Meereisbojen und automatische Wetterstationen 1998 und 1999 Datendokumentation

Sea ice buoys and automatic weather stations 1998 and 1999 data documentation

operated by the

Alfred-Wegener-Institute
for Polar- and Marine Research

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Introduction

The Alfred Wegener Institute for Polar and Marine Research (AWI) operates drifting buoys on sea ice and automatic weather stations (AWS) on continental surfaces since a number of years in the Arctic and Antarctic. This report presents the data form the years 1998 and 1998. The buoys were deployed from onboard the German research vessel "Polarstern" and the US-American icebreaker "Nathaniel B. Palmer", as well as by an US-American aircraft.
The observational programs to the "WCRP-International Program for Antarctic Buoys (IPAB)" and to the "International Arctic Buoy Program (IABP)". Common objectives of the measurements are investigations of the interaction between the ocean, the sea ice and the atmosphere.
The measured data are transmitted to the Global Telecommunication System (GTS) of the World Meteorological Organisation (WMO) by CLS Argos on a regular basis and thus are available for atmospheric analyses and forecasts of the Numerical Forecast Centers (NMC). An overview of the periods of operation, the launching and final positions, and of the sensors used with the buoys and the automatic weather stations in given in Table 1.

Buoy and AWS description

The buoys and AWS were produced by different manufacturers in basically three configurations:

- meteorological buoys with sensors for air pressure and temperature, partly also for wind vector and air humidity,

- AWS with sensors for air pressure, air temperature, wind vector, air humidity and snow height.

.The sensor specifications and measurement ranges can be obtained from the data sheets.
The buoys are identified by their Argos numbers. Instruments were calibrated by the manufacturers. Additionally, the data from different instruments were compared with each other and with the ship's weather station during test runs before deployment.

Data Analysis

The automatic stations and buoys are positioned and the data are transmitted by means of the Argos system, which makes use of two polar-orbiting NOAA-satellites. The satellites need 102 minutes for one orbit, providing 20 - 28 satellite contacts for polar stations. Every 90 or 200 seconds buoys transmit data, consisting of up to thirty-two 8-bit words for measurements and the identification.
The data received by the satellites are transmitted via ground receiving stations to CLS Argos in Toulouse, France. CLS Argos converts the data to physical units and calculates positions from the Doppler shift of transmitter frequencies. Since 1994 new buoys carry Global Positioning System (GPS) receivers, whose data are part of the data transmission. GPS-positions are more accurate and more frequent than Argos-positions. Monthly collections of transmitted data and derived positions are mailed on magnetic tapes to the Alfred Wegener Institute by CLS Argos.

The data are processed at the AWI in several steps. Data are read from the tapes and assigned to the different instruments. Only the data set with the largest number of identical transmissions within a satellite pass is saved. Data files are written using a standard format with empty places for additional measurements and derived quantities. A replacement value (888.88) is assigned to missing data. All data are checked with respect to the permitted sensor ranges and outliers are found by objective methods and graphical editing. Erroneous data are flagged by replacement values.
Using linear interpolation, regularly spaced time series are generated, which have a time resolution of 3 hours. Long gaps are not filled by linear interpolation.

Data presentation

Data from buoys and automatic weather stations are presented separately for the Arctic and Antarctic and for different years. The report comprises trajectories and timeseries. The figures and the monthly statistics of meteorological data are based on the interpolated data with three-hourly resolution.

The ice drift is reflected by trajectories, based on daily positions (first position each day).

The time series comprise air pressure and temperature, humidity, wind speed and direction. Only one air temperature is shown from weather stations and buoys which carrying two air temperature sensors, because the temperature differences usually were very small.

Gaps in the figures are due to sensor failures like freezing of wind sensors and out-of-range data.

Monthly statistics give mean positions, mean meteorological data and mean ice drift in the first line. The second line provides rms-deviations of the same quantities. Winds and ice drift are vector-averaged (u=-west,+east; v=-south, +north). Scalar averages of ice drift speeds and wind speeds are denoted by spd-drift and spd-wind.

Arctic

Buoys:

Argos ID	Depolyment Date	Position		Stop Date	Position		Sensors
9358	19.08.96	82.501N	134.606E	11.08.98	76.650N	11.895W	P,Ta,GPS
8058	21.08.96	81.880N	131.840E	26.04.98	83.716N	3.896E	P,Ta,GPS
8057	22.08.96	81.936N	131.749E	27.04.98	83.306N	3.199E	P,Ta,GPS
9357	22.08.96	81.173N	128.961E	09.10.98	81.314N	18.182E	P,Ta,GPS
9365	23.08.96	81.071N	138.476E	07.08.98	81.470N	6.477E	P,Ta,GPS
9372	05.03.98	82.058N	12.042E	01.09.98	65.862N	32.033W	P,Ta,GPS
9361	27.05.98	84.070N	102.767W	25.09.98	84.487N	88.575W	P,Ta,GPS
14954	24.07.98	80.127N	142.126E	21.12.98	80.696N	147.275E	P,Ta,GPS
14955	23.07.98	80.813N	149.081E	21.12.99	86.011N	165.582W	P,Ta,GPS
3311	16.08.99	79.992N	149.618E				P,Ta,GPS
8065	16.08.99	74.951N	170.352E				P,Ta,GPS

Antarctic

Buoys:

Argos ID	Depolyment Date	Position		Stop Date	Position		Sensors
8061	24.01.97	73.961S	33.326W	26.12.99	53.650S	115.105W	P,Ta,GPS
8064	24.01.97	75.059S	33.479W	07.04.98	59.408S	27.119W	P,Ta,GPS
8068	24.01.97	74.653S	30.908W	03.12.99	54.086S	109.100W	P,Ta,GPS
8060	26.01.97	74.381S	40.247W	08.02.98	60.368S	38.875W	P,Ta,GPS
8059	27.01.97	73.711S	37.733W	17.06.99	58.436S	158.003E	P,Ta,GPS
8065	19.01.98	56.755S	4.781E	21.09.98	58.466S	49.403E	P,Ta,GPS
9356	05.05.98	69.722S	4.848W	10.06.98	71.075S	20.351W	P
8066	16.01.99	60.000S	0.000W	29.06.99	62.945S	47.786E	P,Ta,GPS
9360	30.01.99	74.750S	49.000W	26.06.99	70.115S	55.345W	P,Ta,GPS
9362	30.01.99	75.742S	48.993W		64.479S	40.196W	P,Ta,GPS
8056	02.02.99	74.712S	61.098W	05.06.99	74.708S	61.139W	P,Ta,GPS
9358	08.02.99	75.263S	51.755W	16.03.99	74.541S	55.369W	P,Ta,GPS
9363	20.06.99	68.857S	77.142W	15.11.99	69.634S	75.807W	P,Ta,GPS
9365	20.06.99	69.198S	78.253W	28.07.99	69.499S	79.075W	P,Ta,GPS
9357	24.06.99	68.687S	78.637W	08.07.99	69.259S	78.991W	P,Ta,GPS

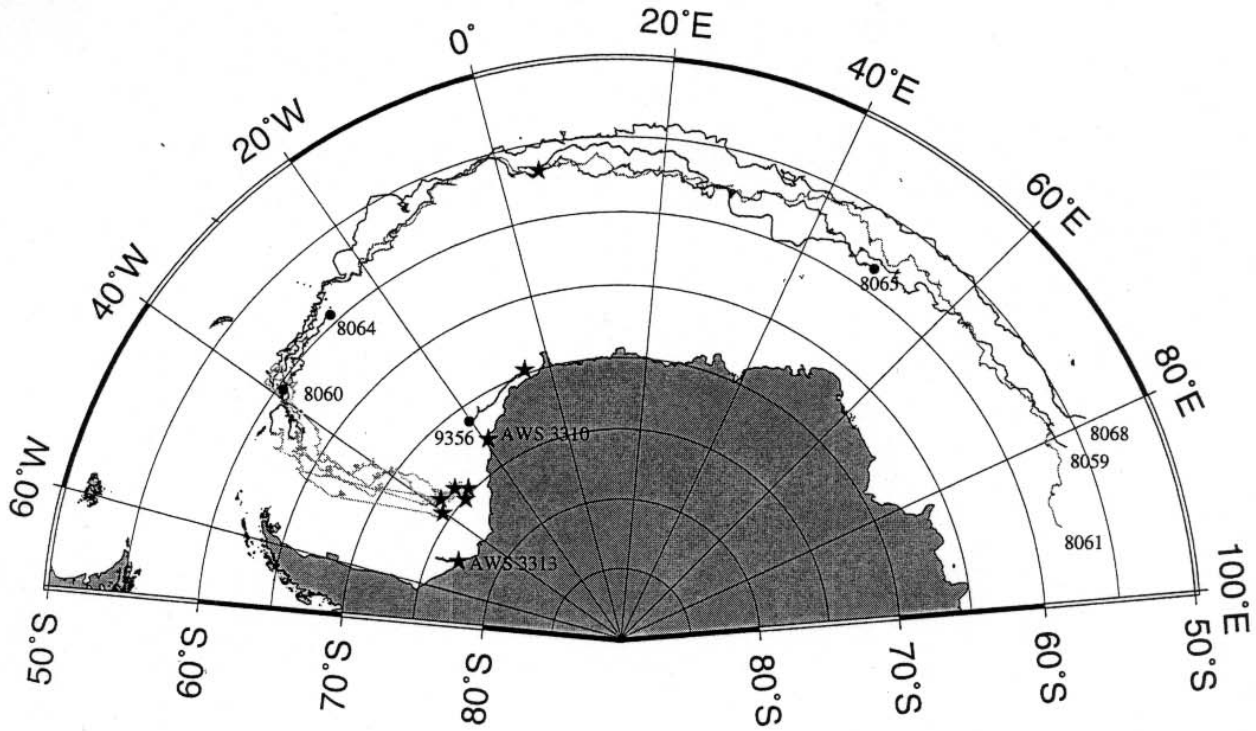
Automatic Weather Stations:

Argos ID	Position Lat.	Lon.	Start Date	Stop Date	Heigth a. msl	Sensors
3310	72.870S	19.048W	18.01.95	24.01.99	34m	P,2Ta,W,H
3313	77.071S	50.109W	11.02.97	30.01.99	40m	P,2Ta,W,H
3317	72.864S	19.065W	24.01.99		35m	P,2Ta,W,H

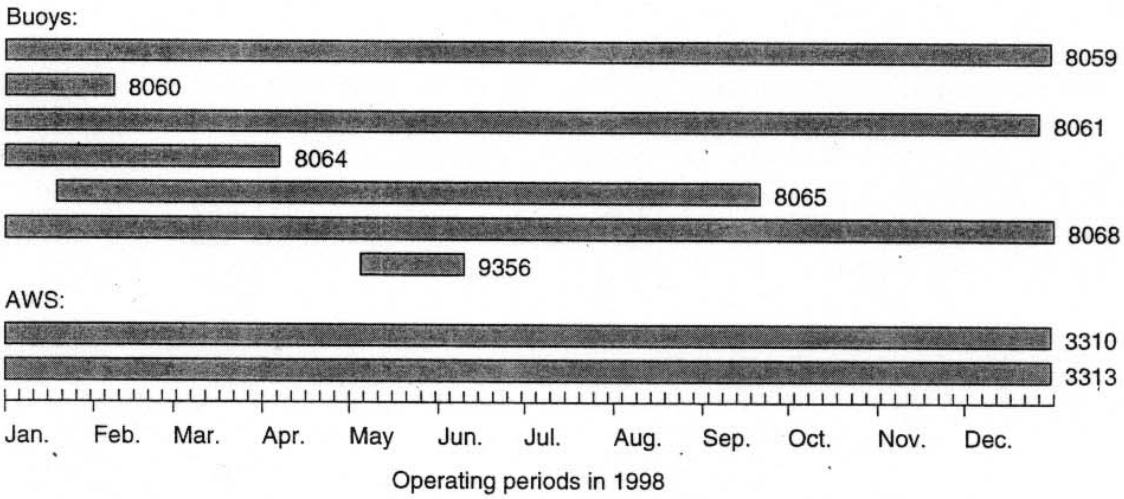
P = air temperature
Ta = air temperature
W = windspeed and winddirection
H = relative humidity
GPS = GPS-Receiver

