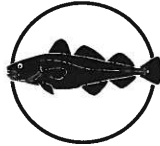


# **The Faroese Fisheries Laboratory**

**Fiskirannsóknarstovan**



## **Traditional Current Measurements on Nordic WOCE ADCP Moorings 1994 - 2000**

**By**

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**Technical Report No.: 00-03**

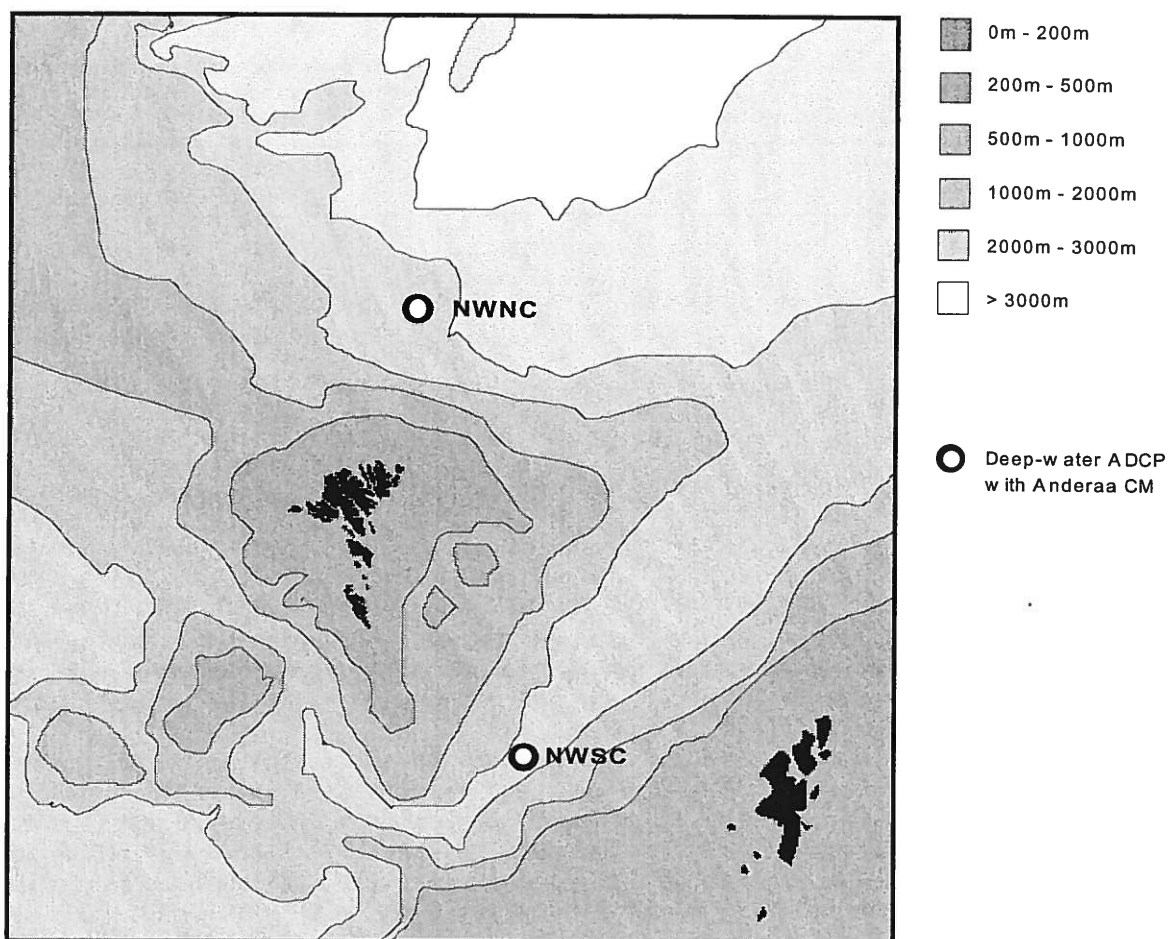
**Tórshavn**

**November 2000**



## Introduction

This report documents 9 Aanderaa Current Meter records associated with ADCP deployments in Faroese waters in 1994 - 2000. The measurements were acquired at 2 standard mooring sites, shown in Figure 1. The deployments are listed in Table 1. Each deployment is identified by an 8-character label where the first four characters indicate the site (Fig. 1) while the last characters show year and month of deployment.



**Figure 1.** Standard ADCP/Aanderaa mooring sites in Faroese waters superposed on a map with the bottom topography. The two sites are indicated by four-letter labels.

As indicated in Figure 1, there are two standard ADCP moorings sites with an Aanderaa Current Meter on the mooring line. The depth of the ADCP's has been quite constant for each deployment, but the depth of the Aanderaa Current Meters has varied in the first years, though it has been almost constant since 1997. For all the deployments the Aanderaa Current Meters have recorded the velocity at 60 minute's intervals. All the Aanderaa Current Meters have recorded speed, direction and temperature, while some also have recorded conductivity and a single Current Meter has recorded turbidity.

## Quality control and calibration

After acquisition, the data series have been calibrated using calibration data from the manufacturer. In the Aanderaa current meter, several speed and compass readings are taken during a sampling interval, while the temperature, conductivity and turbidity readings are taken once at the end of the interval only. At the end of the interval, the instrument stores a vector average of the velocity for the whole sampling interval, as well as the temperature, conductivity and turbidity readings. In the data files, the time of each record is the middle of the speed-averaging

interval. In the calibration procedure the velocity direction has been corrected for magnetic deviation, by adding a constant. The actual correction for each deployment is stored in the header of the data file. The data have been quality controlled by a standard procedure based upon data variation with time in relation to neighbouring values (spikes). The editing has been done manually using an interactive graphical software package developed by the Faroese Fisheries Laboratory (FFL), based upon MATLAB. We have not calibrated salinity and the turbidity is not edited.

**Table 1.** List of Aanderaa Current Meter deployments in the period 1994 - 2000 with information on bottom depth (m), interval (min), duration, Instrument depth (m) and parameters. Possible parameters are temperature (tmp), speed (spd), direction (dir), narrow temperature (Ntmp), salinity (Sal) and turbidity (Turb).

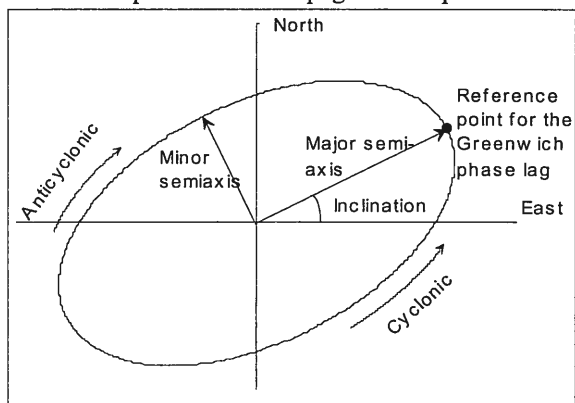
Deployment	Bottom depth	Int. min.	Valid data period	Dur. days	Instr. depth	Parameters
NWNC9410	1730	60	1994 10 22-1995 02 17	118	1678	Tmp, Spd, Dir
NWNC9606	1731	60	1996 06 16-1997 05 22	339	1702	Tmp, Spd, Dir
NWNC9706	1733	60	1997 06 13-1998 06 13	364	716	Tmp, Spd, Dir, Ntmp, Sal
NWNC9907	1740	60	1999 07 02-2000 06 16	349	723	Tmp, Spd, Dir, Ntmp, Sal
NWSC9410	1063	60	1994 10 23-1995 02 20	119	961	Tmp, Spd, Dir
NWSC9511	1063	60	1995 11 10-1996 05 24	195	756	Tmp, Spd, Dir
NWSC9606	1066	60	1996 06 15-1997 05 23	342	759	Tmp, Spd, Dir
NWSC9708	1068	60	1997 08 01-1998 06 15	318	763	Tmp, Spd, Dir, Ntmp, Sal
NWSC9907	1071	60	1999 07 04-2000 06 20	351	764	Tmp, Spd, Dir, Sal, Turb

### Report format

For each deployment, the report contains several pages, beginning with a page that has a drawing of the mooring and details of the deployment. After that there is a text page, which lists metadata information in the header and shows the list of parameters in the data file with a tally of the number of records flagged and not flagged for error in each parameter. Any comments to the data are then listed.

The rest of the text page describes features of the velocity observations in the series. First is shown the residual current, defined as the vectorial average of all non-flagged records. Next are shown the results of tidal analysis on the series which are of sufficient length. The number of records interpolated before the analysis is listed as well the number that could not be interpolated (too large gap). Since all the deployments have 60 minutes intervals all analysis are performed on unfiltered data. 15 of the dominant constituents are listed and for each constituent, amplitude and Greenwich phase lag are shown for the east (E-ampl and E-gpl) and the north (N-ampl and N-gpl) velocity components respectively, followed by the characteristics of the tidal ellipse, its major and minor semi-axes, the inclination (Incl) of the ellipse, its Greenwich phase lag (Grphl), and whether it rotates cyclonically (C) or anticyclonically (A). The definitions of the tidal ellipse parameters are shown in figure 2. The tidal constants were computed by an adapted version of the Foreman FORTRAN package.

Finally, on the text page, is a table listing the directional current distribution as relative numbers of observations in parts per thousand. The table also lists for each direction interval, the relative flux, the average speed and the maximum speed. Then 1-2 pages show plots of the listed parameters as a function of time. Finally, there is a page



showing the progressive vector diagram. For one deployment (NWSC9606) the progressive vector diagram is not included, because of large gaps in the series and for one deployment (NWNC9410) only the first part of the series is included.

**Figure 2.** Parameters of the tidal ellipse for a given constituent. The reference point for the Greenwich phase lag is always chosen to be above the east-west axis.

## Deployment Id: NWNC9410

Project: NORDIC WOCE

Latitude: 63°16.350'N

Longitude: 006°06.300'W

Echo sounding depth: 1775m

Bottom depth corr.: 1730m

Time of deployment: 22/10 -1994 0210UTC

Time of recovery: 17/02 - 1995 1600UTC

### ADCP:

Instrument no.: RDI ADCP 1285

Instrument frequency: 75kHz

Height above bottom: 1114m (corr.)

Depth: 616m (corr.)

Time of first data: 22/10 - 1994 0235UTC

Time of last data: 17/02 - 1995 1455UTC

Sample interval: 5 min

No. of ensembles: 34133

Pings per ens.: 1

Binlength: 25m

Depth of first bin: 586m (corr.)

No. of bins: 30

### Aanderaa:

Instrument no.: RCM8 10067

Height above bottom: 52m (corr.)

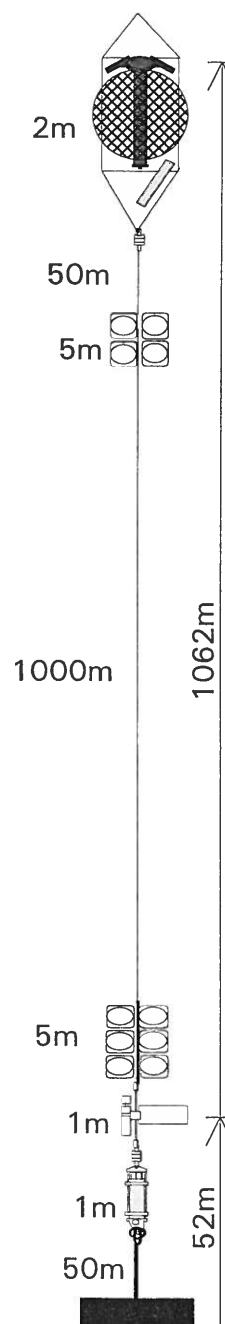
Depth: 1678m (corr.)

Time of first data: 22/10 - 1994 0400UTC

Time of last data: 17/02 - 1995 1400UTC

Sample interval: 60 min

No. of records: 2843



Deployment: NWNC9410 analyzed from beginning to end  
 Instrument no.: 10067  
 Instrument type: Aanderaa  
 Latitude: 63 16.350 N  
 Longitude: 06 06.300 W  
 Bottom depth: 1730  
 Instrument depth: 1678  
 Number of records: 2843  
 Time of first record: 1994 10 22 04 00  
 Time of last record : 1995 02 17 14 00  
 Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	2843	0
Column 8 : Speed	816	2027
Column 9 : Direct	2843	0

Comments  
 -----

Residual current: 30 mm/sec towards: 226 degrees  
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TIDAL ANALYSIS

Error flagged records interpolated for velocity: 0, records not int.: 778  
 Tidal analysis performed on unfiltered data

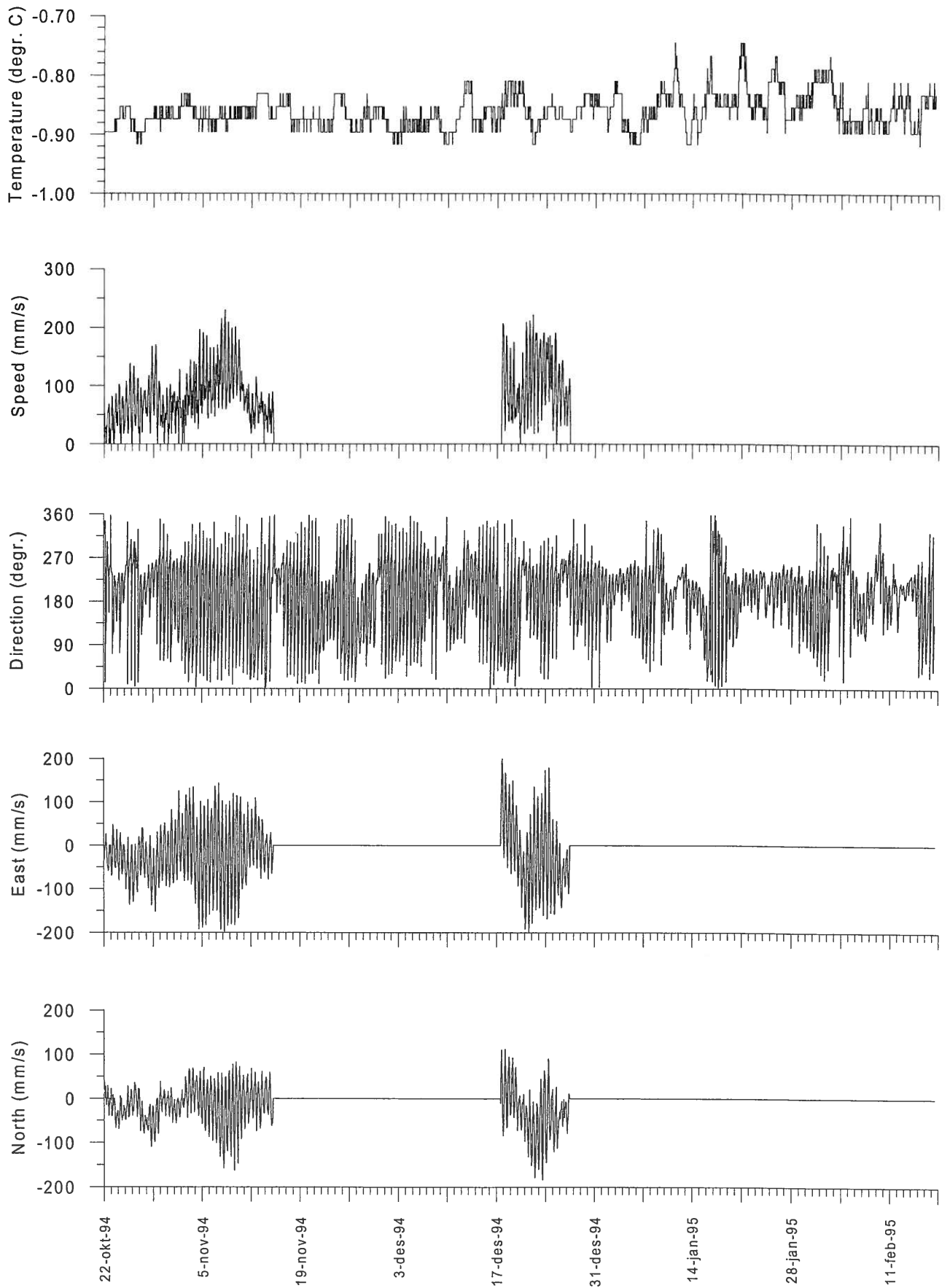
Const	Freq c/hr	E-ampl mm/sec	E-gpl deg	N-ampl mm/sec	N-gpl deg	Major mm/sec	Minor mm/sec	Incl deg	Grphl deg	R
MM	.00151215	21	145	17	130	26	4	39	139	A
MSF	.00282193	28	337	25	332	37	2	42	334	A
Q1	.03721850	3	106	3	243	4	1	135	265	C
O1	.03873065	8	57	3	37	8	1	22	54	A
NO1	.04026859	2	272	3	142	3	2	125	125	A
P1	.04155259	2	290	1	235	2	1	17	284	A I
K1	.04178075	5	306	3	257	5	2	21	299	A
N2	.07899925	34	263	22	174	34	22	1	262	A
M2	.08051140	80	297	40	237	83	33	17	290	A
L2	.08202355	7	49	6	329	7	6	22	32	A
S2	.08333334	29	357	21	306	33	15	31	343	A
K2	.08356149	8	357	6	306	9	4	31	343	A I
MK3	.12229210	1	278	3	161	3	1	98	159	A
M4	.16102280	2	309	3	202	3	2	104	194	A
MS4	.16384470	2	77	0	42	2	0	6	77	A

DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

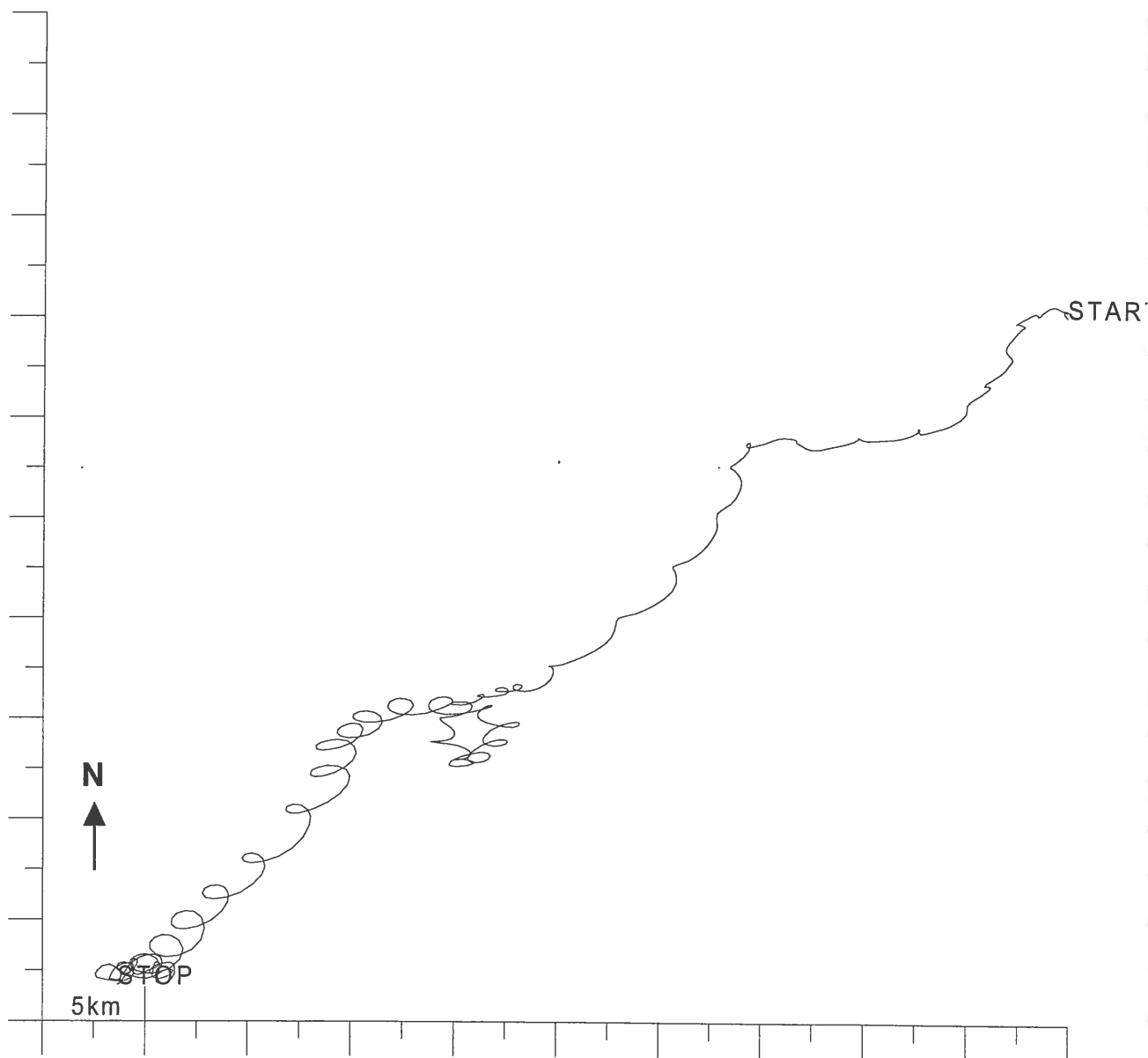
Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	19	11	12	28	19	23	19	29	33	29	15	13	254	254
50 - 100	20	31	34	25	28	22	35	83	89	44	18	7	441	696
100 - 150	0	7	29	19	9	7	13	20	46	19	1	0	175	871
150 - 200	0	8	4	6	4	6	9	30	40	1	0	0	112	984
200 - 300	0	0	2	0	0	0	0	6	7	0	0	0	15	1000
Total (ppt)	40	58	83	79	62	58	78	170	216	94	35	20		
Rel.flux (ppt)	22	61	93	74	53	48	78	195	261	78	21	10		
Avg.spd (mm/s)	47	89	96	79	72	70	85	97	102	70	51	42		
Max.spd (mm/s)	96	188	207	188	180	191	191	230	215	180	104	83		

NWNC9410  
Instrument: Aanderaa 10067



**Progressive vector diagram for the period 22-10-1994 to 15-11-1994**  
**NWNC9410**





**Deployment Id: NWNC9606**

**Project: NORDIC WOCE**

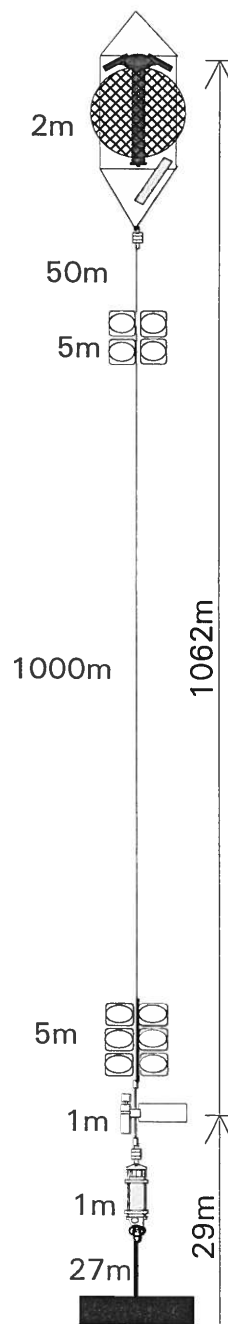
**Latitude:** 63°16.082'N  
**Longitude:** 006°06.509'W  
**Echo sounding depth:** 1777 m  
**Bottom depth corr.:** 1731 m  
**Time of deployment:** 16/06 -1996 2117UTC  
**Time of recovery:** 22/05 - 1997 1841UTC

**ADCP:**

**Instrument no.:** RDI ADCP 1285  
**Instrument frequency:** 75kHz  
**Height above bottom:** 1062 m (corr.)  
**Depth:** 640 m (corr.)  
**Time of first data:** 16/06 - 1996 2200UTC  
**Time of last data:** 22/05 - 1997 1720UTC  
**Sample interval:** 20 min  
**No. of ensembles:** 24467  
**Pings per ens.:** 1  
**Binlength:** 25m  
**Depth of first bin:** 604m (corr.)  
**No. of bins:** 28

**Aanderaa:**

**Instrument no.:** RCM8 10069  
**Height above bottom:** 29 m  
**Depth:** 1702 m (corr.)  
**Time of first data:** 16/06 - 1996 2300UTC  
**Time of last data:** 22/05 - 1997 1700UTC  
**Sample interval:** 60 min  
**No. of records:** 8155



Deployment: NWNC9606 analyzed from beginning to end  
Instrument no.: 10069  
Instrument type: Aanderaa  
Latitude: 63 16.082 N  
Longitude: 06 06.509 W  
Bottom depth: 1731  
Instrument depth: 1702  
Number of records: 8155  
Time of first record: 1996 06 16 23 00  
Time of last record : 1997 05 22 17 00  
Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	8155	0
Column 8 : Speed	8155	0
Column 9 : Direct	8155	0

Comments  
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Residual current: 28 mm/sec towards: 205 degrees  
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TIDAL ANALYSIS

Error flagged records interpolated for velocity: 0, records not int.: 0  
Tidal analysis performed on unfiltered data

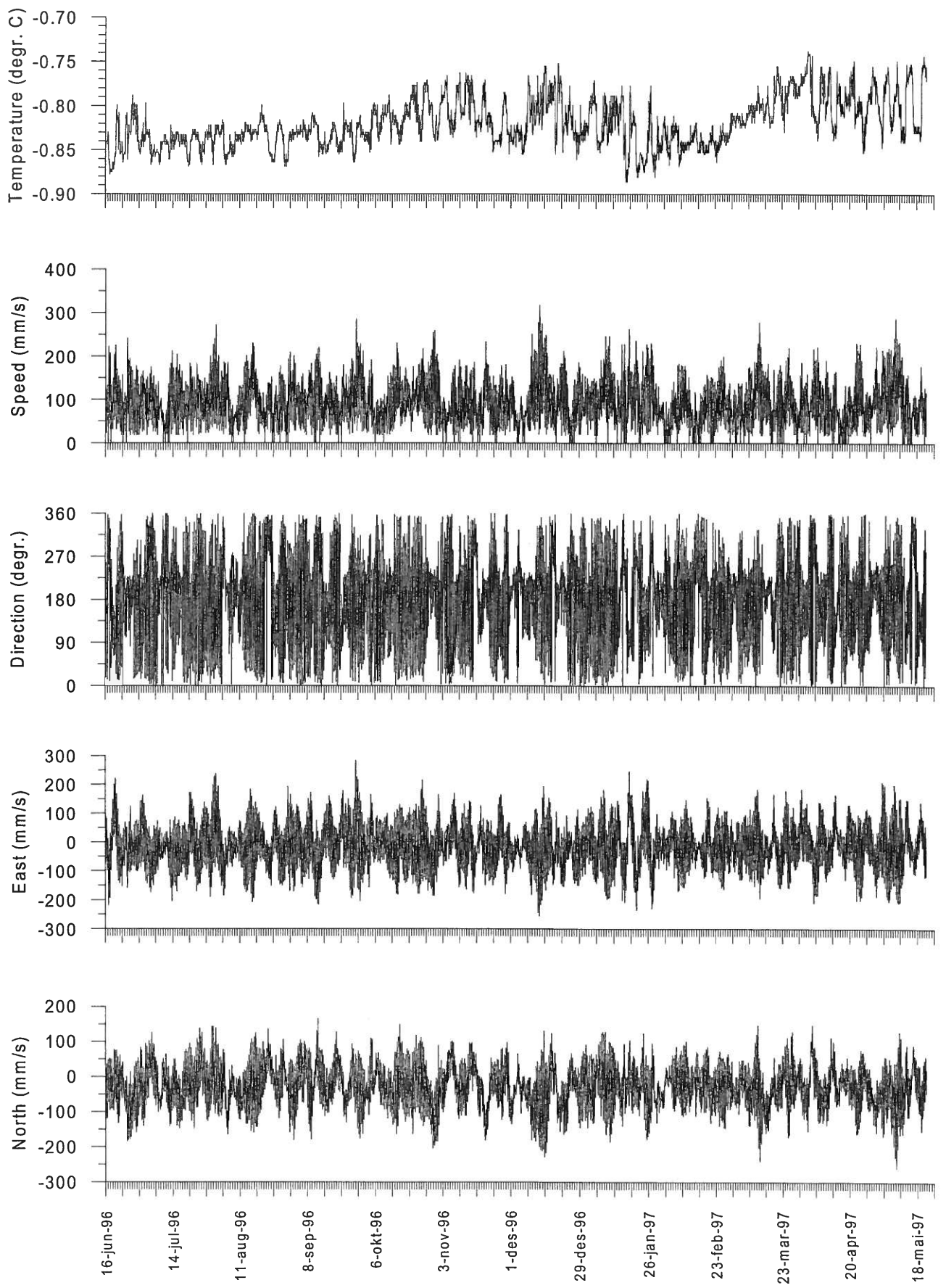
Const	Freq c/hr	E-ampl mm/sec	E-gpl deg	N-ampl mm/sec	N-gpl deg	Major mm/sec	Minor mm/sec	Incl deg	Grphl deg	R
MM	.00151215	4	279	8	303	9	2	64	298	C
MSF	.00282193	3	197	4	217	5	1	49	208	C
Q1	.03721850	4	41	3	57	5	1	36	46	C
O1	.03873065	6	56	2	71	6	0	17	58	C
NO1	.04026859	1	116	0	244	1	0	160	288	C
P1	.04155259	2	323	0	323	2	0	12	323	A
K1	.04178075	5	289	2	261	6	1	19	286	A
N2	.07899925	12	258	5	224	13	3	19	254	A
M2	.08051140	79	294	51	247	87	34	28	283	A
L2	.08202355	2	28	2	345	3	1	59	358	A
S2	.08333334	23	346	20	308	29	10	39	331	A
K2	.08356149	8	314	5	265	9	3	27	303	A
MK3	.12229210	1	66	0	41	1	0	31	59	A
M4	.16102280	1	28	1	255	2	1	130	235	A
MS4	.16384470	1	44	0	37	1	0	29	42	A

DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

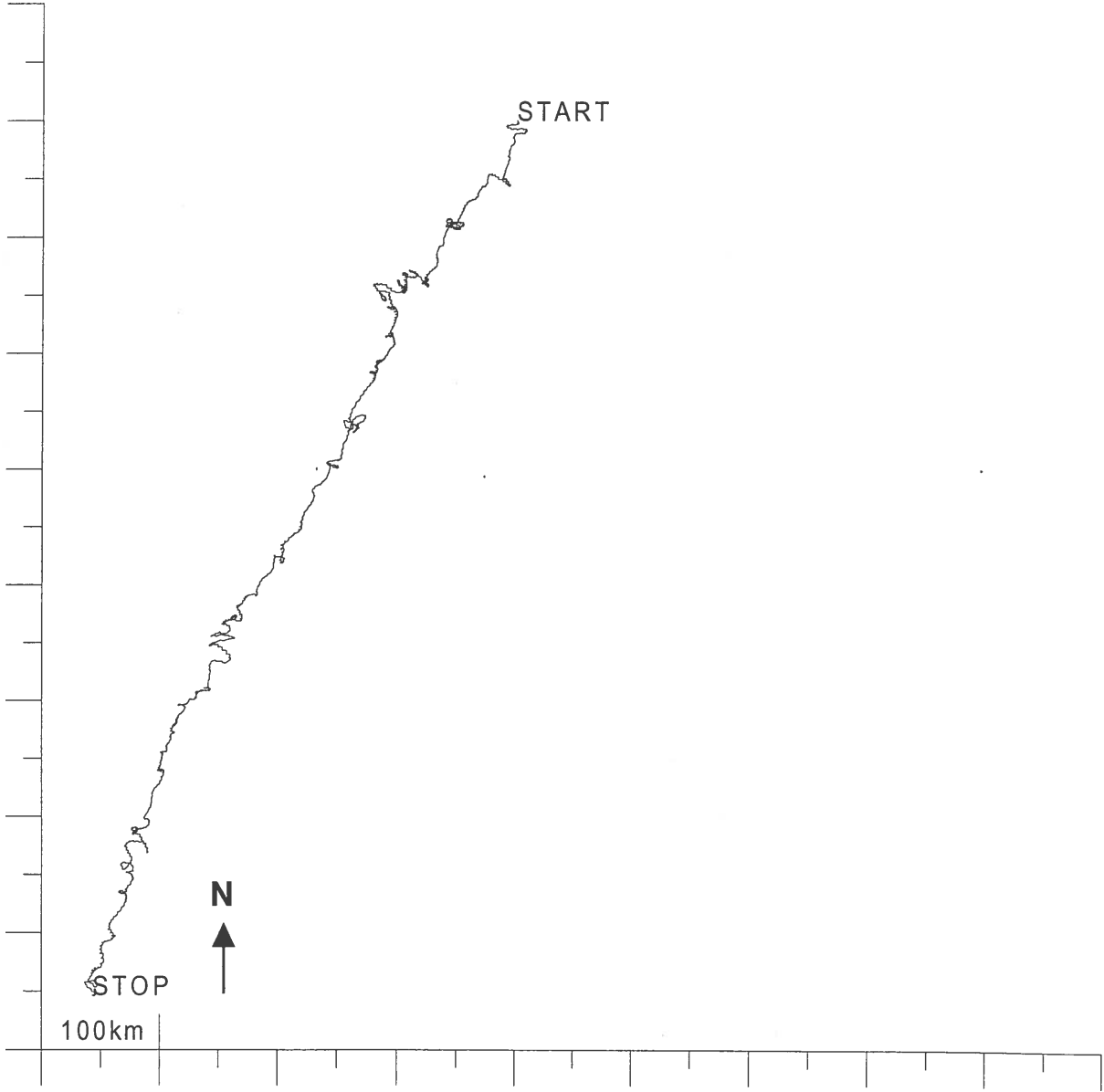
Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	18	16	16	19	17	14	17	19	19	13	11	12	197	197
50 - 100	23	30	39	37	33	37	49	58	42	29	20	17	421	619
100 - 150	6	18	23	20	13	16	35	58	37	16	5	2	256	875
150 - 200	0	4	10	6	2	3	13	32	20	4	0	0	99	974
200 - 300	0	0	3	1	0	0	2	11	5	0	0	0	25	999
300 - 400	0	0	0	0	0	0	0	0	0	0	0	0	0	1000
Total (ppt)	48	71	93	85	68	72	118	179	125	64	38	33		
Rel.flux (ppt)	33	66	97	79	55	64	125	222	143	60	28	22		
Avg.spd (mm/s)	62	85	95	84	75	81	97	113	104	85	67	60		
Max.spd (mm/s)	167	272	262	285	225	238	275	317	278	230	167	157		

NWNC9606  
Instrument: Aanderaa 10069



**Progressive vector diagram  
NWNC9606**



## Deployment Id: NWNC9706

**Latitude:** 63°16.425'N

**Longitude:** 006°06.600'W

**Echo sounding depth:** 1770 m

**Bottom depth corr.:** 1733m

**Time of deployment:** 13/06 -1997 1300UTC

**Time of recovery:** 13/06 - 1998 0530UTC

### ADCP:

**Instrument no.:** RDI ADCP 1285

**Instrument frequency:** 75kHz

**Height above bottom:** 1074 m

**Depth:** 659m (corr.)

**Time of first data:** 13/06 – 1997 1340UTC

**Time of last data:** 13/06 – 1998 0440UTC

**Sample interval:** 20 min

**No. of ensembles:** 26254

**Pings per ens.:** 1

**Binlength:** 25 m

**Depth of first bin:** 623 m (corr.)

**No. of bins:** 28

### Aanderaa:

**Instrument no.:** RCM8 10069

**Height above bottom:** 1017 m

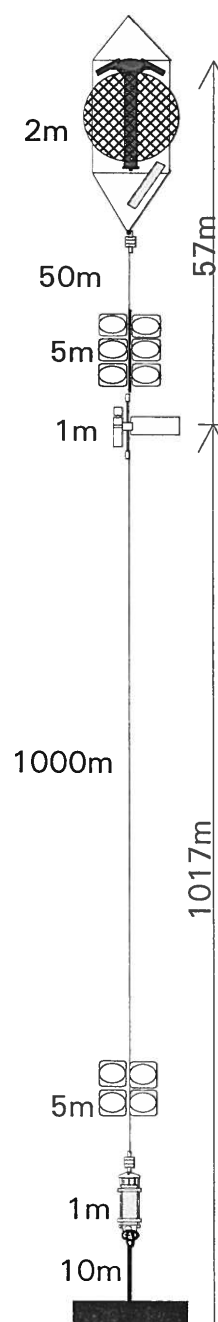
**Depth:** 716m (corr.)

**Time of first data:** 13/06 – 1997 1430 UTC

**Time of last data:** 13/06 – 1998 0330 UTC

**Sample interval:** 60 min

**No. of records:** 8750



Deployment: NWNC9706 analyzed from beginning to end  
 Instrument no.: 10069  
 Instrument type: Aanderaa  
 Latitude: 63 16.425 N  
 Longitude: 06 06.600 W  
 Bottom depth: 1733  
 Instrument depth: 716  
 Number of records: 8750  
 Time of first record: 1997 06 13 14 30  
 Time of last record : 1998 06 13 03 30  
 Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	8750	0
Column 8 : Speed	3337	5413
Column 9 : Direct	8750	0
Column 10 : Salt	8750	0
Column 11 : N-temp	8750	0

Comments

The instrument has two temperature readouts. One Low range (-5 to +11 degr. C) placed in column 7 and one Narrow range (-1.4 to +1.4 degr. C) placed in column 11. The Narrow range temperature is used for the salinity calculations. Salinity is not calibrated and absolute values are not reliable.

