NANTUCKET SHOALS FLUX EXPERIMENT (NSFE79)

PART 2: Moored Array Data Report

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Abstract

The Nantucket Shoals Flux Experiment (NSFE79) was conducted across the continental shelf and upper slope south of Nantucket from March, 1979 to April, 1980 to measure the flow of shelf water from the Georges Bank/Gulf of Maine region into the Middle Atlantic Bight. Conceived as a cooperative field experiment involving the Northeast Fisheries Center (NMFS), U.S. Geological Survey (Woods Hole), University of New Hampshire, and the Woods Hole Oceanographic Institution, the experiment contained two principal components, a moored array of current meter and bottom instrumentation deployed at six locations across the shelf and upper slope spanning a depth range from 46 m to 810 m, and a series of 27 hydrographic surveys made along or near the moored array line during the experiment. A basic description of the NSFE79 hydrographic data has been given in Part 1 by Wright (1983). A description of the moored array components and the basic moored array data sets is presented here in Part 2.

1. Introduction

The Nantucket Shoals Flux Experiment (NSFE79) was conducted across the shelf and upper slope south of Nantucket from March, 1979 to April, 1980 to measure the flow of shelf water from the Georges Bank/Gulf of Maine region into the Middle Atlantic Bight. The principal initial objectives of this experiment were: (1) to measure the alongshelf flux of mass, heat, salt and nutrients over one annual cycle; (2) to measure the vertical and cross-shelf structure of the low-frequency current and temperature fluctuations over the upper slope in and beneath the shelf/slope water front; and (3) to examine the relationship between the alongshelf volume transport and the cross-shelf bottom pressure fields. NSFE79 was conceived and developed as a cooperative field experiment involving the following institutions and principal investigators: Northeast Fisheries Center, NMFS, (W. Wright), U.S. Geological Survey (B. Butman), University of New Hampshire (W. Brown), and Woods Hole Oceanographic Institution (R. Beardsley). The field experiment contained two principal components, a moored array of current meters and bottom instrumentation deployed at six locations across the shelf and upper slope and a series of 27 hydrographic surveys made along or near the moored array transect during the experiment.

A basic description of the NSFE79 hydrographic data has been given in Part 1 by Wright (1983). We present here in Part 2, a description of the moored array component and basic moored array data sets. The moored array design and instrumentation is described next in Section 2 together with a summary of instrument performance and data return. The collection of meteorological data is described in Section 3, and a description of the data processing methods given in Section 4. The basic moored array data sets are then described in primarily graphical form in Section 5.

2. The Moored Array Program

A six-element linear array of moored instrumentation was deployed in NSFE79 along the transect shown in Figure 1 across the continental shelf

and upper slope south of Nantucket Island near 70°W. This transect was chosen to start about 10 km south of Davis South Shoals, the shallow (depths < 20 m) southernmost section of Nantucket Shoals, since little alongshelf transport of shelf water was believed to occur over the shoals. The mooring transect was oriented approximately perpendicular to the local mid- and outer shelf topography and cuts across the upper slope approximately 10 km west of Atlantis Canyon and about 10 km east of Alvin Canyon. The six mooring locations (designated N1 through N6) were separated horizontally by 16 to 23 km and spanned a depth range from 46 m at N1 to 810 m at N6. A schematic cross-section of the array indicating the instrumentation deployed and instrument designation scheme is shown in Figure 1. Mooring locations and additional information about the instrumentation are given in Table 1 and schematics of the individual mooring given in Figure 2.

A total of 19 vector-averaging current meters (VACMs) were deployed in the array, six VACMs at a common level of 10 m depth on surface moorings, and 13 VACMS at 30 m and deeper levels on subsurface moorings. Recent current meter intercomparison experiments such as CMICE (Beardsley et al., 1981) and MILE (Halpern et al., 1981) indicate that the contamination of the 10 m current measurements by the wave-induced motion of the surface flotation is minimized by internal high-frequency vector-averaging in the VACM: the expected experimental error in the 10 m current observations is less than 10 percent.

Bottom pressure/temperature recorders developed and described by Brown (1976) were deployed for the full duration of the experiment at N1, N4 and N5. Shorter pressure and in situ conductivity measurements were made at N1 and N4. An additional pressure/temperature/current instrument was deployed briefly at N2 and for the second half of the experiment at N4. This instrument provided pressure/temperature records which overlapped with those from another UNH bottom instrument at N4 and those from a USGS bottom tripod system developed by Butman and Folger (1979) which was maintained at N2 throughout most of NSF79. This tripod system photographed

the seafloor and measured horizontal current 1 m above the bottom, temperature, pressure and light transmission for purposes of studying sediment transport processes. The VACMs deployed 15 m above the bottom at N2 also recorded light transmission.

The principal uncertainties in the bottom pressure observations are due to the uncertainty in correcting for the temperature sensitivity of the pressure sensor and a secular long term drift due to mechanical creep in the sensor and settling of the instrument frame into the bottom. Previous sensor studies show that temperature-related uncertainties for NSFE79 results could be as much as ± 0.5 millibars per $^{\circ}\text{C}$. Previous studies with dual sensors mounted on a single instrument frame indicate that a typical long term secular drift-rate (including both temperature-related and mechanical creep effects) is about 1 millibar per month. The use of dual pressure records from NSFE79 and more recent calibrations should allow the causes of these different uncertainties to be more completely identified and quantified.

A permanent front separating the fresher shelf water from the more saline slope water is located along the shelf break from the southern flank of Georges Bank to near Cape Hatteras. The approximate mean winter and summer positions of the outer edge of this front (defined by the $35^{\circ}/\text{‰}$ or 10°C surface) as determined by Wright (1976) from historical hydrographic data from the New England shelf is shown in Figure 1. Also shown is the mean position and the standard deviation of the surface expression of the shelf/slope water front determined by Halliwell and Mooers (1979) through statistical analysis of the weekly satellite-derived experimental ocean frontal analysis charts produced by the U.S. Naval Oceanographic Office for 1975-1977. N1 to N3 were located over the middle shelf well inside the front while N4 to N6 were located within the zone covered by lateral movement of the front. Results from previous moored array experiments conducted across the shelf and upper slope near 71°W and 72°W suggest that the subsurface subtidal current and temperature fluctuations should be coherent over the shelf out to the shelf/slope water front

(Flagg, 1977). The coherence of low-frequency current fluctuations across the front has not previously been examined in detail, however, the theoretical work of Ou (1979) and Ou and Beardsley (1980) and the current data reported by Ou et al. (1980) suggest that the deeper low-frequency flow beneath the front may be decoupled from (and thus incoherent with) the shelf current variability. The NSFE79 array was designed to be a coherent array for subtidal current variability over the shelf within the shelf/slope water front, and to provide the first set of long term current measurements to examine the vertical and horizontal structure of current and temperature variability through the front over the upper slope.

NSFE79 was designed as a one-year field experiment, with most of the instrumentation deployed for two periods of approximately six and seven months duration (see Table 1). Longer term measurements were made at N2 by the USGS, so that N2 was maintained on a different deployment and recovery schedule. A summary of the current meter, temperature, conductivity, and bottom pressure data return is shown in Figure 3 (see also Table 1). The overall return from the first six months of NSFE79 was good, with 16 of 19 VACMS (84 percent) returning good current and temperature data. During the second half of NSFE79, only 10 of 19 VACMs (53 percent) returned good current and temperature data due to increased instrument failure and mooring losses. Despite difficulties encountered recovering three of the UNH bottom instruments, bottom pressure/temperature records were obtained for the full experiment at N1, N2, N4, and N5, with the exception of a one-week gap at N2.

To help protect against damage from fishing activity, all subsurface moorings were bracketed by 2 m diameter lighted guard buoys (Figure 2). These guard moorings were designed to last one year, and used heavy (3/4") chain in the top 6 m as well as in the bottom chafe zone. Lighter (1/2") chain was used everywhere else except in the deeper moorings where jacketed (5/16") wire was required to keep from sinking the surface buoys. At 12 months, the planned duration of the experiment, all of the guard buoys were in place. Unfortunately, the recovery cruise was delayed for

one month, and by then four of the 11 guard buoys were missing. We expect these buoys were run over by fishing boats after their batteries expired and their warning lights went out, although the exact causes of the loss of these guard buoys are not known.

The subsurface moorings in NSFE79 were designed to last six months. All subsurface moorings were recovered in good shape except the second setting of N5 which was dragged and cut loose in March, 1980 and later recovered off the Hudson Canyon.

3. The Meteorological Component

Wind measurements were routinely made every three hours on the Nantucket Lightship (NLS) located at 40°30'N, 69°30'W throughout most of NSFE79.