List of the buoys and automatic weather stations operated in 1998 and 1999

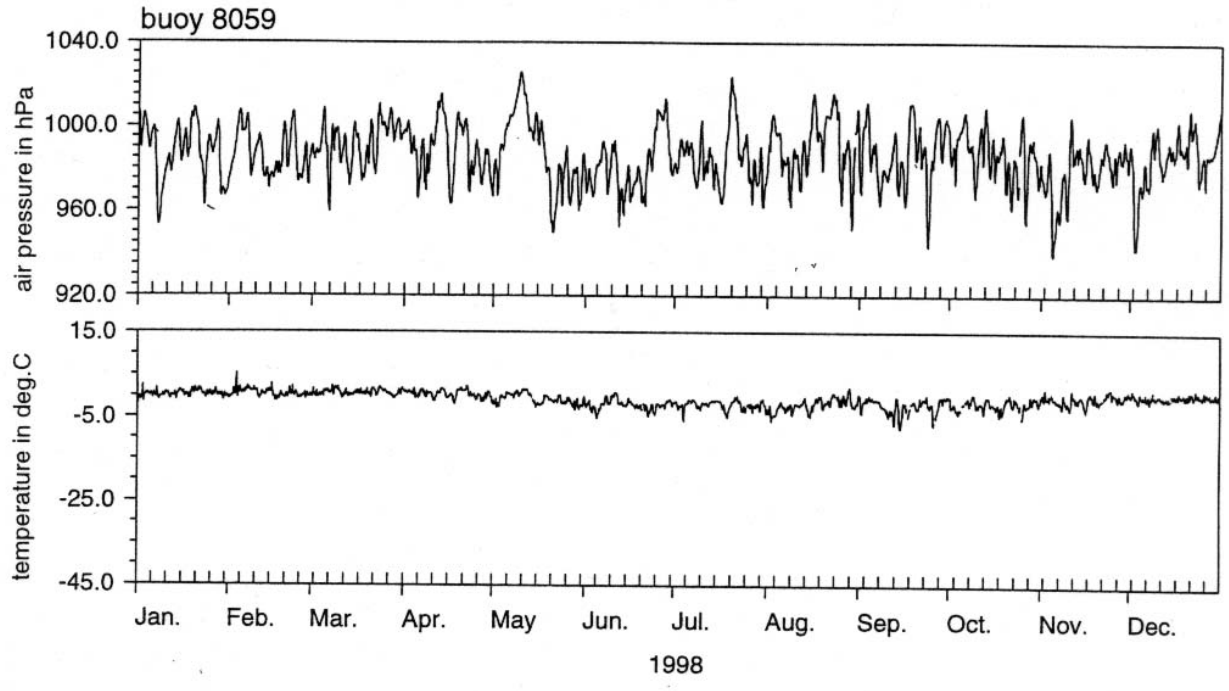
Antarctic Data

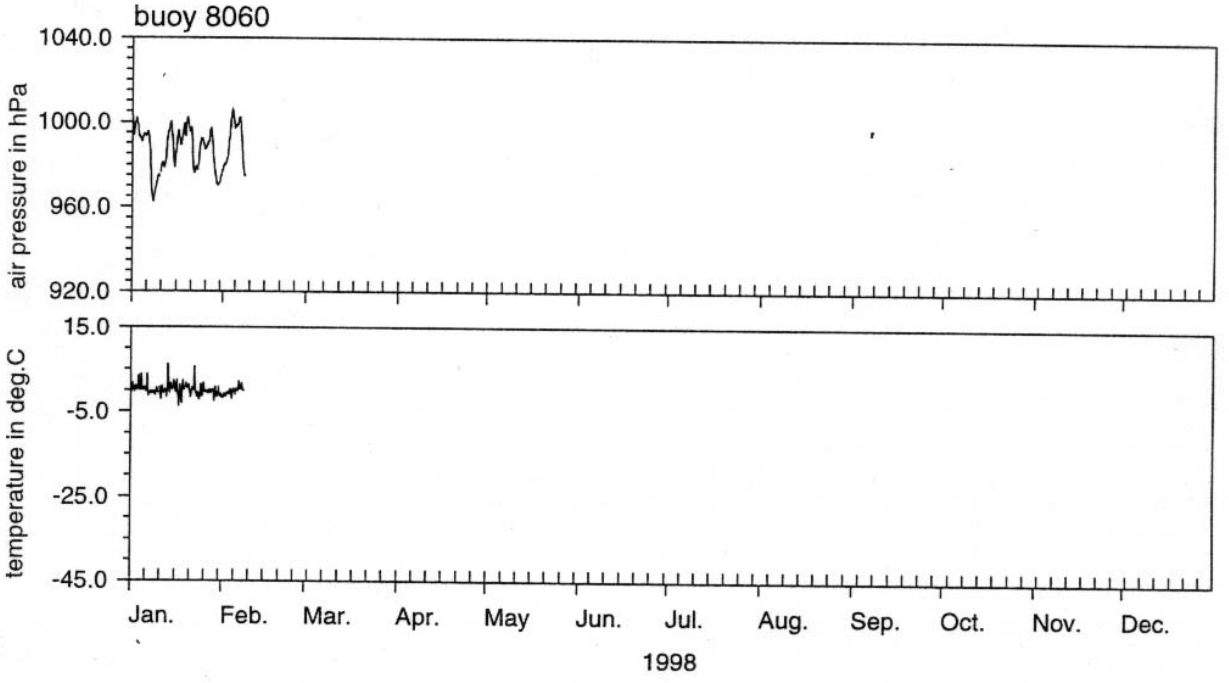


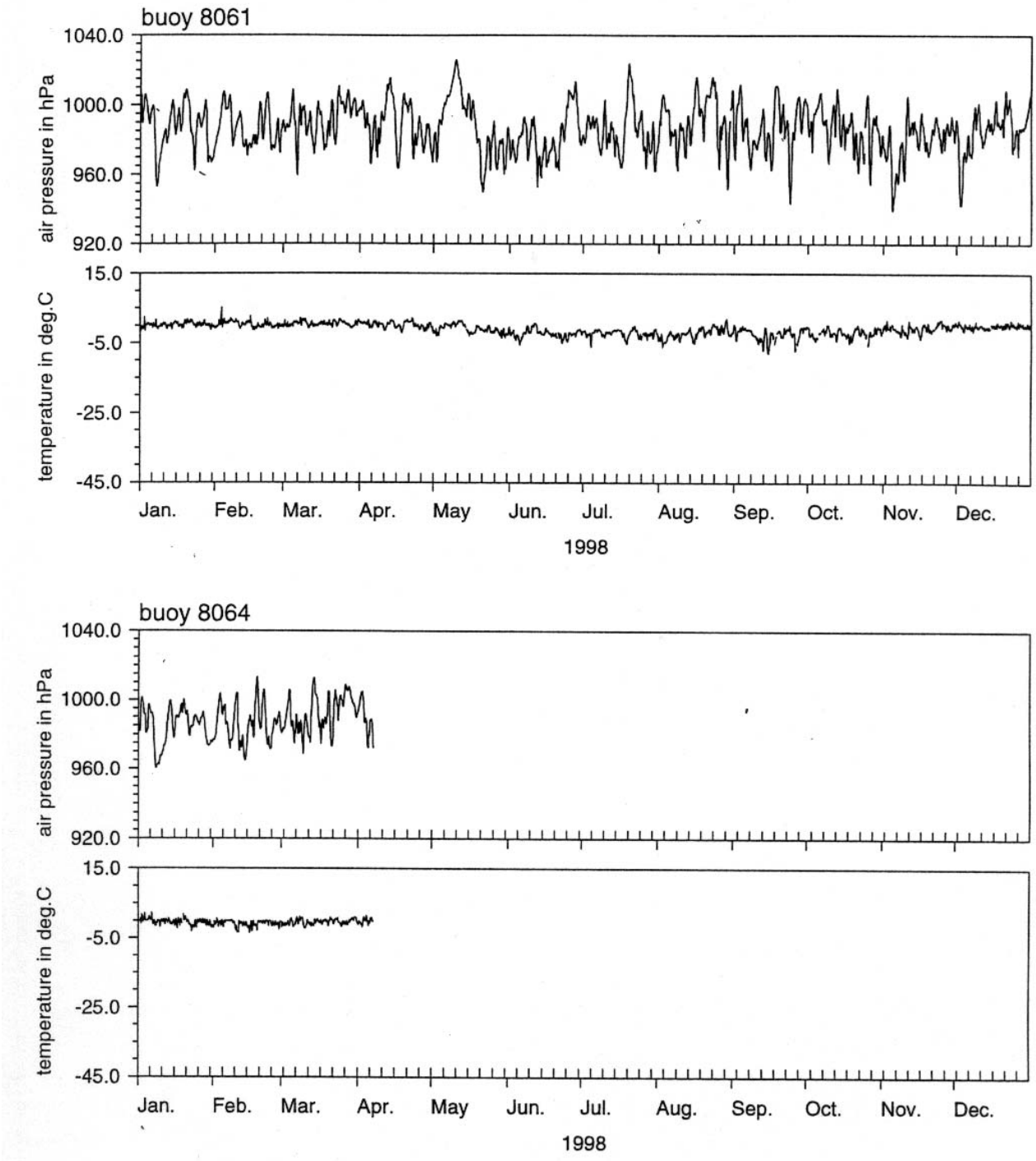
Drift trajectories of the buoys and the positions of the AWS in 1998.
Also shown are the drift trajectories of the year 1997 as grey lines.
The depoyment positions are marked with stars and the last positions
before failure are marked with a dot.

