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STUDIES IN THE MARGINAL ICE ZONE OF THE CHUKCHI SEA. ACOUSTIC AND OCEANOGRAPHIC DATA FOR 1972

Gerald R. Garrison, et al

Washington University

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31 July 1973

Studies in the Marginal Ice Zone of the Chukchi Sea

Acoustic and Oceanographic Data for 1972

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Oceanographic and acoustic measurements were made from an icebreaker and from a camp on an ice floe in the Chukchi Sea during the summer of 1972. The purpose of this report is to present the large amount of data in a form which involves only a minimum amount of processing. These data include temperature and salinity profiles, current measurements, sound level profiles at short range from a 60-kHz pulse transmitter, volume reverberation from biological scatterers, and ice floe movement in relation to wind and currents. The analysis of these data will appear in a subsequent report.

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Studies in the Marginal Ice Zone of the Chukchi Sea

Acoustic and Oceanographic Data for 1972

by G. R. Garrison
E. A. Pence
H. R. Feldman

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CONTENTS

INTRODUCTION

General

The 1972 Pacific Marginal Ice Zone Study (MIZPAC- 2) by the Applied Physics Laboratory was conducted in the Chukchi Sea between 20 July and 18 August.* The objective of the study was to obtain data on the phenomena observed during a study the previous summer--namely, the warm water intrusion from the south, the resulting thermal fine structure and its effect on acoustic transmissions, and the volume reverberation produced by biological scatterers. (Reference 1 describes the 1971 study.) Measurements were made from the USCGC STATEN ISLAND and from a drifting ice floe.

The work from the icebreaker consisted mainly of two cruises (see Table I for itinerary) and was designed to obtain an overall description of the temperature and salinity distribution and the biological scattering layers in the marginal ice zone (MIZ) of the Chukchi Sea as well as some knowledge of the changes that occur during the summer.

Table I. Itinerary for MIZPAC-72.†

20 July	Depart Barrow on STATEN ISLAND
20 July	Barrow Line
24 July	Wainwright Line
25 July	Icy Cape Line
26 July	Chukchi Sea Crossing
28 July	Wainwright Line
29 July	Search for Suitable Floe
30 July	To Barrow
31 July	Depart from Barrow
1 Aug	Ice Camp Established
4 Aug	Barrow Line
5 Aug	Wainwright Line
7 Aug	Wainwright to Ice Camp
12 Aug	Abandon Ice Camp
13 Aug	Barrow Line
14 Aug	Wainwright Line
15 Aug	Chukchi Sea Crossing
17 Aug	Southward Crossing
19 Aug	Arrive Nome

*Local time, Greenwich time less 9 hours, is used throughout this report.

†A map of the area is shown on page 8.

The ice floe served as a stable platform from which measurements over fixed dimensions could be made, and was used to obtain a detailed description of the thermal structure and its effect on acoustic transmissions. The floe was occupied for 12 days. It remained in the MIZ near the coastal current until the last day when it entered the current and was carried into the Beaufort Sea.

Scope of This Report

This report presents the extensive oceanographic and acoustic data taken during the study. These data will be referenced and partially reproduced in a later report when the analysis has been completed.

Logistics

Instrumentation for measuring temperature and salinity profiles and volume reverberation was provided by the Laboratory. The equipment for taking plankton samples was provided by the University of Washington's Oceanography Department. Navigation information was furnished by the STATEN ISLAND, mainly with its NAVSAT equipment. Ship's force also assisted with the measurements by operating winches, taking Nansen samples, etc. The ship's two helicopters provided reconnaissance flights and occasionaly served as platforms for oceanographic measurements.

The Coast Guard radio station at the Naval Arctic Research Laboratory (NARL) gave considerable assistance, providing radio communication between the ship and NARL. The food, fuel and clothing required for the ice camps were supplied by NARL. NARL also served as a base of operations for personnel awaiting transportation to ship or airport.

OCEANOGRAPHIC DATA

Introduction

Most of the temperature and salinity profiling equipment had also been used the previous summer, but one new unit was developed to operate automatically. This automatic profiler, or ACTD, (see Figure 1) lowers a temperature-conductivity-depth probe to the bottom at regular intervals and records the data on paper tape. It was used mainly for overnight operations, but with some improvements in tape storage and the battery pack it should be able to perform for extended periods.

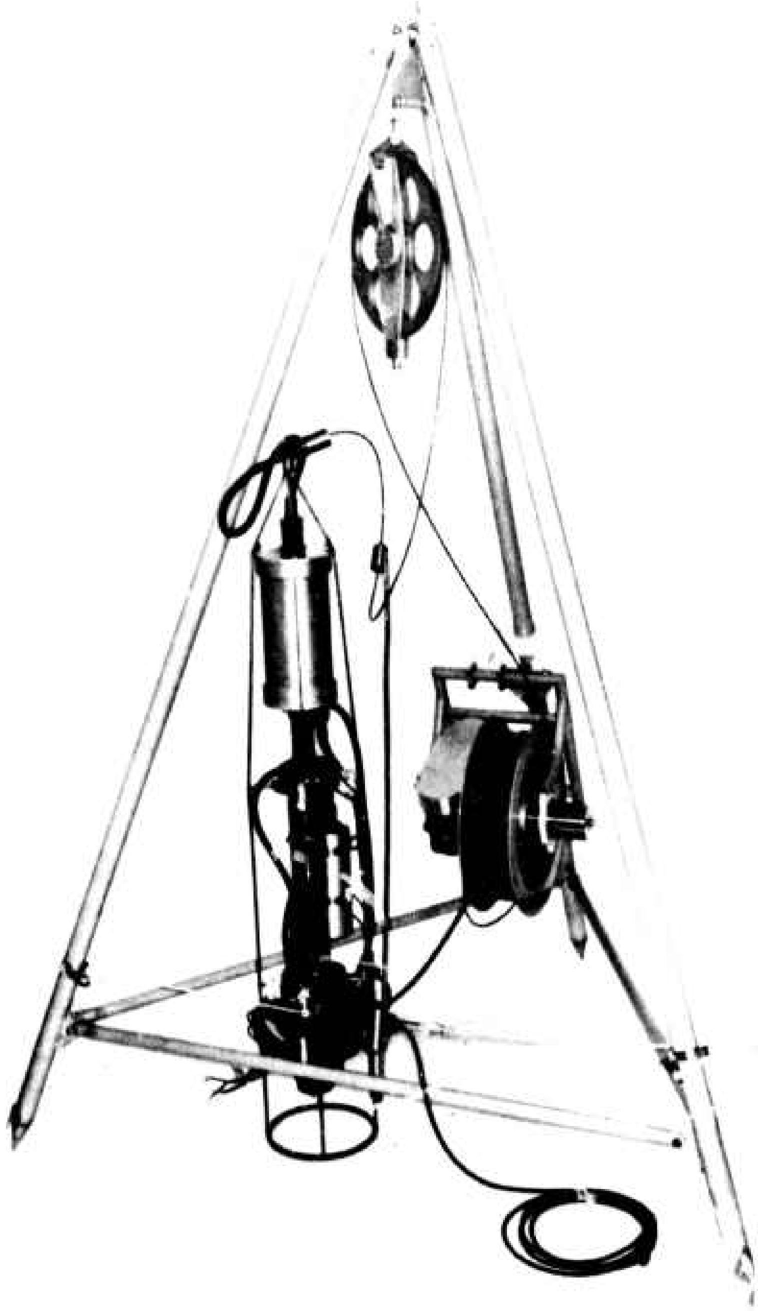


Figure 1. Automatic Profiler.

Five units, consisting of the following components, were provided for measuring profiles:

Designation	Components
CTD, ACTD	NUS conductivity cell, thermistor, Vibrotron® pressure transducer, electric powered winch, cable, paper punch
TD 1, TD 2 and TD 3	Thermistor, Vibrotron, paper punch, control box, cable

Only the CTD and ACTD units had a powered winch. The others were lowered by hand with the cable laid out on the ice or coiled in a wooden box. With only 60 m of cable, this method was more convenient than handling a winch and power source. The cables were marked every 10 m. In general, the probes should have been weighted more heavily because at times the current relative to the ice flow was greater than expected and the probe did not reach the desired depth.

Data recording instrumentation included a data signal converter and a paper punch unit. The signal converters were capable of converting each of three frequency-modulated input signals to four-character BCD numbers. The converter utilized a BCD counter that stored the number of 1-MHz clock pulses generated during 255 complete cycles of the sensor input signal. The output of the BCD counter was gated by the functional timing controls and at the appropriate time was supplied to the paper tape unit for recording. The input sensor signals were sequentially multiplexed to produce a data sample of three BCD outputs, a time/code word used to represent the relative time of the sample from the start of the drop, and an externally set 6-bit code. A data sample was completed in about 0.8 sec.

The punched paper tape output for each profile was about 25 ft long. The tape was usually fed into a box and rolled up after lowering the probe. Although it was necessary to keep the tape dry, it was possible to operate the punch in the open on many days.

A data reduction system was provided in the field to convert the punched tape data to a plot of temperature and salinity versus depth. Occasionally, sound velocity and density were also included. This system consisted of a Hewlett-Packard tape reader, desk calculator, printer and plotter. A 50-meter profile was plotted in about 15 minutes. The system had great flexibility since the plotter could be set to plot each variable at any desired scale. The calculator rapidly performed the lengthy calculations of salinity, sound speed and density. The plotter was the slowest link in the system, with the tape reader only slightly faster.

To demonstrate the feasibility of using helicopters to take measurements below the surface, a temperature-depth probe with cable and recording equipment was installed in a Coast Guard helicopter. As the helicopter hovered 10 feet above the water, the probe was slowly lowered to a depth of 50 m and then recovered. (Another helicopter carried the volume reverberation equipment, and, while the helicopter hovered, the transducer was suspended just below the surface for about 10 minutes.) Before lowering any equipment into the sea, the helicopter's sling cable was dipped into the water to discharge static electricity that had accumulated on the helicopter. If equipment is lightweight and measurements can be taken quickly, the method provides rapid coverage of a large area.

Spring Measurements

Measurements were made along the Barrow line on 29 April 1972 to determine spring conditions. A helicopter (Bell 205A-1) was rented for the day from a firm in Anchorage and provided with a temperature-depth profiler and a small hand winch for taking Nansen samples. The procedure was for the helicopter to land on the ice and remain with rotor turning while the probe was carried to the ice edge and lowered either to the bottom or to 60 meters depth. The recording instrumentation remained aboard.

The first stop was made at the edge of the shore-fast ice about a mile from shore. Stops were planned at 10-mile intervals but there was so much open water and thin ice that the second station was at 20 miles. Succeeding stations were spaced every 10 miles out to 70 miles.

A second series of four measurements at 20-mile intervals was taken at the edge of the shore-fast ice along the coast toward Wainwright. The last station of this series was midway between Wainwright and Icy Cape.

Nansen samples and reversing thermometer readings were taken at three of the stations, two in the first series and one in the second. One thermometer failed but the other showed fair agreement with the thermistor used for profiling.

The temperature profiles are shown in Figures 2 and 3. In these figures the temperature scale is greatly expanded to bring out the fine structure in the nearly isothermal water. Reversing thermometer readings are shown as dots next to the profile and salinities are written near the dot.

Salinities were about 33‰ 60 miles off shore. The high salinity value at 5 meters in the first profile is difficult to explain and may be in error.

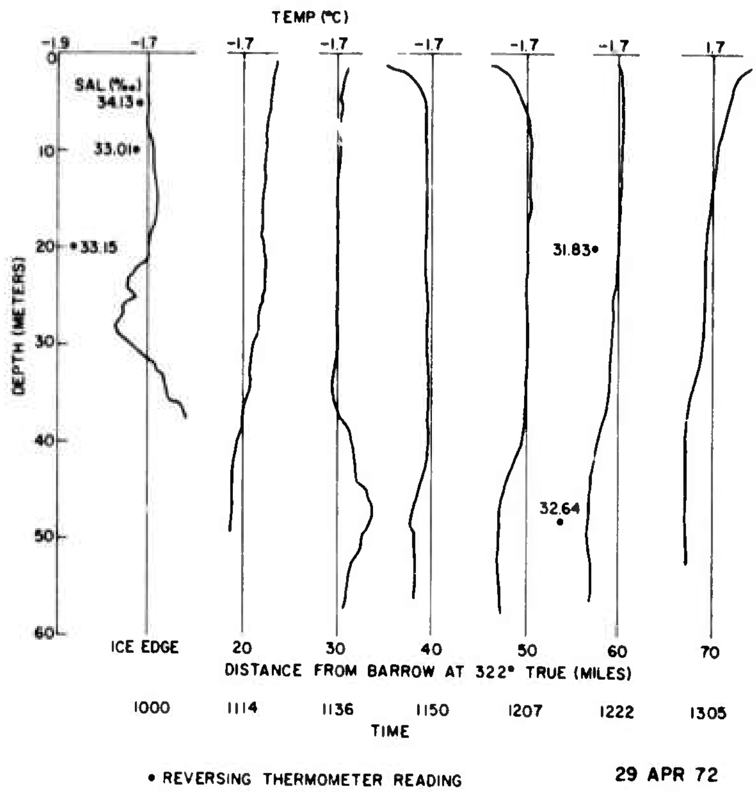


Figure 2. Oceanographic Measurements along a Line North from Barrow.

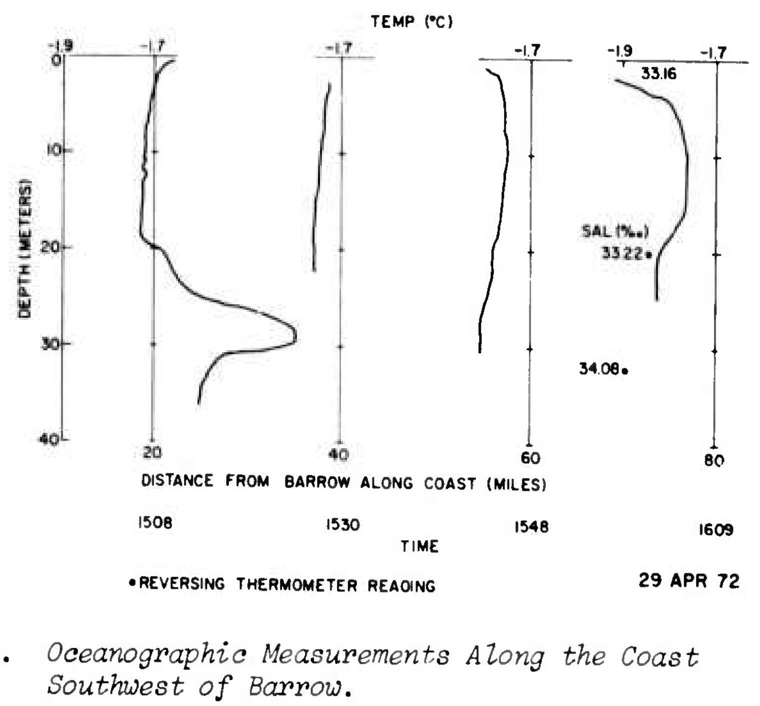


Figure 3. Oceanographic Measurements Along the Coast Southwest of Barrow.

The temperature throughout the area was only slightly above the freezing point. Some layering appears in the profiles taken at Barrow and 20 miles down the coast, but the measurements show that there was no appreciable amount of warm water entering the area at that time. The considerable amount of open water off Barrow was not related to the presence of a warm intrusion, unless layers only 0.1°C warmer than the main body of water can be considered significant.

Chukchi Sea Oceanography

The gross oceanographic structure of the Chukchi Sea was studied in surveys with the icebreaker along the length of the Chukchi MIZ at both the beginning and end of the summer project. The Barrow and Wainwright lines were also run at an intermediate time while the ice camp was occupied.

Measurements in the Chukchi MIZ were taken at the locations shown in Figure 4. The number of measurements is summarized in Table II. Most of the profile measurements included temperature and conductivity but those taken from the helicopter were of temperature only. Appendix A contains plots of all the profiles taken during this phase.

At the time the Barrow line was first run, the ice was only a few miles off Barrow. Fifteen miles from Barrow the ship was stopped by the ice pack and delayed until the fifth and sixth engines were placed in operation.

Table II. Summary of Profiles.

Date	Location	No. of Profiles
20 July	Barrow Line	11
	Helicopter	4
24 July	Wainwright Line	7
25 July	Icy Cape Line	11
26, 27 July	Chukchi Crossing	11
	Helicopter	4
28 July	Wainwright Line	8
	Northeasterly	4
4 Aug	Barrow Line	11
	Helicopter	7
5 Aug	Wainwright Line	7
7 Aug	Northeasterly	11
13 Aug	Barrow Line	6
14 Aug	Wainwright Line	8
15 Aug	Chukchi Crossing	13

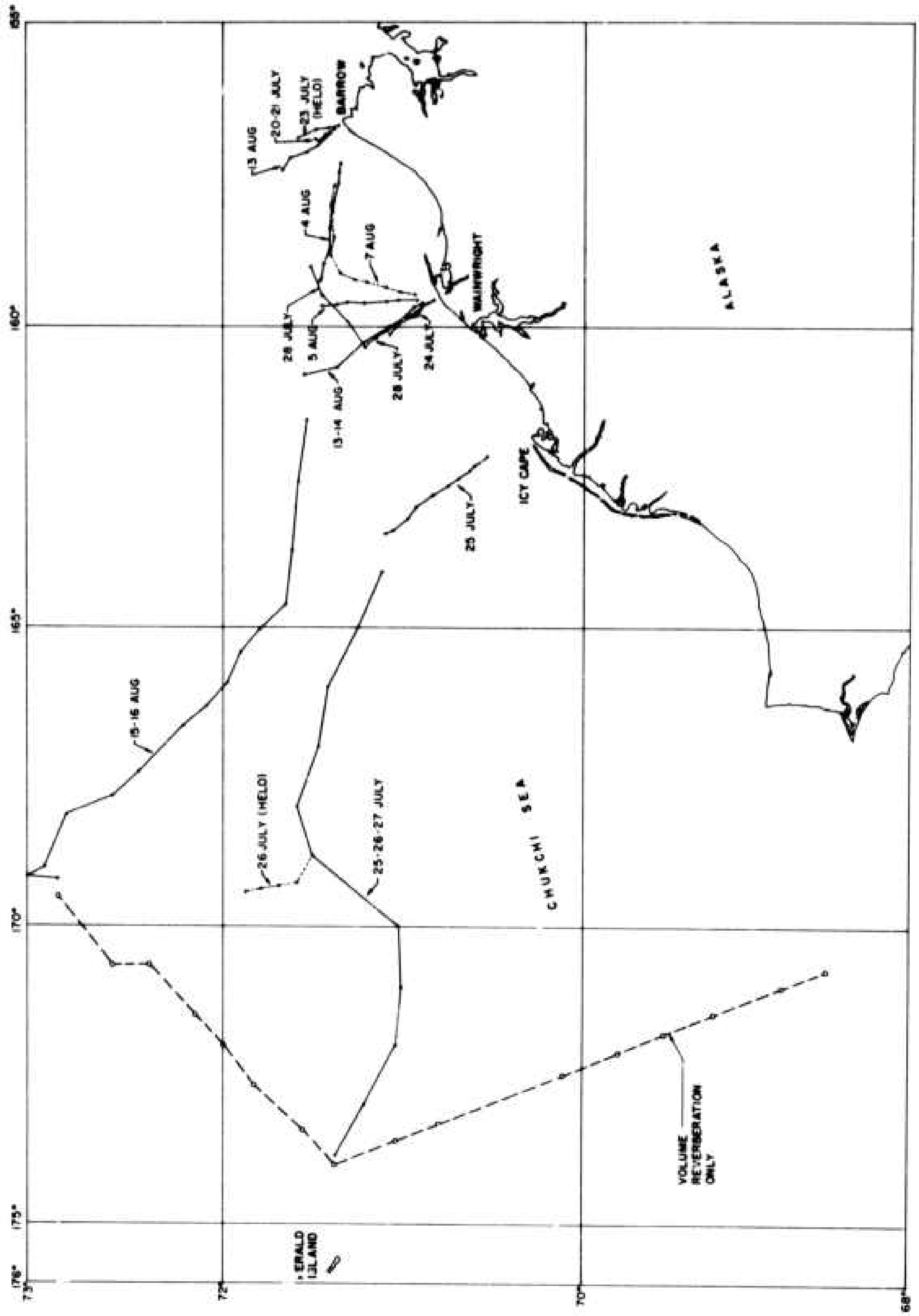


Figure 4. Location of Oceanographic Measurements.

The first profile in Figure 5 shows an intrusion of 2°C water along the coast. The second profile shows that at 6 miles off the coast this intrusion has disappeared and the water remains at the winter temperature distribution. Further out, as shown in the third profile, a small intrusion can be noted at a depth of 40 to 60 meters.

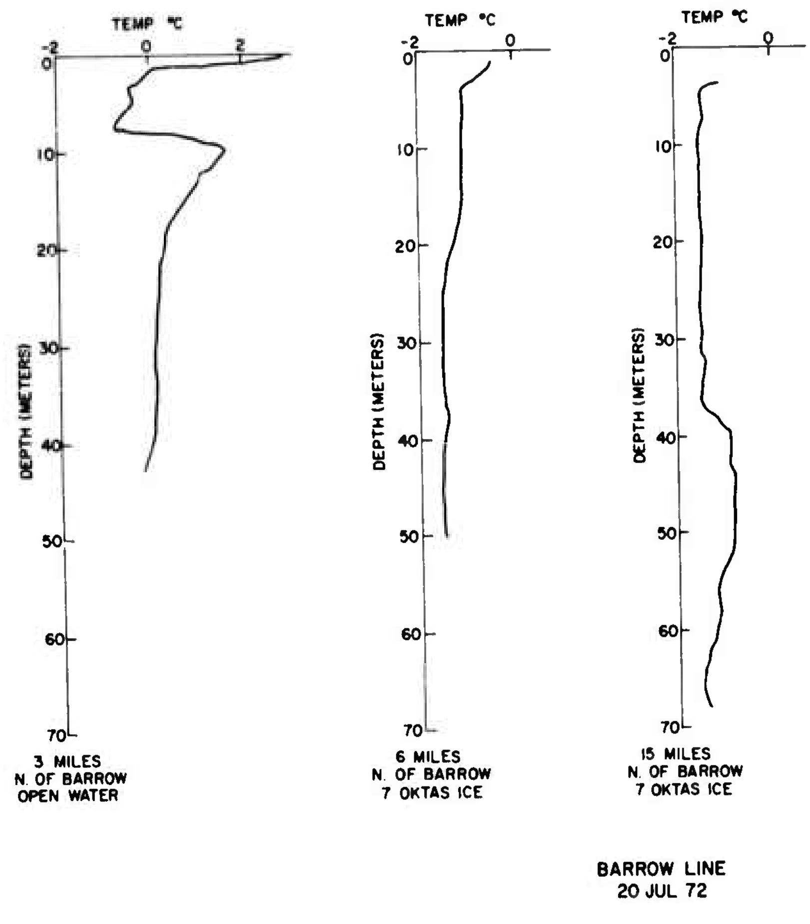


Figure 5. Temperature Profiles along the Barrow Line.

The Wainwright line profiles (see Figure 6) show a layer of 6°C water on the surface. This layer was found to extend to about 15 miles off the coast, where a light ice pack was encountered. The Icy Cape line profiles (see Figure 7) show a larger layer of 6°C water which extends north of latitude 71° and overlays, with a very sharp transition, the -1°C water beneath.