An edited version of this time series was then used to estimate surface wind stress using the neutral steady-state drag coefficient C_d and iterative method given by Large and Pond (1981) where

$$10^3 C_d = \begin{cases} 1.2 & \text{for } U_{10} < 11 \text{ m/sec,} \\ 0.49 + 0.065 U_{10} & \text{for } U > 11 \text{ m/sec,} \end{cases}$$

and U_{10} is the wind speed at 10 m above sea level. A gap from 18 April 1979 to 9 May 1979 in the NLS windstress time series was filled with surface stress data computed using wind data collected by the NOAA environmental buoy EB63 (also named 44003) located at 40°48'N, 68°30'W (see Figure 1 for the location of NLS and EB63). This procedure was used since the two meteorological stations were closely spaced in relationship to the dominant scales of surface wind variability, and excellent agreement was found between the two windstress time series computed for an overlapping period when both stations were working.

4. Data Processing Methods

The data processing methods used to produce the final data sets presented in Section 5 are described below for the current, wind, bottom pressure, and bottom tripod data.

All VACM data were recorded internally on standard magnetic cassette tapes. The rotor count, compass direction, relative east (u) and north (v) current components, temperature (T), and time (t) were recorded at 15-minute intervals. The data tapes were then edited using the standard current meter processing system developed at WHOI. This includes a careful check of the time base, truncation to remove launch and retrieval transients, the removal of erroneous data cycles, and interpolation to fill any resulting gaps in the data. A basic one-hour time series of u, v, speed (s) and direction was then formed by vector-averaging. The coordinate system was rotated 17° east of North to make the v component aligned with the array axis, and the u component aligned parallel with the local topography of the mid- and outer continental shelf. One-hour temperature time series were formed by scalar-averaging the 15-minute values. The hourly VACM data was then further filtered using the PL33 filter described by Flagg et al. (1976) with a half-power period of 38 hours (the filter shape is shown in Figure 4). This filter effectively suppresses tidal and higher-frequency fluctuations.

As described in the previous section, a composite three-hour wind-stress time series was formed using wind data collected from the Nantucket Lightship and EB63. The resultant wind stress vector time series was then rotated 17° east of North, so that the x component of wind stress (corresponding to the u or east velocity component of current) pointed alongshelf towards 107°T . The windstress time series was not low-pass filtered, however, since it did not contain significant energy above 1 cpd.

The bottom pressure time series have been reduced using the "best" temperature-dependent calibrations available to date for each sensor and the observed temperatures on each mooring. An unexplained one-meter linear drift has been removed from the second half of the N1 pressure record. For each one-hour pressure time series, a "residual" series was formed by subtracting the computed principal tidal currents from the original series. Then the "residual" series was low-pass filtered with the PL33 filter to form the "subtidal" pressure series. The subtidal N4 pressure record is a composite of two sets of measurements obtained there with a 3-month overlap.

The bottom USGS tripod data was reduced and edited in a manner identical to the VACM data. Additional variables were created from the measurements in the decoding and processing stages. The bottom tripod burst-sampled pressure every 4 seconds for 48 seconds (12 samples) every 7.5 minutes. The standard deviation of the 12 burst pressure samples was computed for every 7.5 minute interval at the decoding stage and is a measure of the bottom pressure fluctuations associated with the surface waves. In addition, bottom stress was created using the model of Grant and Madsen (1979) which incorporates the enhancement of bottom stress caused by surface waves. The observed current 1 m above the bottom, the high frequency wave current estimated from the burst pressure measurements, and bottom roughness estimated from the bottom photographs were used as input to the Grant and Madsen model.

5. Data Presentation

The edited moored array data sets from NSFE79 will be presented next in both tabular and graphical form. A summary of the mooring location, instrumentation, and data return is given in Table 1. Simple statistics of the basic hourly and low-passed current and temperature and bottom pressure and temperature time series are given in Tables 2 to 5, respectively. Table 6 lists the regression coefficients between u and v for the low-pass current scatter plots shown in Figures 46-75. Monthly means and

standard deviations of temperature and the east and north current components are given in Tables 7 to 9, respectively. Estimates of the correlation time scale for the low-passed east and north current components are given in Table 10 and tidal analyses of the current and bottom pressure data are presented in Tables 11 and 12.

Composite plots of low-passed wind stress, north and east current, and temperature are presented in Figures 5-8. The time-series from each instrument have been stacked vertically on the same time base for easy comparison. The vector plot in Figure 5 summarizes the low-pass current data and clearly illustrates some of the key characteristics of the low-frequency current structure over the shelf and upper slope. The more energetic current fluctuations observed over the shelf tend to be coherent in the vertical and cross-shelf direction and appear to be primarily wind-driven, especially at N1 to N3. At N5 and N6, the more energetic current fluctuations occur at lower frequencies and are associated with the passage of warm core rings through the array. Contour plots of the monthly mean temperature and east current data contained in Tables 7 and 8 are shown in Figures 9 and 10 for the first setting. These plots illustrate the springtime strengthening of the monthly alongshelf flow through June, the significant velocity shear across the shelf/slope front, and the development of the seasonal thermocline over the shelf and slope region and the cold pool over the mid-shelf between N2 and N3.

Figures 11-42 are time series plots of East (u), North, (v), speed, direction and temperature versus time for the basic hourly data from each current meter. The second digit in each number (e.g., "N11F") is the mooring number and the third digit is the vertical position of the instrument from the top on each mooring. The shallowest (10-meter) instrument is designated by a "1" and the numbers increase with increasing depth. Data from the first (or "front") setting and second (or "back") setting are designated by the letters "F" or "B", respectively. This designation scheme was modified for N2 where three settings were made. At N2, the

letters "F", "C", and "B" indicate data from the first, second (or "center"), and third settings, respectively. A composite of hourly temperature, light transmission, bottom pressure variability, and current speed data from the USGS tripod is shown in Figures 43-45.

Progressive vector diagrams and scatter plots for the low-passed current data are shown in Figures 46-75. The current data has been low-pass filtered with the PL33 filter to remove the tidal components and other higher frequency fluctuations. The regression of north on east components has been computed and is drawn in on the scatter plots to show the principal orientation of the low-passed data. The regression coefficients are given in Table 6.

Autospectra for the hourly current and temperature time series shown in Figures 11-42 have been calculated and are shown in Figures 76-93. In each case, the spectra were calculated from the longest continuous piece of data available, averaged over five adjacent frequency bands. The frequency interval Δf is therefore not constant from one autospectrum to the next, although the number of degrees of freedom remains the same. The plot program for these autospectra averages more towards higher frequencies so that the confidence limits become narrower with increasing frequency. As an example, the confidence limits for N11F are shown in Figure 76. The confidence limits for the other autospectrum plots are similar in structure.

Time series of the basic hourly and low-passed temperature and bottom pressure data are shown in Figures 94-102. Time series of the low-passed differences of the bottom pressure data from different locations is shown in Figures 103-104 and autospectra of the hourly temperature and bottom pressure time series are shown for each deployment in Figures 105 and 106.

6. Acknowledgments

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- Figure 87: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N44F and N44B.
- Figure 88: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N51F.
- Figure 89: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N52F and N52B.
- Figure 90: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N54F.

- Figure 91: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N55F and N55B.
- Figure 92: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N56F.
- Figure 93: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N61F and N61B.
- Figure 94: Time series of one-hour and low-pass temperature and bottom pressure for instrument N13F.
- Figure 95: Time series of one-hour and low-pass temperature and bottom pressure for instrument N13B.
- Figure 96: Time series of one-hour and low-pass temperature and bottom pressure for instrument N24F.
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- Figure 98: Time series of one-hour and low-pass temperature and bottom pressure for instrument N24B.
- Figure 99: Time series of one-hour and low-pass temperature and bottom pressure for instrument N45F.
- Figure 100: Time series of one-hour and low-pass temperature and bottom pressure for instrument N45B.
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- Figure 102: Time series of one-hour and low-pass temperature and bottom pressure for instrument N57B.
- Figure 103: Time series of low-pass difference bottom pressure between instruments N57F and N13F, N57F and N45F, and N45F and N13F.
- Figure 104: Time series of low-pass difference bottom pressure between instruments N57B and N13B, N57B and N45B, and N45B and N13B.
- Figure 105: Auto-Spectra of bottom pressure and temperature for instruments N13F, N45F, and N57F.
- Figure 106: Auto-Spectra of bottom pressure and temperature for instruments N13B, N45B, and N57B.