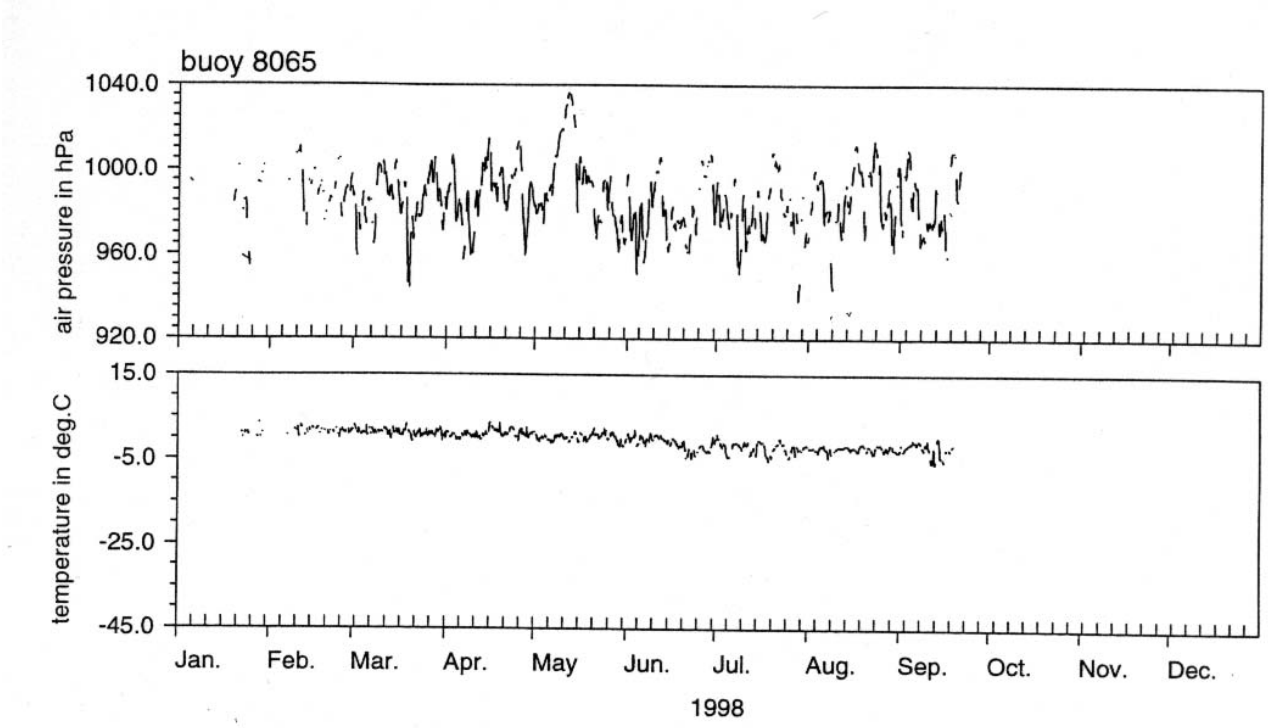


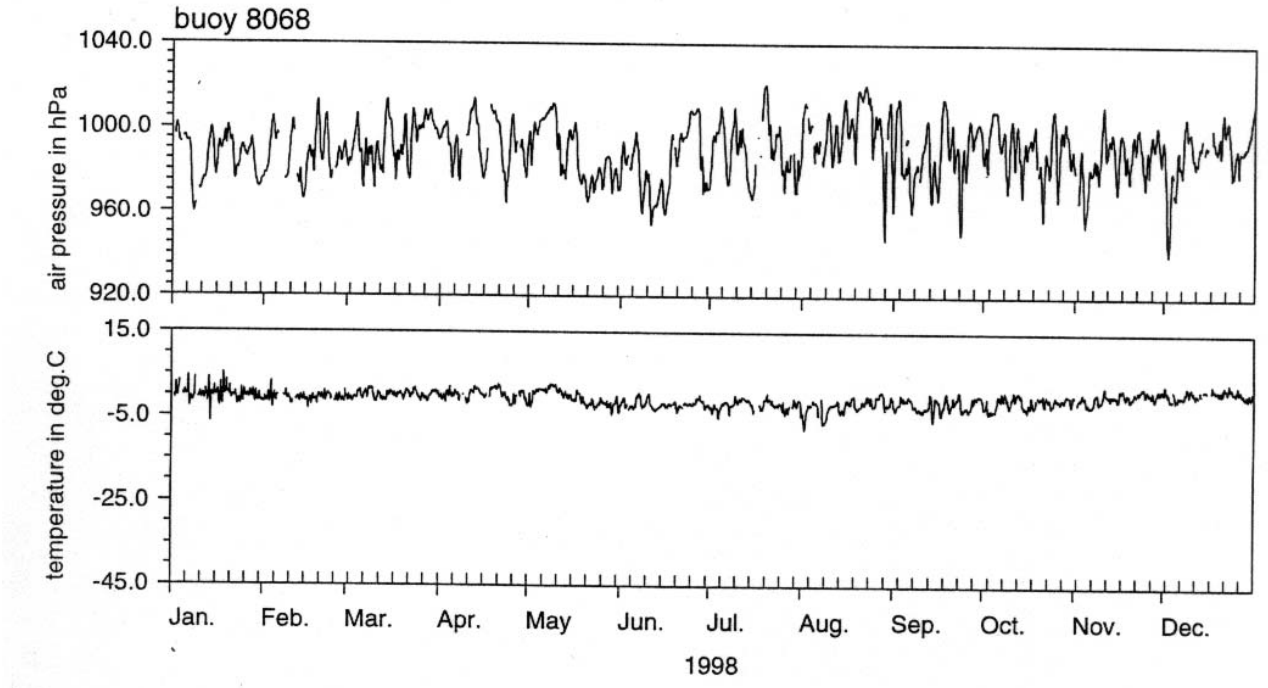
Operating periods in 1998

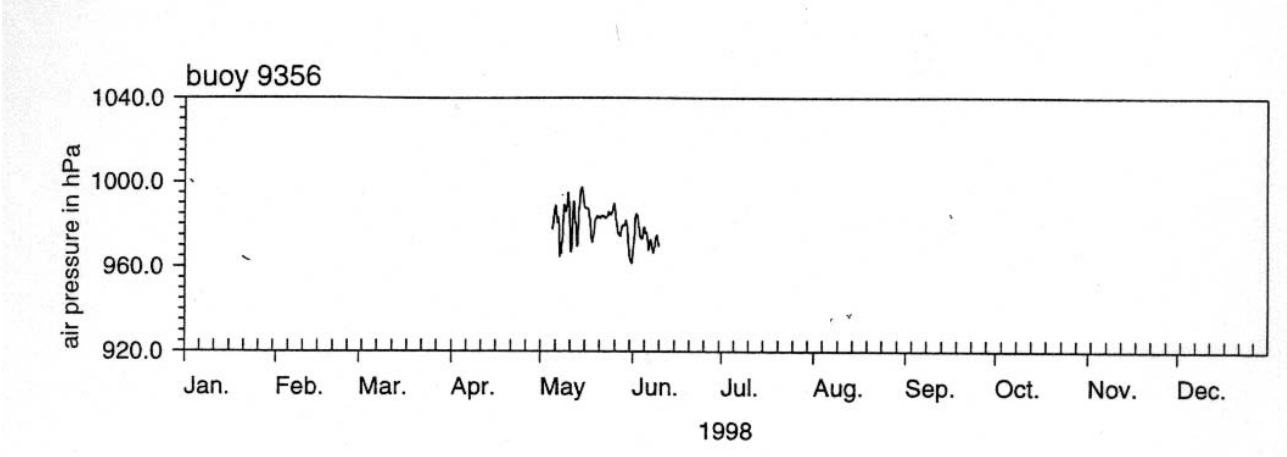

buoy 8059
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1998

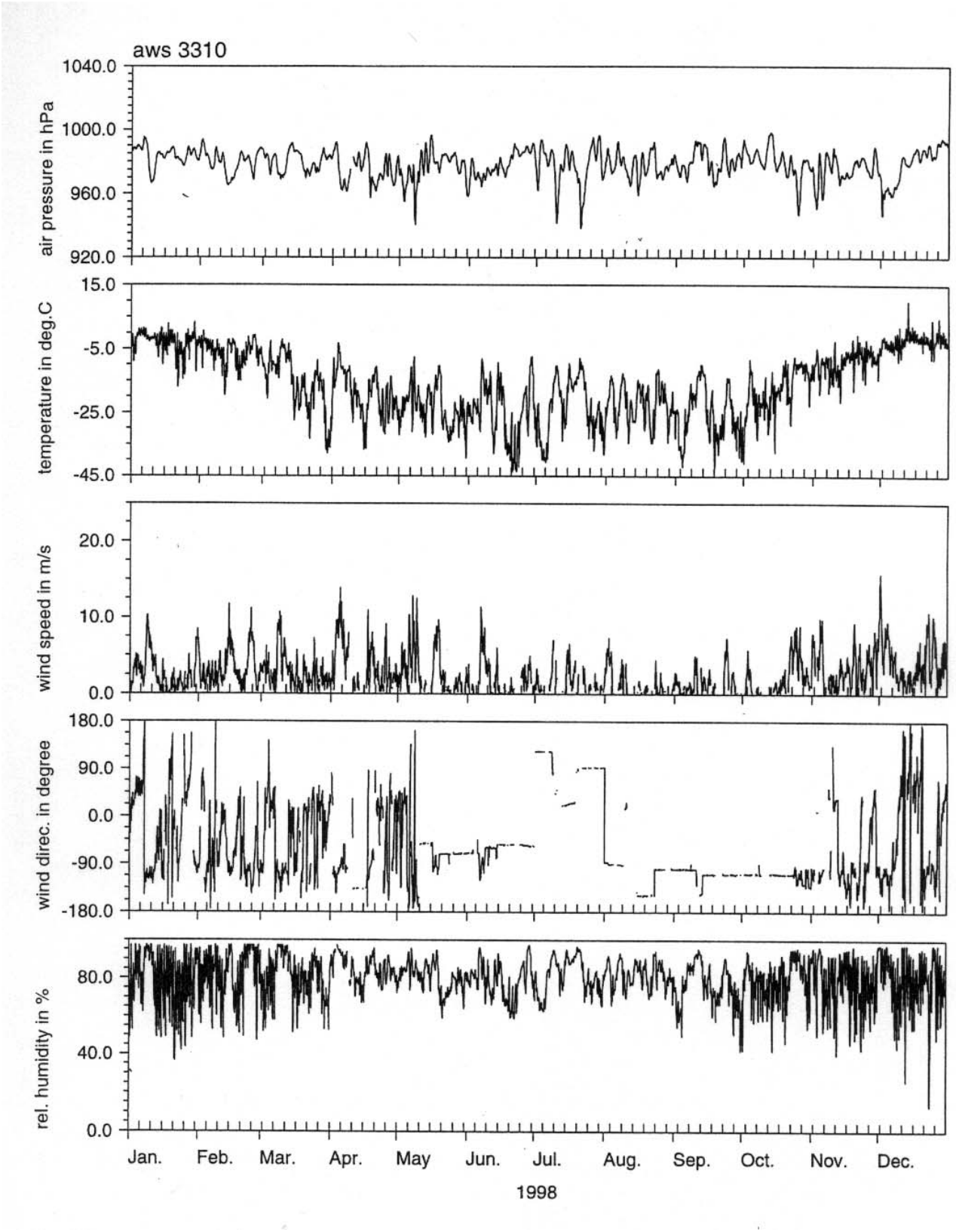

buoy 8060
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1998

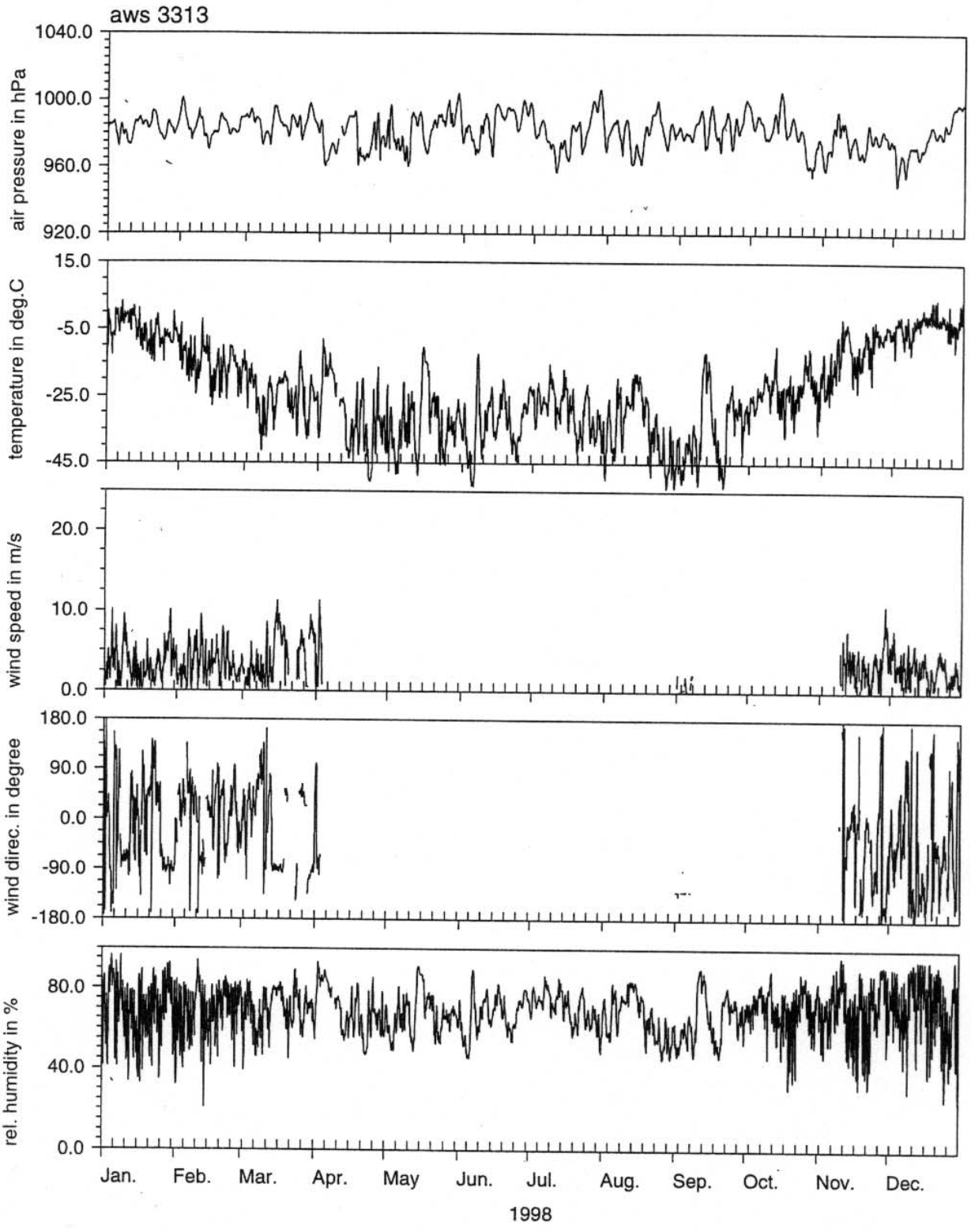

buoy 8061
air pressure in hPa
1040.0
1000.0
960.0
920.0
temperature in deg.C
15.0
-5.0
-25.0
-45.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1998
buoy 8064
air pressure in hPa
1040.0
1000.0
960.0
920.0
temperature in deg.C
15.0
-5.0
-25.0
-45.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
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Aug.
Sep.
Oct.
Nov.
Dec.
1998

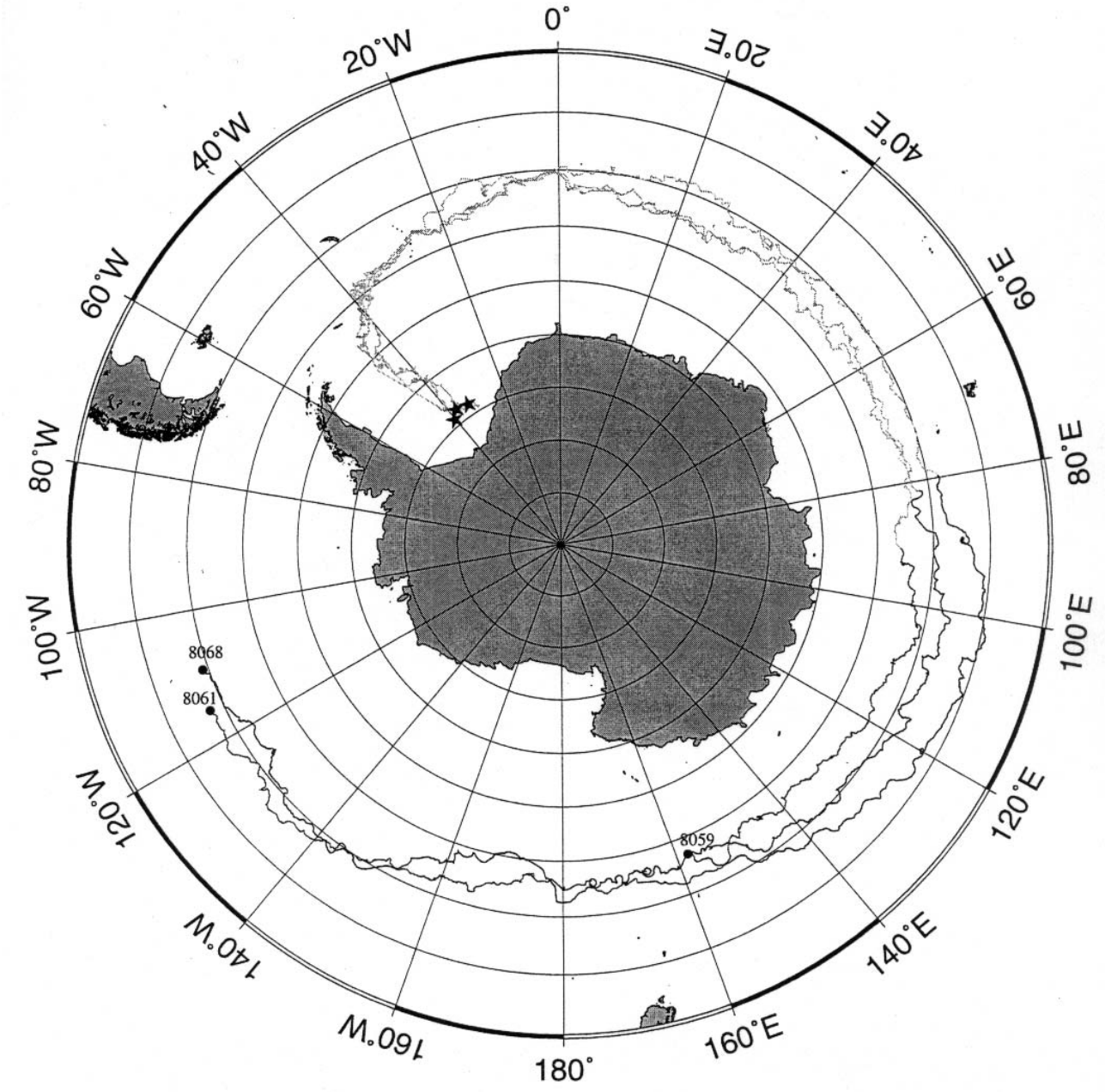

buoy 8065
air pressure in hPa
1040.0
1000.0
960.0
920.0
temperature in deg.C
15.0
-5.0
-25.0
-45.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1998


buoy 8068
air pressure in hPa
1040.0
1000.0
960.0
920.0
temperature in deg.C
15.0
-5.0
-25.0
-45.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1998

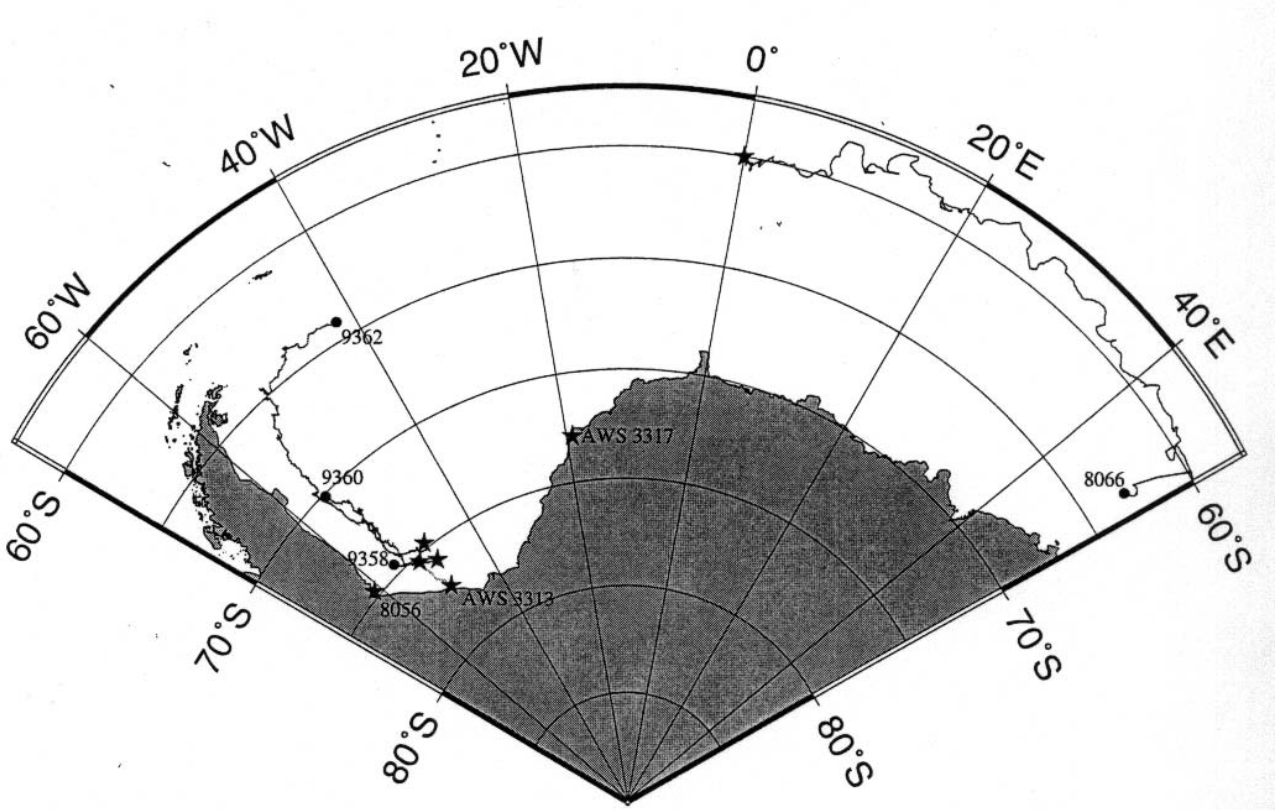

buoy 9356
air pressure in hPa
1040.0
1000.0
960.0
920.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1998


aws 3310
air pressure in hPa
1040.0
1000.0
960.0
920.0
temperature in deg.C
15.0
-5.0
-25.0
-45.0
wind speed in m/s
20.0
10.0
0.0
wind direc. in degree
180.0
90.0
0.0
-90.0
-180.0
rel. humidity in %
80.0
40.0
0.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1998

