .4 % PRESSURE: .4 % WINDS: .4 %

WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+

WIND DIRECTION: N NNE NE E ESE SE SSE S SSW SW W WNW NNW NW NNW

STATION : 8900 D-80

LAT : 70.0 S

LONG : 134.7E

ELEVATION : 2500 M

MAY	HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD
	00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	03	716	715	715	715	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716
	06	718	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712
	09	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719	719
	12	719	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707
	15	719	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705
	18	719	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703
	21	718	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702
	00	725	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712	712
	03	724	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711
	06	723	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709	709
	09	722	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708
	12	721	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707	707
	15	719	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706
	18	717	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706
	21	715	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705
	00	699	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	03	699	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702
	06	700	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702
	09	700	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703
	12	701	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703	703
	15	701	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705	705
	18	701	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706	706
	21	701	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708	708
	00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	03	708	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
	06	707	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699
	09	706	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699
	12	705	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699	699
	15	704	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701	701
	18	704	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702	702
	21	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704
	00	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736
	03	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736	736
	06	736	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735
	09	737	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735	735
	12	737	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733
	15	737	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732	732
	18	737	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730
	21	737	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728

MONTHLY SUMMARY

* TEMPERATURE (C) * MEAN = -47.6 STD DEV = 6.1 MAX = -31.1 AT 2120 GMT ON DAY 31 MIN = -60.0 AT 826 GMT ON DAY 16
 * PRESSURE (MB) * MEAN = 713.2 STD DEV = 12.7 MAX = 743.4 AT 1119 GMT ON DAY 27 MIN = 697.1 AT 1833 GMT ON DAY 19
 * WINDS (M/S) * MEAN = 6.8 STD DEV = 2.7 RESULTANT = 6.7 FROM 177. CONSTANCY = .99 MAX = 17.2 FROM 165. AT 1701 GMT DAY 3
 * MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: 2.0 % PRESSURE: 2.0 % WINDS: 2.0 %
 WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+
 PERCENT: 6 11 20 27 28 6 E ESE SE SSE S SSW SW W WNW NW NNW 0
 WIND DIRECTION: N NNE NE ENE E ESE SE SSE S SSW SW W WNW NW NNW 0

STATION : 8908 NANCY (ICE SHELF - SE) LAT : 77.9 S LONG : 168.2E ELEVATION : 25 M

JAN HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

MONTHLY SUMMARY
 * TEMPERATURE (C) * MEAN = -8.3 STD DEV = 3.1 MAX = 2.2 AT 608 GMT ON DAY 18 MIN = -16.9 AT 1330 GMT ON DAY 24
 * PRESSURE (MB) * MEAN = 996.5 STD DEV = 5.6 MAX = 1005.5 AT 2341 GMT ON DAY 31 MIN = 985.1 AT 827 GMT ON DAY 25
 * WINDS (M/S) * MEAN = 1.9 STD DEV = 1.6 RESULTANT = 1.0 FROM 133. CONSTANCY = .53 MAX = 8.5 FROM 155. AT 2049 GMT DAY 29
 * MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: 52.0 % PRESSURE: 51.6 % WINDS: 51.6 %
 WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+
 PERCENT: 64 27 5 3 0
 WIND DIRECTION: N NNE NE E ESE SE SSE S SSW SW W WSW WNW NNW NW NNW 3

STATION : 8909 SIPLE LAT : 75.9 S LONG : 84.0 W ELEVATION : 1054 M

JAN	HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD
00	00	871	-13	9	141	871	-12	7	111	871	-11	5	128	871	-10	4	141	871	-9	5	141	871	-8	6	141
03	03	871	-13	5	115	871	-12	6	141	871	-11	2	135	871	-10	2	135	871	-9	1	69	871	-8	1	69
06	06	871	-15	9	90	871	-13	7	132	871	-12	4	115	871	-11	4	115	871	-10	4	115	871	-9	4	115
09	09	871	-15	7	111	871	-13	6	131	871	-12	4	180	871	-11	4	180	871	-10	4	180	871	-9	4	180
12	12	871	-14	6	141	871	-12	6	141	871	-11	4	141	871	-10	4	141	871	-9	4	141	871	-8	4	141
15	15	870	-12	7	128	871	-11	6	141	871	-10	4	141	871	-9	2	290	871	-8	6	141	871	-7	3	180
18	18	870	-12	9	90	871	-10	6	141	871	-9	5	141	871	-8	8	141	871	-7	4	180	871	-6	4	180
21	21	871	-12	8	120	871	-10	6	141	871	-9	4	120	871	-8	7	141	871	-7	7	141	871	-6	2	226
00	00	872	-10	3	224	876	-7	2	30	874	-8	3	360	876	-12	2	90	869	-12	1	308	860	-10	5	225
03	03	872	-14	2	239	876	-8	2	27	874	-10	2	356	875	-15	0	0	867	-14	2	309	860	-13	4	239
06	06	873	-18	2	225	876	-9	2	8	874	-10	0	0	875	-18	0	0	866	-15	5	270	860	-16	4	225
09	09	874	-17	2	225	876	-10	2	360	875	-10	0	0	875	-19	1	225	864	-15	5	270	861	-17	4	225
12	12	874	-15	2	238	875	-10	2	360	875	-10	1	180	874	-14	0	0	863	-13	6	225	862	-17	1	198
15	15	875	-10	1	210	875	-10	3	350	875	-10	3	141	873	-11	0	0	862	-10	9	242	862	-15	4	225
18	18	875	-5	0	0	875	-8	3	360	876	-11	5	135	872	-9	0	0	861	-9	8	225	862	-12	1	145
21	21	876	-6	3	45	874	-7	4	360	876	-11	3	135	870	-9	0	0	861	-9	7	229	863	-12	2	49
00	00	869	-14	3	27	872	-13	4	97	872	-13	2	62	871	-13	2	360	867	-11	2	360	869	-12	6	141
03	03	869	-14	2	45	872	-13	5	120	872	-13	1	55	870	-13	3	45	867	-12	3	45	870	-13	8	141
06	06	870	-14	1	37	872	-13	3	111	872	-14	2	69	869	-14	3	359	867	-13	2	89	870	-13	10	141
09	09	871	-14	2	90	872	-13	3	90	872	-14	2	45	869	-14	4	360	868	-14	3	90	871	-13	10	145
12	12	871	-14	3	87	872	-12	3	111	872	-14	1	37	869	-13	4	360	868	-14	4	135	870	-13	9	141
15	15	872	-14	2	69	872	-10	2	90	871	-13	2	360	868	-13	5	359	868	-13	6	120	870	-13	5	141
18	18	872	-13	3	90	872	-12	3	90	871	-13	3	28	868	-12	5	349	868	-11	7	101	870	-12	7	141
21	21	872	-13	5	86	872	-12	3	79	871	-12	2	360	867	-11	4	333	869	-11	6	120	871	-12	10	114
00	00	870	-11	2	90	871	-16	4	180	870	-13	6	165	873	-12	0	0	870	-8	5	267	867	-14	10	231
03	03	870	-12	3	90	871	-22	1	180	870	-14	5	180	872	-18	1	300	869	-8	4	280	866	-16	12	235
06	06	871	-13	2	89	870	-18	4	180	871	-15	2	141	872	-23	2	270	869	-9	5	270	865	-19	13	252
09	09	871	-14	1	180	870	-16	3	173	871	-15	3	180	871	-18	2	309	869	-8	6	270	864	-19	14	243
12	12	872	-13	4	161	870	-16	3	180	872	-14	2	153	871	-15	2	323	869	-8	6	270	862	-19	11	231
15	15	872	-13	5	180	870	-15	5	180	872	-13	3	180	870	-13	3	342	868	-9	7	256	863	-18	7	225
18	18	872	-12	5	150	870	-14	4	180	873	-11	1	149	870	-11	4	349	868	-10	7	243	863	-15	5	224
21	21	872	-13	5	141	870	-13	4	167	873	-10	0	0	870	-6	4	251	868	-10	7	243	863	-15	4	264
00	00	862	-14	0	0	858	-15	6	170	855	-16	7	141	870	-6	4	251	868	-13	10	225	863	-14	4	264
03	03	862	-19	1	0	857	-16	5	141	856	-16	8	141	873	-12	0	0	870	-8	5	267	867	-14	10	231
06	06	862	-22	2	225	856	-18	7	170	857	-18	9	136	872	-18	1	300	869	-8	4	280	866	-16	12	235
09	09	862	-20	2	210	855	-17	8	161	858	-19	10	149	872	-23	2	270	869	-9	5	270	865	-19	13	252
12	12	861	-17	1	198	854	-16	9	170	859	-20	13	141	871	-18	2	309	869	-8	6	270	864	-19	14	243
15	15	861	-16	2	174	853	-15	11	141	861	-19	11	141	871	-15	2	323	869	-8	6	270	862	-19	11	231
18	18	860	-15	4	180	853	-15	10	153	861	-19	11	141	870	-13	3	342	868	-9	7	256	863	-18	7	225
21	21	859	-15	6	162	853	-15	11	141	862	-18	10	141	870	-11	4	349	868	-10	7	243	863	-15	5	224

MONTHLY SUMMARY

* TEMPERATURE (C) * MEAN = -13.2 STD DEV = 3.2 MAX = -2.9 AT 1833 GMT ON DAY 8 MIN = -26.1 AT 709 GMT ON DAY 28
 * PRESSURE (MB) * MEAN = 869.4 STD DEV = 5.5 MAX = 877.7 AT 359 GMT ON DAY 6 MIN = 852.7 AT 1831 GMT ON DAY 30
 * WINDS (M/S) * MEAN = 4.2 STD DEV = 2.9 RESULTANT = 2.0 FROM 156. CONSTANCY = .48 MAX = 16.6 FROM 146. AT 1437 GMT DAY 30
 * MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: .0 % PRESSURE: .0 % WINDS: .0 %
 WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+
 WIND DIRECTION: N NNE NE E ESE SE SSE S SSW SW W WSW WSW NNW NW NNW
 PERCENT: 10 3 5 2 8 5 23 5 14 9 4 6 1 2 1 1

STATION : 8909 SIPLE LAT : 75.9 S LONG : 84.00 W ELEVATION : 1054

JUN	HR	83	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD
00	859	-18	4	45	855	-35	3	225	855	-34	2	189	868	-39	1	270	873	-32	3	291	855	-22	6	360						
03	856	-19	6	90	853	-33	5	198	855	-38	2	225	869	-39	1	270	872	-29	2	319	855	-23	3	336						
06	856	-26	5	134	853	-34	5	212	856	-26	2	180	869	-39	1	270	870	-25	2	360	858	-34	8	225						
09	858	-29	5	170	853	-31	4	201	856	-26	2	179	870	-38	1	280	867	-24	6	12	861	-31	7	225						
12	860	-32	4	189	853	-31	4	218	856	-26	2	149	871	-34	2	278	864	-25	7	360	862	-33	12	260						
15	861	-34	0	0	854	-27	5	180	864	-41	2	225	872	-31	3	263	861	-24	6	27	862	-31	11	243						
18	859	-35	1	225	854	-27	7	193	857	-30	1	180	873	-33	2	270	858	-23	9	24	863	-30	7	243						
21	857	-36	0	0	855	-28	3	205	857	-35	3	198	874	-33	2	270	855	-23	10	37	863	-30	3	270						
00	860	-21	3	289	856	-35	10	263	854	-35	8	90	848	-40	1	225	853	-45	3	297	845	-38	7	136						
03	858	-25	3	360	856	-37	9	270	851	-36	9	79	846	-42	2	206	854	-48	3	270	845	-39	5	149						
06	856	-24	6	285	856	-37	9	257	851	-38	4	101	845	-43	2	225	856	-45	3	270	847	-40	3	141						
09	856	-30	7	270	857	-37	6	251	850	-38	1	122	845	-45	3	229	856	-40	0	0	849	-39	2	161						
12	856	-37	6	233	857	-32	3	180	851	-38	3	206	845	-45	2	229	856	-35	0	0	849	-40	3	159						
15	856	-39	3	260	858	-35	3	161	852	-38	4	149	847	-45	3	225	853	-34	5	90	851	-41	3	177						
18	855	-34	8	270	858	-36	5	70	853	-38	4	141	849	-47	3	270	848	-32	10	90	851	-41	4	180						
21	855	-34	10	270	856	-35	9	45	850	-42	2	222	851	-49	2	276	846	-38	10	110	852	-42	3	206						
00	851	-42	4	181	848	-45	5	270	846	-38	6	270	867	-36	4	214	864	-47	4	225	850	-41	6	225						
03	851	-43	3	211	847	-45	4	259	847	-37	6	249	870	-39	3	225	861	-48	4	255	851	-38	6	225						
06	851	-44	3	206	845	-45	5	262	849	-44	6	239	871	-42	3	225	858	-46	2	231	851	-35	4	252						
09	850	-45	3	225	845	-45	4	251	850	-45	8	225	872	-43	4	214	855	-46	2	231	851	-39	3	229						
12	850	-49	4	225	845	-44	5	225	852	-45	6	251	872	-45	4	229	853	-44	2	240	853	-44	3	240						
15	849	-49	3	252	845	-45	5	243	853	-46	4	277	871	-45	5	218	851	-46	3	225	856	-42	3	180						
18	849	-47	4	242	846	-45	4	248	853	-35	6	270	870	-45	5	225	850	-44	5	225	859	-37	2	225						
21	848	-46	4	270	846	-42	4	270	854	-31	8	257	866	-46	5	225	849	-43	4	225	862	-41	3	221						
00	865	-43	4	190	867	-47	8	188	876	-32	13	141	878	-29	9	141	875	-35	2	218	877	-29	3	301						
03	867	-42	6	180	X	X	X	X	878	-32	10	145	876	-28	9	142	870	-32	2	270	877	-28	6	302						
06	869	-45	4	189	X	X	X	X	878	-32	10	161	875	-28	9	162	876	-35	2	301	878	-21	5	309						
09	870	-47	5	218	X	X	X	X	879	-31	11	180	874	-29	8	141	871	-32	0	0	876	-33	3	332						
12	870	-47	5	169	X	X	X	X	880	-30	9	180	874	-29	5	141	871	-35	1	64	876	-28	5	270						
15	869	-49	5	218	X	X	X	X	881	-30	12	148	873	-31	2	174	871	-37	0	0	876	-30	3	271						
18	869	-48	5	206	X	X	X	X	880	-30	12	141	872	-31	1	163	872	-35	0	0	877	-21	1	270						
21	868	-51	4	218	X	X	X	X	879	-29	10	141	874	-32	2	110	877	-30	2	284	877	-27	4	291						
00	876	-27	3	260	868	-29	0	0	868	-29	0	0	866	-29	0	0	866	-29	0	0	866	-29	0	0						
03	877	-33	5	197	867	-29	0	0	867	-29	0	0	867	-29	0	0	867	-29	0	0	867	-29	0	0						
06	877	-35	3	218	866	-32	4	125	866	-32	4	125	866	-32	4	125	866	-32	4	125	866	-32	4	125						
09	877	-35	3	218	866	-32	3	141	866	-32	3	141	866	-32	3	141	866	-32	3	141	866	-32	3	141						
12	876	-37	3	218	867	-34	2	141	867	-34	2	141	867	-34	2	141	867	-34	2	141	867	-34	2	141						
15	874	-36	2	251	867	-36	4	180	867	-36	4	180	867	-36	4	180	867	-36	4	180	867	-36	4	180						
18	872	-32	1	212	867	-37	3	180	867	-37	3	180	867	-37	3	180	867	-37	3	180	867	-37	3	180						
21	871	-30	0	0	867	-36	4	180	867	-36	4	180	867	-36	4	180	867	-36	4	180	867	-36	4	180						