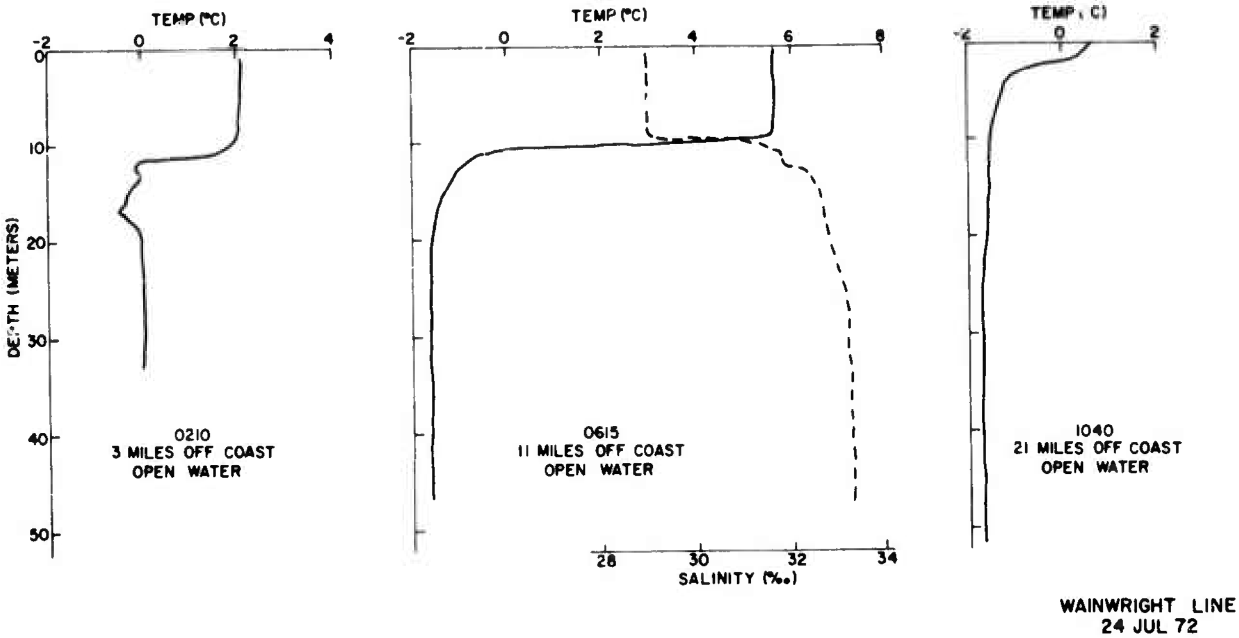


Figure 6. Temperature Profiles along the Wainwright Line.

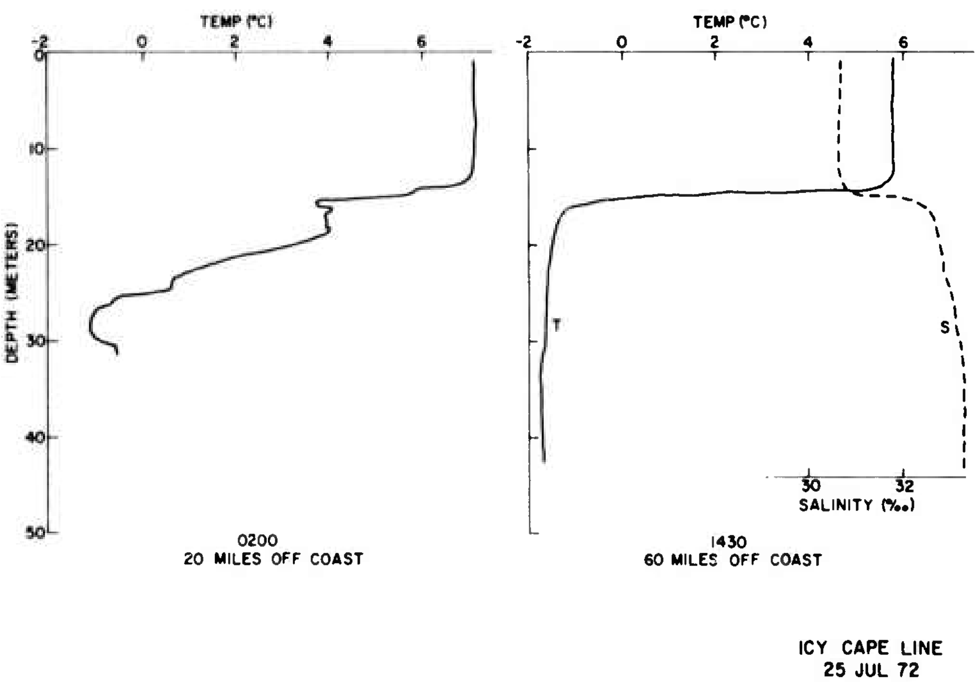


Figure 7. Temperature Profiles along the Icy Cape Line.

Some profiles taken as the STATEN ISLAND turned west and crossed the Chukchi Sea, more or less paralleling the edge of the ice pack, are shown in Figure 8. The warm surface layer became smaller when the ice pack was approached (see Figure 8, 2nd graph) and then larger again as the ship moved into open water. At 174°W, near Herald Island, the layer had a temperature of 8°C and was 15 meters thick. It's salinity was about 31‰ compared to 33‰ for the deeper water.

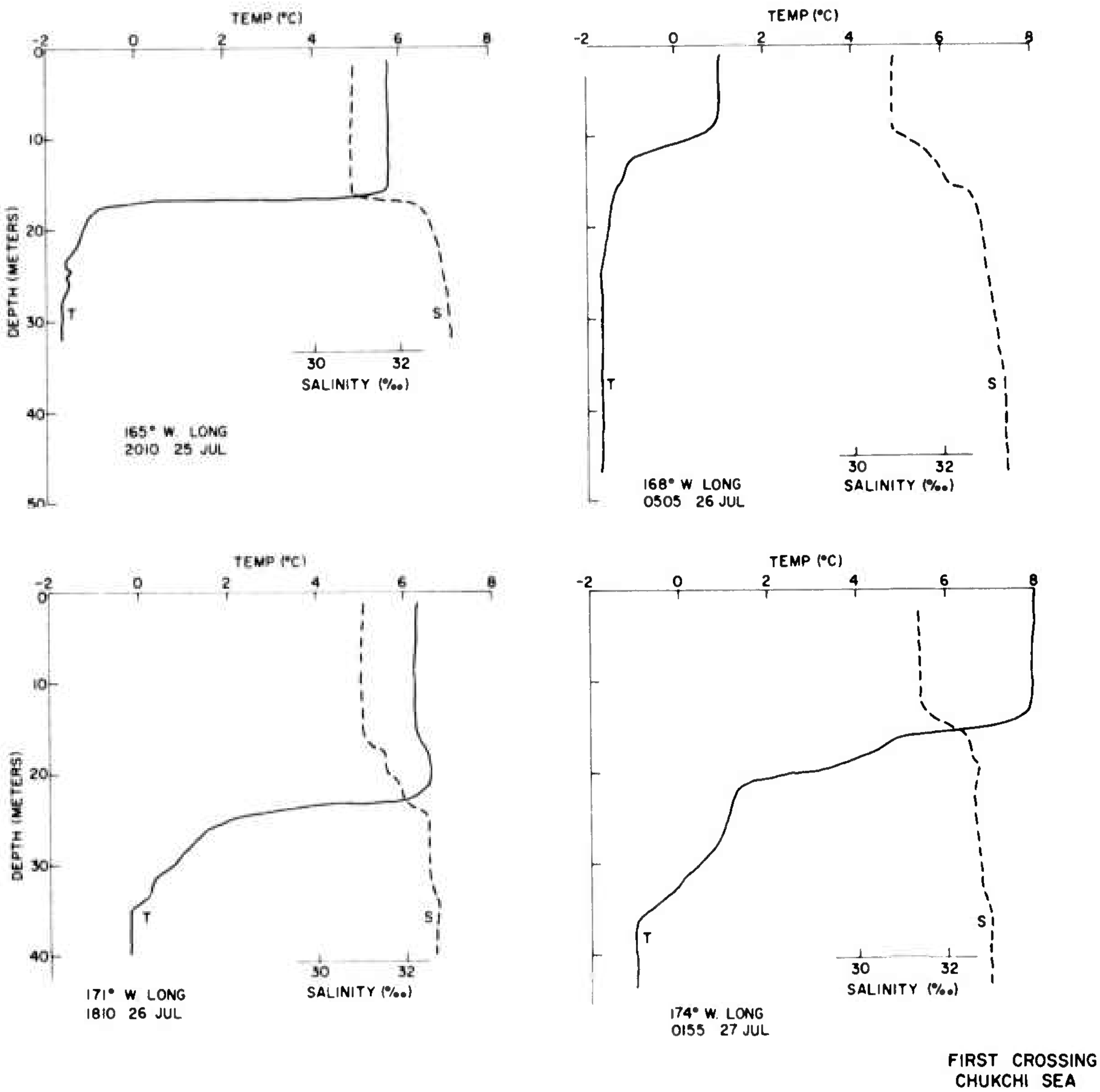


Figure 8. Temperature Profiles across the Chukchi Sea.

The Barrow and Wainwright lines were run again while the ice camp was occupied, and then again during the final cruise. Figure 9 shows profiles taken along the Barrow line in mid-August where the surface layer along the coast is 8°C compared to 2°C in late July. The layer is strong 4 miles off the coast but disappears by 8 miles. The Wainwright line profiles of 14 August (see Figure 10) show the sharply defined surface layer again extending to more than 12 miles off the coast. The salinity difference between the surface layer and deep water is now less, which aids mixing.

The second Chukchi crossing (see Figure 11) was made further north than the first in an attempt to again stay near the ice pack. Because of equipment failures the westernmost profile was at 169°W. Although further north, the profiles show about the same size surface layer as that in the first crossing, indicating that the boundary of the surface layer is closely related to the edge of the ice pack.

Thermal Microstructure

Figure 12 shows the drift of the ice camp. The ice floe drifted slowly southward through the transition region between the winter water and the warm intrusion along the coast. This transition region contained thermal microstructure with temperature excursions of ±0.1°C. As the floe moved southward into the coastal current, a predominant warm layer appeared at the surface and larger microstructure (±0.2 to ±0.3°C) appeared at the lower depths.

The ice floe was used as a platform for making detailed measurements of the temperature and salinity profiles. Four stations were established at the corners of a 140 yd by 160 yd rectangle (see Figure 13). Temperature profiles were measured at all stations and conductivity profiles were included at Camp 2 where the automatic profiler was being tested. The number of measurements at each station is shown in Table III. Appendix B contains all the temperature and salinity profiles obtained from Camp 2 measurements.

We intended to operate all four stations simultaneously on the hour, but this schedule was occasionally disrupted by equipment failure. As a result only three stations were operating for most of the hourly measurements.

On two days a series of measurements was made at 15-minute intervals for 6 hours each day. Equipment failure reduced the total time for four-station operation from the intended 12 hours to 9 hours. This series

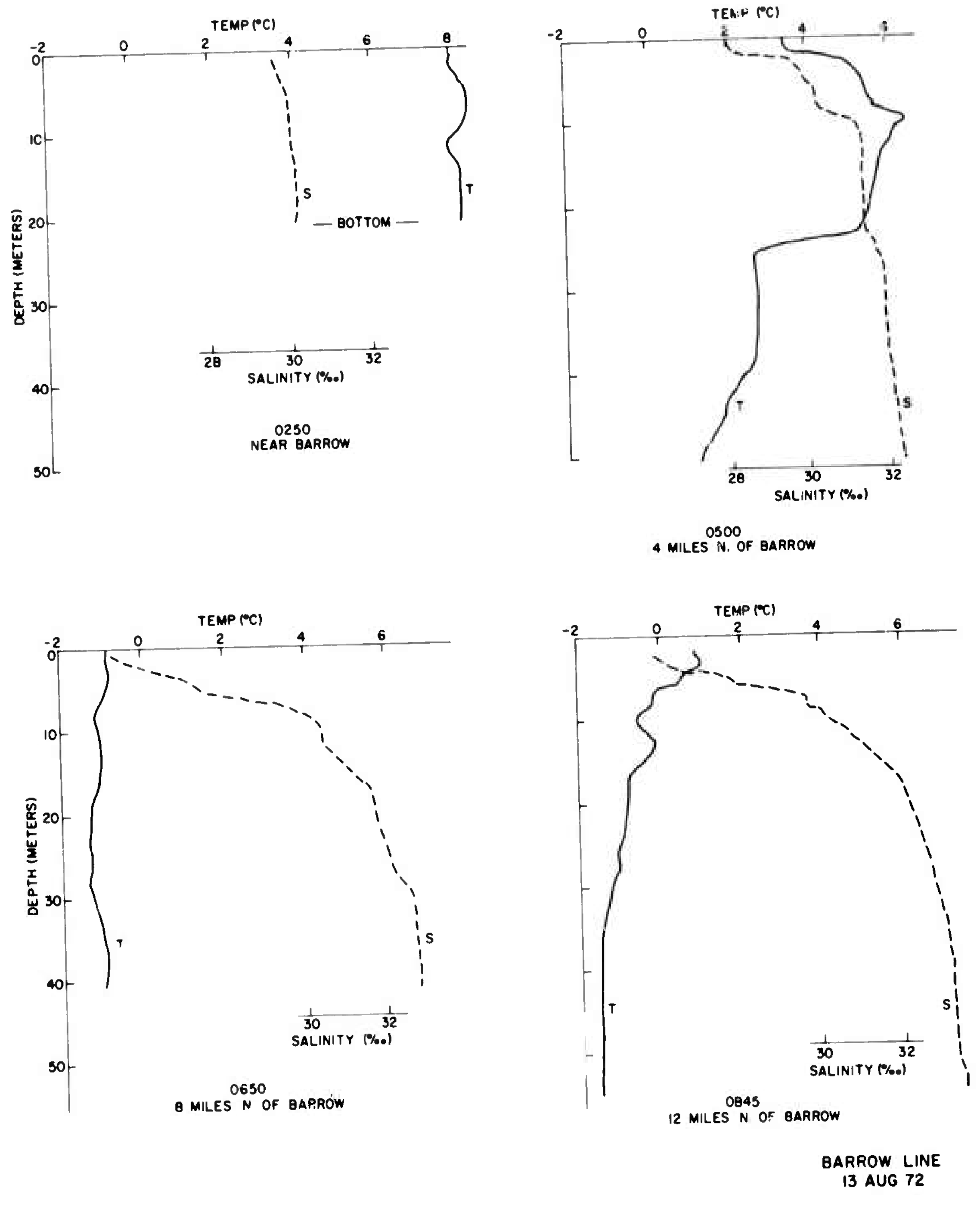


Figure 9. Temperature Profiles along the Barrow Line.

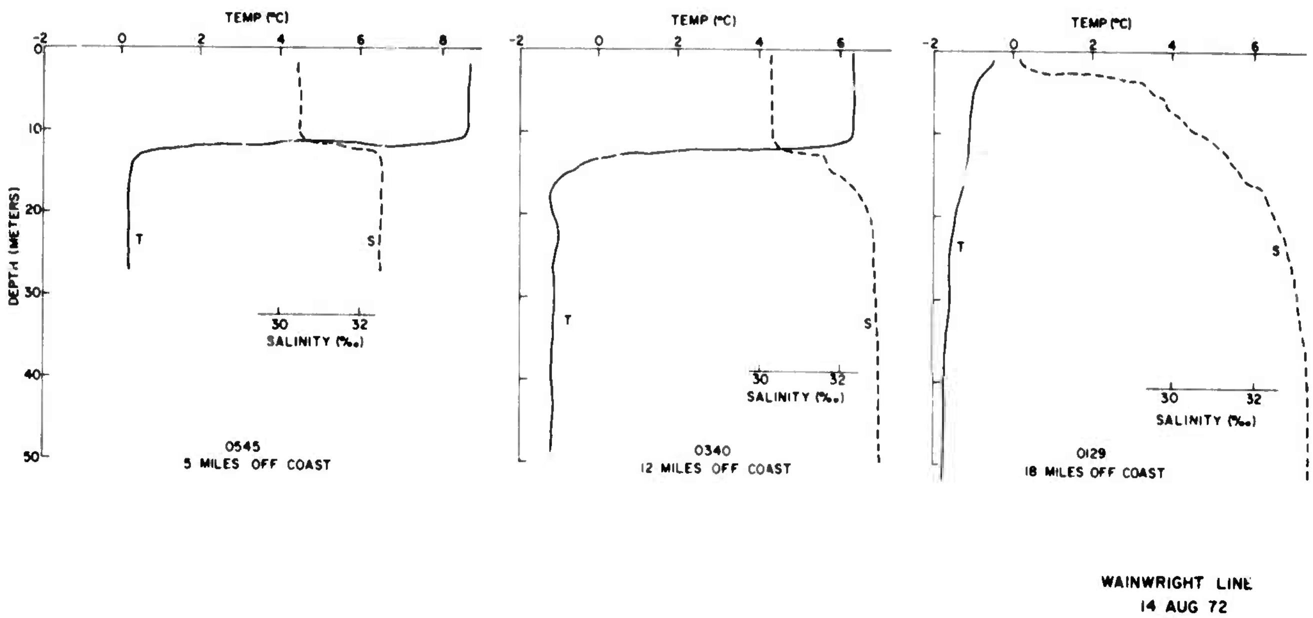


Figure 10. Temperature Profiles along the Wainwright Line.

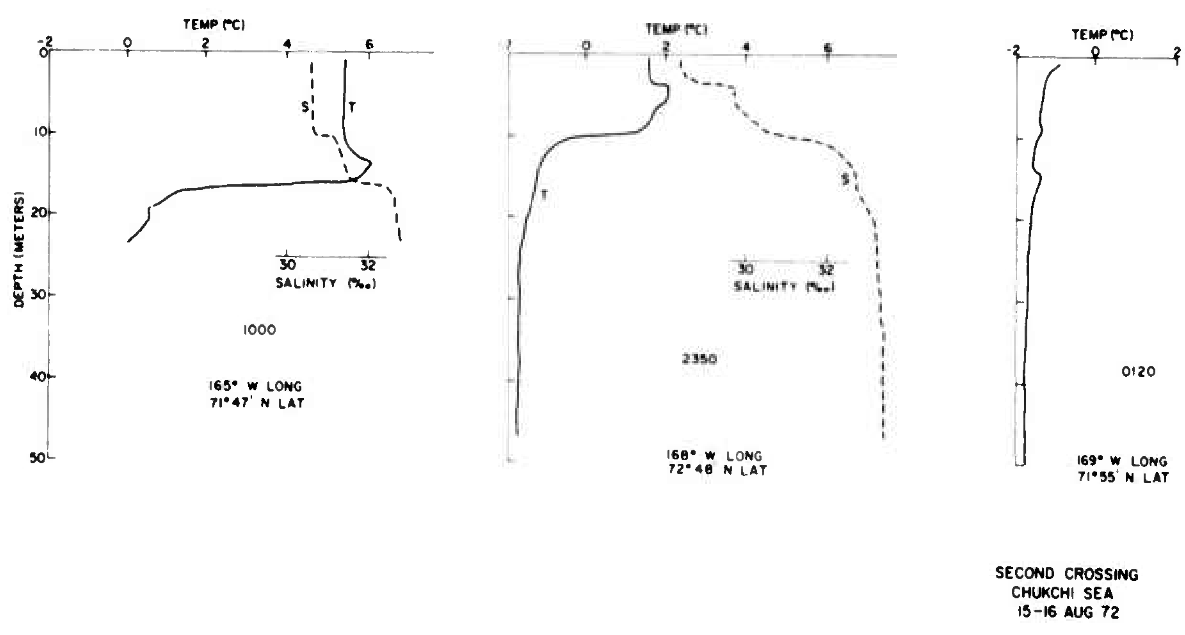


Figure 11. Temperature Profiles for Second Crossing of the Chukchi Sea.

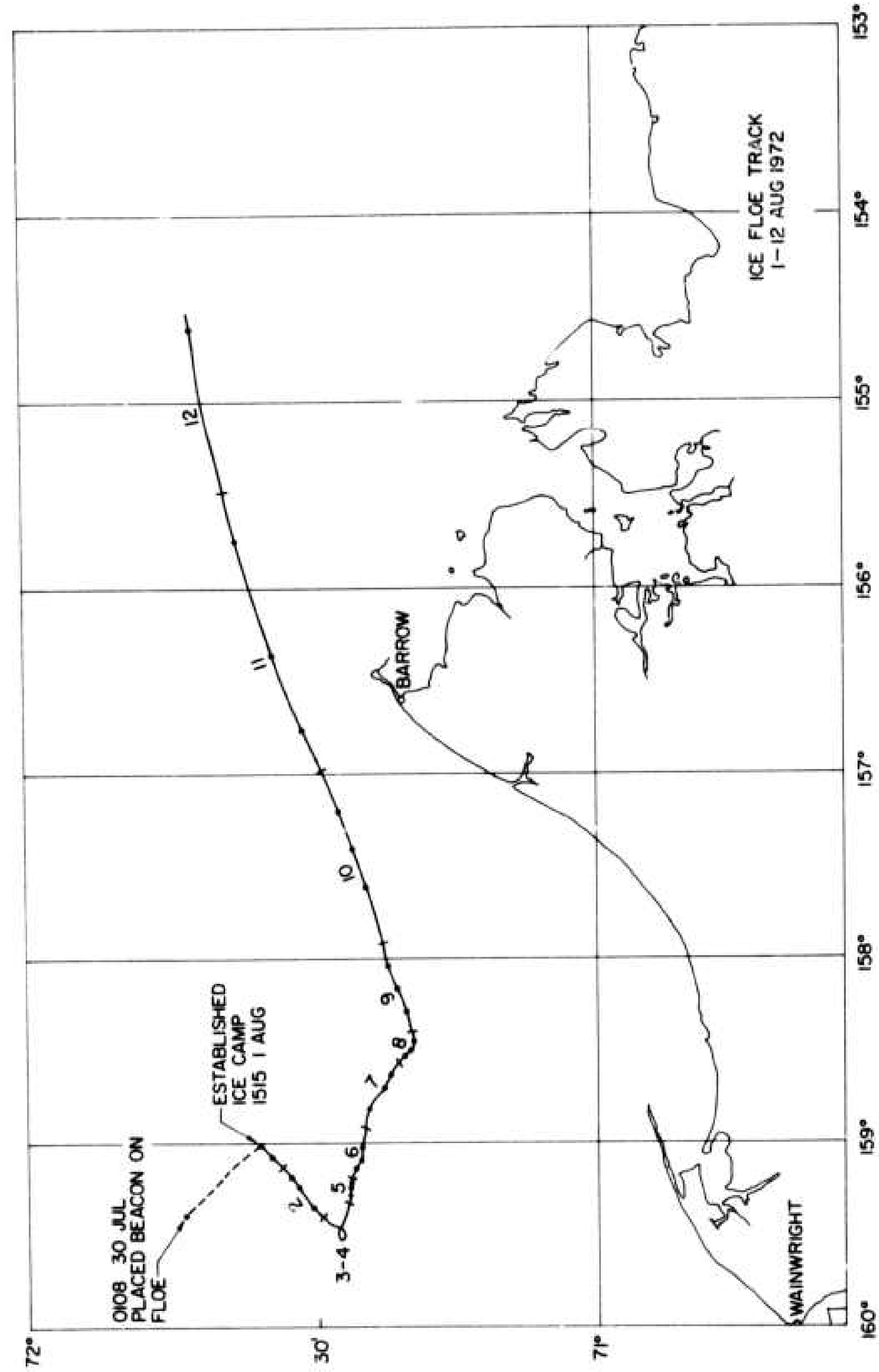


Figure 12. Drift Track of Ice Camp.

