

U.S. Coast Guard Oceanographic Report

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REPORT No. 57

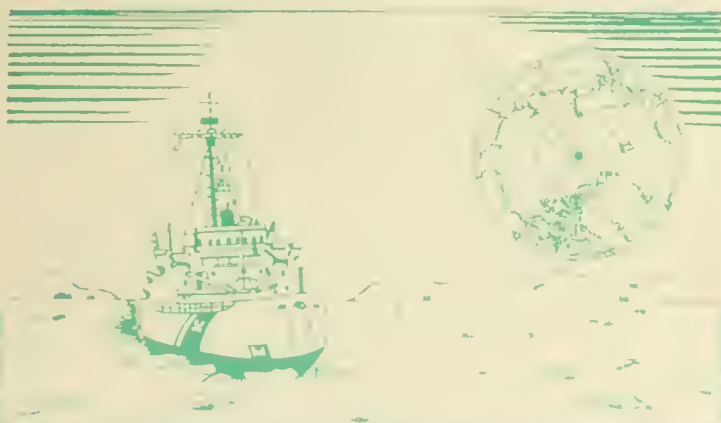
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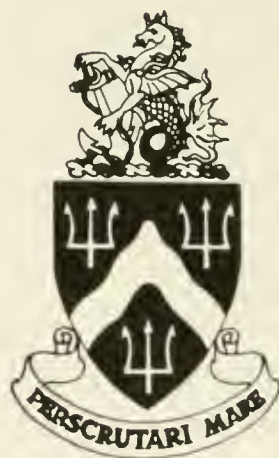
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UNITED STATES COAST GUARD OCEANOGRAPHIC UNIT

# REPORT No. 57 CG 373-57

## OCEANOGRAPHIC CONDITIONS IN NARES STRAIT


August-September 1970

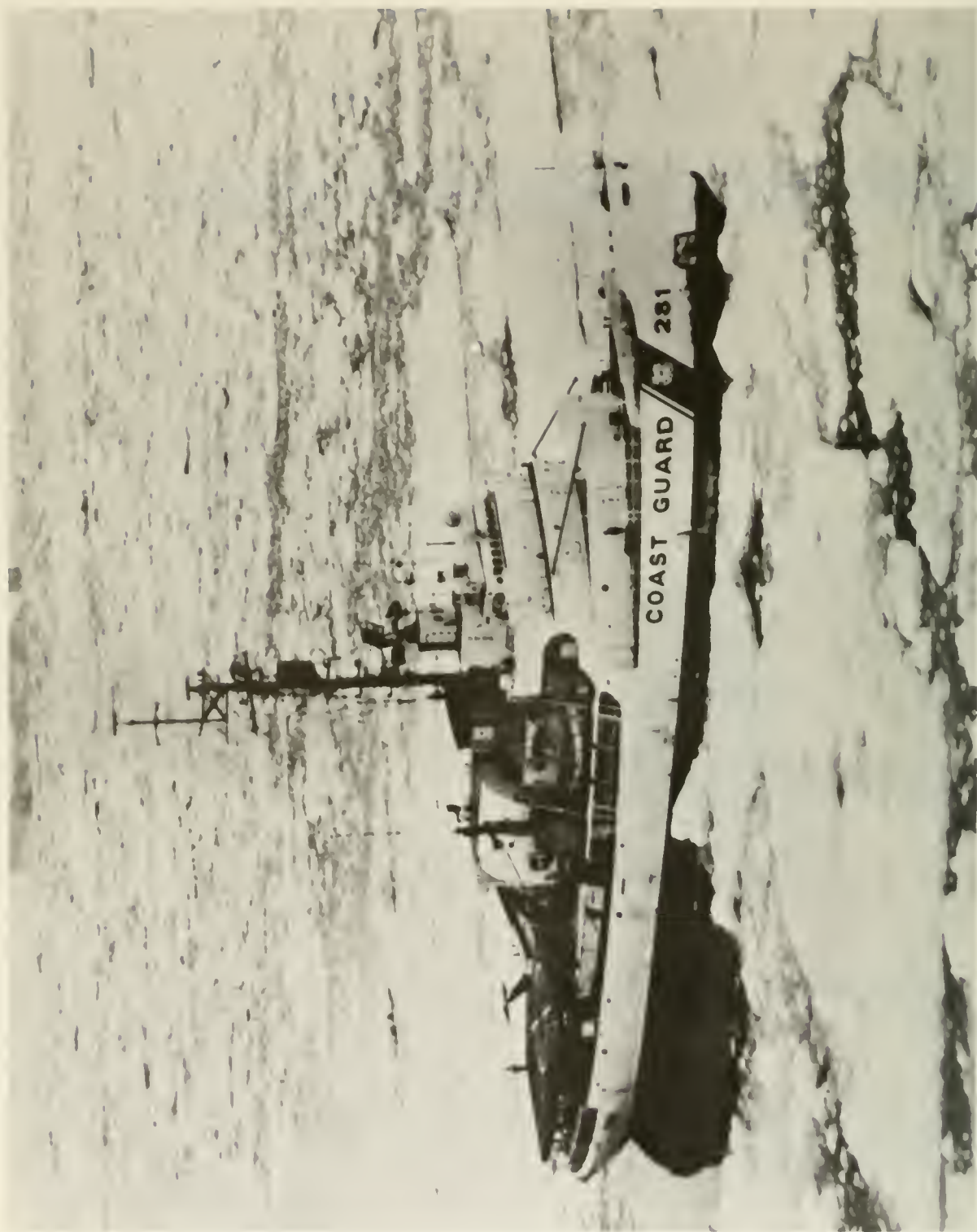
*Martin J. Moynihan*

MBL/WHOI



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WASHINGTON, D.C.  AUGUST 1972



USCGC WESTWIND (WAGB 281)

## ABSTRACT

Oceanographic observations from the CGC WESTWIND in the Nares Strait region during August and September 1970 are presented. Observed temperature-salinity characteristics are discussed in relation to the interchange of water between the Arctic Ocean and Baffin Bay and the formation of Baffin Bay Deep Water. An average northward transport of  $0.48 \times 10^6 \text{m}^3/\text{sec}$ . from Smith Sound into Kane Basin was computed and is compared with previous transport calculations. The relationship of tidal and wind conditions to the volume transport is also discussed.

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# OCEANOGRAPHIC CONDITIONS IN NARES STRAIT

## AUGUST-SEPTEMBER 1970

Martin J. Moynihan<sup>1</sup>

### INTRODUCTION

Nares Strait is the system of channels and basins between Ellesmere Island and Northwest Greenland, connecting Baffin Bay with the Lincoln Sea and Arctic Ocean (fig. 1). It includes (from south to north) Smith Sound, Kane Basin, Kennedy Channel, Hall Basin, and Robeson Channel. Since 1950, several Canadian oceanographers (Bailey, 1957; Collin, 1965; and Dunbar, 1951) have reported on cruises into Nares Strait to present their data and compare the results with the classical expeditions of the Danish GODTHAAB and CGC MARION in 1928.

Coast Guard vessels have also conducted several surveys into Northern Baffin Bay and Nares Strait to investigate the flow of Arctic Water through this channel. The results of surveys by CGC EVERGREEN and CGC EDISTO in 1963 and 1966 respectively have been reported by Franceschetti et al. (1964) and Palfrey and Day (1968). During August and September 1968, 1969, and 1970, the CGC WESTWIND conducted oceanographic surveys in northern Baffin Bay under the auspices of the Baffin Bay-North Water Project, coordinated

by the Arctic Institute of North America and including groups from the University of Washington, U.S. Coast Guard, McGill University and Dartmouth College (Muench, 1971b). CGC EASTWIND and CGC SOUTHWIND completed oceanographic surveys in Kane Basin in September 1968 and 1969 respectively with field parties from the Coast Guard Oceanographic Unit and Naval Oceanographic Office on board (Moynihan, in press).

During August and September 1970, CGC WESTWIND conducted an oceanographic survey from Inglefield Bay on the western coast of Greenland, through the Smith Sound-Kane Basin region and into Kennedy Channel, Hall Basin, and Robeson Channel (figs. 2 and 3). This survey was a combination of two projects at the Coast Guard Oceanographic Unit: first, a continuation of an investigation of the iceberg producing glaciers on the western coast of Greenland and second, a continuation of the 1968 and 1969 surveys in the Nares Strait region to investigate the interchange of water between the Arctic Ocean and Baffin Bay.

<sup>1</sup>Coast Guard Oceanographic Unit, Building 159-E, Navy Yard Annex, Washington, D.C. 20390.

### DATA ACQUISITION AND PROCESSING

Temperature data and water samples were collected by Nansen casts. The water samples were analyzed on board with inductive salinometers. The conductivity values obtained were converted to salinity by use of the *International Oceanographic Tables* published jointly by UNESCO and the National Institute of Oceanography of Great Britain (1966). Water sam-

ples were also collected and frozen for later determination of inorganic phosphate, nitrate, nitrite, and silicate at the Coast Guard Oceanographic Unit using the techniques described by Strickland and Parsons (1968).

The temperature data were processed at the Coast Guard Oceanographic Unit following the procedures specified in the U.S. Naval Ocean-

ographic Office Publication No. 607 (1968). Paired protected thermometers were used on each bottle with unprotected reversing thermometers added on the deeper bottles. Sampling depths were determined from L-Z curves based on thermometric depth and wire angle. All calculations were performed on a PDP-5 digital computer utilizing programs described by O'Hagan (1964). Volume transports were computed using the method of subdividing each oceanographic section into solenoids for computations as described by Kollmeyer (1967).

Data were also obtained on 10 stations using a Bissett-Berman Model 9060 self-contained salinity-temperature-depth (STD) recorder. The STD data were quality controlled by comparison with temperatures and salinities obtained from deep-sea reversing thermometers and water samples collected at the surface and just above the STD at the bottom of the cast. An average quality control correction for the STD stations was determined from the differences between the STD data and the associated quality control samples and was applied to the raw data from the recorder.

The data presented in the Tables of Ocean-

ographic Data (app. A) are reproduced from computer listings from the National Oceanographic Data Center (NODC Cruise Numbers 31-8184 and 31-1705). Anomalies of dynamic height in the listings were computed by NODC, but all discussion of dynamic heights in this text is based on computations made at the Coast Guard Oceanographic Unit. Dynamic heights in water shallower than the reference level were computed in a manner similar to that of Helland-Hansen (1934), as described in detail by Kollmeyer (1967).

The survey and glaciological data from 27 glaciers will be published in a separate Coast Guard publication after the analysis is completed. Glacier fronts were charted, and benchmarks were established at survey stations wherever possible for reference during future surveys. Records were kept on ice movement and calving and on iceberg distribution around the glaciers and in the fjords and bays. Photographic overflights of the major glacier fronts were conducted by a Coast Guard HC-130 aircraft equipped with a T-11 aerial camera. Ship's helicopters were used to obtain oblique and vertical photographs of all glacier fronts.

## DISCUSSION

The interchange of water between the Arctic Ocean and Baffin Bay takes place through Nares Strait, Jones Sound, and Lancaster Sound (fig. 1), but this flow is restricted due to limiting sill depths of 250, 175, and 180 meters respectively (Bailey, 1956). Nares Strait is the deepest and most direct path for this interchange and is of major importance in determining the water and heat budgets of the Arctic Ocean and Baffin Bay. The general bathymetry of Nares Strait consists of a narrow, deep channel running along the western side of the strait with a sill at 250 meters in central Kane Basin (fig. 4).

Previous investigators of the eastern Arctic have noted that waters at about 250 meters have characteristics ( $-0.3^{\circ}\text{C}$ .,  $34.4\text{‰}$ ) similar to deep water found in Baffin Bay and have hypothesized that this water flows over the sill in Kane Basin and sinks to the bottom in Baffin Bay. Bailey (1957) and Collin (1965) concluded that this is not a continuous process

but probably takes place as an intermittent pulsing. Muench (1971a) suggests that this method is less common than previously indicated, and he upholds the theory of Sverdrup, Johnson, and Fleming (1942) that Baffin Bay Deep Water is formed by a mixture of Labrador Sea Deep Water and Baffin Bay Surface Water whose salinity had been increased sufficiently by freezing to cause the water to sink.

Examination of the water characteristics observed in Nares Strait in 1970 (figs. 17 and 18) shows water with the proper temperature-salinity relationship ( $<-0.3^{\circ}\text{C}$ .,  $>34.4\text{‰}$ ) at 200 meters at station 20 over the sill in Kane Basin and at 300 meters at station 19 just south of the sill. However, water of proper salinity for deep water formation was not present in the passage between Kane Basin and Smith Sound. The distribution of salinity and density through Nares Strait (figs. 18 and 19) suggests the presence of an isopycnal wave of denser water overflowing the sill in Kane

Basin. Collin (1965) and Palfrey and Day (1968) interpreted similar density distributions as supporting a pulsing flow of high salinity Arctic Water into Smith Sound.

High salinity water of Atlantic origin ( $>0^{\circ}$  C.,  $>34.7\text{‰}$ ) was found below 300 meters in Hall Basin (figs. 17 and 18). This Arctic Intermediate Water is also effectively blocked from flowing southward into Baffin Bay by the shallow sill at 250 meters in Kane Basin.

Cold water of polar origin ( $<0^{\circ}$  C.,  $<34.0\text{‰}$ ) was found in the upper 200 meters throughout Nares Strait (figs. 17 and 18). This water makes up the major drift southward into Baffin Bay. Water having a temperature less than  $-1.50^{\circ}$  C. was present to a depth of 75 meters in Hall Basin and to between 25 and 50 meters further south in Kane Basin.

A section across the southern end of Nares Strait was occupied three times in rapid succession from 3–5 September 1970 in an attempt to monitor the volume transport between Kane Basin and Smith Sound (fig. 2). Each occupation consisted of 6 stations, and the three occupations were completed in approximately 38 hours. The reference level for geostrophic calculations was selected based upon the deepest usable set of observations on each occupation. The results of the volume transport calculations are presented in table I.

TABLE I. Volume Transport From Smith Sound into Kane Basin.

Stations	Date	Mean Temp. ( $^{\circ}$ C.)	Net Transport ( $\times 10^6 \text{m}^3/\text{sec.}$ )
1 to 6 -----	3-4 Sep 1970	-0.73	10.574
7 to 12 -----	4 Sep 1970	- .93	2 .319
13 to 18 -----	4-5 Sep 1970	- .76	.558
Average -----		- .81	.484

<sup>1</sup> Reference level 500 decibars.

<sup>2</sup> Reference level 300 decibars.

An average northeasterly transport of  $0.48 \times 10^6 \text{m}^3/\text{sec.}$  between Smith Sound and Kane Basin was computed from the September 1970 observations. This average transport is biased due to the shallower sampling on the second occupation of the section that necessitated a shallower reference level for those calculations. Moynihan (in press) computed an average southward transport of  $0.42 \times 10^6 \text{m}^3/\text{sec.}$  through this same section in July 1969.

These values agree with the results of the previous investigators in this region and

further substantiate the variability of the flow through Nares Strait. Collin (1965) cited Kiilerick's calculations of a  $0.42 \times 10^6 \text{m}^3/\text{sec.}$  southward flow in August 1928 as the earliest estimate of the exchange through Kane Basin. Bailey (1956) found an average northward transport of  $0.42 \times 10^6 \text{m}^3/\text{sec.}$  based on four sections in Smith Sound during August 1954 and Collin (1965) estimated an average southward transport of  $0.24 \times 10^6 \text{m}^3/\text{sec.}$  based on five September sections from 1962, 1963, and 1964.

The variability of these geostrophic flow calculations indicates that the exchange of water between Kane Basin and Smith Sound is affected by frictional effects of the wind and bottom and the effect of tidal oscillations, as well as by uncertainties of the geostrophic method in shallow water.

To examine the tidal effect on flow from Kane Basin into Smith Sound, profiles of sea surface dynamic height from CGC WESTWIND stations 1 through 18 were compared with the times and heights of high and low water at the Port Foulke ( $78^{\circ}18'N.$ ,  $72^{\circ}45'W.$ ) tide station (fig. 23). *The Oceanographic Atlas of the Polar Seas, Part II* (U.S. Naval hydrographic Office, 1958) shows cotidal lines progressing from Baffin Bay northward into Kane Basin indicating a northward tidal current on the rising tide. Although each occupation of the section between Kane Basin and Smith Sound occurred on a falling tide, a northeasterly geostrophic flow was calculated, suggesting either a lagging effect between the tidal phase and geostrophic flow or a reduced northeasterly flow due to the tidal current. Collin (1965) noted that ship drift records in 1962 indicated that in the center of the passage there was a southwesterly set of 0.5 to 2.0 knots during the falling tide and an equally strong northeasterly set with a rising tide.

Day (1968) reported that direct current measurements near  $78^{\circ}27'N.$  in Smith Sound in 1963 indicate a circulation dominated by semidiurnal tides with a net transport to the south. Muench (1971a) reported that current measurements from a fixed ice camp in Kane Basin indicate a general southward flow with occasional flow reversals coinciding with the diurnal tidal currents.

A progressive wind vector diagram (fig.

24), drawn from the surface wind observations of CGC WESTWIND at stations 1 through 18, was examined to study the effect of surface wind on the flow from Kane Basin into Smith Sound. A relatively steady wind (mean 10.0 kts. from 055° T.) with velocities varying from 4 to 15 knots was observed. This would induce a surface current transport to the southwest and would reduce the northeasterly flow into

Kane Basin. However, based on all information available, it is felt that permanent and tidal current effects would predominate, particularly when the winds were at such a low velocity.

The results of these observations indicate that year-round direct current, tidal and meteorological measurements are required to completely describe the total water circulation in this Nares Strait region.

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FIGURE 1. Geographic locations in the Nares Strait-Baffin Bay region.

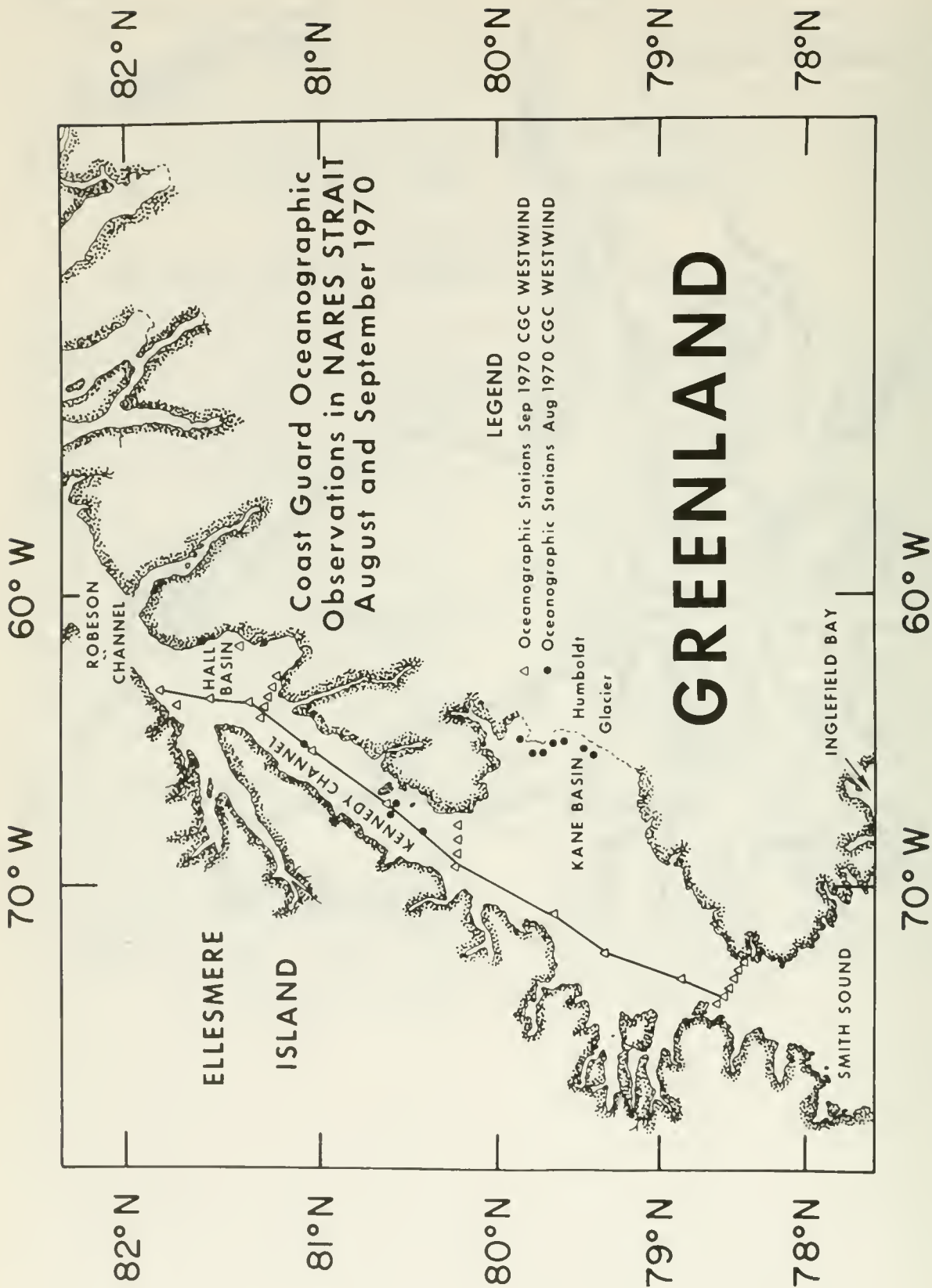


FIGURE 2. Positions of CGC WESTWIND oceanographic stations in Nares Strait during August and September 1970.

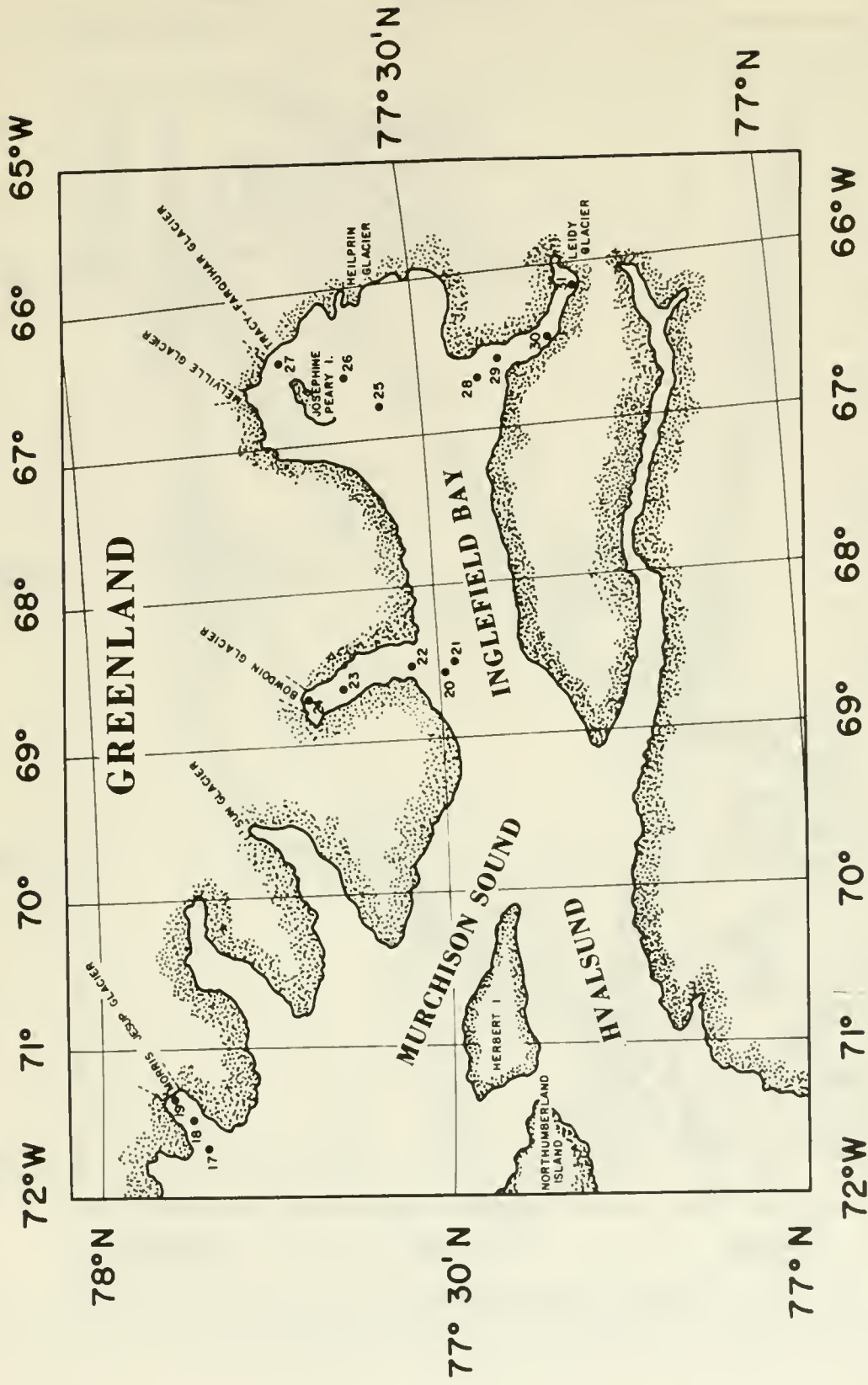


FIGURE 3. Positions of CGC WESTWIND oceanographic stations in northeastern Baffin Bay-Inglefield Bay region during August 1970.

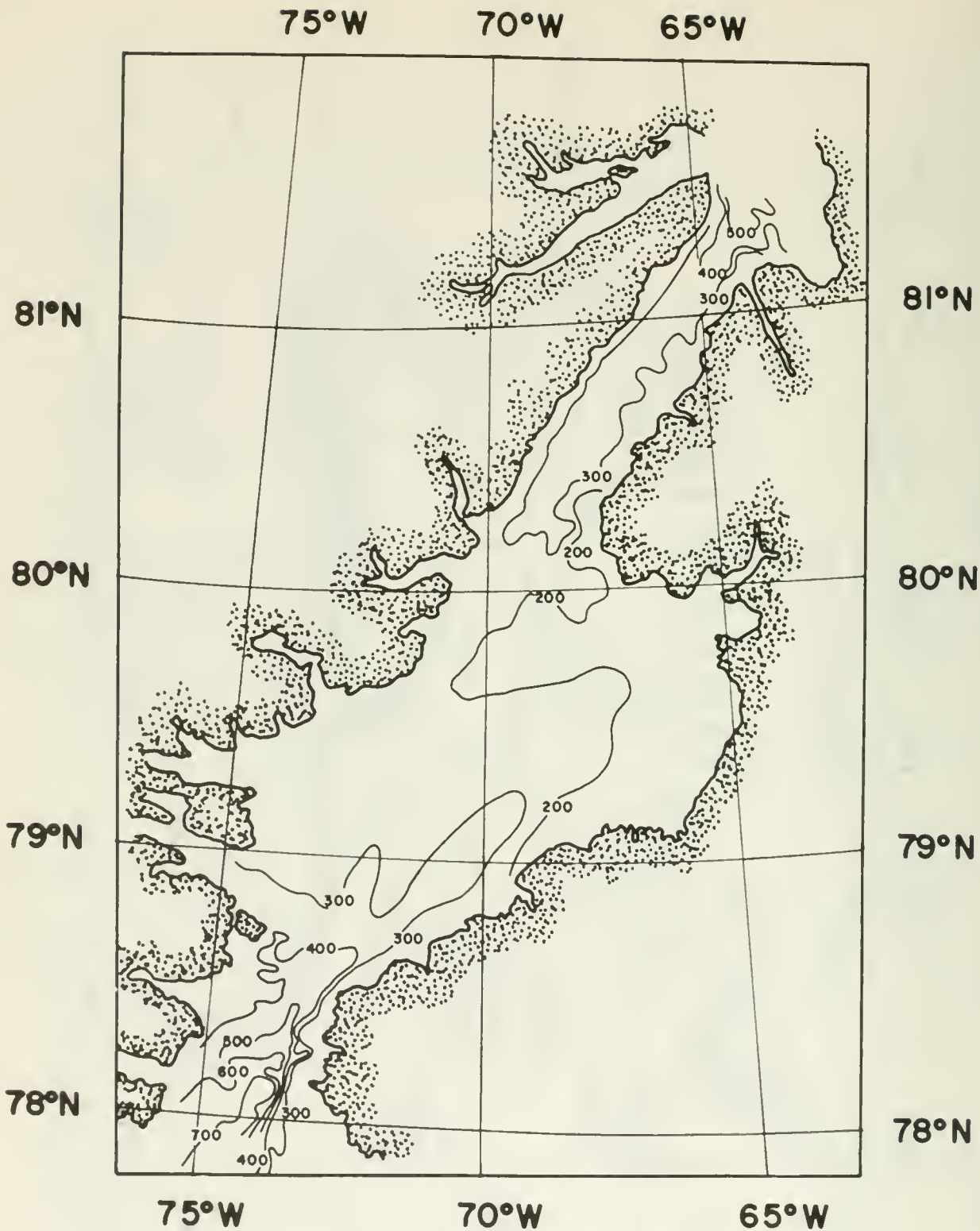


FIGURE 4. Bottom topography of Nares Strait.