TABLE 1: Summary of Instrument Location, Data Return, and Other Relevant Mooring and Instrumentation Information for NSF E79. (Mooring Type Indicated by S for surface, SS for subsurface and B for Bottom-Mounted Mooring)

Mooring Designation	Location (N/W)	Water Depth (m)	Instrument Designation	Instrument Depth (m)	Instrument (Group)	Mooring Type	Deployment/Recovery Time (Day-Month-Year)	Record Length (d)	Condition of Data
N1	40°41.7' 70°08.6'	46	N11	10	VACM/NEFC	S	79-03-21 79-09-08	172	O.K.
			N12	32	VACM/NEFC	SS	79-03-21 79-09-09		Mooring Lost
			N13	45	2P+TC/UNH	B	79-09-09 79-03-15	222	Short Current Record
			N21	10	VACM/USGS	S	79-03-15 79-09-17	181	O.K.
N2	40°29.9' 70°13.0'	66	N21	10	VACM/USGS	S	79-09-20 79-03-07	212	O.K.
			N22	32	VACM/USGS	SS	79-03-07 79-09-17	194	O.K.
			N23	52	VACM/USGS	SS	79-09-17 79-08-07		Mooring Lost
			N24	65	TRIPOD/USGS	B	79-08-07 79-12-16	152	O.K.
N3	40°20.7' 70°16.1'	88	N24	65	PT/UNH	B	79-03-07 79-07-12	131	O.K.
			N31	10	VACM/NEFC	S	79-12-16 80-05-23	140	O.K.
			N32	32	VACM/NEFC	SS	80-05-23 79-08-07	152	O.K.
			N33	72	VACM/NEFC	SS	79-08-07 80-01-04	131	O.K.
N4	40°12.9' 70°18.2'	105	N41	10	VACM/NEFC	S	80-01-04 79-03-07	140	O.K.
			N42	29	VACM/NEFC	SS	79-03-07 79-07-12	116	O.K.
			N43	59	VACM/NEFC	SS	79-07-12 80-01-22	116	O.K.
			N44	89	VACM/NEFC	SS	80-01-22 80-05-23	158	O.K.
N5	40°02.2' 70°22.3'	198	N45	104	2P+TC/UNH	B	80-05-23 79-07-20	157	O.K.
			N45	104	PT/UNH	B	79-07-20 79-09-17	59	O.K.
			N51	10	VACM/WHOI	S	79-09-17 79-03-20	184	O.K.
			N52	28	VACM/WHOI	SS	79-03-20 79-09-19	209	O.K.
N6	39°51.2' 70°25.4'	810	N53	58	VACM/WHOI	SS	79-09-19 79-03-20	183	O.K.
			N54	88	VACM/WHOI	SS	79-03-20 80-04-16	209	O.K.
			N55	118	VACM/WHOI	SS	80-04-16 79-09-05	183	O.K.
			N56	183	VACM/WHOI	SS	79-09-05 80-04-16	209	O.K.
N7	40°02.2' 70°22.3'	198	N57	197	PT/UNH	B	79-03-20 80-04-16	170	O.K.
			N61	10	VACM/REFC	S	79-04-16 80-04-16	170	O.K.
			N62	29	VACM/NEFC	SS	80-04-16 79-09-05	170	O.K.
			N63	59	VACM/NEFC	SS	79-09-05 80-04-16	223	O.K.
N8	40°02.2' 70°22.3'	198	N64	89	VACM/NEFC	SS	80-04-16 79-09-05	223	O.K.
			N65	104	2P+TC/UNH	B	79-09-05 80-04-16	170	O.K.
			N65	104	PT/UNH	B	80-04-16 79-09-05	223	O.K.
			N65	10	VACM/WHOI	S	79-09-05 80-04-16	170	O.K.
N9	40°02.2' 70°22.3'	198	N66	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N66	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N66	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N66	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N10	40°02.2' 70°22.3'	198	N67	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N67	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N67	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N67	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N11	40°02.2' 70°22.3'	198	N68	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N68	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N68	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N68	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N12	40°02.2' 70°22.3'	198	N69	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N69	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N69	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N69	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N13	40°02.2' 70°22.3'	198	N70	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N70	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N70	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N70	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N14	40°02.2' 70°22.3'	198	N71	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N71	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N71	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N71	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N15	40°02.2' 70°22.3'	198	N72	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N72	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N72	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N72	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N16	40°02.2' 70°22.3'	198	N73	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N73	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N73	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N73	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N17	40°02.2' 70°22.3'	198	N74	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N74	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N74	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N74	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N18	40°02.2' 70°22.3'	198	N75	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N75	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N75	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N75	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N19	40°02.2' 70°22.3'	198	N76	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N76	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N76	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N76	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N20	40°02.2' 70°22.3'	198	N77	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N77	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N77	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N77	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N21	40°02.2' 70°22.3'	198	N78	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N78	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N78	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N78	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N22	40°02.2' 70°22.3'	198	N79	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N79	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N79	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N79	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N23	40°02.2' 70°22.3'	198	N80	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N80	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N80	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N80	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N24	40°02.2' 70°22.3'	198	N81	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N81	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N81	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N81	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N25	40°02.2' 70°22.3'	198	N82	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N82	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N82	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N82	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N26	40°02.2' 70°22.3'	198	N83	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N83	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N83	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N83	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N27	40°02.2' 70°22.3'	198	N84	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N84	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N84	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N84	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N28	40°02.2' 70°22.3'	198	N85	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N85	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N85	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N85	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N29	40°02.2' 70°22.3'	198	N86	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N86	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N86	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N86	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N30	40°02.2' 70°22.3'	198	N87	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N87	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N87	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N87	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N31	40°02.2' 70°22.3'	198	N88	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N88	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N88	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N88	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N32	40°02.2' 70°22.3'	198	N89	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N89	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N89	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N89	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N33	40°02.2' 70°22.3'	198	N90	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N90	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N90	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N90	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N34	40°02.2' 70°22.3'	198	N91	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N91	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N91	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N91	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N35	40°02.2' 70°22.3'	198	N92	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N92	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N92	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N92	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N36	40°02.2' 70°22.3'	198	N93	58	VACM/WHOI	SS	80-04-16 79-09-05	223	O.K.
			N93	88	VACM/WHOI	SS	79-09-05 80-04-16	170	O.K.
			N93	118	VACM/WHOI	SS	80-04-16 79-09-05	170	O.K.
			N93	183	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N37	40°02.2' 70°22.3'	198	N94	104	2P+TC/UNH	B	80-04-16 79-09-05	223	O.K.
			N94	104	PT/UNH	B	79-09-05 80-04-16	223	O.K.
			N94	10	VACM/WHOI	S	80-04-16 79-09-05	170	O.K.
			N94	28	VACM/WHOI	SS	79-09-05 80-04-16	223	O.K.
N38	40°02.2' 70°2								