MONTHLY SUMMARY

* TEMPERATURE (C) * MEAN = -35.9 STD DEV = 7.4 MAX = -17.1 AT 217 GMT ON DAY 1 MIN = -51.4 AT 2000 GMT ON DAY 22
 * PRESSURE (MB) * MEAN = 860.9 STD DEV = 10.1 MAX = 881.0 AT 1256 GMT ON DAY 24 MIN = 844.7 AT 107 GMT ON DAY 14
 * WINDS (M/S) * MEAN = 4.3 STD DEV = 2.9 RESULTANT = 2.3 FROM 219. CONSTANCY = .52 MAX = 16.4 FROM 245. AT 1018 GMT DAY 18
 * MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: 2.9 % PRESSURE: 2.9 % WINDS: 2.9 %
 WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+
 WIND DIRECTION: N NNE NE E ESE SE S SSW SW W WSW WNW NNW
 PERCENT: 2 1 1 1 3 1 7 5 11 7 25 11 17 5 1 1

STATION : 8913 WHITLOCK

LAT : 76.1 S

LONG : 168.3E

ELEVATION : 274 M

MARK	HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD
00	950	-13	8	311	946	-10	9	143	970	-9	10	153	966	-8	5	359	958	-13	6	146	952	-12	4	342					
03	948	-12	4	307	946	-10	5	208	971	-9	6	143	964	-9	6	347	957	-14	9	125	952	-13	X	15					
06	946	-12	3	285	946	-8	7	215	971	-9	6	138	962	-10	4	354	956	-14	12	125	952	-12	X	294					
09	944	-10	16	110	948	-9	7	164	971	-9	3	139	961	-11	X	55	955	-14	8	136	953	-13	X	156					
12	944	-9	11	135	951	-8	8	142	970	-9	6	177	960	-11	7	139	954	-14	7	136	954	-13	6	160					
15	944	-9	13	146	953	-9	11	129	965	-10	9	143	960	-12	7	155	954	-14	7	103	956	-15	9	139					
18	944	-9	19	148	954	-9	9	131	967	-10	10	141	960	-13	7	131	953	-13	2	83	957	-14	6	131					
21	945	-10	8	149	955	-9	16	148	970	-9	0	0	959	-14	9	141	952	-13	2	356	958	-14	7	132					
00	958	-13	7	127	954	-14	6	326	951	-11	5	280	950	-17	0	0	953	-13	7	174	951	-13	3	159					
03	958	-12	5	146	954	-13	7	330	942	-12	7	152	951	-16	5	173	953	-12	9	285	950	-12	1	215					
06	958	-12	6	146	949	-12	4	284	941	-12	7	167	951	-15	5	312	952	-13	13	295	950	-12	X	115					
09	957	-12	5	134	948	-11	9	111	942	-12	6	186	951	-15	0	0	952	-12	3	256	950	-13	4	128					
12	956	-11	7	129	947	-12	7	111	942	-12	6	181	951	-14	4	285	952	-14	3	256	950	-13	1	101					
15	954	-9	7	122	946	-12	7	134	944	-12	6	202	951	-14	1	67	952	-14	4	114	950	-13	2	90					
18	953	-9	X	359	945	-12	9	125	945	-13	11	174	951	-13	8	174	951	-14	3	166	950	-14	3	111					
21	954	-11	9	309	951	-11	X	146	948	-17	7	174	952	-14	4	201	951	-13	4	191	949	-14	3	55					
00	949	-13	X	17	948	-13	0	0	946	-16	5	135	951	-16	2	56	943	-21	8	325	944	-16	3	135					
03	948	-13	4	294	948	-13	1	254	946	-16	4	129	950	-16	4	4	941	-19	3	302	945	-17	8	143					
06	948	-13	2	233	948	-13	2	236	946	-16	2	138	949	-16	3	337	941	-19	4	326	946	-18	5	146					
09	948	-14	2	218	948	-13	3	318	947	-17	1	129	949	-18	7	343	940	-19	9	314	948	-17	5	181					
12	948	-14	X	319	948	-14	X	297	947	-16	2	104	947	-20	13	1	940	-20	5	337	949	-17	7	198					
15	947	-14	X	312	947	-14	X	284	946	-15	6	128	945	-21	12	344	941	-20	1	308	950	-17	3	200					
18	947	-14	1	283	947	-17	6	142	949	-15	5	277	945	-22	10	335	941	-20	X	299	951	-18	3	219					
21	948	-14	X	209	948	-16	2	128	947	-15	2	112	943	-20	8	333	942	-18	X	142	952	-17	2	207					
00	953	-16	1	197	957	-14	2	349	957	-11	2	86	966	-22	8	176	965	-22	6	218	955	-19	5	1					
03	954	-16	2	231	957	-14	X	347	957	-11	1	177	966	-21	5	197	963	-21	4	316	953	-20	3	35					
06	954	-16	2	250	957	-14	X	21	958	-11	2	201	966	-22	6	177	962	-20	3	204	952	-19	3	60					
09	955	-17	1	269	957	-15	5	42	959	-17	9	179	966	-23	7	166	962	-20	3	164	952	-19	3	98					
12	955	-17	2	280	957	-15	X	29	960	-17	8	176	965	-23	6	190	960	-22	3	314	950	-21	7	314					
15	956	-17	2	308	956	-14	6	49	961	-17	8	186	965	-25	7	181	959	-21	X	22	950	-20	2	280					
18	956	-15	1	305	956	-14	7	72	961	-16	14	152	965	-22	3	224	957	-20	3	8	950	-18	3	321					
21	957	-15	1	350	956	-13	6	62	963	-17	13	155	965	-22	3	263	957	-20	3	79	949	-17	1	48					
00	948	-16	2	309	948	-6	11	232	961	-9	9	318	966	-21	3	263	957	-20	3	79	949	-17	1	48					
03	945	-15	3	353	950	-7	14	202	962	-10	6	111	966	-21	3	263	957	-20	3	79	949	-17	1	48					
06	944	-14	4	301	953	-7	11	200	963	-10	5	167	966	-21	3	263	957	-20	3	79	949	-17	1	48					
09	945	-11	3	221	954	-9	10	195	964	-10	3	86	966	-21	3	263	957	-20	3	79	949	-17	1	48					
12	945	-10	9	191	955	-8	11	186	964	-11	X	66	966	-21	3	263	957	-20	3	79	949	-17	1	48					
15	946	-9	4	232	957	-8	4	184	963	-12	0	0	966	-21	3	263	957	-20	3	79	949	-17	1	48					
18	947	-9	7	273	958	-9	2	315	961	-12	3	103	966	-21	3	263	957	-20	3	79	949	-17	1	48					
21	948	-7	6	246	960	-9	2	101	960	-13	4	104	966	-21	3	263	957	-20	3	79	949	-17	1	48					

MONTHLY SUMMARY

TEMPERATURE (C) * MEAN = -14.1 STD DEV = 3.9 MAX = -6.1 AT 2327 GMT ON DAY 29 MIN = -24.6 AT 1447 GMT ON DAY 26
 * PRESSURE (MB) * MEAN = 953.4 STD DEV = 7.4 MAX = 971.3 AT 557 GMT ON DAY 4 MIN = 939.8 AT 847 GMT ON DAY 20
 * WINDS (M/S) * MEAN = 5.9 STD DEV = 3.7 RESULTANT = 2.5 FROM 159. CONSTANCY = .43 MAX = 21.2 FROM 152. AT 2217 GMT DAY 2
 * MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: .0 % WINDS: 9.3 %
 WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+
 WIND DIRECTION: N NNE NE E ESE SE SSE S SSW SW W WNW NNW NW NNW
 PERCENT: 5 0 0 3 2 4 7 20 11 11 6 5 2 3 5 10 5

STATION : 8914 D-47 LAT : 67.4 S LONG : 138.7E ELEVATION : 1560 M

MAY HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	809	-30	15	180	815	-25	10	180	811	-24	8	180	811	-24	8	180	811	-24	8	180	811	-24	8	180	811	-24	8	180
06	810	-28	15	166	814	-24	10	180	809	-24	7	180	809	-24	7	180	809	-24	7	180	809	-24	7	180	809	-24	7	180
09	813	-27	13	162	812	-23	7	180	807	-25	7	180	807	-25	7	180	807	-25	7	180	807	-25	7	180	807	-25	7	180
12	814	-27	12	174	810	-23	5	173	805	-24	8	163	805	-24	8	163	805	-24	8	163	805	-24	8	163	805	-24	8	163
15	815	-27	11	166	807	-23	4	183	804	-26	10	161	804	-26	10	161	804	-26	10	161	804	-26	10	161	804	-26	10	161
18	815	-28	11	180	803	-26	7	191	802	-27	12	161	802	-27	12	161	802	-27	12	161	802	-27	12	161	802	-27	12	161
21	815	-28	13	170	801	-28	9	180	801	-28	9	180	801	-28	9	180	801	-28	9	180	801	-28	9	180	801	-28	9	180
00	817	-25	17	167	799	-29	10	187	800	-31	20	160	800	-31	20	160	800	-31	20	160	800	-31	20	160	800	-31	20	160
03	816	-25	17	180	811	-24	8	180	798	-30	15	170	798	-30	15	170	798	-30	15	170	798	-30	15	170	798	-30	15	170
06	816	-26	17	179	809	-24	7	180	797	-29	17	141	797	-29	17	141	797	-29	17	141	797	-29	17	141	797	-29	17	141
09	815	-26	19	170	807	-25	7	180	796	-30	16	145	796	-30	16	145	796	-30	16	145	796	-30	16	145	796	-30	16	145
12	815	-26	16	180	805	-24	8	163	805	-24	8	163	805	-24	8	163	805	-24	8	163	805	-24	8	163	805	-24	8	163
15	814	-25	15	180	804	-26	10	161	804	-26	10	161	804	-26	10	161	804	-26	10	161	804	-26	10	161	804	-26	10	161
18	814	-26	13	180	802	-27	12	161	802	-27	12	161	802	-27	12	161	802	-27	12	161	802	-27	12	161	802	-27	12	161
21	813	-25	10	172	801	-28	12	156	797	-31	16	141	797	-31	16	141	797	-31	16	141	797	-31	16	141	797	-31	16	141
00	796	-26	12	141	799	-30	14	152	798	-31	13	165	798	-31	13	165	798	-31	13	165	798	-31	13	165	798	-31	13	165
03	795	-26	12	143	796	-33	13	180	805	-27	15	146	805	-27	15	146	805	-27	15	146	805	-27	15	146	805	-27	15	146
06	795	-26	15	141	796	-35	16	177	803	-30	17	152	803	-30	17	152	803	-30	17	152	803	-30	17	152	803	-30	17	152
09	795	-27	12	141	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	795	-27	13	149	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	796	-28	11	180	X	-36	14	180	801	-27	23	136	801	-27	23	136	801	-27	23	136	801	-27	23	136	801	-27	23	136
18	796	-29	12	163	801	-37	16	180	801	-37	16	180	801	-37	16	180	801	-37	16	180	801	-37	16	180	801	-37	16	180
21	796	-32	13	172	802	-35	15	162	803	-26	19	141	803	-26	19	141	803	-26	19	141	803	-26	19	141	803	-26	19	141
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	803	-31	14	162	800	-36	11	180	805	-36	12	161	804	-38	12	180	804	-38	12	180	804	-38	12	180	804	-38	12	180
06	802	-30	14	170	800	-40	11	180	804	-34	14	150	805	-39	12	180	805	-39	12	180	805	-39	12	180	805	-39	12	180
09	801	-31	13	180	801	-41	10	180	803	-35	14	180	808	-36	14	180	808	-36	14	180	808	-36	14	180	808	-36	14	180
12	801	-32	14	160	802	-40	10	180	803	-35	14	180	808	-36	14	180	808	-36	14	180	808	-36	14	180	808	-36	14	180
15	800	-33	14	159	803	-41	9	165	802	-34	15	180	811	-32	14	180	828	-26	20	166	835	-24	17	174	826	-24	19	172
18	800	-35	14	169	804	-40	11	159	802	-33	16	180	814	-29	12	180	830	-26	18	180	834	-25	17	179	825	-23	18	180
21	800	-37	14	180	805	-38	11	161	803	-35	12	179	817	-28	15	180	830	-25	17	180	833	-25	18	180	824	-20	19	166
00	824	-20	19	150	829	-18	15	167	823	-27	9	184	823	-27	9	184	823	-27	9	184	823	-27	9	184	823	-27	9	184
03	826	-18	16	180	829	-17	14	166	820	-25	9	181	820	-25	9	181	820	-25	9	181	820	-25	9	181	820	-25	9	181
06	826	-18	18	180	829	-18	15	180	818	-27	8	180	818	-27	8	180	818	-27	8	180	818	-27	8	180	818	-27	8	180
09	823	-18	24	180	829	-18	12	174	815	-27	8	180	815	-27	8	180	815	-27	8	180	815	-27	8	180	815	-27	8	180
12	827	-16	14	180	829	-20	10	166	829	-20	10	166	829	-20	10	166	829	-20	10	166	829	-20	10	166	829	-20	10	166
15	827	-17	17	167	827	-20	12	180	810	-24	7	180	810	-24	7	180	810	-24	7	180	810	-24	7	180	810	-24	7	180
18	828	-17	15	180	826	-22	11	180	807	-26	7	180	807	-26	7	180	807	-26	7	180	807	-26	7	180	807	-26	7	180
21	828	-17	14	167	825	-24	10	180	805	-23	7	180	805	-23	7	180	805	-23	7	180	805	-23	7	180	805	-23	7	180

MONTHLY SUMMARY

* TEMPERATURE (C) * MEAN = -28.4 STD DEV = 4.8 MAX = -15.5 AT 1631 GMT ON DAY 29 MIN = -41.0 AT 1355 GMT ON DAY 23

* PRESSURE (MB) * MEAN = 807.7 STD DEV = 12.2 MAX = 835.3 AT 928 GMT ON DAY 27 MIN = 788.0 AT 1453 GMT ON DAY 19

* WINDS (M/S) * MEAN = 14.3 STD DEV = 3.7 RESULTANT = 13.7 FROM 167. CONSTANCY = .96 MAX = 27.9 FROM 150. AT 701 GMT DAY 19

* MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: 7.3 % PRESSURE: 7.7 % WINDS: 7.3 %

WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+

WIND DIRECTION: N 0 NNE 0 NE 0 E 0 ESE 0 SE 16 SSE 24 S 24 SW 3 WSW 1 WNW 0 NNW 0 0 0 0 0 0 0 0 0 0

STATION : 8914 D-47 LAT : 67.4 S LONG : 138.7E ELEVATION : 1560 M

AUG HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD
00	X	X	21	141	793	-38	9	180	790	-37	15	169	801	-38	17	176	X	X	X	X	X	X	X	X
03	779	-28	21	141	791	-37	13	176	791	-37	13	176	X	X	X	X	X	X	X	X	776	-39	12	180
06	X	-28	21	141	789	-37	8	180	792	-39	14	180	X	X	X	X	X	X	X	X	775	-41	13	180
09	780	-29	19	141	793	-33	10	149	793	-42	16	180	801	-38	7	180	X	X	X	X	775	-40	12	180
12	781	-30	17	149	794	-33	9	170	794	-44	13	180	800	-33	16	180	X	X	X	X	776	-39	12	180
15	783	-30	14	141	796	-33	6	170	796	-43	13	180	799	-34	17	150	X	X	X	X	777	-39	14	169
18	785	-31	15	152	796	-33	7	180	798	-42	18	180	X	X	X	X	X	X	X	X	779	-39	12	166
21	786	-31	11	149	795	-34	5	167	799	-39	18	180	X	X	X	X	X	X	X	X	805	-23	10	120
00	781	-39	14	156	793	-33	12	148	X	X	X	X	804	-33	11	180	809	-26	13	159	805	-23	11	120
03	782	-39	14	180	793	-31	14	141	X	X	X	X	807	-31	12	190	807	-24	14	146	804	-23	11	120
06	783	-38	11	162	793	-31	14	141	790	-24	9	141	810	-32	11	180	805	-23	13	141	804	-24	10	113
09	786	-38	13	156	793	-30	15	134	X	X	X	X	813	-32	12	188	806	-22	11	132	804	-25	12	141
12	788	-38	12	160	791	-29	15	141	X	X	X	X	815	-31	12	180	806	-22	9	141	804	-26	12	141
15	790	-37	12	180	789	-27	15	141	798	-26	5	173	814	-30	12	172	805	-22	9	141	804	-26	7	141
18	792	-36	13	149	787	-27	15	146	800	-32	8	180	812	-28	13	180	806	-22	9	120	804	-26	7	141
21	793	-35	13	158	X	X	X	X	788	-26	9	149	812	-28	13	180	805	-22	12	135	804	-27	6	149
00	804	-28	5	180	X	X	X	X	DAY 17	DAY 18	DAY 18	DAY 18	798	-37	15	167	X	X	X	X	804	-37	11	180
03	X	X	X	X	792	-35	12	180	788	-41	17	180	798	-36	14	180	X	X	X	X	804	-41	15	179
06	X	X	X	X	791	-35	11	166	X	X	X	X	798	-38	16	180	X	X	X	X	803	-40	12	180
09	X	X	X	X	790	-35	13	165	789	-43	19	158	798	-39	15	180	X	X	X	X	803	-37	12	180
12	X	X	X	X	790	-35	13	180	791	-42	17	141	798	-39	19	180	X	X	X	X	803	-37	11	180
15	X	X	X	X	789	-36	14	180	X	X	X	X	798	-41	20	169	802	-36	17	163	803	-37	11	180
18	X	X	X	X	788	-37	14	180	X	X	X	X	798	-37	14	170	803	-35	15	180	803	-38	12	179
21	X	X	X	X	788	-39	16	162	X	X	X	X	804	-35	14	166	804	-35	14	166	804	-38	12	180
00	805	-39	12	190	819	-29	14	158	DAY 24	DAY 25	DAY 25	DAY 25	808	-30	13	180	823	-26	10	163	807	-28	15	169
03	806	-38	12	179	821	-29	12	152	818	-21	14	141	810	-30	16	180	822	-25	9	180	808	-26	17	163
06	808	-38	11	184	823	-29	12	155	814	-21	18	141	813	-30	14	161	820	-25	10	180	809	-27	16	180
09	809	-36	14	180	824	-28	9	180	810	-21	21	141	816	-31	13	159	818	-23	10	148	811	-29	14	180
12	810	-31	15	160	824	-27	8	180	806	-22	19	141	819	-30	12	159	815	-23	10	156	812	-30	16	176
15	810	-28	15	141	823	-23	6	165	804	-22	18	141	822	-30	10	141	815	-23	13	162	813	-30	10	179
18	812	-28	14	146	822	-23	9	149	802	-23	16	141	823	-29	9	141	809	-25	11	180	813	-30	11	184
21	816	-29	15	141	821	-21	12	136	802	-24	12	141	823	-29	10	152	808	-26	14	180	814	-31	11	180
00	815	-28	9	180	X	X	X	X	DAY 29	DAY 30	DAY 30	DAY 30	808	-35	18	170	806	-30	10	166	804	-35	14	166
03	816	-27	10	181	808	-35	18	170	799	-34	14	180	808	-30	16	180	823	-26	10	163	807	-28	15	169
06	815	-27	13	180	806	-35	17	162	798	-35	12	165	810	-30	16	180	822	-25	9	180	808	-26	17	163
09	815	-30	16	180	X	-35	13	180	X	X	X	X	813	-30	14	161	820	-25	10	180	809	-27	16	180
12	816	-33	15	180	805	-33	17	141	797	-37	17	150	816	-31	13	159	818	-23	10	148	811	-29	14	180
15	815	-35	16	177	805	-33	11	161	799	-39	15	145	819	-30	12	159	815	-23	10	156	812	-30	16	176
18	813	-37	17	180	803	-33	15	163	800	-40	13	141	822	-30	10	141	815	-23	13	162	813	-30	10	179
21	813	-37	17	180	801	-34	15	170	801	-39	12	141	823	-29	9	141	809	-25	11	180	813	-30	11	184
					802	-38	15	150	802	-38	15	150	823	-29	10	152	808	-26	14	180	814	-31	11	180

MONTHLY SUMMARY

* TEMPERATURE (C) * MEAN = -31.9 STD DEV = 5.7 MAX = -20.6 AT 2254 GMT ON DAY 23 MIN = -44.0 AT 1113 GMT ON DAY 4
 * PRESSURE (MB) * MEAN = 800.9 STD DEV = 11.6 MAX = 824.2 AT 1027 GMT ON DAY 23 MIN = 775.1 AT 946 GMT ON DAY 7
 * WINDS (M/S) * MEAN = 13.0 STD DEV = 3.2 RESULTANT = 12.4 FROM 163. CONSTANCY = .95 MAX = 26.7 FROM 128. AT 617 GMT DAY 24
 * MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: 17.7 % PRESSURE: 18.5 % WINDS: 17.7 %
 WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+
 PERCENT: 0 0 2 4 9 22 25 22 10 4 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 WIND DIRECTION: N NNE NE ENE E ESE SE SSE S SSW SW W WNW NNW
 PERCENT: 0 0 0 0 0 0 2 24 26 48 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

STATION : 8914 D-47 LAT : 67.4 S LONG : 138.7E ELEVATION : 1560 M

HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD				
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
DAY 8																												
00	781	-40	12	179	784	-35	12	146	784	-37	15	172	791	-35	12	180	795	-30	10	158	795	-30	10	158	795	-30	10	158
03	781	-35	9	180	785	-32	10	162	784	-37	17	180	791	-34	9	184	793	-26	14	141	793	-26	14	141	793	-26	14	141
06	781	-33	8	180	785	-32	9	180	X	X	X	X	790	-33	12	177	792	-25	14	138	792	-25	14	138	792	-25	14	138
09	782	-36	11	180	784	-38	12	180	783	-38	17	180	792	-34	10	180	790	-25	15	141	790	-25	15	141	790	-25	15	141
12	782	-40	11	166	784	-39	12	180	784	-35	17	180	794	-37	11	180	790	-27	12	150	790	-27	12	150	790	-27	12	150
15	782	-41	12	166	784	-39	11	173	786	-35	17	167	795	-39	12	180	790	-28	18	150	790	-28	18	150	790	-28	18	150
18	782	-40	12	180	784	-41	17	181	789	-35	14	163	795	-39	12	172	795	-39	12	172	795	-39	12	172	795	-39	12	172
21	783	-38	12	170	785	-40	16	180	790	-36	12	170	795	-36	11	169	X	X	X	X	X	X	X	X	X	X	X	X
DAY 15																												
00	X	X	X	X	X	X	X	X	816	-27	16	152	817	-28	13	156	807	-27	15	180	807	-27	15	180	807	-27	15	180
03	X	X	X	X	X	X	X	X	817	-25	13	166	817	-25	11	165	805	-26	14	155	805	-26	14	155	805	-26	14	155
06	X	X	X	X	X	X	X	X	817	-24	12	180	816	-25	14	149	803	-25	13	158	803	-25	13	158	803	-25	13	158
09	X	X	X	X	X	X	X	X	817	-26	12	180	815	-27	13	161	801	-27	14	180	801	-27	14	180	801	-27	14	180
12	X	X	X	X	X	X	X	X	815	-28	17	180	814	-29	14	159	800	-31	13	180	800	-31	13	180	800	-31	13	180
15	X	X	X	X	X	X	X	X	812	-29	15	149	813	-30	16	159	797	-36	16	180	797	-36	16	180	797	-36	16	180
18	X	X	X	X	X	X	X	X	814	-29	13	149	811	-31	14	180	795	-37	17	170	795	-37	17	170	795	-37	17	170
21	X	X	X	X	X	X	X	X	815	-28	14	180	809	-30	15	170	793	-37	15	180	793	-37	15	180	793	-37	15	180
DAY 22																												
00	798	-27	7	132	789	-26	13	118	789	-28	9	141	791	-28	11	141	796	-24	7	153	796	-24	7	153	796	-24	7	153
03	799	-25	7	141	787	-25	12	141	789	-27	8	141	792	-25	8	136	797	-22	6	132	788	-23	15	146	788	-23	15	146
06	800	-24	5	141	786	-26	12	141	789	-26	6	141	792	-24	7	141	798	-22	5	141	787	-22	14	141	787	-22	14	141
09	800	-25	3	114	787	-26	12	141	790	-29	4	180	792	-26	7	149	799	-25	5	180	786	-23	15	141	786	-23	15	141
12	799	-27	4	141	787	-27	13	136	791	-33	8	180	793	-30	6	149	799	-29	8	165	786	-26	14	170	786	-26	14	170
15	796	-28	6	141	787	-28	12	141	791	-34	9	162	793	-31	5	145	798	-31	9	180	784	-30	14	159	784	-30	14	159
18	793	-28	10	141	787	-29	13	138	790	-33	10	170	793	-30	7	141	796	-31	12	162	X	X	X	X	X	X	X	X
21	790	-27	13	141	788	-30	10	141	790	-31	12	143	794	-28	7	170	794	-29	12	180	X	X	X	X	X	X	X	X
DAY 29																												
00	787	-23	10	141	794	-24	10	141	791	-25	10	166	791	-25	10	142	791	-25	10	142	791	-25	10	142	791	-25	10	142
03	799	-22	9	111	793	-23	10	141	790	-23	9	180	792	-24	7	141	798	-22	6	132	788	-23	15	146	788	-23	15	146
06	791	-23	7	101	793	-24	10	141	790	-23	9	180	792	-24	7	141	798	-22	5	141	787	-22	14	141	787	-22	14	141
09	793	-25	2	100	793	-26	12	153	790	-25	7	167	792	-26	7	149	799	-25	5	180	786	-23	15	141	786	-23	15	141
12	793	-28	6	141	793	-27	10	149	789	-29	11	165	792	-26	7	149	799	-25	5	180	786	-23	15	141	786	-23	15	141
15	793	-30	7	141	792	-28	11	161	789	-29	11	165	793	-31	5	145	798	-31	9	180	784	-30	14	159	784	-30	14	159
18	793	-29	7	125	792	-29	10	180	788	-34	10	180	793	-30	7	141	796	-31	12	162	X	X	X	X	X	X	X	X
21	794	-27	9	129	791	-29	9	166	788	-32	10	180	794	-28	7	170	794	-29	12	180	X	X	X	X	X	X	X	X
DAY 27																												
00	798	-27	13	141	794	-24	10	141	791	-25	10	166	791	-25	10	142	791	-25	10	142	791	-25	10	142	791	-25	10	142
03	799	-25	7	141	787	-25	12	141	789	-27	8	141	792	-25	8	136	797	-22	6	132	788	-23	15	146	788	-23	15	146
06	800	-24	5	141	786	-26	12	141	789	-26	6	141	792	-24	7	141	798	-22	5	141	787	-22	14	141	787	-22	14	141
09	800	-25	3	114	787	-26	12	141	790	-29	4	180	792	-26	7	149	799	-25	5	180	786	-23	15	141	786	-23	15	141
12	799	-27	4	141	787	-27	13	136	791	-33	8	180	793	-30	6	149	799	-29	8	165	786	-26	14	170	786	-26	14	170
15	796	-28	6	141	787	-28	12	141	791	-34	9	162	793	-31	5	145	798	-31	9	180	784	-30	14	159	784	-30	14	159
18	793	-28	10	141	787	-29	13	138	790	-33	10	170	793	-30	7	141	796	-31	12	162	X	X	X	X	X	X	X	X
21	790	-27	13	141	788	-30	10	141	790	-31	12	143	794	-28	7	170	794	-29	12	180	X	X	X	X	X	X	X	X
DAY 28																												
00	798	-27	13	141	794	-24	10	141	791	-25	10	166	791	-25	10	142	791	-25	10	142	791	-25	10	142	791	-25	10	142
03	799	-25	7	141	787	-25	12	141	789	-27	8	141	792	-25	8	136	797	-22	6	132	788	-23	15	146	788	-23	15	146
06	800	-24	5	141	786	-26	12	141	789	-26	6	141	792	-24	7	141	798	-22	5	141	787	-22	14	141	787	-22	14	141
09	800	-25	3	114	787	-26	12	141	790	-29	4	180	792	-26	7	149	799	-25	5	180	786	-23	15					