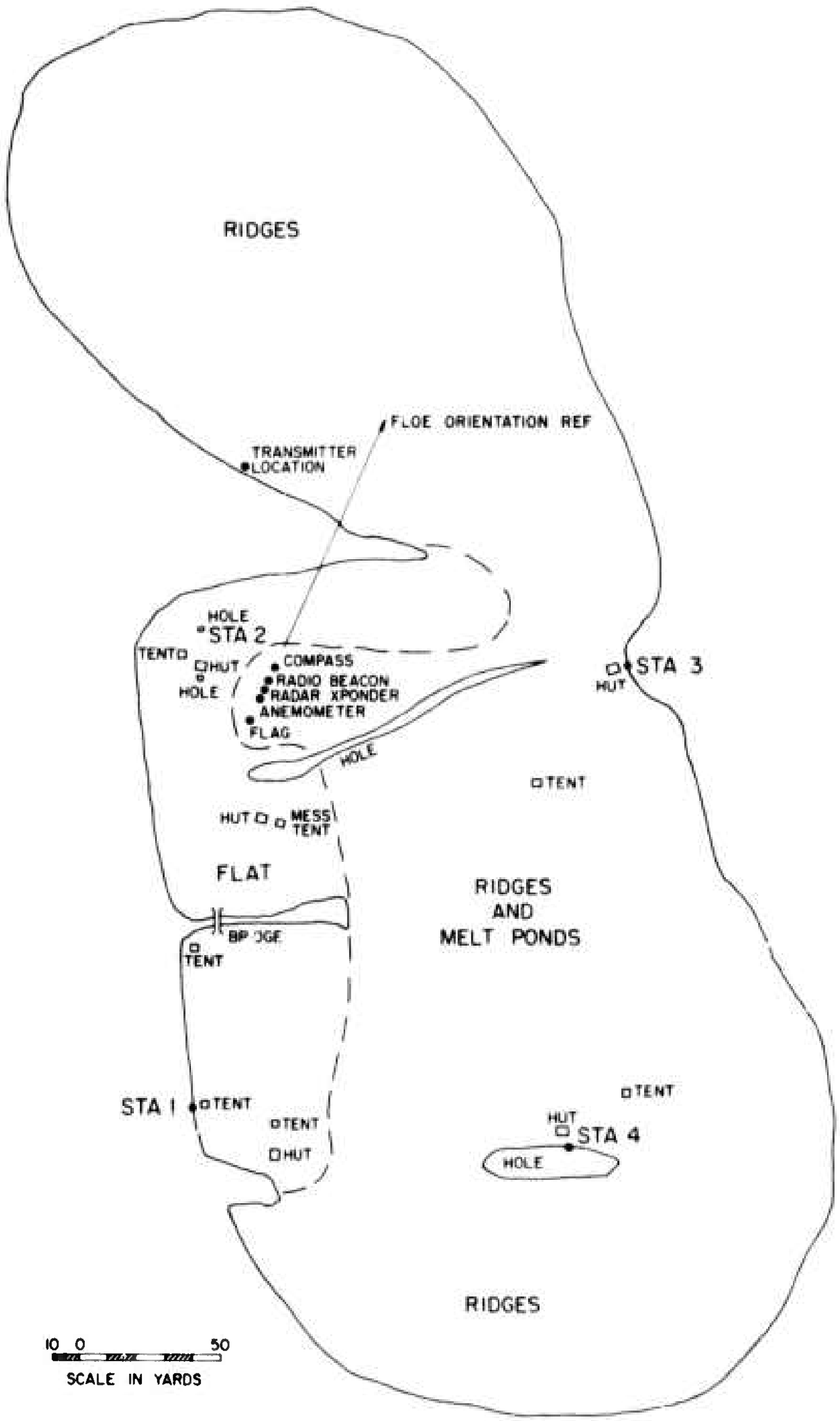


Figure 13. Sketch of the Ice Floe.

has been plotted for each station (Figure 14) with an arrangement that allows comparison of the thermal layers at the four camps. The salinity profiles plotted from measurements at Camp 2 are presented in Figure 15. On 8 August the ice floe moved only 4 miles and the thermal layers changed slowly. On the following day the floe, having moved closer to the intrusion of warm water along the coast, traveled about 10 miles and the profiles had more structure and changed faster. A detailed comparison of the profiles at the four camps is expected to improve our estimates of the horizontal extent of the small thermal layers.

Additional profiles obtained at Camps 3 and 4 are included in Appendix E (pp. E3-E13). These are plotted as a series, usually at a spacing of 1 hour. All series plots in this report have each curve displaced 10 divisions.

The profiles obtained from the icebreaker when it was alongside the ice floe are also included in Appendix E (pp. E14 and E15).

Currents

Current measuring probes were lowered by hand from the ice floe whenever time was available. The measurements were time consuming and had a low priority, so current data are sparse and irregular. A summary of the measurements is given in Table IV.

Table IV. Summary of Current Measurements, 1972.

	Number of Profiles		
Date	Speed	Direction	
3 Aug	3		
4 Aug	3	1	
5 Aug	3	2	
6 Aug	1		
7 Aug	3	3	
8 Aug	3	3	
9 Aug	2	1	
10 Aug	5	5	(20-40 m only)
11 Aug	1		

The unit used to measure current speed consisted of a Savonius rotor and a Vibrotron attached to the end of electrical cables married to a strain line. A 4-lb weight was suspended below the rotor. The pulses from the Savonius reed switch (actuated by the rotor magnets), along with the Vibrotron signal, were fed to counters at the surface where they were read and recorded manually. The direction unit consisted of a large vane and flux-gate compass, along with a Vibrotron, and was operated on a separate strain line. The outputs of the compass and Vibrotron were read and recorded manually at the surface.

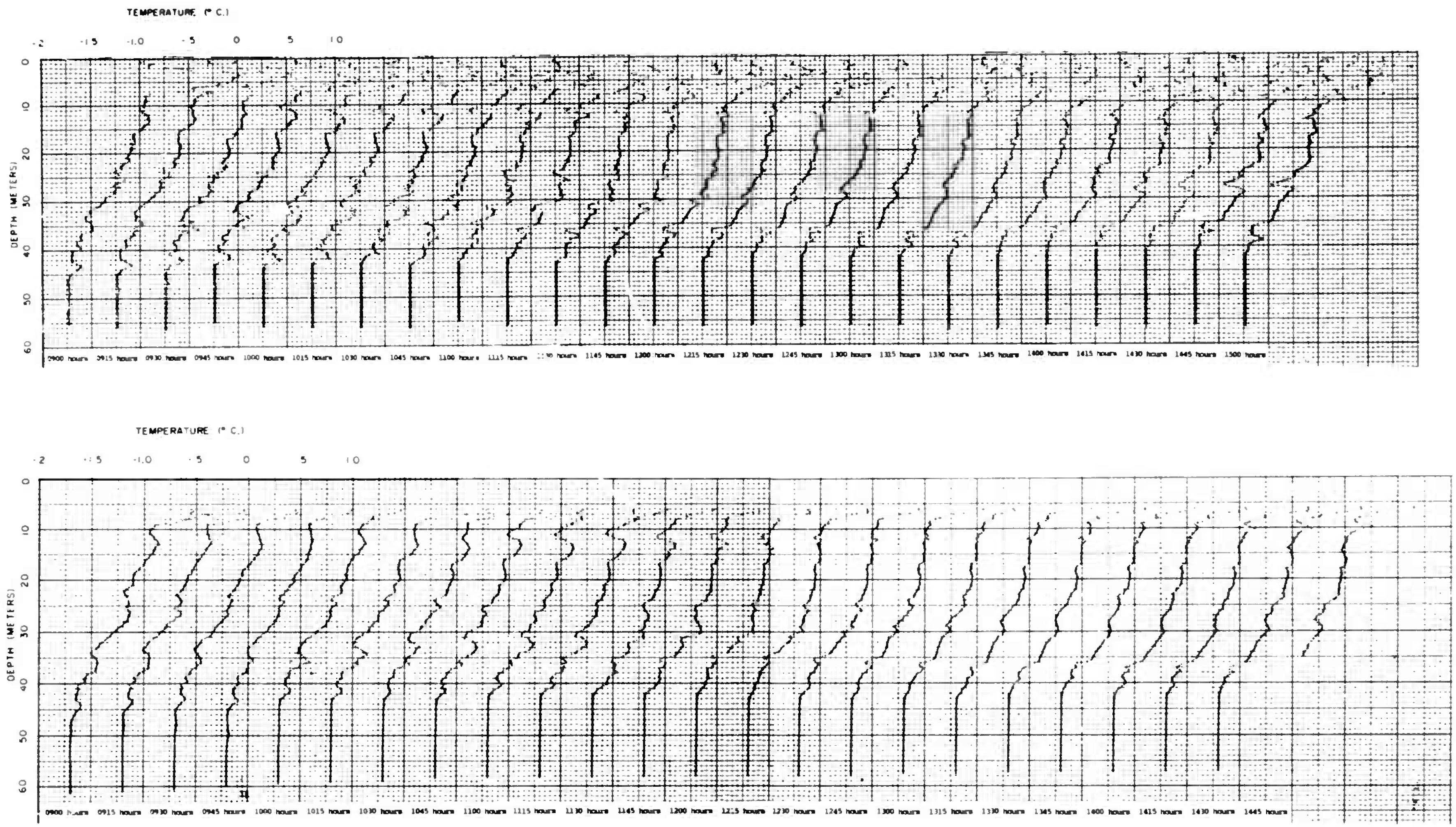
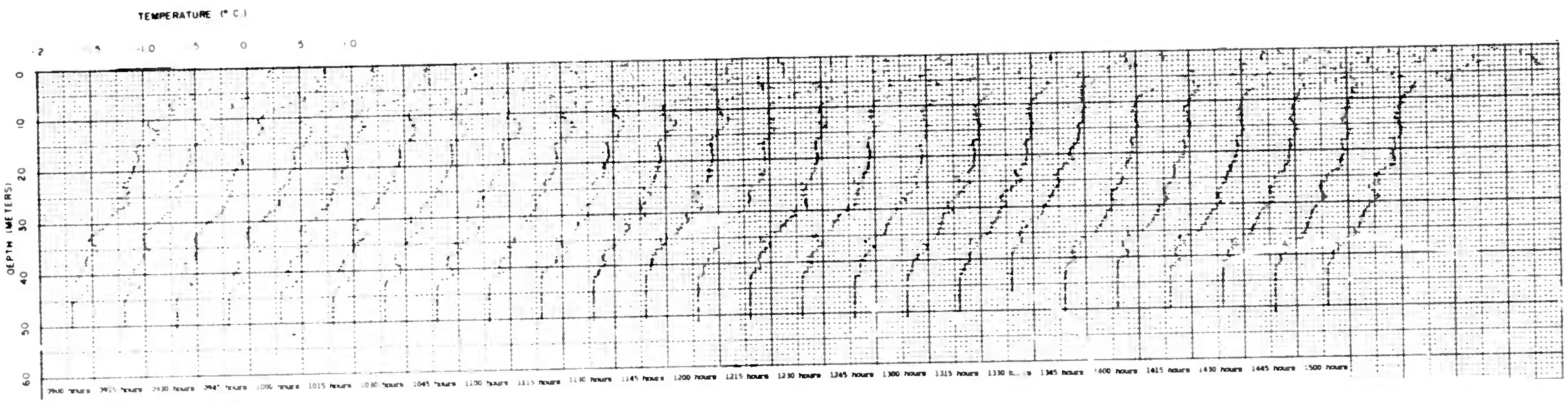


Figure 14a. Temperature Profiles; Camp 1 above, Camp 2 below, 8 August 1972.



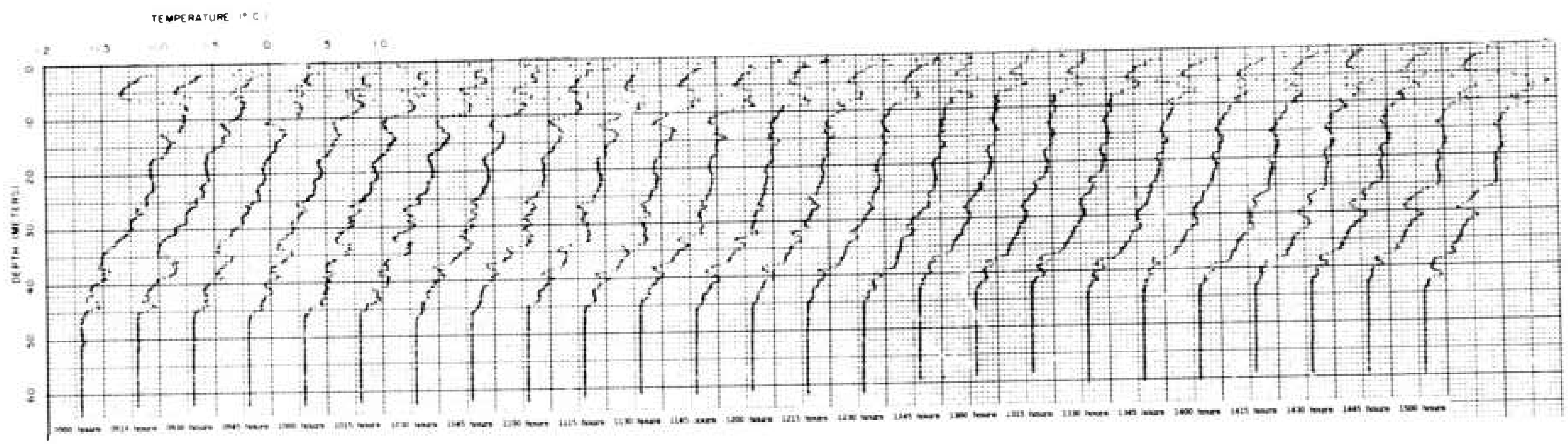


Figure 14b. Temperature Profiles; Camp 3 above, Camp 4 below, 8 August 1972.

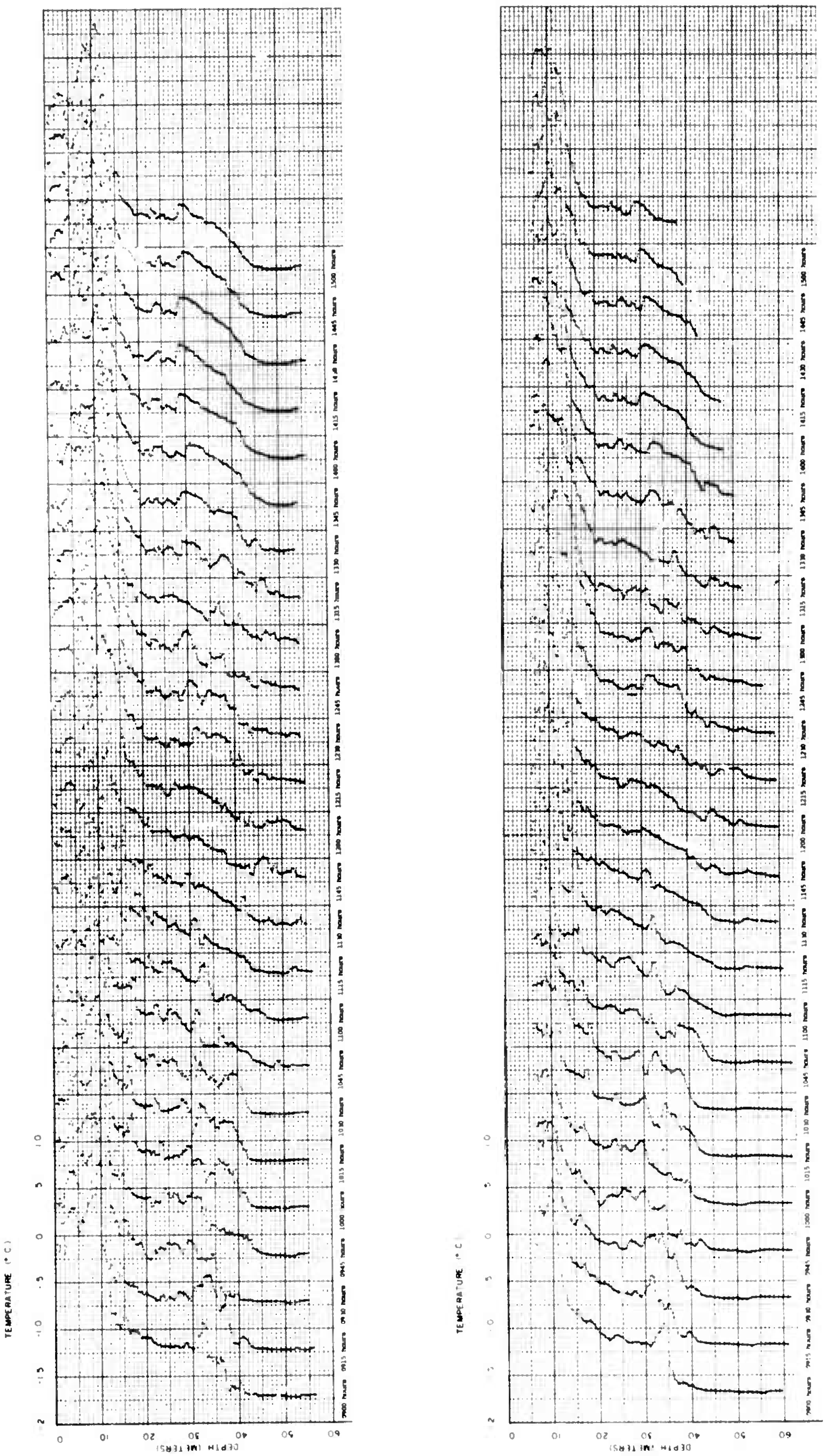


Figure 14c. Temperature Profiles; Camp 1 above, Camp 2 below, 9 August 1972.

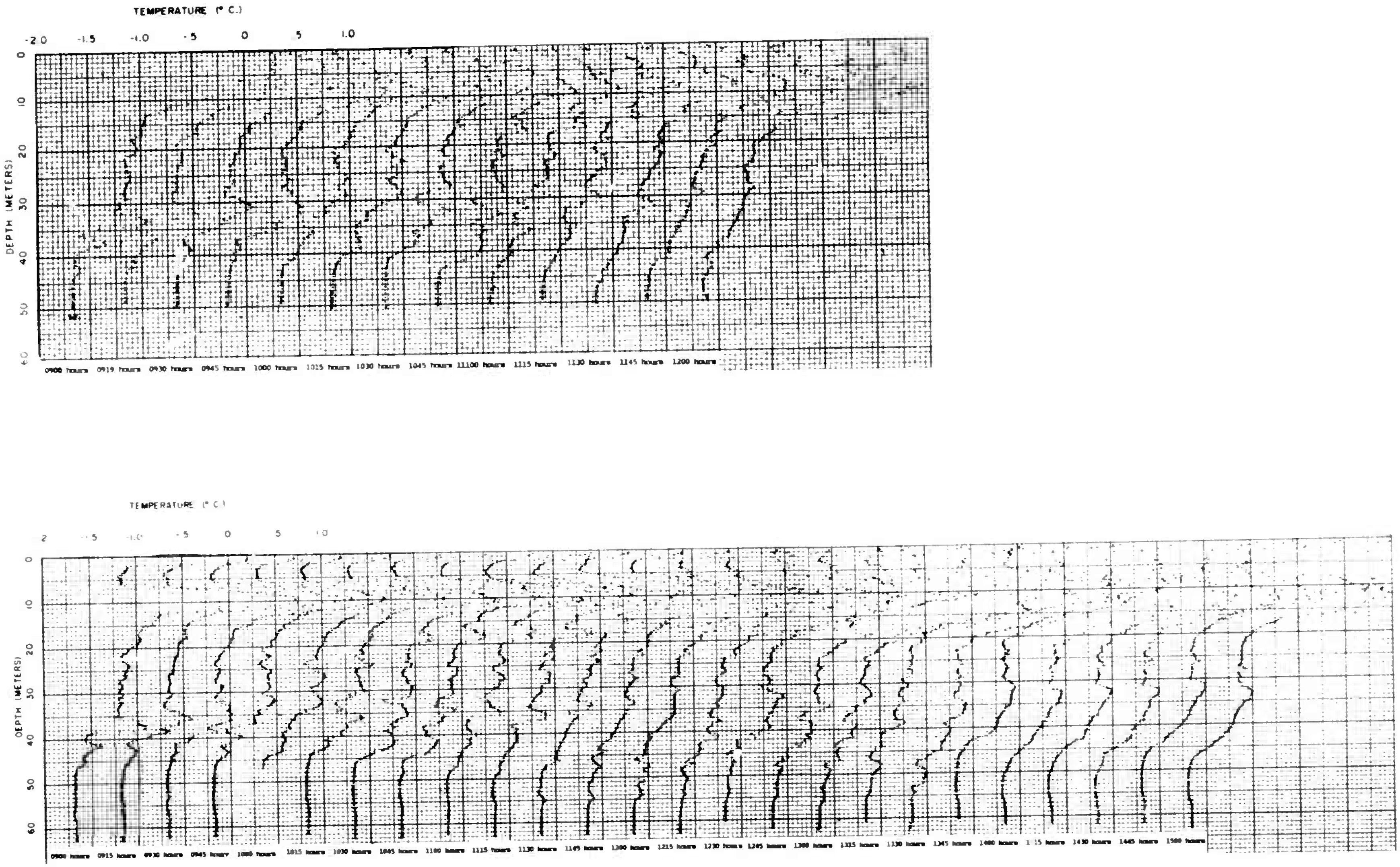


Figure 14d. Temperature Profiles; Camp 3 above, Camp 4 below; 9 August 1972.