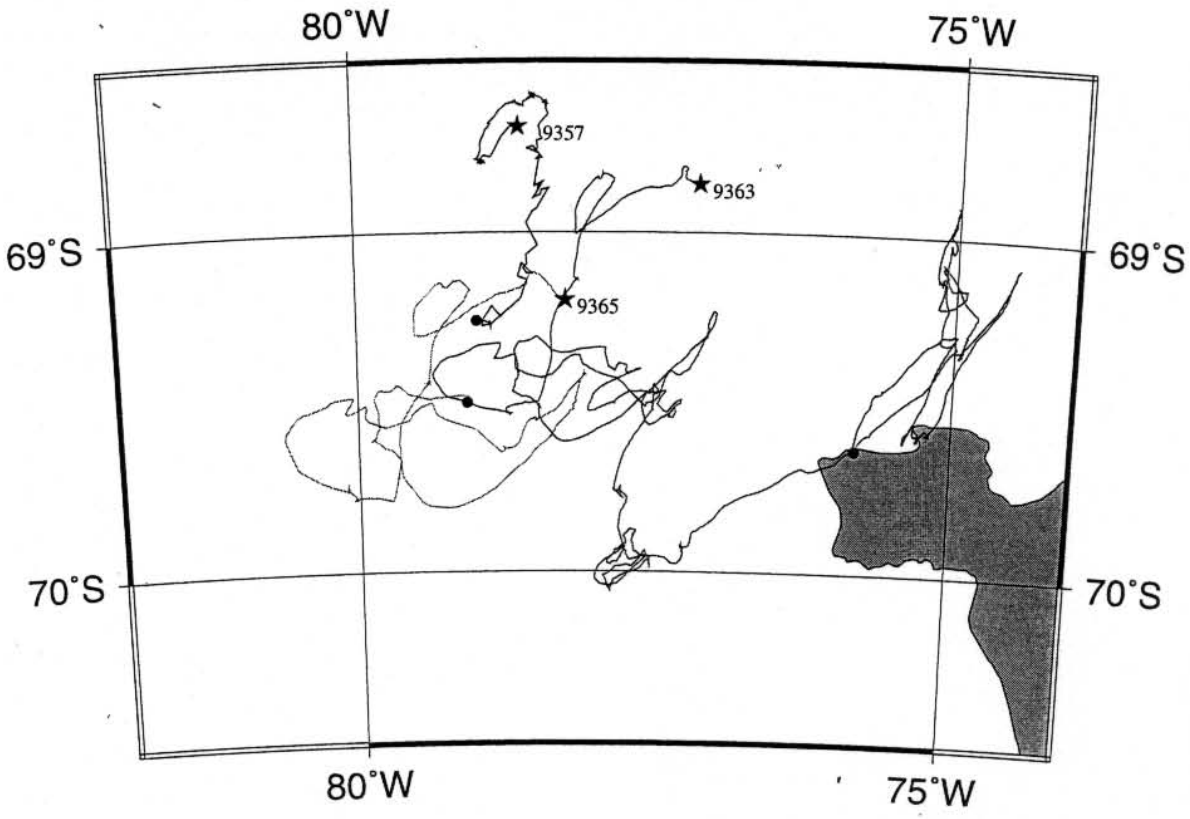

aws 3313
air pressure in hPa
1040.0
1000.0
960.0
920.0
temperature in deg.C
15.0
-5.0
-25.0
-45.0
wind speed in m/s
20.0
10.0
0.0
wind direc. in degree
180.0
90.0
0.0
-90.0
-180.0
rel. humidity in %
80.0
40.0
0.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1998



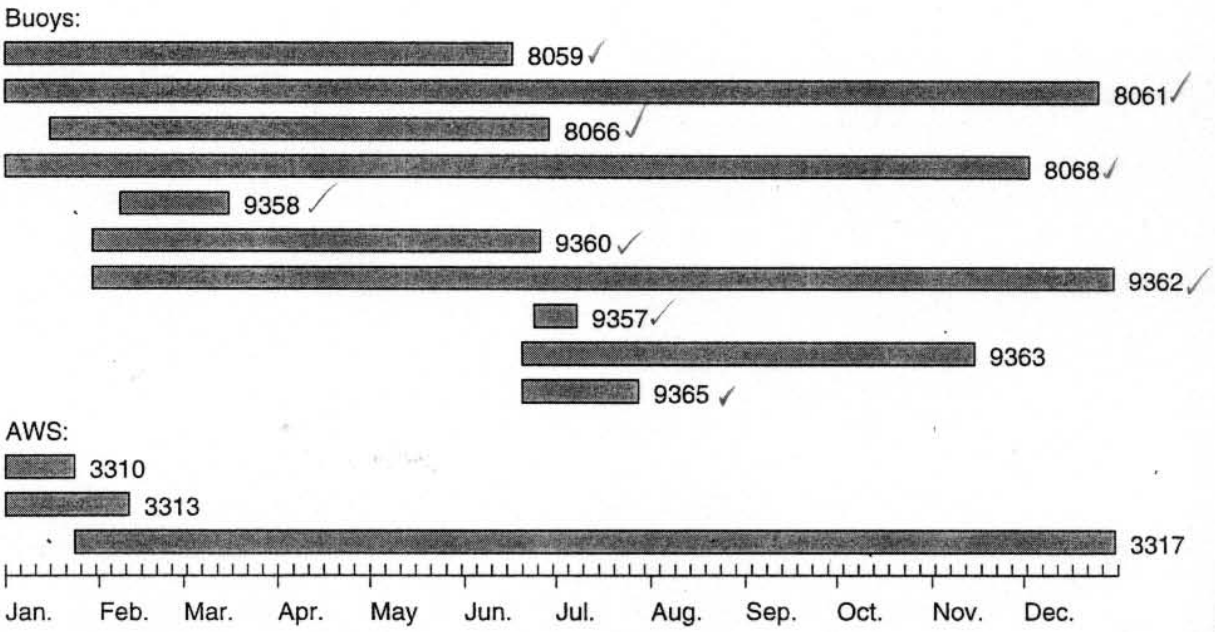
Drift trajectories of the buoys 1999. Also shown are the drift trajectories of the years 1997 and 1998 as grey lines. The depoyment positions are marked with stars and the last positions before failure are marked with a dot.



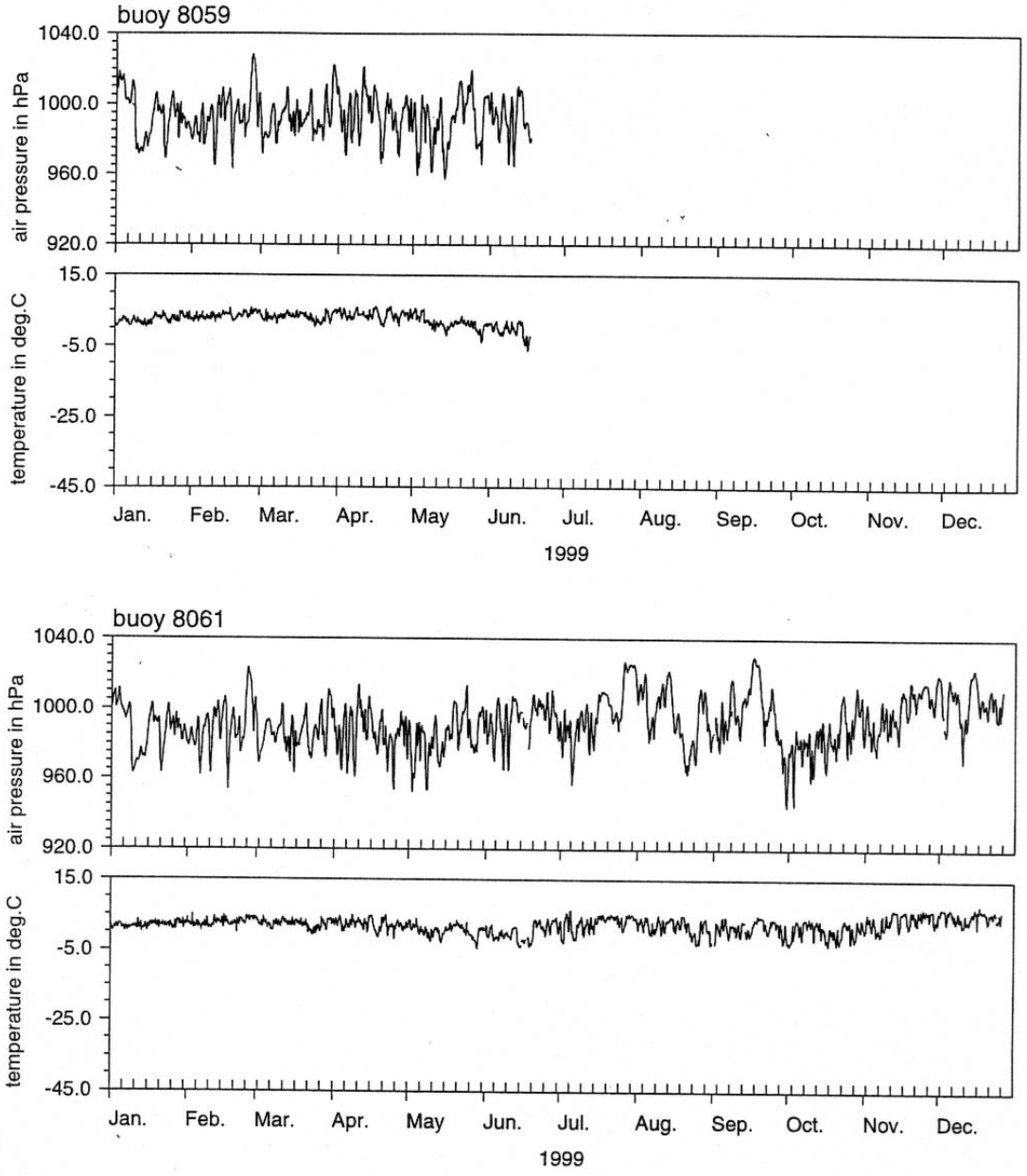
Drift trajectories of the buoys and the positions of the AWS in 1999.
The depoyment positions are marked with stars and the last positions
before failure are marked with a dot.

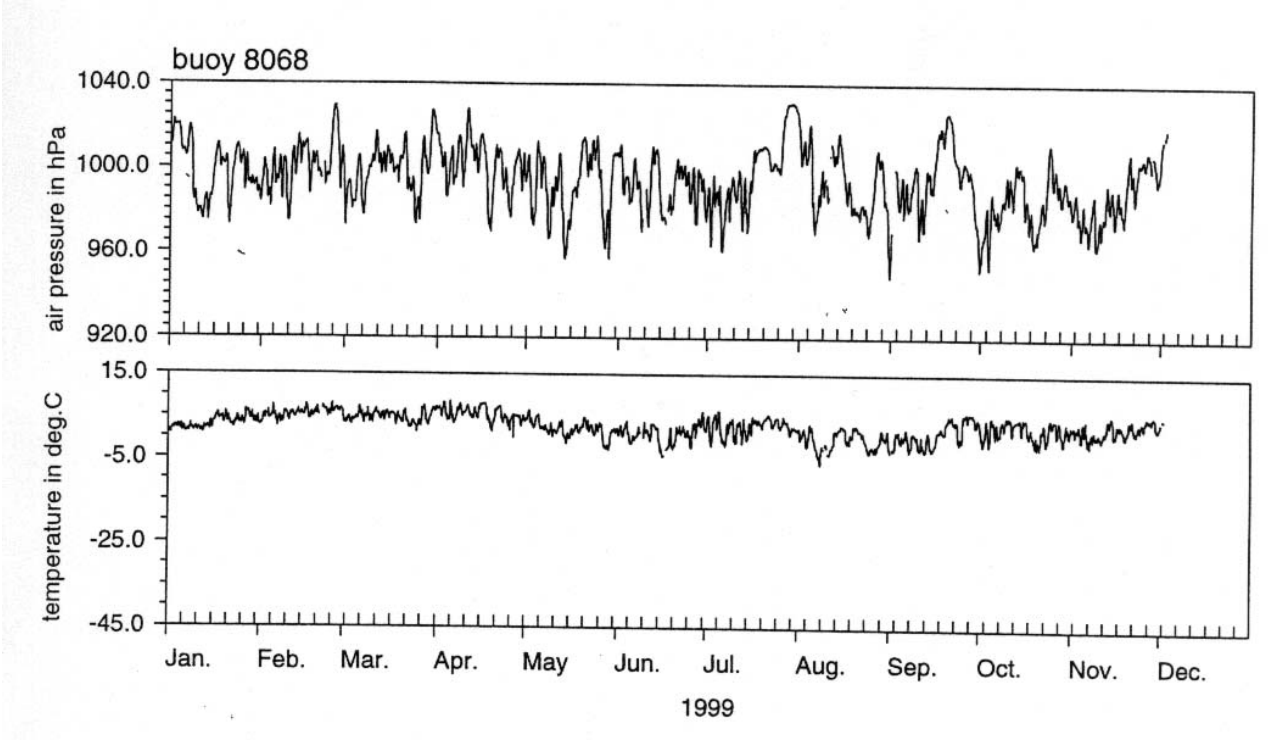


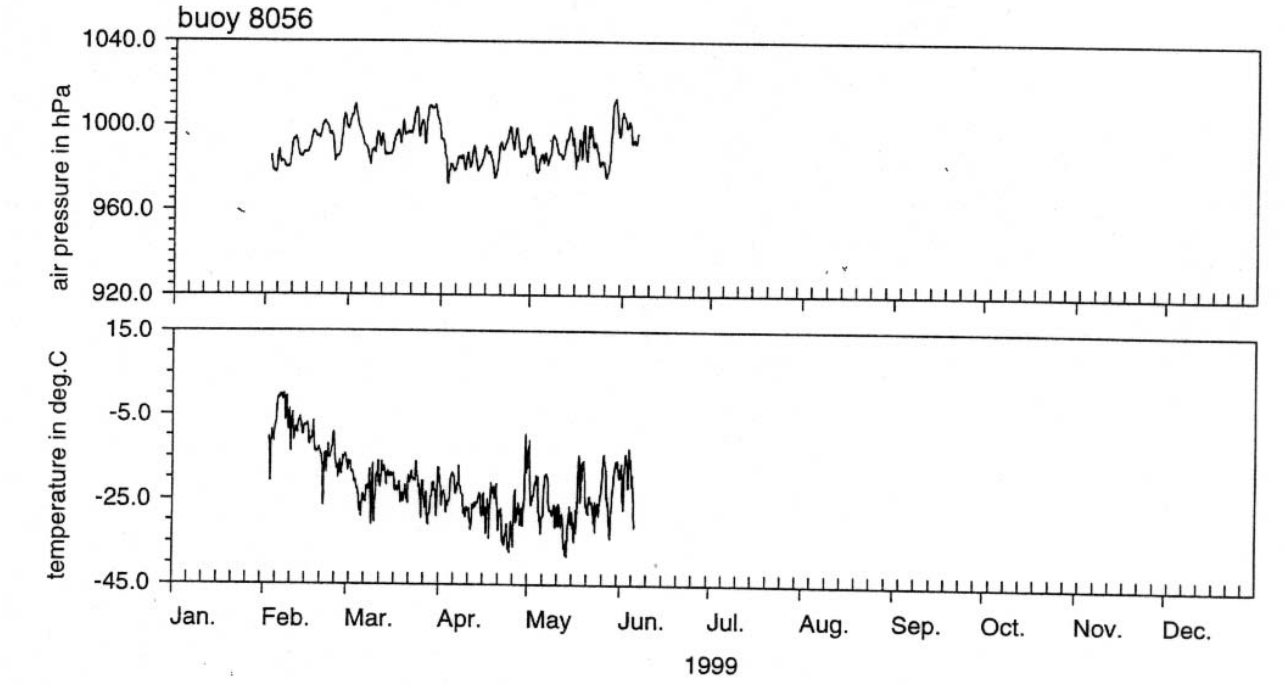
Drift trajectories of the buoys in 1999. The depoyment positions are marked with stars and the last positions before failure are marked with a dot.