STATION : 8918 Windless Bight) LAT : 77.7 S LONG : 167.7E ELEVATION : 40 M

HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD								
00	985	-21	2	22	983	-27	0	0	995	-15	7	97	1003	-16	4	90	997	-20	1	79	991	-19	4	349	981	-14	3	278
03	983	-22	1	104	983	-23	0	0	997	-13	5	101	1002	-18	2	49	997	-19	3	54	990	-22	3	101	982	X	4	280
06	981	-22	3	65	984	-22	1	15	998	-13	5	70	1002	-16	1	101	997	-20	5	89	989	-22	1	360	985	-21	5	90
09	981	-25	1	360	985	-18	1	24	999	-12	0	0	1001	-22	0	0	997	-21	4	90	987	-26	1	233	988	-28	6	89
12	981	-32	0	0	987	-15	1	76	1001	-15	3	83	1000	-20	3	45	997	-21	4	72	986	-25	2	332	989	-30	4	66
15	981	-33	1	201	989	-16	4	360	1001	-15	2	69	998	-21	1	360	996	-21	5	79	985	X	2	289	989	-30	3	46
18	982	-32	0	0	991	-15	1	212	1002	-14	3	54	998	X	1	22	994	-21	4	90	983	-16	4	309	988	-31	4	79
21	982	-27	1	22	993	-14	0	0	1003	-16	3	94	997	-25	1	301	993	-21	6	83	982	-15	3	330	989	-31	0	0
00	989	-28	1	226	984	-19	1	333	983	-23	2	346	974	-16	1	360	988	-28	5	69	986	-19	2	90	983	-26	1	360
03	988	-23	0	0	984	-16	5	356	982	-17	0	0	973	-15	2	330	987	-26	5	90	985	-19	3	52	982	-26	3	360
06	988	-20	0	0	983	-17	3	339	981	-19	1	326	973	-20	2	323	988	-23	2	90	985	-18	2	90	982	-26	2	360
09	988	-23	3	360	984	-15	2	180	980	-19	2	301	973	-19	3	342	988	-23	2	359	985	-21	3	45	982	-26	2	22
12	987	-20	1	332	983	X	1	339	979	-17	1	289	974	-22	0	0	989	-21	1	305	985	-21	5	79	982	-29	3	342
15	986	-15	2	21	983	-18	1	321	977	-19	2	22	978	-16	9	180	988	-19	0	0	984	-20	6	90	981	X	0	0
18	985	-16	0	0	982	-14	2	359	976	-20	1	87	984	-21	2	225	989	-20	4	45	984	-23	4	77	980	X	3	12
21	985	-22	1	15	982	-26	1	90	975	-20	1	349	986	-29	9	49	988	-19	4	93	983	-26	2	45	980	-22	2	291
00	980	-20	4	72	979	X	1	330	982	-21	5	10	978	X	1	360	981	-27	2	101	974	-23	2	270	976	-20	5	258
03	980	-19	1	45	979	-13	1	280	980	-14	1	294	977	-25	0	0	980	-25	4	90	973	-25	1	270	978	-19	4	270
06	979	-22	1	90	980	-11	2	360	981	-17	2	108	978	-23	1	155	980	-25	1	46	972	-27	2	334	979	-17	0	0
09	979	-24	0	0	981	-14	1	270	980	-17	2	69	978	-22	1	69	979	-23	2	41	971	-30	0	0	980	-20	2	3
12	979	-21	1	22	982	-15	3	111	980	-20	4	360	981	-20	1	210	977	-22	0	0	971	-28	0	0	981	-24	2	45
15	979	-26	1	56	982	-20	4	89	979	-16	0	0	980	-22	2	360	976	-19	3	180	971	-22	2	301	X	X	X	X
18	978	-23	1	360	981	-15	1	334	979	-21	3	79	982	-20	2	201	976	-23	1	145	973	-22	0	0	X	X	X	X
21	979	-28	2	60	981	-22	4	79	978	X	6	79	982	-23	4	79	975	-24	1	260	974	-21	0	0	X	X	X	X
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

MONTHLY SUMMARY
 * TEMPERATURE (C) * MEAN = -20.9 STD DEV = 4.6 MAX = -10.9 AT 557 GMT ON DAY 16 MIN = -33.9 AT 757 GMT ON DAY 20
 * PRESSURE (MB) * MEAN = 984.2 STD DEV = 7.5 MAX = 1003.5 AT 2225 GMT ON DAY 3 MIN = 970.9 AT 1407 GMT ON DAY 20
 * WINDS (M/S) * MEAN = 2.3 STD DEV = 1.7 RESULTANT = 1.2 FROM 50. CONSTANCY = .51 MAX = 11.8 FROM 197. AT 1526 GMT DAY 11
 * MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: 37.1 % PRESSURE: 33.5 % WINDS: 33.5 %
 WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 30-35 35-40 40-45 45-50 50-55 55-60 60+
 WIND DIRECTION: N NNE NE E ESE SE SSE SW W WNW NNW
 PERCENT: 52 33 12 2 1 9 23 2 1 1 2 3 2 1 6 5 4 9

STATION : 8918 WINDLESS BIGHT LAT : 77.7 S LONG : 167.7E ELEVATION : 40 M

DEC	HR	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD	PP	TT	VV	DD
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
00	984	3	1	360	980	0	1	360	980	0	1	360	980	0	1	360	980	0	1	360	980	0	1	360	980
03	983	3	2	360	980	0	1	45	981	3	0	0	981	3	0	0	981	3	0	0	981	3	0	0	981
06	982	1	2	225	980	-1	0	0	981	-2	1	45	981	-2	1	45	981	-2	1	45	981	-2	1	45	981
09	981	-1	2	255	980	-2	0	0	981	-3	1	343	981	-3	1	343	981	-3	1	343	981	-3	1	343	981
12	981	-2	1	330	980	-7	2	62	982	-4	1	90	982	-4	1	90	982	-4	1	90	982	-4	1	90	982
15	980	-7	1	225	980	-5	1	34	982	-5	2	104	982	-5	2	104	982	-5	2	104	982	-5	2	104	982
18	980	-6	1	17	980	-9	1	90	983	-6	1	69	983	-6	1	69	983	-6	1	69	983	-6	1	69	983
21	980	-1	1	360	981	-4	0	0	984	-4	1	94	984	-4	1	94	984	-4	1	94	984	-4	1	94	984
00	991	-6	2	15	995	-1	0	0	994	-1	0	0	994	-1	0	0	994	-1	0	0	994	-1	0	0	994
03	992	-4	0	0	995	-1	1	96	993	0	1	339	993	0	1	339	993	0	1	339	993	0	1	339	993
06	993	-3	1	360	996	-3	1	118	992	-1	1	283	992	-1	1	283	992	-1	1	283	992	-1	1	283	992
09	993	-5	1	37	996	-3	0	0	992	-2	1	288	992	-2	1	288	992	-2	1	288	992	-2	1	288	992
12	X	X	X	X	996	-8	0	0	991	-4	0	0	991	-4	0	0	991	-4	0	0	991	-4	0	0	991
15	X	X	X	X	995	-11	1	49	991	-7	1	324	991	-7	1	324	991	-7	1	324	991	-7	1	324	991
18	X	X	X	X	995	-8	1	34	993	-7	1	139	993	-7	1	139	993	-7	1	139	993	-7	1	139	993
21	994	-5	1	360	995	-3	1	330	994	-7	3	118	994	-7	3	118	994	-7	3	118	994	-7	3	118	994
00	972	-3	4	27	973	-3	4	238	981	-6	1	108	981	-6	1	108	981	-6	1	108	981	-6	1	108	981
03	971	-2	2	141	974	-3	1	156	981	-5	1	37	981	-5	1	37	981	-5	1	37	981	-5	1	37	981
06	971	-3	2	90	975	-4	1	360	980	-7	3	45	980	-7	3	45	980	-7	3	45	980	-7	3	45	980
09	971	-5	2	20	977	-6	1	225	X	X	1	37	X	X	1	37	X	X	1	37	X	X	1	37	X
12	971	-6	1	270	979	-9	2	165	979	-7	1	324	979	-7	1	324	979	-7	1	324	979	-7	1	324	979
15	971	-6	1	145	980	-9	1	329	978	-7	0	0	978	-7	0	0	978	-7	0	0	978	-7	0	0	978
18	972	-6	3	330	981	-10	3	270	980	-6	1	214	980	-6	1	214	980	-6	1	214	980	-6	1	214	980
21	972	-3	3	309	981	-9	1	309	980	-4	2	330	980	-4	2	330	980	-4	2	330	980	-4	2	330	980

MONTHLY SUMMARY
 * TEMPERATURE (C) * MEAN = -4.7 STD DEV = 3.4 MAX = 4.2 AT 2239 GMT ON DAY 14 MIN = -14.1 AT 1419 GMT ON DAY 21
 * PRESSURE (MB) * MEAN = 985.1 STD DEV = 6.7 MAX = 998.0 AT 1019 GMT ON DAY 25 MIN = 970.6 AT 1339 GMT ON DAY 29
 * WINDS (M/S) * MEAN = 1.6 STD DEV = 1.3 RESULTANT = .6 FROM 35. CONSTANCY = .38 MAX = 7.9 FROM 187. AT 629 GMT DAY 14
 * MISSING 3-HOURLY OBSERVATIONS * TEMPERATURE: 37.5 % PRESSURE: 37.5 % WINDS: 37.1 %
 WIND SPEED (M/S): 0-2 2-4 4-6 6-8 8-10 10-12 12-14 14-16 16-18 18-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+
 WIND DIRECTION: N NNE NE E ESE SE SSE S SSW SW W WNW NNW
 PERCENT: 16 12 10 6 17 5 3 2 1 4 3 5 5 4 6







V. Field Report -- Ross Island and Inland Sites

Antarctic Automatic Weather Stations

AS 82-83

Field Report, McMurdo Area
Peninsula Area Deployment

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Itinerary, McMurdo area

28/12/82 Leave Madison, Wisconsin

31/12/82 Arrive McMurdo

4/01/83 Visit Jimmy Site to install beacon for helicopter ADF testing.

5/01/83 Visit Jimmy Site to remove AWS 8911 and three boxes of three 12 vdc batteries.

6/01/83 Marble point then to Asgard to remove AWS 8908 and terminate the site.

10/01/83 Laurie Site to remove AWS 8910 and install AWS 8911 after conversion to 12 vdc.

14/01/83 Manning Site after starting for Meeley.

17/01/83 Establish Nancy Site near White Island with AWS 8908 which measures relative humidity and has been converted to 12 vdc power.

18/01/83 Meeley Site by helicopter to install beacon, batteries, and solar panels.

20/01/83 Aborted trip to Dome C by C-130. Flew down Byrd Glacier on return flight.

24/01/83 Laurie Site to install AWS 8911 after wiring correction and find Ferrell Site.

25/01/83 Whitlock Site on Franklin Island by helicopter from the Glacier.

28/01/83 Install box and tower at new Jimmy Site in the Windless Bight at Bucky Wilson's RTG.

30/01/83 Stearns and Weidner leave for Christchurch N.Z.

9/02/83 AWS 8918 installed at Jimmy Site.

MCMURDO AND PENINSULA AREAS.

AWS 8908 and AWS 8911 were converted to 12 vdc operation.

Nancy Site was installed near White Island.

Jimmy Site was relocated to Windless Bight.

Whitlock on Franklin Island was visited.

Ferrell and Meeley sites were found.

Asgard Site was removed.

Marble Point and Manning were visited.

Ice Rise and Spine sites were installed at the Antarctic Peninsula.

Fig 1 gives the location of the AWS units in the vicinity of McMurdo. Each site has a name which stays with the site and the center of the circle has the last two digits of the AWS ID. This year two different AWS units were at Jimmy and Laurie Sites and AWS unit 8908 has been at two different sites. As the stations stop operating and/or need modification at McMurdo, there will continue to be considerable shuffling. Modifications to units can not be made in the field. A unit already modified and operating will have to be taken out to the site, installed and the previous unit returned to McMurdo for future modification. So the rule will be that the site name remains while the ID changes. Fortunately this can happen only once each year. Fig 2 shows the AWS unit located at the Ice Rise on the Larsen Ice Shelf and proposed future locations for the AWS units. Fig. 3 shows the continent wide AWS units and Fig 4 a possible deployment in the vicinity of Byrd Glacier. No additional deployments should be made until the causes of the recent AWS problems can be resolved.

STATION TOLERANCES

The units should be calibrated each time that they are visited. These calibrations are not going to agree and one does not want to change the entire data set each year nor does one really know which calibration is the most accurate.

The tolerances suggested are those of the WMO for synoptic meteorology and are plus or minus the following values.

Pressure	1 mb
Temperature	.5 C
Wind speed	1 m/s
Wind direction	10 deg
Relative Humid.	5 %

Based on the above tolerances the data will not be changed unless the new calibration is outside of the above tolerances. A record of all calibration data in the lab and in the field will be maintained at Wisconsin and is available to anyone on request. In the future, one person should devote his/her time at the sites to recording calibration data at ten minute intervals. Every-body runs around doing something that is useful and we find on our return that not enough data was recorded or it was forgotten altogether. Also the pressure gauges should be checked against the McMurdo pressure prior to and after each trip to a site to determine if anything has happened to the pressure gauges during the trip. An additional benefit is that there is a chance of determining the elevation of the sit relative to McMurdo. The time on the ground at one of the Ross Ice Shelf sites is usually of the order of two hours so that measurements made every ten minutes with or without the Argos test set will be sure to catch the satellite pass.

Table 1. Current AWS Deployment

McMurdo area						
Site	AWS ID	Location	Elevation	Start	Stop	
Manning	8905	78.77 S, 166.85 E	66 m	25/11/80		
Marble Pt	8906	77.43 S, 163.75 E	120 m			
Ferrell	8907	78.02 S, 170.80 E	44 m	10/12/80		
Nancy	8908	77.91 S, 168.17 E	30 m	17/1/83		
Laurie	8911 8910	77.55 S, 169.90 E	27 m	23/1/83 15/12/81	18/4/82	
Jimmy	8911 "	77.80 S, 166.72 E " " "	200 m "	7/12/81 24/10/82	20/7/82 5/1/83	
<i>Windless Bight</i>	8918	77.75 S, 167.67 E	40 m	9/2/83	21/3/83	
Whitlock	8913	76.08 S, 168.33 E	274 m	23/1/82		
Meeley	8915	78.52 S, 170.18 E	49 m	4/12/80		
Asgard	8908	77.60 E, 161.15 E	1750 m ?	1/2/80	6/1/83	
Other AWS units						
Dome C	8904	74.50 S, 123.00 E	3280 m	4/2/80	31/1/83	
Byrd	8903	80.00 S, 120.00 E	1530 m	/2/80		
Siple	8909	75.90 S, 84.30 E	900 m	1/1/82		
Peninsula Area						
Ice Rise	8912	66.90 S, 60.60 W	50 m ?	7/2/83		
Spine	8919	67.60 S, 66.00 W	1540 m ?	9/3/83	20/3/83	