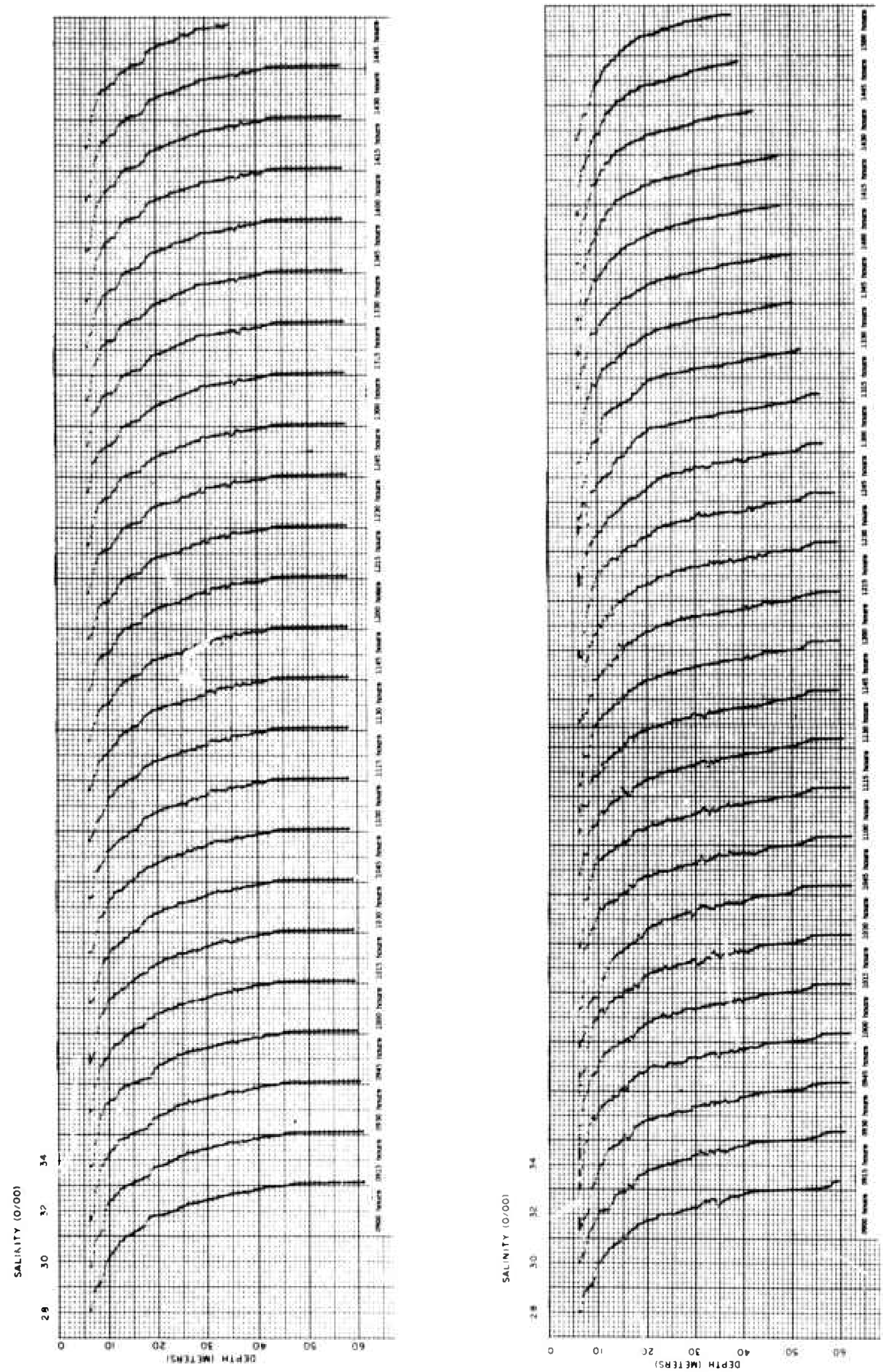


Figure 15. Salinity Profiles, Camp 2; 8 August 1972 above, 9 August 1972 below.

From 3 to 7 August speed profiles were taken by lowering the instrument slowly while manually recording the Vibrotron output and rotor count. Later, the instrument was held at each depth long enough to get a stable reading. The current measurements are relative to the floe, which is usually moving. Direction profiles were taken separately, stopping the instrument at every meter of depth to record the magnetic direction of the current flow. The direction vane was then dragged along the bottom to obtain the direction of the floe's movement. These data are presented in Figures 16-18. The reading near the bottom is an indication of the actual speed of the floe with respect to the bottom. When both the speed and direction of the floe's movement are known, the current reading can be corrected.

Prior to 7 August the current speed was less than 10 cm/sec and the direction was fairly constant below 10 m. On 7 August (see Figure 19) the floe picked up speed in a southeasterly direction and the current relative to the floe was about 20 cm/sec. This is about the same magnitude as the floe speed shown on the ice floe drift track, Figure 12, which means that at this time the absolute current was moving at twice the speed of the floe, or 40 cm/sec.

On 8 August the floe moved at about 8 cm/sec in the same direction as the relative current, which dropped to 5 cm/sec (see Figure 20).

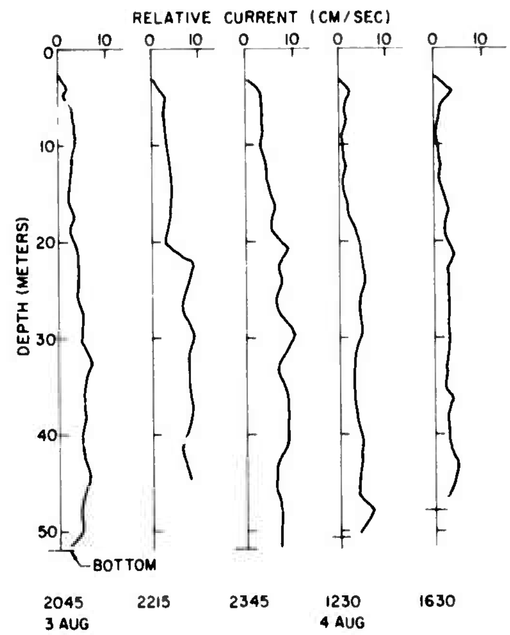


Figure 16. Current Measurements from the Ice Floe on 4 August.

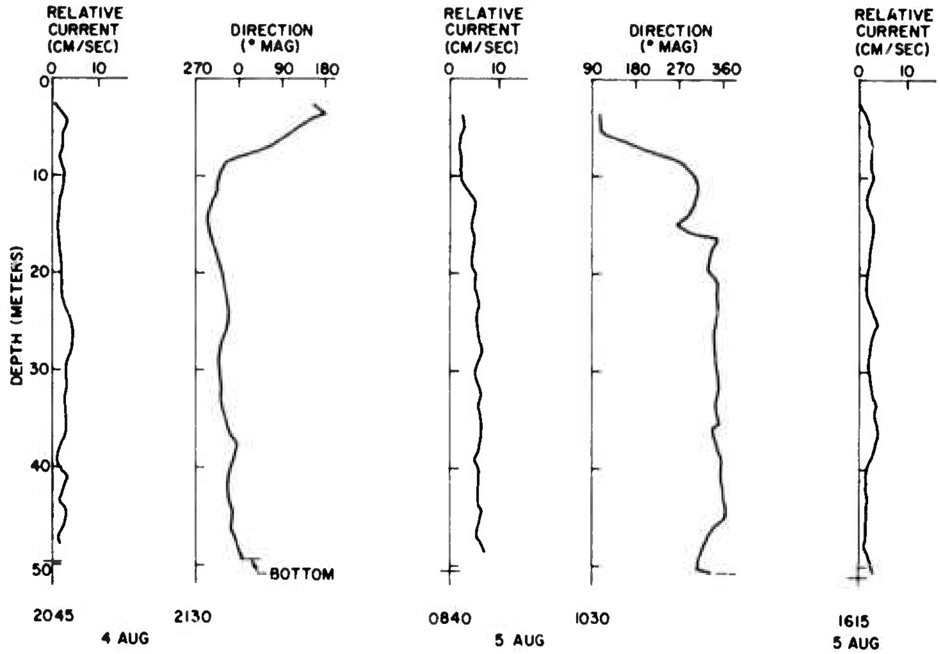


Figure 17. Current Measurements from the Ice Floe on 4, 5 August.

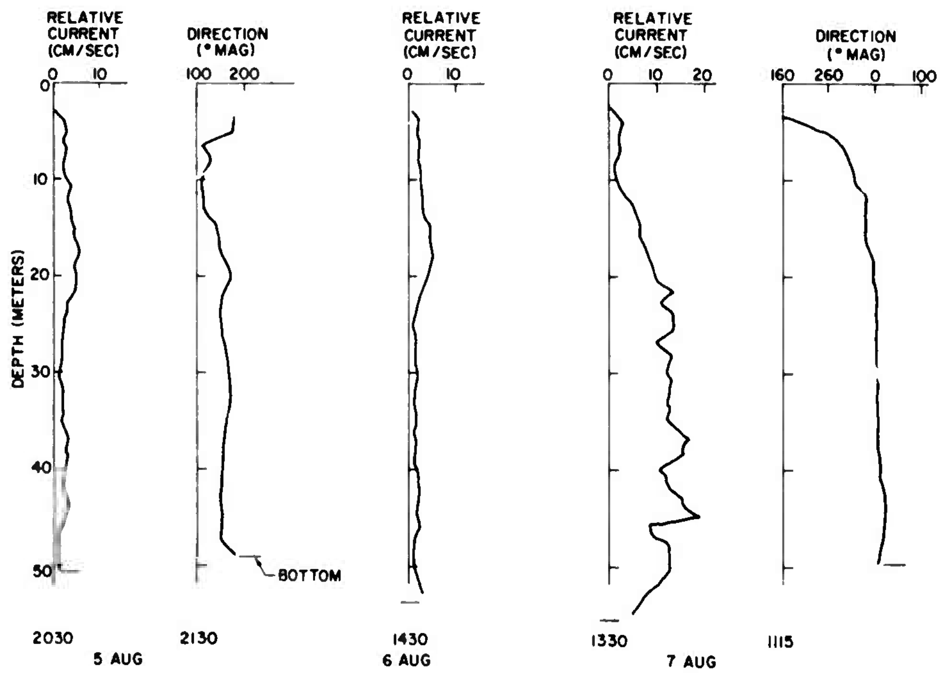


Figure 18. Current Measurements from the Ice Floe on 5-7 August.

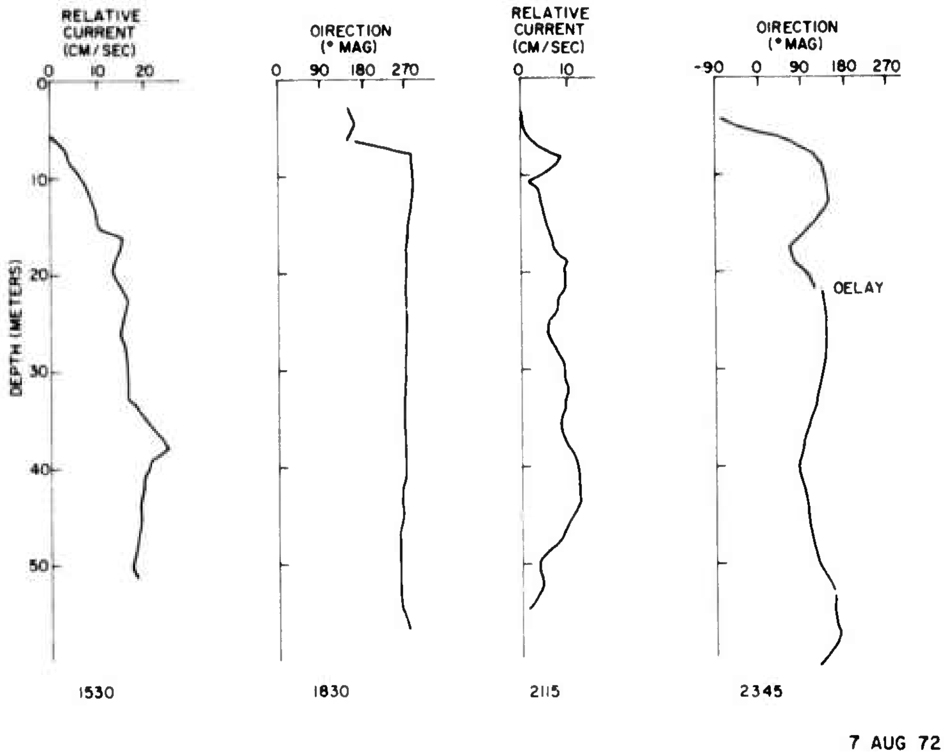


Figure 19. Current Measurements from the Ice Floe on 7 August.

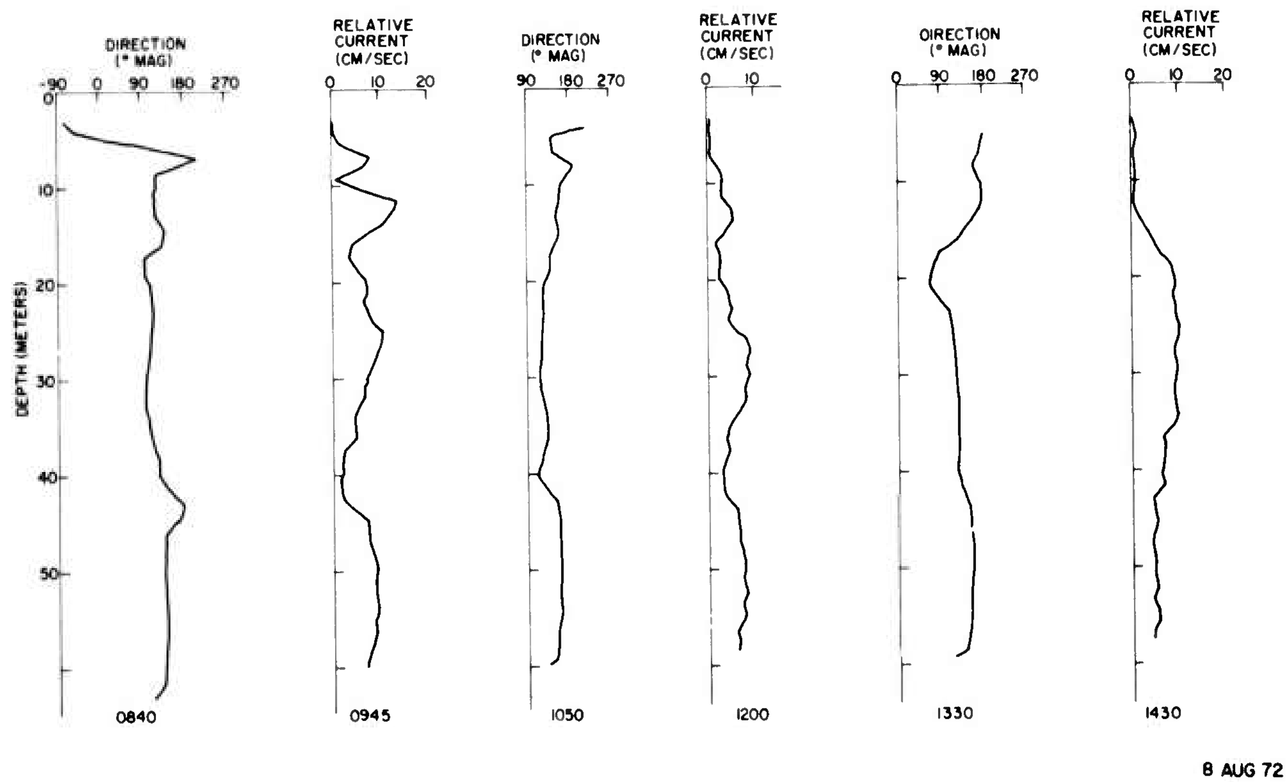


Figure 20. Current Measurements from the Ice Floe on 8 August.

On 9 August (see Figure 21) the floe picked up speed and headed east-northeast. Again the absolute current was 40 cm/sec with the floe at half that speed.

On 10 August the floe moved east-northeast at 35 cm/sec and the relative current built up to 25 cm/sec in the same direction, indicating an absolute current of 60 cm/sec (see Figure 22).

On 11 August the floe drift track showed a speed of about 100 cm/sec. A relative current of 20 cm/sec was measured at 15 m, indicating an absolute current of 120 cm/sec. At depths from 20 to 30 m the relative current was near zero (see Figure 23). The increase in relative speed below 30 m may indicate a current in the opposite direction, in which case it would represent water moving slower than the floe. Unfortunately, no direction measurements were made at this time.

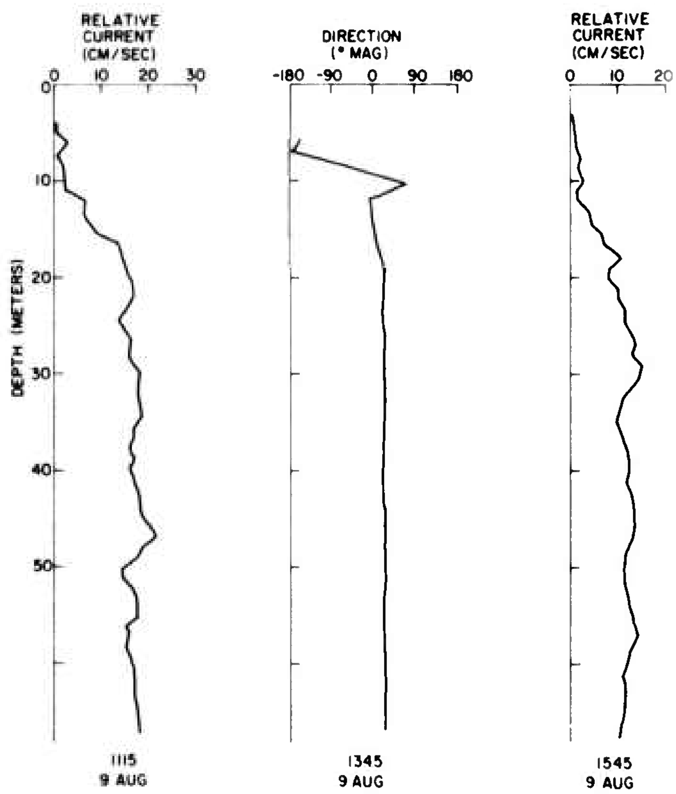


Figure 21. Current Measurements from the Ice Floe on 9 August.

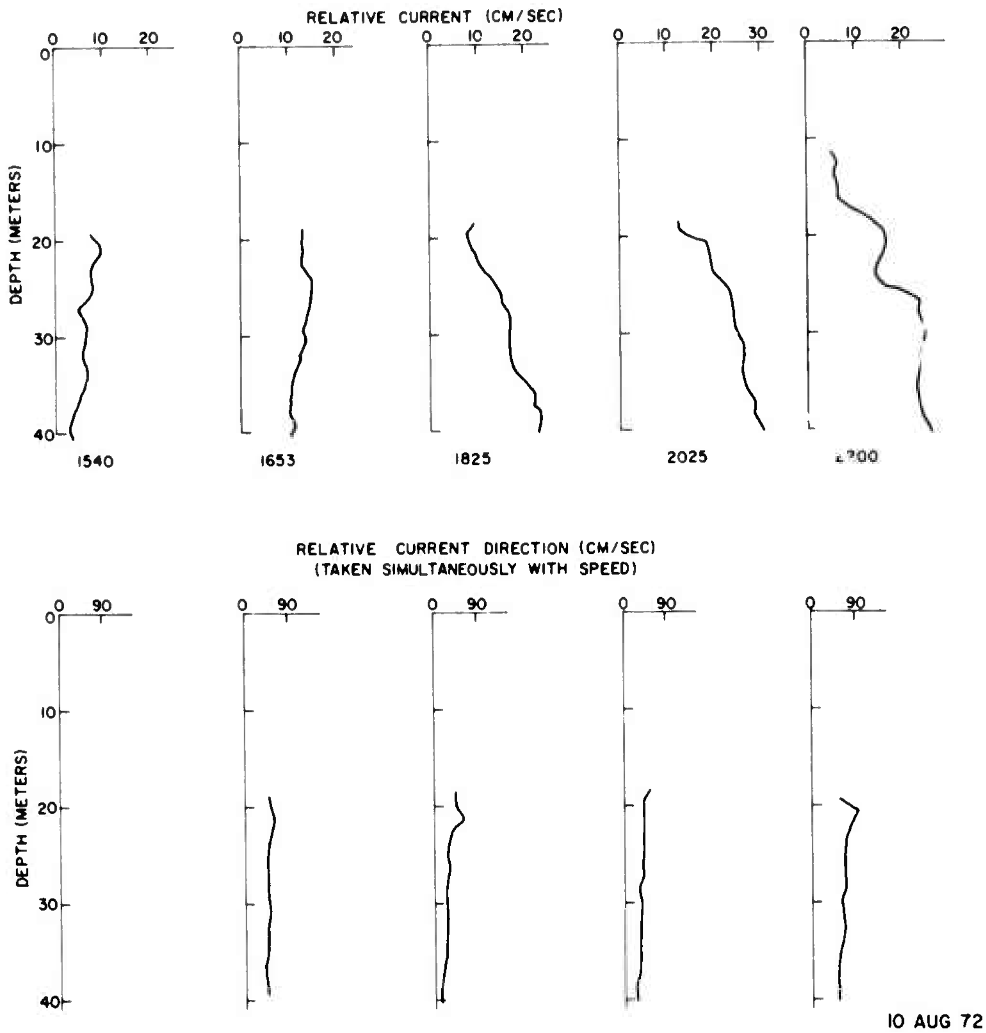


Figure 22. Current Measurements from the Ice Floe on 10 August.

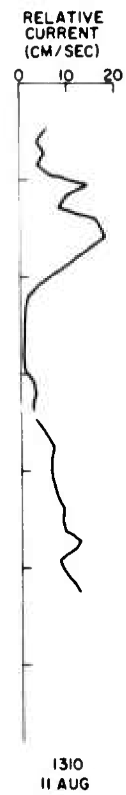


Figure 23. Current Measurements from the Ice Floe on 11 August.

ACOUSTIC DATA

The acoustic studies consisted of short-range transmission measurements between stations on the ice floe and volume reverberation measurements from the icebreaker.

Short Range Transmission

Acoustic transmission measurements at 60 kHz were made from one station on the ice floe to another. The receiver was placed at Camp 1 and the transmitter was placed on the extension of a line from Camp 1 through Camp 2 to give a transmission path of 230 yd. Conditions along the path were determined by the temperature conductivity probe at Camp 2 and the temperature probe at Camp 1. The transmitting transducer was placed at a depth of 33 meters and produced 60-kHz acoustic pulses 4 msec in length at a repetition rate of two per second. The receiving transducer was suspended 1 meter below the thermistor-Vibrotron probe by a separate cable married to the profiling cable. The received sound intensity was punched into paper tape along with the temperature and depth data. In this way temperature and sound intensity were measured simultaneously about every 0.3 meter from the surface to a depth of 50 meters.

Intensity profiles were obtained with every temperature profile taken at Camp 1 from 4 August to 11 August. A typical example is shown in Figure 24, which shows the temperature profile at Camp 1 along with the intensity profile (transmitter depth, 33 m; transmission path, 238 yd). The variation in received intensity is about ±6 dB when temperature variations occur near the depth of the transmission. The temperature layers producing this variation are about ±0.2°C from the average smoothed temperature profile.

More complete sets of data were also obtained. A sample is shown in Figure 25, which includes the temperature profiles at both Camp 1 and Camp 2 and the salinity profile at Camp 2, which was about one-third of the way from the transmitter to the receiver. The transmitter was at a depth of 40 meters and the distance from the transmitter to the receiver was 150 yd.

The temperature profile, with its prominent 0.3°C warmer layer at 25 meters and 0.3°C colder layer at 30 meters, produces a 5-meter thick region at 150 yards where the intensity is more than 10 dB below normal. In general, the fluctuations in intensity were of this magnitude but tended to change sign with every 2 or 3 meters of depth.

Plots of all temperature and intensity profiles taken at regular time intervals with constant range and depth are included in Appendix C. Those profiles taken for various source depths and at various ranges are presented in Appendix D.

In Figure 26 the intensity profiles taken during the 6-hour studies on 8 and 9 August are plotted alongside the corresponding temperature profiles to show the interrelationship.