TABLE 2: Hourly Currents and Temperatures

Sta- tion I.D.	Number of Points	Water Depth (m)	Start/Stop (GMT)	Number of Days	Inst. Depth	u-Component (cm/s)			v-Component (cm/s)			Speed (cm/s)			Temperature (Deg C)		
						Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.
N11	4121	46	790321/790908	171.67	10	-85.10	78.08	-9.20	25.454	-79.30	55.57	0.71	22.159	0.71	88.78	32.18	13.725
N12	3013		790321/790724	125.50	32	-80.16	51.61	-6.43	22.546	-46.63	45.77	0.53	19.597	0.53	80.33	28.77	10.285
N21	5334		790909/800418	222.21	32	-90.13	64.10	-4.04	24.320	-52.55	39.11	-1.99	19.534	0.32	93.89	29.32	11.562
N22	4663	66	790307/790917	194.25	10	-76.23	48.03	-7.79	19.451	-78.96	60.18	-2.06	18.152	0.09	84.67	25.15	11.844
	3658		790307/790807	152.38	32	-55.53	37.62	-6.79	15.538	-44.35	36.88	0.13	13.536	0.13	55.70	19.63	9.306
	3143		790807/791216	130.92	32	-64.23	44.01	-7.07	17.457	-43.61	46.68	-0.82	14.700	0.28	64.24	21.39	10.658
N23	3356		800105/800523	139.79	32	-99.69	56.47	-6.28	21.337	-38.95	31.82	-1.08	13.491	0.34	99.89	22.74	12.675
	3658		790307/790807	152.38	52	-42.47	40.45	-3.40	13.633	-40.85	31.12	-4.03	13.643	0.22	46.05	18.40	7.807
	3143		790807/791216	130.92	52	-55.05	57.82	-5.66	18.108	-53.99	50.99	-1.48	15.625	1.48	61.43	22.06	10.884
N31	4057	88	800104/800523	139.88	52	-84.67	51.19	-5.97	20.161	-38.13	30.72	-2.05	13.113	0.48	86.73	22.03	11.531
	4057		790320/790905	169.04	10	-81.38	55.90	-5.37	21.641	-63.23	53.35	-2.74	19.447	0.60	87.27	25.84	14.655
N32	4390		790320/790919	182.88	32	-64.80	31.32	-7.24	12.206	-32.94	34.55	0.07	10.756	0.34	65.01	15.57	8.644
N33	5027		790920/800416	209.42	32	-89.49	48.46	-8.28	18.514	-45.49	38.64	-1.01	11.797	0.19	89.55	20.15	12.057
	4390		790320/790919	182.88	72	-48.90	33.34	-4.81	12.530	-35.31	36.80	-0.70	10.957	0.12	50.52	15.71	7.347
	5027		790920/800416	209.42	72	-66.93	53.43	-3.86	18.205	-41.47	46.77	-0.49	12.027	0.39	67.10	19.64	10.259
N41	4071	105	790320/790905	169.58	10	-60.78	47.23	-12.51	16.950	-48.63	53.79	-2.16	15.816	0.26	67.95	23.50	12.097
N42	4076		790320/790905	169.79	29	-48.13	30.75	-8.50	11.341	-26.80	30.04	0.35	9.080	0.14	48.37	15.06	7.528
N43	5364		790906/800416	223.46	29	-93.71	48.30	-10.31	17.397	-48.43	46.41	-2.02	12.278	0.23	94.37	20.24	12.417
N44	4076		790320/790905	169.79	59	-48.13	30.75	-8.50	11.340	-26.80	30.04	0.35	9.078	0.14	48.37	15.05	7.527
N51	4094	198	790906/800416	223.46	89	-37.67	29.96	-3.00	11.104	-29.26	25.19	-0.17	9.211	0.31	40.61	13.31	6.331
N52	4093		790318/790905	170.54	10	-58.73	44.03	-4.03	15.192	-39.47	31.72	-0.44	10.978	0.13	75.60	16.97	8.931
N53	4841		790319/790906	201.67	28	-44.37	42.94	1.87	17.419	-55.76	60.44	1.06	15.061	0.34	71.23	20.39	10.779
N54	4093		790906/800326	201.67	28	-65.15	56.67	-6.81	16.786	-40.10	32.02	1.14	9.965	0.29	47.39	14.19	7.436
N55	4093		790319/790906	170.50	88	-28.73	36.29	3.88	10.055	-58.22	45.65	-2.65	13.813	0.50	65.32	20.06	11.115
N56	4841		790906/800326	201.67	118	-37.79	32.27	3.84	10.550	-29.17	28.27	2.26	8.085	0.12	37.17	12.25	6.041
N61	4099	810	790318/790905	170.79	183	-32.45	28.74	-0.80	9.350	-36.42	23.31	-1.94	7.919	0.19	36.51	11.19	5.284
	5398		790905/800417	224.88	10	-69.13	76.07	-2.66	18.330	-57.28	59.77	-2.65	15.388	0.23	76.15	21.28	11.585

TABLE 3: Low-Pass Filtered Currents and Temperature

Station I.D.	Number of Points	Water Depth (m)	Start/Stop (GMT)	Number of Days	Inst. Depth (m)	u-Component (cm/s)			v-Component (cm/s)			Speed (cm/s)			Temperature (Deg C)		
						Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.
M11	4055	46	790322/790907	168.92	10	-33.61	25.29	-9.15	8.985	-23.39	18.71	0.76	6.148	0.17	36.97	12.49	6.837
M12	2947		790322/790723	122.75	32	-20.87	21.58	-6.33	5.914	-19.43	7.54	0.54	3.495	0.14	25.71	8.17	4.564
M21	5268		790910/800417	219.46	32	-63.55	42.01	-3.96	13.532	-30.96	14.98	-2.05	5.856	0.14	63.97	11.56	10.191
M22	4597	66	790308/790916	191.50	10	-40.12	24.87	-7.94	9.879	-22.85	15.37	-2.08	6.158	0.26	40.58	12.33	7.133
	3592		790309/790805	149.63	32	-35.67	23.11	-7.03	7.691	-15.58	7.30	-1.18	3.168	0.21	36.31	9.06	6.151
	3077		790808/791215	128.17	32	-42.81	21.26	-6.96	11.009	-17.79	14.33	-0.59	5.169	0.08	42.81	11.88	7.464
M23	3290		800106/800522	137.04	32	-76.03	36.09	-5.99	16.640	-20.80	12.48	-1.08	4.657	0.16	76.03	12.93	12.973
	3592		790309/790805	149.63	52	-26.31	22.85	-3.59	6.429	-15.06	4.44	-4.06	3.123	0.08	29.51	7.42	5.036
	3077		790808/791215	128.17	52	-34.89	30.14	-5.50	9.857	-10.85	9.10	-0.99	3.868	0.06	36.06	10.00	6.571
	3292		800106/800522	137.04	52	-68.07	37.50	-5.77	15.619	-17.52	12.77	-2.09	3.968	0.16	68.57	12.10	12.282
N31	3991	88	790322/790904	166.25	10	-37.61	23.93	-6.36	12.655	-30.33	14.60	-2.75	6.956	0.38	37.79	13.62	8.422
	1048		790907/791021	43.63	10	-37.87	15.24	-7.09	7.310	-16.78	11.11	0.05	4.237	0.18	38.09	9.35	5.856
N32	4324		790322/790918	180.13	32	-72.55	37.74	-8.34	15.927	-21.07	20.22	-1.01	6.201	0.12	72.73	14.97	11.767
	4961		790921/800415	206.67	32	-32.58	14.54	-4.69	6.475	-8.49	6.85	-0.64	2.474	0.07	33.30	6.99	4.646
N33	4324		790322/790918	180.13	72	-56.30	39.05	-3.89	14.661	-17.93	13.19	-0.47	4.407	0.17	56.66	12.42	9.771
	4961		790921/800415	206.67	72	-47.72	18.36	-12.44	10.620	-33.31	26.66	-2.12	7.384	0.60	58.20	15.46	9.362
N41	4005	105	790321/790904	167.04	10	-76.17	25.55	-10.37	14.708	-26.88	19.91	-2.05	7.408	0.14	76.48	15.56	11.87
N42	4010		790907/800415	220.71	29	-26.81	11.16	-8.46	7.228	-10.10	13.36	0.34	4.016	0.12	27.25	10.44	5.585
N43	5298		790321/790904	167.04	59	-24.21	13.39	-2.86	6.073	-8.43	8.17	-0.15	2.509	0.11	25.11	6.17	3.659
N44	4010		790321/790904	167.04	89	-53.42	32.92	-4.01	12.007	-17.74	17.37	-0.45	4.540	0.07	53.66	10.37	8.575
	5298		790907/800415	220.71	89	-33.81	34.20	1.05	12.471	-36.34	19.10	0.95	8.574	0.23	36.62	13.25	7.447
N51	4028	198	790320/790904	167.75	10	-23.89	30.13	1.94	8.999	-17.47	15.04	1.08	5.413	0.04	30.47	9.26	5.423
N52	4027		790320/790904	167.75	28	-49.03	16.05	-6.83	12.682	-33.44	22.80	-2.68	8.589	0.11	53.22	13.91	9.736
	4775		790907/800324	196.92	28	-22.25	23.88	3.88	8.095	-14.27	15.02	2.25	5.091	0.03	26.96	9.24	5.124
N54	4027		790320/790904	167.75	88	-42.42	33.51	-2.92	11.323	-10.99	15.41	1.77	4.375	0.20	25.07	9.06	5.569
N55	4027		790320/790904	167.75	118	-22.45	18.57	-0.78	6.72	-13.07	11.93	0.28	3.788	0.09	42.27	9.59	7.694
	4755		790907/800324	198.92	118	-22.45	18.57	-0.78	6.72	-11.34	7.54	-1.49	2.665	0.04	25.70	6.09	4.244
N56	4027		790320/790904	167.75	183	-22.99	50.71	11.81	13.38	-22.97	31.95	-1.18	10.000	0.29	54.29	17.18	11.173
N61	4033	810	790320/790904	168.00	10	-51.96	32.57	-2.99	14.511	-35.20	28.98	-2.67	10.890	0.42	52.23	16.57	8.400
	5332		790907/800415	168.00	10												