Residual current: 11 mm/sec towards: 173 degrees

TIDAL ANALYSIS

Error flagged records interpolated for velocity: 0, records not int.: 0  
 Tidal analysis performed on unfiltered data

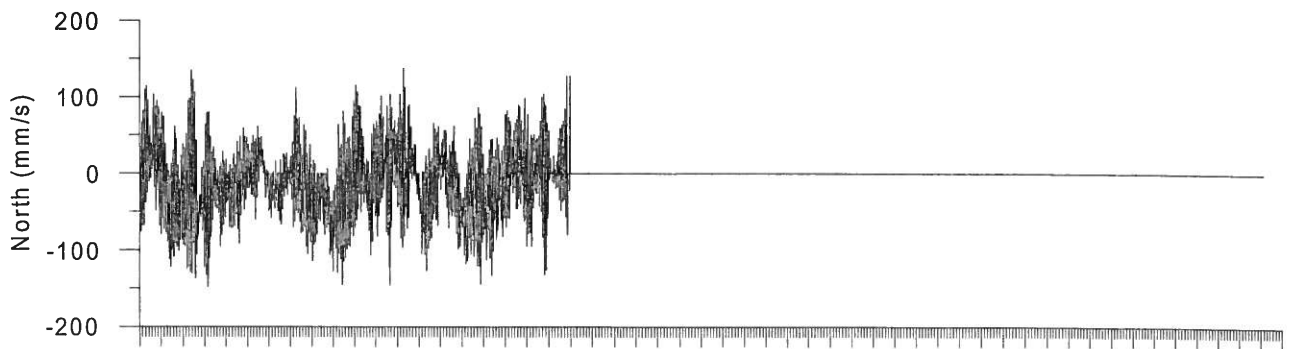
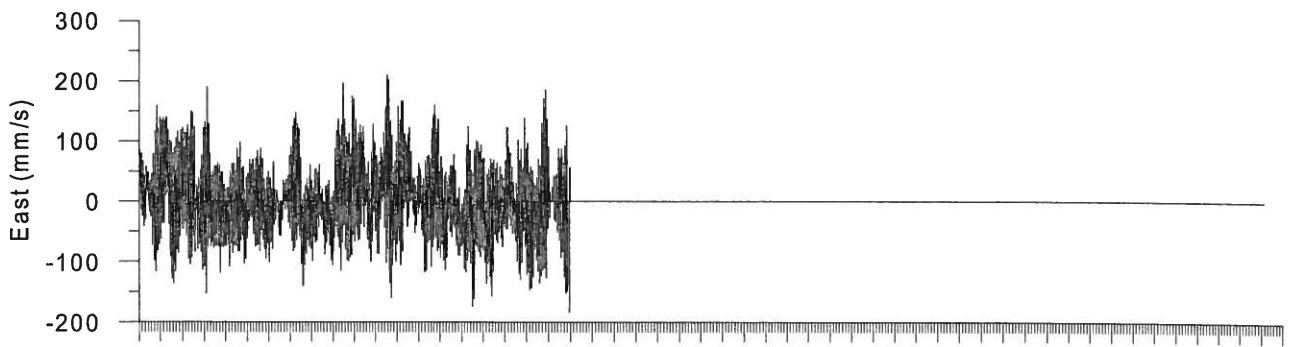
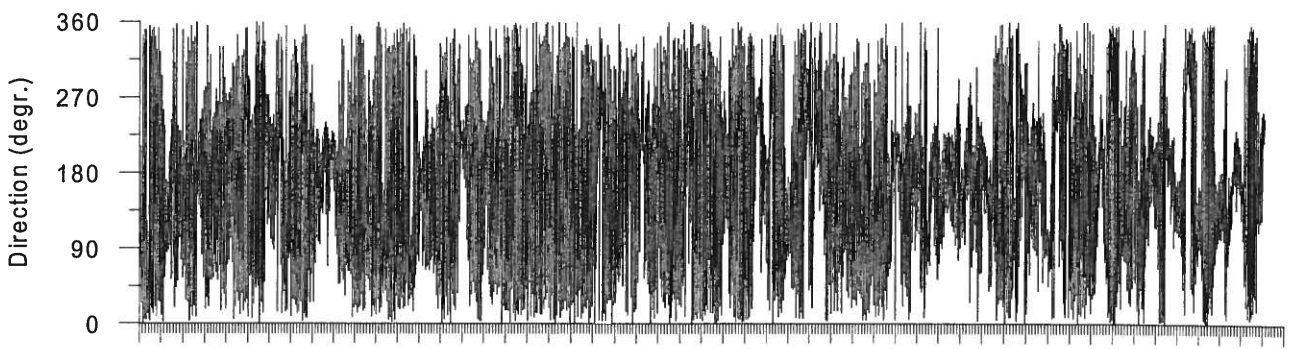
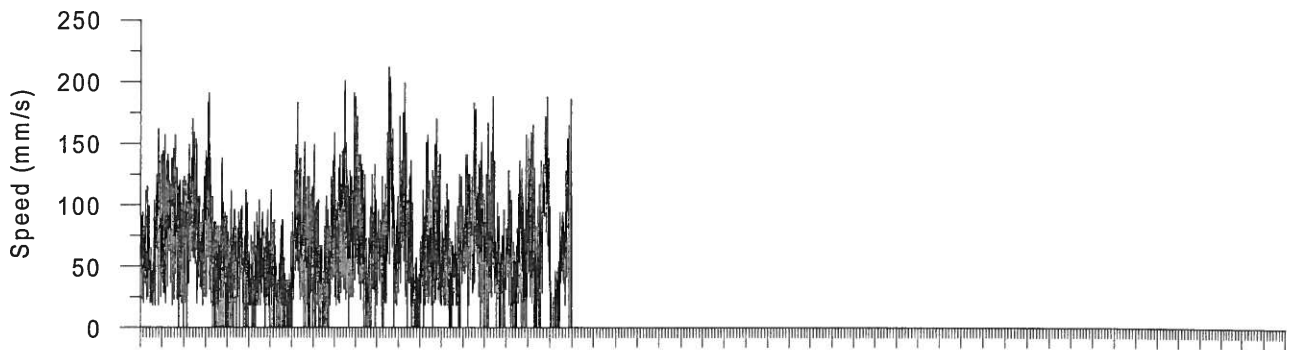
Const	Freq c/hr	E-ampl mm/sec	E-gpl deg	N-ampl mm/sec	N-gpl deg	Major mm/sec	Minor mm/sec	Incl deg	Grphl deg	R
MM	.00151215	3	351	1	139	4	1	159	166	C
MSF	.00282193	2	351	4	29	4	1	58	18	C
Q1	.03721850	4	29	1	359	4	0	8	29	A
O1	.03873065	5	44	1	100	5	1	6	45	C
NO1	.04026859	1	288	1	207	1	1	9	282	A
P1	.04155259	2	263	0	226	2	0	15	260	A
K1	.04178075	4	279	2	248	5	1	20	275	A
N2	.07899925	8	275	8	277	11	0	46	276	C
M2	.08051140	60	285	36	245	67	21	28	275	A
L2	.08202355	7	288	7	202	7	7	21	269	A
S2	.08333334	22	317	13	279	24	7	29	308	A
K2	.08356149	6	317	4	279	7	2	29	308	A
MK3	.12229210	1	319	1	213	1	1	166	147	A
M4	.16102280	1	266	1	222	2	1	48	242	A
MS4	.16384470	1	300	1	219	1	1	27	277	A

DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

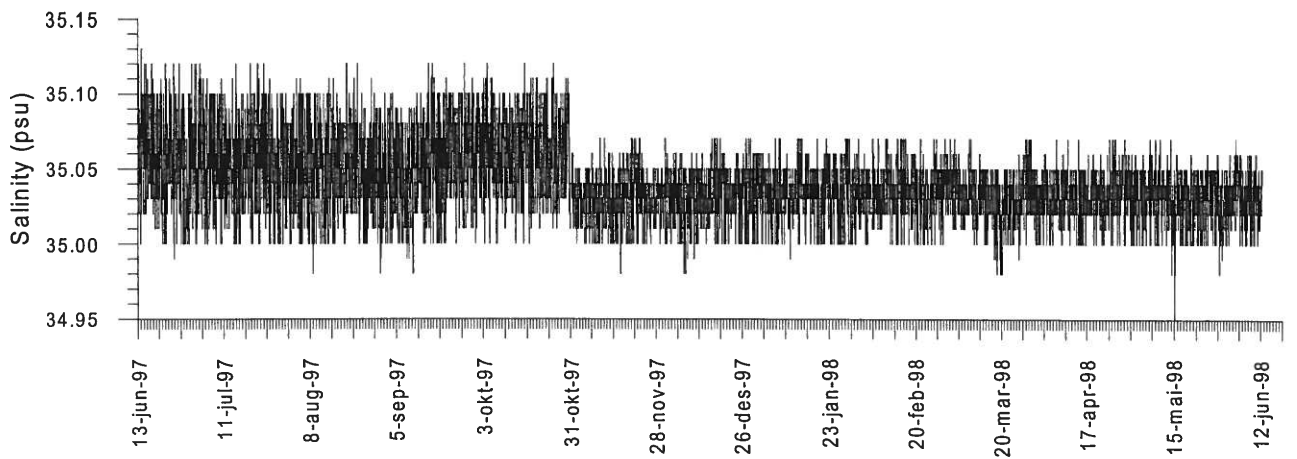
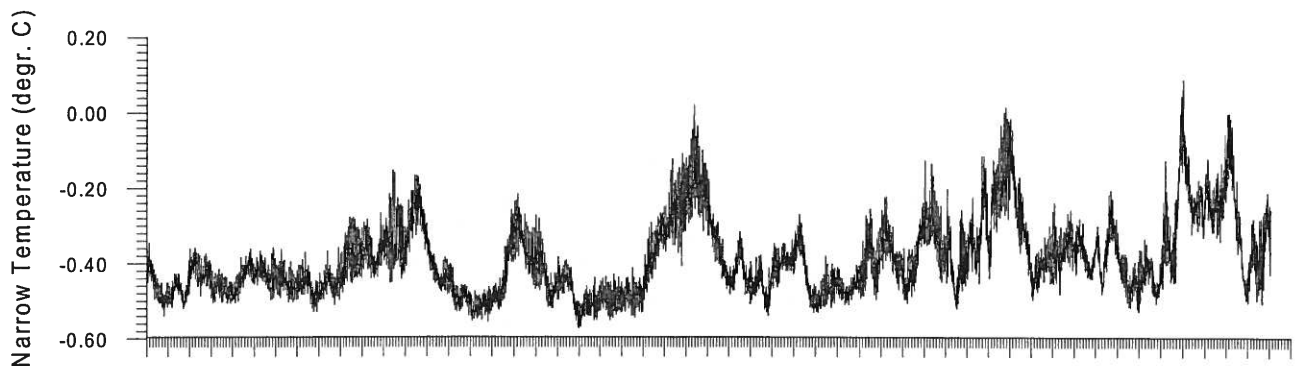
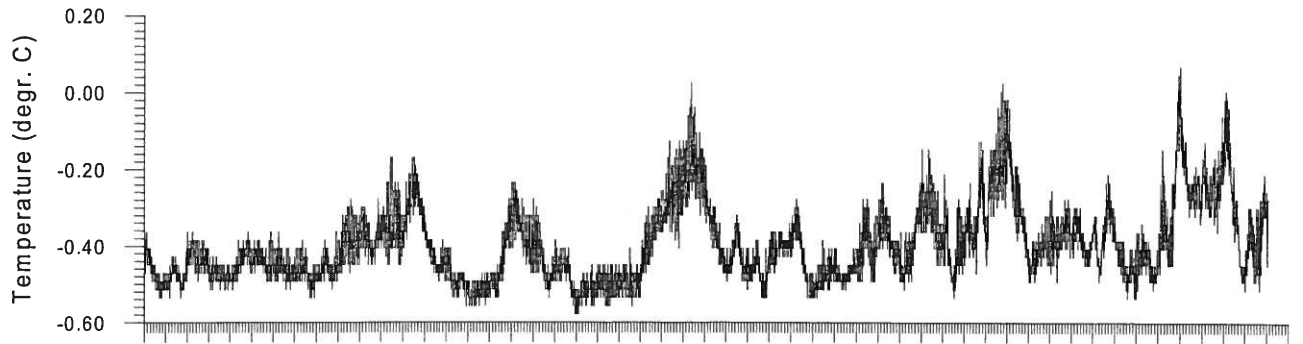
Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	25	35	37	34	26	33	27	34	40	28	20	19	364	364
50 - 100	23	41	54	31	26	30	50	71	59	25	11	12	438	802
100 - 150	3	20	32	14	5	4	19	39	22	5	2	1	171	974
150 - 200	0	5	7	2	0	0	0	5	2	0	0	0	24	998
200 - 300	0	0	0	0	0	0	0	0	0	0	0	0	1	1000
Total (ppt)	53	102	132	83	58	68	98	151	125	59	34	33		
Rel. flux (ppt)	41	109	155	82	48	54	104	179	128	48	24	22		
Avg. spd (mm/s)	53	71	78	66	55	53	71	79	68	54	46	44		
Max. spd (mm/s)	133	199	212	204	180	144	154	188	183	154	128	117		

NWNC9706  
Instrument: Aanderaa 10069



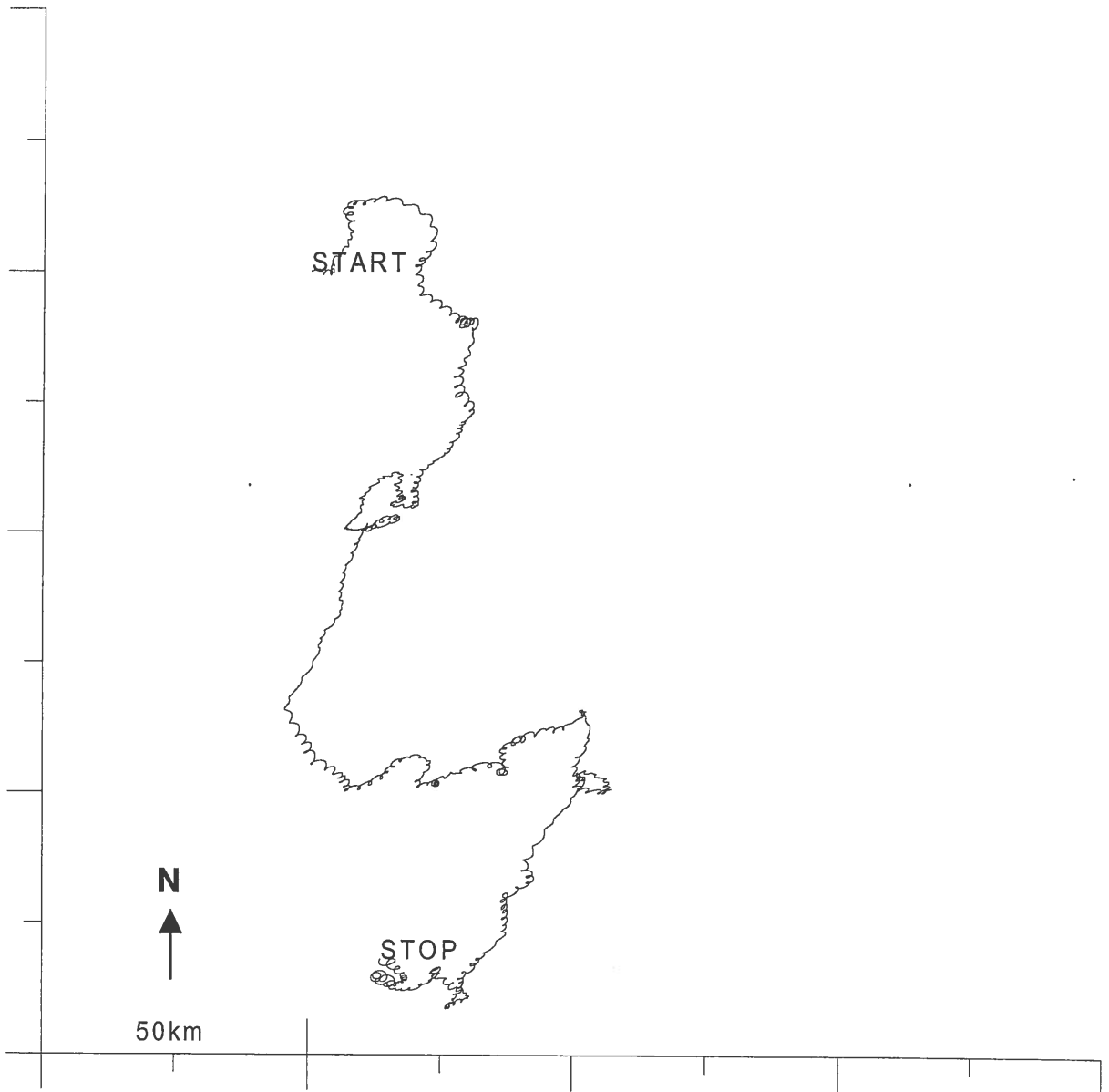
13-jun-97 11-jul-97 8-aug-97 5-sep-97 3-okt-97 31-okt-97 28-nov-97 26-des-97 23-jan-98 20-feb-98 20-mar-98 17-apr-98 15-mai-98 12-jun-98

NWNC9706  
Instrument: Aanderaa 10069





**Progressive vector diagram**  
**NWNC9706**



## **Deployment Id: NWNC9907**

**Latitude:** 63°15.920'N

**Longitude:** 006°06.390'W

**Echo sounding depth:** 1775 m

**Bottom depth corr.:** 1740m

**Time of deployment:** 02/07 -1999 0945UTC

**Time of recovery:** 16/06 - 2000 0825UTC

### **ADCP:**

**Instrument no.:** RDI ADCP 1292

**Instrument frequency:** 75kHz

**Height above bottom:** 1073 m

**Depth:** 667m (corr.)

**Time of first data:** 02/07 – 1999 1020UTC

**Time of last data:** 16/06 – 2000 0720UTC

**Sample interval:** 20 min

**No. of ensembles:** 25192

**Pings per ens.:** 1

**Binlength:** 25 m

**Depth of first bin:** 631 m (corr.)

**No. of bins:** 23

### **Aanderaa:**

**Instrument no.:** RCM8 9912

**Height above bottom:** 1017 m

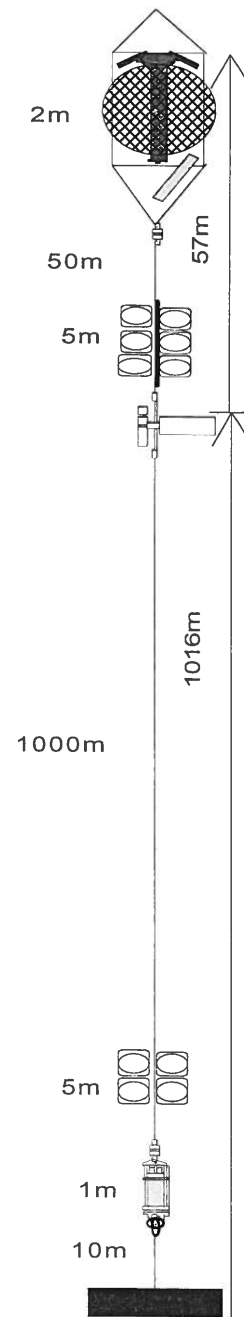
**Depth:** 723m (corr.)