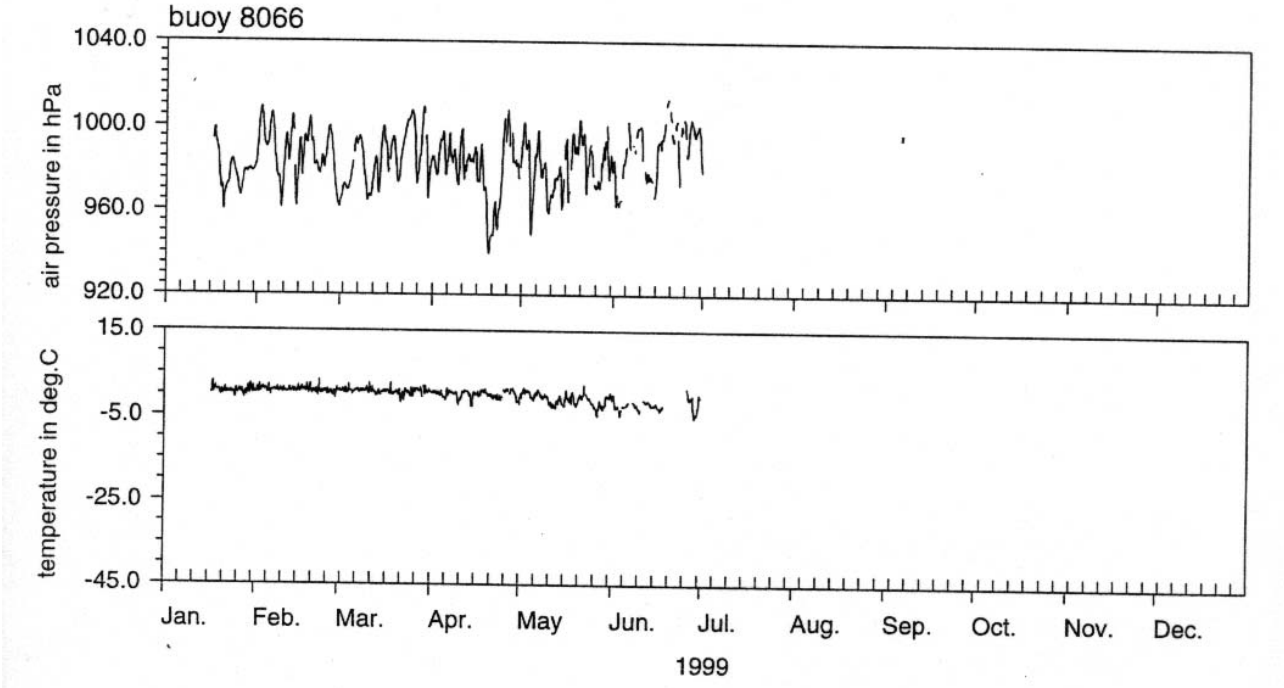


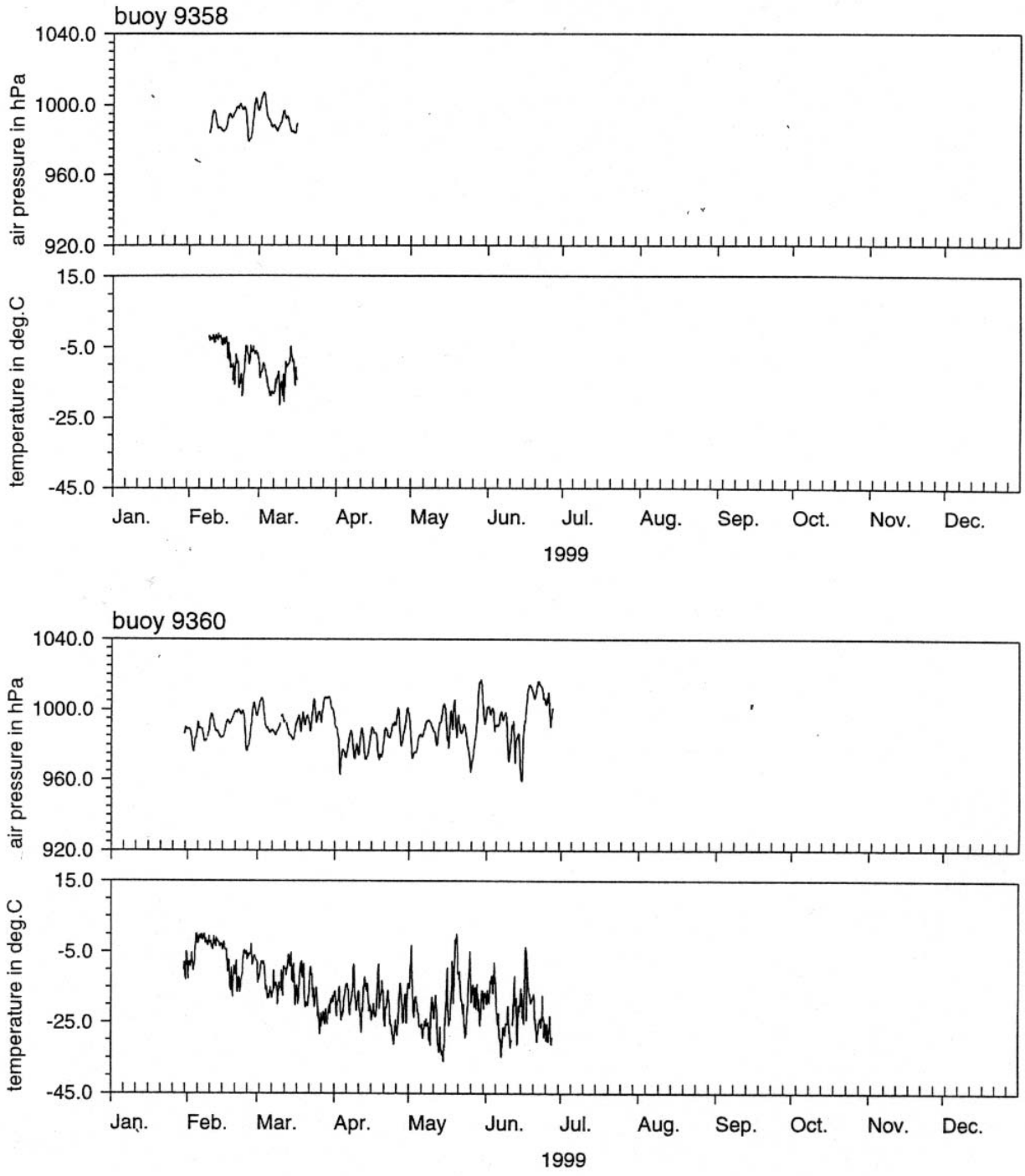
Operating periods in 1999

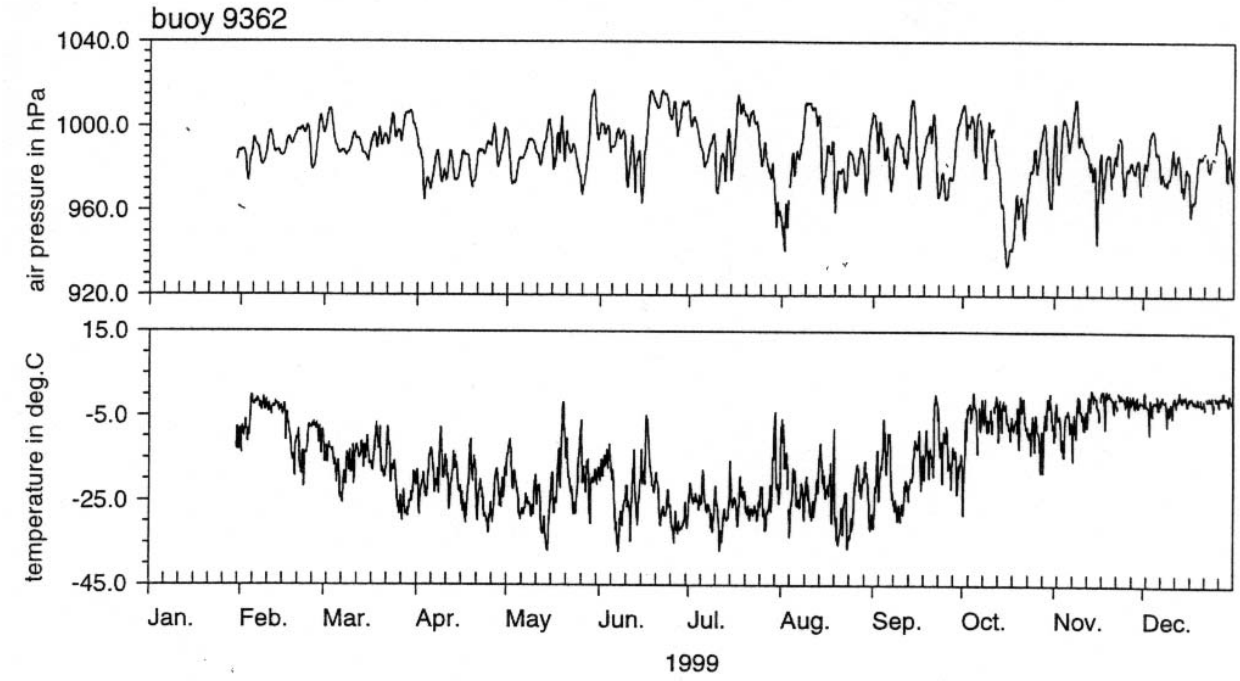

buoy 8059
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999
buoy 8061
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999