TABLE 4: Hourly Pressure/Temperature Statistics

Hourly Pressure/Temperature Statistics					Hourly Pressures (decibars)			Hourly Temperatures (°C)					
Station I.D.	Latitude Longitude	Water Depth (m)	Duration		Sensor Depth (m)	Statistics			Statistics				
			Dates/Times GMT	Days		Max	Min	Mean	σ	Max	Min	Mean	σ
N13 (Picket)	40°41.7'N 70°08.6'W	46	790321/790917	180.54	45	0.763	-0.723	-	0.310	13.60	3.03	7.85	2.806
			790920/800418	211.25	45	1.140	-0.900	-	0.330	15.85	1.18	7.65	4.604
N24 (Kelvin-1)	40°29.9'N 70°13.0'W	66	790720/790917	59.00	65	0.746	-0.708	-	0.321	10.82	7.45	9.10	0.877
			790320/791222	277.13	104	0.802	-0.693	-	0.333	16.27	7.00	11.75	1.327
N45 (Vogel)	40°12.9'N 70°18.2'W	105	790921/800418	210.08	104	0.888	-0.766	-	0.338	15.82	5.61	12.18	1.954
			790320/790918	182.33	197	0.794	-0.681	-	0.339	12.44	9.50	10.95	0.493
N57 (Kiwi)	40°02.2'N 70°22.3'W	198	790921/800417	209.54	197	0.812	-0.736	-	0.340	14.01	9.23	11.47	0.690
			790307/790702	116.79	65	0.734	-0.644	-	0.306				
N24 (USGS) (Tripod)	40°29.9'N 70°13.0'W	66	790807/791202	116.42	65	0.836	-0.774	-	0.325				
			791217/800524	158.79	65	0.992	-0.878	-	0.320				

TABLE 5: Low-Passed Pressure/Temperature Statistics

TABLE 5: Low-Passed Pressure/Temperature Statistics						Subtidal Pressures (decibars)				Subtidal Temperatures (°C)			
Station I.D.	Latitude Longitude	Water Depth (m)	Duration		Sensor Depth (m)	Statistics				Statistics			
			Dates/Times GMT	Days		Max	Min	Mean	σ	Max	Min	Mean	σ
N13 (Picket)	40°41.7'N 70°08.6'W	46	790322/790916	177.79	45	0.141	-0.116	-	0.048	12.59	3.10	7.85	2.767
			790921/800417	208.50	45	0.472	-0.296	-	0.117	15.40	1.55	7.64	4.613
N24 (Kelvin-1)	40°29.9'N 70°13.0'W	66	790721/790916	56.25	65	0.054	-0.077	-	0.025	10.59	7.50	9.10	0.846
			790321/791221	274.38	104	0.098	-0.097	-	0.034	15.74	7.33	11.75	1.286
N45 (Vogel)	40°12.9'N 70°18.2'W	105	790922/800417	207.33	104	0.166	-0.151	-	0.057	15.80	6.24	12.19	1.938
			790320/790917	179.58	197	0.085	-0.097	-	0.030	12.22	9.77	10.95	0.459
N57 (Kiwi)	40°02.2'N 70°22.3'W	198	790922/800416	206.79	197	0.121	-0.105	-	0.042	13.34	9.64	11.48	0.633
			790308/790701	114.04	65	0.120	-0.111	-	0.044				
N24 (USGS) (Tripod)	40°29.9'N 70°13.0'W	66	790806/791201		65	0.145	-0.145	-	0.067				
			791218/800523		65	0.305	-0.280	-	0.083				

TABLE 6: INDEX TO SCATTER PLOTS ($v = A + Bu$)

Inst. No.	Page No.	Figure No.	No. of Points	A	Standard Error	B
N11F	80	46	1014	-2.29	5.37	-.33
N11B	--	--	----	----	----	----
N12F	81	47	737	-1.44	2.97	-.31
N12B	82	48	1317	-3.04	4.81	-.25
N21F	83	49	1150	-2.84	6.09	-.10
N22F	84	50	898	-1.37	3.14	-.03
N22C	85	51	770	-.89	5.15	-.04
N22B	86	52	823	-1.68	4.36	-.10
N23F	87	53	898	-3.34	2.84	.20
N23C	88	54	770	-.35	3.68	.12
N23B	89	55	823	-2.06	3.97	.005
N31F	--	--	----	----	----	----
N31B	91	57	262	-3.84	6.66	-.17
N32F	92	58	1081	-.17	4.23	-.03
N32B	93	59	1241	-1.16	6.20	-.02
N33F	94	60	1081	-.26	2.42	.08
N33B	95	61	1241	-.09	3.86	.15
N41F	96	62	1002	-3.66	7.27	-.12
N41B	--	--	----	----	----	----
N42F	--	--	----	----	----	----
N42B	97	63	1325	-2.27	7.41	-.02
N43F	98	64	1003	.72	4.01	.04
N43B	--	--	----	----	----	----
N44F	99	65	1003	-.14	2.51	.004
N44B	100	66	1325	.22	4.07	.17
N51F	101	67	1007	.79	8.39	.15
N51B	--	--	----	----	----	----
N52F	102	68	1007	.69	5.11	.20
N52B	103	69	1194	-2.32	8.57	.05
N54F	104	70	1007	1.24	4.64	.26
N54B	--	--	----	----	----	----
N55F	105	71	1007	1.14	4.14	.16
N55B	106	72	1194	.71	3.41	.15
N56F	107	73	1007	-1.45	2.64	.06
N56B	--	--	----	----	----	----
N61F	108	74	1009	1.07	10.01	.01
N61B	109	75	1333	-2.00	10.41	.22

Table 7: Monthly mean and standard deviation of temperature.

Inst. No.	TEMPERATURE											
	(1979)						(1980)					
	April	May	June	July	August	September	October	November	December	January	February	March
	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$
	σ	σ	σ	σ	σ	σ	σ	σ	σ	σ	σ	σ
N 11	4.7	7.7	9.5	13.5	15.8	13.3	14.3	15.0	12.5	5.1	2.6	2.7
N 12	4.5	6.2	8.0	10.2	11.3	10.6	14.3	15.0	12.5	5.1	2.6	2.7
N 21	5.2	9.5	11.9	18.5	19.5	13.3	14.3	15.0	12.5	5.1	2.6	2.7
N 22	4.5	5.4	7.4	9.2	1.7	10.6	14.3	15.0	12.5	5.1	2.6	2.7
N 23	4.5	5.2	6.9	7.6	0.7	10.6	14.3	15.0	12.5	5.1	2.6	2.7
N 31	5.7	11.0	15.9	19.9	21.3	13.3	14.3	15.0	12.5	5.1	2.6	2.7
N 32	5.2	6.8	8.7	13.5	11.7	14.3	14.3	15.0	12.5	5.1	2.6	2.7
N 33	5.6	5.7	7.2	8.3	1.1	11.1	14.3	15.0	12.5	5.1	2.6	2.7
N 41	6.1	12.1	18.3	20.9	22.8	13.3	14.3	15.0	12.5	5.1	2.6	2.7
N 42	6.0	7.7	13.0	17.5	16.7	10.6	14.3	15.0	12.5	5.1	2.6	2.7
N 43	7.0	8.4	9.4	10.1	10.6	10.6	14.3	15.0	12.5	5.1	2.6	2.7
N 44	9.6	10.8	11.1	11.8	11.7	11.8	14.3	15.0	12.5	5.1	2.6	2.7
N 51	10.3	13.0	18.9	22.1	23.7	13.3	14.3	15.0	12.5	5.1	2.6	2.7
N 52	11.5	11.3	14.0	18.5	18.9	20.7	14.3	15.0	12.5	5.1	2.6	2.7
N 54	13.0	13.1	13.1	12.7	13.4	12.8	14.3	15.0	12.5	5.1	2.6	2.7
N 55	12.8	12.5	12.4	12.4	12.6	12.8	14.3	15.0	12.5	5.1	2.6	2.7
N 56	11.8	11.3	11.2	11.0	11.1	12.8	14.3	15.0	12.5	5.1	2.6	2.7
N 61	14.9	15.3	19.3	23.1	24.4	22.9	14.3	15.0	12.5	5.1	2.6	2.7

Table 8: Monthly mean and standard deviation of low-pass East current component. Values for months with data gaps less than 5d indicated by asterisk.