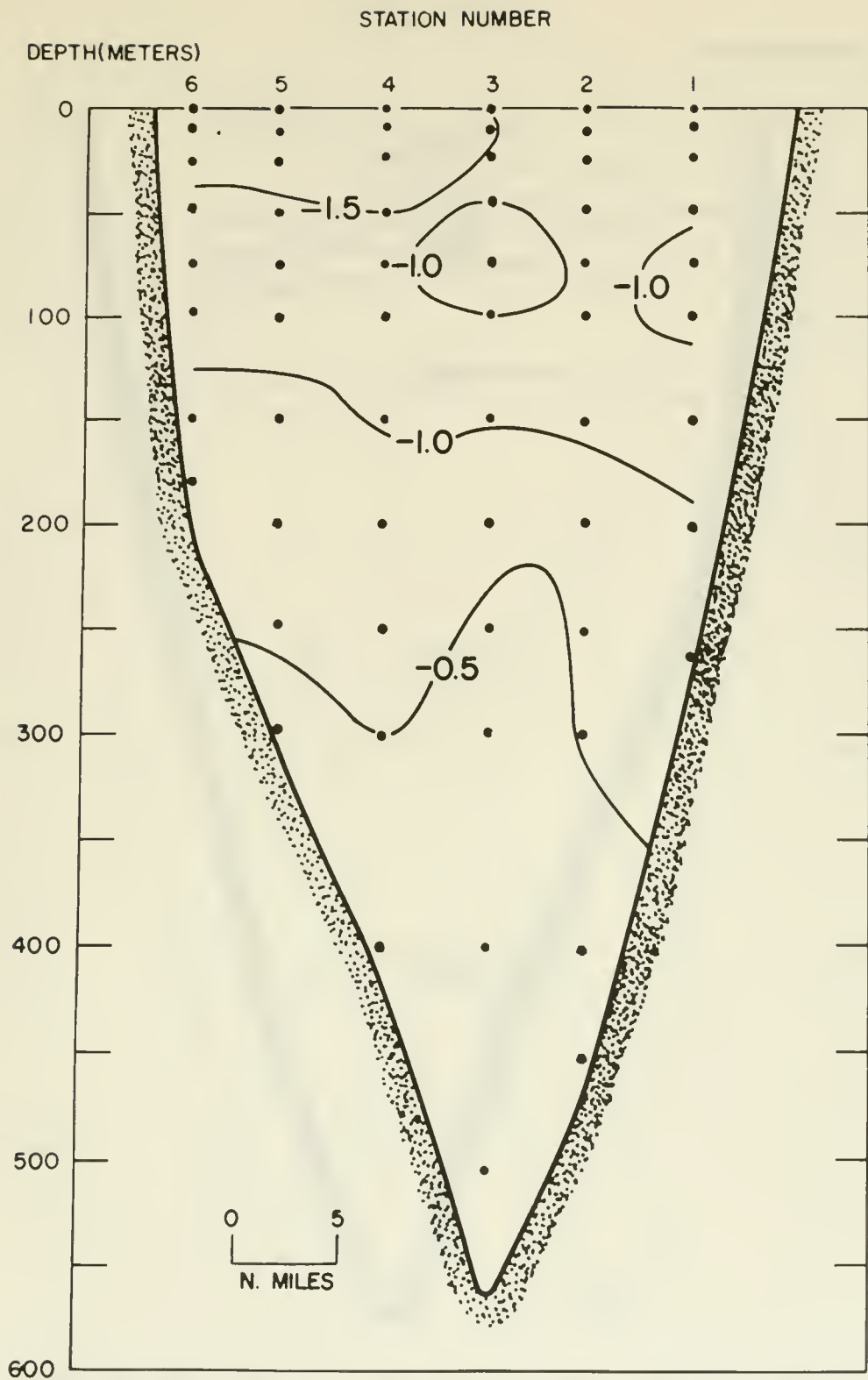


FIGURE 5. Vertical distribution of temperature ( $^{\circ}$  C.). CGC WESTWIND stations 1 through 6, 3-4 September 1970.

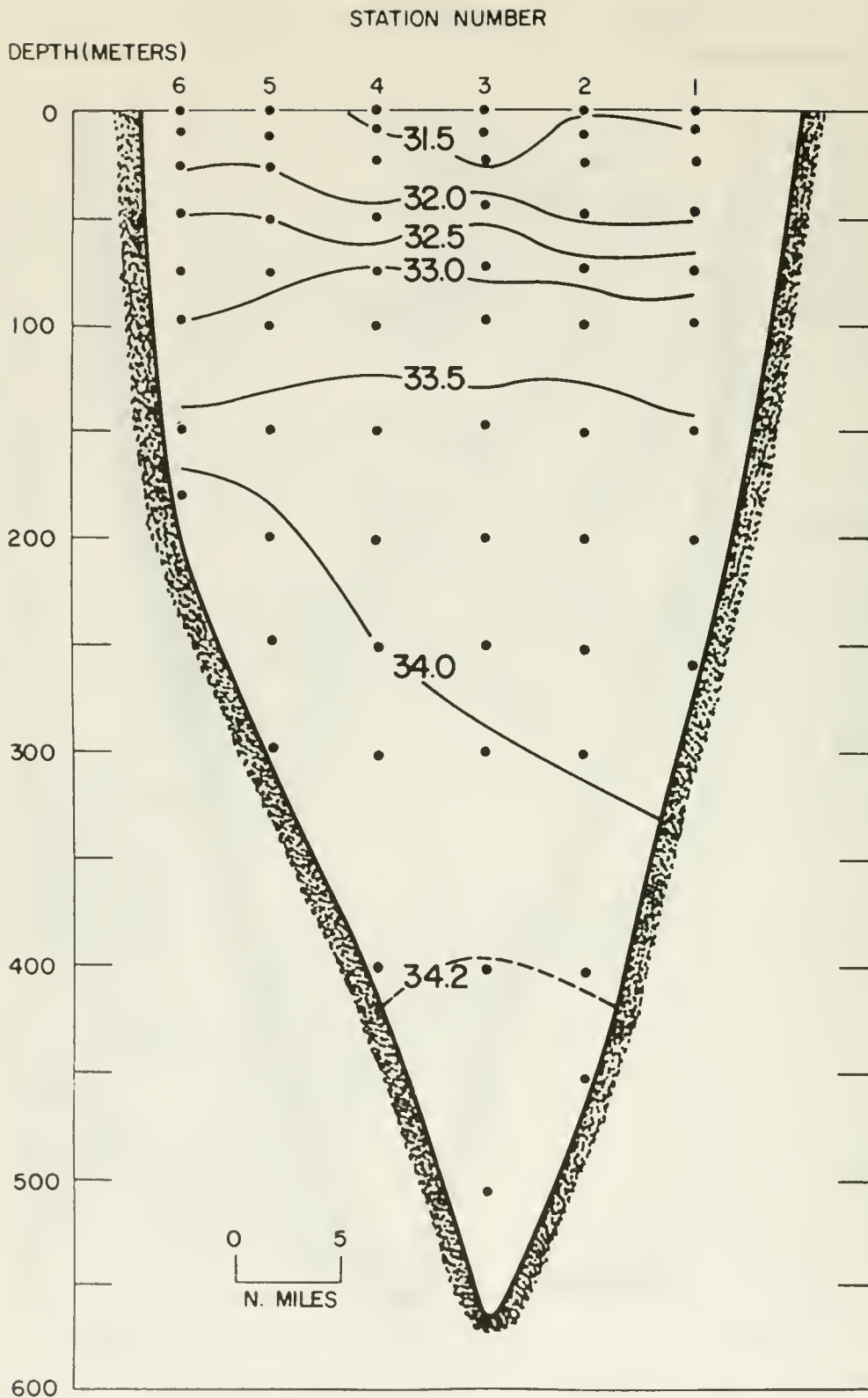


FIGURE 6. Vertical distribution of salinity (‰). CGC WESTWIND stations 1 through 6, 3-4 September 1970.

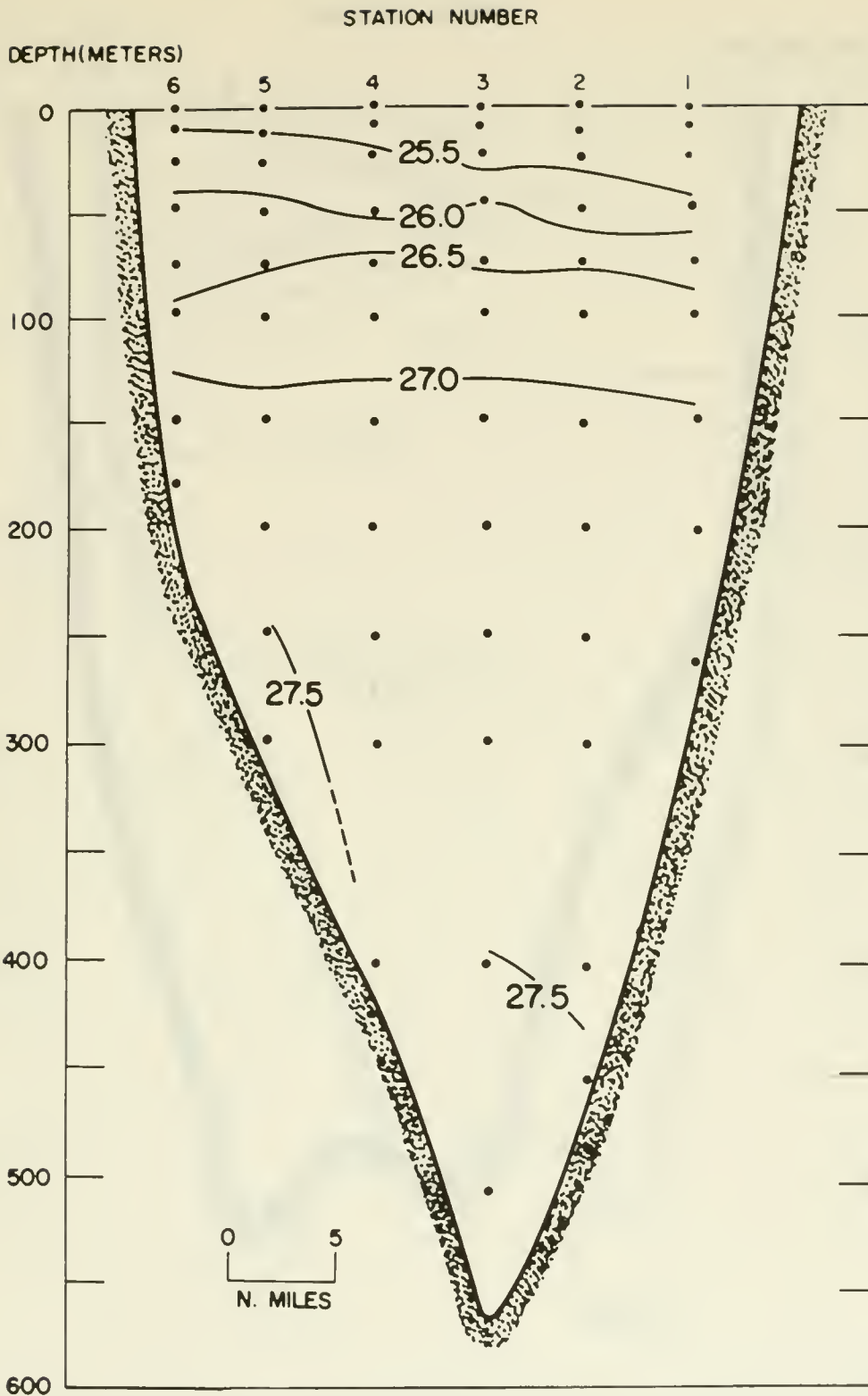


FIGURE 7. Vertical distribution of density ( $\sigma_t$ ). CGC WESTWIND stations 1 through 6, 3-4 September 1970.

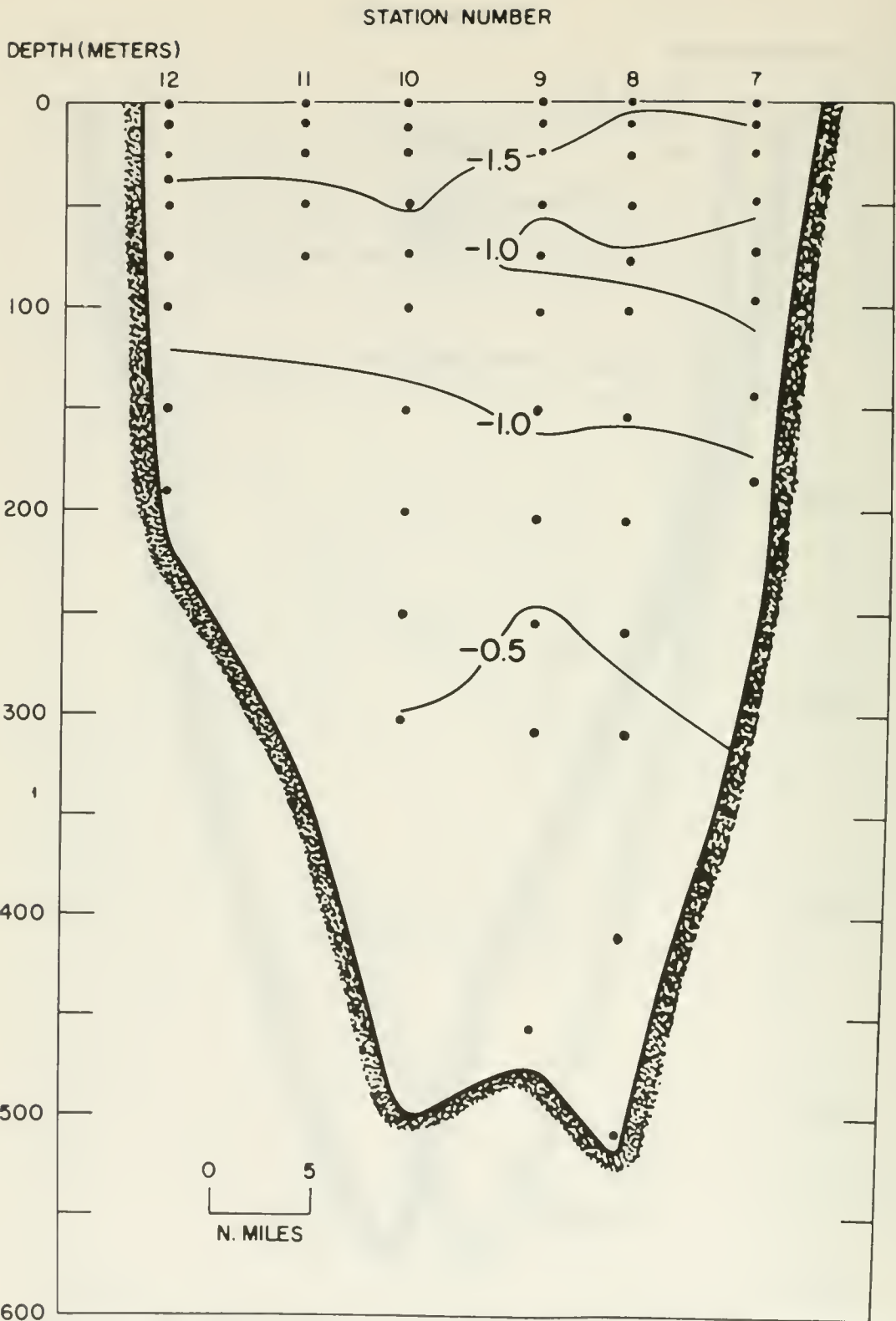


FIGURE 8. Vertical distribution of temperature ( $^{\circ}$  C.). CGC WESTWIND stations 7 through 12, 4 September 1970.

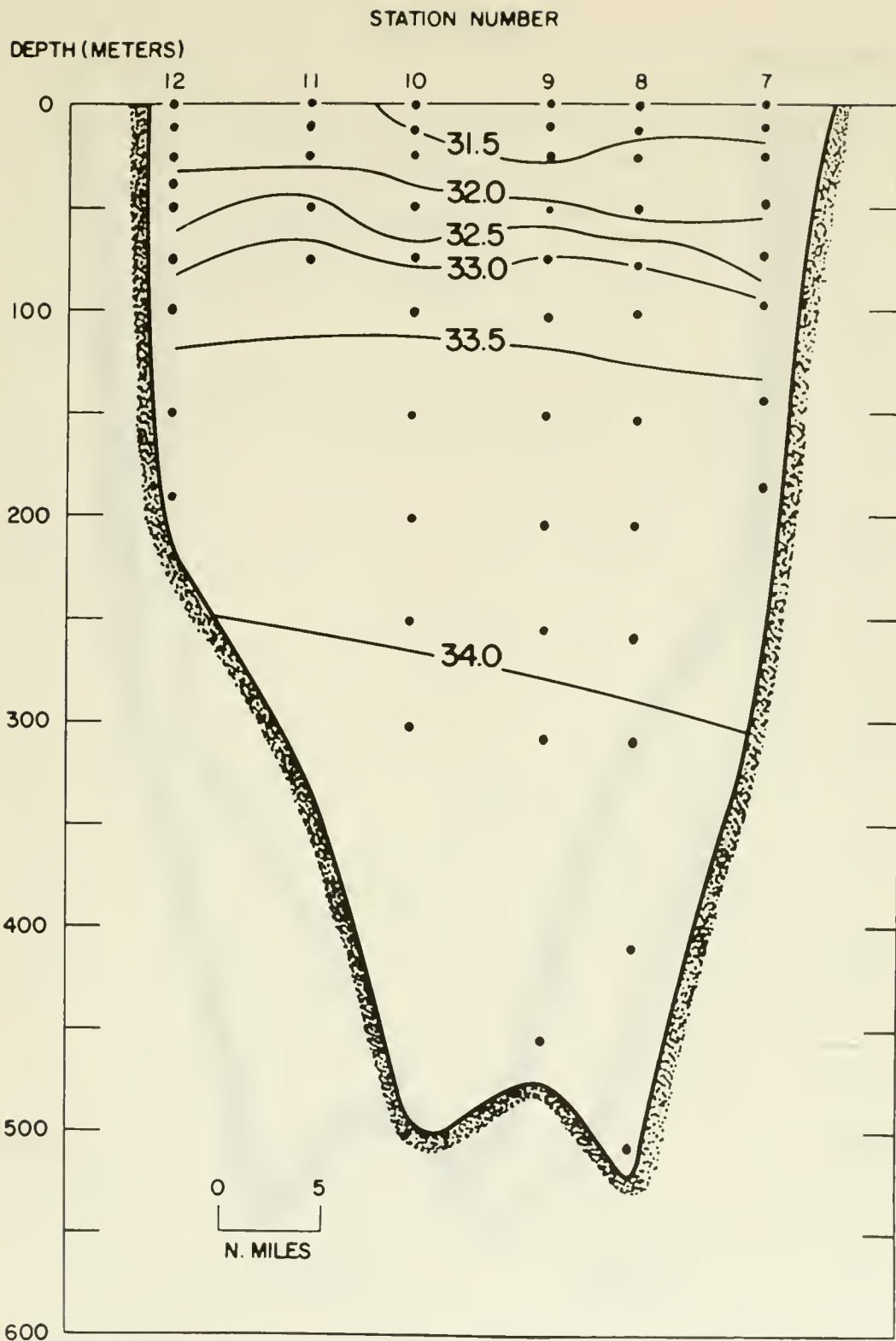


FIGURE 9. Vertical distribution of salinity (‰). CGC WESTWIND stations 7 through 12, 4 September 1970.

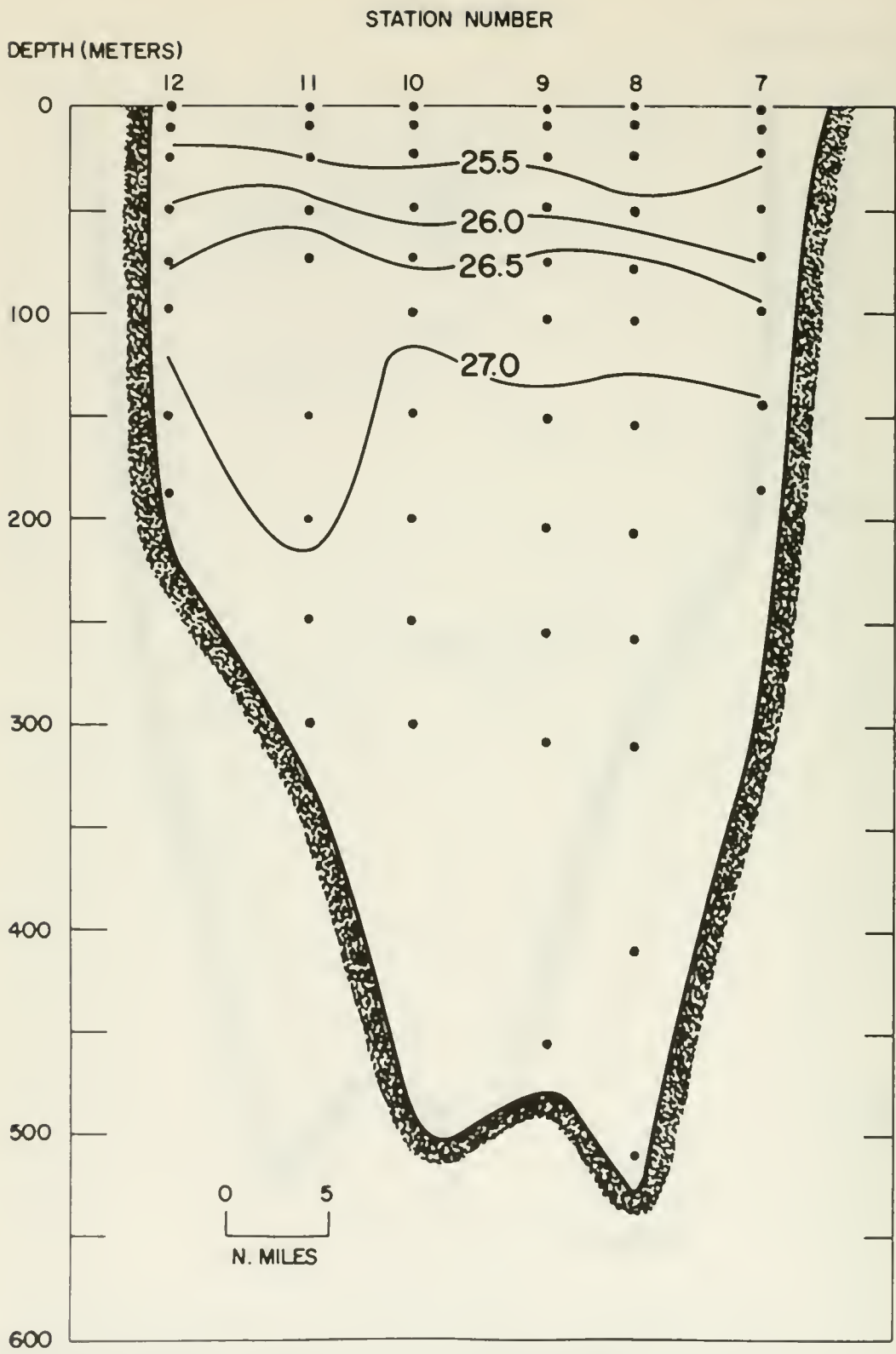


FIGURE 10. Vertical distribution of density ( $\sigma_t$ ). CGC WESTWIND stations 7 through 12, 4 September 1970.

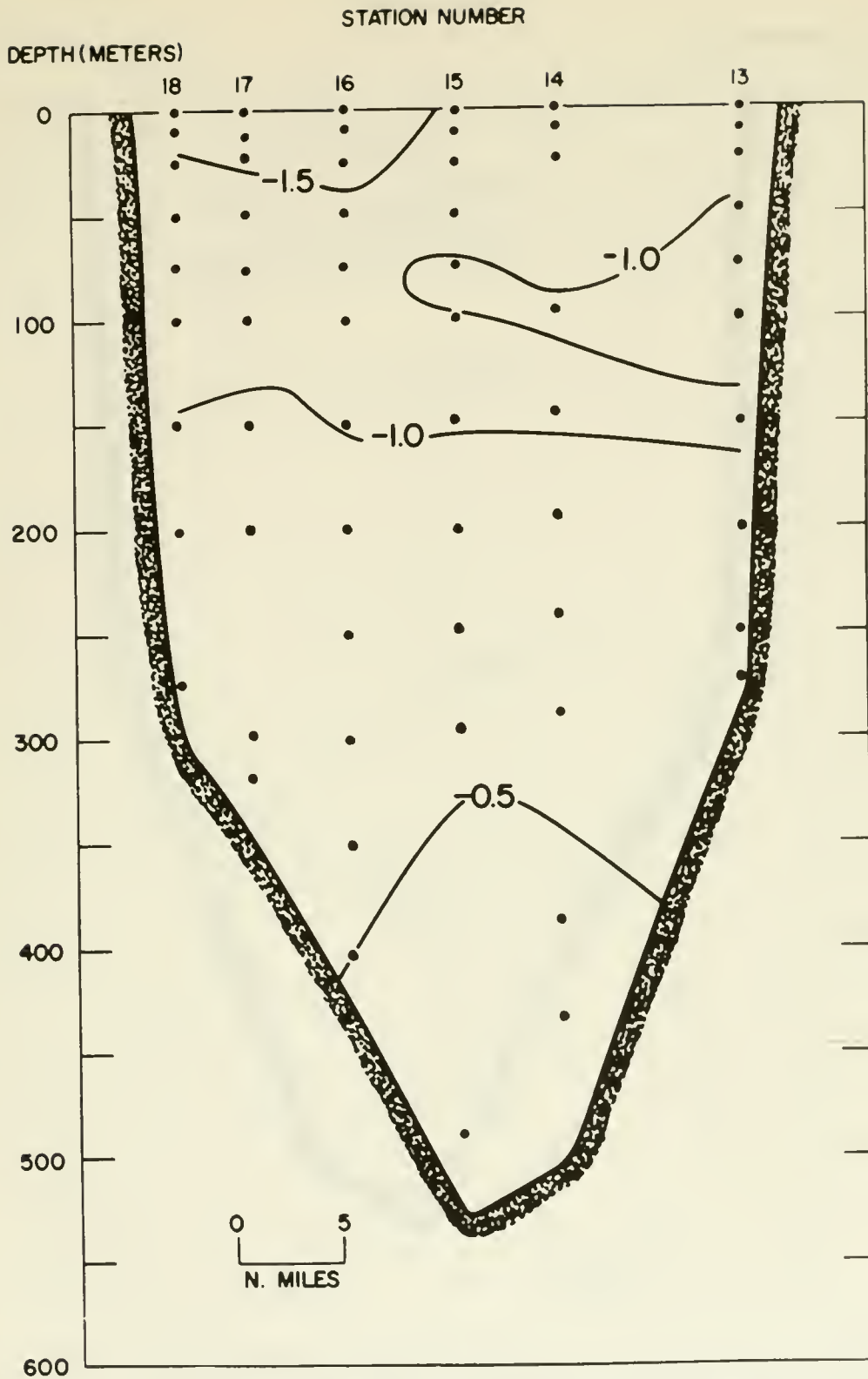


FIGURE 11. Vertical distribution of temperature ( $^{\circ}$  C.). CGC WESTWIND stations 13 through 18, 4-5 September 1970.

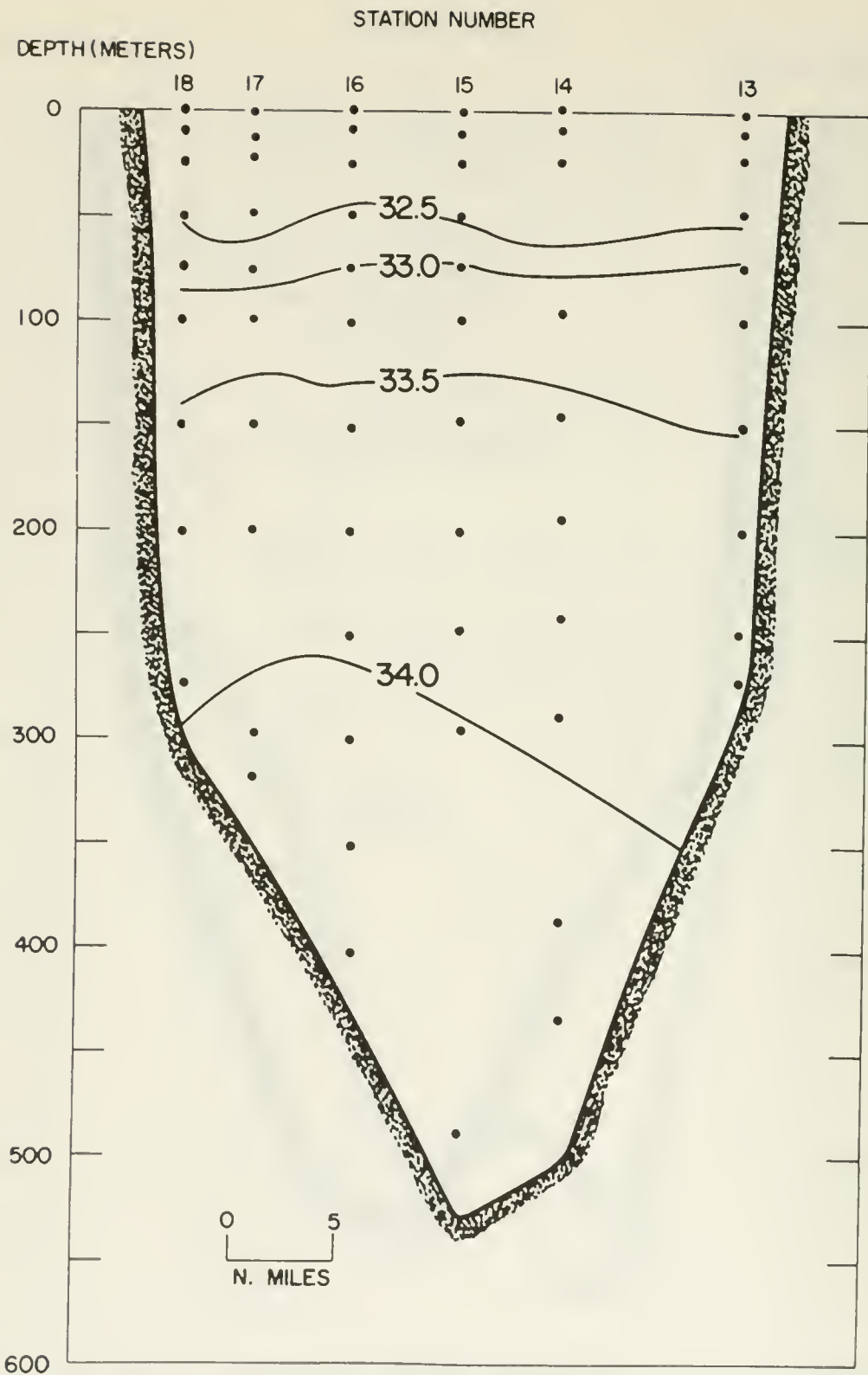


FIGURE 12. Vertical distribution of salinity (‰). CGC WESTWIND stations 13 through 18, 4-5 September 1970.