**Time of first data:** 02/07 – 1999 1029 UTC

**Time of last data:** 16/06 – 2000 0629 UTC

**Sample interval:** 60 min

**No. of records:** 8397



Deployment: NWNC9907 analyzed from beginning to end  
Instrument no.: 9912  
Instrument type: Aanderaa  
Latitude: 63 15.920 N  
Longitude: 06 06.390 W  
Bottom depth: 1740  
Instrument depth: 723  
Number of records: 8397  
Time of first record: 1999 07 02 10 29  
Time of last record : 2000 06 16 06 29  
Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	8397	0
Column 8 : Speed	8397	0
Column 9 : Direct	8397	0
Column 10 : Salt	8396	1
Column 11 : N-temp	8397	0

Comments

The instrument has two temperature readouts. One Low range (-5 to +11 degr. C) placed in column 7 and one Narrow range (-1.4 to +1.4 degr. C) placed in column 11.

The Narrow range temperature is used for the salinity calculations.

Salinity is not calibrated and absolute values are not reliable.

The time-tag clock in the instrument is drifting slightly so the actual time for the last record is 2000 06 16 06 48.

Residual current: 21 mm/sec towards: 172 degrees

TIDAL ANALYSIS

Error flagged records interpolated for velocity: 0, records not int.: 0  
Tidal analysis performed on unfiltered data

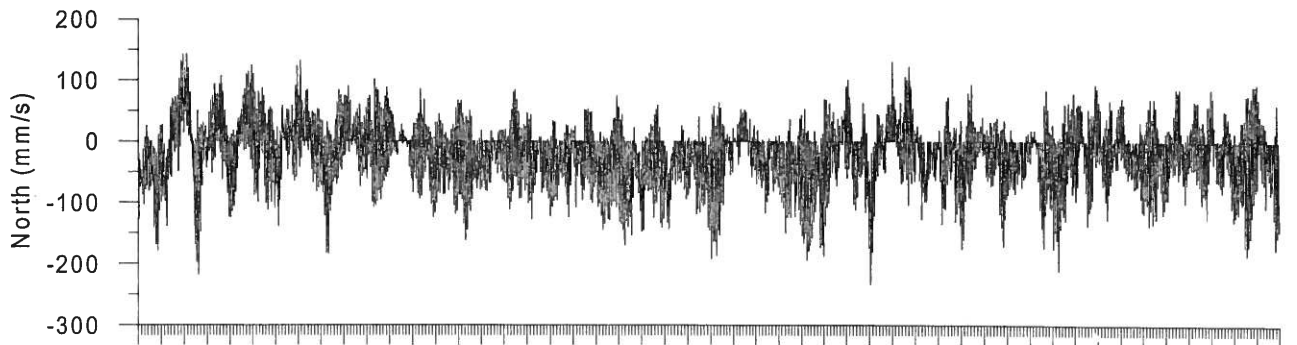
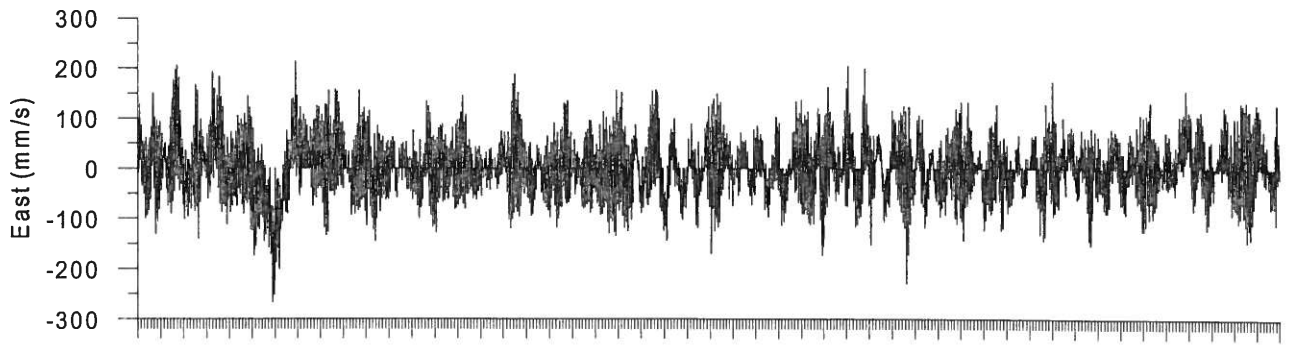
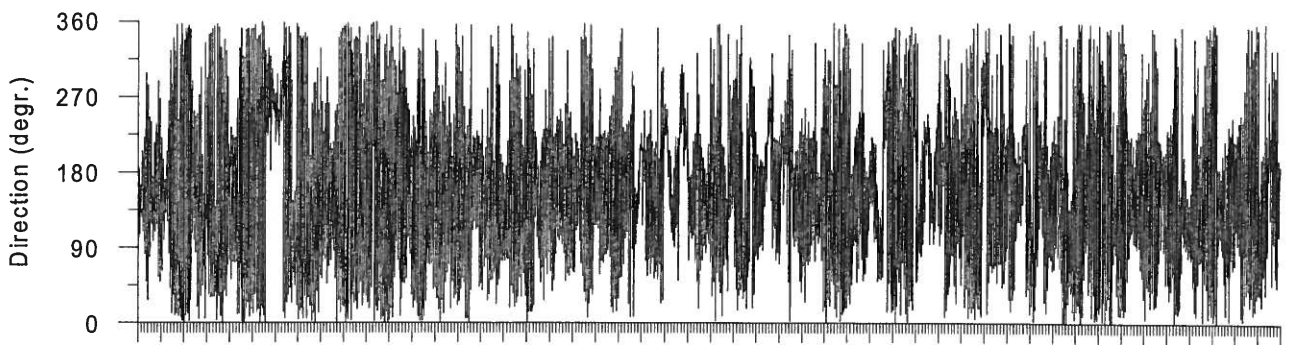
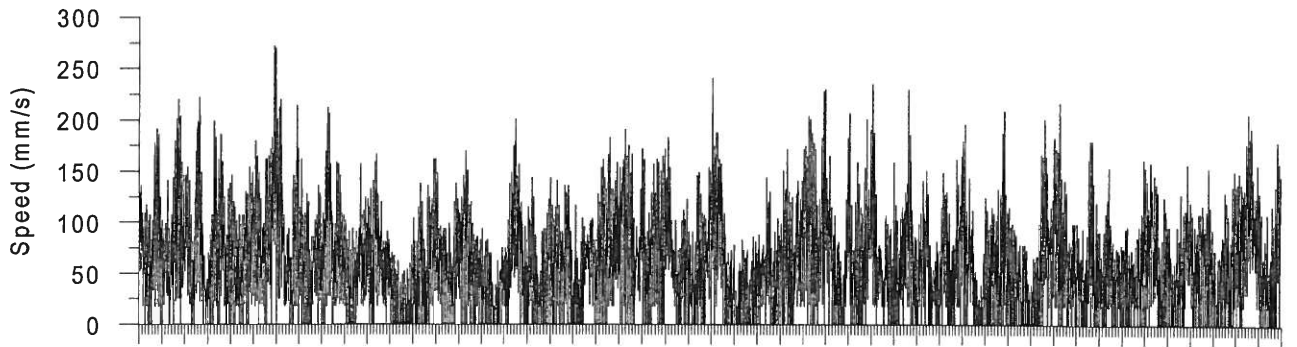
Const	Freq c/hr	E-ampl mm/sec	E-gpl deg	N-ampl mm/sec	N-gpl deg	Major mm/sec	Minor mm/sec	Incl deg	Grphl deg	R
MM	.00151215	4	231	6	156	6	4	72	168	A
MSF	.00282193	2	268	7	274	8	0	73	273	C
Q1	.03721850	3	27	2	345	4	1	21	21	A
O1	.03873065	5	39	2	54	5	0	17	40	C
NO1	.04026859	2	303	1	326	2	0	25	307	C
P1	.04155259	1	296	1	257	1	0	21	290	A
K1	.04178075	5	274	1	218	5	1	8	272	A
N2	.07899925	12	266	10	231	15	5	38	252	A
M2	.08051140	50	288	38	254	61	18	36	276	A
L2	.08202355	2	291	2	236	2	1	46	262	A
S2	.08333334	15	329	14	307	20	4	42	319	A
K2	.08356149	3	310	2	321	4	0	39	314	C
MK3	.12229210	0	215	0	73	0	0	146	48	A
M4	.16102280	1	128	3	7	3	1	98	6	A
MS4	.16384470	1	193	2	48	2	0	109	44	A

DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

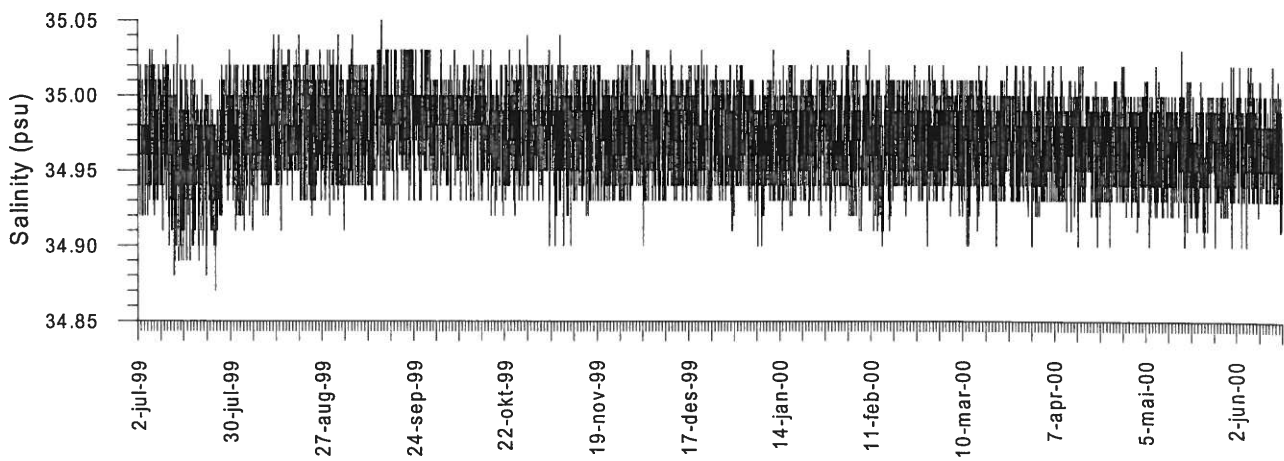
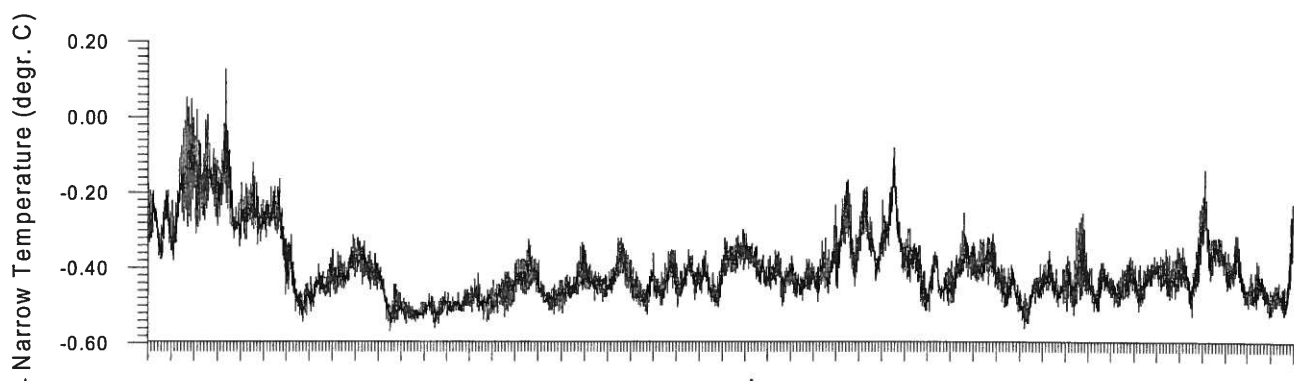
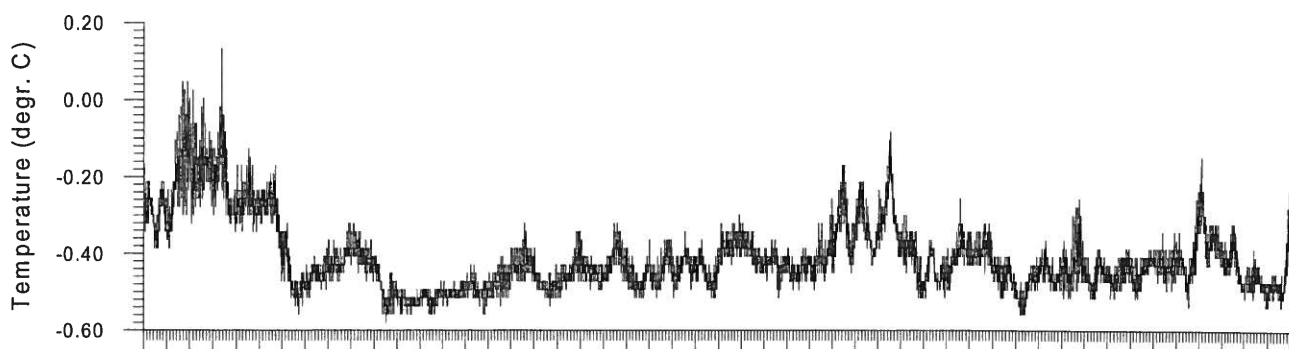
Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	25	36	47	52	50	40	44	40	32	22	16	15	426	426
50 - 100	15	31	50	43	29	35	55	66	30	12	7	6	385	811
100 - 150	2	10	23	13	6	9	25	38	9	2	1	1	144	956
150 - 200	0	1	5	1	0	1	10	12	2	0	0	0	37	993
200 - 300	0	0	1	0	0	0	1	1	2	0	0	0	6	1000
Total (ppt)	43	80	126	111	87	88	137	160	77	37	25	24		
Rel.flux (ppt)	30	75	138	99	65	80	164	210	78	26	16	14		
Avg.spd (mm/s)	43	58	67	55	46	56	74	82	63	43	40	37		
Max.spd (mm/s)	146	201	220	199	196	235	235	241	272	188	146	154		

NWNC9907  
Instrument: Aanderaa 9912

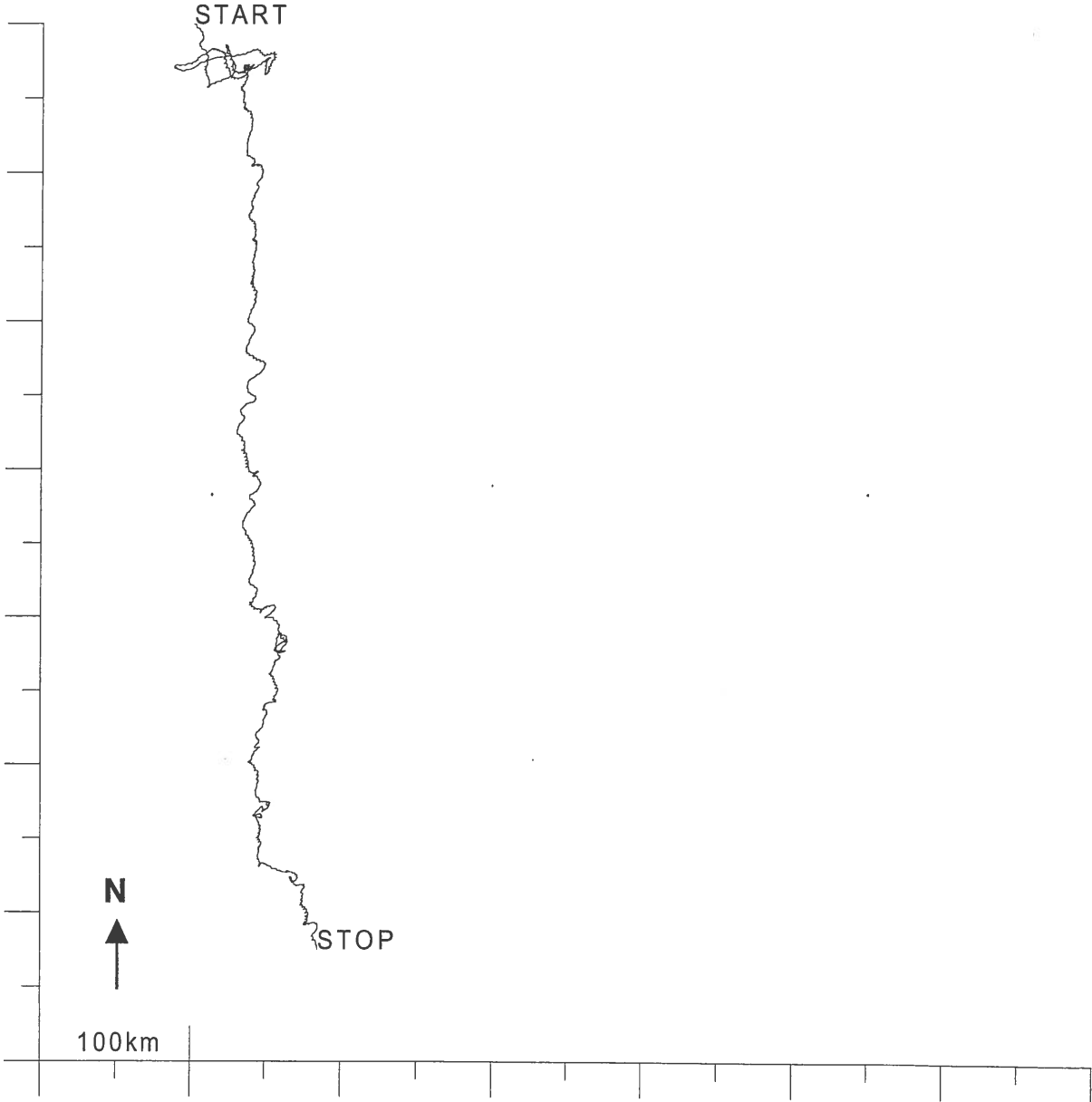


2-jul-99 30-jul-99 27-aug-99 24-sep-99 22-okt-99 19-nov-99 17-des-99 14-jan-00 11-feb-00 10-mar-00 7-apr-00 5-mai-00 2-jun-00