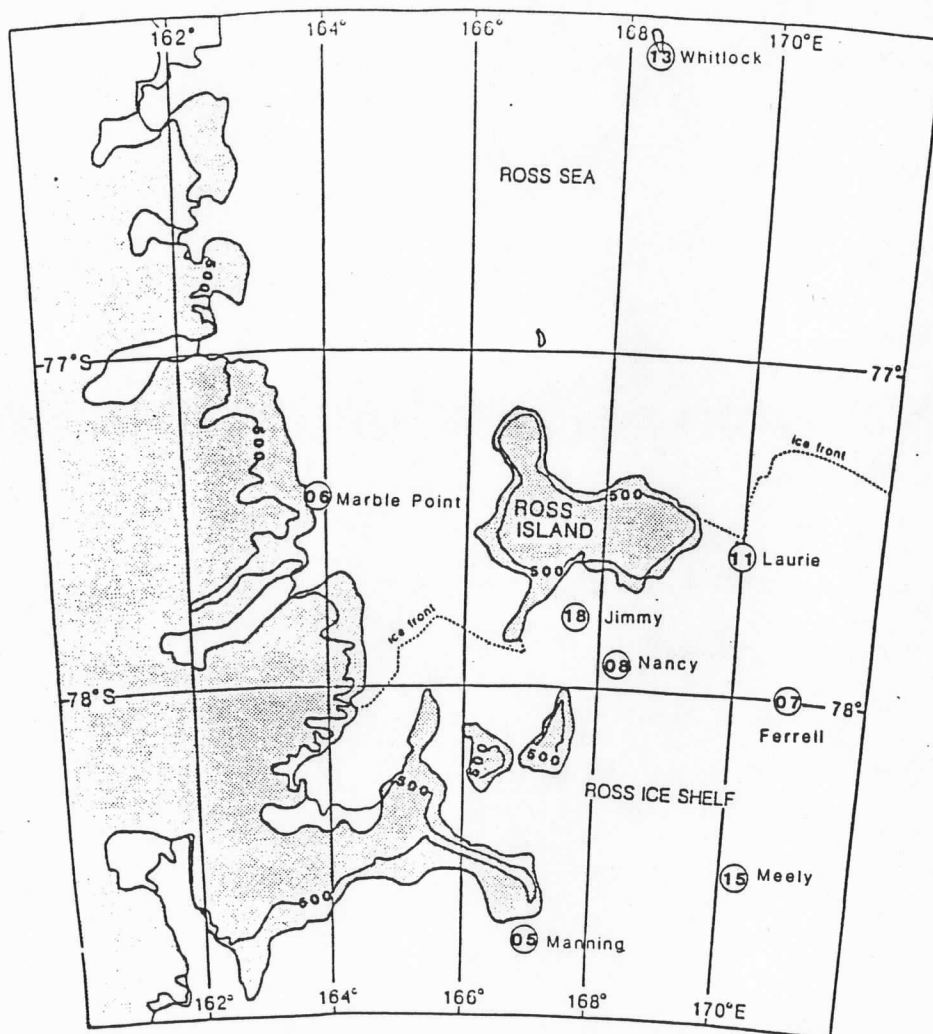
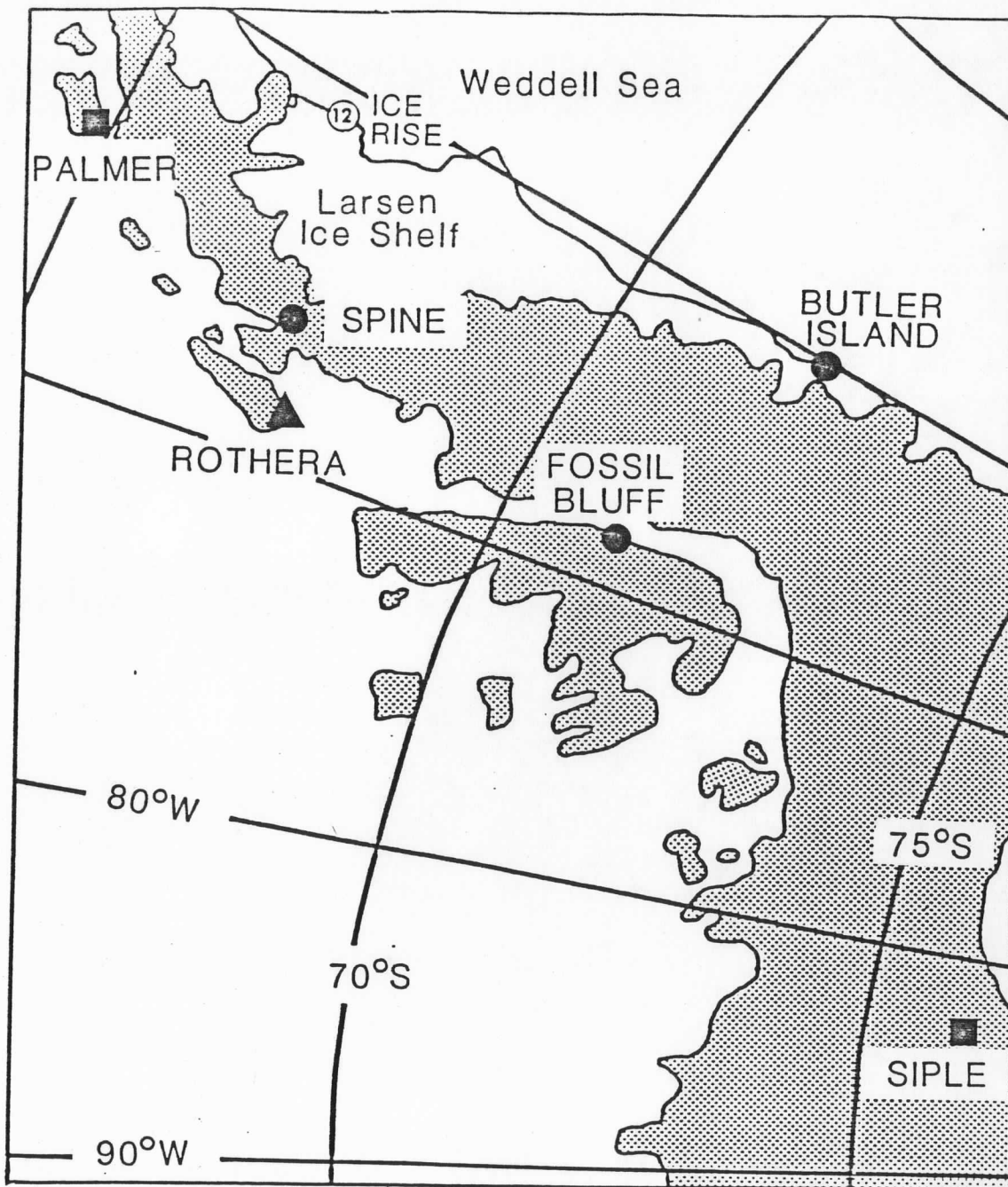


Fig 1. Map showing the locations of the AWS units in the McMurdo area as of 1/2/83. The last two digits of the Id are inside the station circle and the name of the site is to one side. Refer to Table 1 for more detailed information.



- AWS Sites
- U.S. Station
- ▲ B.A.S. Station

100 km

Fig 2. Map of the AWS units in the vicinity of the Antarctic Peninsula which are being installed by the British Antarctic Survey. AWS 8912 at the Ice Rise on the Larsen Ice Shelf is the only unit operating.

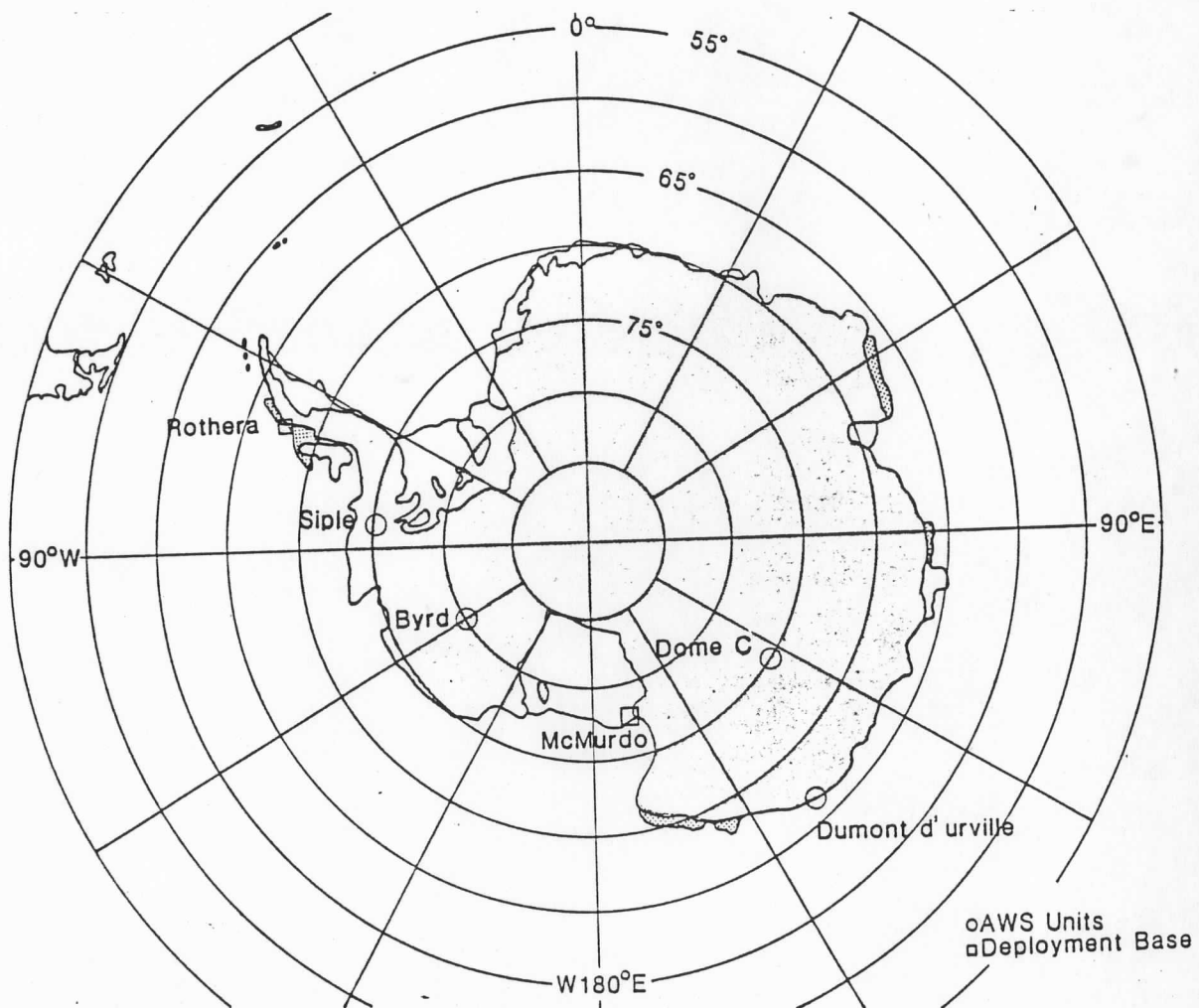


Fig 3. Map of the Antarctic Continent showing the location off the AWS units not shown on Fig 1 and 2 or associated with deployment from Dumont d'Urville. AWS 8904 at Dome C stopped transmitting 31/1/83 after three years of flawless operation recording a low temperature of -82.2 C

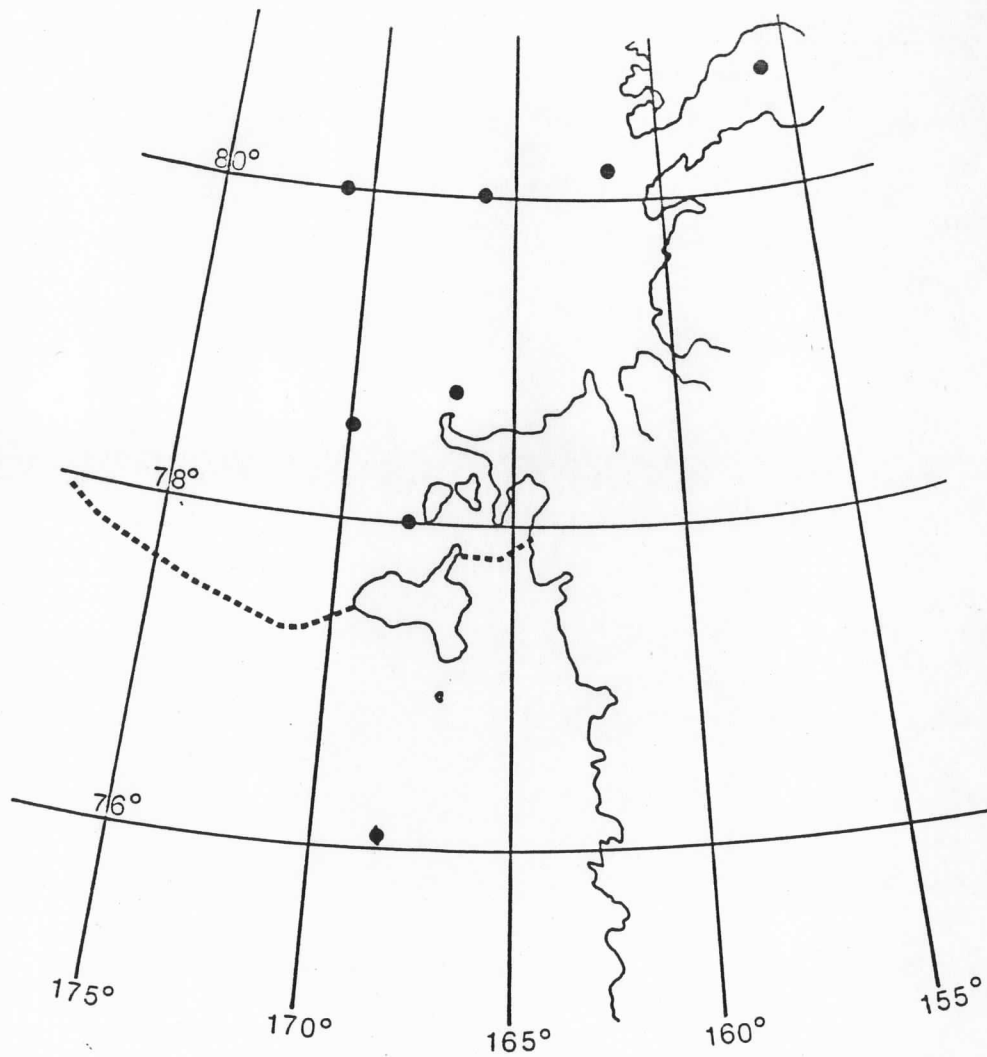


Fig 4. Possible future deployment of AWS units in the vicinity of Byrd Glacier in AS83-84 and AS 84-85. The units remaining in the vicinity of Ross Island are also shown. The purpose is to study the barrier wind.

Marble Point

AWS 8906

6/01/83 77.43 S, 163.75 E, 120 m

Aerovane 11-80-07 removed. 9.22 vdc @ 1800 rpm

Aerovane 03-78-14 installed. 9.20 vdc @ 1800 rpm

Field Calibration:

Item	Test Set	Measured	Corection	
			AS 82-83	AS 81-83
Air temperature	-1.0 C	0.8 C	+1.8 C	+0.5 C
Pressure	977.4 mb	978.3 mb	+0.8 mb	+1.5 mb
Wind speed	Wind speed(m/s)=.2303*(#bits)-0.161			
Wind direction	0 =north, increasing clockwise			0

Site was visited on the way to Asgard. The visibility was poor. The station was in good condition with the barrel anchors in place and the guy wires tight.