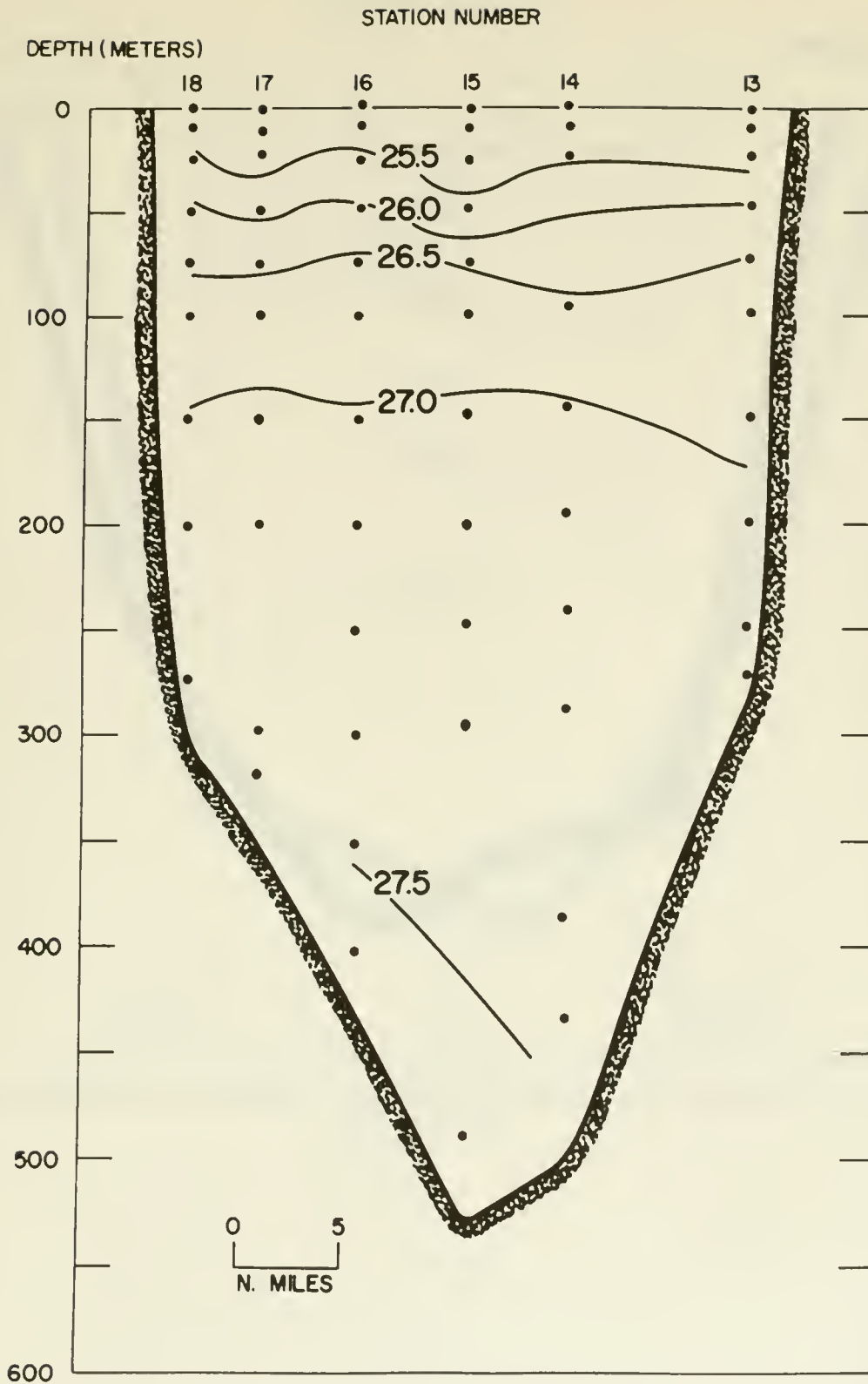


FIGURE 13. Vertical distribution of density ( $\sigma_t$ ). CGC WESTWIND stations 13 through 18, 4-5 September 1970.

STATION NUMBER

DEPTH (METERS)

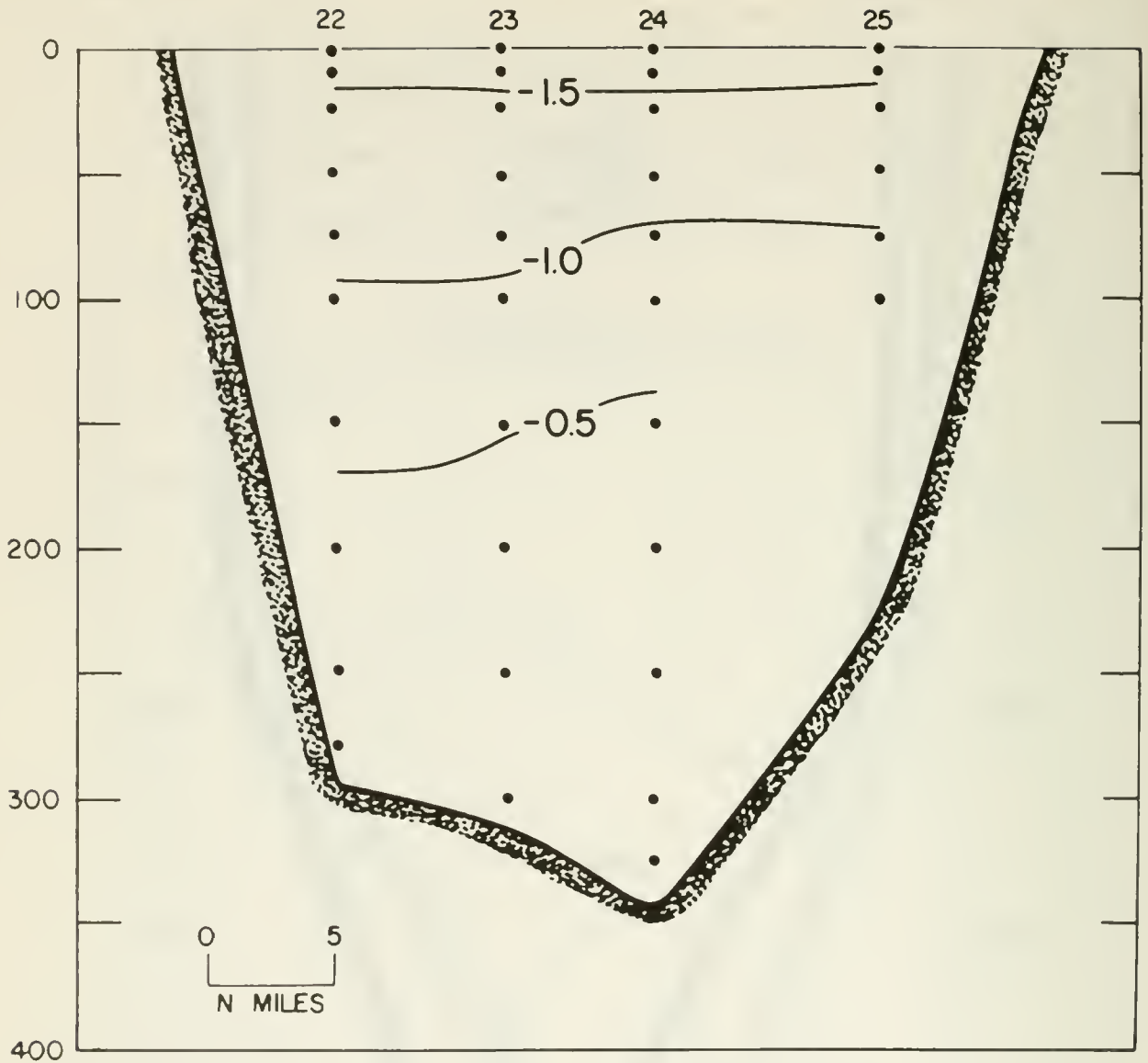


FIGURE 14. Vertical distribution of temperature ( $^{\circ}$  C.). CGC WESTWIND stations 22 through 25, 5-6 September 1970.

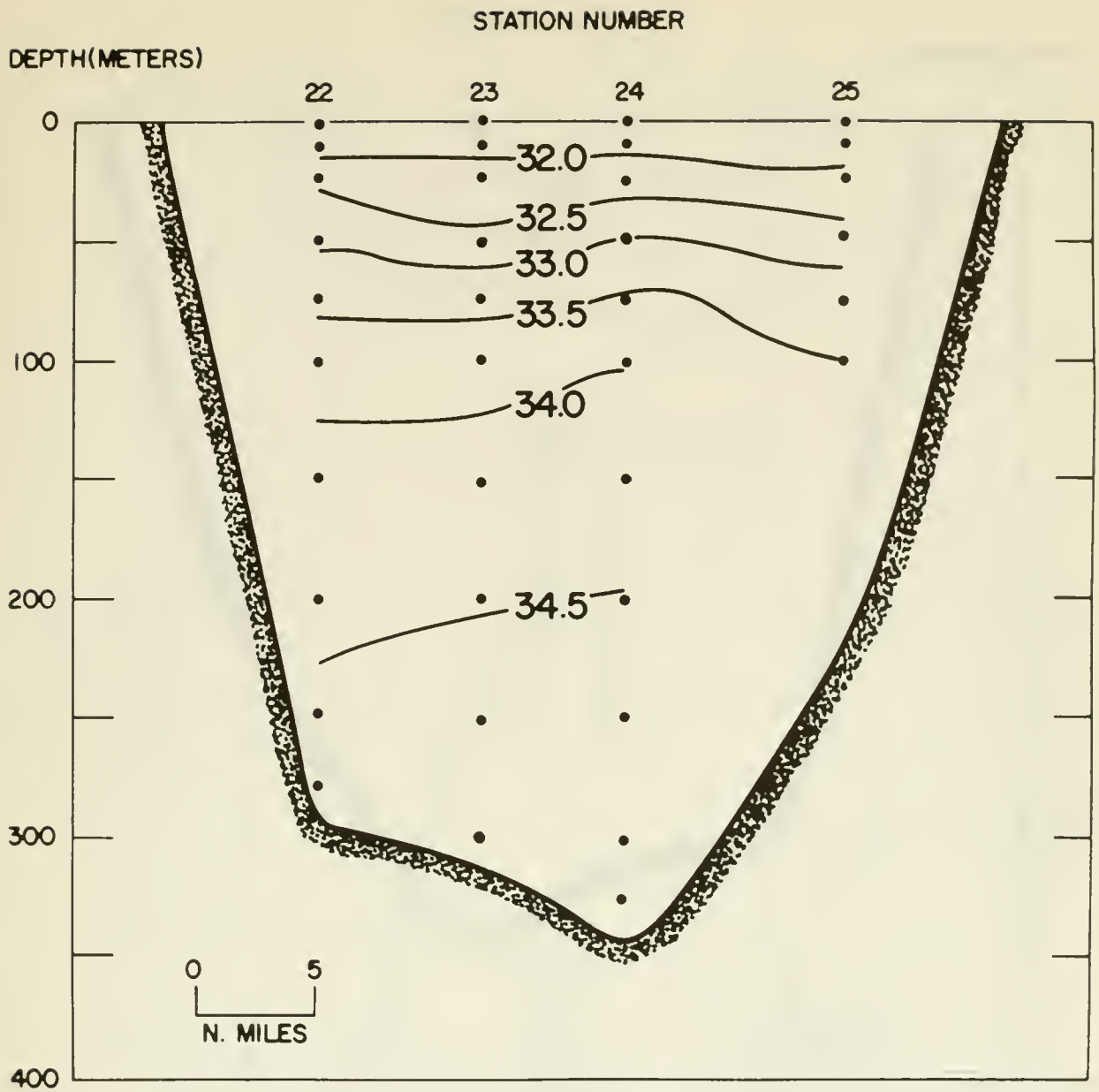


FIGURE 15. Vertical distribution of salinity (‰). CGC WESTWIND stations 22 through 25, 5-6 September 1970.

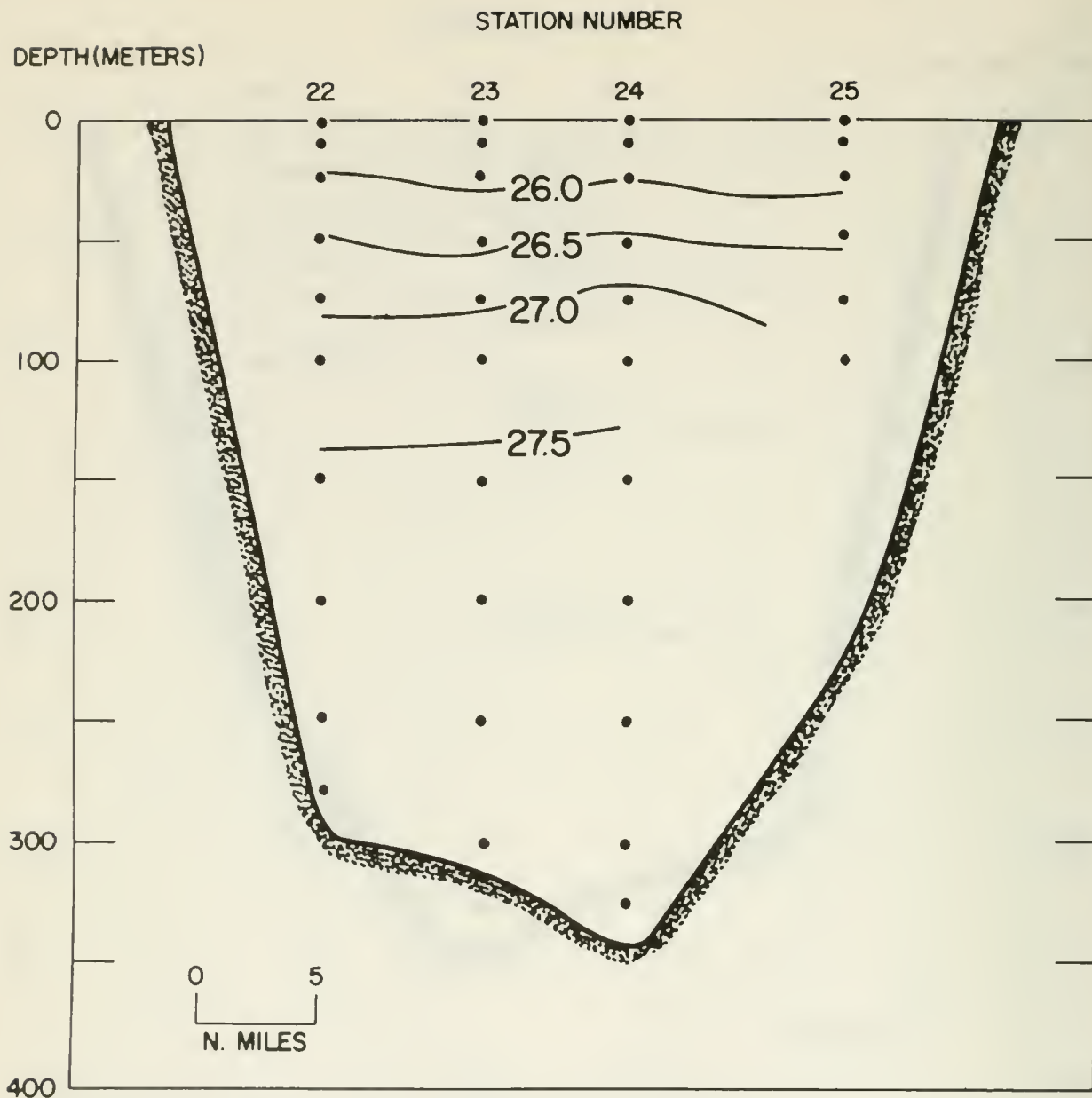


FIGURE 16. Vertical distribution of density ( $\sigma_t$ ). CGC WESTWIND stations 22 through 25, 5-6 September 1970.

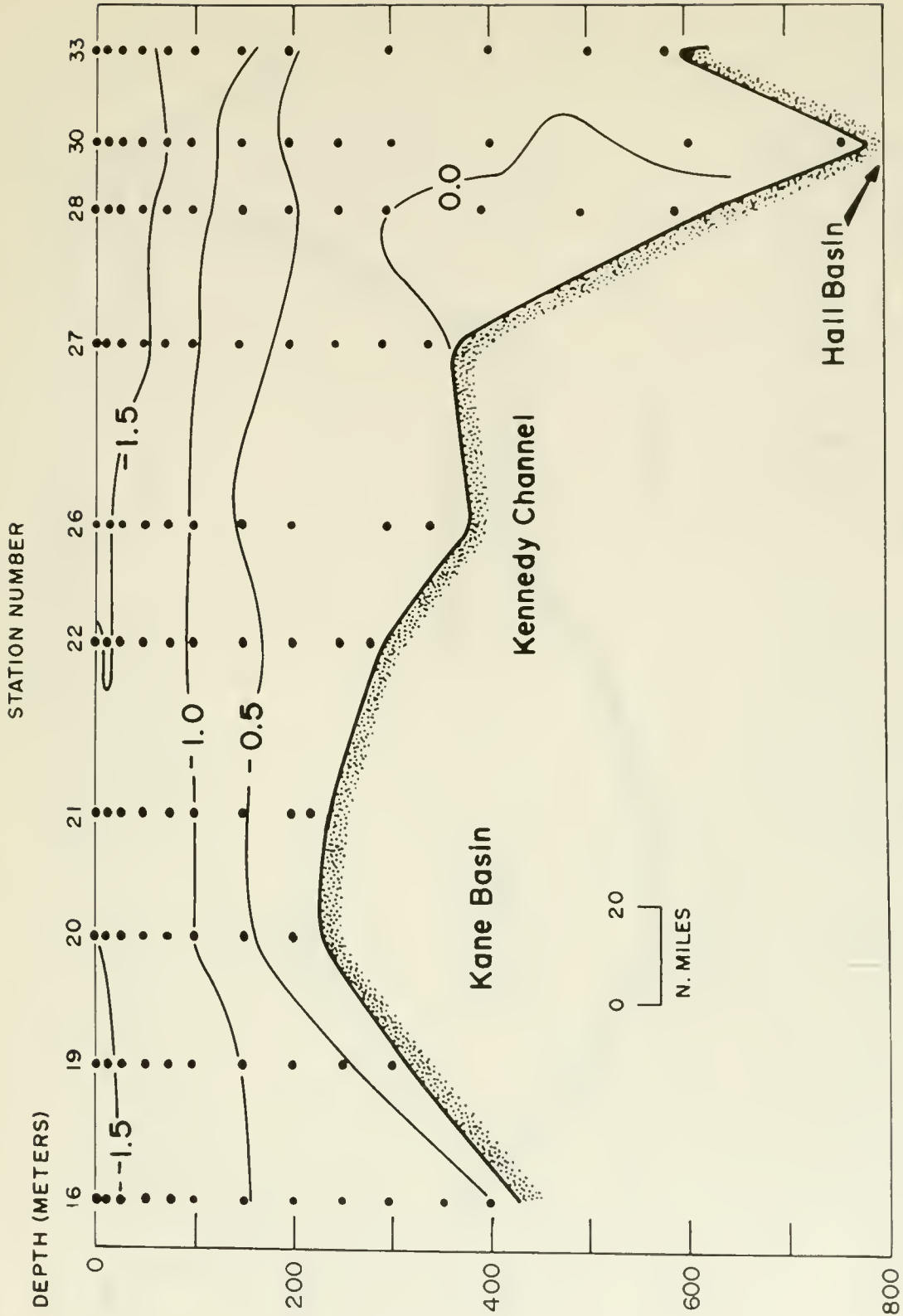


FIGURE 17. Vertical distribution of temperature ( $^{\circ}$  C.) along a longitudinal section through Nares Strait, CGC WESTWIND survey, 5-9 September 1970.

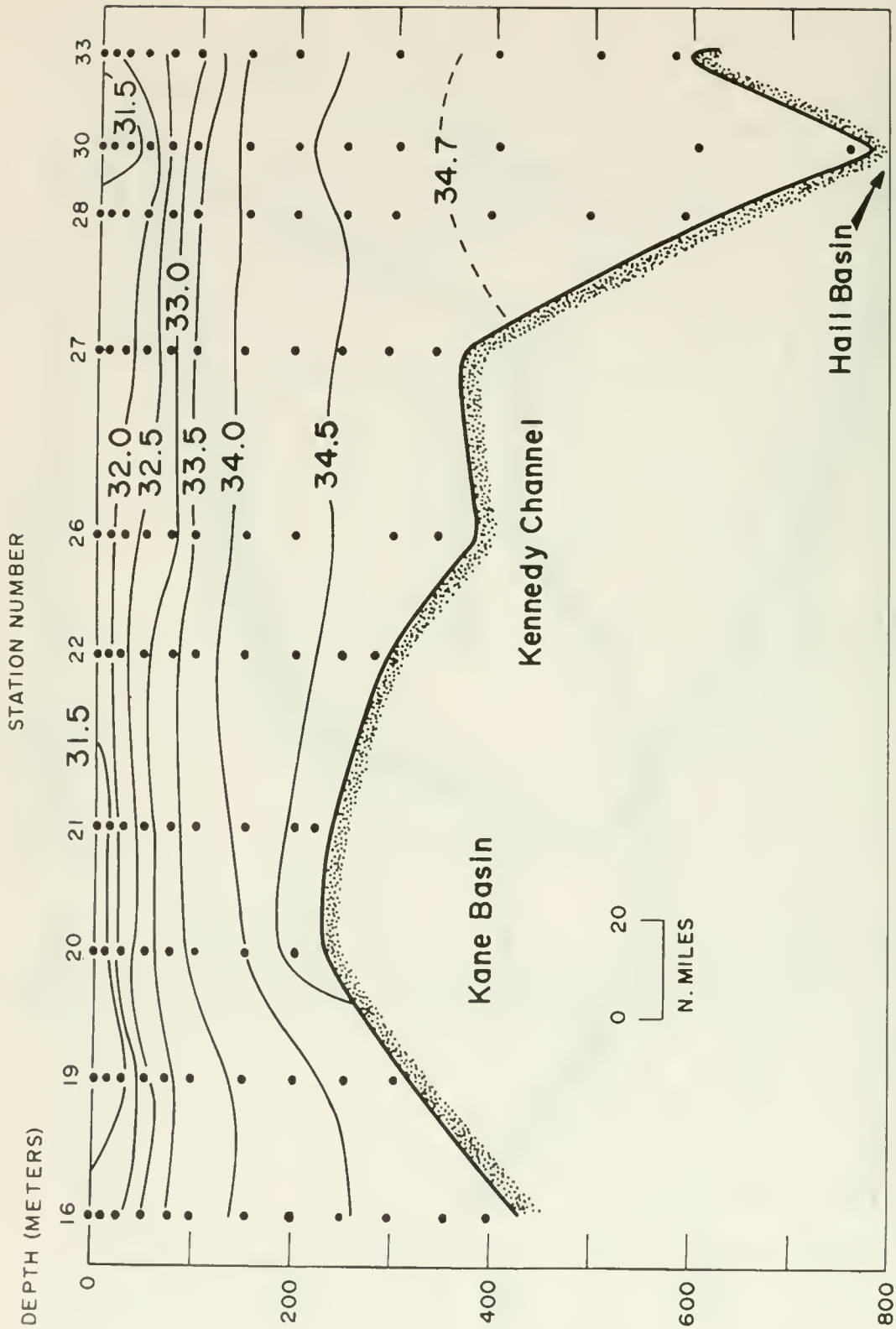


FIGURE 18. Vertical distribution of salinity (‰) along a longitudinal section through Nares Strait, CGC WESTWIND survey, 5-9 September 1970.

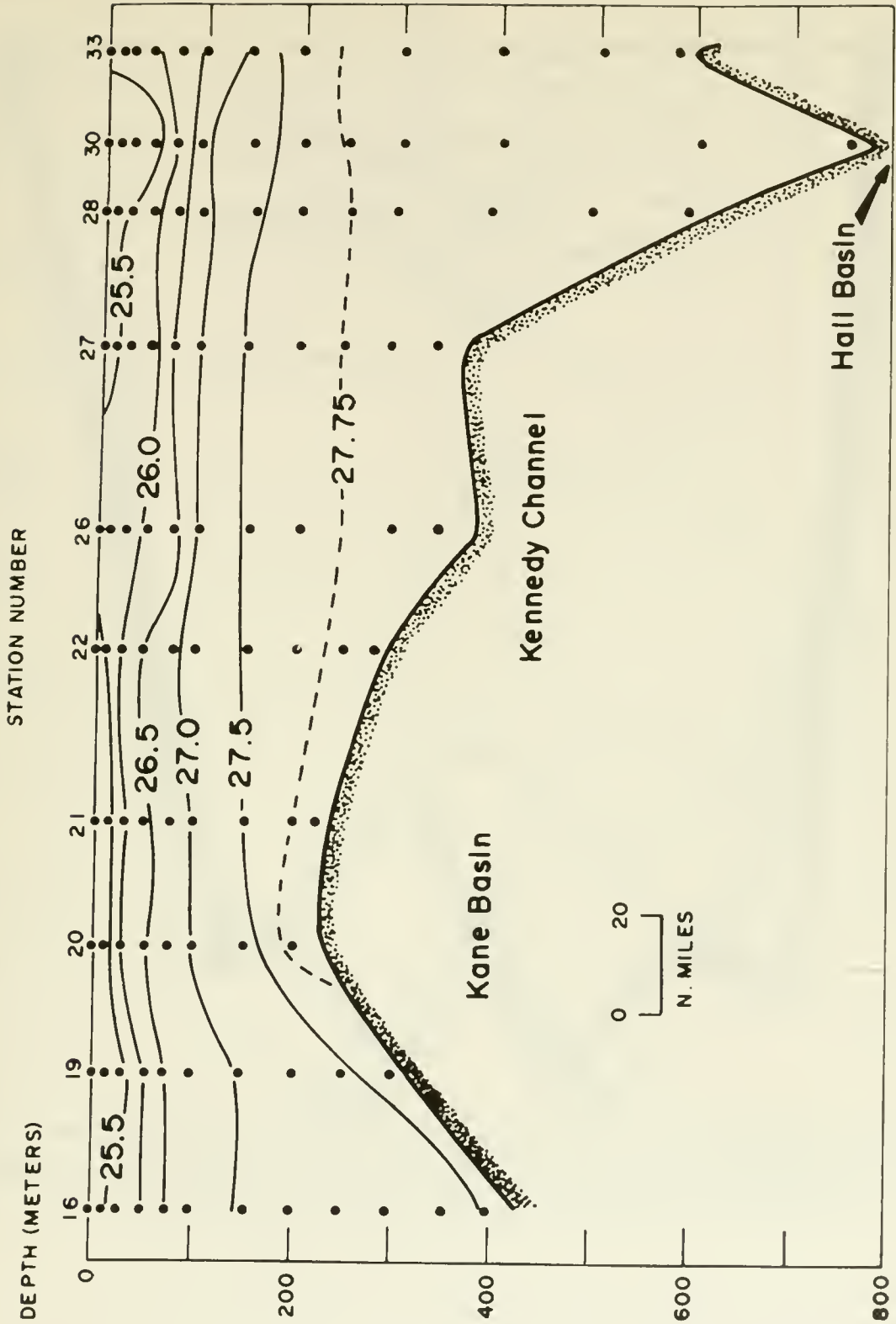


FIGURE 19. Vertical distribution of density ( $\sigma_t$ ) along a longitudinal section through Nares Strait, CGC WESTWIND survey, 5-9 September 1970.

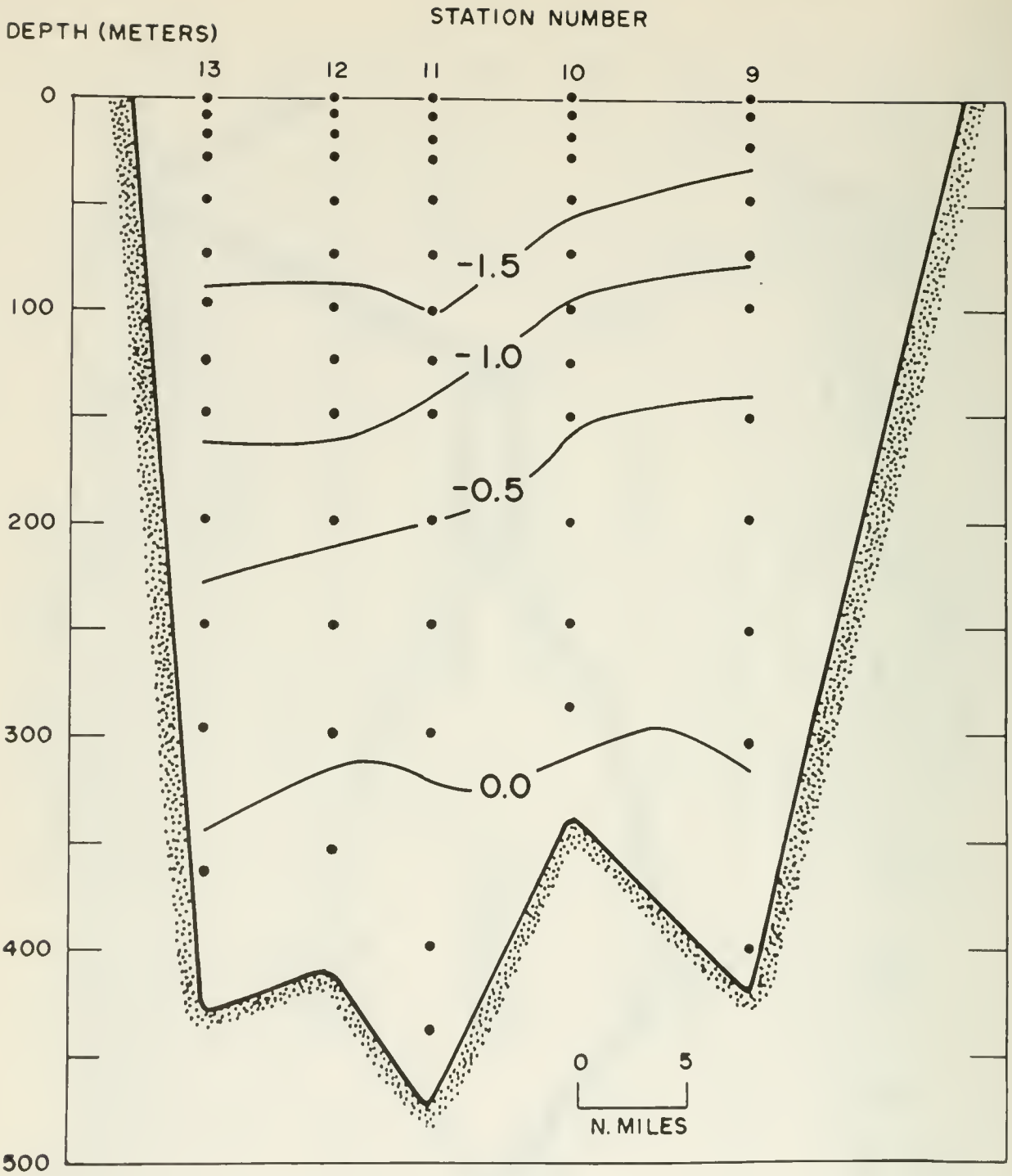


FIGURE 20. Vertical distribution of temperature ( $^{\circ}$  C.). CGC WESTWIND stations 9 through 13, 19-20 August 1970.