NWNC9907  
Instrument: Aanderaa 9912



**Progressive vector diagram  
NWNC9907**



**Deployment Id: NWSC9410**

**Project: NORDIC WOCE**

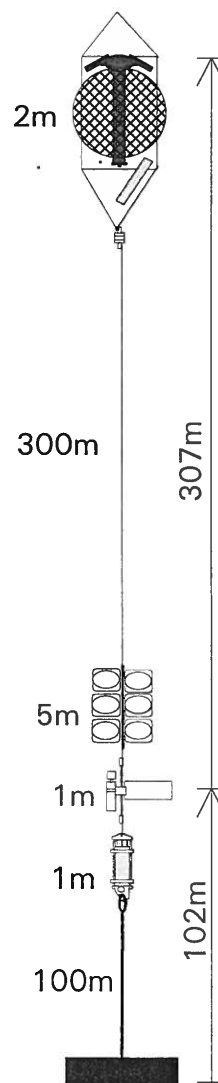
**Latitude:** 60°34.072'N  
**Longitude:** 004°45.896'W  
**Echo sounding depth:** 1086m  
**Bottom depth corr.:** 1063m  
**Time of deployment:** 23/10 -1994 1325UTC  
**Time of recovery:** 20/02 - 1995 1245UTC

**ADCP:**

**Instrument no.:** RDI ADCP 1284  
**Instrument frequency:** 75kHz  
**Height above bottom:** 409m (corr.)  
**Depth:** 654m (corr.)  
**Time of first data:** 23/10 - 1994 1335UTC  
**Time of last data:** 20/02 - 1995 1150UTC  
**Interval:** 5 min  
**No. of ensembles:** 34540  
**Pings per ens.:** 1  
**Binlength:** 25m  
**Depth of first bin:** 624m (corr.)  
**No. of bins:** 30

**Aanderaa:**

**Instrument no.:** RCM8 10069  
**Height above bottom:** 102m  
**Depth:** 961m (corr.)  
**Time of first data:** 23/10 -1994 1500UTC  
**Time of last data:** 20/02 -1995 1100UTC  
**Sample interval:** 60 min  
**No. of records:** 2877



Deployment: NWSC9410 analyzed from beginning to end  
 Instrument no.: 10069  
 Instrument type: Aanderaa  
 Latitude: 60 34.072 N  
 Longitude: 04 45.896 W  
 Bottom depth: 1063  
 Instrument depth: 961  
 Number of records: 2877  
 Time of first record: 1994 10 23 15 00  
 Time of last record : 1995 02 20 11 00  
 Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	2877	0
Column 8 : Speed	2877	0
Column 9 : Direct	2877	0

Comments

Residual current: 8 mm/sec towards: 198 degrees

TIDAL ANALYSIS

Error flagged records interpolated for velocity: 0, records not int.: 0  
 Tidal analysis performed on unfiltered data

Const	Freq c/hr	E-ampl mm/sec	E-gpl deg	N-ampl mm/sec	N-gpl deg	Major mm/sec	Minor mm/sec	Incl deg	Grphl deg	R
MM	.00151215	10	223	6	98	11	5	156	54	A
MSF	.00282193	23	69	19	349	23	18	21	53	A
Q1	.03721850	5	323	4	337	6	1	37	328	C
O1	.03873065	11	29	10	61	14	4	41	43	C
NO1	.04026859	4	141	3	167	5	1	34	149	C
P1	.04155259	2	224	1	238	2	0	34	228	C I
K1	.04178075	5	238	4	251	7	1	38	243	C
N2	.07899925	37	221	11	211	38	2	16	220	A
M2	.08051140	156	262	72	257	172	5	25	261	A
L2	.08202355	2	271	2	1	2	2	86	358	C
S2	.08333334	51	304	39	305	64	0	37	305	C
K2	.08356149	14	304	10	305	17	0	37	305	C I
MK3	.12229210	1	340	0	343	1	0	15	341	C
M4	.16102280	2	230	4	154	4	2	82	157	A
MS4	.16384470	0	333	2	196	2	0	91	196	A

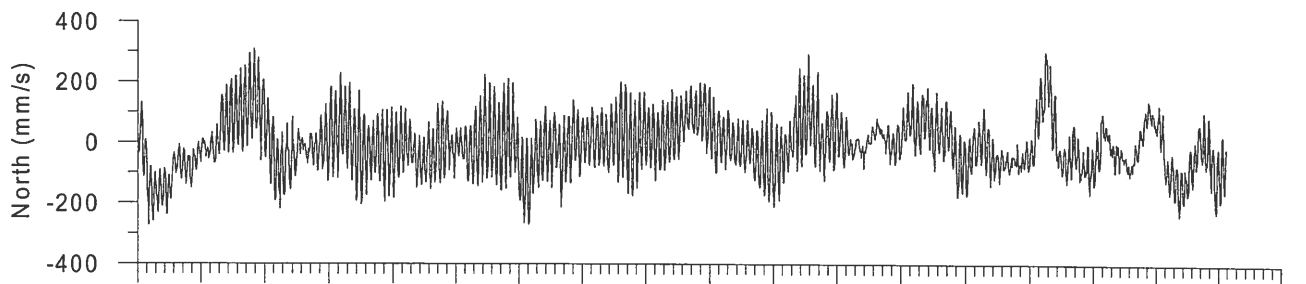
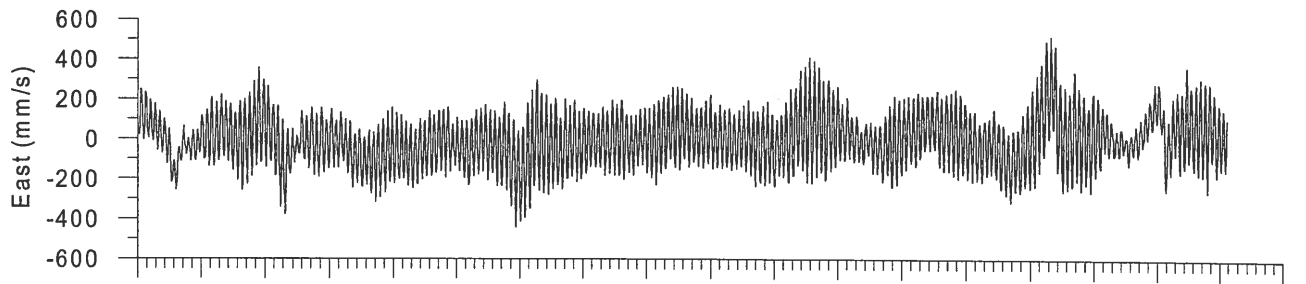
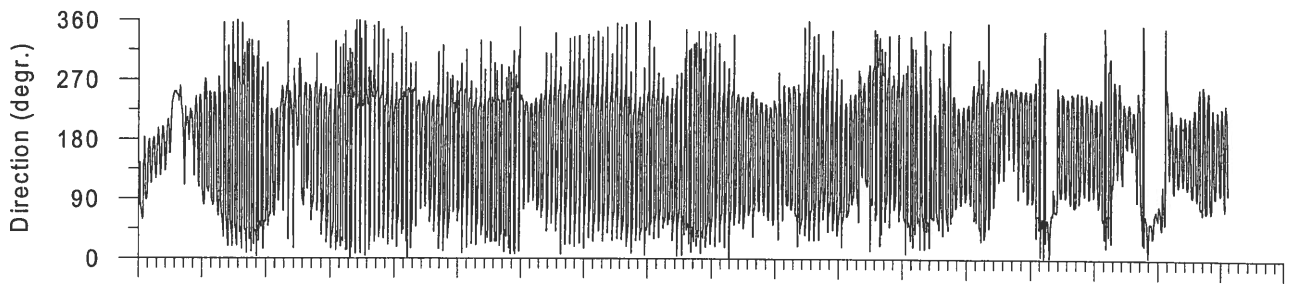
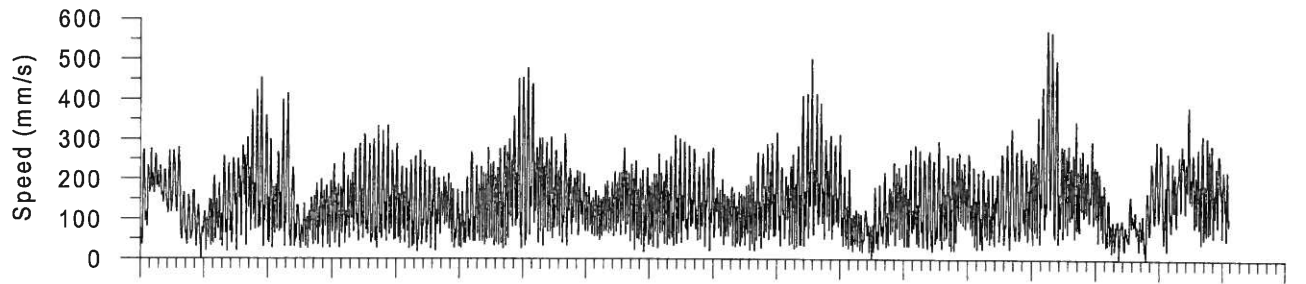
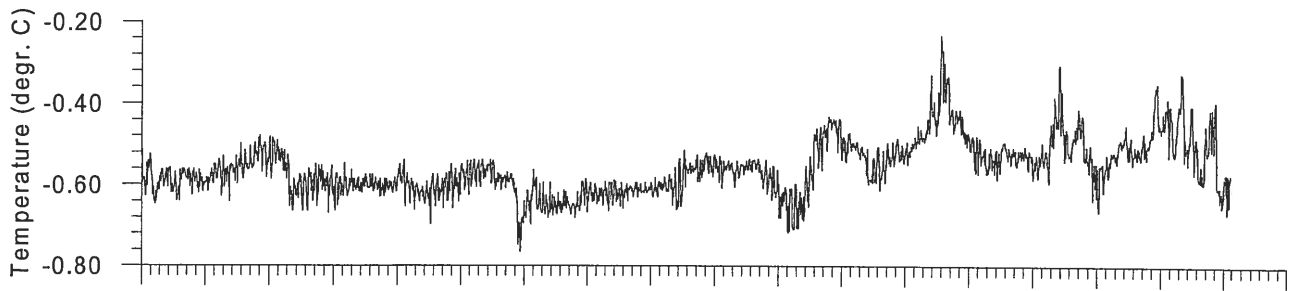
DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	5	6	8	9	8	5	7	6	10	8	6	4	88	88
50 - 100	17	21	22	21	17	16	18	27	30	23	12	9	238	327
100 - 150	12	29	36	18	8	8	10	36	48	15	3	3	232	559
150 - 200	7	30	31	8	4	4	8	33	50	7	0	1	188	748
200 - 300	5	44	37	13	1	3	6	47	51	2	0	0	214	962
300 - 400	0	7	5	1	0	0	0	5	4	0	0	0	24	986
400 - 500	0	4	2	0	0	0	0	1	2	0	0	0	10	997
500 - 600	0	1	0	0	0	0	0	0	0	0	0	0	2	1000
Total (ppt)	48	146	146	72	39	38	52	159	197	56	22	19		
Rel.flux (ppt)	38	180	166	61	24	27	40	180	218	38	10	10		
Avg.spd (mm/s)	118	183	169	125	91	106	115	168	164	102	71	80		
Max.spd (mm/s)	291	572	569	383	251	275	270	477	453	225	159	201		



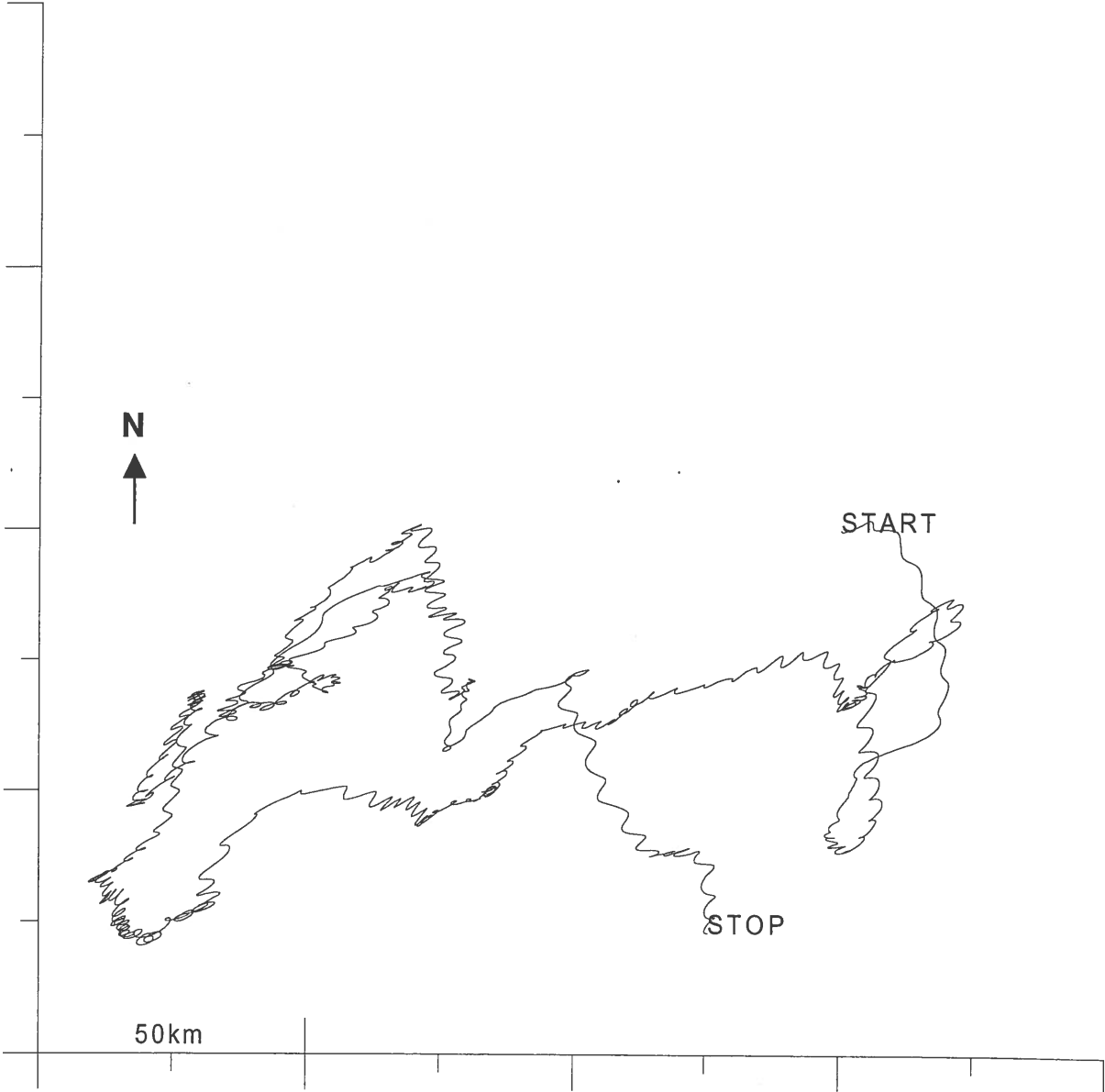
NWSC9410  
Instrument: Aanderaa 10069



23-okt-94 6-nov-94 20-nov-94 4-des-94 18-des-94 1-jan-95 15-jan-95 29-jan-95 12-feb-95 26-feb-95

**Progressive vector diagram**

**NWSC9410**



**Deployment Id: NWSC9511**

**Project: NORDIC WOCE**

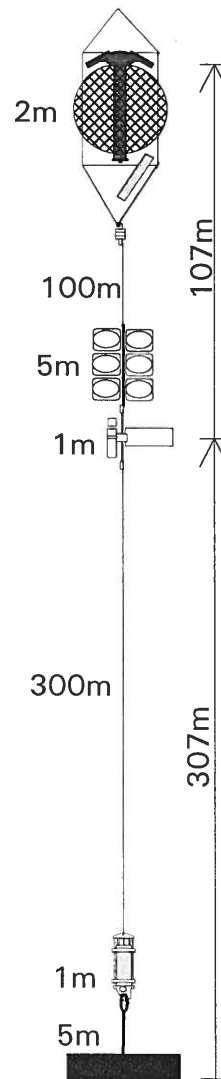
**Latitude:** 60°33.689'N  
**Longitude:** 004°45.308'W  
**Echo sounding depth:** 1083m  
**Bottom depth corr.:** 1063m  
**Time of deployment:** 10/11 -1995 1843UTC  
**Time of recovery:** 24/05 - 1996 1250UTC

**ADCP:**

**Instrument no.:** RDI ADCP 1284  
**Instrument frequency:** 75kHz  
**Height above bottom:** 414m (corr.)  
**Depth:** 649m (corr.)  
**Time of first data:** 10/11 - 1995 1900UTC  
**Time of last data:** 24/05 - 1996 1245UTC  
**Sample interval:** 15 min  
**No. of ensembles:** 18792  
**Pings per ens.:** 1  
**Binlength:** 25m  
**Depth of first bin:** 619m (corr.)  
**No. of bins:** 30

**Aanderaa:**

**Instrument no.:** RCM8 10069  
**Height above bottom:** 307m  
**Depth:** 756m (corr.)  
**Time of first data:** 10/11 - 1995 2000UTC  
**Time of last data:** 24/05 - 1996 1000UTC  
**Sample interval:** 60 min  
**No. of records:** 4695



Deployment: NWSC9511 analyzed from beginning to end  
 Instrument no.: 10069  
 Instrument type: Aanderaa  
 Latitude: 60 33.689 N  
 Longitude: 04 45.308 W  
 Bottom depth: 1063  
 Instrument depth: 756  
 Number of records: 4695  
 Time of first record: 1995 11 10 20 00  
 Time of last record : 1996 05 24 10 00  
 Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	4695	0
Column 8 : Speed	4695	0
Column 9 : Direct	4695	0

Comments  
 -----

Residual current: 55 mm/sec towards: 202 degrees  
 -----

TIDAL ANALYSIS

Error flagged records interpolated for velocity: 0, records not int.: 0  
 Tidal analysis performed on unfiltered data