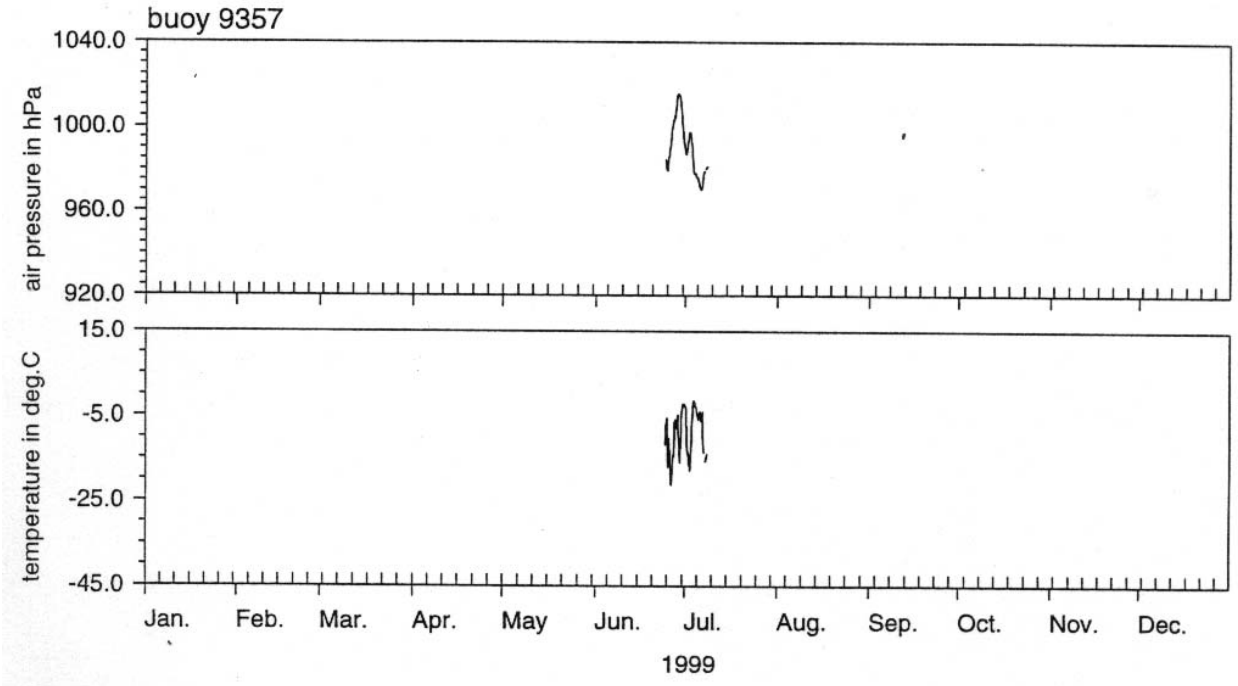

buoy 8068
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999

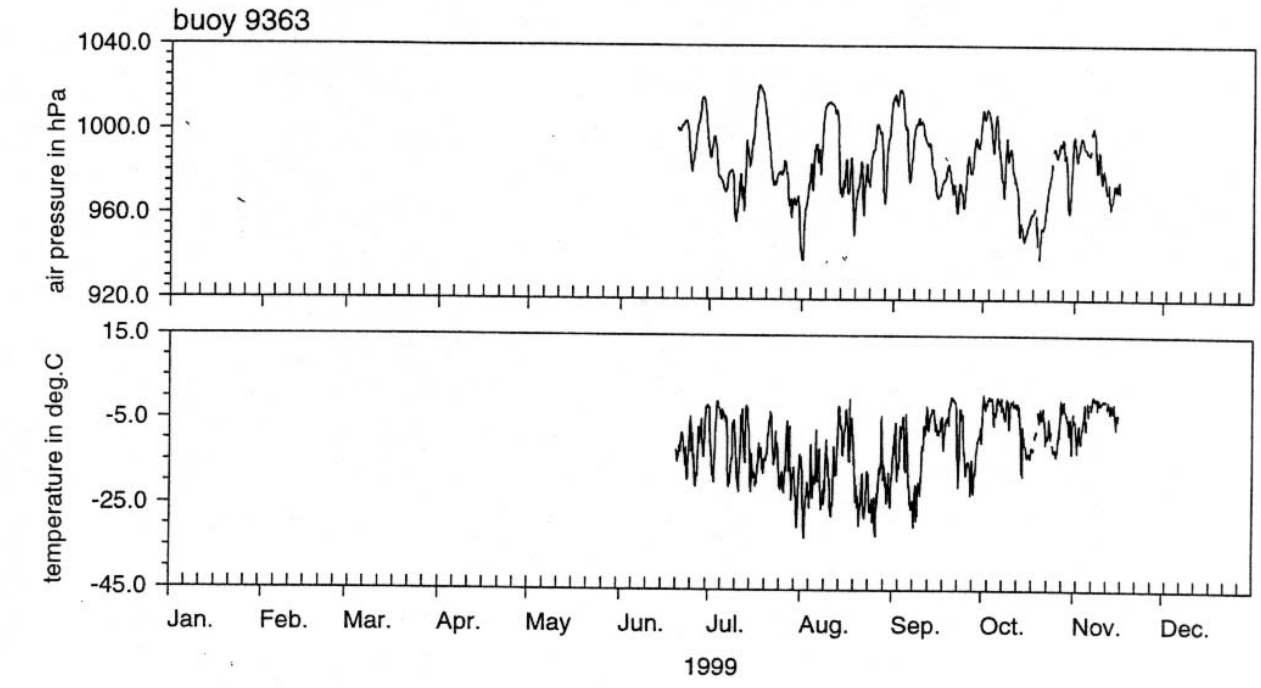

buoy 8056
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999

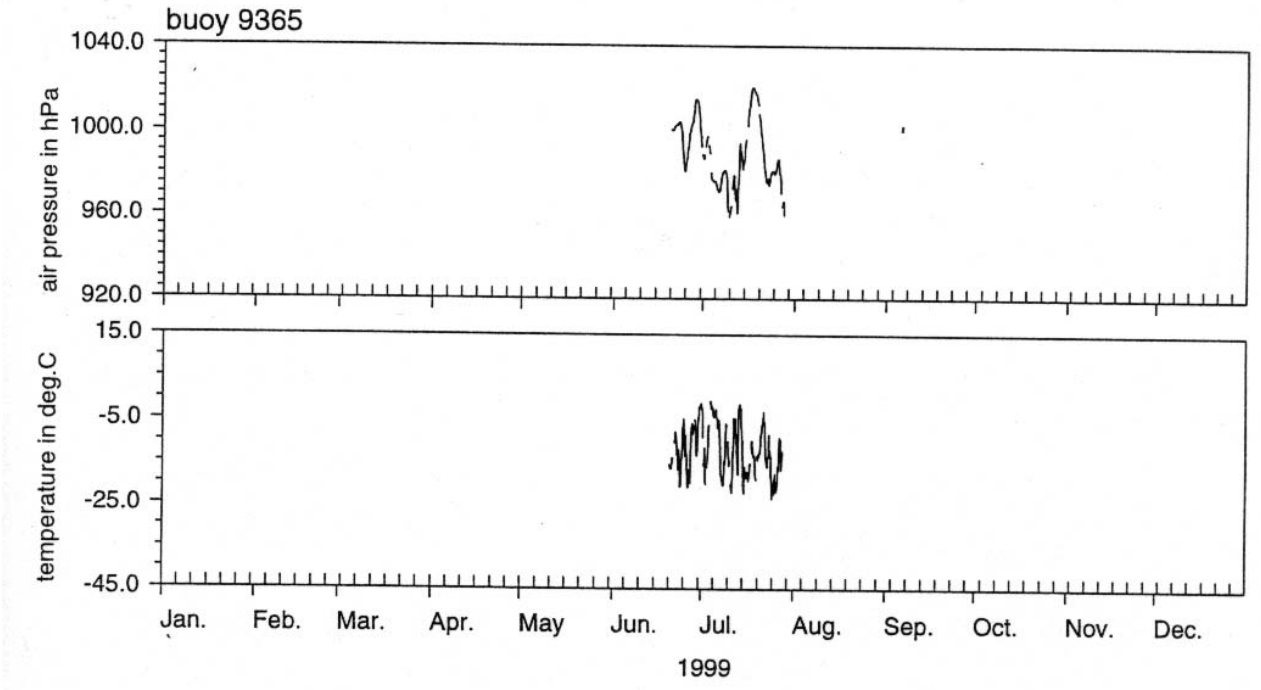

buoy 8066
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999

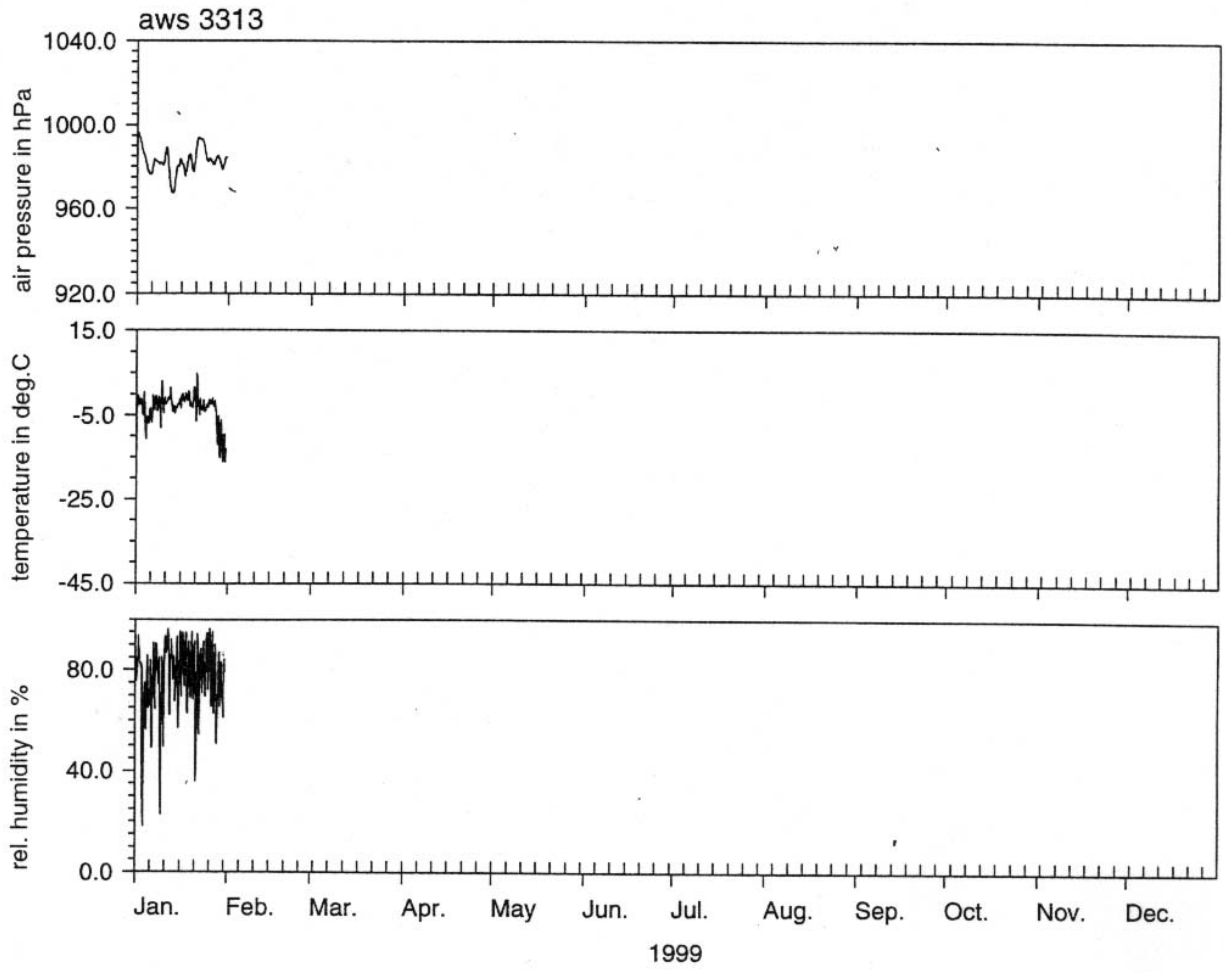

buoy 9358
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999
buoy 9360
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999

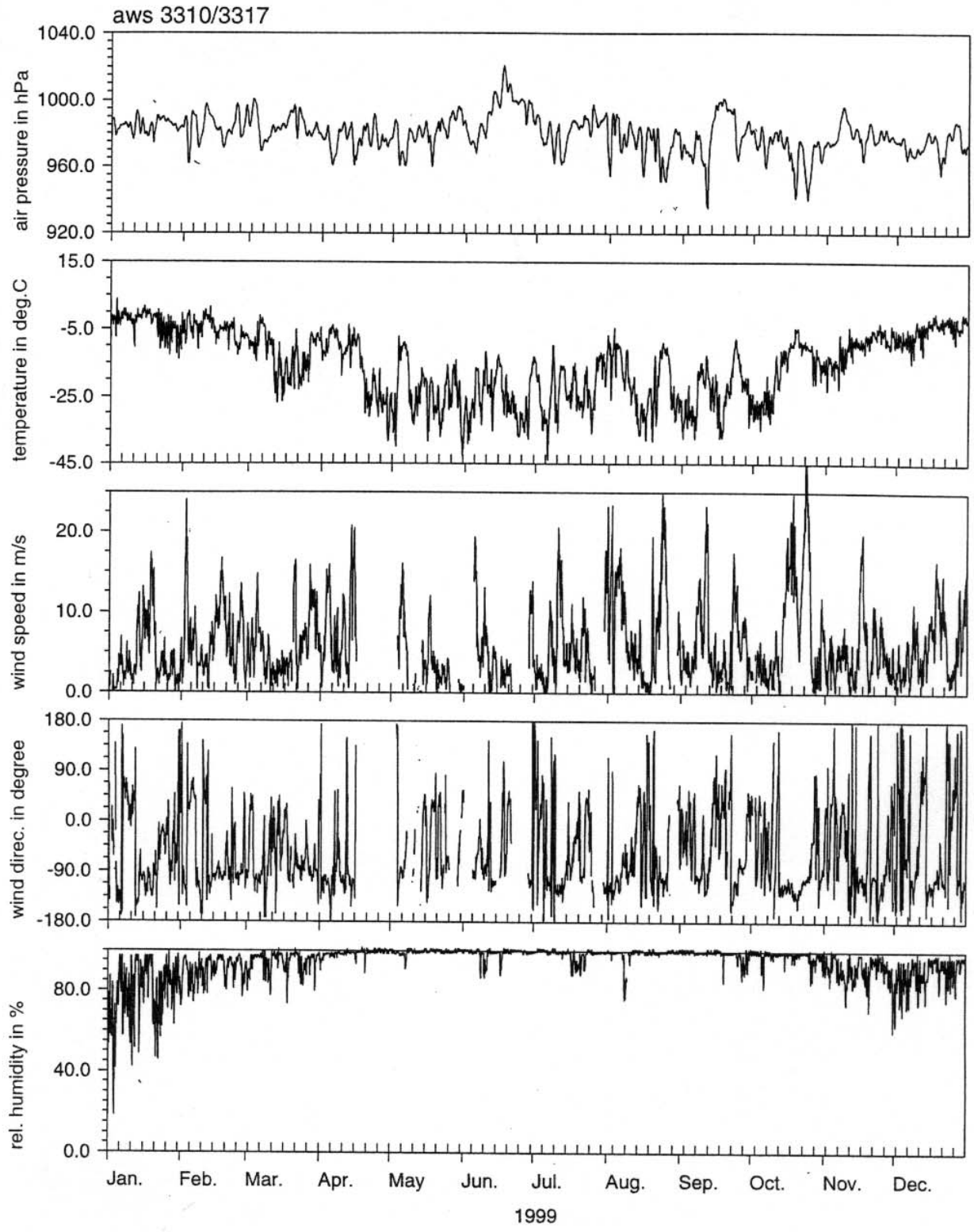

buoy 9362
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999


buoy 9357
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999


buoy 9363
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999


buoy 9365
1040.0
1000.0
960.0
920.0
air pressure in hPa
15.0
-5.0
-25.0
-45.0
temperature in deg.C
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999


aws 3313
air pressure in hPa
1040.0
1000.0
960.0
920.0
temperature in deg.C
15.0
-5.0
-25.0
-45.0
rel. humidity in %
80.0
40.0
0.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999


aws 3310/3317
air pressure in hPa
1040.0
1000.0
960.0
920.0
temperature in deg.C
15.0
-5.0
-25.0
-45.0
wind speed in m/s
20.0
10.0
0.0
wind direc. in degree
180.0
90.0
0.0
-90.0
-180.0
rel. humidity in %
80.0
40.0
0.0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
1999

buoy 8059

operation period: 01.01.98 - 31.12.98

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 98	58.920 S	36.449 W	987.26	0.16	0.09	0.00	0.31
			13.42	0.68	0.24	0.22	0.13
Feb. 98	58.338 S	30.076 W	986.99	0.36	0.20	0.05	0.31
			10.09	0.92	0.18	0.19	0.13
Mar. 98	57.720 S	20.271 W	991.71	0.49	0.25	0.01	0.35
			10.02	0.67	0.18	0.24	0.16
Apr. 98	56.683 S	9.350 W	988.42	0.16	0.25	0.09	0.42
			12.66	0.87	0.27	0.22	0.13
May 98	56.248 S	179.592 W	988.32	-0.97	0.21	-0.05	0.36
			18.27	1.22	0.25	0.23	0.16
June 98	57.097 S	10.585 E	981.43	-2.21	0.27	-0.02	0.38
			13.05	1.18	0.18	0.24	0.14
July 98	57.883 S	21.384 E	984.75	-2.20	0.22	-0.04	0.34
			12.96	1.00	0.18	0.22	0.13
Aug. 98	57.744 S	33.116 E	991.17	-2.03	0.30	0.05	0.45
			13.82	1.50	0.26	0.26	0.18
Sep. 98	57.461 S	43.457 E	986.76	-2.30	0.16	-0.03	0.32
			14.21	1.74	0.19	0.25	0.15
Oct. 98	57.616 S	52.053 E	986.34	-1.91	0.23	0.02	0.38
			11.14	1.21	0.25	0.24	0.16
Nov. 98	57.282 S	63.841 E	978.95	-0.49	0.31	0.01	0.40
			12.27	1.10	0.19	0.22	0.13
Dec. 98	56.551 S	76.013 E	985.31	0.19	0.26	0.05	0.34
			12.53	0.57	0.17	0.20	0.13