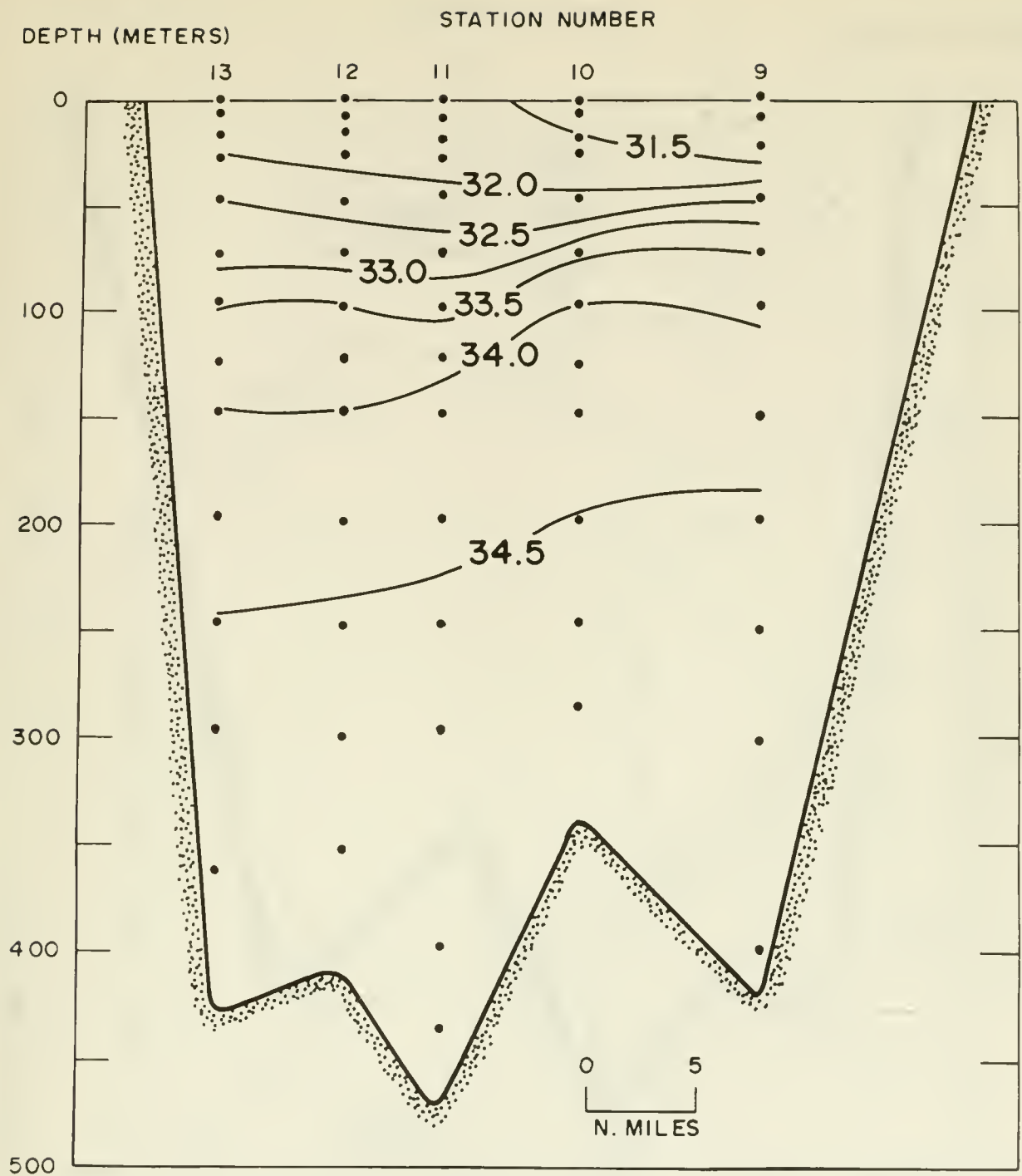


FIGURE 21. Vertical distribution of salinity (‰). CGC WESTWIND stations 9 through 13, 19-20 August 1970.

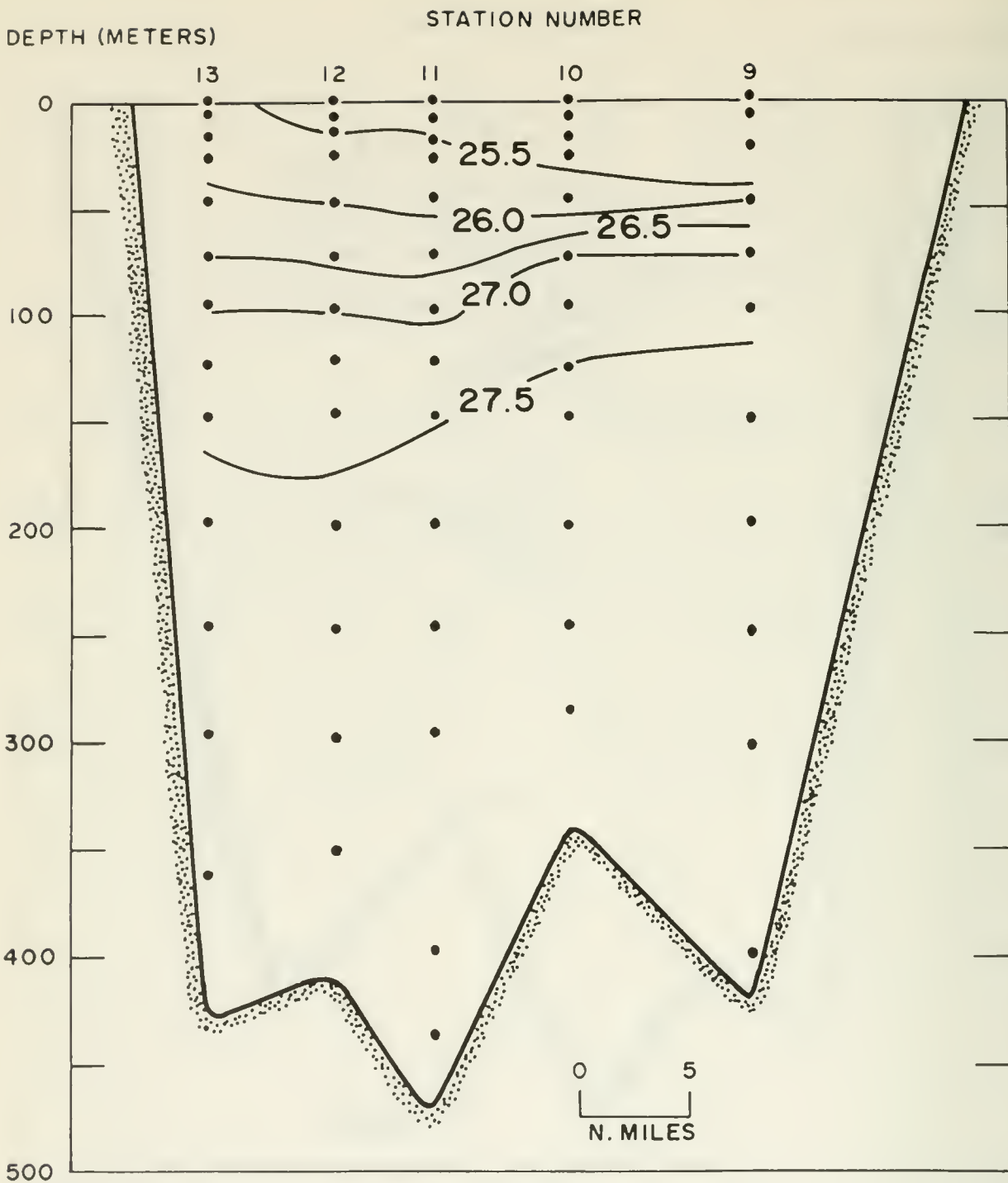


FIGURE 22. Vertical distribution of density ( $\sigma_t$ ) CGC WESTWIND stations 9 through 13, 19-20 August 1970.

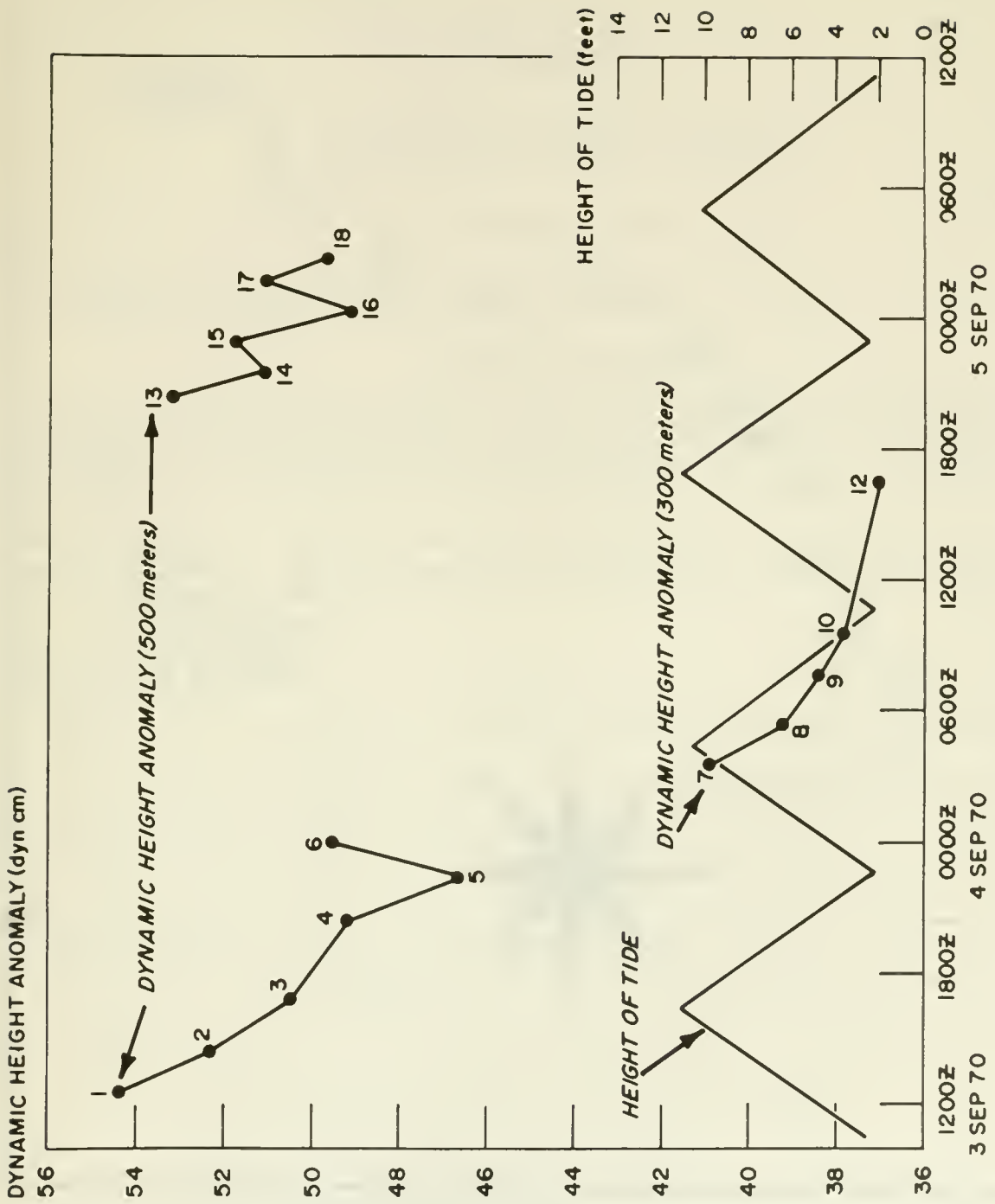


FIGURE 23. Anomaly of sea-surface dynamic height of CGC WESTWIND stations 1 through 18 and the height of tide at Port Foulke, Greenland tide station, 3-5 September 1970.

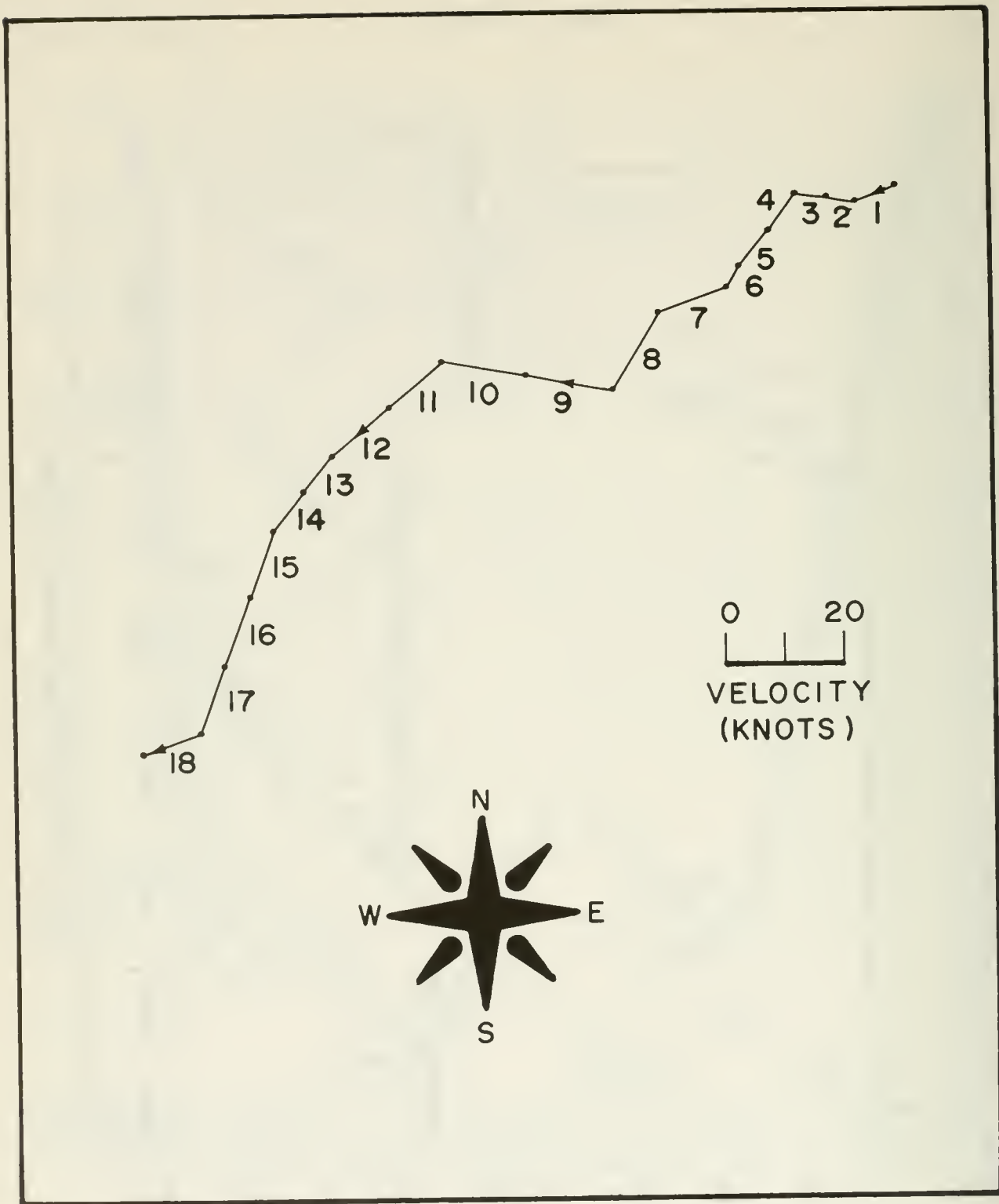


FIGURE 24. Progressive vector diagram of surface wind velocity at CGC WESTWIND stations 1 through 18, 3-5 September 1970.

# APPENDIX A

## OCEANOGRAPHIC DATA

### CRUISES LISTED

Table	Page
I.—CGC WESTWIND, August 1970	31
II.—CGC WESTWIND, September 1970	46

### CODES UTILIZED

A complete description of the codes utilized in the tabulation of oceanographic station data can be found in National Oceanographic Data Center publication M-2, Processing Physical and Chemical Data from Oceanographic Stations. (Rev. August 1964, supplement issued May 1966.)

To facilitate use of the oceanographic station data listing, entry headings which are not self-explanatory are described below.

Depth to Bottom -----	Corrected or uncorrected sounding in meters.
Max. Depth of Samples --- (if 2 digit code)	Depth of deepest sample in hundreds of meters to nearest hundred-meter interval. For internal use only.
or	
DNP (if 1 digit code)	
Wave observations:	
DIR -----	Rounded to nearest multiple of 10 degrees.
HGT -----	Increments of ½ m. Sum of 5 meters plus increments of ½ m if 50 is added to direction.
PER -----	If numerals 2 through 9 are entered, period in seconds is twice the numeric entry of 2X (numeric entry) +1. For other entries see WMO Code 3155.
SEA -----	Sea state according to WMO Code 3700.
Weather Code -----	If preceded by X, weather according to WMO Code 4501. If a two-digit entry, weather according to WMO Code 4677.
Cloud Code:	
Type -----	Cloud type according to WMO Code 0500.
Amount -----	Cloud amount in eighths. Entry of the numeral 9 indicates cloud amount could not be estimated.
Water:	
Color Code -----	Color according to Forel-Ule scale.
Trans. -----	Transparency in whole meters as determined by Secchi disc.
Wind:	
Dir. -----	Rounded to nearest multiple of 10 degrees.
Speed or Force -----	If preceded by letter S, wind speed in knots; if preceded by letter F, wind force according to Beaufort scale.
Barometer -----	Barometric pressure given in tens, units, and tenths of millibars.
Air Temp. ° C. -----	Air temperature to tenths of a degree Celsius.
Vis. Code -----	Visibility according to WMO Code 4300.
No. obs. depths -----	Number of observed levels associated with the station.

Messenger time -----	Entered in hours and tenths of an hour GMT. For Nansen casts, indicates time of release of messenger applicable to the observational level. For STD casts, indicates the starting time of lowering the sensor.
Card type -----	OBS designates observed levels. STD indicates the values at this standard level were interpolated by a modified 3-point LaGrange formula.
Depth (m.) -----	Depth to nearest meter. A postscript T indicates depth was obtained thermometrically; Z indicates uncorrected "wire out" depth. Postscript Q indicates value was marked doubtful by originator; P indicates value was considered doubtful by NODC. Postscripts P and Q retain this meaning throughout the following entries.
T ° C. -----	Temperature to hundredths of a degree Celsius.
S ‰ -----	Salinity in parts-per-thousand.
SIGMA-T -----	Entered to hundredths.
Specific-volume -----	Multiply entry by $10^{-7}$ to obtain specific-volume anomaly in cubic centimeters per gram.
$\Sigma\Delta$ Dyn. M. $\times 10^3$ -----	Multiply entry by $10^{-3}$ to obtain anomaly of dynamic depth in dynamic meters referenced to the sea surface.
Sound Velocity -----	Sound velocity according to Wilson's formula to tenths of a meter per second.
O <sub>2</sub> ml./l. -----	Dissolved oxygen in milliliters per liter entered to hundredths.
PO <sub>4</sub> -P $\mu$ g-at./l. -----	Inorganic phosphate in microgram-atoms per liter entered to hundredths.
Total-P $\mu$ g-at./l. -----	Total phosphorus in microgram-atoms per liter entered to hundredths.
NO <sub>2</sub> -N $\mu$ g-at./l. -----	Nitrite-nitrogen in microgram-atoms per liter entered to hundredths.
NO <sub>3</sub> -N $\mu$ g-at./l. -----	Nitrate-nitrogen in microgram-atoms per liter entered to tenths.
SiO <sub>4</sub> -Si $\mu$ g-at./l. -----	Silicate-silicon in microgram-atoms per liter entered to whole units.
pH -----	Entered to hundredths.

TABLE I.—Observed and interpolated oceanographic data from stations occupied by USCGC WESTWIND, 16-24 August 1970, prepared from NODC Listing No. 31-8184.

SHIP CODE	LATITUDE 1° 10'	LONGITUDE 1° 10'	DATE 10'	MARSDEN SQUARE 10'	STATION (GMT)	TIME 10'	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SPL /	WAVE OBSERVATIONS			WEATHER CODE	INSR CLOUD TYPE AMT	MODE STATION NUMBER
								CRUISE NUMBER	STATION NUMBER			DIR	PER	SEA			
318184	WE	7920 N	06539 W	259	05	08 16 007	1970	WGS	001	0091	2	00	0	X	X2	6 8	0001
* DT S * WIND WIND SPEED BAROMETER AIR TEMPERATURE °C VIS NUMBER SPECIAL WATER TRANS DIR OF FORCE (mb) DRY BULB WET BULB CODE OBS LEVELS OBSERVATIONS COLOR (mi) 18 S08 964 -010 -022 7 07																	
CAST NO.	CARD NO.	DEPTH (m)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	STD DEV x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY m SEC	O <sub>2</sub> ml l	AMBIENT LIGHT Intensity μm cm <sup>-2</sup>				MEASURED SOUND VELOCITY m sec			
										PO <sub>2</sub> -P	TOTAL-P	NO <sub>2</sub> -N	NO <sub>3</sub> -N	S <sub>2</sub> O <sub>3</sub> -S	pH		
007	STD	0000	-0010	0573	0450	0228210	0000	14091									
	ORBS	0000	-0010	05734	0456			14091		016				000	006		
	STD	0010	-0119	3157	2541	0025806	0127	14391									
	ORBS	0010	-0119	31571	2541			14391		054				023	013		
	STD	0020	-0142	3236	2605	0019662	0149	14393									
	ORBS	0025	-0149	32658	2629			14395		081				068	015		
	STD	0030	-0149	3277	2638	0016435	0167	14398									
	STD	0050	-0143	3313	2608	0013723	0198	14409									
	ORBS	0050	-0143	33133	2608			14409		068				056	015		
	STD	0075	-0134	3338	2687	0011823	0230	14421									
	ORBS	0075	-0134	33381	2687			14421		083				075	017		
	ORBS	0085	-0121	33512	2648			14430		082				072	017		
	ORBS	0087	-0121														

SHIP CODE	LATITUDE 1° 10'	LONGITUDE 1° 10'	DATE 10'	MARSDEN SQUARE 10'	STATION (GMT)	TIME 10'	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SPL /	WAVE OBSERVATIONS			WEATHER CODE	INSR CLOUD TYPE AMT	MODE STATION NUMBER
								CRUISE NUMBER	STATION NUMBER			DIR	PER	SEA			
318184	WE	7926 N	06522 W	259	05	08 16 034	1970	WGS	002	0210	2	00	0	X	X2	6 8	0002
* DT S * WIND WIND SPEED BAROMETER AIR TEMPERATURE °C VIS NUMBER SPECIAL WATER TRANS DIR OF FORCE (mb) DRY BULB WET BULB CODE OBS LEVELS OBSERVATIONS COLOR (mi) 22 S16 976 -003 -009 7 07																	
CAST NO.	CARD NO.	DEPTH (m)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	STD DEV x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY m SEC	O <sub>2</sub> ml l	AMBIENT LIGHT Intensity μm cm <sup>-2</sup>				MEASURED SOUND VELOCITY m sec			
										PO <sub>2</sub> -P	TOTAL-P	NO <sub>2</sub> -N	NO <sub>3</sub> -N	S <sub>2</sub> O <sub>3</sub> -S	pH		
039	STD	0000	-0005	2612	2099	0068037	0000	14307									
	ORBS	0000	-0005	26121	2099			14367		074				000	013		
	STD	0010	-0113	3199	2574	0022610	0045	14400									
	ORBS	0010	-0113	31988	2574			14400		081				052	017		
	STD	0020	-0118	3243	2610	0019104	0066	14406									
	ORBS	0025	-0121	32615	2625			14408		082				064	017		
	STD	0030	-0120	3275	2636	0016750	0084	14407									
	STD	0050	-0143	3314	2608	0013056	0114	14409									
	ORBS	0050	-0143	33136	2608			14409		084				068	015		
	STD	0075	-0135	3333	2683	0012210	0147	14418									
	ORBS	0075	-0135	33327	2683			14410		084				070	017		
	STD	0100	-0124	3350	2697	0010941	0176	14431									
	ORBS	0100	-0124	33498	2697			14431		089				079	016		
	STD	0125	-0105	3366	2709	0009752	0201	14446									
	ORBS	0125	-0105	33663	2709			14446		065				083	043		

SHIP CODE	LATITUDE	LONGITUDE	DATE	TIME	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SALINITY	WAVE OBSERVATIONS			WEATHER CODE	INSTR. CLOUD TYPE	NOOD STATION NUMBER			
						CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER				DIR	PER	DIR
313184	WE	7932 N	05504 W	259	95	08 15 17	1970	WGS	003	0226	2	00	0	X	X2	6	8	0003

NOTE: SPEED VALUE IS BASED ON GEARED ELECTROMAGNETIC DRUMPER (MARA BATH 071) OF HANSON'S GEARBOX IN ASTORIA, OREGON. THIS TEST APPLIES

DT	S	WIND		BAROMETER	AIR TEMPERATURE °C			VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
		DIR	SPEED OR FORCE		DRY BULB	WET BULB	CODE			
19	S03	005	008	000	7	10				

CAST NO.	TIME OF DAY	CAST TYPE	DEPTH (m)	TEMP °C	SIGMA-T	SPECIFIC VOLUME ANOMALY (10 <sup>3</sup> )	S&D DYN W (10 <sup>3</sup> )	COMPUTED SOUND VELOCITY (SEC)	AMBIENT LIGHT (lum/m <sup>2</sup> )					MEASURED SOUND VELOCITY (m/sec)				
									PO <sub>2</sub> - P (µg/l)	TOTAL P (µg/l)	NO <sub>2</sub> - N (µg/l)	NO <sub>3</sub> - N (µg/l)	S <sub>2</sub> - S (µg/l)	pH				
176	0800	STO	0000	-0002	0466	0369	0236770	0000	14083									
		OBS	0000	-0002	04661	0369			14083				016			000	001	
		STO	0010	-0127	3185	2563	0023676	0130	14392									
176	0800	STO	0010	-0127	31846	2563			14392				032			037	013	
		STO	0020	-0119	3242	2609	0019283	0151	14405									
176	0800	STO	0025	-0118	32646	2627			14409				050			038	018	
		STO	0030	-0126	3278	2638	0016506	0169	14408									
		STO	0050	-0143	3317	2671	0013425	0199	14409									
176	0800	STO	0050	-0143	33171	2671			14409				048			047	021	
		STO	0075	-0127	3337	2686	0011957	0231	14424									
176	0800	STO	0075	-0127	33366	2686			14424				064			092	026	
		STO	0100	-0112	3357	2702	0010394	0259	14438									
176	0800	STO	0100	-0112	33575	2702			14438				046			053	014	
		STO	0125	-0095	3370	2712	0009476	0284	14452									
		STO	0150	-0081	3380	2713	0008776	0306	14464									
176	0800	STO	0150	-0081	33798	2713			14464				065			095	029	
		STO	0200	-0065	3390	2727	0008063	0348	14481									
176	0800	STO	0200	-0065	33908	2727			14481				072			122	034	
176	0800	STO	0207	-0064	33914	2728			14483				065			100	025	
176	0800	STO	0209	-0062														

SHIP CODE	LATITUDE	LONGITUDE	DATE	TIME	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SALINITY	WAVE OBSERVATIONS			WEATHER CODE	INSTR. CLOUD TYPE	NOOD STATION NUMBER			
						CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER				DIR	PER	DIR
313184	WE	7941 N	06508 W	259	95	08 16 21	1970	WGS	004	0293	2	00	0	X	X1	6	6	0004

NOTE: SPEED VALUE IS BASED ON GEARED ELECTROMAGNETIC DRUMPER (MARA BATH 071) OF HANSON'S GEARBOX IN ASTORIA, OREGON. THIS TEST APPLIES

DT	S	WIND		BAROMETER	AIR TEMPERATURE °C			VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
		DIR	SPEED OR FORCE		DRY BULB	WET BULB	CODE			
15	S02	010	006	000	7	09				

CAST NO.	TIME OF DAY	CAST TYPE	DEPTH (m)	TEMP °C	SIGMA-T	SPECIFIC VOLUME ANOMALY (10 <sup>3</sup> )	S&D DYN W (10 <sup>3</sup> )	COMPUTED SOUND VELOCITY (SEC)	AMBIENT LIGHT (lum/m <sup>2</sup> )					MEASURED SOUND VELOCITY (m/sec)				
									PO <sub>2</sub> - P (µg/l)	TOTAL P (µg/l)	NO <sub>2</sub> - N (µg/l)	NO <sub>3</sub> - N (µg/l)	S <sub>2</sub> - S (µg/l)	pH				
210	0800	STO	0000	0064	2072	1664	0107924	0000	14327									
		OBS	0000	0064	20721	1664			14327				016			000	020	
		STO	0010	-0045	2703	2172	0060947	0085	14353									
		STO	0020	-0120	3140	2527	0027085	0129	14390									
210	0800	STO	0024	-0140	32613	2625			14398				058			056	026	
		STO	0030	-0441	3278	2637	0016475	0151	14401									
210	0800	STO	0049	-0442	33172	2671			14410				056			064	029	
		STO	0050	-0142	3318	2671	0013344	0181	14410									
210	0800	STO	0074	-0133	33402	2690			14421				047			058	040	
		STO	0075	-0132	3342	2690	0011567	0212	14422									
		STO	0100	-0112	3359	2703	0010303	0239	14438									
210	0800	STO	0124	-0098	33735	2712			14450				063			100	024	
		STO	0125	-0098	3371	2713	0009421	0264	14450									
		STO	0150	-0090	3376	2716	0009052	0257	14459									
210	0800	STO	0174	-0082	33812	2720			14467				049			065	040	
		STO	0200	-0072	3397	2726	0004122	0330	14478									
210	0800	STO	0224	-0067	33933	2733			14496				046			069	018	
		STO	0250	-0056	3398	2733	0007459	0369	14495									
210	0800	STO	0268	-0050	33990	2734			14500				060			106	020	
210	0800	STO	0274	-0343	33939	2743			14502				060			095	020	