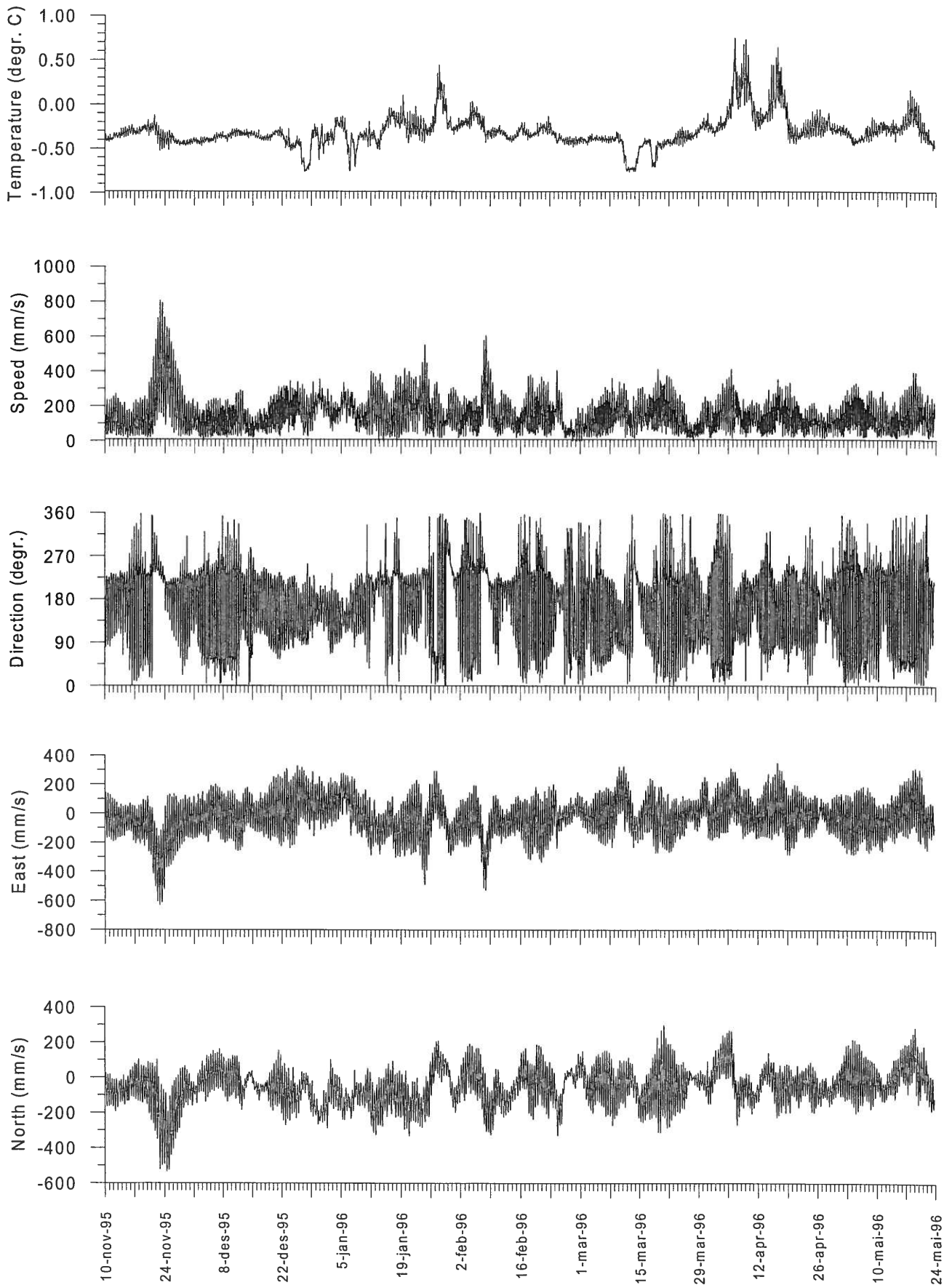
Const	Freq c/hr	E-ampl mm/sec	E-gpl deg	N-ampl mm/sec	N-gpl deg	Major mm/sec	Minor mm/sec	Incl deg	Grphl deg	R
MM	.00151215	28	153	29	180	39	9	46	167	C
MSF	.00282193	8	250	21	338	21	8	89	337	C
Q1	.03721850	8	357	6	23	10	2	36	6	C
O1	.03873065	7	28	6	50	9	2	43	38	C
NO1	.04026859	1	290	2	314	2	0	69	311	C
P1	.04155259	2	261	1	304	3	1	19	266	C
K1	.04178075	6	266	3	1	6	3	177	85	C
N2	.07899925	29	241	19	251	34	3	34	244	C
M2	.08051140	142	267	88	265	167	3	32	267	A
L2	.08202355	2	209	3	43	4	0	127	38	A
S2	.08333334	42	314	42	319	60	3	45	316	C
K2	.08356149	5	329	16	350	17	2	75	349	C
MK3	.12229210	1	279	1	232	1	0	55	248	A
M4	.16102280	1	281	2	328	2	1	74	323	C
MS4	.16384470	2	304	1	159	2	0	163	127	A

DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

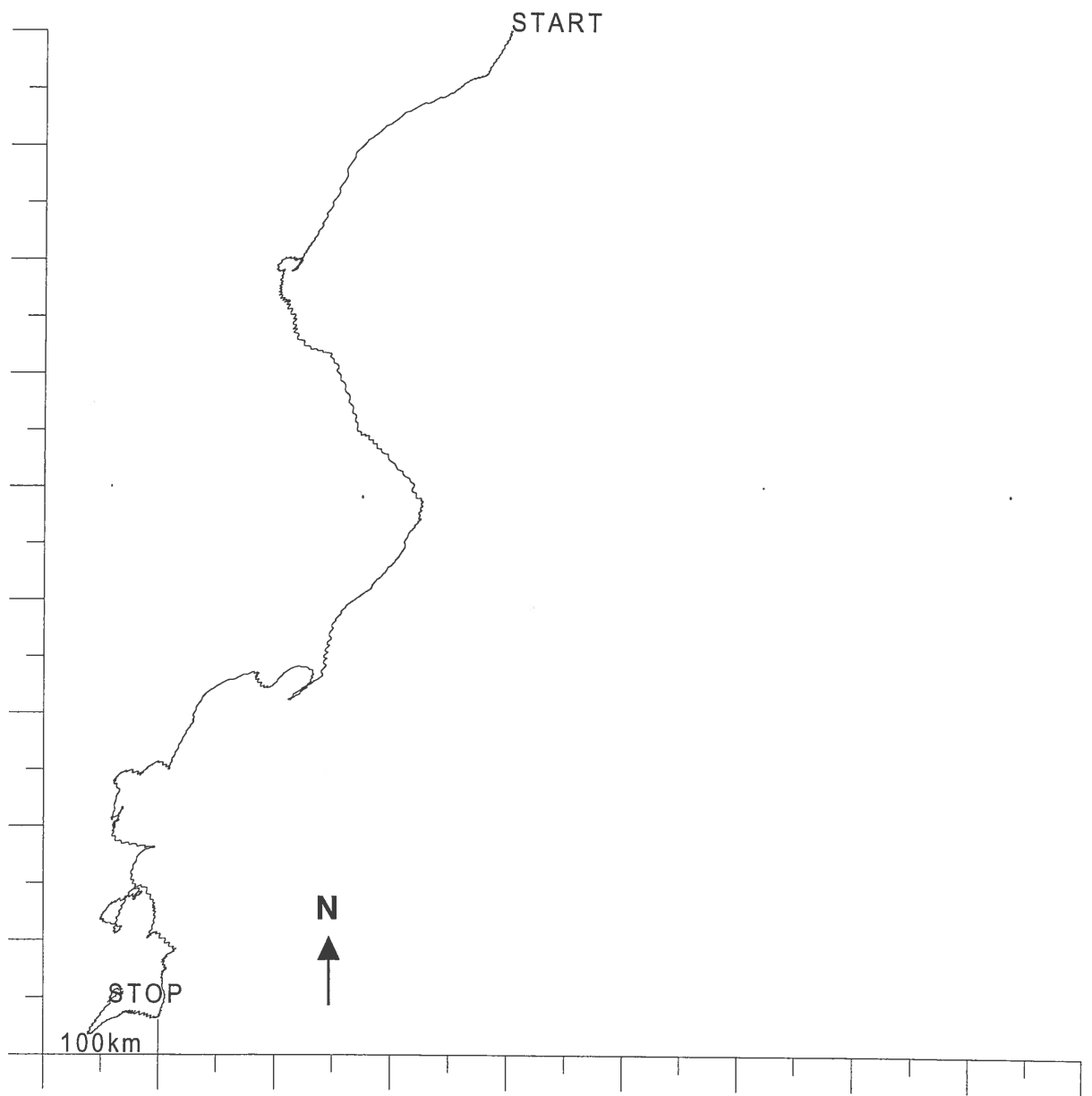
Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	7	8	10	8	9	9	8	10	8	8	5	4	98	98
50 - 100	12	22	25	25	22	20	25	26	21	14	6	7	232	331
100 - 150	8	23	26	19	10	15	23	38	23	6	3	2	203	534
150 - 200	5	28	15	11	7	8	20	55	26	2	0	0	182	717
200 - 300	4	23	23	14	7	5	21	82	25	1	0	0	210	927
300 - 400	0	6	4	1	1	0	2	30	5	0	0	0	53	981
400 - 500	0	0	0	0	0	0	0	7	1	0	0	0	9	990
500 - 600	0	0	0	0	0	0	0	3	1	0	0	0	4	995
600 - 700	0	0	0	0	0	0	0	2	0	0	0	0	2	998
700 - 800	0	0	0	0	0	0	0	1	0	0	0	0	1	999
800 - 900	0	0	0	0	0	0	0	0	0	0	0	0	0	1000
Total (ppt)	38	112	105	81	59	59	103	258	115	34	15	16		
Rel.flux (ppt)	27	112	97	68	45	42	98	350	122	19	7	8		
Avg.spd (mm/s)	113	158	146	132	119	110	150	212	166	88	71	77		
Max.spd (mm/s)	320	411	354	338	356	312	566	805	606	270	154	228		

NWSC9511  
Instrument: Aanderaa 10069



**Progressive vector diagram  
NWSC9511**



**Deployment Id: NWSC9606**

**Project: NORDIC WOCE**

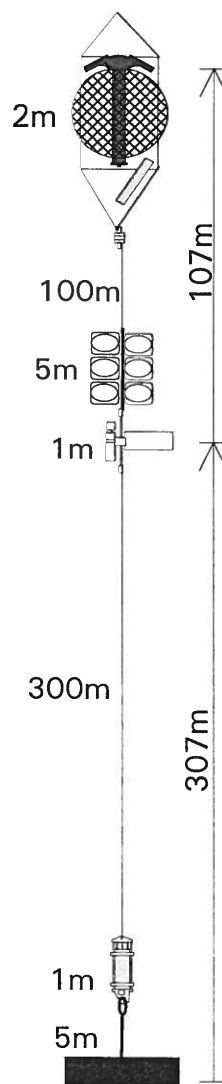
**Latitude:** 60°33.666'N  
**Longitude:** 004°45.580'W  
**Echo sounding depth:** 1084m  
**Bottom depth corr.:** 1066m  
**Time of deployment:** 15/06 -1996 1045UTC  
**Time of recovery:** 23/05 - 1997 1700UTC

**ADCP:**

**Instrument no.:** RDI ADCP 1284  
**Instrument frequency:** 75kHz  
**Height above bottom:** 414m (corr.)  
**Depth:** 652m (corr.)  
**Time of first data:** 15/06 - 1996 1120UTC  
**Time of last data:** 23/05 - 1997 1640UTC  
**Sample interval:** 20 min  
**No. of ensembles:** 24641  
**Pings per ens.:** 1  
**Binlength:** 25m  
**Depth of first bin:** 616m (corr.)  
**No. of bins:** 28

**Aanderaa:**

**Instrument no.:** RCM8 10067  
**Height above bottom:** 307m  
**Depth:** 759m (corr.)  
**Time of first data:** 15/06 - 1996 1300UTC  
**Time of last data:** 23/05 - 1997 1600UTC  
**Sample interval:** 60 min  
**No. of records:** 8212



Deployment: NWSC9606  
Instrument no.: 10067  
Instrument type: Aanderaa  
Latitude: 60 33.666 N  
Longitude: 04 45.580 W  
Bottom depth: 1066  
Instrument depth: 759  
Number of records: 8212  
Time of first record: 1996 06 15 13 00  
Time of last record : 1997 05 23 16 00  
Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	8212	0
Column 8 : Speed	1075	7137
Column 9 : Direct	8211	1

Comments  
-----

Residual current: 61 mm/sec towards: 199 degrees  
-----

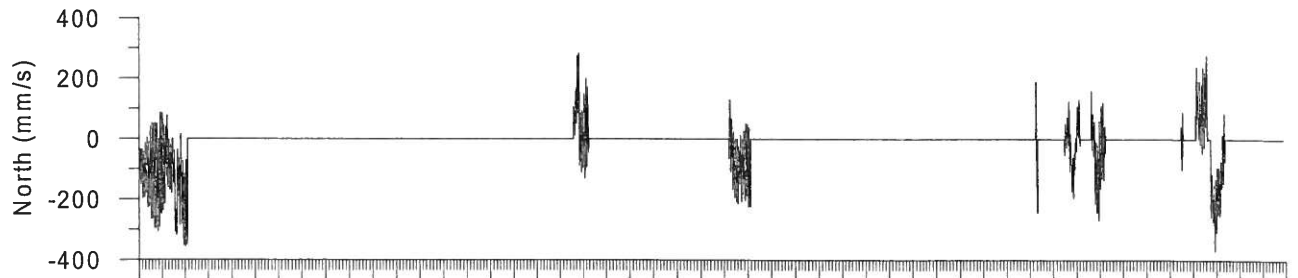
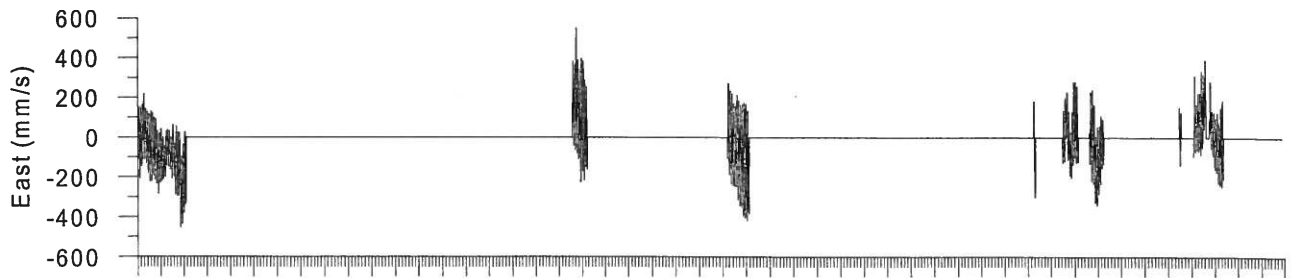
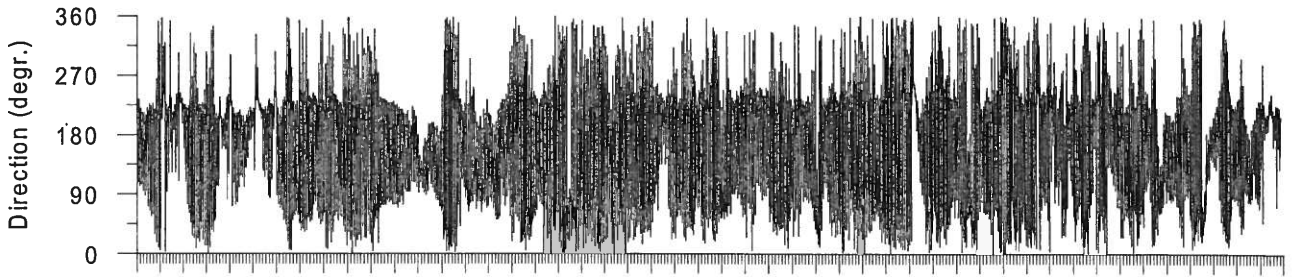
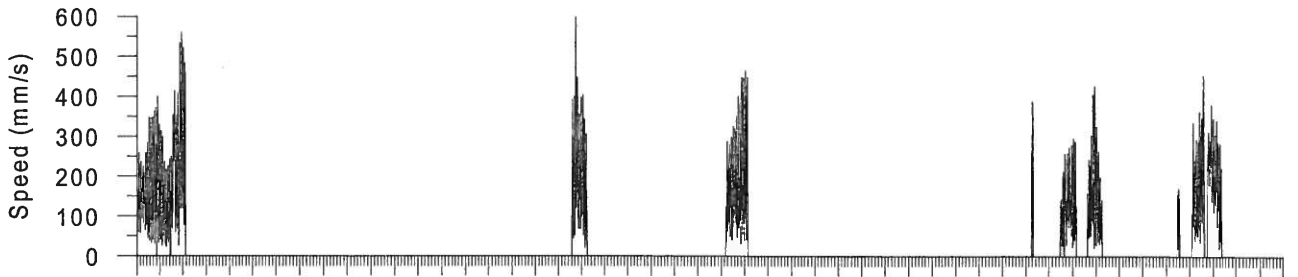
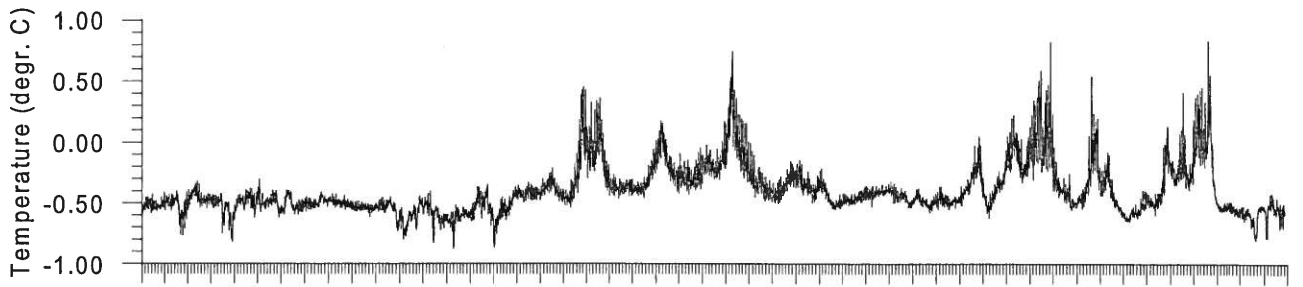
DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	7	4	4	8	5	8	9	8	3	3	10	8	82	82
50 - 100	11	16	17	10	20	16	22	13	17	13	14	8	183	266
100 - 150	2	21	29	28	13	15	17	33	28	5	1	2	201	467
150 - 200	1	7	21	17	5	5	20	48	19	0	0	4	152	620
200 - 300	4	25	36	11	7	11	23	90	16	0	0	0	226	846
300 - 400	0	11	17	1	0	0	13	53	12	0	0	0	109	956
400 - 500	0	3	4	0	0	0	0	19	7	0	0	0	35	991
500 - 600	0	0	1	0	0	0	0	6	0	0	0	0	8	1000
Total (ppt)	27	90	134	78	52	57	106	273	106	22	27	24		
Rel.flux (ppt)	15	93	152	59	33	39	99	367	108	10	9	11		
Avg.spd (mm/s)	104	188	206	139	115	124	169	243	185	81	62	85		
Max.spd (mm/s)	275	477	598	312	272	291	380	561	464	144	136	191		



NWSC9606  
Instrument: Aanderaa 10067



15-jun-96 13-jul-96 10-aug-96 7-sep-96 5-okt-96 2-nov-96 30-nov-96 28-des-96 25-jan-97 22-feb-97 22-mar-97 19-apr-97 17-mai-97

## **Deployment Id: NWSC9708**

**Latitude:** 60°34.030'N

**Longitude:** 004°46.100'W

**Echo sounding depth:** 1085m

**Bottom depth corr.:** 1068m

**Time of deployment:** 01/08 -1997 1145UTC

**Time of recovery:** 15/06 - 1998 1550UTC

### **ADCP:**

**Instrument no.:** RDI ADCP 1577

**Instrument frequency:** 75kHz

**Height above bottom:** 410m

**Depth:** 658m (corr.)

**Time of first data:** 01/08 - 1997 1220UTC

**Time of last data:** 15/06 - 1998 1500UTC

**Sample interval:** 20 min

**No. of ensembles:** 22905

**Pings per ens.:** 1

**Binlength:** 25 m

**Depth of first bin:** 694m (corr.)

**No. of bins:** 28

### **Aanderaa:**

**Instrument no.:** RCM8 10067

**Height above bottom:** 305m

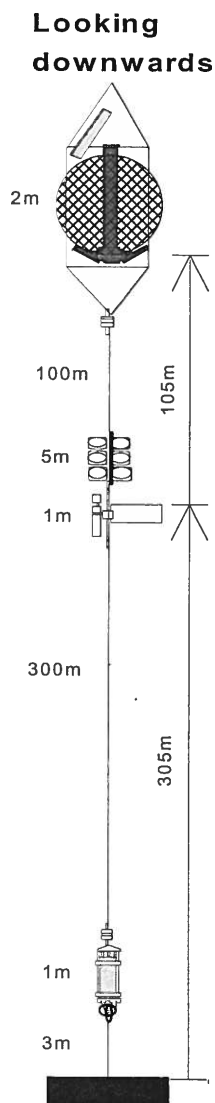
**Depth:** 763m (corr.)