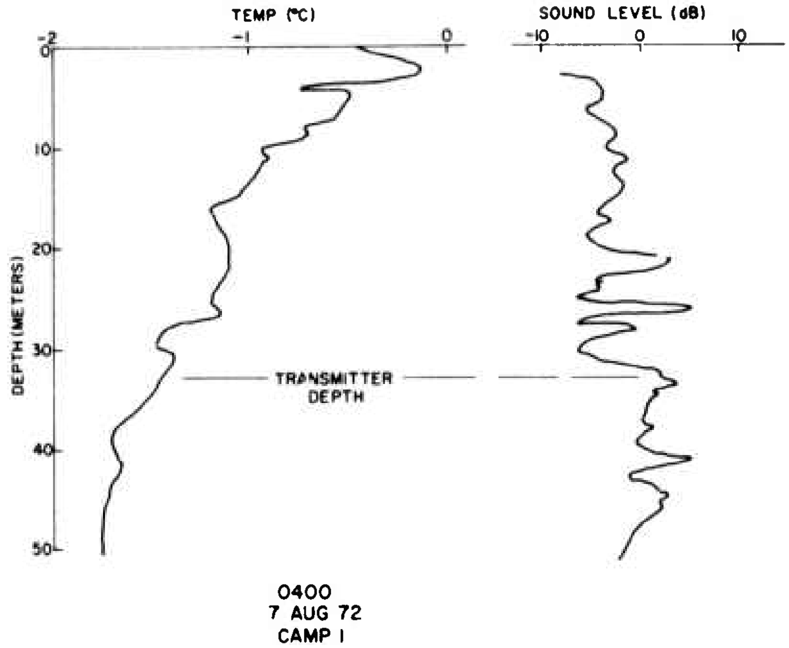


Figure 24. Sound Intensity Distortion.

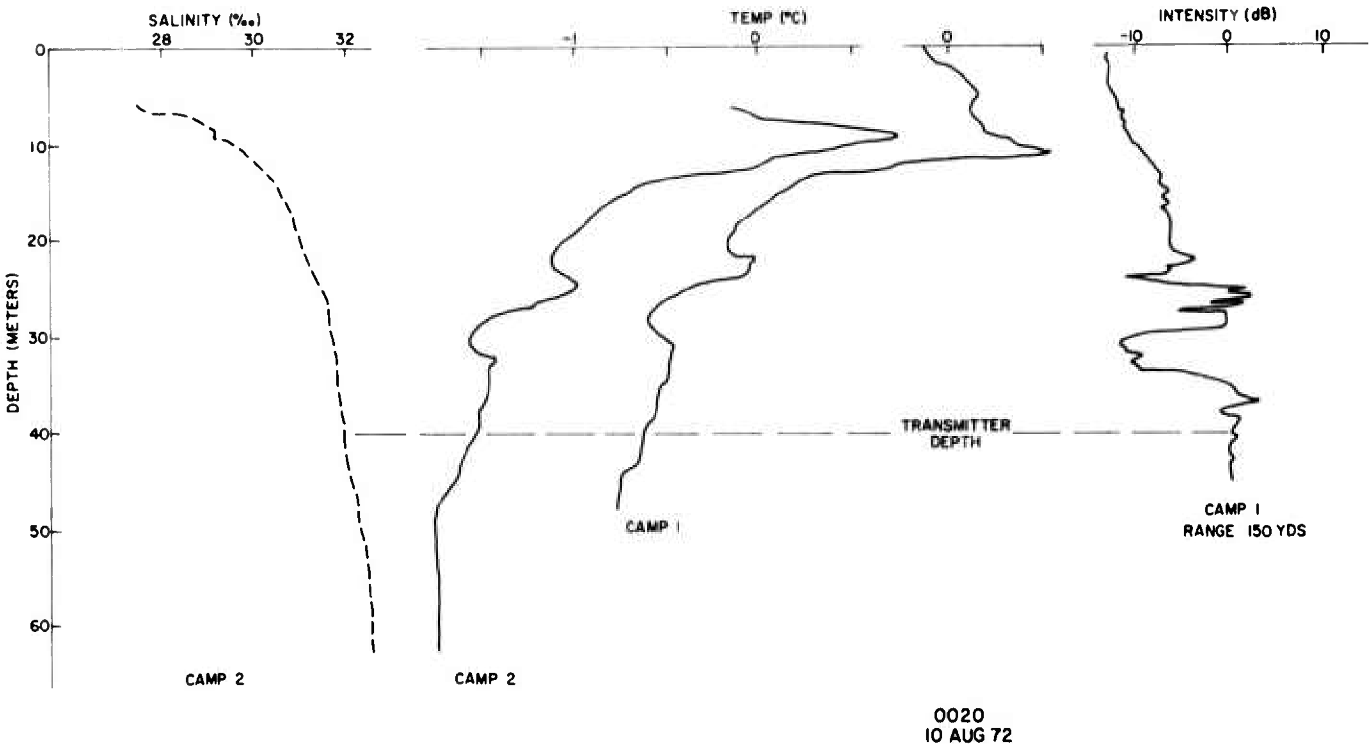


Figure 25. Sound Intensity Anomaly.

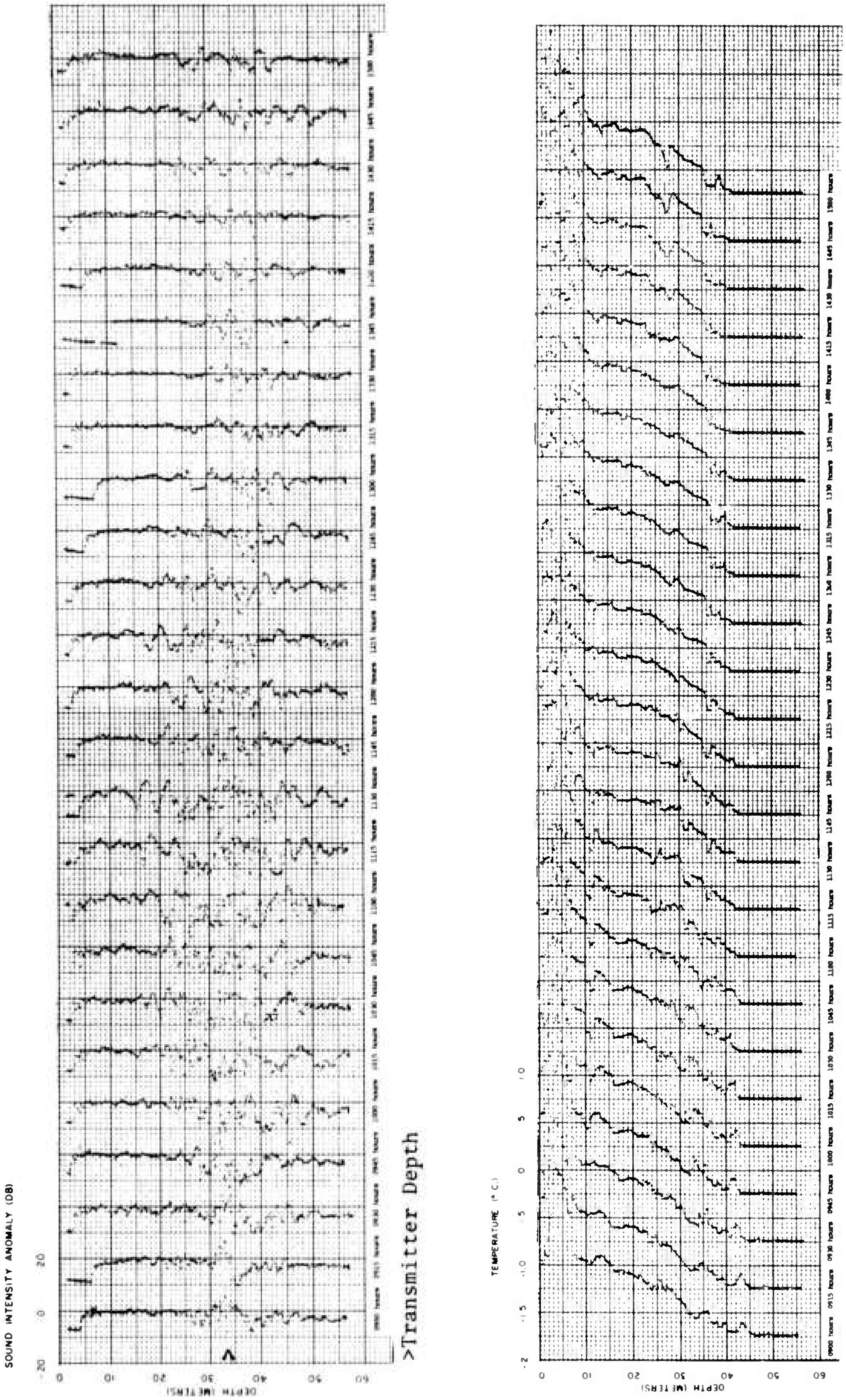


Figure 26a. Series of Intensity and Temperature Profiles for 8 August 1972.

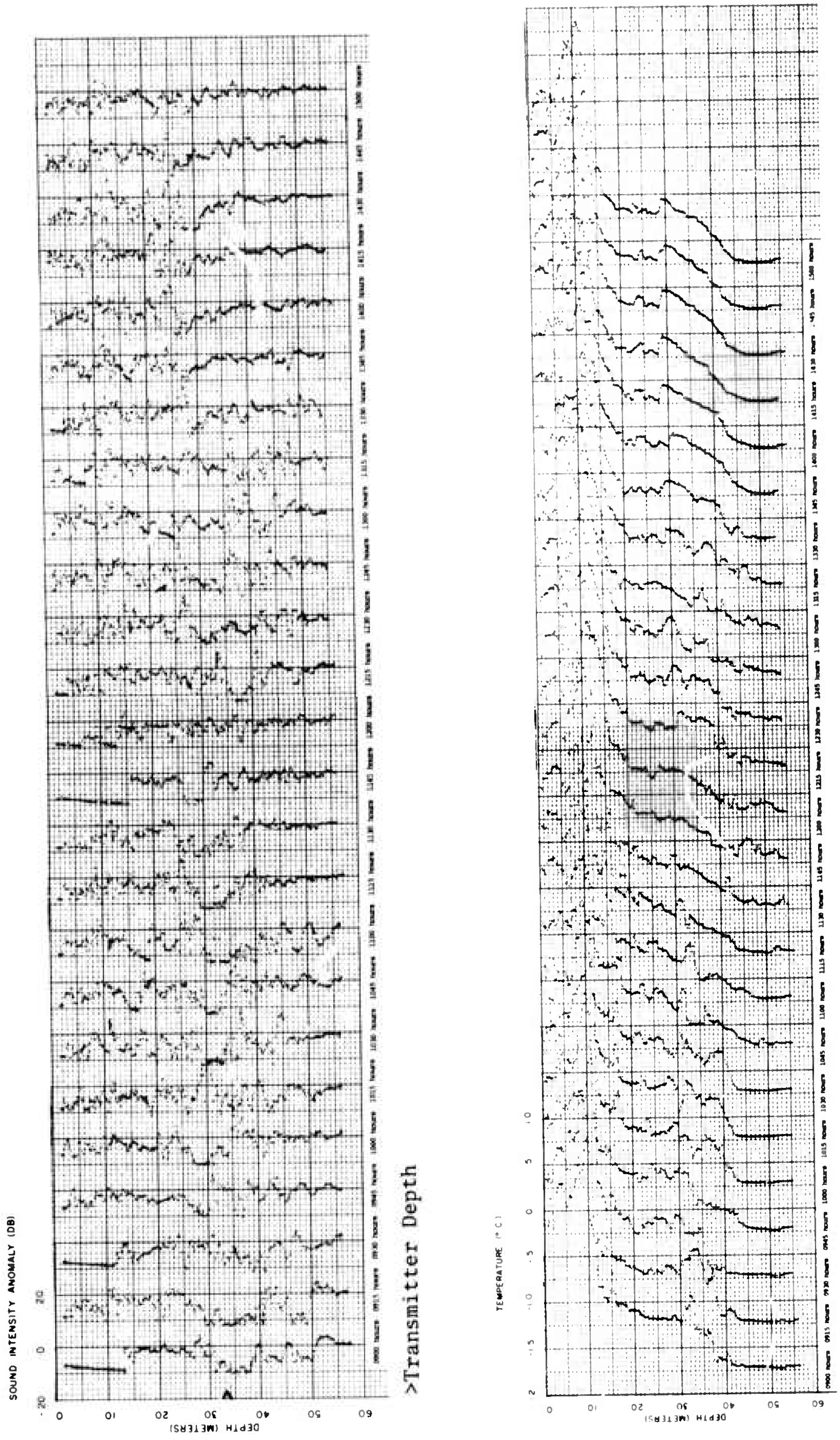


Figure 26b. Series of Intensity and Temperature Profiles for 9 August 1972.

Volume Reverberation

Measurements of volume scattering strength in the Chukchi Sea were made from the icebreaker STATEN ISLAND during two cruises, 20-29 July and 13-18 August 1972. The data were taken with two downward-looking, narrow beam, pulsed, echo-sounding systems, one operating at 38 kHz and one at 105 kHz.

The transducers were calibrated and their beam patterns measured at the Applied Physics Laboratory. The remainder of the system was calibrated before each measurement by introducing a known RF voltage at the input from the transducer and recording the resultant signal on the data track of the tape deck immediately prior to recording the echo data. The data and synchronization pulses were recorded on 2-track analog tape decks and analyzed on the DDAPS* system (Ref. 2), as were the 105-kHz data in 1971, to obtain quantitative results for the acoustic volume scattering strength in each of 10 depth intervals at each location.

Measurements were made at 81 locations with the 38-kHz system and at 98 locations with the 105-kHz system along the tracks shown in Figure 4. At most of these locations a conductivity and a temperature profile were also taken, and at 35 locations some biological sampling was performed. Approximately 29 vertical net hauls and 55 horizontal trawls were performed by Mr. Miles Furnas of the University of Washington Department of Oceanography. The final report will include a discussion of the relationship between the observed volume scattering strength, the conductivity and temperature profiles, and the biological samples.

In addition to recording the data on magnetic tape for subsequent analysis, echogram recordings were made of both the 38- and 105-kHz data. The results were extremely variable. Scattering layers were observed at all depths but there was a general tendency for the strongest volume scattering to occur in the top 40-50 meters. In particular, it was noted that there was considerable scattering in the top 10-15 meters when an intrusion of warm surface water was observed by the CTD profiler. Figures 27 and 28 show a sample of the echograms recorded by each system at the same location in about 25 fathoms of water, a depth typical of the region. Easily observed are a dense group of small scatterers in the top 8 meters or so, two layers in the neighborhood of 20 meters, and assorted individual scatterers at greater depths. Although there is a fairly good correspondence between these particular records at the two frequencies, such correspondence is often not so marked. A particular effort will be made in the data analysis to identify the biological species causing the scattering on the basis of the relative scattering strength between the two frequencies.

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*Digital Data Acquisition and Processing System. Developed at the University of Washington, this system gives the average scattering strength in each of up to 10 depth intervals.

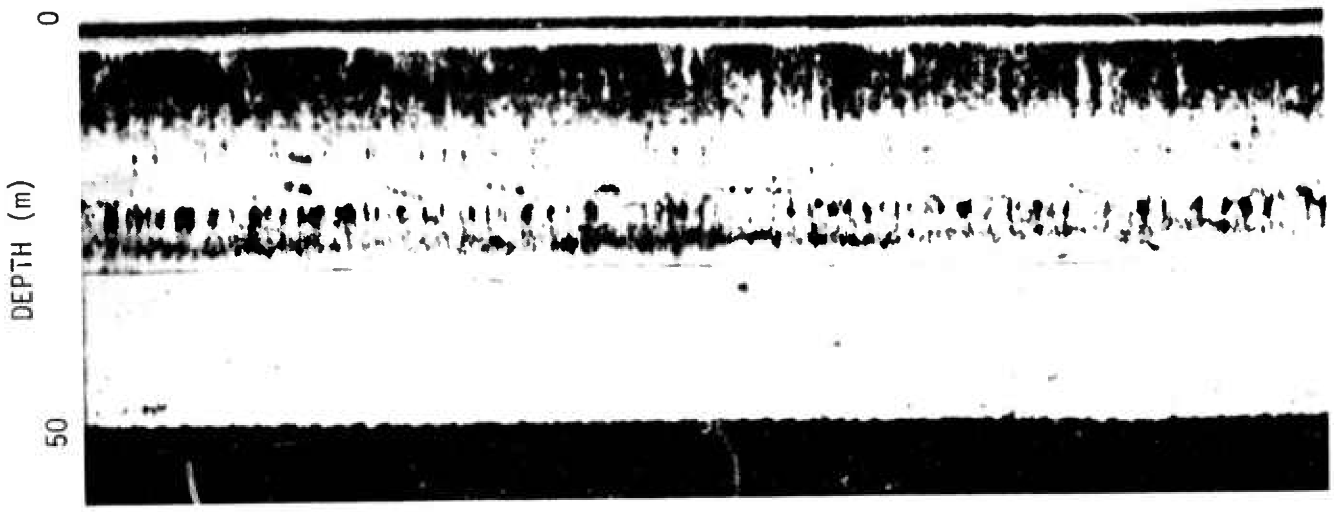


Figure 27. Echogram Taken at 38 kHz.

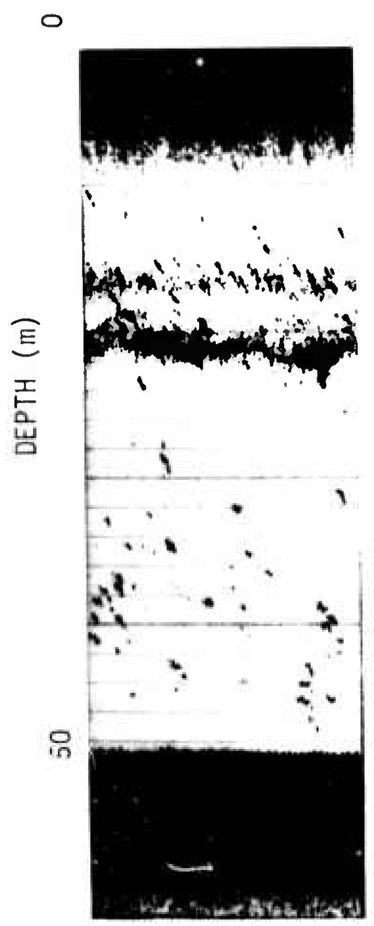


Figure 28. Echogram Taken at 105 kHz.

ENVIRONMENTAL DATA

Although our main interest in these studies was below the surface, observations above the surface were considered important because of the interaction between air and sea. Routine environmental observations were taken from the ice floe during most of the encampment.

Weather

Observations and readings of several instruments were taken hourly on the ice floe about 16 hours each day. All information was recorded in a log book for the period of the ice floe occupation, 2-11 August. A tabulation of this data appears in Figure 29.

The wind speed was measured with a 3-cup anemometer mounted on a 12-ft pole. A magnetic pick-off sent electrical pulses to a counter at the foot of the pole. Wind speeds were low except for winds of 20-30 mph on 6 August and 15-20 mph on 8 August. The wind direction was estimated by facing the wind and noting the direction on the compass. Winds were from the east at first, changing to westerly on 5 August and continuing westerly or southwesterly until the floe was abandoned on 11 August. A graph of wind speed and direction is given in Figure 30.

The barometric pressure was recorded by an aircraft altimeter with a barometric correction. The altitude was brought to zero with the correction control and the barometric pressure was then obtained by reading the control setting. The peaks in pressure are summarized below:

High	2 Aug	30.28
Low	6 Aug	29.28
High	7 Aug	29.87
Low	8 Aug	29.60
High	9 Aug	29.98
Low	10 Aug	29.79
High	11 Aug	29.96

Air temperature was measured with a thermocouple meter sheltered from the sun. The temperature usually dropped to near freezing at night. On sunny days it rose as high as 52°F. During rainy days it varied between 40°F and 45°F.

Other Routine Measurements

Floe orientation was measured with a marine binnacle compass fixed on the floe. The reference line was established along the initial radio beacon antenna. The floe changed orientation at a varying rate with a maximum of about 15°/hr. The fastest changes occurred with rapid changes in the wind. (See Figure 29 for the tabulated data and Figure 30 for a plot of floe orientation.)

DATE	TIME	WIND V MPH	WIND DIR °MAG	BAROM "HG	AIR TEMP °F	FLOE DIR °MAG	WATER DEPTH, M	RADAR XPNDR	RADIO BEACON	STATEN ISLAND	SUN	SKY	REMARKS
2 AUG	0100	6	90	30.28	44	14	–	–	–	–	NOT VIS	$\frac{1}{2}$ CLOUD, LOW FOG	
	0900	2	160	30.25	40	65	–	–	–	–	NOT VIS.	HAZY	
	1300	–	–	–	–	125	–	–	–	–	–	–	
	1600	–	–	–	–	–	50.2	–	–	–	–	–	
	1800	4	100	30.22	47	142	51.1	–	–	–	VISIBLE	CLEAR, NO FOG	
	2100	$3\frac{1}{2}$	90	30.15	44	155	51.2	–	–	–	VISIBLE	CLEAR, SUNNY	
	2300	5	90	30.13	47	155	–	–	–	–	VISIBLE	CLEAR, NO HAZE	
	2400	3	80	30.13	43	1.5	–	–	–	–	OBSCURED	CLEAR, LOW HAZE	
3 AUG	0100	3	80	30.11	42	155	50.8	–	–	–	OBSCURED	CLEAR, LOW HAZE	
	0300	$1\frac{1}{2}$	85	30.04	52	150	51.2	–	–	–	HAZY	LOW FOG	$\frac{1}{8}$" SKIM ICE ON PONDS & OCEAN
	1200	2	80	29.96	52	135	50.2	–	–	–	VISIBLE	CLEAR	
	1400	2	340	29.98	52	130	49.9	–	–	–	VISIBLE	CLEAR	
	1500	$2\frac{1}{2}$	60	29.94	–	130	–	–	–	–	VISIBLE	CLEAR	
	1600	$3\frac{1}{2}$	40	29.88	45	125	50.8	–	–	–	VISIBLE	CLEAR	
	1800	$2\frac{1}{2}$	350	29.86	42	125	50.1	–	–	–	VISIBLE	CLEAR	
	1900	4	330	29.84	41	125	50.0	–	–	–	VISIBLE	CLEAR	
	2000	4	000	29.84	42	125	49.8	–	–	–	VISIBLE	CLEAR	
	2100	5	320	29.82	38	125	49.4	–	–	–	262° MAG.	$\frac{1}{2}$ CLOUD, NO FOG	
	2200	3	300	29.81	38	125	49.7	–	–	–	275° OBSCURED	$\frac{1}{2}$ CLOUD	
	2300	$5\frac{1}{2}$	290	29.80	39	125	49.3	–	–	–	296° OBSCURED	$\frac{1}{2}$ CLOUD	
	2400	2	010	29.79	39	120	49.5	–	–	–	309°	CLEAR	
4 AUG	0100	1	330	29.78	35	120	49.6	–	–	–	319	CLEAR, LOW CLOUDS	SKIM ICE ON OCEAN

Figure 29. MIZPAC 72 - Station Able - Camp 2 - Weather and Observations.