Inst. No.	(1979)						EAST COMPONENT						(1980)													
	April		May		June		July		August		September		October		November		December		January		February		March		April	
	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ
N 11	-6.1	8.4	-11.3	6.8	-11.7	7.9	-12.8	6.4	-9.6	10.1																
N 12	-3.7	6.7	-7.4	4.7	-7.6	4.9					-5.8	10.0	-4.9	11.2	-1.8	12.2	-3.5	19.8	-4.0	11.7	-3.3	17.7				
N 21	-7.0	9.7	-11.9	5.6	-12.2	6.6	-3.0	5.7	-6.2	9.3																
N 22	-6.3	7.2	-7.7	5.7	-8.6	5.6	-7.1	4.5	-7.2*	6.7	-7.9	8.5	-4.7	12.5	-9.9	11.4	-1.1*	25.5	-8.9	15.3	-6.2	17.5	-6.9	9.1		
N 23	-3.9	5.7	-3.9	4.8	-4.4	4.7	-4.3	3.4	-4.5*	5.8	-5.6	8.5	-4.2	12.0	-7.8	9.3			-8.5	14.3	-6.4	17.0	-6.1	8.0		
N 31																										
N 32	-6.6	7.6	-5.1	5.6	-8.5	9.7	-8.6	4.9	-7.7	5.8	-7.7	8.2	-3.3	10.4	-14.3	11.8	-6.3	11.7	-8.6	25.5	-11.7	15.3	-9.2	17.3		
N 33	-5.0	7.4	-5.2	5.6	-6.6	6.2	-4.7	4.9	-3.9	6.5	-2.9	6.5	0.1	13.5	-5.1	9.9	-2.6	12.1	-3.2	21.6	-9.0	13.6	-5.8	16.6		
N 41	-13.1	12.8	-19.6	8.5	-18.7	7.6	-7.1	5.9	-5.7	8.0																
N 42											-5.2	8.1	-6.6	9.0	-13.2	13.5	-15.3	23.9	-15.6	15.2	-11.1	15.9				
N 43	-7.5	9.6	-11.6	6.2	-11.0	6.6	-5.0	5.3	-8.0	4.8																
N 44	-2.8	7.3	-4.5	4.8	-4.7	6.3	-1.8	4.5	0.1	5.0	-3.8	6.5	-0.3	7.8	-2.5	7.2	-3.9	10.6	-4.1	18.7	-9.0	13.4	-6.1	13.9		
N 51	0.4	13.0	-4.0	9.9	-6.0	8.1	14.2	8.3	5.6	6.9																
N 52	4.5	8.8	-2.5	8.6	-2.6	3.8	10.0	6.7	3.8	6.3	1.5	8.8	0.6	8.7	-4.3	10.3	-7.5	14.4	-10.7	14.6	-15.4	11.3				
N 54	8.4	7.5	-0.8	7.9	-7	5.5	8.8	5.9	6.1	6.3																
N 55	7.6	7.1	-1.2	8.4	-1.3	5.5	10.3	7.4	6.5	6.8	2.2	8.0	-1.4	7.5	-2.3	8.3	-5.7	8.5	-3.4	17.2	-9.4	-11.3				
N 56	2.2	5.1	-3.5	7.9	-2.4	4.6	1.7	6.3	0.7	6.7																
N 61	7.1	12.4	18.8	15.2	-0.6	5.7	22.8	9.7	10.6	8.6	9.3	12.6	2.9	10.2	4.5	12.7	-8.6	10.8	-15.0	12.8	-11.3	11.9	0.9	16.4		

Table 9: Monthly mean and standard deviation of low-pass North current component. Values for months with data gaps less than 5d indicated by asterisk.

Inst. No.	NORTH COMPONENT												(1980)													
	April		May		June		July		August		September		October		November		December		January		February		March		April	
	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ
N 11	-0.8	6.3	2.5	5.0	1.8	6.0	0.9	5.4	1.7	6.5																
N 12	-0.4	4.5	0.5	2.6	1.1	3.1							-1.3	5.0	-0.7	3.9	-2.9	7.2	-4.4	8.4	-2.3	3.0	-2.2	7.3		
N 21	-1.8	5.2	-2.3	5.8	-2.8	6.3	-1.0	4.6	-0.8	7.0																
N 22	-1.8	2.9	-1.4	2.6	-1.3	2.7	0.3	2.9	1.3*	4.9	0.2	5.4	-1.2	4.7	-1.3	4.7					-1.1	3.2	-1.8	5.9	-0.5	2.2
N 23	-4.8	2.9	-4.1	2.1	-3.9	3.3	-3.2	2.6	-0.3*	3.4	-2.5	3.3	-0.8	3.2	-0.9	4.3					-1.6	3.4	-2.5	4.4	-1.8	2.1
N 31																										
N 32	-1.3	3.8	-0.6	3.5	-0.6	5.8	0.7	4.2	1.1	3.6	1.8*	3.5	-0.2	5.8	1.5	7.5	-3.0	6.0	-3.3	6.8	-1.9	4.8	-1.0	5.6		
N 33	-0.6	2.5	-0.7	2.1	-0.9	2.7	-0.7	2.2	-0.3	2.7	-1.5*	2.5	-0.4	2.7	-0.9	4.7	0.7	3.9	0.3	6.7	-1.6	4.2	-0.8	3.9		
N 41	-2.1	8.7	-1.5	10.6	-4.6	7.1	-0.7	3.2	-1.5	5.3																
N 42													0.2	6.6	0.4	8.0	-7.0	9.2	-4.4	7.1	-4.2	5.7	-1.2	6.5		
N 43	0.7	3.6	-0.4	4.4	-1.7	3.5	0.3	3.7	2.7	3.9																
N 44	0.2	2.9	-0.1	3.0	-0.8	3.0	0.2	1.4	0.1	1.7	0.1*	2.3	0.3	3.1	-0.5	3.2	-1.4	5.1	0.6	6.3	-2.1	5.0	-0.5	4.8		
N 51	0.6	9.3	-2.4	9.6	-1.3	7.3	3.7	5.3	5.0	7.2																
N 52	1.8	5.4	-1.1	5.2	-1.3	6.1	3.9	4.3	2.4	3.1	0.3*	4.6	-0.8	7.0	2.9	6.7	-7.6	10.0	-4.2	8.8	-6.1	8.7				
N 54	3.4	3.5	-0.7	5.4	-0.6	6.2	6.0	3.0	3.8	2.8																
N 55	2.6	3.1	-0.4	4.3	-0.7	5.4	5.0	3.6	2.6	2.9	0.9*	3.6	1.0	2.1	1.1	2.8	-0.4	2.2	0.9	5.7	-1.0	5.0				
N 56	-1.0	1.6	-2.7	3.2	-1.9	2.2	-0.1	2.8	-1.7	2.7																
N 61	9.1	8.5	-9.6	5.6	-1.2	4.6	8.5	6.5	2.9	7.1	-3.1*	7.5	-2.1	8.3	1.1	10.2	-4.1	13.9	-6.9	12.2	-5.2	10.0	0.6	10.1		

Table 10. Twice the integral time scale in days for the East and North components as estimated from the low-pass VACH data.

East	N1	N2	N3	N4	N5	N6	North	N1	N2	N3	N4	N5	N6
1	3	3	3	8	10	10	1	2	2	2	2	5	7
2	3	3	3	3	8		2	2	2	2	2	6	
3		3	3	3			3		2	2	2		
4				3	7		4				2	7	
5					6		5					6	
6					4		6					4	

Table 11: Amplitude and phase estimates and 95% confidence limits for dominant semi-diurnal and diurnal tidal current components. (The M2 results have been computed with North directed towards 16°T; all other results have been computed with North oriented towards 14°T.)