SHIP CODE	LATITUDE	LONGITUDE	DEPTH	STATION TIME	YEAR	ORIGINATOR		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS	WEATHER CODE	INSTR	MOOD STATION NUMBER	
						CRUISE NUMBER	STATION NUMBER							
318184	WE	8039 N	06712 W	907 07 08 18 130	1970	WGS	008	0356	2	00	0 X	X7	0 9	0008
* DT S WIND BAROMETER AIR TEMPERATURE °C VIS NUMBER SPECIAL WATER TRANS DRH SPEED OR FORCE (mbs) DRY BULB WET BULB CODE OBS LEVELS OBSERVATIONS 07 50 27 502 088 000 -003 6 13														
* CAST TIME DURATION CARD TYPE DEPTH (m) °C S ... SIGMA-T SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup> S A D DYN = 10 <sup>3</sup> COMPUTED SOUND VELOCITY = SEC O <sub>2</sub> = 1 AMBIENT LIGHT: TOTAL P NO <sub>2</sub> - N NO <sub>3</sub> - N S-O <sub>2</sub> - S MEASURED SOUND VELOCITY = m/s 130 STD 0000 -0148 3122 2513 0028455 0000 14371 056 025 018 OBS 0000 -0148 3122 2513 0026013 0027 14371 STD 0010 -0176 3153 2538 0025844 0053 14364 OBS 0010 -0176 3153 2538 14364 STD 0020 -0177 3155 2540 0025844 0053 14365 OBS 0020 -0177 3155 2540 14365 STD 0030 -0174 3166 2565 0023445 0077 14370 OBS 0030 -0179 3136 2565 14370 STD 0050 -0161 3295 2653 0015076 0116 14338 OBS 0050 -0161 3295 2653 14338 STD 0075 -0144 3317 2671 0013397 0151 14411 OBS 0075 -0149 3317 2671 14411 STD 0100 -0142 3337 2687 0011874 0183 14421 OBS 0100 -0142 3337 2687 14421 STD 0125 -0116 3376 2717 0006354 0209 14443 OBS 0125 -0116 3376 2717 14443 STD 0150 -0096 3413 2746 0006225 0228 14466 OBS 0150 -0065 3413 2746 14466 STD 0200 -0061 3430 2759 0005024 0256 14488 OBS 0200 -0061 3430 2759 14488 STD 0250 -0029 3452 2775 0003487 0277 14514 OBS 0250 -0029 3452 2775 14514 STD 0300 -0012 3460 2781 0002965 0294 14532 OBS 0300 -0012 3460 2781 14532 OBS 0315 -0008 3462 2762 14536 044 015 039														

SHIP CODE	LATITUDE	LONGITUDE	DEPTH	STATION TIME	YEAR	ORIGINATOR		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS	WEATHER CODE	INSTR	MOOD STATION NUMBER	
						CRUISE NUMBER	STATION NUMBER							
318184	WE	8115 N	06233 W	907 12 08 19 188	1970	WGS	009	0420	2	00	0 X	X1	7 6	0009
* DT S WIND BAROMETER AIR TEMPERATURE °C VIS NUMBER SPECIAL WATER TRANS DRH SPEED OR FORCE (mbs) DRY BULB WET BULB CODE OBS LEVELS OBSERVATIONS 18 503 069 001 -005 7 12														
* CAST TIME DURATION CARD TYPE DEPTH (m) °C S ... SIGMA-T SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup> S A D DYN = 10 <sup>3</sup> COMPUTED SOUND VELOCITY = SEC O <sub>2</sub> = 1 AMBIENT LIGHT: TOTAL P NO <sub>2</sub> - N NO <sub>3</sub> - N S-O <sub>2</sub> - S MEASURED SOUND VELOCITY = m/s 188 STD 0000 -0160 3121 2513 0028482 0000 14365 OBS 0000 -0160 31214 2513 14365 STD 0010 -0166 3127 2517 0028045 0028 14365 OBS 0010 -0166 31268 2517 14365 STD 0020 -0162 3131 2520 0027745 0056 14369 OBS 0025 -0155 31325 2521 14372 STD 0030 -0156 3163 2546 0025251 0082 14378 OBS 0050 -0157 3269 2632 0017096 0125 14405 STD 0050 -0137 32695 2632 14405 STD 0075 -0102 3367 2710 0009714 0158 14440 OBS 0075 -0102 33670 2710 14440 STD 0100 -0057 3394 2731 0007635 0180 14455 OBS 0100 -0057 33940 2731 14455 STD 0125 -0063 3421 2752 0005729 0197 14473 STD 0150 -0044 3440 2767 0004334 0209 14489 OBS 0151 -0043 34408 2767 14490 STD 0200 -0016 3456 2778 0003260 0228 14512 OBS 0201 -0016 34562 2778 14513 STD 0250 -0008 3461 2781 0002945 0244 14525 OBS 0252 -0008 34609 2782 14526 STD 0300 0002 3457 2736 0002492 0257 14539 OBS 0304 0003 34678 2737 14540 STD 0400 0004 3473 2730 0002117 0280 14560 OBS 0402 0011 34728 2790 14561 OBS 0404 0013														

SHIP CODE	LATITUDE ° 10'	LONGITUDE ° 10'	DEPTH METER	MARSden SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAL MPLS	WAVE OBSERVATIONS	WEATHER CODE	INSTR CLOUD TYPE AMT	MOCK STATION NUMBER		
					10'	1'	MONTH DAY		HR 10'	CRUISE NUMBER							STATION NUMBER	
318184	WE	81155N	063160W	907	13	08	19	218	1970	WGS	010	0338	2	00	0 X	X1	0 9	0010

NOTE: THESE VALUES REPRESENT THE OBSERVED INSTANTANEOUS SURFACE WIND (WIND) AND  
WINDS MEASURED BY AIRBORNE WIND PROFILER

WIND DIRECTION DEG	WIND SPEED OR FORCE	BAROMETRIC (mmHg)	AIR TEMPERATURE °C		VIS NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
075	075	075	-003	-004	6	12

CAST NO	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup>	SAL DYN M 10 <sup>3</sup>	COMPUTED SOUND VELOCITY M SEC	AMBIENT LIGHT lum/cm <sup>2</sup>				MEASURED SOUND VELOCITY M SEC	
										O <sub>2</sub> μM	PO <sub>2</sub> μM	TOTAL P μg wt/l	NO <sub>2</sub> N μg wt/l	NO <sub>3</sub> N μg wt/l	S <sub>0</sub> - S <sub>t</sub> μg wt/l
218		STD	0000	-0092	3130	2518	0027965	0000	14399	050				096	042
		OBS	0000	-0092	3130	2518	0027965	0000	14399						
		STD	0010	-0157	3143	2530	0026812	0027	14372						
001		OBS	0010	-0157	3143	2530	0026812	0027	14372						
		STD	0020	-0175	3155	2540	0025349	0053	14366						
		OBS	0020	-0175	3155	2540	0025349	0053	14366						
		STD	0030	-0173	3161	2545	0025376	0079	14370						
		OBS	0030	-0173	3161	2545	0025376	0079	14370						
		STD	0050	-0169	3223	2595	0020593	0125	14384						
		OBS	0050	-0169	3223	2595	0020593	0125	14384						
		STD	0075	-0114	3362	2706	0010055	0163	14433						
		OBS	0075	-0114	3362	2706	0010055	0163	14433						
		STD	0100	-0093	3407	2742	0006674	0184	14454						
		OBS	0100	-0093	3407	2742	0006674	0184	14454						
		STD	0125	-0069	3421	2752	0005691	0200	14471						
		OBS	0125	-0069	3421	2752	0005691	0200	14471						
		STD	0150	-0053	3430	2759	0005068	0213	14484						
		OBS	0150	-0053	3430	2759	0005068	0213	14484						
STD	0200	-0025	3452	2775	0003515	0234	14508								
OBS	0200	-0025	3452	2775	0003515	0234	14508								
STD	0250	-0007	3462	2782	0002847	0250	14526								
OBS	0250	-0007	3462	2782	0002847	0250	14526								
OBS	0288	-0003	3467	2785	0002847	0250	14535								

SHIP CODE	LATITUDE ° 10'	LONGITUDE ° 10'	DEPTH METER	MARSden SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAL MPLS	WAVE OBSERVATIONS	WEATHER CODE	INSTR CLOUD TYPE AMT	MOCK STATION NUMBER		
					10'	1'	MONTH DAY		HR 10'	CRUISE NUMBER							STATION NUMBER	
318184	WE	81171N	063490W	907	13	08	20	002	1970	WGS	011	0475	2	00	0 X	X1	0 9	0011

NOTE: THESE VALUES REPRESENT THE OBSERVED INSTANTANEOUS SURFACE WIND (WIND) AND  
WINDS MEASURED BY AIRBORNE WIND PROFILER

WIND DIRECTION DEG	WIND SPEED OR FORCE	BAROMETRIC (mmHg)	AIR TEMPERATURE °C		VIS NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
082	082	082	-003	-004	7	14

CAST NO	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup>	SAL DYN M 10 <sup>3</sup>	COMPUTED SOUND VELOCITY M SEC	AMBIENT LIGHT lum/cm <sup>2</sup>				MEASURED SOUND VELOCITY M SEC	
										O <sub>2</sub> μM	PO <sub>2</sub> μM	TOTAL P μg wt/l	NO <sub>2</sub> N μg wt/l	NO <sub>3</sub> N μg wt/l	S <sub>0</sub> - S <sub>t</sub> μg wt/l
002		STD	0000	-0146	3160	2543	0025534	0000	14377	056				024	030
		OBS	0000	-0146	3160	2543	0025534	0000	14377						
		STD	0010	-0157	3164	2547	0025198	0025	14374						
003		OBS	0010	-0157	3164	2547	0025198	0025	14374						
		STD	0020	-0168	3172	2554	0024553	0050	14372						
		OBS	0020	-0168	3172	2554	0024553	0050	14372						
		STD	0030	-0170	3183	2563	0023691	0074	14374						
		OBS	0030	-0170	3183	2563	0023691	0074	14374						
		STD	0050	-0175	3221	2593	0020737	0118	14381						
		OBS	0050	-0175	3221	2593	0020737	0118	14381						
		STD	0075	-0164	3272	2635	0016919	0165	14397						
		OBS	0075	-0164	3272	2635	0016919	0165	14397						
		STD	0100	-0152	3343	2672	0011384	0201	14417						
		OBS	0100	-0152	3343	2672	0011384	0201	14417						
		STD	0125	-0115	3394	2732	0007575	0224	14446						
		OBS	0125	-0115	3394	2732	0007575	0224	14446						
		STD	0150	-0081	3417	2749	0005939	0241	14469						
		OBS	0150	-0081	3417	2749	0005939	0241	14469						
STD	0200	-0052	3442	2768	0004143	0266	14494								
OBS	0200	-0052	3442	2768	0004143	0266	14494								
STD	0250	-0023	3460	2782	0002880	0284	14516								
OBS	0250	-0023	3460	2782	0002880	0284	14516								
STD	0300	-0006	3468	2787	0002395	0297	14535								
OBS	0300	-0006	3468	2787	0002395	0297	14535								
STD	0400	-0014	3475	2793	0001815	0318	14549								
OBS	0400	-0014	3475	2793	0001815	0318	14549								
OBS	0438	-0019	3477	2795	0001815	0318	14555								



SHIP NO	SHIP CODE	LATITUDE	LONGITUDE	DATE	TIME	YEAR	ORIGINATOR'S	DEPTH	BATHY	WAVE OBSERVATIONS	WEATHER CODE	INSTR	STATION NUMBER				
318184	WE	81010N	066000W	907	16 08 20	075	1970	WGS 014	0365	2	00	0	X	X2	0	9	0014

NOTE: THIS FORM IS TO BE FILLED IN BY THE OBSERVERS (NOT THE DATA REDUCER) AT THE TIME OF OBSERVATION. THIS FORM IS NOT TO BE FILLED IN BY THE DATA REDUCER.

DT	ST	WIND	BAROMETRIC	AIR TEMPERATURE	VIS	NUMBER	SPECIAL
WATER	TRANS	DIR	SPEED	DRY	WET	CS	OBSERVATIONS
COLOR	PARCEL		OR FORCE	BULB	BULB	LEVELS	
DT	SO	22	S12	089	-011	-013	6 14

CARD	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME	σ <sub>t</sub>	COMPUTED SOUND VELOCITY	AMBIENT LIGHT	MEASURED SOUND VELOCITY
075	STO 0000	-0168	3159	2543	0025570	0000	14367	078	029 032
	OBS 0000	-0168	3159	2543			14367		
	STO 0010	-0166	3160	2544	0025488	0025	14369		
	OBS 0010	-0168	3160	2544			14369		
	STO 0020	-0175	3161	2545	0025386	0051	14367		
001	OBS 0020	-0175	3161	2545			14367		
	STO 0030	-0177	3160	2549	0024980	0076	14369		
	OBS 0030	-0177	3160	2549			14369		
	STO 0050	-0179	3199	2576	0022420	0123	14376		
	OBS 0050	-0179	3199	2576			14376		
	STO 0075	-0165	3277	2639	0016430	0172	14397		
	OBS 0075	-0165	3277	2639			14397		
	STO 0100	-0149	3350	2697	0010852	0206	14419		
	OBS 0100	-0149	3350	2697			14419		
	STO 0125	-0107	3401	2737	0007074	0228	14450		
	OBS 0125	-0107	3401	2737			14450		
	STO 0150	-0070	3425	2755	0005376	0244	14475		
	OBS 0150	-0070	3425	2755			14475		
	STO 0200	-0052	3442	2768	0004148	0268	14494		
	OBS 0200	-0052	3442	2768			14494		
	STO 0250	-0015	3461	2782	0002877	0285	14522		
	OBS 0250	-0015	3461	2782			14522		
	STO 0300	-0010	3462	2783	0002632	0299	14533		
	OBS 0300	-0010	3462	2783			14533		
	STO 0334	-0007	3462	2782			14540		
	OBS 0334	-0007	3462	2782			14540		
	STO 0348	-0006	34622	2783			14542		
	OBS 0348	-0006	34622	2783			14542	051	076 037

SHIP NO	SHIP CODE	LATITUDE	LONGITUDE	DATE	TIME	YEAR	ORIGINATOR'S	DEPTH	BATHY	WAVE OBSERVATIONS	WEATHER CODE	INSTR	STATION NUMBER				
318184	WE	8039 N	05712 W	907	07 08 20	155	1970	WGS 015	0430	2	00	0	X	X1	0	9	0015

NOTE: THIS FORM IS TO BE FILLED IN BY THE OBSERVERS (NOT THE DATA REDUCER) AT THE TIME OF OBSERVATION. THIS FORM IS NOT TO BE FILLED IN BY THE DATA REDUCER.

DT	ST	WIND	BAROMETRIC	AIR TEMPERATURE	VIS	NUMBER	SPECIAL
WATER	TRANS	DIR	SPEED	DRY	WET	CS	OBSERVATIONS
COLOR	PARCEL		OR FORCE	BULB	BULB	LEVELS	
DT	SO	25	S10	112	008	-003	7 14

CARD	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME	σ <sub>t</sub>	COMPUTED SOUND VELOCITY	AMBIENT LIGHT	MEASURED SOUND VELOCITY
165	STO 0010	-0161	3148	2534	0026422		14370		
	OBS 0010	-0161	3148	2534			14370		
	STO 0020	-0170	3162	2546	0025314		14370		
	OBS 0020	-0170	3162	2546			14370		
	STO 0030	-0175	3211	2585	0021525		14376		
001	OBS 0030	-0175	3211	2585			14376		
	STO 0050	-0170	3265	2630	0017290		14389		
	OBS 0050	-0170	3265	2630			14389		
	STO 0075	-0144	3357	2703	0010350		14420		
	OBS 0075	-0140	3357	2703			14420		
	STO 0100	-0102	3400	2730	0007177		14448		
	OBS 0100	-0102	3400	2730			14448		
	STO 0105	-0098	3401	2737			14451		
	OBS 0105	-0098	3401	2737			14451		
	STO 0125	-0083	3421	2753			14450		
	OBS 0125	-0083	3421	2753			14450		
	STO 0150	-0071	3429	2755	0005450		14470		
	OBS 0150	-0071	3429	2755			14470		
	STO 0153	-0064	3427	2757	0005253		14478		
	OBS 0153	-0064	3427	2757			14478		
	STO 0200	-0047	3442	2760	0004158		14495		
	OBS 0200	-0047	3442	2760			14495		
	STO 0250	-0032	3453	2776	0003399		14513		
	OBS 0250	-0032	3453	2776			14513		
	STO 0300	-0017	3461	2782	0002952		14529		
	OBS 0300	-0017	3461	2782			14529		
	STO 0300	-0017	3461	2782			14529		
	OBS 0300	-0017	3461	2782			14529		
	STO 0334	-0007	3467	2786			14552	054	062 029
	OBS 0334	-0007	3467	2786			14552		

SHIP CODE	LATITUDE	LONGITUDE	DEPTH	STATION TIME			ORIGINATOR'S		DEPTH TO BOTTOM	BAR PRESS	WAVE OBSERVATIONS				WEATHER CODE	INSTA CLOUD	NOOD STATION NUMBER
				YEAR	MONTH	DAY	CRUISE NUMBER	STATION NUMBER			DIR	PER	PER	HEI			
318184 WE	80165N	068520W	907	08	20	218	1970	WGS	016	0330	2	00	0	X	X1	09	0016

DT S		WIND		AIR TEMPERATURE		VIS	
WATER TEMP	WIND DIR	WIND SPEED	BAROMETER	DRY BULB	WET BULB	CODE	SPECIAL OBSERVATIONS
50	18	502	112	003	-003	7	13

\* THIS PAGE PRINTS THE STATION DATA ONLY. THE WAVE OBSERVATIONS AND WEATHER CODE ARE PRINTED ON THE NEXT PAGE.  
 \* WAVE OBS. PRINTS DIR PER PER HEI.

STATION	DEPTH (m)	T °C	S	SIGMA T	SPECIFIC VOLUME ANOMALY (10 <sup>-3</sup> )	SAD DYN (10 <sup>-3</sup> )	COMPUTED SOUND VELOCITY (SEC)	O <sub>2</sub> ml/l	AMBIENT LIGHT				MEASURED SOUND VELOCITY (SEC)		
218	OBS	0000	-0158	3148	2534	0026432	0000		074				023	035	035
	OBS	0000	-0156	3148	2534		14370								
	STU	0010	-0175	3155	2540	0025859	0026								
	OBS	0010	-0175	3155	2540		14365								
	STU	0020	-0178	3168	2551	0024842	0051								
	OBS	0020	-0178	3168	2551		14367								
	STU	0030	-0175	3202	2578	0022214	0075								
	OBS	0030	-0175	3202	2578		14375								
	STU	0050	-0153	3251	2617	0018478	0115								
	OBS	0050	-0153	3251	2617		14395								
	STU	0075	-0134	3315	2669	0013599	0155								
	OBS	0075	-0134	3315	2669		14417								
	STU	0100	-0123	3380	2721	0008631	0183								
	OBS	0100	-0123	3380	2721		14436								
	STU	0125	-0101	3390	2728	0007932	0204								
	OBS	0125	-0101	3390	2728		14452								
	STU	0150	-0073	3426	2757	0005265	0220								
	OBS	0150	-0073	3426	2757		14472								
	STU	0200	-0045	3443	2769	0004107	0244								
	OBS	0200	-0045	3443	2769		14497								
	STU	0250	-0027	3456	2779	0003201	0262								
	OBS	0250	-0027	3456	2779		14516								
	STU	0300	-0007	3460	2781	0002977	0277								
	OBS	0300	-0007	3460	2781		14534								
	STU	0325	-0004	34634	2783		14540		046				062	035	

SHIP CODE	LATITUDE	LONGITUDE	DEPTH	STATION TIME			ORIGINATOR'S		DEPTH TO BOTTOM	BAR PRESS	WAVE OBSERVATIONS				WEATHER CODE	INSTA CLOUD	NOOD STATION NUMBER
				YEAR	MONTH	DAY	CRUISE NUMBER	STATION NUMBER			DIR	PER	PER	HEI			
318184 WE	7751 N	07139 W	260	08	22	113	1970	WGS	017	0146	2	00	0	X	X2	08	0017

DT S		WIND		AIR TEMPERATURE		VIS	
WATER TEMP	WIND DIR	WIND SPEED	BAROMETER	DRY BULB	WET BULB	CODE	SPECIAL OBSERVATIONS
19	512	150	052	032	7	08	

\* THIS PAGE PRINTS THE STATION DATA ONLY. THE WAVE OBSERVATIONS AND WEATHER CODE ARE PRINTED ON THE NEXT PAGE.  
 \* WAVE OBS. PRINTS DIR PER PER HEI.

STATION	DEPTH (m)	T °C	S	SIGMA T	SPECIFIC VOLUME ANOMALY (10 <sup>-3</sup> )	SAD DYN (10 <sup>-3</sup> )	COMPUTED SOUND VELOCITY (SEC)	O <sub>2</sub> ml/l	AMBIENT LIGHT				MEASURED SOUND VELOCITY (SEC)		
113	STU	0000	0239	3091	2470	0032541	0000								
	OBS	0000	0239	3091	2470		14544								
	STU	0010	0000	3173	2549	0024970	0028		006						
	OBS	0010	0000	3173	2549		14449								
113	STU	0020	0080	3260	2615	0018752	0050		006						
	OBS	0020	0080	3260	2615		14499								
113	STU	0025	0097	32912	2639	0015427	0067		010						
	OBS	0025	0097	32912	2639		14512								
	STU	0030	0053	3302	2650	0015427	0067								
	OBS	0030	0053	3302	2650		14497								
	STU	0050	-0051	3330	2678	0012733	0095								
	OBS	0050	-0051	3330	2678		14454								
	STU	0051	-0054	33311	2679		14453		040					029	039
	OBS	0051	-0054	33311	2679		14453								
	STU	0075	-0073	3336	2684	0012176	0127								
	OBS	0075	-0073	3336	2684		14444		044					036	019
	STU	0100	-0068	3339	2666	0011926	0157								
	OBS	0100	-0068	3339	2666		14440								
113	STU	0102	-0089	33390	2607		14446		049					042	046
	OBS	0102	-0089	33390	2607		14446								
	STU	0125	-0106	3345	2692	0011366	0186								
	OBS	0125	-0106	3345	2692		14443		049					050	031
113	OBS	0127	-0106												

SHIP NUMBER	SHIP CODE	LATITUDE	LONGITUDE	DATE	WARDEN SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS	WEATHER CODE	INST. CLOUD TYPE	MODEC STATION NUMBER			
						10'	1"	MONTH		DAY	HR							MIN	CRUISE NUMBER	STATION NUMBER
318184	WE	77525N	07127 W	260	71	08	22	153	1970	WGS	018	0201	2	00	0	X	X6	5	8	0018

NOTE: THIS FORM IS INTENDED FOR RECORDING ELECTRONICALLY OBSERVED METEOROLOGICAL DATA (W) IS HEADLINE DATED BY OBSERVER WHEN THEY APPEAR

WIND	BAROMETER	AIR TEMPERATURE °C		VIS	NUMBER OBS. LEVELS	SPECIAL OBSERVATIONS
		DRY BULB	WET BULB			
14	508	154	055	035	6	09

CAST NUMBER	DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	S & D DYN. W. x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	O <sub>2</sub> - 1	AMBIENT LIGHT				MEASURED SOUND VELOCITY - SEC							
											PO <sub>2</sub> - P	EQVAL. P	NO <sub>2</sub> - N	NO <sub>3</sub> - N	S	O <sub>2</sub> - S	PH					
153	085	STD	0000	0255	3046	2433	0036057	0000	14545													
		085	0000	0255	30464	2433			14545													
		STD	0010	0209	3151	2519	0027820	0031	14540													
153	085	0010	0209	31507	2519				14540													
		STD	0020	0101	3260	2614	0019934	0055	14509													
153	085	0025	0758	32983	2647				14496													
		STD	0030	0031	3306	2655	0014946	0072	14485													
		STD	0050	-0044	3328	2676	0012950	0100	14457													
153	085	0050	-0044	33276	2676				14457													
		STD	0075	-0066	3333	2681	0012422	0131	14452													
153	085	0075	-0066	33333	2681				14452													
		STD	0100	-0092	3340	2686	0011771	0162	14445													
153	085	0100	-0092	33404	2688				14445													
		STD	0125	-0098	3344	2691	0011495	0191	14446													
		STD	0150	-0110	3347	2693	0011205	0219	14445													
153	085	T0150	-0110	33466	2693				14445													
153	085	T0184	-0136	33503	2697				14439													
153	085	0186	-0136																			

SHIP NUMBER	SHIP CODE	LATITUDE	LONGITUDE	DATE	WARDEN SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS	WEATHER CODE	INST. CLOUD TYPE	MODEC STATION NUMBER			
						10'	1"	MONTH		DAY	HR							MIN	CRUISE NUMBER	STATION NUMBER
318184	WE	7754 N	07118 W	260	71	08	22	192	1970	WGS	019	0206	2	00	0	X	X1	7	7	0019

NOTE: THIS FORM IS INTENDED FOR RECORDING ELECTRONICALLY OBSERVED METEOROLOGICAL DATA (W) IS HEADLINE DATED BY OBSERVER WHEN THEY APPEAR

WIND	BAROMETER	AIR TEMPERATURE °C		VIS	NUMBER OBS. LEVELS	SPECIAL OBSERVATIONS
		DRY BULB	WET BULB			
34	514	145	052	034	7	09

CAST NUMBER	DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	S & D DYN. W. x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	O <sub>2</sub> - 1	AMBIENT LIGHT				MEASURED SOUND VELOCITY - SEC							
											PO <sub>2</sub> - P	EQVAL. P	NO <sub>2</sub> - N	NO <sub>3</sub> - N	S	O <sub>2</sub> - S	PH					
192	085	STD	0000	0260	2982	2380	0041159	0000	14547													
		085	0000	0280	29816	2380			14547													
		STD	0010	0220	3109	2485	0031088	0036	14540													
192	085	0010	0220	31086	2485				14540													
		STD	0020	0067	3252	2610	0019222	0061	14493													
192	085	0025	0013	33019	2652				14476													
		STD	0030	0003	3309	2658	0014690	0078	14472													
		STD	0050	-0039	3325	2673	0013187	0106	14459													
192	085	0050	-0039	33248	2673				14459													
		STD	0075	-0032	3333	2682	0012362	0138	14440													
192	085	0075	-0032	33329	2682				14440													
		STD	0100	-0090	3339	2687	0011689	0168	14445													
192	085	0100	-0090	33390	2687				14445													
		STD	0125	-0101	3342	2689	0011629	0197	14445													
		STD	0150	-0112	3344	2692	0011359	0226	14444													
192	085	T0150	-0112	33445	2692				14444													
192	085	T0163	-0127	33484	2695				14443													
192	085	0185	-0128																			





OBS ID	SHIP CODE	LATITUDE	LONGITUDE	DRIFT	MARSSEN SQUARE	STATION TIME			ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS			WEATHER CODE	INSTR CLOUD TYPE	MOOC STATION NUMBER		
						MONTH	DAY	HR	CRUISE NUMBER	STATION NUMBER			DIR	PER	SEAS					
318184	WE	7732 N	06830 W		259	78	03	23	121	1970	WGS	022	0512	2	00	0	X	X2	09	0022

\* OBS ID'S USED TO IDENTIFY OBSERVATIONS. OBSERVATIONS SHOULD BE IDENTIFIED BY STATION AND TIME.

WIND	SPEED OR FORCE	BAROMETER	AIR TEMPERATURE °C		VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
02	501	246	042	023	7	10	

CAST NO	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup>	SAD DTN M	COMPUTED SOUND VELOCITY - SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT				MEASURED SOUND VELOCITY - SEC				
											PO <sub>2</sub> - P	TOTAL P	NO <sub>2</sub> - N	NO <sub>3</sub> - N	S O <sub>2</sub> - S	S - P			
121	STD	0000	0172	2649	2121	0065865	0000	14454											
	OBS	0000	0172	26497	2121			14454		005				000	025				
	STD	0010	0052	2665	2139	0064148	0065	14403											
001	OBS	0010	0057																
	STD	0020	-0044	2631	2154	0062651	0128	14362											
	OBS	0020	-0044																
	STD	0030	-0044	2696	2157	0061394	0190	14304											
	OBS	0030	-0044																
	STD	0040	-0114	2728	2154	0053802	0310	14311											
	OBS	0040	-0114																
	STD	0075	-0131	2768	2226	0055661	0453	14342											
	OBS	0075	-0131																
	STD	0100	-0125	2808	2259	0052566	0589	14356											
	OBS	0100	-0123																
	STD	0125	-0118	2848	2291	0049463	0716	14368											
	OBS	0125	-0118																
	STD	0150	-0116	2908	2323	0046374	0836	14378											
	OBS	0150	-0116																
STD	0200	-0085	2907	2380	0040283	1053	14413												
OBS	0200	-0085																	
STD	0250	-0007	3047	2448	0034425	1239	14468												
OBS	0250	-0007																	
STD	0300	0052	3127	2510	0028616	1337	14514												
OBS	0300	0052																	
STD	0400	0085	3286	2636	0016723	1624	14568												
OBS	0400	0085																	
STD	0470	0057																	
OBS	0470	0057																	
STD	0493	0051	34342	2754				14607		077				112	034				

OBS ID	SHIP CODE	LATITUDE	LONGITUDE	DRIFT	MARSSEN SQUARE	STATION TIME			ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS			WEATHER CODE	INSTR CLOUD TYPE	MOOC STATION NUMBER		
						MONTH	DAY	HR	CRUISE NUMBER	STATION NUMBER			DIR	PER	SEAS					
318184	WE	77382N	06838 W		259	78	03	23	150	1970	WGS	023	0293	2	00	0	X	X2	68	0023

\* OBS ID'S USED TO IDENTIFY OBSERVATIONS. OBSERVATIONS SHOULD BE IDENTIFIED BY STATION AND TIME.