**Time of first data:** 01/08 - 1997 1300 UTC

**Time of last data:** 15/06 - 1998 1400 UTC

**Sample interval:** 60 min

**No. of records:** 7634



Deployment: NWSC9708 analyzed from beginning to end  
Instrument no.: 10067  
Instrument type: Aanderaa  
Latitude: 60 34.030 N  
Longitude: 04 46.100 W  
Bottom depth: 1068  
Instrument depth: 763  
Number of records: 7634  
Time of first record: 1997 08 01 13 00  
Time of last record : 1998 06 15 14 00  
Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	7634	0
Column 8 : Speed	7634	0
Column 9 : Direct	7634	0
Column 10 : Salt	7632	2
Column 11 : N-temp	7634	0

Comments

The instrument has two temperature readouts. One Low range (-5 to +11 degr. C) placed in column 7 and one Narrow range (-1.4 to +1.4 degr. C) placed in column 11. The Narrow range temperature is used for the salinity calculations. Salinity is not calibrated and absolute values are not reliable. The time-tag clock in the instrument is drifting slightly so the actual time for the last record is 1998 06 15 13 57.

Residual current: 50 mm/sec towards: 187 degrees

TIDAL ANALYSIS

Error flagged records interpolated for velocity: 0, records not int.: 0  
Tidal analysis performed on unfiltered data

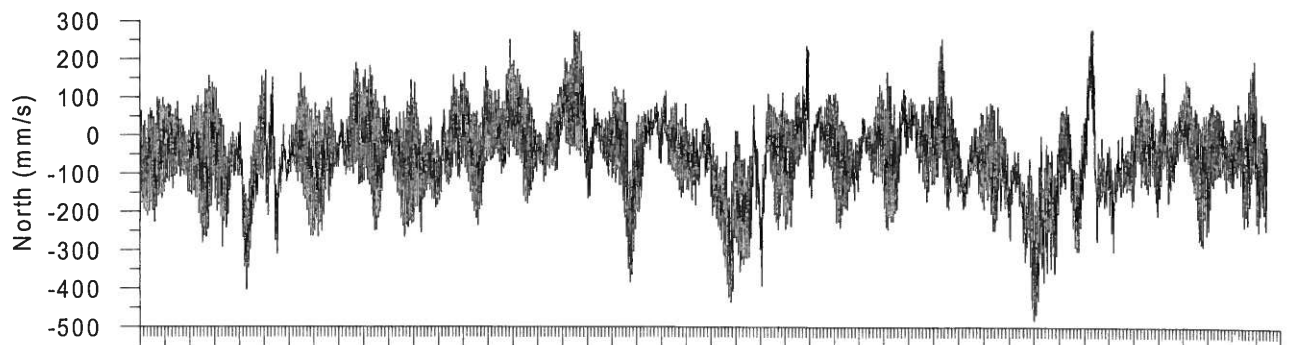
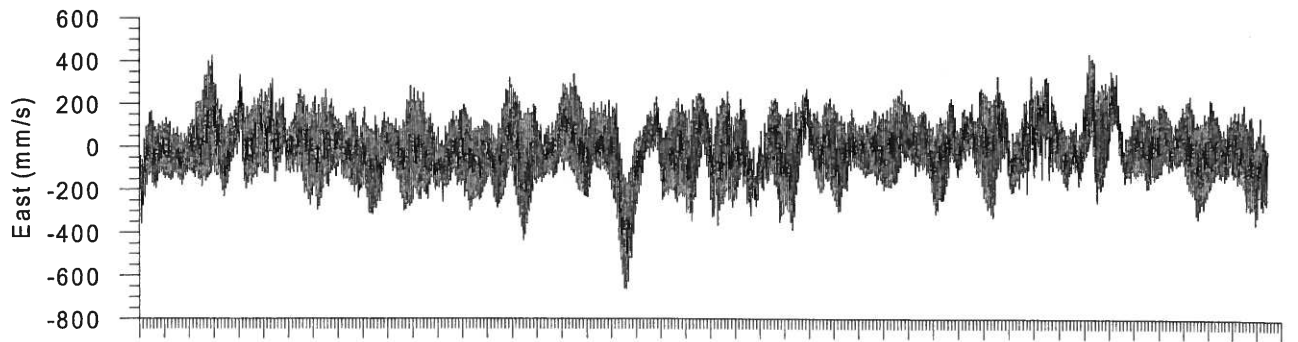
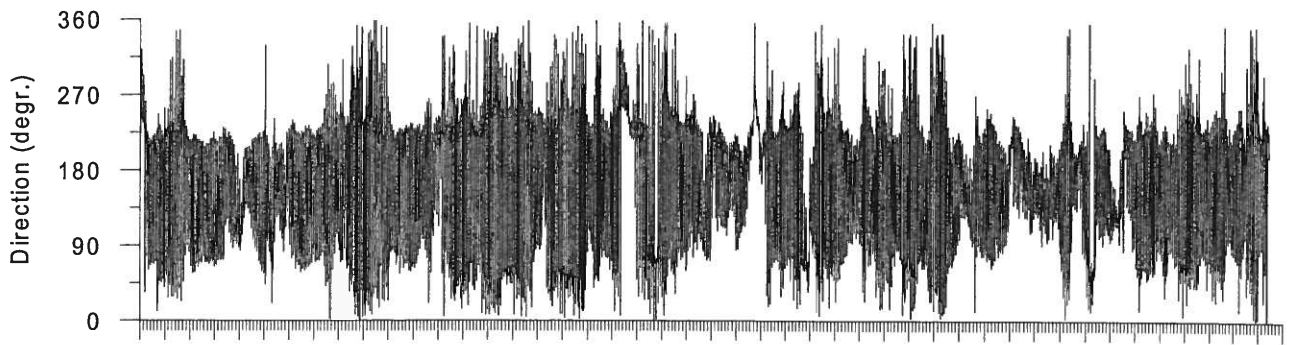
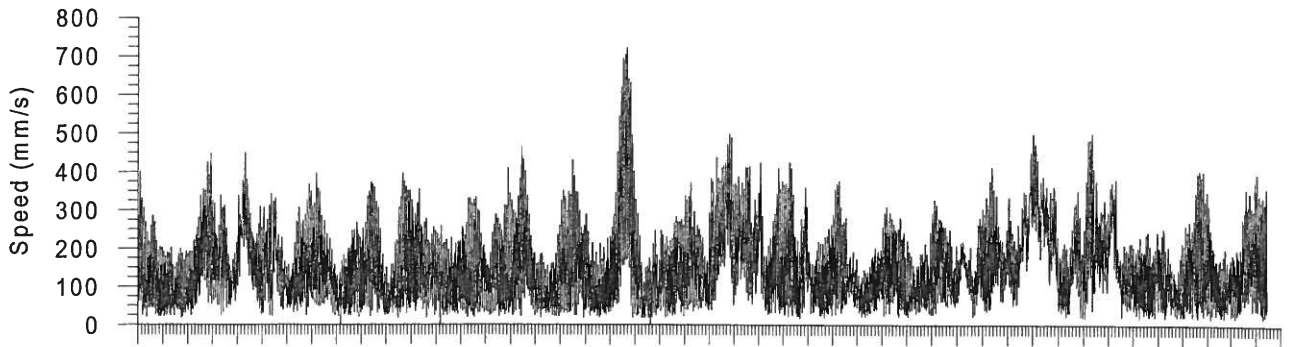
Const	Freq c/hr	E-ampl mm/sec	E-gpl deg	N-ampl mm/sec	N-gpl deg	Major mm/sec	Minor mm/sec	Incl deg	Grphl deg	R
MM	.00151215	14	351	26	324	29	6	63	329	A
MSF	.00282193	17	244	15	289	20	8	40	263	C
Q1	.03721850	5	2	4	30	6	2	42	14	C
O1	.03873065	11	8	8	45	13	4	34	20	C
NO1	.04026859	1	306	0	139	1	0	165	127	A
P1	.04155259	2	273	0	17	2	0	176	91	C
K1	.04178075	6	238	3	240	7	0	27	238	C
N2	.07899925	28	205	8	227	29	3	15	207	C
M2	.08051140	150	248	82	242	171	8	28	247	A
L2	.08202355	6	337	6	271	7	4	53	297	A
S2	.08333334	47	293	39	296	61	2	40	294	C
K2	.08356149	11	300	15	295	18	1	54	297	A
MK3	.12229210	1	254	0	343	1	0	0	254	C
M4	.16102280	1	195	1	266	1	1	59	243	C
MS4	.16384470	1	278	0	18	1	0	176	96	C

DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

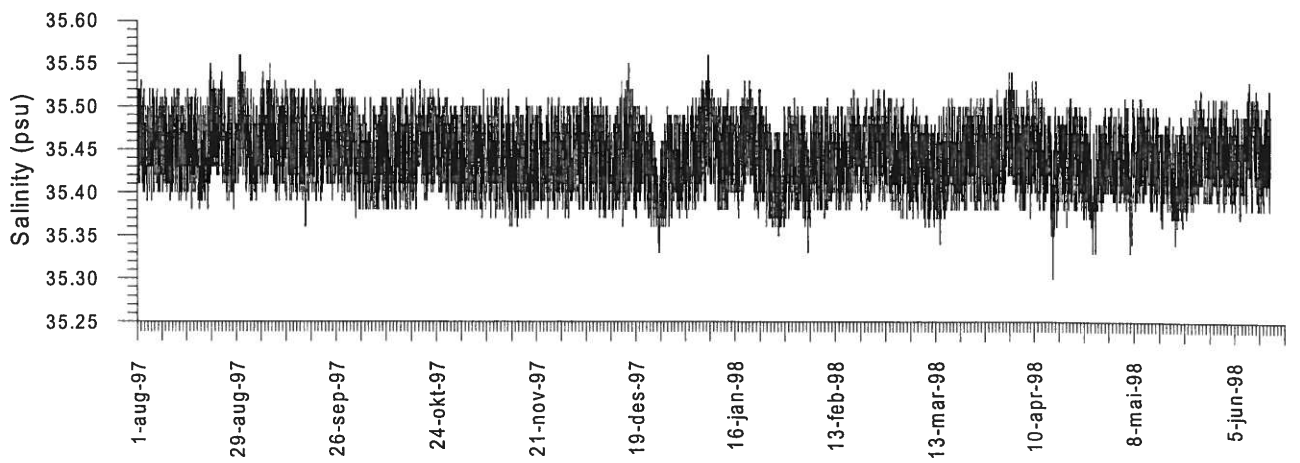
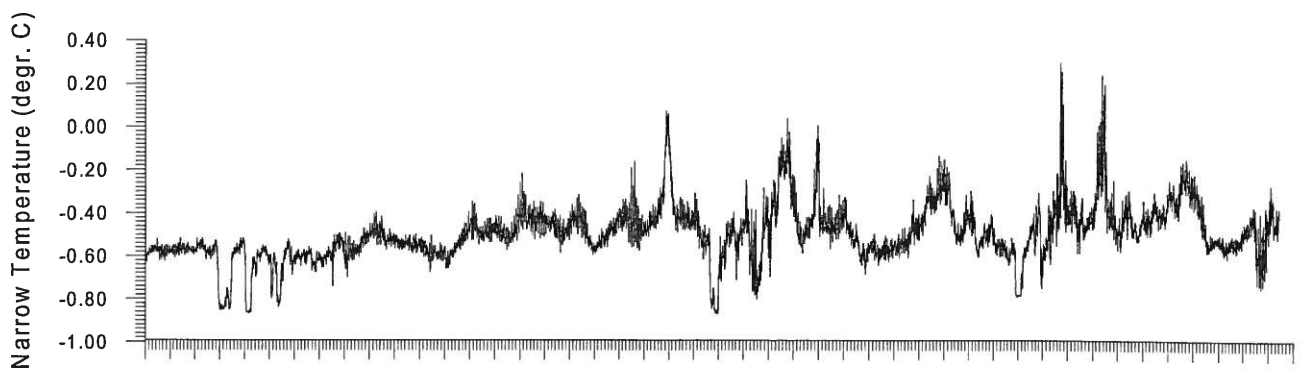
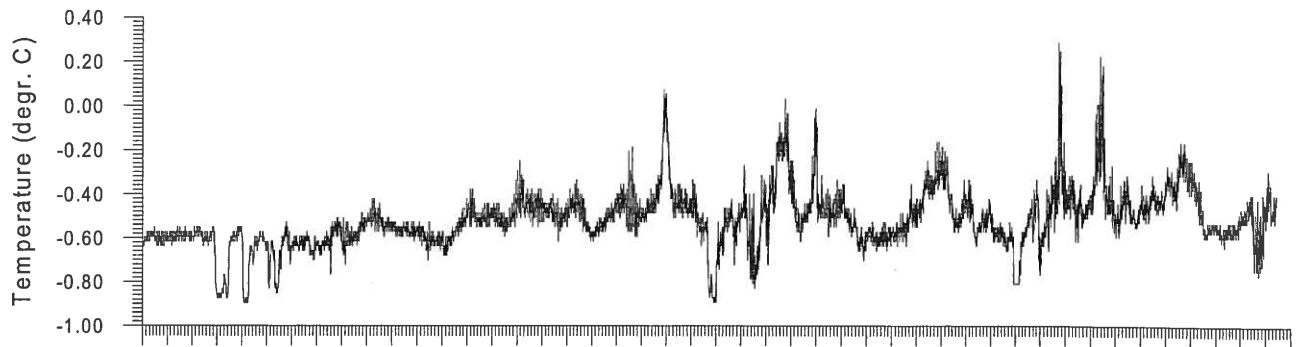
Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	8	6	9	8	7	8	5	9	8	4	6	3	87	87
50 - 100	8	22	34	24	18	13	23	28	23	8	4	3	213	301
100 - 150	4	25	47	22	14	10	20	52	26	4	2	1	233	534
150 - 200	2	19	36	16	12	5	15	54	23	4	0	0	192	726
200 - 300	1	13	30	14	13	5	15	63	28	2	0	0	188	914
300 - 400	0	5	5	4	2	3	10	27	9	0	0	0	69	983
400 - 500	0	1	1	0	0	0	3	3	2	0	0	0	12	996
500 - 600	0	0	0	0	0	0	0	0	0	0	0	0	1	998
600 - 700	0	0	0	0	0	0	0	0	1	0	0	0	1	999
700 - 800	0	0	0	0	0	0	0	0	0	0	0	0	0	1000
Total (ppt)	25	94	164	90	69	47	94	240	124	24	13	9		
Rel.flux (ppt)	14	89	155	80	61	40	100	290	138	17	5	4		
Avg.spd (mm/s)	89	149	149	141	140	134	168	191	176	112	68	72		
Max.spd (mm/s)	275	501	482	380	380	451	498	690	721	293	251	222		

NWSC9708  
Instrument: Aanderaa 10067

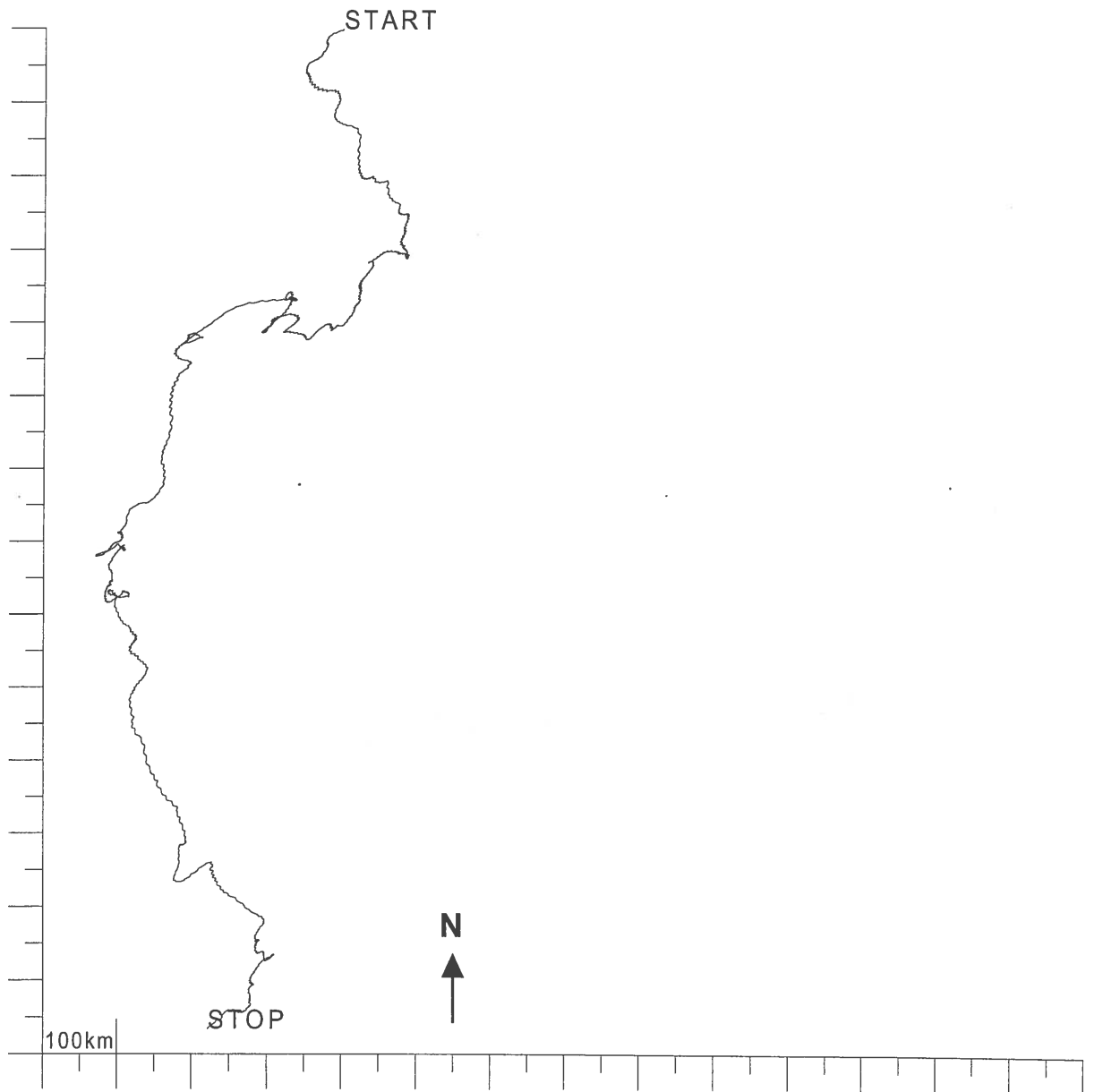


1-aug-97 29-aug-97 26-sep-97 24-okt-97 21-nov-97 19-des-97 16-jan-98 13-feb-98 13-mar-98 10-apr-98 8-mai-98 5-jun-98