buoy 8060

operation period: 01.01.98 - 08.02.98

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 98	61.151 S	42.852 W	986.89	0.07	0.09	0.02	0.21
			10.12	1.33	0.16	0.16	0.11
Feb. 98	60.631 S	39.784 W	991.85	-0.32	0.15	0.09	0.27
			9.92	0.91	0.18	0.17	0.15

buoy 8061

operation period: 01.01.98 - 31.12.98

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 98	414.831 N	36.705 W	986.68	-0.10	0.09	0.03	0.30
			13.15	0.72	0.24	0.22	0.15
Feb. 98	58.535 S	30.417 W	986.99	0.38	0.19	0.06	0.31
			10.17	0.85	0.19	0.20	0.15
Mar. 98	57.537 S	20.659 W	992.03	0.70	0.26	0.03	0.39
			10.19	0.71	0.20	0.27	0.17
Apr. 98	56.465 S	9.224 W	988.27	0.21	0.26	0.07	0.44
			12.73	0.89	0.28	0.25	0.14
May 98	56.155 S	177.369 W	988.78	-0.73	0.29	-0.04	0.41
			18.39	1.20	0.25	0.24	0.18
June 98	56.990 S	14.487 E	981.80	-2.00	0.26	-0.03	0.38
			12.67	1.30	0.19	0.25	0.16
July 98	57.754 S	25.523 E	984.55	-2.00	0.24	-0.03	0.38
			13.02	1.19	0.20	0.26	0.15
Aug. 98	57.099 S	37.752 E	991.39	-1.68	0.31	0.08	0.43
			12.53	1.42	0.21	0.26	0.18
Sep. 98	56.280 S	48.688 E	988.25	-1.31	0.19	-0.01	0.39
			15.02	1.24	0.23	0.31	0.18
Oct. 98	56.826 S	58.520 E	987.52	-1.25	0.26	-0.04	0.42
			11.94	1.32	0.26	0.26	0.15
Nov. 98	56.912 S	71.608 E	978.29	-0.58	0.34	0.03	0.43
			11.27	1.07	0.17	0.25	0.14
Dec. 98	57.288 S	84.801 E	982.57	0.23	0.26	-0.06	0.38
			10.31	0.70	0.22	0.23	0.16

buoy 8064

operation period: 01.01.98 - 07.04.98

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 98	63.199 S	43.642 W	984.66	-0.34	0.05	0.02	0.17
			10.20	0.87	0.13	0.14	0.09
Feb. 98	61.713 S	40.073 W	986.29	-0.89	0.10	0.11	0.25
			10.88	0.89	0.17	0.17	0.13
Mar. 98	60.122 S	34.026 W	992.06	-0.38	0.16	0.03	0.27
			10.21	0.78	0.15	0.19	0.11
Apr. 98	59.541 S	28.631 W	990.19	-0.12	0.30	0.06	0.36
			9.45	0.80	0.16	0.17	0.13

buoy 8065

operation period: 19.01.98 - 21.09.98

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 98	56.186 S	6.484 E	982.42	0.99	0.20	0.12	0.24
			14.79	0.88	0.08	0.08	0.09
Feb. 98	55.445 S	10.658 E	990.53	1.50	0.10	0.01	0.12
			8.88	0.65	0.06	0.07	0.06
Mar. 98	55.705 S	14.782 E	985.02	1.10	0.13	-0.02	0.17
			11.89	0.73	0.10	0.10	0.09
Apr. 98	55.961 S	19.579 E	987.85	0.87	0.10	-0.01	0.13
			13.11	0.83	0.08	0.07	0.06
May 98	56.968 S	23.352 E	993.08	0.15	0.08	-0.08	0.18
			18.50	0.87	0.16	0.09	0.11
June 98	58.529 S	27.457 E	980.27	-0.95	0.11	-0.05	0.23
			13.45	1.40	0.17	0.18	0.14
July 98	59.149 S	34.755 E	978.59	-2.03	0.21	0.00	0.27
			13.47	1.29	0.13	0.18	0.12
Aug. 98	414.872 N	42.630 E	987.31	-2.34	0.11	0.03	0.14
			13.83	0.61	0.10	0.10	0.12
Sep. 98	58.390 S	47.486 E	983.28	-2.30	0.12	-0.01	0.17
			13.63	1.55	0.17	0.12	0.17

buoy 8068

operation period: 01.01.98 - 31.12.98

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 98	62.231 S	42.879 W	985.77	-0.13	0.05	0.02	0.20
			10.09	1.46	0.15	0.16	0.11
Feb. 98	60.803 S	39.306 W	987.75	-0.86	0.10	0.10	0.26
			10.73	0.85	0.21	0.19	0.17
Mar. 98	59.009 S	31.965 W	993.21	-0.06	0.21	0.05	0.33
			9.97	0.83	0.17	0.22	0.12
Apr. 98	56.904 S	21.670 W	992.63	0.09	0.25	0.12	0.40
			11.25	1.21	0.25	0.25	0.19
May 98	55.618 S	13.482 W	987.59	-0.54	0.14	-0.01	0.34
			13.19	1.68	0.25	0.22	0.13
June 98	55.622 S	175.987 E	982.88	-1.88	0.32	0.01	0.40
			14.92	0.91	0.18	0.22	0.16
July 98	55.213 S	8.170 E	990.32	-1.88	0.27	0.02	0.39
			13.02	1.08	0.22	0.23	0.17
Aug. 98	54.865 S	19.862 E	999.32	-2.05	0.29	0.01	0.41
			13.60	1.72	0.20	0.25	0.14
Sep. 98	55.262 S	30.103 E	988.66	-1.65	0.20	-0.05	0.45
			14.04	1.41	0.31	0.31	0.19
Oct. 98	55.431 S	41.183 E	990.62	-1.03	0.32	0.03	0.43
			11.03	1.30	0.26	0.24	0.19
Nov. 98	55.167 S	56.267 E	986.54	0.39	0.40	-0.01	0.47
			10.56	1.12	0.16	0.22	0.12
Dec. 98	54.676 S	72.003 E	988.88	1.31	0.36	0.05	0.44
			12.80	0.92	0.18	0.22	0.13

buoy 9356

operation period: 05.05.98 - 10.06.98

month	position degree		press. hPa	u-drift m/s	v-drift m/s	spd-drift m/s
May 98	70.335 S	10.963 W	981.51	-0.19	-0.06	0.24
			7.75	0.17	0.12	0.16
June 98	71.019 S	18.636 W	974.17	-0.16	-0.02	0.26
			4.94	0.19	0.19	0.17

automatic weather station 3310

position: 72.870 S 19.048 W
heigth above msl: 34 meters
operation period: 01.01.98 - 31.12.98

month	press. hPa	temp. °C	humidty %	u-wind m/s	v-wind m/s	spd-wind m/s
Jan. 98	983.84	-3.03	78.28	-0.98	0.13	2.64
	5.80	3.45	15.77	3.00	1.66	2.40
Feb. 98	979.82	-6.31	82.56	-2.37	0.01	3.24
	7.06	3.73	13.47	2.71	1.79	2.38
Mar. 98	980.03	-16.10	80.69	-1.24	0.60	2.78
	5.91	8.55	11.35	2.71	1.78	2.16
Apr. 98	974.79	-19.13	84.51	-2.30	-0.19	3.38
	8.77	6.78	6.79	3.56	1.94	3.21
May 98	976.09	-23.66	80.47	-1.72	-0.19	2.73
	9.81	6.06	7.21	2.84	2.21	2.91
June 98	978.76	-24.73	78.96	-1.43	0.36	1.59
	7.06	8.91	9.17	2.11	1.04	2.28
July 98	977.24	-23.57	81.30	1.33	0.58	1.91
	12.79	8.91	9.43	1.19	1.67	1.63
Aug. 98	977.89	-22.47	82.00	-0.90	-0.03	1.06
	6.93	5.86	6.47	1.65	0.54	1.64
Sep. 98	980.21	-25.75	76.57	-1.23	-0.39	1.32
	7.70	8.16	10.62	1.50	0.56	1.58
Oct. 98	979.77	-17.83	78.71	-1.86	-0.69	2.00
	9.14	6.80	11.46	2.17	0.78	2.29
Nov. 98	975.31	-8.98	77.43	-2.14	-0.16	3.44
	7.98	3.69	13.68	3.00	2.08	2.47
Dec. 98	978.99	-2.17	79.05	-1.96	-0.40	4.28
	11.48	2.44	15.48	4.22	2.36	2.99

automatic weather station 3313

position: 77.071 S 50.109 W
heigth above msl: 40 meters
operation period: 01.01.98 - 31.10.98

month	press. hPa	temp. °C	humidty %	u-wind m/s	v-wind m/s	spd-wind m/s
Jan. 98	983.23	-5.55	69.36	-1.26	0.73	3.48
	4.93	3.71	14.81	3.45	1.64	2.14
Feb. 98	984.36	-15.61	67.95	0.46	1.92	3.28
	6.20	5.08	13.34	2.85	1.69	2.02
Mar. 98	986.10	-25.29	69.94	-1.42	0.91	4.18
	5.83	6.24	9.75	4.43	1.86	2.90
Apr. 98	976.26	-30.88	68.91	-2.45	0.66	5.17
	9.42	10.07	11.32	4.68	1.00	3.56
May 98	983.15	-32.64	67.15			
	10.06	8.81	10.09			
June 98	986.88	-33.04	67.05			
	8.73	8.19	9.50			
July 98	980.39	-29.57	71.13			
	11.01	6.62	7.68			
Aug. 98	980.47	-34.03	65.98			
	8.80	9.26	10.79			
Sep. 98	984.70	-34.67	64.59	-0.28	-0.22	0.36
	7.66	10.29	11.71	0.47	0.38	0.60
Oct. 98	980.75	-23.19	70.18			
	10.70	5.04	10.58			

automatic weather station 3313
(drifting on the iceberg A38B, breakup from the shelfice reported on 22.10.98)

operation period: 01.11.98 - 31.12.98
heigth above msl: 40 meters

month	position degree		press. hPa	temp. C°	Humidty %	u-drift m/s	v-drift m/s	spd-drift m/s
Nov. 98	76.383 S	50.925 W	976.00	-11.53	69.39	-0.01	0.03	0.06
			7.20	6.16	14.71	0.03	0.05	0.04
Dec. 98	75.963 S	51.635 W	977.67	-3.08	71.64	0.00	0.02	0.04
			11.96	2.95	16.36	0.02	0.04	0.03

buoy 8056

operation period: 02.02.99 - 05.06.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Feb. 99	74.713 S	61.141 W	990.42	-10.30	0.00	0.00	0.03
			7.17	5.39	0.03	0.02	0.02
Mar. 99	74.715 S	61.143 W	997.12	-21.85	0.00	0.00	0.02
			7.20	3.44	0.02	0.01	0.01
Apr. 99	74.714 S	61.140 W	986.59	-26.26	0.00	0.00	0.02
			5.88	4.63	0.02	0.02	0.02
May 99	74.717 S	61.138 W	990.18	-25.02	0.00	0.00	0.02
			7.96	5.68	0.03	0.02	0.02
June 99	74.718 S	61.141 W	997.69	-19.98	0.00	0.00	0.02
			4.80	4.95	0.01	0.02	0.01

buoy 8059

operation period: 01.01.99 - 17.06.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 99	55.282 S	89.266 E	993.25	2.18	0.36	0.05	0.50
			12.77	1.04	0.26	0.36	0.29
Feb. 99	54.537 S	102.296 E	994.29	3.39	0.29	0.01	0.44
			12.82	0.94	0.25	0.30	0.22
Mar. 99	54.162 S	113.454 E	993.05	3.16	0.29	0.03	0.42
			10.30	1.06	0.22	0.26	0.14
Apr. 99	54.492 S	128.887 E	993.69	3.74	0.47	-0.06	0.55
			11.33	1.25	0.21	0.25	0.16
May 99	56.344 S	144.427 E	990.02	1.47	0.28	-0.10	0.41
			14.67	1.68	0.20	0.25	0.16
June 99	57.994 S	154.233 E	991.97	-0.40	0.31	-0.07	0.45
			10.86	1.98	0.28	0.26	0.21

buoy 8061

operation period: 01.01.99 - 26.12.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 99	57.203 S	95.389 E	988.60	1.69	0.21	0.06	0.34
			12.48	0.73	0.22	0.22	0.19
Feb. 99	56.599 S	104.769 E	990.08	2.64	0.24	-0.02	0.38
			13.55	0.95	0.22	0.25	0.16
Mar. 99	56.706 S	115.337 E	986.56	2.24	0.27	0.01	0.37
			9.75	1.07	0.22	0.21	0.15
Apr. 99	57.212 S	127.512 E	986.36	2.18	0.29	-0.05	0.42
			11.61	1.38	0.24	0.26	0.18
May 99	58.055 S	139.492 E	984.39	0.52	0.25	-0.02	0.40
			12.23	1.55	0.23	0.24	0.14
June 99	57.408 S	153.942 E	994.66	0.23	0.41	0.08	0.56
			9.92	2.13	0.29	0.34	0.25
July 99	57.410 S	168.804 E	999.08	2.99	0.27	-0.07	0.48
			15.47	2.12	0.41	0.29	0.32
Aug. 99	58.233 S	179.067 W	995.92	1.89	0.26	0.01	0.43
			15.16	2.07	0.26	0.27	0.16
Sep. 99	57.313 S	166.192 W	997.16	1.73	0.31	0.07	0.42
			17.64	1.89	0.17	0.25	0.14
Oct. 99	55.861 S	151.513 W	984.24	0.90	0.37	0.06	0.48
			11.89	2.17	0.24	0.27	0.20
Nov. 99	54.542 S	136.457 W	1000.28	4.01	0.36	0.06	0.49
			11.13	2.05	0.24	0.29	0.19
Dec. 99	53.801 S	122.177 W	1004.30	5.25	0.41	0.01	0.51
			10.42	1.39	0.21	0.29	0.18

buoy 8066

operation period: 16.01.99 - 29.06.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 99	60.133 S	0.320 E	978.01	0.59	0.03	-0.02	0.07
			7.89	0.68	0.04	0.05	0.03
Feb. 99	59.915 S	4.126 E	987.52	0.82	0.16	0.03	0.31
			11.96	0.57	0.22	0.25	0.20
Mar. 99	59.188 S	12.462 E	984.66	0.57	0.21	0.03	0.46
			11.94	0.63	0.31	0.30	0.15
Apr. 99	58.721 S	25.207 E	979.94	-0.02	0.35	0.01	0.54
			14.49	0.84	0.34	0.33	0.23
May 99	59.197 S	40.875 E	981.12	-0.92	0.33	-0.05	0.52
			11.64	1.30	0.40	0.31	0.30
June 99	61.398 S	48.440 E	990.11	-2.25	-0.02	-0.14	0.20
			12.28	1.32	0.17	0.24	0.26