Asgard

AWS 8908

6-01-83

Aerovane 11-80-11 removed

The station was removed after the visit to Marble point and all items including the barrels and RTG were removed. AWS 8908 was subsequently modified to operate on 12 vdc power and reinstalled at Nancy Site along with the humidity element which was rechecked at McMurdo before deployment to Nancy Site.

Manning

AWS 8905

14/01/83 78.77 S, 166.85 E, 30 m(est)

Aerovane 03-78-10 removed

Aerovane 12-78-09 installed

Field Calibration:

Item	Test Set	Measured	Correction	
			AS 82-83	AS 81-82
Air temperature	-8.5 C	-7.8 C	+0.7 C	-0.6 C
Pressure	983.2 mb	983.2 mb	.0 mb	-0.5 mb
Wind speed	Wind speed (m/s) = .2397 *(3bits) - .127			
Wind direction	North = 0, increasing clockwise 0			

Manning was the alternate for a trip originally planned for Meeley. The station was spotted by Slotten. The RTG was below the snow level about 50 cm. The minimum thermometer installed last season had the wire in the bottom as did all others. The box as raised one tower rung or about 15 inches. The sensor cable was not long enough to extend the tower another 5 feet. This should be done next season and the RTG should be lifted onto a platform. When raising the tower, new anchor boards and guys will be needed. The snow accumulation from 11/80 to 11/81 was 64 cm and from 11/81 to 1/83 was 37 cm.

Nancy Site

AWS 8908

17/01/83 77.91 S, 168.17 E, 30 m (est)

Aerovane 11-80-07 installed

Beacon Frequency 235.8 MHz

Field Calibration:

Item	Test Set	Measured	Correction
Air temperature	-4.3 C	-4.9 C	-.6 C
Pressure	993.5 mb	994.8 mb	+1.3 mb
Wind speed	Wind speed (m/s) = 2297* (#bits) +.466		
Wind direction	North = 0, increasing clockwise		0

This is a new site. Power is three boxes of three twelve volt batteries charged by a 10 watt solar panel. A beacon transmitter was installed. The guys were fifty feet of chain going to boards 2 x 4 feet anchored in the snow. Snow level after installation was 15 inches up on the tower at the level of the first rung from the bottom. The site is north of the desired location but should be satisfactory.

Meeley Site

AWS 8915

18/01/83 78.52 S, 170.18 E, 30 m (est)

Aerovane 12-78-10 removed

Aerovane 03-78-09 installed

Beacon Frequency 235.65 MHz

Field Calibration:

Item	Test Set	Measured	Correction
Air temperature		-2.5 C	
Pressure	987.9 mb	987.5 mb	-0.5 mb
Wind speed	Wind speed (m/s) = .2296*(#bits) -.508		
Wind direction	North= +353.6 deg, increasing clockwise		+6.4 deg

The site was not serviced last season. The old batteries were charged briefly and the new box of 12 volt batteries and the solar panel were installed and checked to see that the connection were correct. The new battery was buried on top of the old batteries. The beacon transmitter was installed. The flag on the bamboo pole on the tower was ragged and may have interferred with the wind measurement. This is only speculation but the torn rag could have tangled with the prop. Boom height above the snow was about 9 feet. The aerovane prop was rubbing on the decal which could have decreased the wind speed. There was a slight hollow in the snow(5 cm) at the tower base. The guys were in good shape and the tower was erect. Snow accumulation data is not available because time did not allow photographs to be taken during installation in AS 80-81.

Ferrell Site

AWS 8907

24/01/83 78.02 S, 170.80 E, 20 m (est)

Aerovane 03-78-08 was removed

Aerovane 12-78-16 installed

Beacon Frequency 235.2 MHz

Field Calibration:

Item	Test Set	Measured	Correction
Air temperature	Argos test set	not available	
Pressure			
Wind speed			
Wind direction	North = 0, increasing clockwise		0

Comments

Field calibrations were not done because the Argos test set was on the Glacier for the trip to Franklin Island. The beacon transmitter was installed. The station was in excellent condition and snow accumulation from 12/80 to 1/83 was 110 cm.

Whitlock Site

AWS 8913

25/01/83 76.08 S, 168.33 E, 221 m (By barometric difference)

Aerovane 00-00-00 Left in place because screws would not come out.

Field Calibration;

Item	Test set	Measured	Correction
Air temperature	-4.8 C	-4.5 C	+0.3 C
Pressure	954.3 mb	953.7 mb	-0.6 mb

Wind speed Use previous calibration

Wind direction North = 346 deg, increasing clockwise +14 deg

Aerovane could not be removed. The tower was leaning slightly to the north. The barrell anchors did not have weights in them and were not actually anchoring the tower. An snow anchor board to the south and an additional line to the battery box to the south west were installed. The tower base was frozen into the ice which was doing the actual anchoring. The snow must melt during the summer. 400 lbs of weight should be carried out next year to anchor the barrels along with an entire boom assembly to replace the aerovane.

Laurie Site

AWS 8911

10/01/83 77.55 S, 169.9 E, 30 m

Aerovane 12-78-09 removed

Aerovane 03-78-07 installed

Beacon Frequency 235.5 MHz

Field calibration;

Item	Test set	Measured	Correction
Air temperature	Argos test set not available		
Pressure	" "	" "	" "
Wind speed	Wind speed (m/s) = .2352*(#bits)-.470		
Wind direction	North = 0, increasing clockwise		0

The AWS unit had stopped transmitting the previous April. The power was okay. AWS 8910 was removed and AWS 8911 was installed after conversion to 12 vdc. The old batteries were removed and three boxes of 12 vdc batteries and a 10 watt solar panel were installed. A beacon transmitter was installed although the station is easily found. The tower was well anchored with no signs of stress on the tower. The liquid column was broken in the minimum thermometer. The modification to AWS 8911 had not been made correctly and two other trips to the site were required before the station operated correctly on 23/01/83. The snow accumulation from 11/81 to 1/83 was 38 cm.

Jimmy Site (Windless Bight) AWS 8918

9/02/83 77.75 S, 167.67 E, 30 m (est)

Aerovane 03-78-09 removed when at Starr Glacier

Aerovane 11-80-09 installed

Field Calibration:

Item	Test set	Measured	Correction
------	----------	----------	------------

Calibration was not done at time of installation. Use initial method for processing data.

Jimmy Site was removed from Starr Glacier above McMurdo on 5/1/83 and relocated at Bucky Wilson's RTG at Windless Bight. The site was installed without the AWS unit on 9/2/83. Mike Savage installed AWS 8918 on 9/2/83 upon his return from Dumont d'Urville. AWS 8918 was questionable and only operated for 40 days stopping on 21/03/83.

at Bucky Wilson's RTG at Windless Bight. The site was installed without the AWS unit on 9/2/83. Mike Savage installed AWS 8918 on 9/2/83. AWS 8918 was found not to be operating perfectly and operated for about 40 days stopping on 21/03/83 after being turned on 9/02/83.

Byrd

AWS 8903

Location 80.0 S, 120.0 E, 1530 m

Aerovane 00-00-01 in place

This site was not visited in AS 82-83

The snow accumulation from Dec 80 to Dec 81 was 71 cm.

Dome C

AWS 8904

Location 74.50 S, 123.00 E, 3280 m

Aerovane 03-78-05 in place

This site was not visited in AS 82-83 due to fog at the surface which prevented landing the C-130. The AWS unit stopped transmitting on 31/01/83 and showed signs of trouble about 1/01/83 when the temperature data became erratic. A new station will be constructed for installation in AS 83-84 using the same ID.

Siple

AWS 8909

Location 75.90 S, 84.30 E, 900m

Aerovane 03-78-12 in place

The site was not visited in AS 82-83 due to transportation problems. Two five foot tower sections were sent to Siple so that the tower could be raised by the station people according to their judgement. The snow was at the top of the box in January 83 or about five feet deep. In AS 83-84 the station should be converted to 12 vdc and powered by batteries and solar panel. The tower height should be increased at that time enough to survive the accumulated snow for three years.

Antarctic Peninsula

Ice Rise, Larsen Ice Shelf
Antarctic Peninsula

AWS 8912

7/02/83 66 deg 57's, 60 deg 36' W, 50 m estimated

AWS 8912 is operating satisfactorily. Calibration data at the site is not available yet.

Spine

AWS 8919

9/03/83 67 deg, 39'S, 66 deg, 05'W, 1680 m

AWS 8919 was installed although it was known that the pressure was not being measured correctly. The unit subsequently failed 20 /03/83

Butler Island

AWS 8902

This unit was deployed by the BAS but upon installation at Butler Island the unit did not operate. The unit was removed leaving the tower and other equipment in place on Butler Island and will be returned to Wisconsin for repairs.

AWS units not operatating

AWS 8902

This unit has failed and will be returned to Wisconsin for repairs and then returned to the BAS in AS 83-84

AWS 8904

This unit failed at Dome C on 31/01/83. A new unit should be constructed to operate on the RTG and with the same ID for installation at Dome C in AS 83-84.

AWS 8910

This unit failed at Laurie Site in April 82 and has been returned to Wisconsin. This unit will be repaired, modified for 12 vdc operation and used for testing the relative humidity and temperature difference installation proposed for the next year. Cause of failure needs to be determined.

AWS 8911

This unit was installed at Laurie Site after conversion to 12 vdc operation in AS 82-83. The unit failed on 28/3/83.

AWS 8914

AWS 8916

AWS 8917

This unit is not operating and is to be returned to Wisconsin for repairs.

AWS 8918

This unit is not operating and a replacement unit will be constructed to operate on 12 vdc and include moisture and vertical temperature

difference for installation in AS 83-84. The same ID will be used.

AWS 8919

Aerovane Record AS-82-82

number	from	to	slip	bear	brush	pot
00-00-00		Whitlock 1/82				
00-00-01		Byrd 12/81				
03-78-05	Ferrell AS 81-82	Dome C				
03-78-07	Dome C	Laurie	#	#		#
03-78-08	Ferrell	M				
03-78-09	Jimmy	Meeley			#	#
03-78-10	Manning	M				
03-78-12		Siple 01/82				
03-78-14	Byrd 12/81	Marble Pt				
03-78-16	Asgard 12/80					
12-78-09	Laurie	Manning				#
12-78-10	Meeley	W		#	#	#
12-78-16		Ferrell				#
11-80-07	Marble Pt	Nancy				
11-80-09		Jimmy				
11-80-11	Asgard		#			#

M In inventory at McMurdo and needs to be repaired

Item repaired

W Returned to Wisconsin with a slow tachometer

Inventory- McMurdo

2 extension cords- 4 plug about 20 feet long
1 extension cord 8 plug about 3 feet long
1 6 vdc, 10 W solar panel which can be converted to 12 vdc
3 6 vdc gel cell batteries
1 12 volt gel cell battery
3 12 vdc battery boxes 3 batteries each for Siple wired for 6 pin plug
1 6 vdc battery box with 10 batteries wired for 12 vdc with small 3
pin plug
2 empty battery boxes
2 3 foot tower sections -could be base of tower
8 5 foot tower sections
1 7 foot tower section
1 1800 rpm motor for spin test of aerovanes
Aerovane parts
6 pots, new
9 bearing sets, new, large and small
allen wrenches
spline wrenches
3 brush sets, new
3 rubber gaskets for base
2 aerovanes 12-78-10 and 3-78-008 not repaired
4 props for aerovanes
4 aerovane mounting posts
1 roll of mylar tape, aluminized

Inventory, shipped to Madison

Gray tool box
with assorted tools

Blankenship's case

Martha's case

Model 5121 humidity probe

Frequency meter

Brunton compass and tripod

Orys soldering iron

AWS calibration boxes

Shunt regulator, broken

Moisture monitor

Tip Decoder

drill

Inverter

12 vdc power supply

Camera tripod

Barometer cases

Electronic components

4 generator anemometers -

Aerovane 12-78-10 which has the slow tachometer.

Aerovane parts needed for next year

Brushes

Screws for base and prop

Slow tachometer fixed

Modifications for the AWS units for AS 83-84

1. The humidity probe used on AWS 8908 at the Asgard Site apparently operated satisfactorily. After removal from Asgard the circuit for the humidity probe was studied and it should be possible to make a similar circuit for future probes on the presently deployed AWS units. A chip Intersil 7606 can be used to amplify the signal and send it to the channel previously reserved for humidity. The data from previous updates will not be stored for previous updates. Only the last update will be transmitted.

The electronics need to be assembled prior to the trip to Antarctica then the stations will have to be modified at McMurdo or Rothera. The sensor will have to be mounted on the boom near the temperature sensor. An additional plug may need to be installed on the electronics box. The power consumption is slightly greater but should not be a problem and depends upon the design of the circuitry which has yet to be determined.

2. AWS 8909 at Siple needs to be modified for 12 vdc power as was successfully done this past season for AWS 8908 and 8911.

3. The vertical air temperature from about 50 cm to about 3 m could be used to determine the vertical flux of sensible heat using the appropriate theory and the wind speed. The vertical temperature difference can be measured using a five junction set of thermocouples and the Intersil 7606 chip. It is expected that the vertical temperature difference can be determined to better than 0.1 C. The method has been tried on Plateau Station data and appears to give reasonable values for the vertical sensible heat flux. This

modification would be similar to the moisture measurement and would use one of the channels previously used for battery voltage.

4. Another possible modification is to modify the read only memory in the AWS unit. The modification would be to not measure and store the internal temperature for the previous 4 updates as the temperature is only needed to 1.0 C in order to correct the pressure data for temperature to within 0.1 mb as the internal temperature changes slowly. Then one could store wind speed and direction for the last 4 updates as this information would be more useful to the meteorologist. Another way to obtain more data is to remove the checksum from the program. One should be wary of modifying the read-only-memory on a system that is working so very well. A mix of stations with different formats would increase the complexity of the data processing but not to a large extent.

5. An additional possibility is to design a new station operating system that would include everything that anybody could possibly want.