			K1		O1		95% Limits		M2		S2		N2		95% Limits	
			H	G	H	G	H	G	H	G	H	G	H	G	H	G
			cm/s	deg	cm/s	deg	%	deg	cm/s	deg	cm/s	deg	cm/s	deg	%	deg
NSFE11	E	11.9	170	6.3	129	-15,+20	±10	: 27.7	93	3.1	149	6.2	69	-7,+8	±4	
40.69N 70.14W																
10 m 4121hrs	N	9.6	60	4.5	26	-16,+23	±11	: 25.1	8	1.9	79	5.2	-22	-7,+9	±4	
NSFE12	E	7.4	169	3.7	131	-18,+27	±13	: 25.6	66	2.3	147	5.5	35	-6,+6	±3	
40.69N 70.14W																
32 m 5334hrs	N	5.7	55	2.6	11	-18,+27	±13	: 22.7	-19	1.5	87	4.7	304	-7,+8	±4	
NSFE21	E	9.0	108	3.9	72	-19,+28	±13	: 17.4	314	1.6	21	3.6	279	-7,+10	±5	
40.50N 70.21W																
10 m 4663hrs	N	7.2	15	3.3	-20	-22,+37	±16	: 18.1	237	1.9	-37	3.4	192	-9,+11	±6	
NSFE22	E	7.8	112	4.4	71	-15,+20	±10	: 15.2	315	.9	-28	3.9	289	-7,+8	±4	
40.50N 70.21W																
37 m 3658hrs	N	5.6	20	2.7	-21	-19,+28	±13	: 15.7	239	.5	-12	3.8	211	-7,+9	±5	
NSFE23	E	6.2	124	3.5	86	-19,+28	±13	: 14.9	311	.9	295	3.9	275	-7,+8	±4	
40.50N 70.21W																
52 m 6813hrs	N	4.9	41	2.9	10	-21,+33	±15	: 16.2	235	.6	71	3.9	197	-7,+9	±5	
NSFE31	E	6.2	188	3.4	143	-59,+285	±101	: 10.5	98	2.2	155	2.3	90	-25,+47	±19	
40.34N 70.27W																
10 m 1114hrs	N	4.4	97	2.9	54	-60,+285	±106	: 10.3	23	1.0	61	2.4	17	-31,+67	±25	
NSFE32	E	5.2	178	2.7	145	-21,+33	±15	: 10.9	85	1.0	135	2.2	60	-9,+11	±6	
40.34N 70.27W																
32 m 5027hrs	N	3.7	82	1.8	58	-28,+54	±22	: 10.3	9	.3	23	2.1	-24	-12,+14	±7	
NSFE33	E	5.2	186	2.4	138	-25,+49	±19	: 11.7	77	.5	197	3.1	34	-11,+15	±7	
40.34N 70.27W																
72 m 5027hrs	N	4.2	87	1.8	52	-29,+71	±24	: 10.5	0	.7	180	2.9	315	-14,+20	±10	
NSFE41	E	6.2	190	2.9	151	-26,+53	±20	: 9.7	112	2.5	236	2.8	27	-23,+41	±17	
40.21N 70.30W																
10 m 4071hrs	N	5.2	104	2.8	78	-26,+55	±20	: 11.2	27	2.8	139	3.1	292	-23,+41	±17	
NSFE42	E	4.2	181	2.5	145	-23,+41	±17	: 8.1	94	.2	289	2.1	57	-15,+21	±10	
40.21N 70.30W																
29 m 5364hrs	N	3.1	92	1.6	62	-36,+96	±33	: 8.1	13	.8	245	2.7	-28	-16,+24	±11	
NSFE43	E	5.9	192	3.1	137	-20,+34	±15	: 7.4	100	.7	125	1.7	87	-15,+21	±10	
40.21N 70.30W																
59 m 4076hrs	N	4.3	96	2.2	64	-23,+44	±17	: 7.4	21	.5	248	2.0	5	-13,+18	±9	
NSFE44	E	5.0	186	2.5	141	-26,+53	±20	: 8.0	78	.6	196	1.3	56	-17,+26	±12	
40.21N 70.30W																
89 m 5364hrs	N	4.0	100	2.0	53	-26,+55	±20	: 8.0	3	.9	164	1.1	-23	-20,+33	±14	
NSFE51	E	4.4	200	1.7	156	-36,+96	±33	: 3.1	142	1.3	143	1.2	145	-49,+223	±59	
40.04N 70.37W																
10 m 4094hrs	N	4.0	110	1.6	75	-44,+163	±47	: 3.0	65	.7	-25	1.7	61	-49,+245	±61	
NSFE52	E	3.5	182	1.9	142	N/A	N/A	: 2.6	121	.9	133	1.3	150	N/A	N/A	
40.04N 70.37W																
28 m 4093hrs	N	2.4	93	1.9	48	N/A	N/A	: 2.4	44	.6	320	1.7	47	N/A	N/A	
NSFE54	E	3.1	200	1.6	151	-26,+54	±20	: 3.2	86	.4	153	.5	21	-40,+133	±39	
40.04N 70.37W																
88 m 4093hrs	N	2.7	109	1.3	62	-27,+60	±21	: 2.8	12	.8	106	.6	271	-46,+186	±53	
NSFE55	E	2.9	196	1.5	138	-28,+62	±22	: 4.3	83	.6	227	1.0	29	-30,+74	±24	
40.04N 70.37W																
118 m 4093hrs	N	2.6	96	1.5	61	-27,+58	±21	: 4.0	2	1.1	138	1.1	276	-35,+89	±31	
NSFE56	E	3.3	203	1.4	142	-25,+51	±19	: 3.9	116	.5	-34	1.9	71	-36,+96	±33	
40.04N 70.37W																
183 m 4093hrs	N	2.9	106	1.5	65	-26,+56	±20	: 4.3	37	1.4	230	2.3	-25	-37,+104	±35	
NSFE61	E	.9	243	1.0	207	-48,+213	±59	: 1.6	236	1.1	118	.6	151	-55,+270	±84	
39.85N 70.42W																
10 m 5398hrs	N	1.1	149	1.7	68	-57,+285	±89	: 2.4	148	.8	-9	.7	80	-48,+213	±59	

Table 12: Principal harmonic constituents for the NSFE bottom pressure array with amplitude and Greenwich epoch presented in units of millibars and degrees, respectively. The analysis has been performed on composite series at each site and the 95% confidence limits for the K1 and M2 constituents are listed.

Station I.D.	Length of Series (Days)	K1			O1			K1			M2			S2			M2			95% Limits		
		H	G	H	G	H	G	H	G	H	H	G	H	H	G	H	H	G	H	H	G	H
N1	365	6.5	173	5.6	190	±0.17	±1.3	38.7	356	8.9	18	9.4	340	±0.19	±0.3							
N2*	390	7.2	174	6.0	186	±0.15	±1.0	39.5	353	9.0	18	9.6	337	±0.20	±0.3							
N4	394	8.1	177	6.5	185	±0.11	±0.8	42.0	353	9.2	18	9.7	336	±0.25	±0.3							
N5	365	8.5	175	6.9	180	±0.11	±0.8	43.1	351	10.3	14	10.0	333	±0.21	±0.3

Figure 1: Schematic cross-section of NSFE79 moored array design. The mean winter (solid) and summer (dashed) positions of the outer shelf/slope front (defined by the $35^{\circ}/^{\circ}$ and/or 10°C surface) are taken from Wright (1976). The mean and standard deviation of the surface expression of the front shown at the top is taken from Halliwell and Mooers (1979). The insert map shows the locations of the NSFE79 array, and the two meteorological stations: the Nantucket Light Ship (NLS) and NOAA environmental buoy (EB63). The water depth in meters appears in parentheses next to the mooring number.

Figure 2: Schematics of mooring design for surface guard and subsurface current meter moorings.

Figure 3: Summary chart of good current, temperature, and bottom pressure data return.

PL33 FREQUENCY RESPONSE FUNCTION

Figure 4: Characteristics of PL33 filter.

Figure 5: Vector plot of windstress and low-pass current data for NSF79. The currents are plotted on the local isobath co-ordinate system with the alongshelf component u up and the cross-shelf component v directed towards the left. The wind is plotted in a coordinate system rotated 30° counterclockwise from the current coordinate system so that $77^\circ T$ is p and $347^\circ T$ is towards the left. This coordinate system for the wind has been chosen to give the maximum coherence between alongshelf current and alongshelf wind.

Figure 6: Time series of low-pass North components for NSFE79.

Figure 7: Time series of low-pass East components for NSFE79.

Figure 8: Time series of low-pass temperature data for NSFE79.

Figure 9: Contour plots of monthly mean temperature for April through September.

Figure 10: Contour plots of monthly mean East current for April through September.

Figure 11: Time series of hourly-averaged data for instrument N11F.

Figure 12: Time series of hourly-averaged data for instrument N12F.

MOORING N12

TEMPERATURE (deg c)

Figure 13: Time series of hourly-averaged data for instrument N12B.

Figure 14: Time series of hourly-averaged data for instrument N21F.

Figure 15: Time series of hourly-averaged data for instrument N22F.

Figure 16: Time series of hourly-averaged data for instrument N22C.

Figure 17: Time series of hourly-averaged data for instrument N2B.

Figure 18: Time series of hourly-averaged data for instrument N23F.

Figure 19: Time series of hourly-averaged data for instrument N23C.

Figure 21: Time series of hourly-averaged data for instrument N24F.

Figure 22: Time series of hourly-averaged data for instrument N24C.

Figure 23: Time series of hourly-averaged data for instrument N24B.

Figure 24: Time series of hourly-averaged data for instrument N31B.

Figure 25: Time series of hourly-averaged data for instrument N32F.

Figure 26: Time series of hourly-averaged data for instrument N32B.

Figure 27: Time series of hourly-averaged data for instrument N33F.

Figure 28: Time series of hourly-averaged data for instrument N33B.

Figure 29: Time series of hourly-averaged data for instrument N41F.

Figure 30: Time series of hourly-averaged data for instrument N42B.

Figure 31: Time series of hourly-averaged data for instrument N43F.