WIND	SPEED OR FORCE	BAROMETER	AIR TEMPERATURE °C		VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
22	501	246	042	023	7	10	

CAST NO	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup>	SAD DTN M	COMPUTED SOUND VELOCITY - SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT				MEASURED SOUND VELOCITY - SEC			
											PO <sub>2</sub> - P	TOTAL P	NO <sub>2</sub> - N	NO <sub>3</sub> - N	S O <sub>2</sub> - S	S - P		
150	STD	0000	0207	2697	2158	0062366	0000	14476										
	OBS	0000	0207	26969	2158			14476		003				000	032			
150	STD	0010	0025	3120	2505	0029167	0045	14453										
	OBS	0015	-0040	32650	2625			14444		049				023	037			
150	STD	0020	-0059	3283	2640	0016309	0065	14439										
	OBS	0030	-0050	3313	2666	0015332	0083	14430										
150	STD	0040	-0110	33334	2683			14425		053				075	035			
	OBS	0050	-0114	3339	2687	0011830	0109	14426										
150	STD	0065	-0115	33453	2693			14429		062				095	027			
	OBS	0075	-0111	3347	2694	0011193	0138	14432										
150	STD	0090	-0107	33501	2696			14437										
	OBS	0100	-0106	3351	2697	0010901	0165	14440										
150	STD	0125	-0104	3354	2700	0010636	0192	14445										
	OBS	0141	-0103	33570	2702			14449		074				117	032			
150	STD	0150	-0099	3359	2703	0010337	0218	14452										
	OBS	T0192	-0071	33673	2709			14473		072				113	030			
150	STD	0200	-0053	3368	2709	000744	0269	14483										
	OBS	0243	-0011	33818	2718			14512		076				114	045			
150	STD	0250	-0013	3385	2721	0008649	0315	14512										
	OBS	T0273	-0036	33984	2732			14507		064				097	036			
150	OBS	0275	-0039															

SHIP CODE	LATITUDE 1 10	LONGITUDE 1 10	MOON PHASE	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAL SMPLE REP	WAVE OBSERVATIONS			WEATHER CODE	INSIDE CLOUD TYPE		MODEC STATION NUMBER	
				10'	1"	MONTH	DAY	HR		MIN	CRUISE NUMBER			STATION NUMBER	DIR	HGT		PER	SEA STATE		TYPE
318184	WE	77415N	06940 W	259	78	08	23	174	1970	WGS	024	0201	2	00	0	X	X7	6	8	0024	
										<b>DT</b> <b>S</b> WIND: WIND SPEED (KTS) WIND DIRECTION (DEG) WIND FORCE (KTS) BAROMETER: BAROMETER (INCHES) BAROMETER (MM HG) AIR TEMPERATURE: AIR TEMPERATURE (°C) AIR TEMPERATURE (°F) VIS: VISIBILITY (MILES) VISIBILITY (KILOMETERS) NUMBER OBS LEVELS: NUMBER OBS LEVELS SPECIAL OBSERVATIONS: SPECIAL OBSERVATIONS											
										34 506 257 045 027 6 09											
CASE NO.	DURATION MIN	CARD TYPE	DEPTH (M)	TEMP	SIGMA-T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	SAD DPN x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY M/SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT lum/cm <sup>2</sup>				MEASURED SOUND VELOCITY m/sec							
										PO <sub>2</sub> - P µg/l	TOTAL P µg/l	NO <sub>2</sub> - N µg/l	NO <sub>3</sub> - N µg/l	S. O <sub>2</sub> - S µg/l	pH						
174		STO	0000	-0126	2576	2071	0070672	0000	14306												
		UBS	0000	-0126	25759	2071			14306					000						028	
		STO	0010	-0060	3246	2610	0019175	0044	14432												
174		OBS	0010	-0060	32458	2610			14432					031						048	
		STO	0020	-0089	3296	2652	0015212	0062	14427												
174		OBS	0020	-0099	33143	2607			14425					059						044	
		STO	0030	-0102	3317	2671	0013397	0076	14425												
		STO	0050	-0110	3335	2694	0012143	0102	14427												
174		OBS	0050	-0110	33366	2684			14427					056						031	
		STO	0075	-0111	3344	2691	0011440	0131	14432												
174		OBS	0075	-0111	33440	2691			14432					103						039	
		STO	0100	-0107	3348	2695	0011077	0159	14439												
174		OBS	0100	-0107	33485	2695			14439					092						036	
		STO	0125	-0105	3353	2698	0010771	0187	14445												
		STO	0150	-0102	3356	2701	0010507	0213	14451												
174		OBS	0150	-0102	33562	2701			14451					054						048	
174		OBS	0170	-0079	33593	2703			14457					067						050	
174		OBS	0180	-0079																	

SHIP CODE	LATITUDE 1 10	LONGITUDE 1 10	MOON PHASE	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAL SMPLE REP	WAVE OBSERVATIONS			WEATHER CODE	INSIDE CLOUD TYPE		MODEC STATION NUMBER	
				10'	1"	MONTH	DAY	HR		MIN	CRUISE NUMBER			STATION NUMBER	DIR	HGT		PER	SEA STATE		TYPE
318184	WE	77331N	06646 W	259	76	08	23	227	1970	WGS	025	0448	2	00	0	X	X2	7	8	0025	
										<b>DT</b> <b>S</b> WIND: WIND SPEED (KTS) WIND DIRECTION (DEG) WIND FORCE (KTS) BAROMETER: BAROMETER (INCHES) BAROMETER (MM HG) AIR TEMPERATURE: AIR TEMPERATURE (°C) AIR TEMPERATURE (°F) VIS: VISIBILITY (MILES) VISIBILITY (KILOMETERS) NUMBER OBS LEVELS: NUMBER OBS LEVELS SPECIAL OBSERVATIONS: SPECIAL OBSERVATIONS											
										06 506 269 039 028 7 11											
CASE NO.	DURATION MIN	CARD TYPE	DEPTH (M)	TEMP	SIGMA-T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	SAD DPN x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY M/SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT lum/cm <sup>2</sup>				MEASURED SOUND VELOCITY m/sec							
										PO <sub>2</sub> - P µg/l	TOTAL P µg/l	NO <sub>2</sub> - N µg/l	NO <sub>3</sub> - N µg/l	S. O <sub>2</sub> - S µg/l	pH						
227		STO	0000	0196	3210	2567	0023256	0000	14541												
		OBS	0000	0146	32096	2567			14541					002						028	
		STO	0010	0085	3211	2576	0022485	0022	14493												
227		OBS	0010		32109				14493					000						041	
		STO	0020	0003	3271	2628	0017525	0042	14466												
227		OBS	0025	-0026	32930	2647			14466					011						031	
		STO	0030	-0074	3302	2655	0014540	0059	14455												
		STO	0050	-0061	3330	2679	0012678	0066	14449												
227		OBS	0050	-0071	33304	2679			14449					031						031	
		STO	0075	-0067	3344	2691	0011496	0116	14443												
227		OBS	0075	-0077	33444	2691			14443					030						033	
227		OBS	0099	-0080	33495	2695			14449					047						048	
		STO	0100	-0076	3350	2695	0011037	0145	14449												
		STO	0125	-0080	3354	2699	0010793	0172	14456												
227		OBS	0149	-0072	33537	2702			14465					043						037	
		STO	0156	-0072	3359	2732	0013412	0198	14465												
227		OBS	T0194	-0045	33691	2709			14487					035						037	
		STO	0200	-0244	3369	2739	0039723	0249	14488												
227		OBS	0243	-0076	33823	2718			14515					065						036	
		STO	0250	-0002	3384	2719	0008828	0295	14517												
227		OBS	0298	0066	34106	2737			14500					039						037	
		STO	0300	0068	3411	2738	0007126	0335	14501												
227		OBS	T0397	0088	34301	2751			14589					046						016	

SHIP CODE	LATITUDE	LONGITUDE	DEPTH M	MARSDEN SQUARE	STATION (GMT)	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	RAE SAMPL BY	WAVE OBSERVATIONS	WEATHER CODE	INST CLOUD TYPE AMT	MODE STATION NUMBER	
							CRUISE NUMBER	STATION NUMBER							
313184	77362N	066342W	259	76	08 24 004	1970	HGS	026	0512	Z	00	0 X	X2	7 8	0026

NOTE: READ THESE INSTRUCTIONS FOR RECORDING ELECTRONICALLY OBTAINED METEOROLOGICAL DATA (RTS) OF  
 THIS REPORT BASED BY SYSTEMS. OTHER DATA APPLY.

WIND SPEED (KTS)	WIND DIRECTION (DEG)	BAROMETRIC PRESSURE (INCH)	AIR TEMPERATURE °C		VIS IBILITY (M)	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
06	S06	269	039	028	7	13	

CAST NO.	DURATION (MIN)	CARD TYPE	DEPTH (m)	T °C	S ...	SIGMA - T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	SAD DYN M x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY M SEC	AMBIENT LIGHT				MEASURED SOUND VELOCITY (M SEC)				
										PO <sub>2</sub> - P ug/l	TOTAL P ug/l	NO <sub>2</sub> - N ug/l	NO <sub>3</sub> - N ug/l	S - O <sub>2</sub> - S ug/l	S	O <sub>2</sub>	S	pH
004		STD	0000	0188	3186	2549	0024981	0000	14534									
		OBS	0000	0188	31862	2549			14534									
		STD	0010	0149	3199	2562	0023747	0024	14520									
004		OBS	0010		31991													
		STD	0020	0105	3247	2603	0019831	0046	14509									
		OBS	0025	0082	32669	2621			14502									
		STD	0030	0047	3281	2634	0016955	0054	14489									
		STD	0050	-0052	3322	2672	0013357	0094	14452									
004		OBS	0050	-0052	33220	2672			14452									
		STD	0075	-0097	3341	2688	0011749	0126	14443									
		OBS	0075	-0067	33411	2686			14443									
		STD	0100	-0083	3346	2692	0011359	0155	14450									
		OBS	0100	-0085	33462	2692			14450									
		STD	0125	-0076	3354	2698	0010781	0182	14458									
		STD	0150	-0069	3360	2703	0010323	0209	14466									
004		OBS	0150	-0069	33602	2703			14466									
		STD	0200	-0054	3368	2709	0009788	0259	14482									
		OBS	T0201	-0055	33680	2709			14482									
		STD	0250	0005	3387	2721	0008644	0305	14521									
004		OBS	0257	0014	33899	2723			14527									
		STD	0300	0071	3415	2740	0006913	0344	14563									
004		OBS	0303	0074	34159	2741			14565									
		STD	0400	0088	3430	2752	0005834	0408	14589									
004		OBS	T0406	0088	34310	2752			14591									
004		OBS	0469	0086	34346	2755			14601									
004		OBS	0471	0087														

SHIP CODE	LATITUDE	LONGITUDE	DEPTH M	MARSDEN SQUARE	STATION (GMT)	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	RAE SAMPL BY	WAVE OBSERVATIONS	WEATHER CODE	INST CLOUD TYPE AMT	MODE STATION NUMBER	
							CRUISE NUMBER	STATION NUMBER							
318184	7742 N	06625 W	259	76	08 24 047	1970	HGS	027	0274	Z	00	0 X	X2	6 8	0027

NOTE: READ THESE INSTRUCTIONS FOR RECORDING ELECTRONICALLY OBTAINED METEOROLOGICAL DATA (RTS) OF  
 THIS REPORT BASED BY SYSTEMS. OTHER DATA APPLY.

WIND SPEED (KTS)	WIND DIRECTION (DEG)	BAROMETRIC PRESSURE (INCH)	AIR TEMPERATURE °C		VIS IBILITY (M)	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
03	S04	267	038	021	7	09	

CAST NO.	DURATION (MIN)	CARD TYPE	DEPTH (m)	T °C	S ...	SIGMA - T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	SAD DYN M x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY M SEC	AMBIENT LIGHT				MEASURED SOUND VELOCITY (M SEC)				
										PO <sub>2</sub> - P ug/l	TOTAL P ug/l	NO <sub>2</sub> - N ug/l	NO <sub>3</sub> - N ug/l	S - O <sub>2</sub> - S ug/l	S	O <sub>2</sub>	S	pH
047		STD	0000	0000	3068	2465	0033013	0000	14433									
		OBS	0000	0000	30681	2465			14433									
		STD	0010	0127	3149	2523	0027446	0030	14504									
047		OBS	0010	0127	31489	2523			14504									
		STD	0020	0047	3240	2601	0020063	0054	14482									
047		OBS	0025	0015	32733	2624			14472									
		STD	0030	-0004	3284	2639	0016463	0072	14466									
		STD	0050	-0060	3317	2668	0013681	0102	14448									
047		OBS	0050	-0060	33173	2668			14448									
		STD	0075	-0084	3336	2684	0012120	0134	14444									
047		OBS	0075	-0084	33364	2684			14444									
		STD	0100	-0082	3348	2693	0011251	0163	14450									
		OBS	0100	-0082	33477	2693			14450									
		STD	0125	-0073	3350	2695	0011080	0191	14459									
		STD	0150	-0065	3354	2698	0010812	0219	14468									
047		OBS	T0152	-0064	33544	2698			14468									
		STD	0200	-0048	3366	2707	0009954	0271	14485									
047		OBS	T0204	-0046	33669	2707			14487									
		STD	0250	-0015	3378	2715	0009206	0318	14511									
047		OBS	0253	-0012	33785	2715			14512									

DDF YR	DDF MO	DDF DAY	SHIP CODE	LATITUDE 1 TO	LONGITUDE 1 TO	MILES OFF SHORE	MARSDEN SQUARE 10'	STATION TIME (GMT) MONTH DAY HR TO	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF DIR	WAVE OBSERVATIONS			WEATHER CODE	INSTR CLOUD TYPE (amt)	MODE STATION NUMBER
										CRUISE NUMBER	STATION NUMBER			DIR	HT	PER			
31	8	18	4	7725 N	06540 W	259	76	08 24 075	1970	HGS	028	0201	2	00	0	X	X1	3 6	0028

\* WITH THIS FORM TEMPLATE FOR STREAM AUTOMATION DATA (SUD) OR  
 \* MANUAL DATA BY SYSTEMS OPERATOR APPLIC

WIND DIR	WIND SPEED OR FORCE	BAROMETER (mm)	AIR TEMPERATURE °C		VIS NUMBER	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
07	506	266	032	018	7	09

CAST NO	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY δ 10 <sup>3</sup>	S.A.O. DTN = P 10 <sup>3</sup>	COMPUTED SOUND VELOCITY = SEC	AMBIENT LIGHT Sun (μE)				MEASURED SOUND VELOCITY = SEC	
										PO <sub>2</sub> - P μg/l	TOTAL P μg/l	NO <sub>2</sub> - N μg/l	NO <sub>3</sub> - N μg/l	S O <sub>2</sub> - S μg/l	pH
075	STS	0000	0177	3170	2537	0026109	0000	14527							
	UBS	0000	0177	31696	2537			14527							
	STD	0010	0147	3204	2567	0023339	0024	14520							
075	UBS	0010	0147	32044	2567			14520							
	STD	0020	0029	3256	2614	0018785	0345	14475							
075	UBS	0025	-0014	32748	2632			14459							
	STD	0030	-0020	3262	2638	0016515	0363	14458							
	STD	0050	-0043	3303	2660	0014401	0094	14455							
075	UBS	0050	-0043	33080	2660			14455							
	STD	0075	-0065	3329	2677	0012783	0126	14451							
075	UBS	0075	-0065	33287	2677			14451							
	STD	0100	-0059	3342	2659	0011632	0159	14445							
075	UBS	0100	-0059	33417	2659			14445							
	STD	0125	-0039	3349	2695	0011074	0167	14451							
	STD	0150	-0042	3357	2701	0010511	0214	14455							
075	UBS	T0151	-0032	33568	2701			14455							
075	UBS	T0175	-0078	33639	2736			14460							
075	UBS	0181	-0076												

DDF YR	DDF MO	DDF DAY	SHIP CODE	LATITUDE 1 TO	LONGITUDE 1 TO	MILES OFF SHORE	MARSDEN SQUARE 10'	STATION TIME (GMT) MONTH DAY HR TO	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF DIR	WAVE OBSERVATIONS			WEATHER CODE	INSTR CLOUD TYPE (amt)	MODE STATION NUMBER
										CRUISE NUMBER	STATION NUMBER			DIR	HT	PER			
31	8	18	4	7723 N	06032 W	259	76	08 24 093	1970	HGS	029	0338	2	00	0	X	X1	3 6	0029

\* WITH THIS FORM TEMPLATE FOR STREAM AUTOMATION DATA (SUD) OR  
 \* MANUAL DATA BY SYSTEMS OPERATOR APPLIC

WIND DIR	WIND SPEED OR FORCE	BAROMETER (mm)	AIR TEMPERATURE °C		VIS NUMBER	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
07	506	266	032	018	7	11

CAST NO	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY δ 10 <sup>3</sup>	S.A.O. DTN = P 10 <sup>3</sup>	COMPUTED SOUND VELOCITY = SEC	AMBIENT LIGHT Sun (μE)				MEASURED SOUND VELOCITY = SEC	
										PO <sub>2</sub> - P μg/l	TOTAL P μg/l	NO <sub>2</sub> - N μg/l	NO <sub>3</sub> - N μg/l	S O <sub>2</sub> - S μg/l	pH
093	UBS	0000	0137	3132	2549	0025008	0000	14511							
	STD	0010	0123	3224	2584	0021671	0023	14512							
093	UBS	0010	0123	32244	2584			14512		007			005	000	
	STD	0020	0119	3241	2598	0020393	0044	14514							
093	UBS	0025	0109	32500	2606			14511		005			011	024	
	STD	0030	0049	3234	2619	0016342	0063	14497							
	STD	0050	-0036	3305	2657	0014706	0096	14458							
093	UBS	0050	-0036	33051	2657			14458		025			078	011	
	STD	0075	-0051	3322	2672	0013337	0131	14457							
093	UBS	0075	-0051	33221	2672			14457		030			102	013	
	STD	0100	-0055	3336	2684	0012105	0163	14443							
093	UBS	0101	-0056	33354	2685			14442		032			118	026	
	STD	0125	-0054	3347	2694	0011226	0192	14449							
	STD	0150	-0091	3357	2701	0010475	0219	14456							
093	UBS	0152	-0091	33578	2702			14456		041			165	022	
	STD	0200	-0050	3372	2712	0009494	0269	14485							
093	UBS	0202	-0049	33724	2712			14486		056			193	024	
	STD	0250	-0019	3360	2717	0009005	0216	14509							
093	UBS	0253	-0019	33605	2717			14510		038			153	020	
	STD	0300	-0006	3384	2719	0004770	0360	14524							
093	UBS	T0322	-0005	33843	2720			14528		042			173	034	
093	UBS	0324	-0005												

SHIP CODE	LATITUDE	LONGITUDE	MARSDEN SQUARE	STATION TIME			ORIGINATOR'S		DEPTH TO BOTTOM	WAVE OBSERVATIONS	WEATHER CODE	INSTRUMENT		MOOD STATION NUMBER
				MONTH	DAY	YEAR	CRUISE NUMBER	STATION NUMBER				TYPE	AWT	
318184	WE	77188N	066260W	25	76	08 24 111	1970	WGS U30	0329	Z	00	0 X	X1 6 2	0030

\* NOT USED FURTHER FOR STANDARDIZATION PURPOSES (SEE DATA SHEET) BUT IS REMOVED BY EXTENDED USE OF THIS APPENDIX

WIND	SPEED OR FORCE	BAROMETER (INCH)	AIR TEMPERATURE °C		VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
02	S20	264	033	023	7	11	

CAST NO.	DURATION	CARD TYPE	DEPTH (M)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	SAD DYN M x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	AMBIENT LIGHT				MEASURED SOUND VELOCITY - SEC	
										PO <sub>2</sub> P	TOTAL P	NO <sub>2</sub> N	NO <sub>3</sub> N	S	U
111	STO	0000	0114	3211	2574	0022651	0000	14505							
	OBS	0003	0114	32108	2574			14505							
	STO	0010	0104	3221	2582	0021852	0022	14503	001				005	013	
111	OBS	0013	0104	32206	2582			14503	000				004	020	
	STO	0020	0076	3238	2596	0020390	0043	14494							
111	OBS	0025	0061	32468	2606			14490	006				011	011	
	STO	0030	0043	3259	2616	0018620	0062	14484							
	STO	0050	-0017	3297	2650	0015376	0096	14465							
111	OBS	0050	-0017	32974	2650			14465	014				048	012	
	STO	0075	-0063	3326	2675	0013001	0132	14452							
111	OBS	0075	-0063	33259	2675			14452	021				098	014	
	STO	0100	-0121	3346	2693	0011248	0162	14432							
111	OBS	0100	-0121	33460	2693			14432	029				137	014	
	STO	0125	-0103	3354	2699	0010699	0190	14446							
	STO	0150	-0082	3361	2704	0010182	0216	14461							
111	OBS	0150	-0082	33614	2704			14461	038				175	017	
	STO	0200	-0032	3376	2714	0009252	0264	14494							
111	OBS	0200	-0031	33764	2715			14495	019				108	020	
	STO	0250	-0013	3390	2717	0009009	0310	14512							
111	OBS	0251	-0013	33805	2717			14512	033				162	017	
	STO	0300	-0009	3382	2716	0008865	0355	14522							
111	OBS	0310	-0009	33823	2718			14524	037				154	017	
111	OBS	0312	-0009												

SHIP CODE	LATITUDE	LONGITUDE	MARSDEN SQUARE	STATION TIME			ORIGINATOR'S		DEPTH TO BOTTOM	WAVE OBSERVATIONS	WEATHER CODE	INSTRUMENT		MOOD STATION NUMBER
				MONTH	DAY	YEAR	CRUISE NUMBER	STATION NUMBER				TYPE	AWT	
318184	WE	7716 N	066608 W	25	76	08 24 139	1970	WGS 031	0229	Z	00	0 X	X1 0 1	0031

\* NOT USED FURTHER FOR STANDARDIZATION PURPOSES (SEE DATA SHEET) BUT IS REMOVED BY EXTENDED USE OF THIS APPENDIX

WIND	SPEED OR FORCE	BAROMETER (INCH)	AIR TEMPERATURE °C		VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
03	S03	251	024	015	7	09	

CAST NO.	DURATION	CARD TYPE	DEPTH (M)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	SAD DYN M x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	AMBIENT LIGHT				MEASURED SOUND VELOCITY - SEC	
										PO <sub>2</sub> P	TOTAL P	NO <sub>2</sub> N	NO <sub>3</sub> N	S	U
139	STO	0000	0120	3213	2575	0022560	0000	14508							
	OBS	0000	0120	32125	2575			14508					003		
	STO	0010	0113	3213	2576	0022450	0022	14506					005	012	
139	OBS	0010	0113	32134	2576			14506	005				005	030	
	STO	0020	0099	3222	2583	0021741	0044	14503							
139	OBS	0025	0088	32282	2589			14499	003				006	013	
	STO	0030	0069	3241	2600	0020125	0065	14493							
	STO	0050	-0006	3286	2640	0016311	0102	14469							
139	OBS	0050	-0005	32858	2640			14469	011				040	015	
	STO	0075	-0076	3331	2681	0012400	0137	14437							
139	OBS	0075	-0076	33314	2681			14437	029				122	019	
	STO	0100	-0110	3350	2696	0010963	0167	14438							
139	OBS	0100	-0110	33502	2696			14438	026				130	019	
	STO	0125	-0045	3357	2703	0010354	0193	14455							
	STO	0150	-0065	3365	2708	0009901	0219	14459							
139	OBS	0151	-0064	33652	2708			14470	078				269	028	
	STO	0200	-0036	3373	2712	0009448	0267	14492							
139	OBS	0200	-0036	33734	2712			14492	087				263	028	
139	OBS	0202	-0022												

TABLE II.—Observed and interpolated oceanographic data from stations occupied by USCGC WESTWIND, 3-9 September 1970, prepared from NODC Listing No. 31-1705.

SHIP NO.	SHIP CODE	LATITUDE	LONGITUDE	MARSDEM SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS			WEATHER CODE	INSUR CLOUD	NODC STATION NUMBER
					TO	MONTH	DAY		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER			
311705	NE	78262N	07309 W	260 83	09	03	126	1970	KBS	001	0284	1	00	0	X	X1	4 3	0001

NOTE: WHEN SURVEY NUMBER AND STATION NUMBER ARE NOT SPECIFIED, THESE DATA ARE THE PROPERTY OF THE USCGC WESTWIND.

WIND	AIR TEMPERATURE °C		BAROMETER (mm)	SPECIAL OBS. LEVELS	
	DRY BULB	WET BULB		DRY BULB	WET BULB
07	507	128	-012	-021	7 09

CAST NO.	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY (10 <sup>3</sup> )	SAD DTM (10 <sup>3</sup> )	COMPUTED SOUND VELOCITY (SEC)	O <sub>2</sub> ml/l	AMBIENT LIGHT (μmole/l)				MEASURED SOUND VELOCITY (m/sec)	
											NO <sub>2</sub> -P	TOTAL-P	NO <sub>3</sub> -N	NO <sub>3</sub> -M	S-O <sub>2</sub> -S	pH
126	08S	ST0	0000	-0136	3144	2530	0026777	0030	14380							
		ST0	0000	-0136	31441	2530			14330							
		ST0	0010	-0131	3151	2536	0026259	0026	14385							
126	08S	ST0	0010	-0131	31509	2536			14385							
		ST0	0020	-0137	3152	2537	0026123	0052	14384							
126	08S	ST0	0025	-0137	31547	2539			14385							
		ST0	0030	-0124	3155	2537	0025896	0078	14387							
		ST0	0050	-0114	3183	2531	0023798	0128	14404							
126	08S	ST0	0050	-0114	31830	2531			14404							
		ST0	0075	-0070	3276	2635	0016803	0179	14442							
126	08S	ST0	0075	-0070	32755	2635			14442							
		ST0	0100	-0092	3313	2666	0013866	0217	14441							
126	08S	ST0	0100	-0092	33130	2666			14441							
		ST0	0125	-0108	3339	2687	0011825	0249	14441							
		ST0	0150	-0114	3357	2712	0010373	0277	14445							
126	08S	ST0	0151	-0114	33576	2713			14445							
		ST0	0200	-0098	3370	2712	0030403	0326	14463							
126	08S	ST0	0200	-0098	33703	2713			14463							
		ST0	0250	-0082	3331	2720	0039681	0372	14480							
126	08S	ST0	0250	-0077	33530	2722			14485							

SHIP NO.	SHIP CODE	LATITUDE	LONGITUDE	MARSDEM SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS			WEATHER CODE	INSUR CLOUD	NODC STATION NUMBER
					TO	MONTH	DAY		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER			
311705	WE	7828 N	073275 W	260 83	09	03	143	1970	KBS	002	0476	1	00	0	X	X1	4 3	0002

NOTE: WHEN SURVEY NUMBER AND STATION NUMBER ARE NOT SPECIFIED, THESE DATA ARE THE PROPERTY OF THE USCGC WESTWIND.