Data Word

The present data word is as follows:

	[+10] [+20] [+30]															
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2																								
1	[T external {12}]										[T internal {12}]										[Checksum {8}]															
2	[Pressure {16}]										[P(-10) {8}]										[Checksum {8}]									
3	[Speed {8}]								[Direction {8}]								[RH {8}]								[Checksum {8}]							
External Temperature Difference																																																								
4	[T(-10) {6}]						[T(-20) {6}]						[T(-30) {6}]						[T(-40) {6}]						[Checksum {8}]							
Internal Temperature Difference																																																								
5	[T(-10) {6}]						[T(-20) {6}]						[T(-30) {6}]						[T(-40) {6}]						[Checksum {8}]							
6	[P(-20) {8}]								[P(-30) {8}]								[P(-40) {8}]								[Checksum {8}]							
7	[Mean Wind {8}]								[Vect Dir {8}]								[Cycle {8}]								[Checksum {8}]							
8	[Battery {8}]								[Zener {8}]								[Heater {8}]								[Checksum {8}]							

The above was the first data word for the AWS IIA units and has worked very well. It was designed prior to any experience with the Argos system and as a result the transmission had a large number of checksums so that it would be possible to recover the data if it was garbled during the transmission. Based on three years of experience the data is transmitted so well that at most only one check sum would be needed. This would make available seven 8 bit words for data. The internal temperature is needed to only 1 C in order to correct the pressure data for temperature to 0.1 mb and the internal temperature changes less than 1 C in 40 minutes so the past internal temperature does not need to be stored. This makes available three 8 bit words. In addition only the battery voltage is needed and the zener and heater make another two 8 bit words available for a total of twelve 8 bit words. These words could be used for four values of

relative humidity leaving eight unused 8 bit words. The mean wind speed and direction could be replaced by four past values each leaving two unused words. These could be used for measuring the vertical temperature gradient. Some packing could be done by using differences from the mean value as is done for pressure and temperature at the present time. The above changes would require reprogramming the read-only memories and might be limited by the memory in the unit. Another change that could be made is in the intervals between updates which is now 3 times the transmission interval, nominally 200 sec. This could be changed to 6 times which would result in virtually continuous coverage by the satellites as the interval between passes is of the order of one hour and the storage above would provide 80 minutes of past data at a nominal 20 minute interval. This is something that needs to be decided by all and would take place only by rotating AWS units between sites.

Field Report -- Adélie Land

Trip Report

Adélie Land, Antarctica

24 December 1982 - 7 February 1983

Michael L. Savage

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SUMMARY

Four automatic weather stations (AWS) have been deployed in Adelie Land, East Antarctica in support of a joint United States-French study of the katabatic wind phenomenon.

AWS sites had been established at D-10, D-47, and D-57 in previous seasons, but only the unit at D-57 was functioning, and its performance was erratic. We repaired these three stations and they are now functioning properly.

A new AWS site was established at D-80. It is also working properly.

Travel to the stations was via a 5 vehicle overland traverse party. A total of 880 km were traversed from 1 January - 26 January 1983. The traverse party consisted of 6 members of Expédition Polaires Françaises, Dr. Gerd Wendler and Yugi Kodama of the University of Alaska, and myself.

Travel between McMurdo Station and Dumont d'Urville Station was via U.S. C-130 aircraft.

D-10

AWS 8901

latitude: 66 deg 42 min South
longitude: 139 deg 48 min East
elevation: 240 meters
distance from coast: 10 kilometers
Argos hex id: 8B17A

- o Station had failed due to broken antenna cable. New cable installed.
 - o Past pressure values were 17.4 mb low due to malfunction of AWS 8900 1 MHz oscillator. Oscillator replaced.
 - o **AWS 8900 had been in place. Removed 0600 Z 26 Dec 82.** This AWS later installed at D-80.
 - o Voltage regulator serving batteries had failed (shunted current from solar panel away from batteries at 11.5 volts rather than 14.6 volts) and as a result batteries were low, but still servicable. New regulator installed.
 - o Past wind direction wiring ok.
 - o **AWS 8901 installed 0013 Z 1 Jan 83.**
 - o The aerovane that was purchased new this year was installed.
 - o Aerovane wiring convention:
 - pin 7: generator +
 - pin 6: generator -
 - pin 3: pot
 - pin 4: wiper
 - pin 5: pot
- Resistance between pins 4 and 5 increases for N-E-S-W rotation of the aerovane.
- o 5 foot tower section added.
 - o Batteries charged.
 - o Snow accumulation here is approx 1 meter per year due to drifting around the tower. Last season the tower and solar panel were dug out and repositioned.
 - o The navigator determined that the orientation of the aerovane was correct to within one degree.

o The electronics box was repositioned higher on the tower, more cable was spliced onto the power line, and additional guy wires were added.

o Calibrations were determined as follows:

** wind speed reads 8.7 percent high **

** wind direction reads correct **

** pressure reads 2.15 mb low **

** temperature reads correct **

Determination of wind speed calibration coefficients was accomplished by inputting known voltages and comparing output of Argos Test Set to values of wind speed specified by manufacturer of aerovane (.1056 volts / mile per hour). Voltages were input from 1 to 14 volts in increments of 1 volt. Linear curve fit was then made to these data. Correlation coefficient = 1.0000

$$\text{Wind Speed (m/s)} = .2503 * (\# \text{ bits}) + .1210$$

The previous wind speed calibration equation was:

$$\text{Wind Speed (m/s)} = .2721 * (\# \text{ bits})$$

Therefore the wind speed was overstated by 8.7 % minus a constant offset of .12 m/s.

D-47

AWS 8914

latitude: 67 deg 23 min South
longitude: 138 deg 43 min East
elevation: 1560 meters
distance from coast: 110 kilometers
Argos hex id: 8B4BF

- o The station had been installed 2 years earlier with AWS 8914 electronics, but had never been received by satellite.
- o Cause of problem traced to bad antenna. New antenna installed.
- o Carrier frequency found to be 1128 Hz high (satellite can only tolerate +/- 1200 Hz freq error). Adjusted freq to 401.650000 MHz
- o Station on the air at 09 Z 24 January
- o 5 foot tower section added. Electronics box repositioned and guy wires added. Solar panel dug out and repositioned.
- o Wind direction orientation ok.
- o Batteries and solar panel ok.
- o Voltage regulator shunting current away from batteries at 13.3 volts. Replaced IC and now regulates at 14.6 volts.
- o Removed old aerovane. Installed aerovane which had been in storage at Dumont d'Urville. Before installing aerovane I replaced generator brushes and examined slip rings and bearings.
- o Aerovane wiring convention:
 - pin 1: generator +
 - pin 2: generator -
 - pin 3: pot
 - pin 4: wiper
 - pin 5: pot

Resistance between pins 4 and 5 increases for N-E-S-W rotation of the aerovane.

o Calibrations determined as follows:

** wind speed reads 19.8 percent high **

** wind direction reads correct **

** pressure reads 1.13 mb low **

** temperature reads correct **

Wind speed calibration accomplished in same manner as with AWS 8901. Correlation co-efficient = 1.0000.

$$\text{Wind Speed (m/s)} = .2266 * (\# \text{ bits}) - .06$$

Therefore the previous equation overstated the wind speed by 19.8 percent.

D-57

AWS 8916

latitude: 68 deg 11 min South
longitude: 137 deg 32 min East
elevation: 2103 meters
distance from coast: 210 kilometers
Argos hex id: 88506

- o Station has been operating intermittently since being deployed two years ago.
- o Cause of intermittent operation traced to failed voltage regulator. Regulator did not shunt current away from batteries and consequently battery voltage was allowed to rise to more than 15 volts. This resulted in frequency error in oscillator which led to non-reception by satellite. Batteries were at 15.9 volts when we arrived.
- o Replaced IC in voltage regulator and confirmed voltage regulation at 14.6 volts.
- o Found transmitter frequency to be 1040 Hz high. Adjusted to 401.650000MHz
- o Added 5 foot tower extension. Dug out and repositioned solar panel. Snow accumulation here about .5 meters/year. Electronics box repositioned and guy wires added.
- o Removed old aerovane. Installed new aerovane 12-78-07-79 which had been in storage at Dumont d'Urville. Before installing aerovane I replaced generator brushes and examined slip rings and bearings.
- o Aerovane wiring convention:
 - pin 1: generator +
 - pin 2: generator -
 - pin 3: pot
 - pin 4: wiper
 - pin 5: pot

Resistance between pins 4 and 5 increases for N-E-S-W rotation of the aerovane.

o Calibrations determined as follows:

** wind speed reads 22.3 percent high **

** wind direction reads correct **

** pressure reads 0.40 mb low **

** temperature reads correct **

Wind speed calibration accomplished in same manner as with AWS 8901. Correlation co-efficient = 1.0000.

$$\text{Wind Speed (m/s)} = .2221 * (\# \text{ bits}) - .00$$

Therefore previous equation overstated the wind speed by 22.3 percent.

D-80

AWS 8900

latitude: 70 deg 01 min South
longitude: 134 deg 43 min East
elevation: 2500 meters (+/- 50 m)
distance from coast: 440 kilometers
Argos hex id: 8B129

- o A new station was installed using AWS 8900.
- o Station on the air with all sensors operating correctly at 1315Z 14 January.
- o Transmitter frequency adjusted.
- o Small 10 watt solar panel mounted directly on tower.
- o Aerovane used was one that had been in storage at Dumont d'Urville. Disassembled, inspected and new generator brushes installed.
- o Aerovane wiring convention:
 - pin 6: generator +
 - pin 7: generator -
 - pin 3: pot
 - pin 4: wiper
 - pin 5: pot

Resistance between pins 4 and 5 increases for N-E-S-W rotation of the aerovane.

- o Calibrations determined as follows:
 - ** wind speed reads 11.7 percent high **
 - ** wind direction reads correct **
 - ** pressure reads 0.61 mb low **
 - ** temperature reads correct **

Wind speed calibration accomplished in same manner as with AWS 8901. Correlation co-efficient = 1.0000.

$$\text{Wind Speed (m/s)} = .2430 * (\# \text{ bits}) - 0.111$$

Therefore previous equation overstated the wind speed by 11.7 percent.

TECHNICAL NOTES

1. Voltage Regulators:

The regulators at D-10 and D-57 had failed. In addition, I had two additional failures in the field of new regulators that I tried to install. Finally I figured out the problem: the integrated circuit in the regulator cannot tolerate a voltage greater than about 18 volts. The open circuit output of the large solar panels is 21 volts. If the regulator is presented with this voltage, it will fail. However, once loaded down with the low impedance of the batteries the voltage of the solar panel falls to about 16 volts. Therefore it is imperative that the batteries be connected to the solar panel before the voltage regulator is connected to the solar panel. Failure to have done this is the reason that the station at D-57 has transmitted erratically for the last two years.

A new regulator should be developed that can tolerate the voltage of the open circuit solar panel.

2. Frequency errors:

The correct carrier frequency for all the AWS transmitters is 401.650000 MHz. The transmitter contains an 8X frequency multiplier, and is driven by a high stability oscillator. The frequency of this oscillator should be 50.206250 MHz. A previous document erroneously specified the oscillator frequency as 50.206375 MHz which gives a carrier frequency of 401.651000, or 1000 Hz too high. The satellite can only tolerate a frequency error of 1200 Hz. I found the three AWS units in the field to all be about 1000 Hz too high, and reset them to the correct frequency.

3. Antenna cables:

The antenna cable at D-10 had separated at the junction of the fitting and the cable. This cable did not have the right angle fitting as did the other stations, and as a result the cable was forced to make a sharp right angle bend. It is necessary that spare antenna cables with TNC connectors (screw fittings) at both ends and a right angle fitting at one end be brought along on future trips.

4. Towers:

All the towers have been installed using wire ropes for guy wires, turnbuckles, and cable clamps. Also, the anchors ("deadmen") have been frozen into the snow surface by pouring liquid water into the anchor holes and

allowing the anchors to freeze in before loading the tower. This technique has made for extremely stable towers and should be used on all future deployments.

Acknowledgements

The success of the AWS program in Adélie Land this season was due in large part to the outstanding support provided by Expéditions Polaires Françaises. Members of the traverse party were Pierre Laffont, Jacqui Wiget, Didier Simon, Claude Busicchia, Bernard Piccot, and Michel Fourchet. It was a privilege to work with such a professional and outstanding group of men. Our thanks also to Jean Vaugelade and Robert Guillard for their many efforts in making this joint program possible, and for the hospitality shown to us in Antarctica.

Funding for the AWS program is provided by the National Science Foundation, Division of Polar Programs. The AWS units were designed and constructed by members of the Radioscience Laboratory, Stanford University under the direction of Allen M. Peterson. Frank Drobona, Kok Chen, Brian Kline, Cal Teague, and Bill Crosby of Stanford have all participated. Rob Flint and Joseph Bossiere deployed some of the stations on earlier traverses in Adélie Land.

Thanks also to the many people in the U.S. Antarctic Research Program from pilots to cooks who helped out in getting us from McMurdo to Dumont d'Urville and back again.

Addendum

As of the time of this writing, 4 March 83, the AWS established at D-10, D-47, D-57, and D-80 are all functioning properly and the data is being received by satellite. Unfortunately, the AWS at Dome C which forms the terminus of the station array failed at the end of January 1983 for unknown reasons after operating successfully for 3 years. It was not possible to fly to Dome C for repairs due to the lateness of the season.





Antarctic automatic weather stations, austral summer 1982-1983

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Automatic weather stations (AWS) measuring wind speed and direction, air temperature and pressure are deployed on the antarctic continent as shown in figures 1 and 2. The locations and period of record are given in table 1. The computer-based AWS units telemeter the data to polar-orbiting satellites equipped with the Argos data collection system (Savage, Stearns, and Teague 1981; Stearns 1982; Stearns and Savage 1981).

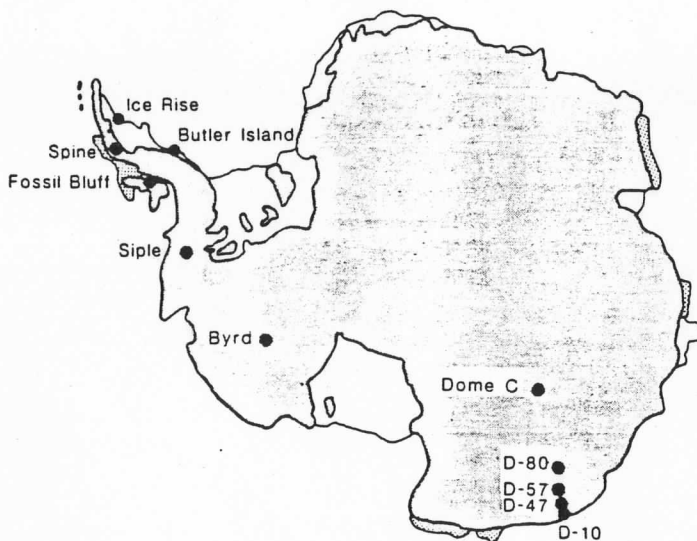


Figure 1. Antarctic continent showing the sites for the AWS units as of January 1983 (except for those in the McMurdo Station vicinity). The actual locations and periods of record are given in table 1. D-10 is about 10 kilometers south of Dumont d'Urville. ("GMT" denotes Greenwich mean time.)

The purpose of the AWS units in the vicinity of the Antarctic Peninsula is to study the flow of stable air from the east which is blocked by the barrier formed by the Antarctic Peninsula. The resulting thermal wind vector turns the air flow toward the north. The northward flow occasionally carries ice from the Weddell Sea into the south Atlantic which reduces sea surface temperatures by more than 3°C at 50°S 45°E (van Loon 1972).

One AWS unit was deployed to the ice rise site on the Larsen Ice Shelf in austral summer 1982-1983 by the British Antarctic Survey in support of research on the barrier wind flow along the Antarctic Peninsula.

An overland traverse was made by Expeditions Polaires Françaises from Dumont d'Urville to D-80 in support of a katabatic

wind study by G. Wendler of the University of Alaska. Michael Savage went on the traverse to install and calibrate the AWS units.