DATE	TIME	WIND V. MPH	WIND DIR °MAG	BAROM "HG	AIR TEMP °F	FLOE DIR °MAG	WATER DEPTH, M	RADAR XPNDR	RADIO BEACON	STATEN ISLAND	SUN	SKY	REMARKS
4 AUG	0900	1	320	29.70	42	125	48.9	–	–	–	75° MAG	CLEAR, DISTANT HAZE,	1/4" SKIM ICE
	1000	0	–	29.62	42	135	48.8	–	–	–	90°	CLEAR	
	1200	0	–	29.64	43	140	49.4	–	–	–	VISIBLE	CLEAR	
	1300	0	–	29.63	43	127	49.3	–	–	–	135°	CLEAR	
	1400	0	–	29.61	45	150	48.9	–	–	–	150	CLEAR	
	1500	0	–	29.60	46	156	49.7	–	–	–	165	1/2 CLOUD	
	1600	0	–	29.59	45	158	48.5	–	–	–	185	3/4 CLOUD	
	1700	0	–	29.58	44	161	48.7	–	–	–	202	1/2 CLOUD	
	2000	1/2	90	29.54	42	171	48.9	–	–	–	OBSCURED	3/4 CLOUD	
	2100	0	–	29.53	42	176	47.9	–	–	–	OBSCURED	3/4 CLOUD	
	2200	0	–	29.52	42	181	48.5	–	–	–	OBSCURED	3/4 CLOUD	
	2300	1/2	180	29.52	38	186	48.7	–	–	–	OBSCURED	CLOUDY	
	2400	1	240	29.52	44	190	47.8	–	–	–	OBSCURED	CLOUDY	
5 AUG	0500	–	–	–	–	–	–	–	–	–	–	RAINED ≅.05"	
	0800	4	240	29.51	36	255	48.5	OFF	–	–	60°-OBSCURED – CLOUDY		NO ICE ON OCEAN
	0900	3	180	29.52	44	260	48.6	–	–	–	85°-OBSCURED – CLOUDY		
	1000	8	190	29.52	43	265	48.2	–	–	–	OBSCURED	CLOUDY	
	1100	6	210	29.52	41	275	49.0	–	–	–	110°-OBSCURED, CLOUDY, FOG, HAZE.		
	1200	10-12	210	29.54	46	280	49.2	–	–	–	120°	HAZY	
	1300	8	220	29.52	49	292	49.0	ON	–	NEARBY	144°	OVERCAST & FOG	
	1400	6	210	29.52	47	308	49.4	ON	–	NEARBY	160°	FOG & HAZY	
	1500	4	210	29.51	48	325	49.4	ON	–	DEPARTED	180	1/2 CLOUD	
	1600	3	190	29.51	51	332	48.7	ON	–	–	195	LIGHT OVERCAST	

Figure 29. MIZPAC 72 - Station Able - Camp 2 - Weather and Observations, cont.

DATE	TIME	WIND V MPH	WIND DIR °MAG	BAROM "HG	AIR TEMP °F	FLOE DIR °MAG	WATER DEPTH, M	RADAR XPNDR	RADIO BEACON	STATEN ISLAND	SUN	SKY	REMARKS
5 AUG	1700	3	160	29.51	46	340	50.7	ON	—	1 MI @ 260°	214°	HAZY, LIGHT CLOUDS	
	1800	1	170	29.48	50	350	49.7	ON	—	HIDDEN IN FOG	OBSCURED	HAZY, LIGHT MIST	
	1900	4	130	29.48	48	000	49.1	ON	—	1 MI @ 260°	242	CLOUDY	
	2000	6	120	29.45	46	003	49.3	ON	—	1 MI @ 260°	OBSCURED	CLOUDY	
	2100	7	140	29.43	44	010	49.2	ON	—	1 MI @ 270	OBSCURED	CLOUDY	
	2200	8	140	29.40	44	015	49.5	ON	—	1 MI @ 280	OBSCURED	CLOUDY	
	2300	12-16	160	29.38	45	018	50.1	ON	—	1 MI @ 290	OBSCURED	CLOUDY	
	2400	12	170	29.37	40	017	48.6	ON	—	1 MI @ 310	HEAVY OVERCAST & RAIN		
6 AUG	0800	18-24	160	29.28	36	240	50.6	ON	—	INVISIBLE	OVERCAST,	CLOUDS & RAIN	RAIN & STRONG WINDS DURING NIGHT
	0900	10-12	190	29.31	40	238	50.8	ON	—	½ MI @ 150°	OBSCURED	OVERCAST	
	1000	14-16	215	29.33	35	243	51.3	ON	—	½ MI @ 150°	OBSCURED	OVERCAST, LIGHT MIST	
	1100	10-12	195	29.37	39	238	51.6	ON	—	½ MI @ 150	110°	½ CLOUD	
	1200	10-12	180	29.40	37	235	50.7	ON	—	½ MI @ 150°	OBSCURED	CLOUDY	
	1300	10-12	210	2939	44	235	51.8	ON	—	ALONGSIDE	145	OBSCURED	
	1400	16-20	220	2943	43	233	51.9	ON	—	DEPARTED	165	¾ CLOUD	
	1500	16-20	250	29.45	42	229	52.1	ON	—	½ MI @ 90°	OBSCURED	CLOUDY	
	1600	20-25	275	29.46	38	217	52.4	ON	—	1 MI @ 90°	OBSCURED	CLOUDY	
	1700	20	280	29.50	38	220	51.9	ON	—	1 MI @ 90°	OBSCURED	OVERCAST	
	1800	20-26	270	29.55	32	222	51.9	ON	—	1 MI @ 90	OBSCURED	OVERCAST	
	1900	25-30	285	29.58	33	233	51.5	ON	—	1 MI @ 100°	OBSCURED	OVERCAST	
	2000	25	280	29.60	33	282	—	ON	—	ALONGSIDE	OBSCURED	OVERCAST	

Figure 29. MIZPAC 72 - Station Able - Camp 2 - Weather and Observations, cont.

DATE	TIME	WIND V MPH	WIND DIR °MAG	BAROM "HG	AIR TEMP °F	FLOE DIR °MAG	WATER DEPTH, M	RADAR XPNDR	RADIO BEACON	STATEN ISLAND	SUN	SKY	REMARKS
6 AUG	2100	19-20	250	29.63	33	294	51.8	ON	—	DEPARTED	OBSCURED	OVERCAST	
	2200	16-20 GUSTS-25	250	29.66	33	325	52.3	ON	-	1 MI @ 230°	OBSCURED	OVERCAST	
	2300	12-15	250	29.68	33	337	52.9	ON	-	1 MI @ 180	OBSCURED	OVERCAST	
	2400	10	260	29.70	32	342	52.9	ON	-	INVISIBLE	OBSCURED	FOG - LIGHT MIST	
7 AUG	0900	14	260	29.76	33	325	61.6	ON	-	OUT OF SIGHT	OBSCURED	OVERCAST	
	1000	18	250	29.79	35	320	58.6	ON	—	OUT OF SIGHT	105°	CLOUDY	
	1100	20	260	29.80	37	318	53.7	ON	—	2 MI. @220	120°	HAZY, OVERCAST	
	1200	16-20	240	29.82	39	320	53.4	ON	-	ALONGSIDE	OBSCURED	HAZY, OVERCAST	
	1300	10-12	245	29.83	37	320	53.7	ON	—	DEPARTED OUT OF SIGHT	150°	HAZY, OVERCAST	
	1400	10-12	250	29.85	35	330	54.5	ON	—	OUT OF SIGHT	165°	HAZY	
	1500	14	250	29.86	37	330	54.0	OFF	—	OUT OF SIGHT	180	HAZY, OVERCAST	
	1600	8	250	29.84	39	318	53.5	OFF	-	OUT OF SIGHT	205°	—	
	1700	10	280	29.85	40	302	54.4	ON & OFF	-	OUT OF SIGHT	225°	HAZY, OVERCAST	
	1800	12	270	29.86	41	290	55.8	OFF & ON	—	OUT OF SIGHT	OBSCURED	OVERCAST	
	1900	10	280	29.87	46	290	56.4	OFF	—	OUT OF SIGHT	OBSCURED	OVERCAST	
	2000	4	270	29.86	43	295	57.2	OFF	—	OUT OF SIGHT	OBSCURED	OVERCAST	
	2100	4	230	29.85	44	295	58.0	ON & OFF	ON	OUT OF SIGHT	OBSCURED	OVERCAST	
	2200	6	250	29.85	41	286	60.1	ON	ON	OUT OF SIGHT	OBSCURED	OVERCAST	
	2300	2	270	29.85	36	270	61.2	ON	OFF	ALONGSIDE	OBSCURED	OVERCAST	
	2400	2	310	29.85	37	270	60.8	ON	OFF	OUT OF SIGHT	OBSCURED	OVERCAST	
8 AUG	0100	1	290	29.86	36	265	59.8	ON	—	OUT OF SIGHT	OBSCURED	OVERCAST	
	0200	0	—	29.84	34	260	59.6	ON	-	OUT OF SIGHT	OBSCURED	OVERCAST	
	0300	1	80	29.84	31	260	59.1	ON	—	OUT OF SIGHT	OBSCURED	OVERCAST	

Figure 29. MIZPAC 72 - Station Able - Camp 2 - Weather and Observations, cont.

DATE	TIME	WIND V MPH	WIND DIR °MAG	BAROM "HG	AIR TEMP °F	FLOE DIR °MAG	WATER DEPTH, M	RADAR XPNDR	RADIO BEACON	STATEN ISLAND	SUN	SKY	REMARKS
8 AUG	0400	3	90	29.82	26	260	59.0	ON	—	OUT OF SIGHT	OBSCURED	OVERCAST	
	0500	8	100	29.82	30	255	59.5	ON	—	OUT OF SIGHT	OBSCURED	OVERCAST	
	0600	5	90	29.80	31	245	61.5	ON	—	OUT OF SIGHT	OBSCURED	OVERCAST	
	0700	4	90	29.79	34	240	63.7	ON	—	OUT OF SIGHT	OBSCURED	OVERCAST	
	0800	13	100	29.77	34	235	62.3	ON	—	OUT OF SIGHT	OBSCURED	OVERCAST, FOG	
	0900	12-14	120	29.77	43	221	62.5	OFF	—	OUT OF SIGHT	80°	CLOUDS, LOW FOG	
	1000	8	135	29.77	51	205	60.5	ON	—	OUT OF SIGHT	98	HAZY	
	1100	8	130	29.77	50	192	58.5	ON	—	OUT OF SIGHT	115°	$\frac{3}{4}$ CLOUD, LIGHT HAZE	
	1200	6-8	120	29.73	48	182	59.2	OFF	—	OUT OF SIGHT	OBSCURED	CLOUDY	
	1300	6-8	120	29.71	46	170	59.6	ON	—	2MI@300°	OBSCURED	OVERCAST	
	1400	10	100	29.68	45	165	58.8	ON	—	2MI.@300	OBSCURED	OVERCAST, LIGHT RAIN	
	1500	8-10	100	29.66	47	165	57.8	ON	—	2MI@300	OBSCURED	OVERCAST	
	1600	10	125	29.65	49	163	57.4	OFF	—	2MI@300	OBSCURED	OVERCAST, RAIN	
	1700	10-12	120	29.64	46	165	57.1	ON	—	ALONGSIDE	OBSCURED	OVERCAST, RAIN	
	1800	15	150	29.62	48	165	57.2	OFF	—	INVISIBLE	OBSCURED	THICK FOG	
	1900	14-18	190	29.61	49	161	57.2	OFF	—	INVISIBLE	OBSCURED	THICK FOG	
	2000	16-20	205	29.60	46	160	57.4	OFF	—	$\frac{1}{2}$ MI@030	OBSCURED	OVERCAST	
	2100	16-20	210	29.59	43	180	59.6	OFF	—	INVISIBLE	OBSCURED	THICK FOG	
	2200	16-20	230	29.60	38	190	61.5	OFF	—	INVISIBLE	OBSCURED	THICK FOG	
	2300	20	250	29.61	32	210	63.8	OFF	—	INVISIBLE	OBSCURED	THICK FOG	
	2400	24-28	270	29.65	35	230	67.1	OFF	—	INVISIBLE	OBSCURED	THICK FOG	

Figure 29. MIZPAC 72 - Station Able - Camp 2 - Weather and Observations, cont.

DATE	TIME	WIND V. MPH	WIND DIR °MAG	BAROM "HG	AIR TEMP °F	FLOE DIR °MAG	WATER DEPTH, M	RADAR XPNDR	RADIO BEACON	STATEN ISLAND	SUN	SKY	REMARKS
9 AUG	0800	12	270	29.87	33	310	97.3	OFF	ON	INVISIBLE	OBSCURED	THICK FOG	
	0900	14	270	29.91	33	310	?	OFF	OFF	ALONGSIDE	OBSCURED	THICK FOG	
	1000	4	270	29.94	38	300	110.0	OFF	—	ALONGSIDE	OBSCURED	HAZY	
	1100	4	255	29.96	45	296	113.0	ON	—	—	120°	OVERCAST, FOG	
	1200	2	220	29.98	44	300	110.5	ON	—	ALONGSIDE	135°	OVERCAST	
	1300	1	250	29.97	49	315	114.5	ON	—	ADJACENT	OBSCURED	OVERCAST	
	1400	1	270	29.98	41	325	125.0	ON	—	NEAR BY	OBSCURED	OVERCAST	
	1500	0	—	29.98	45	350	NOT READ	ON	—	NEARBY	OBSCURED	OVERCAST	
	1600	2	010	29.96	45	008	120.0	ON	—	NEARBY	OBSCURED	OVERCAST	
	1700	0	—	29.95	39	020	NOT READ	ON	—	NEARBY	OBSCURED	OVERCAST	
	1800	1	060	29.96	37	030	NOT READ.	ON	—	ALONGSIDE	OBSCURED	OVERCAST	
	1900	1	060	29.94	37	042	NOT READ.	ON	—	NEAR BY	OBSCURED	OVERCAST	
10 AUG	1000	4	310	29.90	35	035	—	ON	—	INVISIBLE	OBSCURED	FOG	
	1100	1	270	29.89	42	020	—	ON	—	INVISIBLE	OBSCURED	OVERCAST, FOG	
	1200	1	240	29.91	48	000	—	ON	—	1MI @220°	135°	THIN OVERCAST	
	1400	1	200	29.90	49	020	—	ON	—	1MI @050°	170°	HAZY	
	1500	1	160	29.88	44	030	—	ON	—	1MI. @050°	180°	HAZY	
	1600	1	150	29.86	45	039	—	ON	—	1MI @060°	OBSCURED	OVERCAST	
	1700	0	—	29.82	47	038	—	ON	—	1MI. @060°	OBSCURED	OVERCAST	
	1800	1	090	29.81	45	040	—	ON	—	INVISIBLE BUT AUDIBLE	OBSCURED	OVERCAST, FOG	
	1900	1	015	29.79	—	049	—	ON	—	INVISIBLE BUT AUDIBLE	OBSCURED	FOG, RAIN	
	2000	1	030	29.78	40	060	—	ON	—	1MI. @050	OBSCURED	FOG, RAIN	

Figure 29. MIZPAC 72 - Station Able - Camp 2 - Weather and Observations, cont.

DATE	TIME	WIND V MPH	WIND DIR °MAG	BAROM "HG	AIR TEMP °F	FLOE DIR °MAG	WATER DEPTH, M	RADAR XPNDR	RADIO BEACON	STATEN ISLAND	SUN	SKY	REMARKS
10 AUG	2100	0	—	29.80	40	069	—	ON	—	2MI @ 045°	OBSCURED	OVERCAST	
	2200	0	—	29.80	37	075	OUT OF SIGHT	ON	—	INVISIBLE	OBSCURED	OVERCAST, FOG, LIGHT RAIN	
	2300	1	210	29.81	—	080	—	ON	—	INVISIBLE	OBSCURED	FOG, RAIN	
	2400	4	200	29.82	37	080	—	ON	—	INVISIBLE	OBSCURED	FOG, RAIN	
11 AUG	0900	8	215	29.91	42	123	—	ON	—	2 MI @ 045	OBSCURED	OVERCAST	
	1000	12	240	29.92	36	121	—	ON	—	2 MI @ 050	OBSCURED	OVERCAST	
	1100	12	290	29.93	39	110	—	OFF	—	NEARBY	110°	CLOUDY	
	1200	10	240	29.95	42	108	—	ON	—	NEARBY	.20°	CLOUDY	
	1300	12	250	29.95	43	088	—	ON	—	NEARBY	150°	OVERCAST	
	1400	8-10	250	29.95	49	052	—	ON	—	1½ MI @ 358	175°	HAZY	
	1600	10	270	29.96	48	315	—	ON	—	2 MI @ 010	OBSCURED	OVERCAST	
	1800	6-8	270	29.95	48	315	—	—	—	1 MI @ 340	OBSCURED	OVERCAST	
	1900	10	275	29.95	42	310	—	ON	—	1 MI @ 290	250°	OVERCAST	
	2000	10	265	29.94	42	300	—	ON	—	1 MI @ 260°	OBSCURED	OVERCAST	
	2100	5	265	29.93	38	295	—	ON	—	INVISIBLE	OBSCURED	CLOUDY, FOG, MIST	
	2200	4	285	29.93	39	340	—	ON	—	2 MI @ 230	OBSCURED	CLOUDY	
	2300	1	265	29.93	33	307	—	ON	—	2 MI @ 240	305°	¼ CLOUD	
	2400	4-6	255	29.94	32	308	—	ON	—	INVISIBLE	SET	LOW CLOUD BANK	

Figure 29. MIZPAC 72 - Station Able - Camp 2 - Weather and Observations, cont.

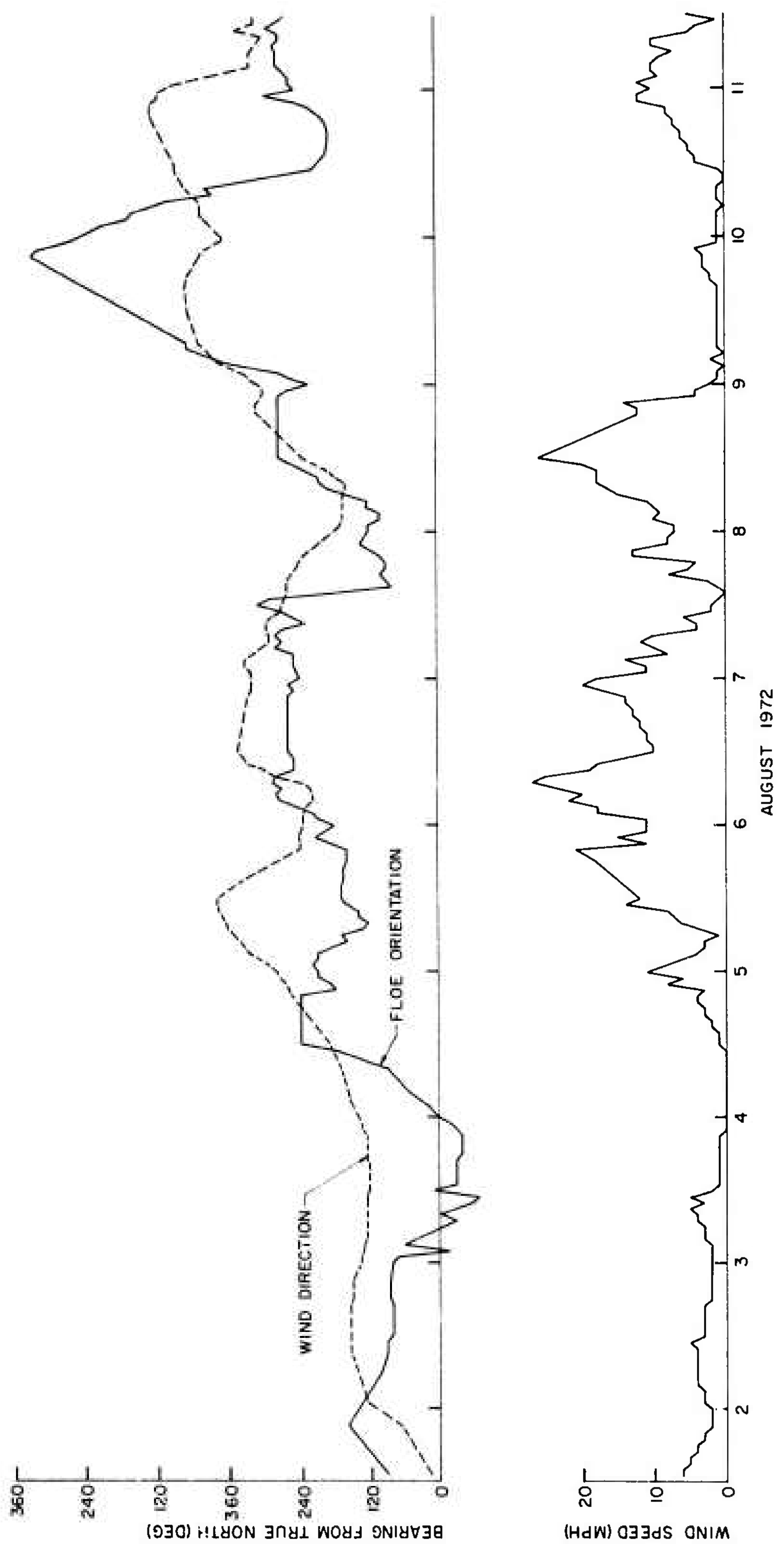


Figure 30. Ice Floe Orientation Compared to the Wind.

Water depth was measured with an acoustic fathometer. Sound pulses at 360 kHz were reflected off the bottom and the transmit and return pulses were used to start and stop an oscillator whose output was gated into a pulse counter. The maximum depth readable was 150 meters. This data is tabulated in Figure 29.

Some additional depth information was obtained by dropping the temperature-depth probe to the bottom and noting the maximum depth recorded by the Vibrotron pressure transducer.

Other observations tabulated in Figure 29 are:

(1) radar transponder, on or off
(2) radio beacon, on or off
(3) location of STATEN ISLAND relative to the floe
(4) bearing of the sun
(5) the sky condition.

REFERENCES

1. APL-UW 7223, "Studies in the Marginal Ice Zone of the Chukchi and Beaufort Seas: A Report on Project MIZPAC-71B," by G.R. Garrison and E.A. Pence, 31 January 1973.

2. APL/Sea Grant Document, "Program Description, DDAFS #1, An Integrator Program to Estimate Fish Population Density," 1 May 1971.

APPENDIX A

CHUKCHI SEA PROFILES FROM ICEBREAKER

Profiles of temperature and conductivity were measured from the icebreaker at the locations shown in Figure 4. Profiles were calculated and plotted for temperature, salinity, sound speed, and density. The few measurements from the helicopter provided temperature data only. A list of the times of these profiles is given below.