buoy 8068

operation period: 01.01.99 - 03.12.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 99	52.807 S	85.160 E	998.59	2.98	0.28	0.10	0.47
			13.08	1.37	0.37	0.30	0.30
Feb. 99	51.305 S	98.471 E	1001.30	5.38	0.44	0.02	0.56
			11.03	1.08	0.29	0.33	0.27
Mar. 99	51.002 S	114.885 E	999.16	4.63	0.46	0.01	0.58
			12.04	1.21	0.29	0.28	0.20
Apr. 99	52.366 S	133.113 E	1000.72	5.43	0.48	-0.12	0.58
			11.38	1.54	0.21	0.30	0.20
May 99	55.668 S	151.413 E	991.73	2.06	0.41	-0.16	0.57
			15.29	1.83	0.27	0.34	0.24
June 99	57.835 S	165.696 E	991.69	1.03	0.25	-0.02	0.50
			10.10	2.07	0.34	0.40	0.29
July 99	58.957 S	178.474 E	999.53	2.88	0.33	-0.07	0.50
			17.87	1.88	0.24	0.36	0.21
Aug. 99	58.986 S	166.867 W	991.57	-0.12	0.31	0.08	0.46
			14.82	2.14	0.25	0.31	0.22
Sep. 99	56.285 S	150.140 W	995.51	1.38	0.46	0.16	0.60
			15.79	2.77	0.25	0.36	0.26
Oct. 99	55.712 S	133.120 W	983.99	2.44	0.36	-0.10	0.50
			12.11	2.00	0.27	0.29	0.20
Nov. 99	55.802 S	117.773 W	986.68	2.73	0.38	0.10	0.46
			12.68	1.60	0.25	0.22	0.23
Dec. 99	54.561 S	109.537 W	1015.33	4.62	0.33	0.12	0.40
			2.18	0.69	0.36	0.03	0.30

buoy 9357

operation period: 24.06.99 - 08.07.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
June 99	68.773 S	78.561 W	999.52	-10.17	0.01	-0.03	0.15
			11.48	5.44	0.10	0.15	0.09
July 99	69.064 S	78.694 W	981.76	-8.22	-0.02	-0.06	0.08
			8.53	5.34	0.03	0.08	0.07

buoy 9358

operation period: 08.02.99 - 16.03.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Feb. 99	75.100 S	52.815 W	992.43	-6.95	-0.04	0.02	0.09
			6.33	4.33	0.07	0.07	0.06
Mar. 99	74.755 S	54.654 W	991.97	-13.62	-0.03	0.03	0.09
			6.45	3.67	0.05	0.09	0.07

buoy 9360

operation period: 30.01.99 - 26.06.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Feb. 99	74.656 S	50.258 W	990.18	-6.03	-0.04	0.00	0.10
			6.78	4.44	0.08	0.09	0.07
Mar. 99	74.052 S	53.057 W	994.72	-15.62	-0.03	0.05	0.10
			6.87	5.31	0.06	0.09	0.07
Apr. 99	72.784 S	53.978 W	983.28	-19.75	0.01	0.06	0.14
			8.04	4.56	0.09	0.12	0.09
May 99	71.835 S	53.788 W	989.16	-20.36	0.00	0.02	0.10
			10.49	7.51	0.07	0.10	0.07
June 99	70.833 S	54.607 W	996.58	-22.12	-0.02	0.07	0.12
			13.33	6.54	0.09	0.11	0.10

buoy 9362

operation period: 30.01.99 -31.12.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 99	75.692 S	48.853 W	987.37	-10.43	0.05	0.05	0.08
			1.46	1.95	0.03	0.04	0.03
Feb. 99	75.611 S	49.662 W	990.91	-7.18	-0.02	0.00	0.08
			6.56	4.88	0.05	0.08	0.06
Mar. 99	75.064 S	52.085 W	995.30	-17.56	-0.03	0.04	0.09
			6.42	5.32	0.07	0.07	0.06
Apr. 99	73.867 S	53.873 W	983.27	-21.35	-0.01	0.06	0.14
			7.83	5.05	0.07	0.13	0.09
May 99	72.946 S	54.167 W	989.07	-21.77	0.00	0.02	0.13
			10.15	6.84	0.09	0.13	0.09
June 99	71.914 S	54.758 W	998.83	-23.96	-0.01	0.07	0.16
			13.07	6.76	0.10	0.15	0.11
July 99	70.400 S	55.620 W	989.81	-25.67	-0.01	0.06	0.11
			13.84	4.79	0.06	0.11	0.09
Aug. 99	68.793 S	55.755 W	984.99	-23.45	0.01	0.07	0.11
			15.39	6.29	0.07	0.08	0.07
Sep. 99	67.057 S	54.806 W	988.50	-16.87	0.02	0.07	0.12
			12.20	6.89	0.06	0.11	0.08
Oct. 99	65.503 S	53.200 W	978.74	-6.48	0.03	0.06	0.12
			20.48	4.70	0.07	0.10	0.07
Nov. 99	64.500 S	50.276 W	984.99	-3.12	0.08	0.03	0.16
			11.68	3.55	0.10	0.12	0.09
Dec. 99	64.188 S	45.018 W	981.91	-1.35	0.12	0.00	0.18
			9.40	1.33	0.14	0.13	0.13

buoy 9363

operation period: 20.06.99 - 15.11.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
June 99	68.978 S	77.657 W	999.94	-11.03	-0.04	-0.03	0.12
			9.13	4.87	0.09	0.11	0.09
July 99	69.298 S	78.098 W	982.54	-12.66	0.00	-0.02	0.15
			17.01	6.55	0.14	0.12	0.11
Aug. 99	69.709 S	77.624 W	985.48	-18.45	0.01	-0.02	0.11
			17.76	7.17	0.10	0.11	0.10
Sep. 99	69.753 S	76.249 W	988.50	-11.02	0.03	0.02	0.07
			15.47	7.46	0.07	0.08	0.09
Oct. 99	409.650 N	75.175 W	978.25	-5.28	0.00	0.02	0.07
			18.85	4.52	0.06	0.10	0.09
Nov. 99	69.327 S	75.434 W	983.42	-3.17	-0.02	-0.05	0.09
			10.55	3.22	0.07	0.10	0.09

buoy 9365

operation period: 20.06.99 - 28.07.99

month	position degree		press. hPa	temp. C°	u-drift m/s	v-drift m/s	spd-drift m/s
June 99	69.307 S	78.824 W	999.63	-11.62	-0.05	-0.03	0.14
			9.04	5.25	0.10	0.11	0.09
July 99	69.461 S	79.235 W	985.04	-12.24	0.01	0.00	0.16
			15.21	6.13	0.15	0.13	0.11

automatic weather station 3313 (drifting on the iceberg A38B)

operation period: 01.01.99 - 30.01.99
heigth above msl: 40 meters

month	position degree		press. hPa	temp. C°	humidty %	u-drift m/s	v-drift m/s	spd-drift m/s
Jan. 99	75.417 S	52.317 W	982.87	-3.28	76.84	-0.01	0.01	0.04
			6.05	3.35	14.26	0.02	0.04	0.02

automatic weather station 3310/3317

position: 72.864 S 19.065 W
heigth above msl: 35 meters
operation period: 01.01.99 - 31.12.99

month	press. hPa	temp. °C	humidty %	u-wind m/s	v-wind m/s	spd-win m/s
Jan. 99	984.56	-3.19	79.11	-2.48	-0.51	4.32
	3.72	3.22	14.92	4.11	3.18	3.83
Feb. 99	984.08	-5.09	90.23	-4.27	-0.10	6.96
	8.05	2.88	6.03	6.11	3.37	4.29
Mar. 99	984.09	-12.55	94.08	-4.45	0.70	5.70
	7.06	6.01	5.01	4.52	2.35	3.71
Apr. 99	976.59	-16.40	98.61	-6.50	-2.20	7.94
	6.81	8.86	1.63	5.91	2.91	5.24
May 99	980.79	-24.12	99.44	-2.22	0.33	3.75
	8.93	7.93	1.37	4.21	2.24	3.72
June 99	993.35	-24.92	98.95	-4.17	0.20	5.43
	12.18	7.14	2.68	5.01	2.15	4.34
July 99	981.55	-22.66	98.50	-3.59	-0.61	5.70
	8.86	7.13	2.96	5.27	3.72	4.72
Aug. 99	974.67	-21.22	98.75	-5.84	-0.92	8.02
	10.14	8.18	3.90	7.18	4.14	6.27
Sep. 99	979.77	-23.56	98.92	-3.47	0.30	5.99
	14.23	7.18	2.71	5.44	4.03	4.68
Oct. 99	969.82	-16.83	97.91	-6.16	-2.08	7.95
	10.26	7.87	3.15	7.61	3.87	7.21
Nov. 99	979.88	-9.74	91.34	-2.97	-0.17	4.95
	6.31	4.10	6.20	4.58	2.96	3.75
Dec. 99	974.08	-4.67	89.79	-3.54	-1.12	5.99
	6.43	2.93	7.39	5.46	2.73	3.88

Sensor Specification

as provided by the manufacturer

Buoys: 8057; 8058; 8059; 8060; 8061; 8064; 8068; 9357; 9358

Manufacturer: METOCEAN Data Systems Limited, Canada

Air Pressure

Company:	Paroscientific, Inc.
Sensor:	Digiquartz transducer 216B-102
Accuracy:	+/- 0.01%
Resolution:	10 bit -> 0.15 hPa
Range:	920 - 1053.45 hPa
Data sampling:	Interval: 1 h, Average 20 s
Sensor location:	approx. sea surface

Air Temperature

Resolution:	10 it -> 0.06°C
Range:	-45°C - +16.38°C
Data sampling:	Interval: 1 h, Average 20 s
Sensor location:	approx. 1 m above ice surface

GPS-Receiver

Company:	Rockwell
Type:	Nav Core V GPS
Resolution:	1/10000° for lattitude and longitude
Data sampling:	Cycle: 5 s, Average 10 min.
	Interval: 1 h

Buoys: 3311; 8065; 9361; 9365; 9372; 14954; 14955

Manufacturer: Christian Michelsen Research, Norway

Air Pressure

Company:	Paroscientific, Inc.
Sensor:	Digiquartz transducer 216B-102
Accuracy:	+/- 0.01%
Resolution:	10 bit -> 0.13hPa
Range:	920 - 1060 hPa
Data sampling:	Cycle: 10 s, Average 1 min.
	Interval: 10 min.
Sensor location:	approx. sea surface

Air Temperature

Company:	Fenwal
Sensor:	192-222-LET-A01
Resolution:	10 bit -> 0.1°C
Range:	-60°C - +30°C
Data sampling:	Cycle: 10 s, Average 1 min.
	Interval: 10 min.
Sensor location:	approx. 1 m above ice surface

GPS-Receiver

Buoys: 9357; 9358; 9360; 9362; 9363; 9365 (Antarctic)

Manufacturer: Sellmann & Kruse GbR, Germany

Air Pressure

Company:	Vaisala
Sensor:	PTB220 class A
Accuracy:	+/- 0.2 hPa
Resolution:	11 bit -> 0.10hPa
Range:	900 - 1104.7 hPa
Data sampling:	Avèrage over 1 min.
	Interval: 1 hour
Sensor location:	approx. sea surface
	Gill pressure port 2m above ice surface

Air Temperature

Company:	R.M. Young
Sensor:	Model 41342 (PT1000)
Resolution:	10 bit -> 0.1°C
Range:	-50°C - +50°C
Data sampling:	Interval: 1 hour
Sensor location:	2 m above ice surface

GPS-Receiver

Company:	Rockwell
Type:	Nav Core V GPS
Resolution:	1/10000° for lattitude and longitude
Data sampling:	Interval: 1 hour

Automatic Weather Stations: 3310; 3313

Manufacturer: University of Wisconsin, USA

Air Pressure

Company:	Paroscientific, Inc.
Sensor:	Digiquartz transducer 215A-102
Accuracy:	+/- 0.2 hPa
Resolution:	16 bit -> 0.05 hPa
Data sampling:	Interval: 10 min.
Sensor location:	approx. ice surface

Air Temperature

Resolution:	12 bit -> 0.125°C
Range:	-100°C - +412°C
Data sampling:	Interval: 10 min.
Sensor location:	approx. 3 m above ice surface

Vertical Air Temperature Difference

Resolution:	8 bit -> 0.0625°C
Range:	-5.125°C - +10.8125°C
Data sampling:	Interval: 20 min.
Sensor location:	3 m and 1 m. above ice surface

Humidity

Company:	Vaisala
Sensor:	HMP35A
Accuracy:	2% rel. humidity in the range of 0 - 90%
	3% rel. humidity in the range of 90 - 100%
Resolution:	8 bit -> 0.4%
Range:	0 - 102%
Data sampling:	Interval: 20 min.
Sensor location:	approx. 3 m above ice surface

Wind

Company:	Belfort
Sensor:	Model 123 aerovane
Resolution:	Speed: 8 bit -> 0.25 m/s
	Direction: 8 bit -> 1.4°
Range:	Speed : 0 - 64 m/s
	Direction: 0 - 356°
Data sampling:	Interval: 10 min.
Sensor location:	approx. 3 m above ice surface

Automatic Weather Station: 3317

Manufacturer: Sellmann & Kruse GbR, Germany

Air Pressure

Company:	Paroscientific, Inc.
Sensor:	Digiquartz transducer 216B
Accuracy:	+/- 0.2 hPa
Resolution:	11 bit -> 0.10 hPa
Data sampling:	Interval: 200 sec.
Sensor location:	approx. ice surface

Air Temperature

Company:	R.M. Young
Sensor:	Model 41342 (PT1000)
Resolution:	10 bit -> 0.1°C
Range:	-50°C - +50°C
Data sampling:	Interval: 200 sec.
Sensor location:	approx. 2 m and 5 m above ice surface

Humidity

Company:	Vaisala
Sensor:	HMP35A
Accuracy:	2% rel. humidity in the range of 0 - 90%
	3% rel. humidity in the range of 90 - 100%
Resolution:	8 bit -> 0.4%
Range:	0 - 102%
Data sampling:	Interval: 200 sec.
Sensor location:	approx. 5 m above ice surface

Wind

Company:	R.M.Young
Sensor:	Wind Monitor-RE
Resolution:	Speed: 8 bit -> 0.16 m/s
	Direction: 8 bit -> 1.406°
Range:	Speed: 0 - 40.8 m/s
	Direction: 0 - 358.53°
Data sampling:	Interval: 200 sec.
Sensor location:	approx. 5 m above ice surface