The AWS sites in the McMurdo area are shown in figure 2. The AWS unit previously at Mount Oliver, Asgard Mountains in support of E. I. Friedmann's biology project was removed, converted from 6-volt direct-current to 12-volt direct-current power, and installed just east of White Island on the Ross Ice Shelf at Nancy Site. Other AWS units in figure 2 were serviced, and Jimmy Site was moved from Starr Glacier near McMurdo Station to Bucky Wilson's site at Windless Bight. The remaining sites were visited for servicing. Assistance during January 1983 was provided by Hugh Slotten.

The AWS units around McMurdo Station are used for meteorological support of the air operations and as a mesoscale network to determine wind velocity divergence and thus the vertical motion at a height of 3 meters.

Sites on the Ross Ice Shelf such as Meeley and Ferrell are difficult to locate. Beacon transmitters operating on the helicopter automatic direction finder (ADF) frequencies and powered by solar panels were installed at Laurie, Nancy, Ferrell, and Meeley sites. The beacons could be detected at a distance of 10 nautical miles by the helicopters. It is hoped that the beacon transmitters will reduce the helicopter flying time previously required to search for the AWS sites.

Snow accumulation data for the sites as determined from photographs of the AWS tower are: Laurie, December 1982 to January 1983, 38 centimeters; Manning, November 1980 to December 1981, 64 centimeters, and December 1981 to January 1983, 37 centimeters; Ferrell, December 1981 to January 1983, 110 centimeters. The 2-year accumulation for Manning and Ferrell of 101 centimeters and 110 centimeters respectively are in good agreement as are the 1-year accumulations for Laurie and Manning of 38 centimeters and 37 centimeters, respectively.

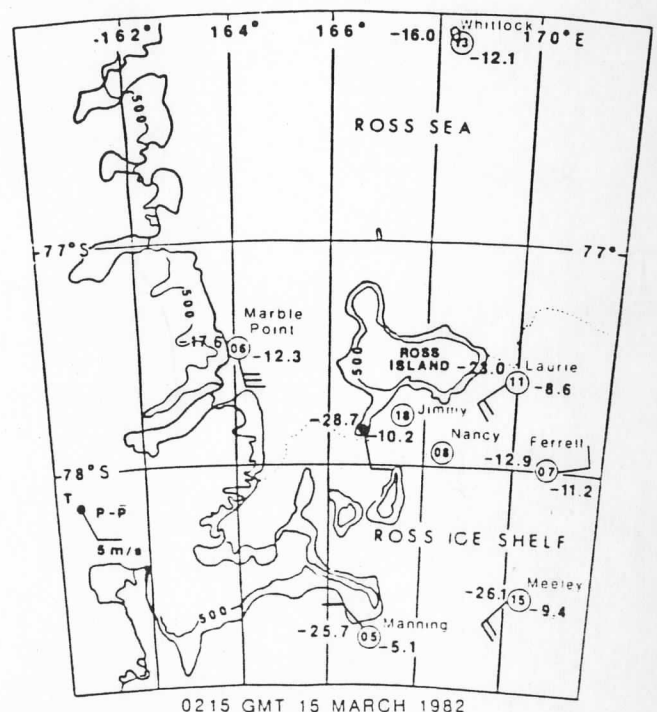


Figure 2. AWS sites in the McMurdo Station area as of January 1983. The mean pressure used in the station data is for March 1982.

Antarctic automatic weather station (AWS) as of austral summer 1982–1983

Site	AWS identification number	Location	Elevation (in meters)	Start ^a	Stop ^a
McMurdo area^b					
Manning	8905	78.76 S 166.85 E	74	25/11/80	
Marble Point	8906	77.44 S 163.74 E	121	5/2/80	
Ferrell	8907	78.03 S 170.79 E	44	10/12/80	
Nancy	8908	77.90 S 168.07 E	25	17/1/83	
Laurie	8910	77.56 S 170.09 E	25	15/12/81	18/4/82
Jimmy	8911	77.80 S 166.71 E	202	23/1/83	23/3/83
	8911			7/12/81	20/7/82
Whitlock	8918	77.75 S 167.67 E	39	24/10/82	5/1/82
	8913	76.14 S 168.40 E	275	9/2/83	21/3/83
Meeley	8915	78.50 S 170.14 E	49	23/1/82	
Asgard	8908	77.60 S 161.15 E	1,580	4/12/80	
Other AWS sites					
Byrd	8903	80.00 S 120.00 W	1,530	1/2/80	
Dome C	8904	74.50 S 123.00 E	3,280	4/2/80	31/1/83
Siple	8909	75.90 S 84.30 W	900	1/1/82	
Antarctic Peninsula area					
Ice Rise	8912	66.90 S 60.60 W	50	7/2/83	
Spine	8919	67.60 S 66.00 W	1,540	9/3/80	20/3/83
Fossil B		71.33 S 68.37 W		Planned	
Butler I		70.02 S 60.35 W		Planned	
Dumont d'Urville area					
D-80	8900	70.02 S 134.70 E	2,500	14/1/83	
D-10	8901	66.67 S 139.80 E	240	1/1/83	
D-47	8914	67.40 S 138.70 E	1,560	24/1/83	
D-57	8916	68.20 S 137.52 E	2,103	16/1/82	
Proposed deployment austral summer 1983–1984					
Byrd Glacier		80.2 S 163 E			
Terra Nova Bay		75.2 S 163 E			
Ross Ice Shelf		78.4 S 175 W			

^a Day/month/year.

^b McMurdo area locations were revised from survey and satellite, 28 June 1983. Height was determined by barometry-error \pm 5 meters, 28 June 1983.

Wind speed and direction, air temperature and pressure for 15 March 1982 are shown in figure 2. The convergence of the wind direction and the contrasting air temperatures across the convergence zone were associated with warmer air which apparently moved into the area from the relatively open ocean northeast of Ross Island. Similar abrupt temperature decreases of 10°C to 15°C were experienced by the earlier explorers who reported a need to don more clothing (Simpson 1919). The AWS data were sufficient to show that the temperature changes occurred within a 10-minute period.

This work is supported by National Science Foundation grant DPP 79-25040. Members of the Radio Science Laboratory under the direction of Alan Peterson (Stanford University) designed, developed, and initially deployed the AWS units. Chris Bales of the British Antarctic Survey is deploying the AWS units around the Antarctic Peninsula. Expeditions Polaires Francaises conducted the traverse from Dumont d'Urville to D-80 under the leadership of Pierre Laffont. The VXE-6 helicopter pilots and

crew were determined to find the AWS units, which are difficult to locate, on the Ross Ice Shelf and their efforts were successful.

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VII. Fleming Article

Antarctic automatic weather stations as forecasting aids

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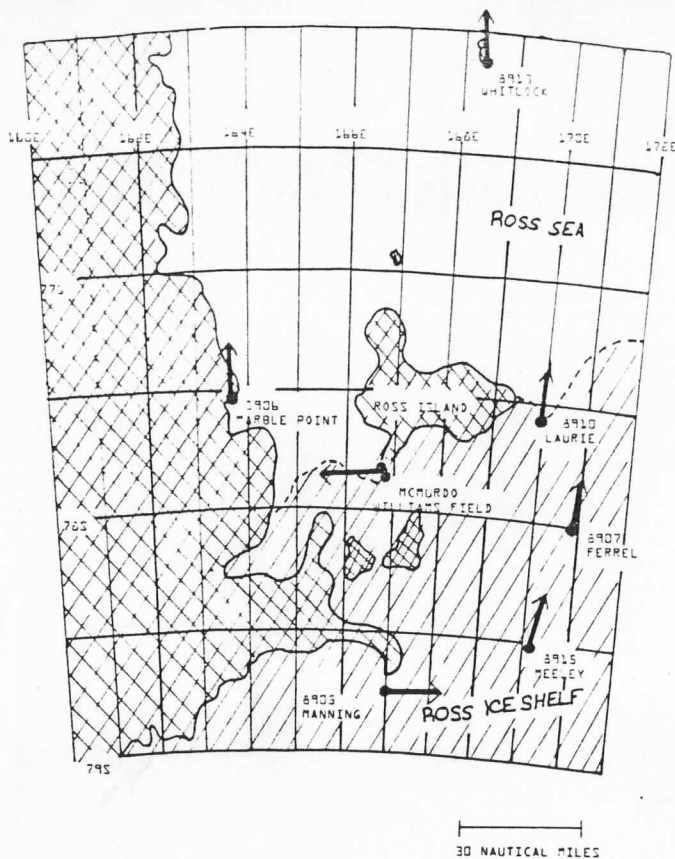
Meteorological support of flight operations is probably more crucial within Antarctica than in any other region of the world. The flight path from Christchurch, New Zealand, to McMurdo Station, Antarctica, (the most direct route and the only route used by the United States Antarctic Research Program) is unique because there are no alternate landing sights available for an aircraft once the point of safe return to New Zealand has been passed. Therefore, the 24-hour forecast issued for the ice runway or Williams Field complex (the Antarctic landing sight) by the Naval Support Force Antarctica Forecast Duty Officer is the determining factor in a "go" or "no-go" situation for the pilot. For the U.S. ski-equipped LC-130 aircraft a "whiteout" (total loss of surface and horizon definition due to either falling snow, blowing snow, or fog) at the skiway is not as serious as it is for the wheeled aircraft of the U.S. Air Force or New Zealand Air Force. The LC-130 aircraft have the capability of landing on the open ungroomed ice shelf, while the U.S. and New Zealand Air Force are restricted to the prepared ice runway.

The lack of surface and upper-air weather data in the Antarctic is well-known in the scientific community. The closest

regularly reporting weather stations around McMurdo are South Pole (1,171.6 kilometers), Leningradskaya (857.8 kilometers) and Vostok (1,110.4 kilometers). This data "grid" is so inadequate that it is not even sufficient for a decent large-scale analysis much less the small-scale analysis necessary for local forecasting in the Ross Island region. The antarctic automatic weather stations have filled a portion of the data void in this region well, at least in the meso-scale around Ross Island.

The benefit of the stations with respect to forecasting wind speed and direction is obvious. Because all strong wind events for the Ross Island region come, often abruptly, from the south, a close look at the stations to the south and southeast can often give a 3- to 6-hour or more "heads-up" of approaching strong winds.

The most difficult weather event to forecast, however, for Williams Field and the ice runway and one that can often lead to below minimum runway conditions for the aircraft, especially during the latter part of the austral summer operating season, is fog. Unfortunately, satellite imagery is of minimal assistance because the fog, without precipitation, is primarily caused by radiational cooling and moisture advection (moisture not in the visible condensed state). A close look at the dense fog occurrences during the period from 1 November 1982 to 31 January 1983 revealed a strong correlation between a wind from the southeast quadrant (090 to 170T) at Ferrel Station (8907) and dense fog at Williams Field. The mean flow pattern for the region around Ross Island can be inferred from the figure. This flow pattern is relatively stable and results in a no-fog situation. Any deviation from this flow signals a change in the dynamic state of the atmosphere, especially in the low-level. The period from 1 November 1982 to 31 January 1983 seems to indicate that



Location of automatic weather stations around Ross Island and their mean wind direction. (From Antarctic Automatic Weather Station Data Archiving Center at the Department of Meteorology, University of Wisconsin, Madison, Wisconsin.)

moisture advection into the Williams Field region occurs when the surface flow backs into the southeast quadrant in the region of station 8907.

- On 17 December 1982 the wind at station 8907 backed to southeast at 0600 Greenwich mean time (GMT) (Z) and persisted until 18Z when the wind returned to the normal southerly direction. Dense fog developed at Williams Field at 14Z (8 hours after the southeast windshift at 8907) and persisted until 21Z.
- On 21 December 1982 the wind at station 8907 backed to southeast at 15Z and persisted until 00Z. Dense fog developed at Williams Field at 1730Z (2½ hours after the southeast windshift at 8907) and persisted until 2015Z. Patchy fog persisted until 00Z.
- On 29 December 1982 the wind at station 8907 backed to east-southeast at 15Z and persisted until 03Z the next day. Dense fog developed at Williams Field at 2010Z (5 hours after southeast windshift at 8907) and persisted until 2245Z, but patchy fog persisted until 05Z the next day.
- On 2 January 1983 the wind at station 8907 backed to southeast at 03Z and persisted until 1530Z. Dense fog developed at Williams Field at 19Z and persisted until 2030Z. Distant fog persisted until 06Z the next day.

- On 22 January there was southeast wind at 8907 from 00Z to 06Z. Dense fog at Williams Field for brief period around 0515Z. Patchy and distant fog persisted from 03 to 07Z. (Fog might have been dense for longer period had it not occurred during the warmest part of the day.)
- On 27 and 29 January dense fog occurred at Williams Field with a southeast wind at 8907.
- On 30 November 1982 the wind at station 8907 shifted to southeast at 09Z and persisted until 03Z the next day. No fog developed at Williams Field. Two possible explanations for this may be (1) the strength of the wind during this period was slightly less than the previous cases and (2) there also may not have been sufficient moisture available to the east during this period. (Moisture sensors for the automatic weather stations are planned for installation during the next two Deep Freeze seasons.)
- On 19 December 1982 dense fog developed at the Williams Field complex while the wind at station 8907 did not shift to the southeast quadrant. Fog during this period developed with marked *warming* at Williams Field whereas in the previous positive cases fog occurred with marked radiation cooling. Although data from Laurie Station (8910) was not available for this period, Whitlock Station (8913) reported north to northeast winds prior to and during this fog period. Apparently moisture was advected from the warm and moist open water to the north. (Laurie Station, just east of Cape Crozier, was returned to normal operation in January of 1983 and will undoubtedly provide useful data for observing moisture advection from the north for the next operating season.)
- On 13 January there was a southeast wind at 8907 between 03 and 06Z. No fog developed at Williams Field, probably because the wind came at the warmest period of day. (It appears that southeast wind must occur and persist into the early "evening" hours in order for fog to develop.)
- On 20 January there was a southeast wind at 8907 between 15Z and 03Z the next day. No fog developed at Williams Field, probably because wind speed was less than 4 knots throughout period.

What supports the strong correlation between the southeast winds at 8907 and fog development at Williams Field even more is that in no other period, other than the ones previously mentioned, did fog without precipitation occur. There also appears to be a good correlation between the onset of snow during the other times when the wind at 8907 backed southeast. There were *no* incidences where the wind at 8907 was southeast (greater than 4 knots) without either fog or snow sometime during or after the southeast wind shift at 8907.

Therefore, with the exception of a few brief and anomalous periods between 1 November 1982 and 31 January 1983 there appears to be an apparent strong correlation between a wind within the southeast quadrant at station 8907 and the development of fog at Williams Field. Fog often occurs 3 to 8 hours (or more) after the wind shift. The expertise of the duty meteorologist combined with a correlation factor such as this will lead to better forecasting skill with respect to fog and even precipitation during future Deep Freeze deployment seasons.

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