Barrow Line

Date	Time
20 Jul	1445, 1830, 2130
21 Jul	0630

Icebreaker lodged in ice

22 Jul	0800, 1110, 1620, 1920
23 Jul	0410, 0430

Helicopter

23 Jul	0930, 1000, 1030, 1100

Near Barrow

23 Jul	1730

Wainwright Line

24 Jul	0210, 0330, 0500, 0615, 0715, 0850, 1040

Icy Cape Line

25 Jul	0015, 0205, 0320, 0535, 0650, 0750, 0925, 1035, 1130, 1315, 1430

Chukchi Crossing

25 Jul	1650, 2010, 2340
26 Jul	0215, 0505, 0750, 1520, 1810, 2035, 2300
27 Jul	0155

Helicopter

26 Jul	0940, 1000, 1020, 1040

Wainwright Line

28 Jul	0200, 0415, 0455, 0600, 0645, 0815, 1000, 1130

Moving northeast

28 Jul	1320, 1500, 1640, 2050

Barrow Line (Westerly)

4 Aug	1145, 1230, 1315, 1410

Helicopter

4 Aug	7 stations at 1500-1700

Wainwright Line (Northerly)

5 Aug	0400, 0515, 0700, 0820, 0915, 1100, 1230

Northeasterly

7 Aug	0445, 0530, 0630, 0715, 0930, 1045, 1210, 1320, 1415, 1510, 1600

Barrow Line

13 Aug	0250, 0500, 0650, 0850, 1030, 1145

Wainwright Line

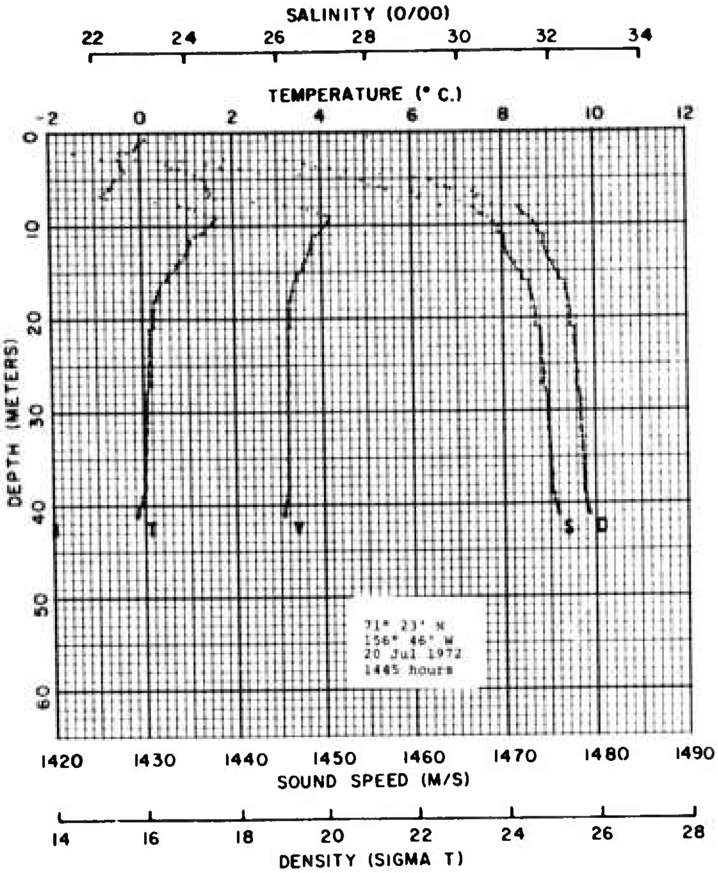
13 Aug	1945, 2215
14 Aug	0000, 0129, 0240, 0340, 0430, 0545

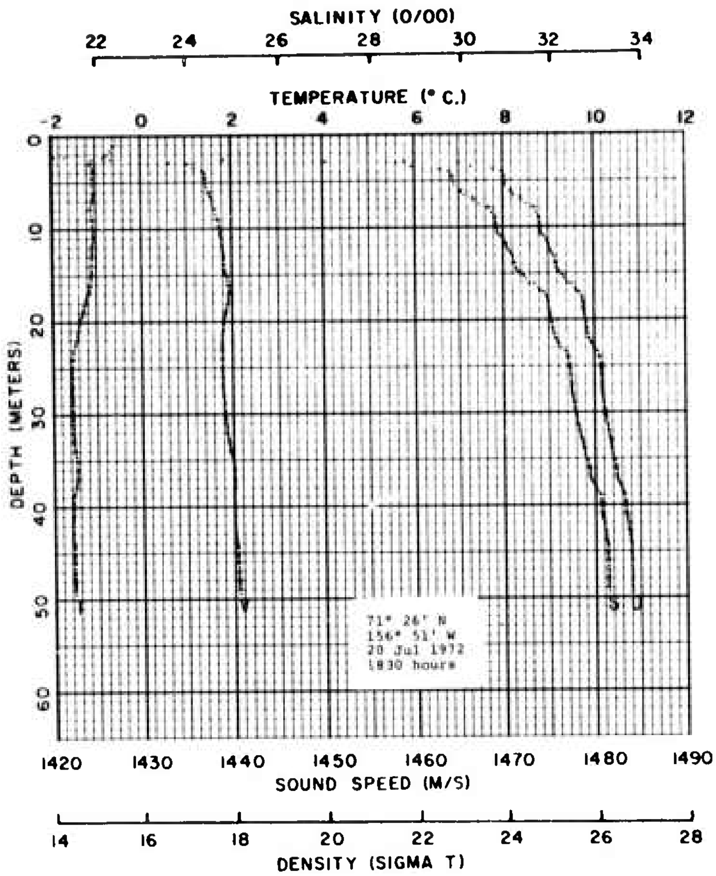
Chukchi Crossing

15 Aug	0110, 0345, 0600, 0835, 1000, 1200, 1410, 1530, 1700, 1900, 2115, 2350
16 Aug	0300

Helicopter

16 Aug	3 stations (not included)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 23' N
156° 46' W
20 Jul 1972
1445 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
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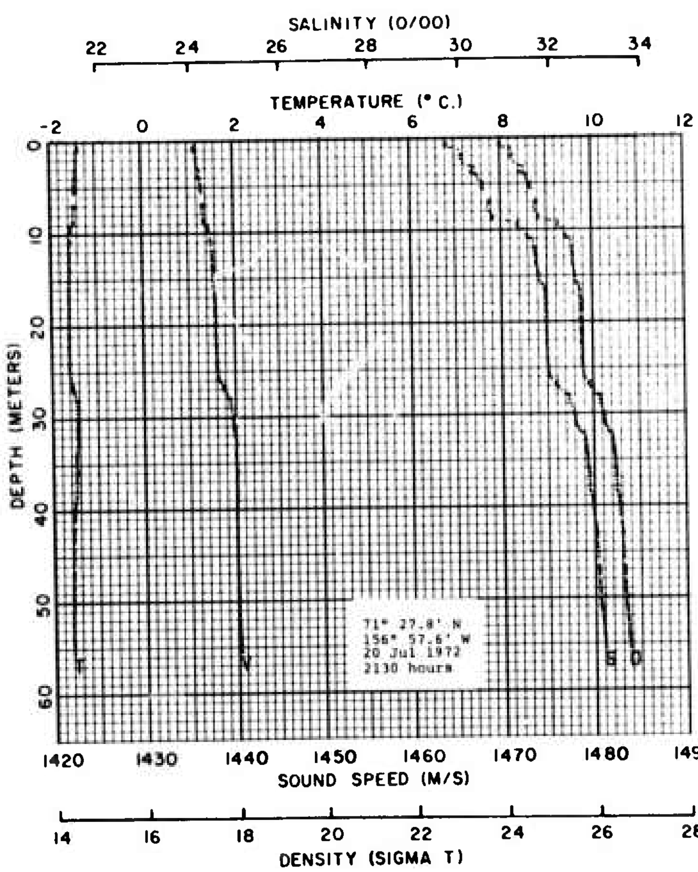
S D
71° 26' N
156° 51' W
20 Jul 1972
1830 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
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T V S D
71° 27.8' N
156° 57.6' W
20 Jul 1972
2130 hours
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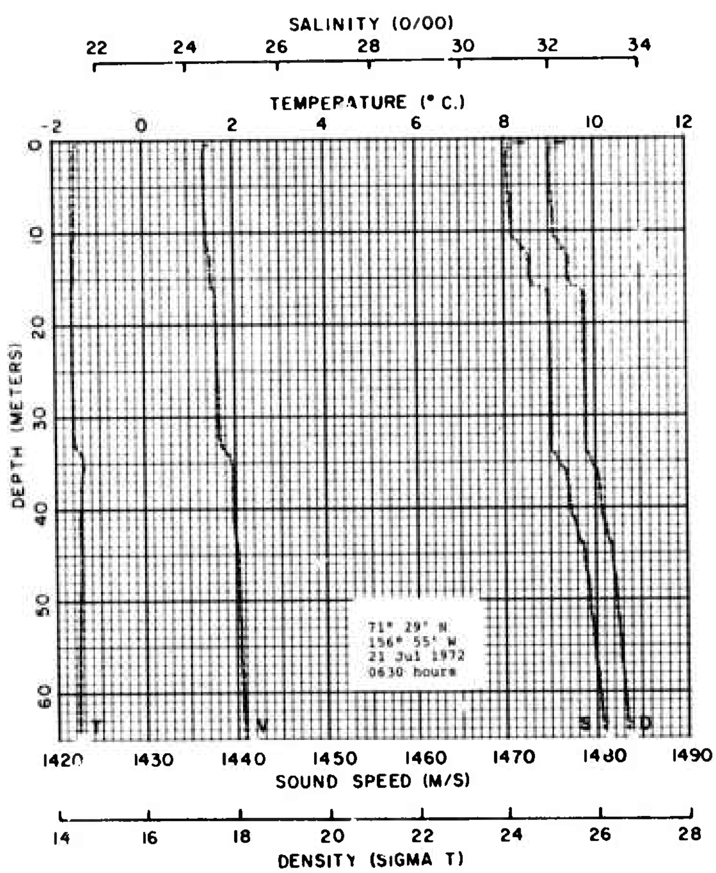
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
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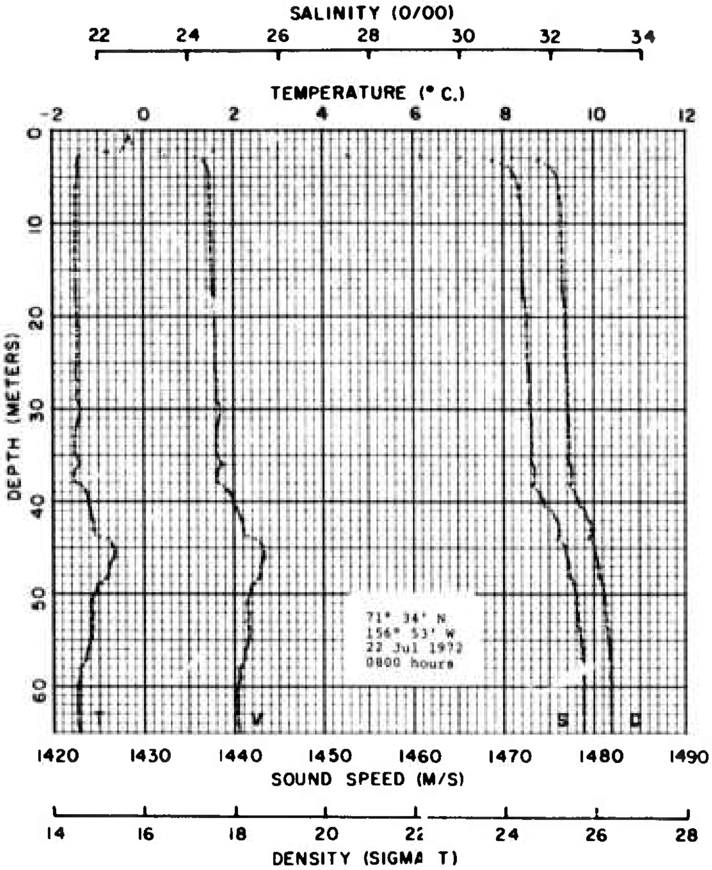
T V S D
71° 29' N
156° 55' W
21 Jul 1972
0630 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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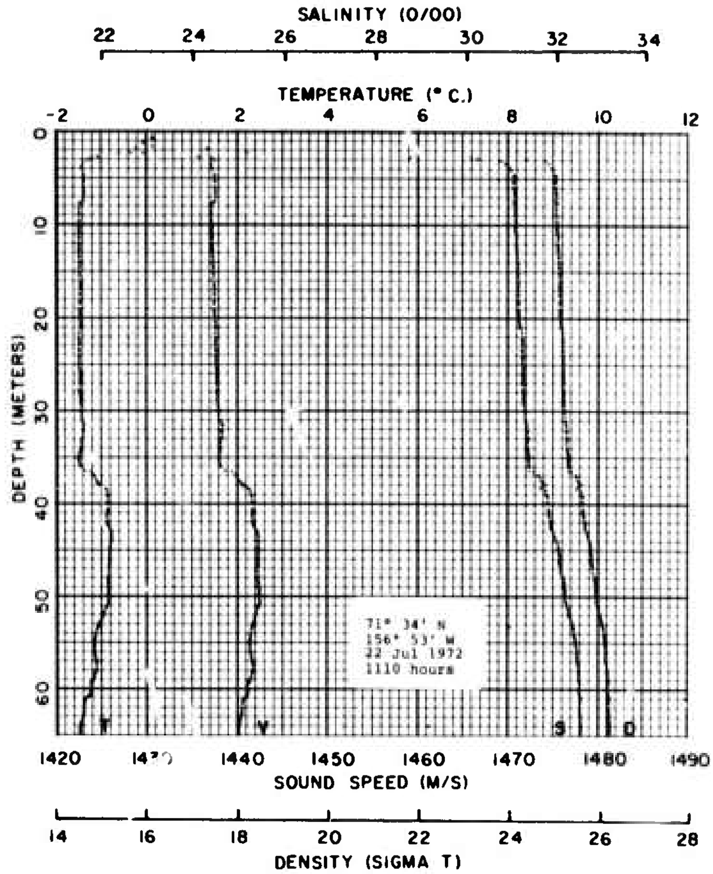
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 34' N
156° 53' W
22 Jul 1972
0800 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
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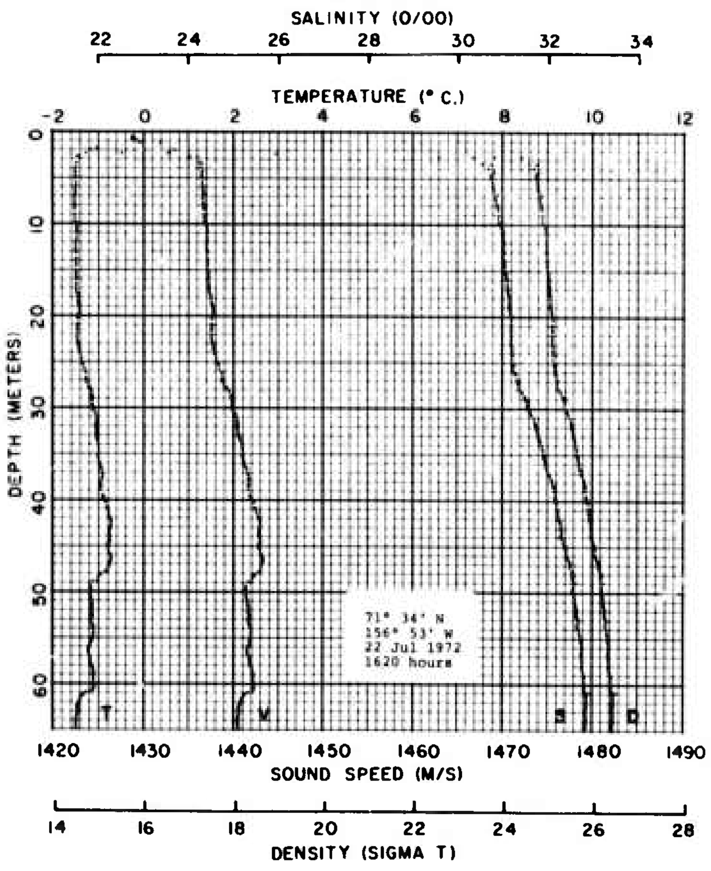
71° 34' N
156° 53' W
22 Jul 1972
1110 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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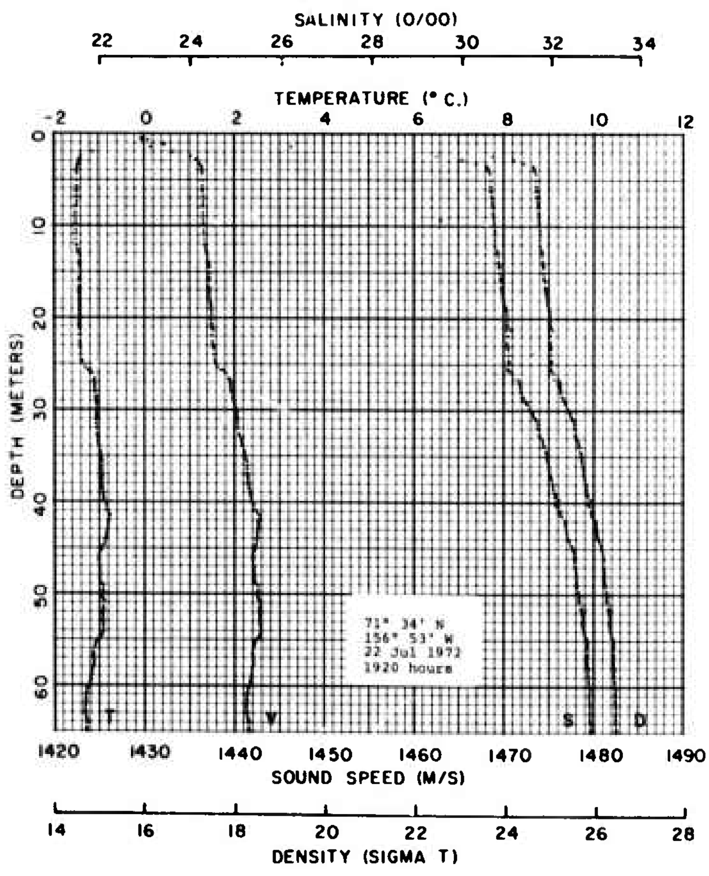
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 34' N
156° 53' W
22 Jul 1972
1620 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
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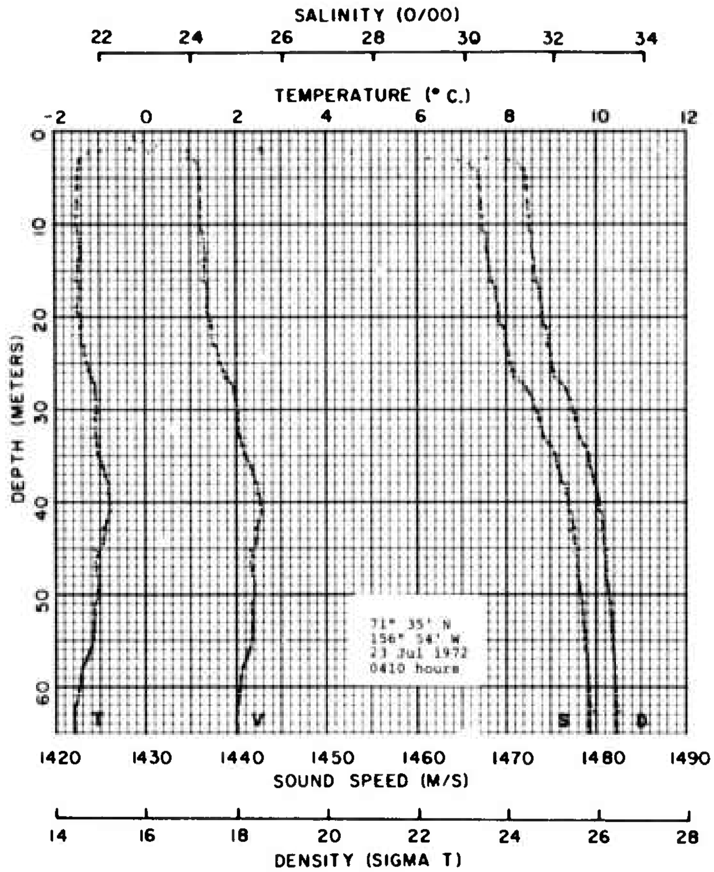
71° 34' N
156° 53' W
22 Jul 1972
1920 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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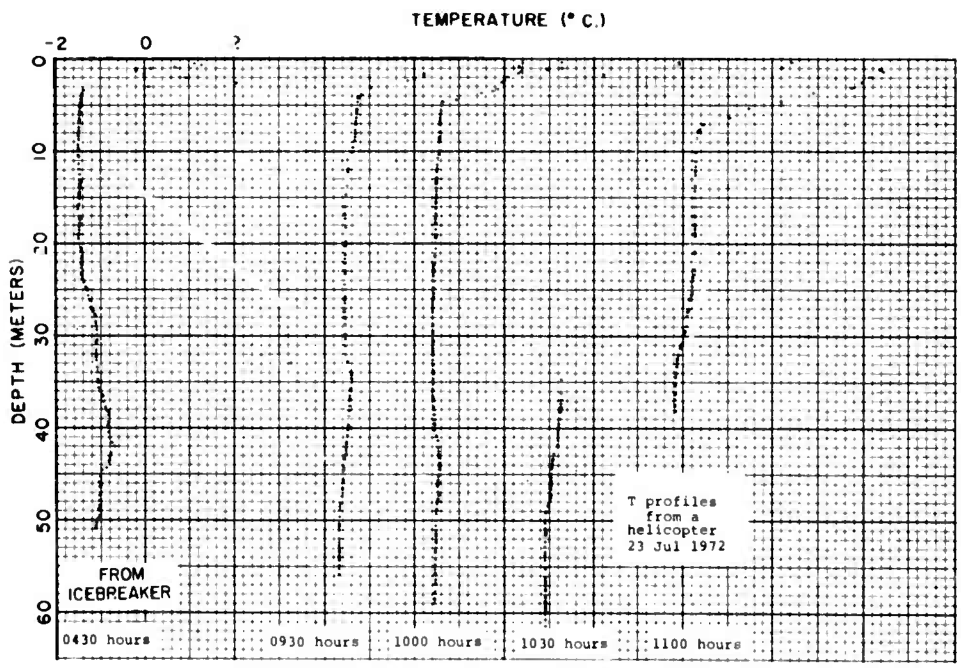
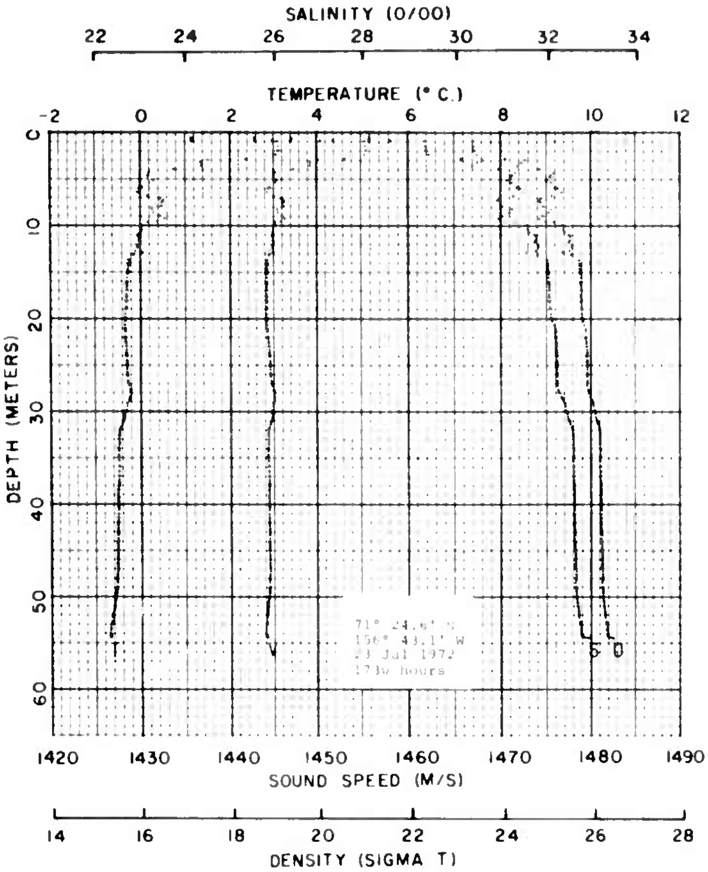
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 35' N
156° 54' W
23 Jul 1972
0410 hours
T
V
S
D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