NWSC9708  
Instrument: Aanderaa 10067



**Progressive vector diagram  
NWSC9708**



## **Deployment Id: NWSC9907**

**Latitude:** 60°33.960'N

**Longitude:** 004°45.981'W

**Echo sounding depth:** 1081m

**Bottom depth corr.:** 1071m

**Time of deployment:** 04/07 -1999 1950UTC

**Time of recovery:** 19/06 - 2000 0730UTC

### **ADCP:**

**Instrument no.:** RDI ADCP 1578

**Instrument frequency:** 75kHz

**Height above bottom:** 414m (corr.)

**Depth:** 657m (corr.)

**Time of first data:** 04/07 - 1999 2020UTC

**Time of last data:** 20/06 - 2000 0700UTC

**Sample interval:** 20 min

**No. of ensembles:** 25305

**Pings per ens.:** 1

**Binlength:** 25m

**Depth of first bin:** 621m (corr.)

**No. of bins:** 25

### **Aanderaa:**

**Instrument no.:** RCM9 196

**Height above bottom:** 307m

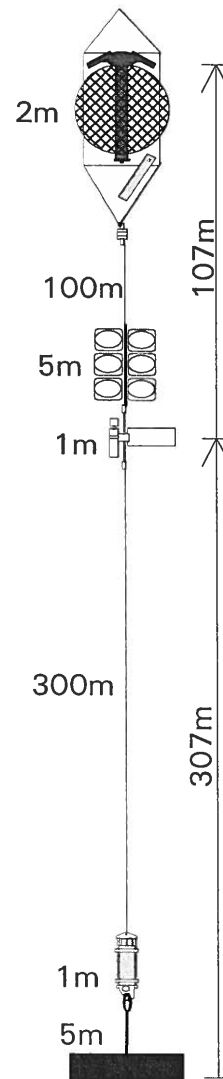
**Depth:** 764m (corr.)

**Time of first data:** 04/07 - 1999 2029 UTC

**Time of last data:** 20/06 - 2000 0629 UTC

**Sample interval:** 60 min

**No. of records:** 8435



Deployment: NWSC9907 analyzed from beginning to end  
Instrument no.: 196  
Instrument type: Aanderaa  
Latitude: 60 33.960 N  
Longitude: 04 45.981 W  
Bottom depth: 1071  
Instrument depth: 764  
Number of records: 8435  
Time of first record: 1999 07 04 20 29  
Time of last record : 2000 06 20 06 29  
Time between records (min.): 60.000

Parameters	Records OK	Records flagged
Column 1 : Recno		
Column 2- 4: Date		
Column 5- 6: Time		
Column 7 : Temp	8435	0
Column 8 : Speed	8435	0
Column 9 : Direct	8435	0
Column 10 : Salt	8434	1
Column 11 : Turb	8435	0

Comments

Salinity is not calibrated and absolute values are not reliable.  
The time-tag clock in the instrument is drifting slightly so the actual time for the last record is 2000 06 20 06 26.

Residual current: 30 mm/sec towards: 215 degrees

TIDAL ANALYSIS

Error flagged records interpolated for velocity: 0, records not int.: 0  
Tidal analysis performed on unfiltered data

Const	Freq c/hr	E-ampl mm/sec	E-gpl deg	N-ampl mm/sec	N-gpl deg	Major mm/sec	Minor mm/sec	Incl deg	Grphl deg	R
MM	.00151215	11	94	18	99	21	1	58	97	C
MSF	.00282193	1	108	1	198	1	1	90	199	C
Q1	.03721850	3	335	3	11	4	1	42	351	C
O1	.03873065	6	19	5	33	8	1	36	24	C
NO1	.04026859	1	56	2	250	2	0	129	245	A
P1	.04155259	1	169	1	71	1	1	95	69	A
K1	.04178075	5	237	1	247	5	0	16	238	C
N2	.07899925	16	223	12	254	20	5	36	234	C
M2	.08051140	76	250	47	249	90	1	32	250	A
L2	.08202355	7	88	8	356	8	7	93	354	A
S2	.08333334	29	296	24	296	37	0	39	296	C
K2	.08356149	8	285	11	280	13	1	51	282	A
MK3	.12229210	1	172	0	181	1	0	18	173	C
M4	.16102280	6	325	7	327	9	0	47	326	C
MS4	.16384470	4	4	7	6	8	0	62	5	C

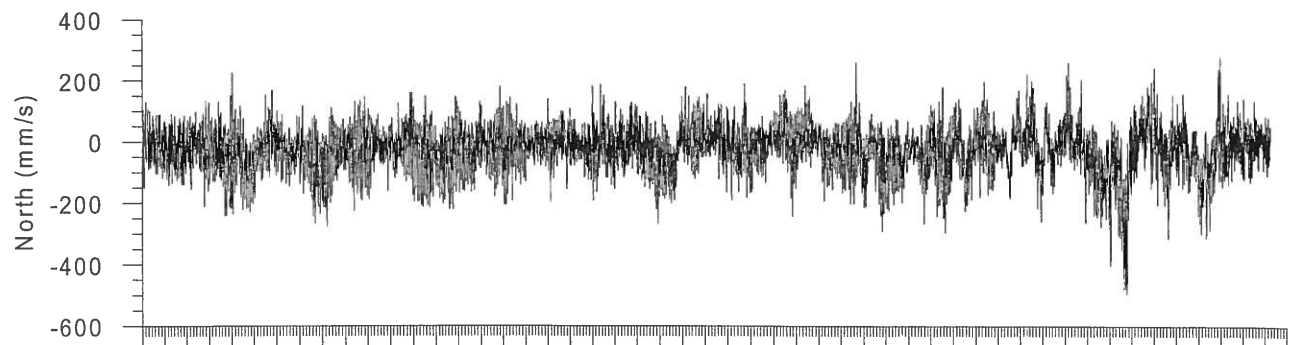
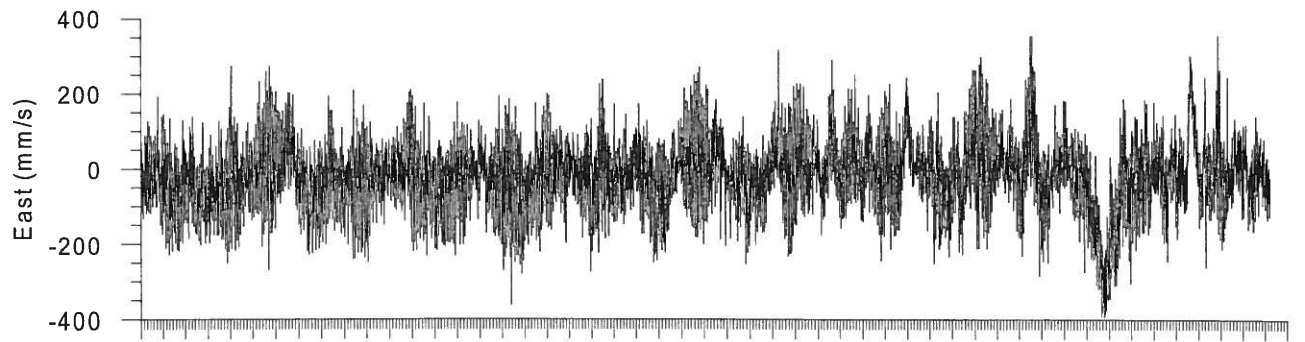
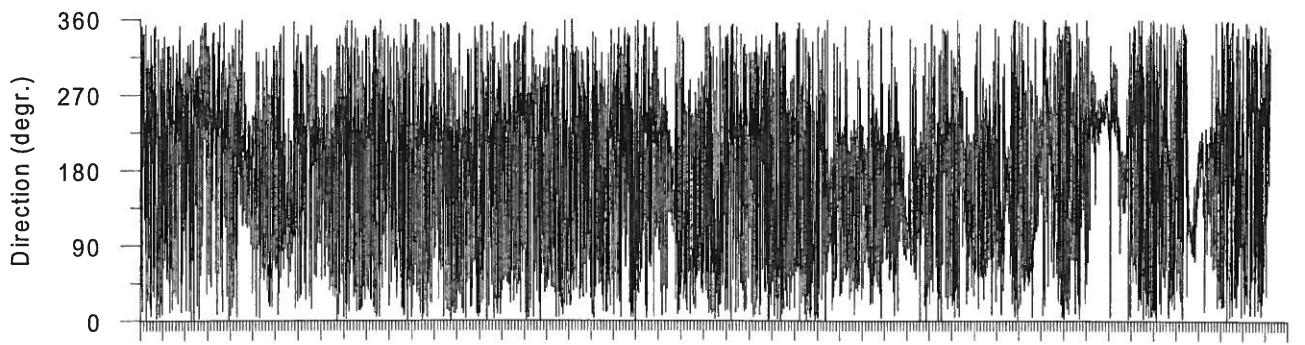
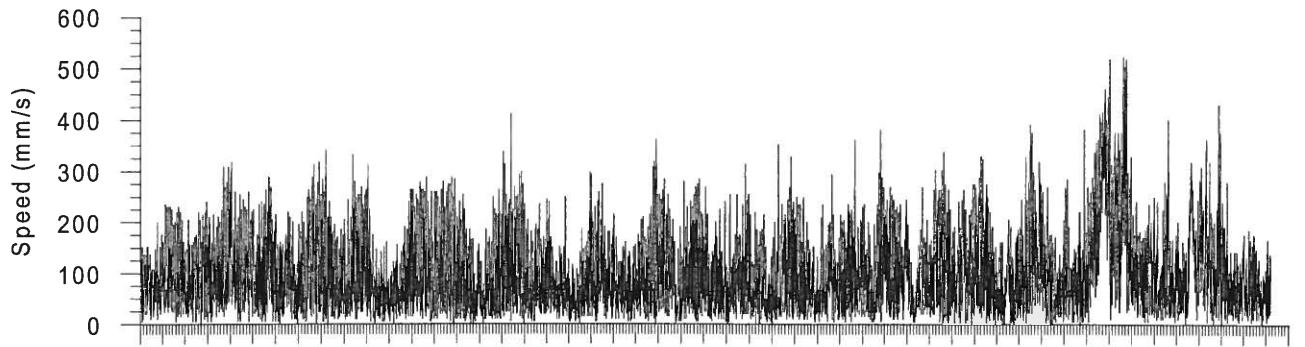
DIRECTIONAL CURRENT DISTRIBUTION (for all nonflagged observations in series)

Relative number of observations in parts per thousand (ppt) grouped into speed and direction intervals (of 30 degree width centred around the directions shown)

Speed intervals (mm/s)	Direction intervals												All dir.	
	15	45	75	105	135	165	195	225	255	285	315	345	Tot	Acc
0 - 50	24	21	25	25	23	25	27	30	25	25	23	19	300	300
50 - 100	18	27	28	24	22	23	26	40	31	23	18	12	296	596
100 - 150	5	17	21	13	7	8	19	36	32	10	3	3	180	777
150 - 200	3	10	14	5	2	2	12	39	22	4	0	0	117	894
200 - 300	0	8	10	3	0	1	9	39	14	0	0	0	89	983
300 - 400	0	0	0	0	0	0	1	6	3	0	0	0	13	997
400 - 500	0	0	0	0	0	0	1	0	0	0	0	0	2	999
500 - 600	0	0	0	0	0	0	0	0	0	0	0	0	0	1000
Total (ppt)	52	86	102	72	57	60	98	193	129	64	45	35		
Rel.flux (ppt)	34	89	109	59	37	41	106	271	156	46	25	20		
Avg.spd (mm/s)	66	103	107	83	66	69	108	141	121	72	55	57		
Max.spd (mm/s)	284	430	391	318	264	411	523	518	435	269	235	249		

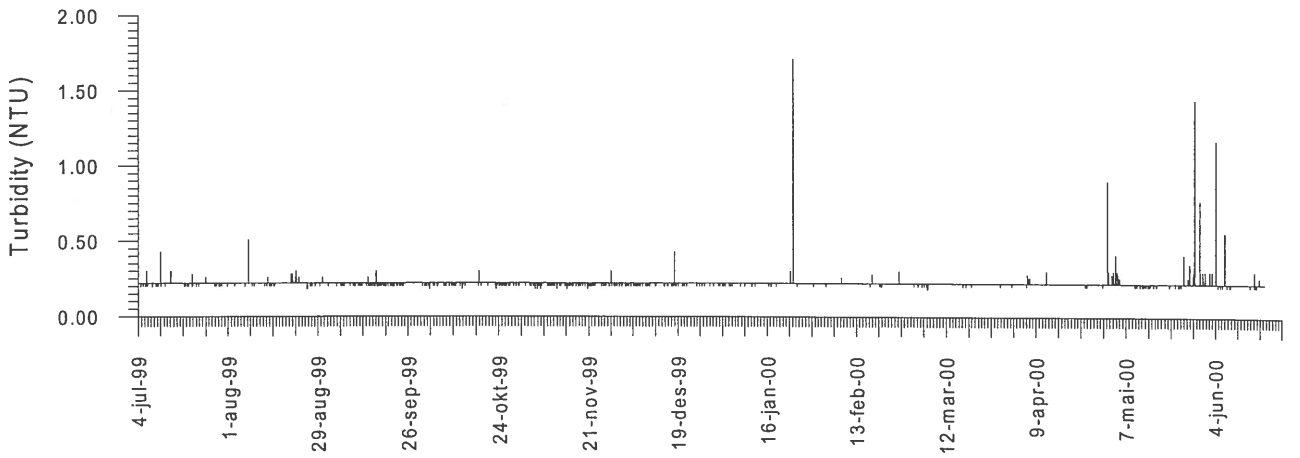
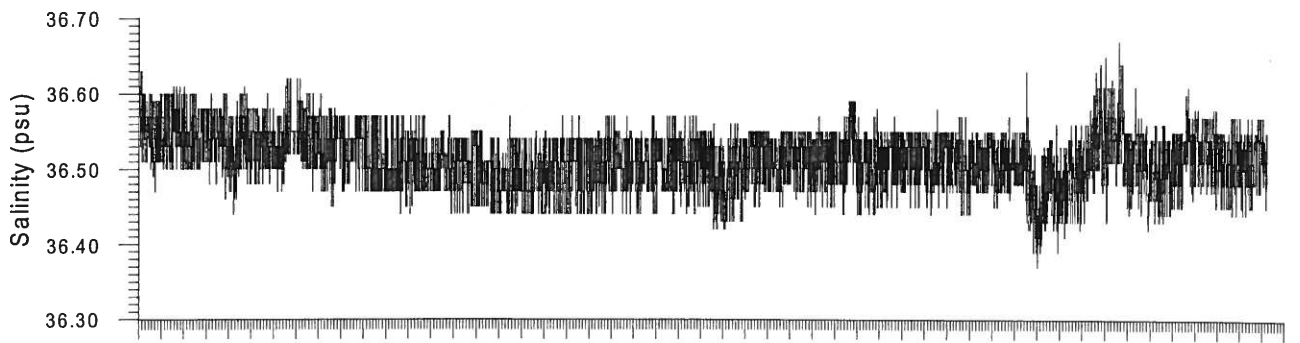
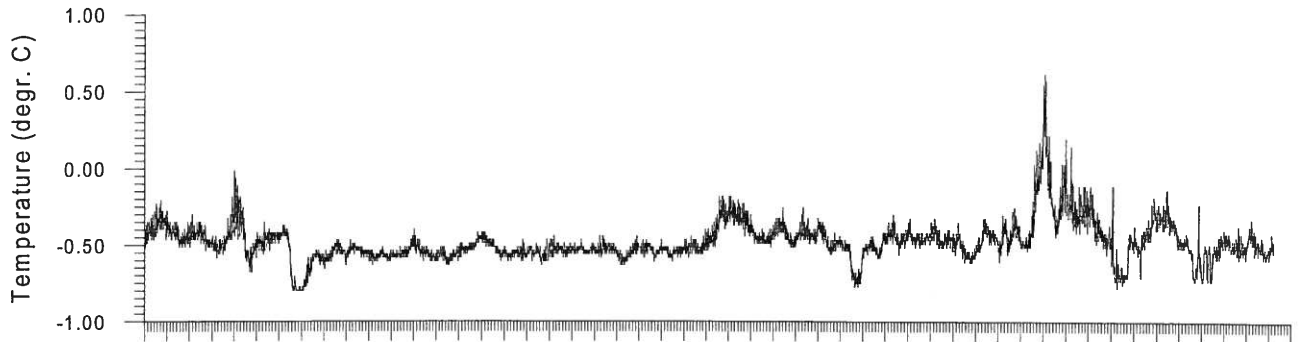


NWSC9907  
Instrument: Aanderaa 196



4-jul-99 1-aug-99 29-aug-99 26-sep-99 24-okt-99 21-nov-99 19-des-99 16-jan-00 13-feb-00 12-mar-00 9-apr-00 7-mai-00 4-jun-00

NWSC9907  
Instrument: Aanderaa 196



**Progressive vector diagram**  
**NWSC9907**