Figure 32: Time series of hourly-averaged data for instrument N44F.

Figure 33: Time series of hourly-averaged data for instrument N44B.

Figure 34: Time series of hourly-averaged data for instrument N51F.

Figure 35: Time series of hourly-averaged data for instrument N52F.

Figure 36: Time series of hourly-averaged data for instrument N52B.

Figure 37: Time series of hourly-averaged data for instrument N54F.

Figure 38: Time series of hourly-averaged data for instrument N55F.

Figure 39: Time series of hourly-averaged data for instrument N55B.

Figure 40: Time series of hourly-averaged data for instrument N56F.

Figure 41: Time series of hourly-averaged data for instrument N61F.

Figure 42: Time series of hourly-averaged data for instrument N61B.

Figure 43: Time series of one-hour temperature, light transmission, standard deviation of bottom pressure, and speed for instrument N24F.

Figure 44: Time series of one-hour temperature, light transmission, standard deviation of bottom pressure, and speed for instrument N24C.

Figure 45: Time series of one-hour temperature, light transmission, standard deviation of bottom pressure, and speed for

N

0 200
KILOMETERS

N11FPL33R

79- 111-22 10 79- 1X -07

Figure 46: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N11F.

N ↑

0 200
KILOMETERS
N12FPL33R

79-111-22 TO 79-111-23

Figure 47: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N12F.

N ↑

0 200
KILOMETERS
N12BPL33R

79- 1X -10 10 80- 1V -17

Figure 48: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N12B.

N

0 200
KILOMETERS

N21FPL33R

79- 111-08 TO 79- 1X -16

Figure 49: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N21F.

0 200
KILOMETERS

N22FPL33R

79- 111-09 TO 79-VIII-05

Figure 50: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N22F.

N

0 200
KILOMETERS
N22CPL33R

79-V111-08 TO 79-X11-15

Figure 51: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N22C.

N

0 200
KILOMETERS
N22BPL33R

80- 1 -06 10 80- V -22

Figure 52: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N22B.

Figure 53: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N23F.

N23CPL33R

79-VIII-08 TO 79-XII-15

Figure 54: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N23C.

N

0 200
KILOMETERS

N23BPL33R

80- 1 -06 10 80- V -22

Figure 55: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N23B.

Figure 56: Scatter plots of low-pass hourly-averaged current data for instruments N24F, N24C, and N24B.

N ↑

0 200
KILOMETERS
N31BPL33R

79- 1X -07 10 79- X -21

Figure 57: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N31B.

N

0. 200.
KILOMETERS
N32FPL33R

79- 111-22 TO 79- 1X -18

Figure 58: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N32F.

N

0 200
KILOMETERS
N32BPL33R

79- 1X -21 TO 80- 1V -15

Figure 59: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N32B.

0. 200.
KILOMETERS
N33FPL33R

79- 111-22 10 79- 1X -18

Figure 60: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N33F.

N

0. 200.
KILOMETERS
N33BPL33R

79- 1X -21 TO 80- 1V -15

Figure 61: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N33B.

N

0 200
KILOMETERS
N41FPL33R
79-111-21 TO 79-1X-04

Figure 62: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N41F.

Figure 63: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N42B.

KILOMETERS

N43FPL33R

79-111-21 10 79-1X -04

Figure 64: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N43F.

N ↑

0 200
KILOMETERS

N44FPL33R

79- 111-21 10 79- 1X -04

Figure 65: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N44F.

0. 200.

KILOMETERS

N44BPL33R

79- 1X -07 TO 80- 1V -15

Figure 66: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N44B.

N

0. 200. KILOMETERS

N51FPL33R

79- 111-20 TO 79- 1X -04

Figure 67: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N51F.

N

0: KILOMETERS 200.

N52FPL33R

79- 111-20 10 79- 1X -04

Figure 68: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N52F.

Figure 69: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N52B.

Figure 70: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N54F.

N

0 200
KILOMETERS
N55FPL33R

79- 111-20 TO 79- 1X -04

Figure 71: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N55F.

N ↑

0: ——— KILOMETERS 200.
N55BPL33R

79- IX -07 TO 80- III-24

Figure 72: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N55B.

N

0. 200.
KILOMETERS
N56FPL33R

79- 111-20 10 79- 1X -04

Figure 73: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N56F.

N

0 200
KILOMETERS
N61FPL33R

79-111-20 TO 79-1X-04

Figure 74: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N61F.

Figure 75: Progressive vector diagram and scatter plot of low-pass hourly-averaged current data for instrument N61B.

Figure 76: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N11F.

Figure 77: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N12F and N12B.

Figure 78: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N21F.

Figure 79: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N22F, N22C, and N22B.

Figure 80: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N23F, N23C, and N23B.

Figure 81: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N31B.

Figure 82: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N32F and N32B.

AUTO SPECTRUM
N33FAR EAST
79-11-20 TO 79-1X-19
1 PIECES WITH 2187 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N33FAR NORTH
79-11-20 TO 79-1X-19
1 PIECES WITH 2187 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N33FAR EAST
79-11-20 TO 79-1X-19
1 PIECES WITH 2187 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N33B81HR TEMPERATURE
79-1X-20 TO 80-1V-15
1 PIECES WITH 2500 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N33B81HR NORTH
79-1X-20 TO 80-1V-15
1 PIECES WITH 2500 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N33B81HR EAST
79-1X-20 TO 80-1V-15
1 PIECES WITH 2500 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

Figure 83: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N33F and N33B.

Figure 84: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N41F.

Figure 85: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N42B.

AUTO SPECTRUM
N43FAR EAST
79-111-20 TO 79-1X-04
1 PIECES WITH 2025 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N43FAR NORTH
79-111-20 TO 79-1X-04
1 PIECES WITH 2025 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N43FAR NORTH
79-111-20 TO 79-1X-04
1 PIECES WITH 2025 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

Figure 86: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N43F.

Figure 87: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N44F and N44B.

AUTO SPECTRUM
N51FAR TEMPERATURE
79-111-18 TO 79-1X-03
1 PIECES WITH 2025 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N51FAR NORTH
79-111-18 TO 79-1X-03
1 PIECES WITH 2025 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N51FAR EAST
79-111-18 TO 79-1X-03
1 PIECES WITH 2025 ESTIMATES
PER PIECE. AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

Figure 88: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N51F.

Figure 89: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N52F and N52B.

Figure 90: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N54F.

Figure 91: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N55F and N55B.

Figure 92: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instrument N56F.

AUTO SPECTRUM
N61FAR EAST
79-111-18 TO 79-1X-05
1 PIECES WITH 2048 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N61FAR NORTH
79-111-18 TO 79-1X-05
1 PIECES WITH 2048 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N61FAR EAST
79-111-18 TO 79-1X-05
1 PIECES WITH 2048 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N61BCHRR
79-1X-05 TO 80-1V-08
1 PIECES WITH 2592 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N61BCHRR NORTH
79-1X-05 TO 80-1V-08
1 PIECES WITH 2592 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
N61BCHRR EAST
79-1X-05 TO 80-1V-08
1 PIECES WITH 2592 ESTIMATES
PER PIECE, AVERAGED OVER
5 ADJACENT FREQUENCY BANDS

Figure 93: Auto spectrum of East, North, and temperature computed from hourly-averaged data for instruments N61F and N61B.

Figure 94: Time series of one-hour and low-pass temperature and bottom pressure for instrument N13F.

Figure 95: Time series of one-hour and low-pass temperature and bottom pressure for instrument N13B.

Figure 96: Time series of one-hour and low-pass temperature and bottom pressure for instrument N24F.

Figure 97: Time series of one-hour and low-pass temperature and bottom pressure for instrument N24C.

Figure 98: Time series of one-hour and low-pass temperature and bottom pressure for instrument N24B.

Figure 99: Time series of one-hour and low-pass temperature and bottom pressure for instrument N45F.

Figure 100: Time series of one-hour and low-pass temperature and bottom pressure for instrument N45B.

Figure 101: Time series of one-hour and low-pass temperature and bottom pressure for instrument N57F.

Figure 102: Time series of one-hour and low-pass temperature and bottom pressure for instrument N57B.

Figure 103: Time series of low-pass difference bottom pressure between instruments N57F and N13F, N57F and N45F, and N45F and N13F.

Figure 104: Time series of low-pass difference bottom pressure between instruments N57B and N13B, N57B and N45B, and N45B and N13B.

Figure 105: Auto-Spectra of bottom pressure and temperature for instruments N13F, N45F, and N57F.

Figure 106: Auto-Spectra of bottom pressure and temperature for instruments N13B, N45B, and N57B.

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