WIND	AIR TEMPERATURE °C		BAROMETER (mm)	SPECIAL OBS. LEVELS	
	DRY BULB	WET BULB		DRY BULB	WET BULB
10	505	120	005	-011	7 12

CAST NO.	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY (10 <sup>3</sup> )	SAD DTM (10 <sup>3</sup> )	COMPUTED SOUND VELOCITY (SEC)	O <sub>2</sub> ml/l	AMBIENT LIGHT (μmole/l)				MEASURED SOUND VELOCITY (m/sec)	
											NO <sub>2</sub> -P	TOTAL-P	NO <sub>3</sub> -N	NO <sub>3</sub> -M	S-O <sub>2</sub> -S	pH
144	08S	ST0	0000	-0141	3149	2535	0026359	0030	14378							
		ST0	0000	-0141	31494	2535			14378							
		ST0	0010	-0138	3152	2537	0026187	0026	14382							
144	08S	ST0	0010	-0138	31516	2537			14382							
		ST0	0020	-0128	3157	2542	0025643	0052	14389							
144	08S	ST0	0025	-0124	31627	2545			14392							
		ST0	0030	-0122	3167	2549	0025000	0077	14395							
		ST0	0050	-0115	3185	2533	0023616	0126	14404							
144	08S	ST0	0050	-0115	31853	2533			14404							
		ST0	0075	-0104	3285	2643	0016018	0175	14427							
144	08S	ST0	0075	-0104	32846	2643			14427							
		ST0	0100	-0106	3332	2682	0012363	0211	14437							
144	08S	ST0	0100	-0106	33320	2682			14437							
		ST0	0125	-0106	3350	2696	0013978	0240	14443							
		ST0	0150	-0107	3363	2737	0029955	0266	14449							
144	08S	ST0	0150	-0107	33631	2707			14449							
		ST0	0200	-0088	3375	2716	0039103	0314	14468							
144	08S	ST0	0200	-0088	33749	2716			14468							
		ST0	0250	-0061	3397	2726	0005093	0357	14471							
		ST0	0251	-0061	33847	2727			14491							
		ST0	0300	-0051	3397	2732	0007546	0396	14505							
144	08S	ST0	0301	-0051	33972	2732			14505							
		ST0	0400	-0045	3417	2743	0006062	0464	14527							
144	08S	ST0	0400	-0045	34169	2743			14527							
144	08S	ST0	0453	-0042	34215	2751			14538							

SHIP CODE	LATITUDE	LONGITUDE	DATE	HOURS	MINUTES	STATION	TIME	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA STATE	WAVE OBSERVATIONS	WEATHER CODE	INSR CLOUD	MODE STATION NUMBER	
									CRUISE NUMBER	STATION NUMBER							
311705	WE 7829 N	07345 W	260	83	09	03	169	1970	KBS	003	0567	1	00	0	X	X1 4 3	0003

\* NOT USED FURTHER FOR OBSERVATION UNLESS SPECIALLY MARKED (S) OR (M) IN COLUMN NUMBER BY OBSERVER WHEN THEY APPLY

WIND DIRECTION	WIND SPEED (KNOTS)	BAROMETRIC PRESSURE (mm)	AIR TEMPERATURE (°C)		VISIBILITY (MILES)	NUMBER OF OBSERVATIONS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
10	505	120	005	-011	7	12	

CAST NO.	TIME OF DAY	CARD TYPE	DEPTH (m)	TEMPERATURE (°C)	SALINITY	SIGMA-T	SPECIFIC VOLUME ANOMALY = 10 <sup>4</sup>	SOUND VELOCITY (m/sec)	COMPUTED SOUND VELOCITY (m/sec)	O <sub>2</sub> (%)	AMBIENT LIGHT					MEASURED SOUND VELOCITY (m/sec)		
											PAR	PAR*	PAR**	PAR***	PAR****	PAR*****	PAR*****	PAR*****
169	0000	STO	0000	-0148	3132	2521	0027684	0000	14373									
	0000	OBS	0000	-0148	31320	2521			14373									
	0010	STO	0010	-0151	3133	2522	0027619	0027	14373									
169	0010	OBS	0010	-0151	31327	2522			14373									
	0020	STO	0020	-0149	3137	2525	0027283	0055	14376									
169	0025	OBS	0025	-0146	31331	2527			14378									
	0030	STO	0030	-0134	3166	2548	0025072	0081	14389									
	0050	STO	0050	-0065	3248	2613	0019876	0125	14422									
169	0050	OBS	0050	-0065	32479	2613			14422									
	0075	STO	0075	-0065	3292	2649	0015480	0168	14437									
169	0075	OBS	0075	-0065	32924	2649			14437									
	0100	STO	0100	-0100	3328	2678	0012699	0203	14439									
169	0100	OBS	0100	-0100	33279	2678			14439									
	0125	STO	0125	-0102	3349	2695	0011042	0233	14445									
	0150	STO	0150	-0105	3366	2709	0009721	0259	14451									
169	0150	OBS	0150	-0105	33663	2709			14451									
	0200	STO	0200	-0057	3387	2724	0008302	0304	14484									
169	0200	OBS	0200	-0057	33872	2724			14484									
	0250	STO	0250	-0039	3395	2730	0007803	0344	14502									
169	0250	OBS	0250	-0039	33946	2730			14502									
	0300	STO	0300	-0041	3402	2735	0037240	0382	14510									
169	0300	OBS	0300	-0041	34017	2735			14510									
	0400	STO	0400	-0043	3421	2751	0005769	0447	14528									
169	0400	OBS	0400	-0043	34209	2751			14529									
	0500	STO	0500	-0042	3424	2753	0005496	0503	14540									
169	0500	OBS	0500	-0042	34242	2754			14547									

SHIP CODE	LATITUDE	LONGITUDE	DATE	HOURS	MINUTES	STATION	TIME	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA STATE	WAVE OBSERVATIONS	WEATHER CODE	INSR CLOUD	MODE STATION NUMBER	
									CRUISE NUMBER	STATION NUMBER							
311705	WE 78308N	07403 W	260	84	09	03	204	1970	KBS	004	0420	1	00	0	X	X1 0 2	0004

\* NOT USED FURTHER FOR OBSERVATION UNLESS SPECIALLY MARKED (S) OR (M) IN COLUMN NUMBER BY OBSERVER WHEN THEY APPLY

WIND DIRECTION	WIND SPEED (KNOTS)	BAROMETRIC PRESSURE (mm)	AIR TEMPERATURE (°C)		VISIBILITY (MILES)	NUMBER OF OBSERVATIONS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
04	508	117	-019	-026	7	11	

CAST NO.	TIME OF DAY	CARD TYPE	DEPTH (m)	TEMPERATURE (°C)	SALINITY	SIGMA-T	SPECIFIC VOLUME ANOMALY = 10 <sup>4</sup>	SOUND VELOCITY (m/sec)	COMPUTED SOUND VELOCITY (m/sec)	O <sub>2</sub> (%)	AMBIENT LIGHT					MEASURED SOUND VELOCITY (m/sec)		
											PAR	PAR*	PAR**	PAR***	PAR****	PAR*****	PAR*****	PAR*****
204	0000	STO	0000	-0154	3149	2535	0026387	0000	14372									
	0000	OBS	0000	-0154	31487	2535			14372									
	0010	STO	0010	-0155	3148	2534	0026449	0026	14373									
204	0010	OBS	0010	-0155	31477	2534			14373									
	0020	STO	0020	-0157	3168	2550	0024871	0052	14377									
204	0025	OBS	0025	-0157	31771	2558			14379									
	0030	STO	0030	-0156	3179	2559	0024037	0076	14380									
	0050	STO	0050	-0151	3211	2585	0021573	0122	14390									
204	0050	OBS	0050	-0151	32108	2585			14390									
	0075	STO	0075	-0103	3307	2661	0014293	0167	14431									
204	0075	OBS	0075	-0103	33071	2661			14431									
	0100	STO	0100	-0109	3336	2685	0012010	0199	14436									
204	0100	OBS	0100	-0109	33365	2685			14436									
	0125	STO	0125	-0109	3351	2697	0010868	0228	14442									
	0150	STO	0150	-0110	3364	2737	0009699	0254	14448									
204	0150	OBS	0150	-0110	33637	2737			14448									
	0200	STO	0200	-0080	3392	2721	0008603	0300	14473									
204	0200	OBS	0200	-0080	33819	2721			14473									
	0250	STO	0250	-0063	3400	2735	0007303	0340	14491									
204	0250	OBS	0250	-0063	34000	2735			14492									
	0300	STO	0300	-0051	3413	2745	0006333	0374	14507									
204	0300	OBS	0300	-0051	34132	2745			14507									
	0400	STO	0400	-0046	3419	2744	0005882	0435	14527									
204	0400	OBS	0400	-0046	34190	2750			14527									





SHIP CODE	LATITUDE	LONGITUDE	DATE	WARSDEN SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAL (‰)	WAVE OBSERVATIONS			WEATHER CODE	INST. CLOUD TYPE	MOOD STATION NUMBER	
					MONTH	DAY	HR		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER				SEA
311705	WE 7826 N	07304 W	26 08	83	09	04	035	1970	KBS	007	0274	1	00	0	X	X1	4	3	0007
<small>NOTE: SPEED, DIRECTION AND DEPTH ARE DERIVED ELECTRONICALLY DISPLAYED METAL DATA (DTS) OR COMPUTED BASED ON SURVEYOR'S SPEED AND DEPTH MEASUREMENTS.</small>																			
CAST		CARD TYPE	DEPTH (m)	TEMP (°C)	SIGMA-T	SPECIFIC VOLUME ANOMALY (σ <sub>t</sub> )	SAL (‰)	COMPUTED SOUND VELOCITY (m/sec)	SAL (‰)	AMBIENT LIGHT			MEASURED SOUND VELOCITY (m/sec)						
DURATION	NO.									PO <sub>4</sub> -P	TOTAL P	NO <sub>3</sub> -N	NO <sub>2</sub> -N	S O <sub>2</sub> -S	pH				
07	S12	119	-033	-039	7	09	0027040	0000	14371										
035	OBS	STO	0000	-0154	3140	2528	0027040	0000	14371										
		STO	0010	-0154	31403	2528			14371										
		STO	0010	-0156	3139	2527	0027084	0027	14371										
035	OBS	STO	0010	-0156	31395	2527			14371										
		STO	0020	-0134	3150	2535	0026323	0053	14385										
035	OBS	STO	0025	-0125	31561	2540			14391										
		STO	0030	-0121	3166	2547	0025136	0079	14395										
035	OBS	STO	0030	-0107	31772	2573			14409										
		STO	0050	-0106	3197	2573	0022721	0127	14410										
035	OBS	STO	0073	-0086	32277	2597			14427										
		STO	0075	-0085	3237	2604	0019757	0180	14429										
035	OBS	STO	0097	-0084	33148	2667			14444										
		STO	0100	-0086	3319	2670	0013434	0221	14445										
		STO	0125	-0099	3348	2694	0011179	0252	14447										
035	OBS	STO	0143	-0108	33611	2705			14447										
		STO	0150	-0112	3362	2706	0010361	0279	14447										
035	OBS	STO	0200	0096	33688	2732			14549										
		STO	0200		3374														
035	OBS	STO	0224		33854														

SHIP CODE	LATITUDE	LONGITUDE	DATE	WARSDEN SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAL (‰)	WAVE OBSERVATIONS			WEATHER CODE	INST. CLOUD TYPE	MOOD STATION NUMBER	
					MONTH	DAY	HR		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER				SEA
311705	WE 78275 N	07332 W	26 08	83	09	04	054	1970	KBS	008	0521	1	00	0	X	X1	4	5	0008
<small>NOTE: SPEED, DIRECTION AND DEPTH ARE DERIVED ELECTRONICALLY DISPLAYED METAL DATA (DTS) OR COMPUTED BASED ON SURVEYOR'S SPEED AND DEPTH MEASUREMENTS.</small>																			
CAST		CARD TYPE	DEPTH (m)	TEMP (°C)	SIGMA-T	SPECIFIC VOLUME ANOMALY (σ <sub>t</sub> )	SAL (‰)	COMPUTED SOUND VELOCITY (m/sec)	SAL (‰)	AMBIENT LIGHT			MEASURED SOUND VELOCITY (m/sec)						
DURATION	NO.									PO <sub>4</sub> -P	TOTAL P	NO <sub>3</sub> -N	NO <sub>2</sub> -N	S O <sub>2</sub> -S	pH				
03	S15	126	-034	-044	7	12	0026777	0000	14371										
054	OBS	STO	0000	-0155	3144	2530	0026777	0000	14371										
		STO	0010	-0158	31436	2530			14371										
		STO	0010	-0158	3144	2530	0026767	0026	14381										
054	OBS	STO	0010	-0136	31441	2530			14381										
		STO	0020	-0124	3150	2535	0026350	0053	14388										
054	OBS	STO	0026	-0124	31538	2539			14391										
		STO	0030	-0125	3158	2541	0025754	0079	14392										
		STO	0050	-0129	3177	2557	0024239	0129	14396										
054	OBS	STO	0052	-0129	31787	2558			14397										
		STO	0075	-0095	3296	2652	0015171	0178	14433										
054	OBS	STO	0078	-0094	33052	2660			14435										
		STO	0100	-0107	3334	2683	0012218	0212	14437										
054	OBS	STO	0104	-0109	33381	2697			14437										
		STO	0125	-0107	3353	2698	0010761	0241	14444										
		STO	0150	-0104	3367	2709	0009704	0267	14451										
054	OBS	STO	0155	-0103	33637	2711			14453										
		STO	0203	-0068	3381	2720	0009701	0313	14478										
054	OBS	STO	0207	-0064	33832	2721			14481										
		STO	0250	-0055	3394	2730	0007783	0354	14494										
054	OBS	STO	0254	-0054	33355	2731			14495										
		STO	0300	-0046	3401	2735	0007243	0391	14507										
054	OBS	STO	0310	-0047	3427	2736			14509										
		STO	0400	-0046	3413	2743	0005930	0458	14527										
054	OBS	STO	0411	-0046	34137	2749			14529										
		STO	0507	-0043	3422	2751	0005974	0516	14545										
054	OBS	STO	0510	-0042	34219	2752			14547										



SHIP NO.	SHIP NAME	SHIP CODE	LATITUDE	LONGITUDE	MOON PHASE	MARSDEN SQUARE	STATION TIME			ORIGINATOR'S		DEPTH TO BOTTOM	BU SMBP	WAVE OBSERVATIONS			WEATHER CODE	INSTR CLOUD TYPE	NODEC STATION NUMBER
							YEAR	MONTH	DAY	COURSE NUMBER	STATION NUMBER			DIR	HGT	PER			
311705	WE	7832 N	07424 W	260	64	09 04 151	1970	KBS	011	0329	1	00	0	X	X1	05	0011		

0001 OBSERVED PULSE TEMPERATURE FOR REMOTE ELECTRONICALLY OPERATED MEASUREMENT (RETE) BU  
000001 OBSERVED BY ELECTRONIC OPERATOR (EOP)

WIND DIRECTION	WIND SPEED	BAROMETER PRESSURE	AIR TEMPERATURE °C		VIS NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
05	12	138	-018	-028	7	05

CAST NO.	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY = 10 <sup>3</sup>	S&D DYN = 10 <sup>3</sup>	COMPUTED SOUND VELOCITY = SEC	O <sub>2</sub> = 1.1	AMBIENT LIGHT					MEASURED SOUND				
											PO <sub>2</sub> = P	TOTAL P	NO <sub>2</sub> = N	NO <sub>3</sub> = N	S-O <sub>2</sub> = S	VELOCITY = 100	PH			
151	STD	0000	0000	-0163	3157	2541	0025733	0000	14369											
	OBS	0000	0000	-0163	31570	2541			14369											
	STD	0010	0010	-0165	3156	2541	0025778	0025	14370											
151	OBS	0010	0010	-0165	31562	2541			14370											
	STD	0020	0020	-0165	3159	2543	0025550	0051	14372											
151	OBS	0025	0025	-0165	31605	2544			14373											
	STD	0030	0030	-0159	3170	2566	0023194	0075	14381											
	STD	0050	0050	-0139	3275	2636	0016680	0115	14405											
151	OBS	0050	0050	-0139	32749	2636			14405											
	STD	0075	0075	-0128	3310	2665	0013762	0154	14419											
151	OBS	0075	0075	-0128	33104	2665			14419											

SHIP NO.	SHIP NAME	SHIP CODE	LATITUDE	LONGITUDE	MOON PHASE	MARSDEN SQUARE	STATION TIME			ORIGINATOR'S		DEPTH TO BOTTOM	BU SMBP	WAVE OBSERVATIONS			WEATHER CODE	INSTR CLOUD TYPE	NODEC STATION NUMBER
							YEAR	MONTH	DAY	COURSE NUMBER	STATION NUMBER			DIR	HGT	PER			
311705	WE	7836 N	074415 W	260	64	09 04 164	1970	KBS	012	0210	1	00	0	X	X1	05	0012		

0001 OBSERVED PULSE TEMPERATURE FOR REMOTE ELECTRONICALLY OPERATED MEASUREMENT (RETE) BU  
000001 OBSERVED BY ELECTRONIC OPERATOR (EOP)

WIND DIRECTION	WIND SPEED	BAROMETER PRESSURE	AIR TEMPERATURE °C		VIS NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
05	12	138	-018	-028	7	08

CAST NO.	TIME DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY = 10 <sup>3</sup>	S&D DYN = 10 <sup>3</sup>	COMPUTED SOUND VELOCITY = SEC	O <sub>2</sub> = 1.1	AMBIENT LIGHT					MEASURED SOUND				
											PO <sub>2</sub> = P	TOTAL P	NO <sub>2</sub> = N	NO <sub>3</sub> = N	S-O <sub>2</sub> = S	VELOCITY = 100	PH			
164	STD	0000	0000	-0166	3153	2536	0026060	0000	14367											
	OBS	0000	0000	-0166	31527	2538			14367											
	STD	0010	0010	-0166	3156	2541	0025787	0025	14369											
164	OBS	0010	0010	-0166	31561	2541			14369											
	STD	0020	0020	-0159	3172	2554	0024544	0051	14377											
164	OBS	0025	0025	-0155	31912	2561			14380											
	STD	0030	0030	-0153	3193	2570	0022941	0074	14384											
	STD	0050	0050	-0145	3234	2603	0019791	0117	14397											
164	OBS	0050	0050	-0145	32341	2603			14397											
	STD	0075	0075	-0136	3270	2632	0017069	0163	14410											
164	OBS	0075	0075	-0136	32596	2632			14410											
	STD	0100	0100	-0110	3335	2674	0012154	0200	14435											
164	OBS	0100	0100	-0110	33346	2674			14435											
	STD	0125	0125	-0097	3359	2703	0010332	0228	14449											
	STD	0150	0150	-0067	3375	2716	0019098	0252	14460											
164	OBS	0150	0150	-0067	33753	2716			14460											
164	OBS	0150	0150	-0075	33953	2724			14474											

SHIP CRUISE NUMBER	SHIP CODE	LATITUDE	LONGITUDE	MAGNETIC DEVIATION	MARSDEN SQUARE		STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAL MAY/	WAVE OBSERVATIONS	WEATHER CODE	INSTB CLOUD TYPE	NODEC STATION NUMBER
					10'	1"	MONTH	DAY	HR		MIN	CRUISE NUMBER						
311705	WE	7823 N	07306 W		260	83	04	04	202	1970	KBS	013	0274	1	00 0 X	X1	3 5	0013

NOTE: WATER COLUMN TEMPERATURE READINGS ELECTRONICALLY DERIVED FROM DATA OBTAINED FROM  
 (1) DATA BASED BY AUTOMATIC SYSTEMS THAT APPLY

WIND DIRECTION	WIND SPEED (KTS)	BAROMETER (INH)	AIR TEMPERATURE °C		VIS NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
04	50	136	-017	-025	7	10

CAST DURATION NUMBER	CARD TYPE	DEPTH (M)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY δ 10 <sup>3</sup>	S&D DTN IN δ 10 <sup>3</sup>	COMPUTED SOUND VELOCITY = SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT lum/cm <sup>2</sup>				MEASURED SOUND VELOCITY = MPH				
										PO <sub>2</sub> - P μg/l	EQAL - P μg/l	NO <sub>2</sub> - N μg/l	NO <sub>3</sub> - N μg/l	S <sub>0</sub> - S μg/l	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	
202	STD	0000	-0143	3139	2526	0027185	0000	14376										
	UBS	0000	-0143	31386	2526			14376										
	STD	0010	-0143	3138	2526	0027184	0027	14378										
202	UBS	0010	-0143	31385	2526			14378										
	STD	0020	-0139	3140	2527	0027084	0054	14381										
202	UBS	0025	-0135	31470	2533			14385										
	STD	0030	-012	3171	2552	0024719	0030	14395										
	STD	0050	-0069	3248	2643	0013859	0123	14425										
202	UBS	0050	-0085	32483	2613			14425										
	STD	0075	-0092	3303	2656	0014540	0165	14435										
202	UBS	0075	-0042	33030	2658			14435										
	STD	0100	-0090	3338	2665	0011393	0199	14445										
202	UBS	0100	-0090	33375	2695			14445										
	STD	0125	-0101	3344	2691	0011467	0228	14445										
	STD	0150	-0105	3350	2676	0010983	0255	14448										
202	UBS	0150	-0105	33499	2676			14448										
	STD	0200	-0099	3361	2704	0010165	0309	14466										
202	UBS	0200	-0099	33609	2704			14466										
	STD	0250	-0075	3350	2719	0009751	0356	14483										
202	UBS	0250	-0075	33503	2719			14483										
202	UBS	0250	-0069	33820	2721			14491										

SHIP CRUISE NUMBER	SHIP CODE	LATITUDE	LONGITUDE	MAGNETIC DEVIATION	MARSDEN SQUARE		STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAL MAY/	WAVE OBSERVATIONS	WEATHER CODE	INSTB CLOUD TYPE	NODEC STATION NUMBER
					10'	1"	MONTH	DAY	HR		MIN	CRUISE NUMBER						
311705	WE	7828 N	07329 W		260	83	09	04	215	1970	KBS	014	0503	1	00 0 X	X1	3 6	0014

NOTE: WATER COLUMN TEMPERATURE READINGS ELECTRONICALLY DERIVED FROM DATA OBTAINED FROM  
 (1) DATA BASED BY AUTOMATIC SYSTEMS THAT APPLY

WIND DIRECTION	WIND SPEED (KTS)	BAROMETER (INH)	AIR TEMPERATURE °C		VIS NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
04	50	136	-014	-025	7	11

CAST DURATION NUMBER	CARD TYPE	DEPTH (M)	T °C	S	SIGMA-T	SPECIFIC VOLUME ANOMALY δ 10 <sup>3</sup>	S&D DTN IN δ 10 <sup>3</sup>	COMPUTED SOUND VELOCITY = SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT lum/cm <sup>2</sup>				MEASURED SOUND VELOCITY = MPH				
										PO <sub>2</sub> - P μg/l	EQAL - P μg/l	NO <sub>2</sub> - N μg/l	NO <sub>3</sub> - N μg/l	S <sub>0</sub> - S μg/l	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	
215	STD	0000	-0137	3147	2533	0026577	0000	14380										
	UBS	0000	-0137	31467	2533			14380										
	STD	0010	-0137	3146	2532	0026586	0026	14381										
215	UBS	0010	-0137	31465	2532			14381										
	STD	0020	-0131	3157	2540	0025806	0052	14367										
215	UBS	0024	-0129	31621	2545			14390										
	STD	0030	-0125	3142	2551	0023849	0077	14396										
	STD	0050	-0112	3241	2608	0019393	0120	14413										
215	UBS	0073		3292														
	STD	0075	-0102	3295	2652	0015187	0164	14430										
215	UBS	0097	-0098	33276	2678			14440										
	STD	0100	-0094	3330	2680	0012537	0198	14440										
	STD	0125	-0102	3348	2695	0011115	0226	14445										
215	UBS	0146	-0105	33608	2705			14449										
	STD	0150	-0102	3362	2706	0010020	0254	14451										
215	UBS	0194	-0076	33787	2718			14473										
	STD	0200	-0073	3381	2720	0008724	0301	14476										
215	UBS	0241	-0061	33709	2727			14490										
	STD	0250	-0067	3391	2728	0007459	0343	14491										
215	UBS	0289	-0057	33944	2731			14500										
	STD	0300	-0055	3399	2734	0007361	0381	14503										
215	UBS	0316	-0045	34178	2749			14525										
	STD	0400	-0045	3418	2749	0005964	0448	14527										
215	UBS	0433	-0045	34184	2749			14533										



SHIP CODE	LATITUDE	LONGITUDE	DATE MONTH DAY HR	TIME MIN	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAMP NO	WAVE OBSERVATIONS	WEATHER CODE	INSTR CLOUD TYPE	MODE STATION NUMBER	
						CRUISE NUMBER	STATION NUMBER							
311705	WE 7832 N	07423 W	26 04 05	016	1970	KBS	017	0347	1	00	0	X	X1 4 5	0017

\* THIS FORM IS TO BE FILLED IN ELECTRONICALLY BY THE OBSERVER WITH DATA FROM THE  
 \* OBSERVER'S LOGS BY THE OBSERVER WITH DATA FROM THE

WIND DIRECTION (DEG)	WIND SPEED (KTS)	BAROMETER (INCH)	AIR TEMPERATURE (°C)		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
02	S12	145	-028	-034	7	10	

CAST NO	TIME OF DAY	CARD TYPE	DEPTH (M)	TEMP (°C)	SIGMA-T	SPECIFIC VOLUME ANOMALY (x 10 <sup>3</sup> )	SAD OTM (x 10 <sup>3</sup> )	COMPUTED SOUND VELOCITY (M/SEC)	D <sub>2</sub> (M)	AMBIENT LIGHT					MEASURED SOUND VELOCITY (M/SEC)		
										PO <sub>4</sub> -P (µg/l)	TOTAL-P (µg/l)	NO <sub>3</sub> -N (µg/l)	NO <sub>2</sub> -N (µg/l)	S. O <sub>2</sub> (µg/l)	PH	DEPTH (M)	TEMP (°C)
016	0000	STO	0000	-0156	3134	2523	0027493	0000	14369								
	0000	OBS	0000	-0156	3134.3	2523			14369								
	0010	STU	0010	-0156	3135	2523	0027447	0027	14371								
016	0010	OBS	0010	-0156	3134.8	2523			14371								
	0020	STU	0020	-0155	3144	2531	0026720	0054	14374								
016	0025	OBS	0025	-0155	3151.4	2537			14376								
	0030	STU	0030	-0151	3163	2546	0025275	0080	14380								
	0050	STU	0050	-0137	3214	2587	0021365	0127	14397								
016	0055	OBS	0055	-0139	3213.6	2597			14397								
	0075	STU	0075	-0131	3288	2647	0015660	0173	14415								
016	0075	OBS	0075	-0131	3288.2	2647			14415								
	0100	STU	0100	-0117	3323	2675	0015010	0209	14431								
016	0100	OBS	0100	-0117	3323.1	2675			14431								
	0125	STU	0125	-0101	3355	2700	0010601	0238	14447								
	0150	STU	0150	-0086	3376	2716	0008881	0263	14460								
016	0150	OBS	0150	-0086	3378.1	2718			14460								
016	0150	OBS	0150	-0070	3395.9	2733			14479								
	0200	STU	0200	-0070	3397	2733	0007502	0304	14479								
	0250	STU	0250	-0062	3401	2736	0007183	0340	14491								
016	0250	OBS	0250	-0058	3409.9	2743			14503								
	0300	STU	0300	-0058	3410	2743	0006516	0375	14503								
016	0300	OBS	0300	-0056	3414.7	2747			14508								

SHIP CODE	LATITUDE	LONGITUDE	DATE MONTH DAY HR	TIME MIN	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SAMP NO	WAVE OBSERVATIONS	WEATHER CODE	INSTR CLOUD TYPE	MODE STATION NUMBER	
						CRUISE NUMBER	STATION NUMBER							
311705	WE 78332N	07435 W	26 04 05	027	1970	KBS	018	0296	1	00	0	X	X1 3 6	0018

\* THIS FORM IS TO BE FILLED IN ELECTRONICALLY BY THE OBSERVER WITH DATA FROM THE  
 \* OBSERVER'S LOGS BY THE OBSERVER WITH DATA FROM THE

WIND DIRECTION (DEG)	WIND SPEED (KTS)	BAROMETER (INCH)	AIR TEMPERATURE (°C)		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
07	S10	161	-017	-022	7	05	

CAST NO	TIME OF DAY	CARD TYPE	DEPTH (M)	TEMP (°C)	SIGMA-T	SPECIFIC VOLUME ANOMALY (x 10 <sup>3</sup> )	SAD OTM (x 10 <sup>3</sup> )	COMPUTED SOUND VELOCITY (M/SEC)	D <sub>2</sub> (M)	AMBIENT LIGHT					MEASURED SOUND VELOCITY (M/SEC)		
										PO <sub>4</sub> -P (µg/l)	TOTAL-P (µg/l)	NO <sub>3</sub> -N (µg/l)	NO <sub>2</sub> -N (µg/l)	S. O <sub>2</sub> (µg/l)	PH	DEPTH (M)	TEMP (°C)
027	0000	STO	0000	-0168	3137	2525	0027257	0000	14364								
	0000	OBS	0000	-0168	3137.1	2525			14364								
	0010	STU	0010	-0165	3141	2529	0026921	0027	14367								
027	0010	OBS	0010	-0165	3141.4	2529			14367								
	0020	STU	0020	-0151	3182	2561	0023838	0052	14382								
027	0025	OBS	0025	-0146	3177.9	2574			14387								
	0030	STU	0030	-0146	3207	2581	0021927	0075	14389								
	0050	STU	0050	-0147	3241	2607	0019266	0116	14397								
027	0050	OBS	0050	-0147	3240.9	2607			14397								
	0075	STU	0075	-0132	3284	2643	0015003	0160	14414								
027	0075	OBS	0075	-0132	3283.7	2643			14414								
	0100	STU	0100	-0123	3315	2668	0013604	0197	14427								
027	0100	OBS	0100	-0123	3315.1	2668			14427								
	0125	STU	0125	-0104	3341	2689	0011671	0229	14441								
	0150	STU	0150	-0086	3362	2705	0010086	0256	14454								
027	0150	OBS	0150	-0086	3362.0	2705			14454								
	0200	STU	0200	-0072	3372	2724	0007888	0301	14478								
027	0200	OBS	0200	-0072	3371.7	2724			14478								
	0250	STU	0250	-0070	3395	2751	0007655	0340	14487								
027	0250	OBS	0250	-0070	3396.1	2732			14492								

SHIP CODE	LATITUDE 1 10	LONGITUDE 1 10	SHIP SECTION	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	RAZ SAMPLE	WAVE OBSERVATIONS	WEATHER CODE	INST'R CLOUD TYPE AMT	MOOD STATION NUMBER	
				10"	1"	MONTH	DAY	HR		MIN	CRUISE NUMBER							STATION NUMBER
311705	WE	7855 N	07310 W	260	83	09	05	070	1970	KBS	019	0320	1	00	0 X	X1	0 4	0019

\* NOTE: THESE VALUES ARE FOR STANDARD ELECTRONICALLY OBTAINED METEOROLOGICAL DATA (MET) AND  
 WINDS ARE BASED ON AIRPANELS WHICH ARE NOT APPLICABLE

WIND DIRECTION	WIND SPEED (KTS)	BAROMETER (INCH)	AIR TEMPERATURE °C		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
04	512	171	-045	-052	7	10	

CAST NO.	CARD TYPE	DEPTH (m)	TEMP °C	SIGMA-t	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	S&D OTN x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY m/sec	AMBIENT LIGHT				MEASURED SOUND VELOCITY				
								PO <sub>2</sub> - P ug/dl	TOTAL P ug/dl	NO <sub>2</sub> - N ug/dl	NO <sub>3</sub> - N ug/dl	S <sub>2</sub> - S <sub>1</sub> ug/dl	S <sub>2</sub> - S <sub>1</sub> ug/dl	pH		
070	STD	0000	-0157	3126	2517	0028092	0000	14368								
	OBS	0000	-0157	31265	2517			14368								
	STD	0010	-0157	3128	2517	0028000	0028	14369								
	OBS	0010	-0157	31276	2517			14369								
	STD	0020	-0137	3139	2526	0027166	0055	14382								
070	OBS	0025	-0131	31480	2533			14387								
	STD	0030	-0133	3165	2549	0025117	0081	14389								
	STD	0050	-0137	3230	2600	0020118	0127	14400								
070	OBS	0050	-0137	32301	2600			14400								
	STD	0075	-0137	3300	2656	0014755	0170	14414								
070	OBS	0075	-0137	32978	2656			14414								
	STD	0100	-0136	3317	2671	0013383	0205	14421								
070	OBS	0100	-0136	33175	2671			14421								
	STD	0125	-0112	3345	2692	0011346	0236	14440								
	STD	0150	-0094	3365	2708	0009861	0263	14455								
070	OBS	0150	-0094	33650	2708			14455								
	STD	0200	-0074	3383	2722	0008505	0309	14474								
070	OBS	0201	-0075	33837	2722			14474								
	STD	0250	-0052	3411	2743	0005517	0346	14478								
070	OBS	T0251	-0052	34113	2744			14478								
	STD	0300	-0031	3440	2765	0004394	0373	14520								
070	OBS	T0302	-0030	34411	2767			14521								

SHIP CODE	LATITUDE 1 10	LONGITUDE 1 10	SHIP SECTION	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	RAZ SAMPLE	WAVE OBSERVATIONS	WEATHER CODE	INST'R CLOUD TYPE AMT	MOOD STATION NUMBER	
				10"	1"	MONTH	DAY	HR		MIN	CRUISE NUMBER							STATION NUMBER
311705	WE	79192N	072238W	260	92	09	05	134	1970	KBS	020	0228	1	00	0 X	X1	0 3	0020

\* NOTE: THESE VALUES ARE FOR STANDARD ELECTRONICALLY OBTAINED METEOROLOGICAL DATA (MET) AND  
 WINDS ARE BASED ON AIRPANELS WHICH ARE NOT APPLICABLE

WIND DIRECTION	WIND SPEED (KTS)	BAROMETER (INCH)	AIR TEMPERATURE °C		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
02	510	176	-023	-034	7	08	

CAST NO.	CARD TYPE	DEPTH (m)	TEMP °C	SIGMA-t	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	S&D OTN x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY m/sec	AMBIENT LIGHT				MEASURED SOUND VELOCITY					
								PO <sub>2</sub> - P ug/dl	TOTAL P ug/dl	NO <sub>2</sub> - N ug/dl	NO <sub>3</sub> - N ug/dl	S <sub>2</sub> - S <sub>1</sub> ug/dl	S <sub>2</sub> - S <sub>1</sub> ug/dl	pH			
138	STD	0000	-0150	3122	2513	0028419	0000	14370									
	OBS	0000	-0150	31224	2513			14370									
	STD	0010	-0143	3140	2527	0027084	0027	14378									
138	OBS	0010	-0143	31398	2527			14378									
	STD	0020	-0140	3202	2576	0022271	0052	14390									
138	OBS	0025	-0138	32272	2598			14395									
	STD	0030	-0137	3241	2609	0019302	0073	14398									
	STD	0050	-0132	3285	2645	0015822	0108	14410									
138	OBS	0050	-0132	32863	2645			14410									
	STD	0075	-0127	3321	2673	0013140	0144	14421									
138	OBS	0075	-0127	33212	2673			14421									
	STD	0100	-0098	3365	2708	0009939	0173	14445									
138	OBS	0100	-0098	33654	2708			14445									
	STD	0125	-0073	3390	2720	0006768	0196	14459									
	STD	0150	-0063	3400	2735	0007325	0216	14475									
138	OBS	T0150	-0063	33999	2735			14475									
	STD	0200	-0008	3456	2778	0003300	0243	14516									
138	OBS	T0200	-0008	34560	2778			14516									

FORM NO. 107 10-67	SHIP CODE	LATITUDE	LONGITUDE	MARSDEN SQUARE	STATION (GMT)	TIME	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	BAU NO.	WAVE OBSERVATIONS			WEATHER CODE	INST. CLOUD TYPE AMT	MODE STATION NUMBER
								CRUISE NUMBER	STATION NUMBER			DIR	PER	SEA			
311705	WE	79402N	071175W	260	91	09 05 175	1970	K85	021	0238	1	00	0	X	X1	0 1	0021

U.S. GOVERNMENT PRINTING OFFICE: 1969 O 344-100  
GPO: 1969 O 344-100

WIND DIR	WIND SPEED OR FORCE	BAROMETER (mb)	AIR TEMPERATURE °C		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
07	508	180	-033	-039	7	09	

CAST NO.	CARD TYPE	DEPTH (m)	TEMP °C	SIGMA-t	SPECIFIC VOLUME ANOMALY - δt	S&D DYN. M x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	AMBIENT LIGHT				MEASURED SOUND VELOCITY - M/S		
								PO <sub>2</sub> - P	TOTAL - P	NO <sub>2</sub> - N	NO <sub>3</sub> - N	S. O <sub>2</sub> - S	pH	
175	STD	0003	-0140	3118	2539	0028791	0000	14374						
	OBS	0000	-0140	31178	2509			14374						
	STD	0010	-0148	3122	2512	0028472	0028	14373						
175	OBS	0010	-0148	31216	2512			14373						
	STD	0020	-0146	3187	2505	0023458	0054	14384						
175	OBS	0025	-0145	32129	2586			14389						
	STD	0030	-0144	3227	2598	0020342	0076	14393						
	STD	0050	-0138	3280	2641	0016273	0113	14406						
175	OBS	0050	-0138	32802	2641			14406						
	STD	0075	-0122	3337	2636	0011949	0148	14426						
175	OBS	0075	-0122	33370	2636			14426						
	STD	0100	-0101	3365	2708	0009820	0175	14444						
	OBS	0100	-0101	33655	2708			14444						
	STD	0125	-0077	3396	2732	0007580	0197	14464						
	STD	0150	-0054	3421	2751	0005770	0214	14482						
175	OBS	0150	-0054	34207	2751			14482						
	STD	0200	-0013	3454	2776	0003459	0237	14514						
175	OBS	0200	-0013	34536	2776			14514						
175	OBS	0220	-0016	34534	2776			14516						

FORM NO. 107 10-67	SHIP CODE	LATITUDE	LONGITUDE	MARSDEN SQUARE	STATION (GMT)	TIME	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	BAU NO.	WAVE OBSERVATIONS			WEATHER CODE	INST. CLOUD TYPE AMT	MODE STATION NUMBER
								CRUISE NUMBER	STATION NUMBER			DIR	PER	SEA			
311705	WE	8011 N	06942 W	907	99	09 05 215	1970	K85	022	0293	1	00	0	X	X1	0 3	0022

U.S. GOVERNMENT PRINTING OFFICE: 1969 O 344-100  
GPO: 1969 O 344-100

WIND DIR	WIND SPEED OR FORCE	BAROMETER (mb)	AIR TEMPERATURE °C		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
09	510	176	-043	-050	7	10	

CAST NO.	CARD TYPE	DEPTH (m)	TEMP °C	SIGMA-t	SPECIFIC VOLUME ANOMALY - δt	S&D DYN. M x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	AMBIENT LIGHT				MEASURED SOUND VELOCITY - M/S		
								PO <sub>2</sub> - P	TOTAL - P	NO <sub>2</sub> - N	NO <sub>3</sub> - N	S. O <sub>2</sub> - S	pH	
215	STD	0000	-0148	3180	2560	0023903	0000	14379						
	OBS	0000	-0148	31801	2560			14379						
	STD	0010	-0152	3173	2559	0024019	0024	14379						
215	OBS	0010	-0152	31794	2559			14379						
	STD	0020	-0149	3222	2534	0020721	0046	14388						
	OBS	0025	-0147	32433	2609			14392						
	STD	0030	-0147	3222	2618	0013414	0065	14395						
	STD	0050	-0149	3276	2653	0015052	0099	14408						
215	OBS	0050	-0140	32403	2653			14408						
	STD	0075	-0129	3342	2670	0011543	0132	14428						
	OBS	0075	-0129	33423	2670			14428						
	STD	0100	-0093	3392	2721	0008622	0157	14450						
	OBS	0100	-0093	33616	2721			14450						
	STD	0125	-0075	3405	2739	0006304	0177	14465						
	STD	0150	-0043	3423	2753	0005577	0192	14478						
215	OBS	0150	-0043	34229	2753			14478						
	STD	0200	-0025	3444	2769	0004094	0217	14502						
	OBS	0200	-0025	34438	2769			14502						
	STD	0250	-0012	3457	2778	0003221	0235	14523						
215	OBS	0250	-0012	34568	2778			14523						
215	OBS	0250	-0013	34576	2777			14528						



SHIP CODE	LATITUDE	LONGITUDE	DATE	TIME	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	S&D	WAVE OBSERVATIONS			WEATHER CODE	INSTR	MODE STATION NUMBER	
						CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER				SEA
311705	WE	8011 N	06910 W	907 09	09 05 230	1970	KBS	023	0311	1	00	0	X	X1	6 2	0023

NOTE: OTHER PLUGS TO BE USED ELECTRICALLY DEVELOPED SERIAL DATA (DT) ARE INDICATED BY APOSTROPHES WHEN THEY APPLY

WIND	WIND DIR	WIND SPEED OR FORCE	BAROMETER (mb)	AIR TEMPERATURE (°C)		VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
				DRY BULB	WET BULB			
16	518	173	-050	-054	7	10		

CAST NO.	TIME	DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	S&D DYN # x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	AMBIENT LIGHT					MEASURED SOUND VELOCITY - sec	
											PO <sub>2</sub> - P	TOTAL P	NO <sub>2</sub> N	NO <sub>3</sub> N	S	O <sub>2</sub> - S	pH
230	085	0000	STO	0000	-0159	3185	2564	0023593	0000	14375							
			OBS	0000	-0159	3184.9	2564			14375							
			STO	0010	-0158	3185	2564	0023557	0023	14377							
230	085	0010	STO	0020	-0158	3185.3	2564			14377							
			STO	0020	-0147	3212	2585	0021545	0046	14388							
230	085	0025	STO	0030	-0143	3223.6	2595			14392							
			STO	0030	-0142	3231	2601	0020016	0066	14394							
			STO	0050	-0134	3273	2635	0015816	0103	14405							
230	085	0050	STO	0075	-0139	32731	2635			14405							
			STO	0075	-0110	3348	2695	0011143	0138	14433							
230	085	0075	STO	0100	-0110	3347.9	2695			14433							
			STO	0100	-0095	3385	2724	0008315	0163	14450							
230	085	0100	STO	0125	-0095	33855	2724			14450							
			STO	0125	-0072	3411	2744	0006440	0181	14468							
			STO	0150	-0053	3430	2759	0005050	0195	14484							
230	085	10150	STO	0200	-0053	3430.2	2759			14484							
			STO	0200	-0025	3450	2713	0003675	0217	14508							
230	085	10200	STO	0250	-0025	3449.7	2773			14508							
			STO	0250	-0012	3457	2774	0003185	0234	14523							
230	085	10250	STO	0300	-0012	3457.2	2775			14523							
			STO	0300	-0010	3459	2780	0003038	0250	14532							
230	085	10300	STO	0300	-0010	3459.2	2780			14532							

SHIP CODE	LATITUDE	LONGITUDE	DATE	TIME	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	S&D	WAVE OBSERVATIONS			WEATHER CODE	INSTR	MODE STATION NUMBER	
						CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER				SEA
311705	WE	8011 N	06842 W	907 08	04 06 003	1970	KBS	024	0347	1	00	0	X	X1	6 2	0024

NOTE: OTHER PLUGS TO BE USED ELECTRICALLY DEVELOPED SERIAL DATA (DT) ARE INDICATED BY APOSTROPHES WHEN THEY APPLY

WIND	WIND DIR	WIND SPEED OR FORCE	BAROMETER (mb)	AIR TEMPERATURE (°C)		VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
				DRY BULB	WET BULB			
16	518	173	-050	-054	7	11		

CAST NO.	TIME	DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY x 10 <sup>3</sup>	S&D DYN # x 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	AMBIENT LIGHT					MEASURED SOUND VELOCITY - sec	
											PO <sub>2</sub> - P	TOTAL P	NO <sub>2</sub> N	NO <sub>3</sub> N	S	O <sub>2</sub> - S	pH
053	085	0000	STO	0000	-0160	3184	2563	0023648	0000	14374							
			OBS	0000	-0160	3184.2	2563			14374							
			STO	0010	-0159	3184	2563	0023666	0023	14376							
003	085	0010	STO	0020	-0153	3183.8	2563			14376							
			STO	0020	-0147	3213	2586	0021464	0046	14388							
003	085	0025	STO	0030	-0142	3227.2	2598			14393							
			STO	0030	-0134	3242	2610	0019173	0056	14397							
			STO	0050	-0122	3301	2657	0014772	0100	14417							
103	085	0050	STO	0075	-0122	3301.2	2657			14417							
			STO	0075	-0095	3371	2713	0004409	0130	14443							
003	085	0075	STO	0100	-0095	3371.3	2713			14443							
			STO	0100	-0073	3359	2734	0007373	0151	14459							
003	085	0100	STO	0125	-0073	3393.6	2734			14459							
			STO	0125	-0050	3417	2750	0005656	0168	14475							
			STO	0150	-0045	3435	2752	0004721	0181	14488							
003	085	0150	STO	0200	-0045	3435.1	2752			14488							
			STO	0200	-0020	3452	2775	0005572	0202	14510							
003	085	10200	STO	0250	-0020	3451.7	2775			14510							
			STO	0250	-0011	3455	2774	0005150	0218	14523							
003	085	10250	STO	0300	-0011	3457.5	2774			14523							
			STO	0300	-0003	3454	2754	0002734	0233	14536							
003	085	0300	STO	0300	-0003	3467.7	2784			14536							
			STO	0325	0000	3464.3	2764			14542							

SHIP CODE	LATITUDE	LONGITUDE	DATE RELATION	MARSDEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	BALL SAMPL EFF	WAVE OBSERVATIONS			WEATHER CODE	INSTR		NODC STATION NUMBER	
				10'	1"	MONTH	DAY		HR	10'			CRUISE NUMBER	STATION NUMBER	DIR		PER	SEA		TYPE
311705	WE	8011 N	06759 W	907	07	09	06	017	1970	K85	025	0128	1	00	0	X	X1	6	4	0025

NOTE: OVER FIVE TEMPERATURE READINGS ELECTRONICALLY DERIVED SERIAL DATA (SD) OR  
SERIALS DERIVED BY ASSISTANT OPERATOR APPROX

WIND DIRECTION	WIND SPEED (KTS)	BAROMETER (IN)	AIR TEMPERATURE °C		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
20	511	191	-038	-045	7	06	

CASE NO.	TIME DURATION OR REVERSE TIME	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY δ 10 <sup>3</sup>	S & D DTW = S 10 <sup>3</sup>	COMPUTED SOUND VELOCITY = SEC	AMBIENT LIGHT (μm/cm <sup>2</sup> )				MEASURED SOUND VELOCITY = 100				
										PO <sub>2</sub> - P μg of l	TOTAL P μg of l	NO <sub>2</sub> - N μg of l	NO <sub>3</sub> - N μg of l	O <sub>2</sub> S μg of l	S	pH		
017	STU	0000	-0158	3175	2556	0024337	0000	14374										
	OBS	0000	-0158	3175.3	2556			14374										
017	STU	0010	-0155	3176	2556	0024309	0024	14377										
	OBS	0010	-0155	3175.6	2556			14377										
017	STU	0020	-0144	3205	2580	0022089	0047	14388										
	OBS	0025	-0140	32180	2590			14393										
017	STU	0030	-0138	3229	2599	0020195	0068	14396										
	STU	0050	-0125	3274	2636	0016754	0105	14412										
017	STU	0050	-0125	3274.4	2636			14412										
	STU	0075	-0095	3331	2680	0012506	0142	14437										
017	STU	0075	-0096	3330.8	2680			14437										
	STU	0100	-0074	3354	2699	0010751	0171	14446										
017	OBS	0100	-0054	3353.6	2699			14446										

SHIP CODE	LATITUDE	LONGITUDE	DATE RELATION	MARSDEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	BALL SAMPL EFF	WAVE OBSERVATIONS			WEATHER CODE	INSTR		NODC STATION NUMBER	
				10'	1"	MONTH	DAY		HR	10'			CRUISE NUMBER	STATION NUMBER	DIR		PER	SEA		TYPE
311705	WE	8030 N	06815 W	907	08	09	06	039	1970	K85	026	0384	1	00	0	X	X1	6	4	0026

NOTE: OVER FIVE TEMPERATURE READINGS ELECTRONICALLY DERIVED SERIAL DATA (SD) OR  
SERIALS DERIVED BY ASSISTANT OPERATOR APPROX

WIND DIRECTION	WIND SPEED (KTS)	BAROMETER (IN)	AIR TEMPERATURE °C		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
20	520	151	-038	-045	7	10	

CASE NO.	TIME DURATION OR REVERSE TIME	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY δ 10 <sup>3</sup>	S & D DTW = S 10 <sup>3</sup>	COMPUTED SOUND VELOCITY = SEC	AMBIENT LIGHT (μm/cm <sup>2</sup> )				MEASURED SOUND VELOCITY = 100				
										PO <sub>2</sub> - P μg of l	TOTAL P μg of l	NO <sub>2</sub> - N μg of l	NO <sub>3</sub> - N μg of l	O <sub>2</sub> S μg of l	S	pH		
039	STU	0000	-0162	3169	2567	0023285	0000	14374										
	OBS	0000	-0162	3189.8	2567			14374										
039	STU	0010	-0157	3191	2569	0023076	0023	14378										
	OBS	0010	-0157	3191.5	2569			14378										
039	STU	0020	-0145	3205	2580	0022071	0045	14388										
	OBS	0025	-0140	3212.8	2585			14392										
039	STU	0030	-0137	3225	2597	0020429	0067	14396										
	STU	0050	-0127	3266	2629	0017360	0104	14410										
039	STU	0050	-0127	3266.4	2629			14410										
	STU	0075	-0114	3264	2643	0016005	0140	14418										
039	OBS	0075	-0124	3284.7	2643			14418										
	STU	0100	-0093	3363	2706	0010075	0179	14447										
039	OBS	0100	-0093	3362.6	2706			14447										
	STU	0125	-0076	3430	2735	0007723	0200	14465										
039	STU	0150	-0046	3420	2755	0005386	0216	14486										
	OBS	0150	-0046	3426.3	2755			14486										
039	STU	0200	-0025	3447	2771	0003420	0240	14507										
	OBS	0200	-0025	3447.0	2771			14507										
039	STU	0230	-0017	3454	2776	0003415	0258	14523										
	STU	0250	-0004	3460	2781	0003021	0274	14533										
039	OBS	0107	-0005	3455.5	2781			14534										
	OBS	0143	0000	3463.5	2783			14545										

SHIP NAME	SHIP CODE	LATITUDE	LONGITUDE	MOON PHASE	MARSden SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	BAR. SAMP. REF.	WAVE OBSERVATIONS				WEATHER CODE	INSIB		NODC STATION NUMBER
						CRUISE NUMBER	STATION NUMBER	MONTH		DAY	HR			MIN	CRUISE NUMBER	STATION NUMBER	DIR		HGT	PER	

311705	WE	8100 N	06600 W	907	16	09	06	090	1970	KBS	027	3365	1	00	0	X	X1	6	2	0027
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NOTE: WHEN USING TEMPLATE FOR READING ELECTRICALLY OBTAINED SERIAL DATA (SD) USE HEADINGS DANGER BY EXTENSIVE WHEN THEY APPLY

WIND	SPEED OR FORCE	BAROMETER (mm)	AIR TEMPERATURE °C		VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
22	S18	186	-031	-038	7	11	

CAST NO.	DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY - t 10 <sup>3</sup>	S.D. DYN. W. t 10 <sup>3</sup>	COMPUTED SOUND VELOCITY m. SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT				MEASURED SOUND VELOCITY	
											PO <sub>2</sub> - P	TOTAL - P	NO <sub>2</sub> - N	NO <sub>3</sub> - N	S. O <sub>2</sub> - S	VELOCITY - m. sec
090		STD	0000	-0168	3154	2539	0025951	0000	14366							
		OBS	0000	-0168	3154	2539			14366							
		STD	0010	-0167	3154	2539	0025941	0025	14368							
		OBS	0010	-0167	3154	2539			14368							
		STD	0020	-0163	3175	2556	0024363	0051	14375							
		OBS	0025	-0161	31833	2563			14378							
		STD	0030	-0160	3188	2566	0023348	0075	14380							
		OBS	0050	-0157	3220	2542	0020839	0119	14389							
		STD	0050	-0147	3220	2542			14389							
		OBS	0075	-0122	3299	2655	0014865	0163	14421							
		STD	0075	-0122	3299	2655			14421							
		OBS	0100	-0102	3358	2703	0010377	0195	14443							
		STD	0100	-0102	3358	2703			14443							
		OBS	0125	-0081	3356	2732	0007561	0217	14462							
		STD	0125	-0081	3356	2732			14462							
		OBS	0149	-0065	34212	2752	0005658	0234	14477							
		STD	0150	-0065	3422	2752			14477							
		OBS	0193	-0042	34399	2766	0004307	0259	14498							
		STD	0200	-0041	3441	2767			14498							
		OBS	0247	-0017	34540	2776	0003353	0278	14521							
		STD	0250	-0016	3455	2777			14521							
		OBS	0295	-0002	34629	2783	0002767	0293	14537							
		STD	0300	-0001	3463	2783			14537							
		OBS	0344	-0001	34650	2784			14545							

SHIP NAME	SHIP CODE	LATITUDE	LONGITUDE	MOON PHASE	MARSden SQUARE	STATION TIME			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	BAR. SAMP. REF.	WAVE OBSERVATIONS				WEATHER CODE	INSIB		NODC STATION NUMBER
						CRUISE NUMBER	STATION NUMBER	MONTH		DAY	HR			MIN	CRUISE NUMBER	STATION NUMBER	DIR		HGT	PER	

311705	WE	81205N	06358 W	907	13	09	06	171	1970	KBS	028	0622	1	00	0	X	X1	0	3	0028
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NOTE: WHEN USING TEMPLATE FOR READING ELECTRICALLY OBTAINED SERIAL DATA (SD) USE HEADINGS DANGER BY EXTENSIVE WHEN THEY APPLY

WIND	SPEED OR FORCE	BAROMETER (mm)	AIR TEMPERATURE °C		VIS	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB			
25	S14	179	-022	-033	7	13	

CAST NO.	DURATION	CARD TYPE	DEPTH (m)	T °C	S	SIGMA-t	SPECIFIC VOLUME ANOMALY - t 10 <sup>3</sup>	S.D. DYN. W. t 10 <sup>3</sup>	COMPUTED SOUND VELOCITY m. SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT				MEASURED SOUND VELOCITY	
											PO <sub>2</sub> - P	TOTAL - P	NO <sub>2</sub> - N	NO <sub>3</sub> - N	S. O <sub>2</sub> - S	VELOCITY - m. sec
171		STD	0000	-0161	3161	2544	0025443	0000	14370							
		OBS	0000	-0161	31608	2544			14370							
		STD	0010	-0167	3163	2546	0025243	0025	14370							
		OBS	0010	-0167	31632	2546			14370							
		STD	0020	-0164	3167	2549	0024943	0050	14373							
		OBS	0025	-0162	31713	2553			14376							
		STD	0030	-0161	3177	2557	0023991	0074	14378							
		OBS	0050	-0154	3218	2570	0021020	0119	14390							
		STD	0050	-0154	32178	2570			14390							
		OBS	0075	-0143	3240	2641	0016218	0166	14408							
		STD	0100	-0117	3345	2693	0011304	0200	14434							
		OBS	0100	-0117	33454	2693			14434							
		STD	0125	-0095	3382	2721	0008601	0225	14453							
		OBS	0150	-0077	3404	2743	0006589	0244	14470							
		STD	0150	-0077	34087	2743			14470							
		OBS	0200	-0056	3436	2764	0004586	0272	14491							
		STD	0250	-0033	3451	2775	0003520	0293	14512							
		OBS	0250	-0033	34513	2775			14512							
		STD	0300	0000	34653	2785			14538							
		OBS	0300	0000	3465	2785	0002625	0308	14538							
		STD	0347	0011	34725	2797			14560							
		OBS	0495	0016	34700	2794	0002148	0332	14561							
		STD	0500	0016	3473	2797			14561							
		OBS	0592	0018	34745	2791	0002099	0353	14583							
		STD	0592	0018	34745	2791			14583							



SHIP NAME	CRUISE NUMBER	SHIP CODE	LATITUDE ° 10'	LONGITUDE ° 10'	DATE MONTH DAY	TIME HR MIN	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	RAJ M/PS	WAVE OBSERVATIONS	WEATHER CODE	'INST' CLOUD TYPE AMT	NODC STATION NUMBER	
								CRUISE NUMBER	STATION NUMBER							
311705	WE	8146 N	06403 W	907	14 09 08	171	1970	K85	031	0457	1	00	0 X	X1	0 2	0031

WIND SPEED VALUE REPORTED FOR STANDARD ELECTRICALLY OPERATED METAL CUP ANEMOMETER (S) OR  
MANUALLY OPERATED BY OBSERVER WHO THEY APPLY

WIND DIRECTION (true)	WIND SPEED (kt)	BAROMETER (mb)	AIR TEMPERATURE °C		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB CODE			
24	508	157	-025	-032	7	11	

CAST NO.	TIME DURATION HR MIN	CARD TYPE	DEPTH (m)	TEMP °C	SIGMA-T	SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup>	S.D.	COMPUTED SOUND VELOCITY M/SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT lum/cm <sup>2</sup>				MEASURED SOUND VELOCITY m/sec	
										PO <sub>2</sub> - P μg of l	TOTAL - P μg of l	NO <sub>2</sub> - N μg of l	NO <sub>3</sub> - N μg of l	S. O <sub>2</sub> - S μg of l	S. H
171		STO	0000	-0167	3183	2563		14371							
		OBS	0000	-0167	31834	2563		14371							
		STO	0010	-0167	3187	2566		14373							
171		OBS	0010	-0167	31870	2566		14373							023
		STO	0020	-0164	3191	2569		14376							
171		OBS	0025	-0163	31952	2572		14378							022
		STO	0030	-0163	3201	2577		14380							
		STO	0050	-0157	3233	2603		14391							
171		OBS	0050	-0157	32327	2603		14391							028
		STO	0075	-0142	3283	2648		14410							
171		OBS	0075	-0142	32833	2648		14410							030
		STO	0100	-0133	3324	2676		14423							
171		OBS	0100	-0132	33238	2676		14423							030
		STO	0125	-0122	3354	2700		14437							
		STO	0150	-0107	3351	2722		14452							
171		OBS	0150	-0107	33915	2722		14452							028
		STO	0200	-0061	3426	2756		14438							
171		OBS	0200	-0061	34259	2756		14438							023
		STO	0250	-0043	3441	2768		14506							
171		OBS	T0250	-0043	34415	2768		14506							025
		STO	0300	-0029	3461	2761		14533							
171		OBS	T0301	-0029	34609	2762		14533							021
		STO	0400	-0011	3469	2766		14550							
171		OBS	T0432	-0012	34711	2790		14555							023

SHIP NAME	CRUISE NUMBER	SHIP CODE	LATITUDE ° 10'	LONGITUDE ° 10'	DATE MONTH DAY	TIME HR MIN	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	RAJ M/PS	WAVE OBSERVATIONS	WEATHER CODE	'INST' CLOUD TYPE AMT	NODC STATION NUMBER	
								CRUISE NUMBER	STATION NUMBER							
311705	WE	81537N	06304 W	907	13 09 09	002	1970	K85	032	0626	1	00	0 X	X1	6 2	0032

WIND SPEED VALUE REPORTED FOR STANDARD ELECTRICALLY OPERATED METAL CUP ANEMOMETER (S) OR  
MANUALLY OPERATED BY OBSERVER WHO THEY APPLY

WIND DIRECTION (true)	WIND SPEED (kt)	BAROMETER (mb)	AIR TEMPERATURE °C		VIS MILES	NUMBER OBS LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB CODE			
10	504	159	-047	-054	7	12	

CAST NO.	TIME DURATION HR MIN	CARD TYPE	DEPTH (m)	TEMP °C	SIGMA-T	SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup>	S.D.	COMPUTED SOUND VELOCITY M/SEC	O <sub>2</sub> ml/l	AMBIENT LIGHT lum/cm <sup>2</sup>				MEASURED SOUND VELOCITY m/sec	
										PO <sub>2</sub> - P μg of l	TOTAL - P μg of l	NO <sub>2</sub> - N μg of l	NO <sub>3</sub> - N μg of l	S. O <sub>2</sub> - S μg of l	S. H
009		STO	0000	-0165	3191	2569		14373							
		OBS	0000	-0165	31906	2569		14373							
		STO	0010	-0168	3190	2568		14373							
009		OBS	0010	-0168	31900	2568		14373							
		STO	0020	-0167	3204	2579		14379							
009		OBS	0025	-0161	32097	2584		14381							
		STO	0030	-0160	3214	2588		14383							
		STO	0050	-0157	3233	2602		14371							
009		OBS	0060	-0155	32417	2610		14395							
		STO	0075	-0144	3280	2641		14408							
009		OBS	0075	-0144	32804	2641		14408							
		STO	0100	-0133	3324	2676		14423							
009		OBS	0100	-0133	33239	2676		14423							
		STO	0125	-0127	3360	2705		14435							
		STO	0150	-0113	3389	2728		14450							
009		OBS	0150	-0113	33891	2728		14450							
		STO	0200	-0062	3423	2757		14487							
009		OBS	0200	-0062	34277	2757		14487							
		STO	0250	-0028	3447	2772		14514							
		STO	0300	-0008	3451	2761		14534							
009		OBS	T0300	-0008	34508	2761		14534							
		STO	0400	-0013	3470	2783		14549							
009		OBS	T0400	-0013	34637	2789		14549							
		STO	0500	-0017	3473	2792		14564							
009		OBS	0500	-0017	34735	2792		14564							
		STO	0600	-0017	3474	2793		14580							
009		OBS	T0600	-0017	34740	2793		14580							

SHIP CODE	LATITUDE	LONGITUDE	DATE	TIME	STATION	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	SEA SURF	WAVE OBSERVATIONS				WEATHER CODE	CLOUD TYPE	MOON STATION NUMBER
							CRUISE NUMBER	STATION NUMBER			DIR	PER	PER	DIR			
311705	WE	81525N	06304 W	907 13	09 09 045	1970	KBS	033	0594	1	00	0	X	X1	0 4	0033	

THIS FORM FOLLOWS THE STANDARDIZATION AGREEMENT MADE WITH THE IHO IN 1964  
 IS REVISION NUMBER 01, EXTENDED FROM THE 1964 EDITION

WIND	WIND SPEED OR FORCE	BAROMETER (mb)	AIR TEMPERATURE (°C)		NUMBER OBS. LEVELS	SPECIAL OBSERVATIONS
			DRY BULB	WET BULB		
21	S04	155	-052	-057	7	

CAST NO.	TIME	CARD TYPE	DEPTH (m)	TEMP (°C)	SIGMA-T	SPECIFIC VOLUME ANOMALY - 10 <sup>3</sup>	SOUND DTM - 10 <sup>3</sup>	COMPUTED SOUND VELOCITY - SEC	AMBIENT LIGHT					MEASURED SOUND VELOCITY			
									PO <sub>4</sub> -P	TOTAL-P	NO <sub>3</sub> -N	NO <sub>2</sub> -N	S O <sub>2</sub> -S	PH	1000	500	
		STU	0000	-0161	3187	2505	0023448	0000	14374								
045		08S	0003	-0161	31867	2505			14374								
		STU	0010	-0167	3182	2562	0023810	0023	14372								
045		08S	0010	-0167	31818	2562			14372								
		STU	0020	-0164	3201	2577	0022315	0046	14378								
045		08S	0025	-0163	32086	2583			14380								
		STU	0030	-0163	3209	2594	0021671	0068	14381								
		STU	0050	-0162	3225	2596	0020477	0110	14387								
045		08S	0050	-0162	32247	2596			14387								
		STU	0075	-0140	3270	2633	0016976	0157	14405								
045		08S	0075	-0140	32705	2633			14405								
		STU	0100	-0141	3300	2657	0014727	0197	14416								
045		08S	0100	-0141	32998	2657			14416								
		STU	0125	-0124	3361	2705	0010105	0226	14436								
		STU	0150	-0104	3404	2740	0005856	0249	14450								
045		08S	0150	-0104	34038	2740			14450								
		STU	0200	-0051	3433	2765	0004499	0277	14494								
045		08S	0200	-0051	34375	2765			14494								
		STU	0250	-0023	3452	2775	0003510	0297	14517								
		STU	0300	-0006	3462	2783	0002817	0313	14535								
045		08S	0302	-0006	34622	2783			14535								
		STU	0400	-0009	3470	2789	0002224	0339	14551								
045		08S	0404	-0009	34702	2789			14552								
		STU	0500	-0015	3474	2793	0001842	0359	14566								
045		08S	0506	-0015	34745	2793			14567								
045		08S	0582	-0019	34738	2792			14577								

532-AA

Woods Hole Oceanographic Institution  
ATLAS - GAZETTEER COLLECTION