TEMPERATURE (° C.)
-2 0 2
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
from a
helicopter
23 Jul 1972
FROM
ICEBREAKER
0430 hours
0930 hours
1000 hours
1030 hours
1100 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
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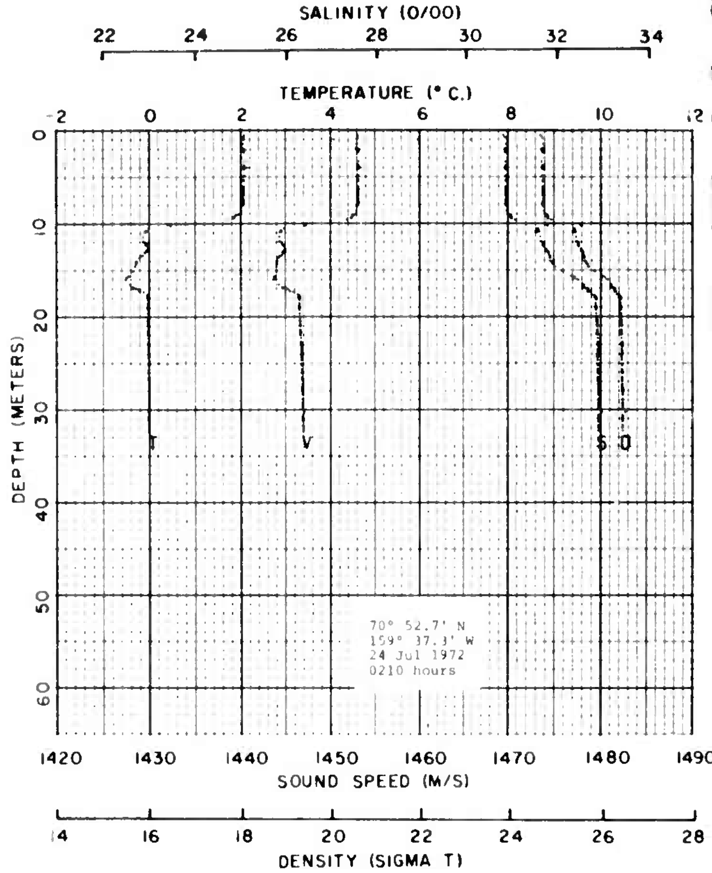
23 Jul 1972
1730 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
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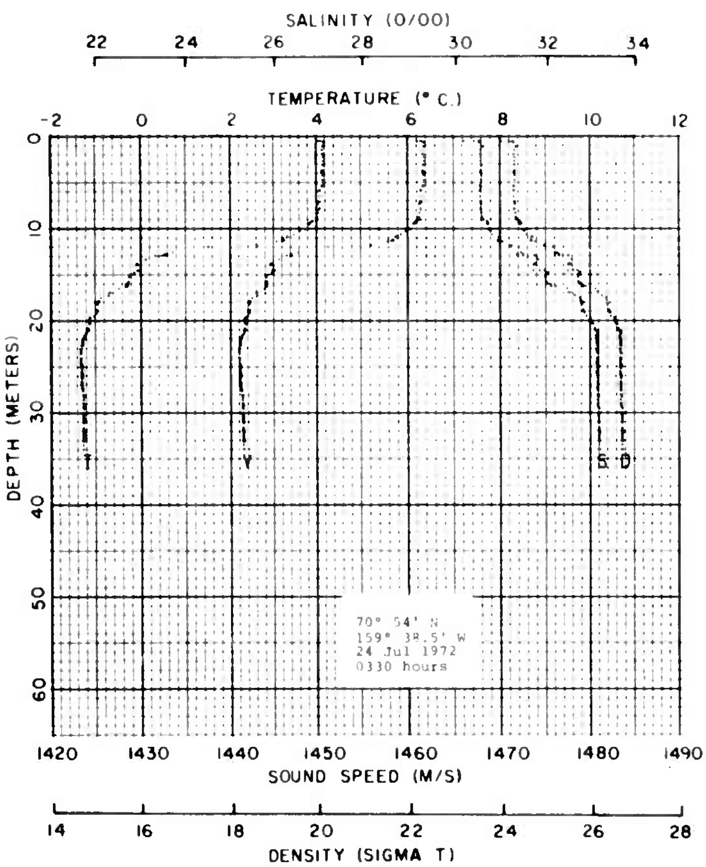
159° 37.3' W
24 Jul 1972
0210 hours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TEMPERATURE (° C.)
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SOUND SPEED (M/S)
DENSITY (SIGMA T)
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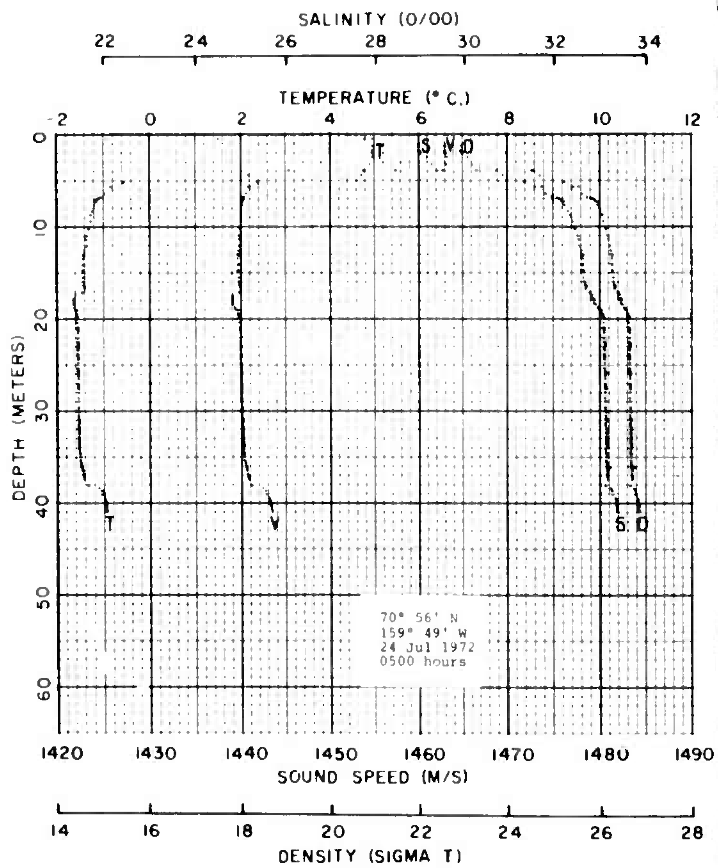
24 Jul 1972
0330 hours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SOUND SPEED (M/S)
DENSITY (SIGMA T)
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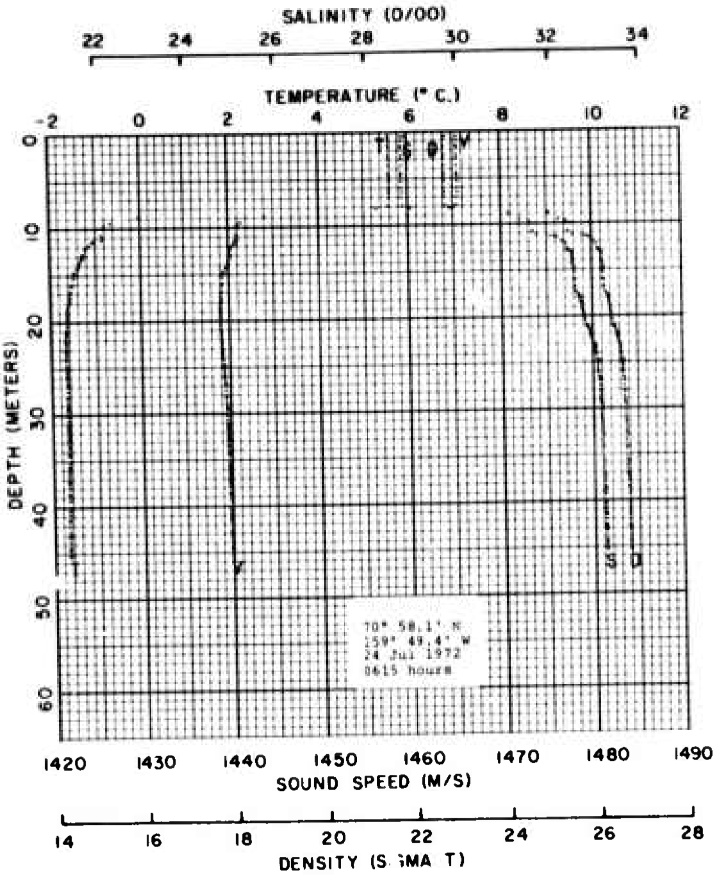
159° 49' W
24 Jul 1972
0500 hours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TEMPERATURE (° C.)
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DEPTH (METERS)
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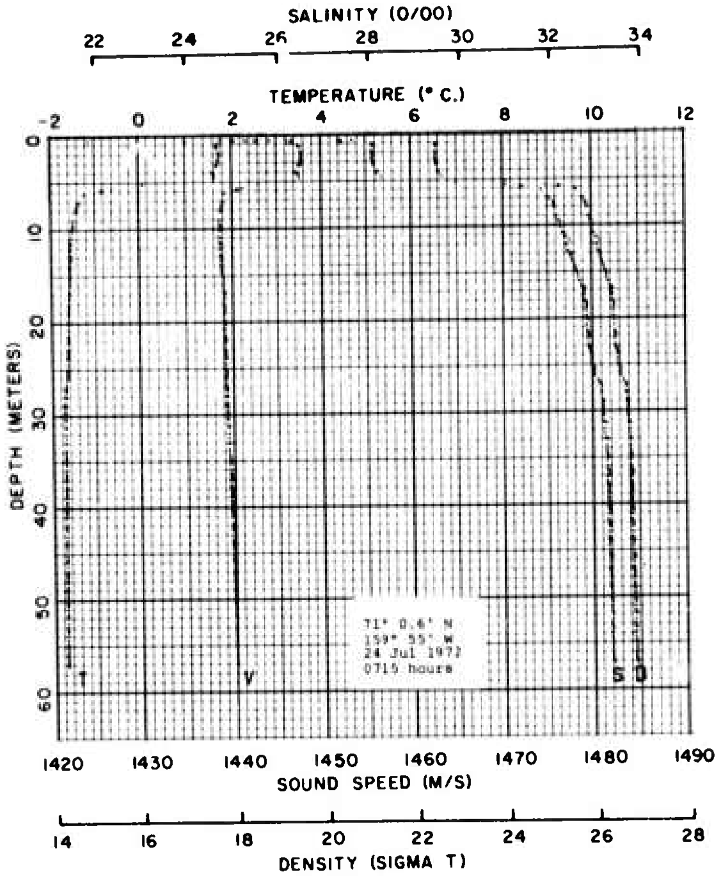
70° 58.1' N
159° 49.4' W
24 Jul 1972
0615 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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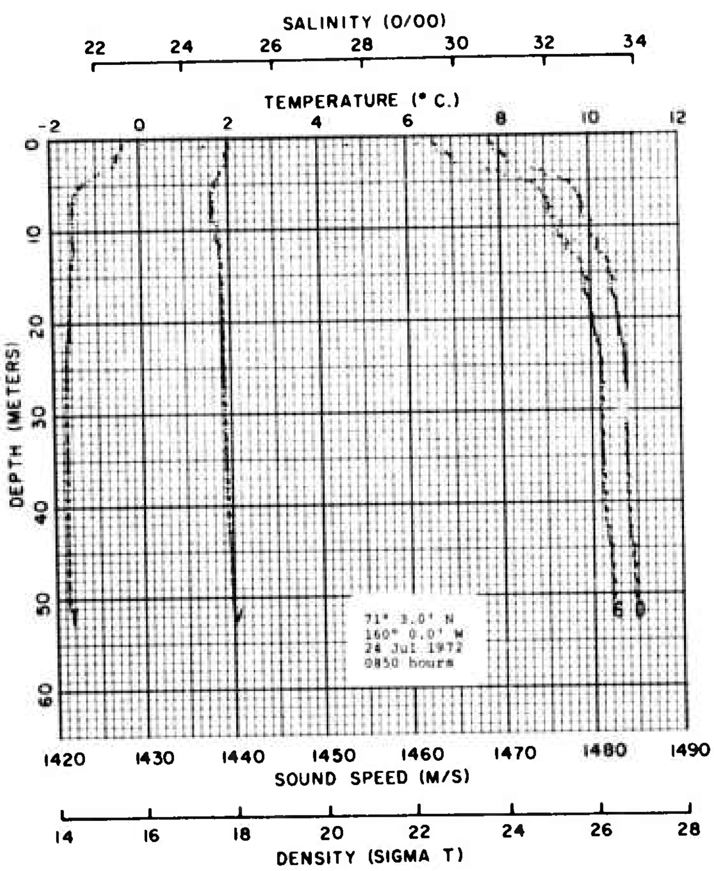
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 0.6' N
159° 55' W
24 Jul 1972
0715 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
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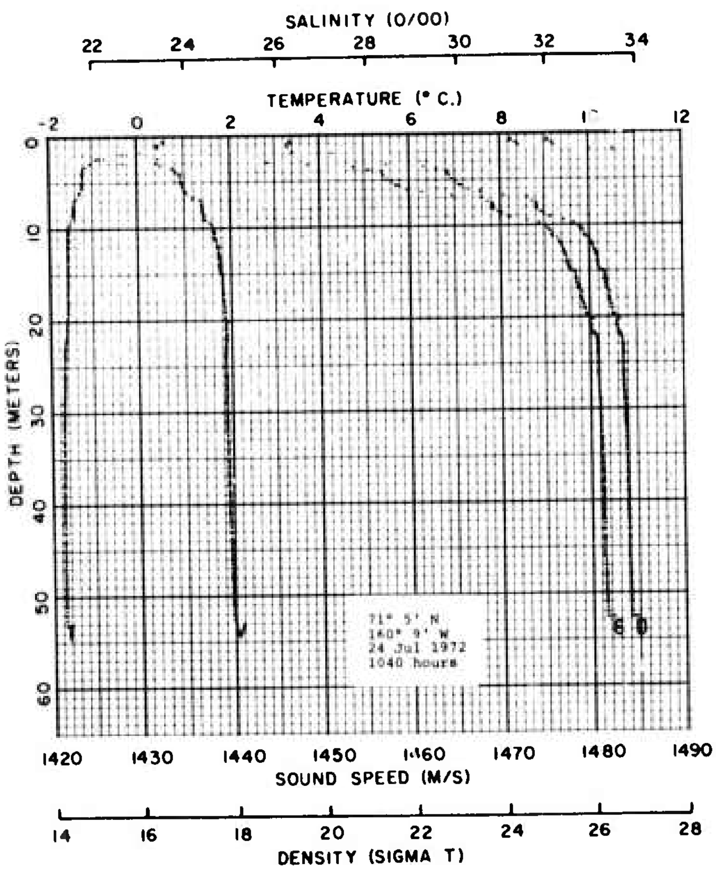
71° 3.0' N
160° 0.0' W
24 Jul 1972
0850 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
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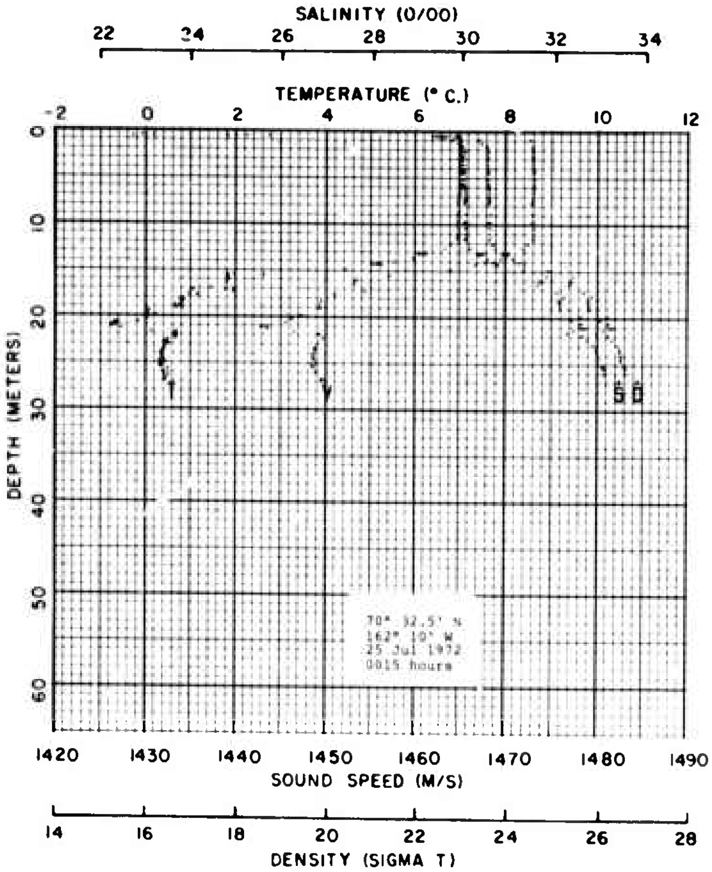
71° 5' N
160° 0' W
24 Jul 1972
1040 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
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T V S D
70° 32.5' N
162° 10' W
25 Jul 1972
0015 hours
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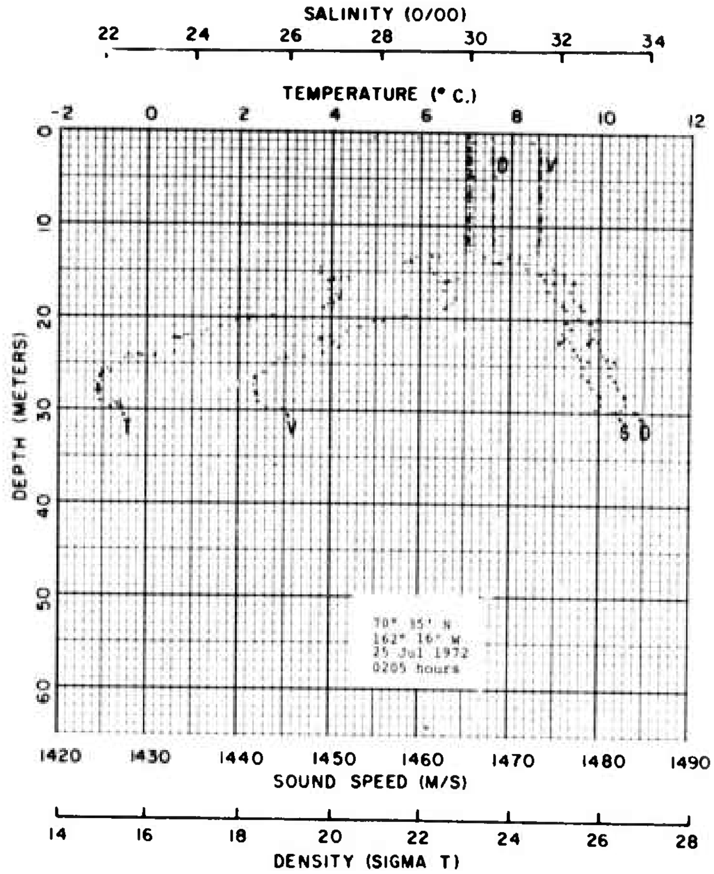
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
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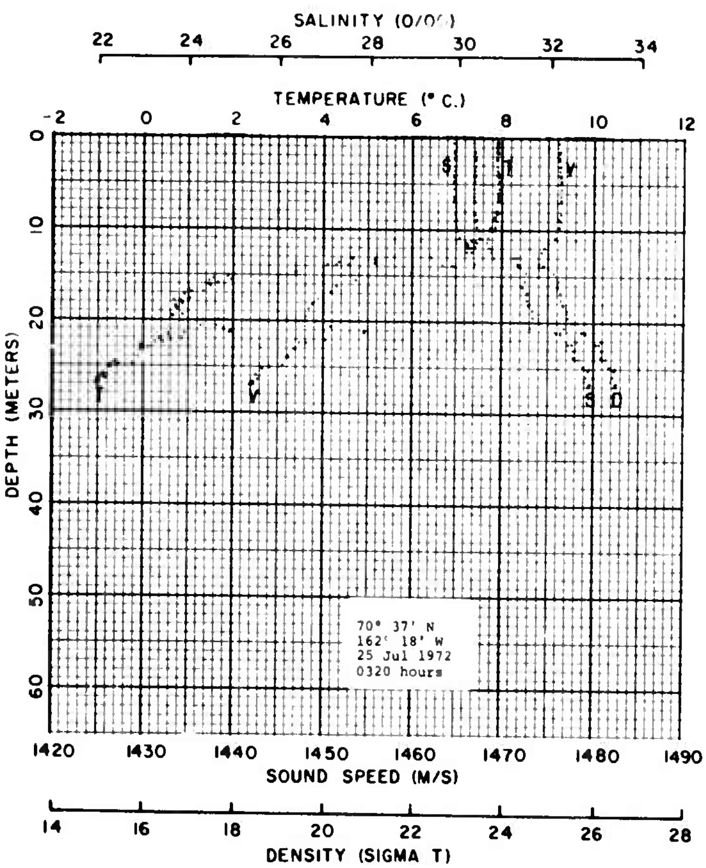
D V T V S D
70° 35' N
162° 16' W
25 Jul 1972
0205 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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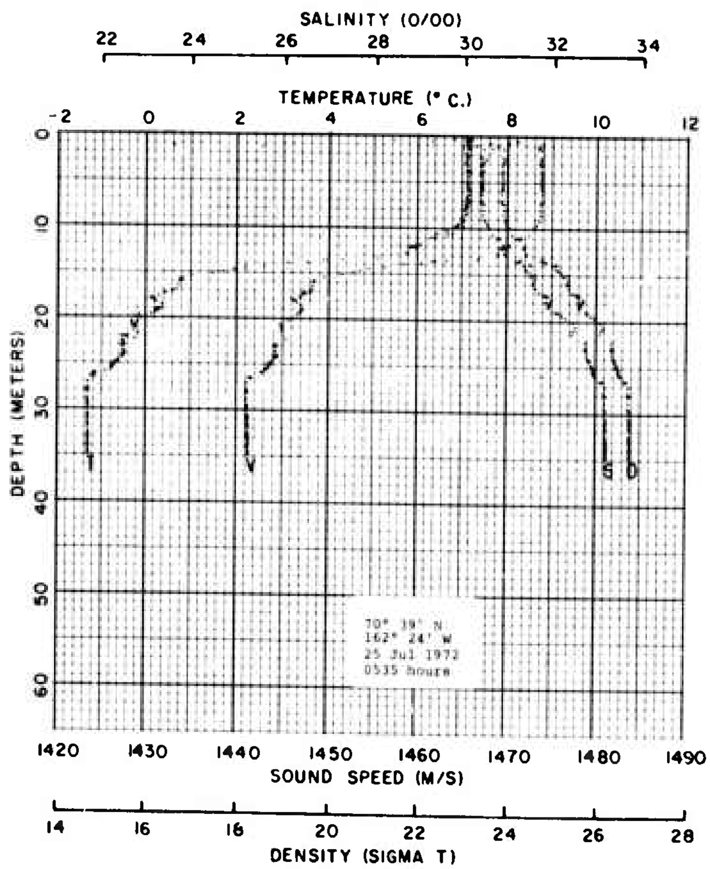
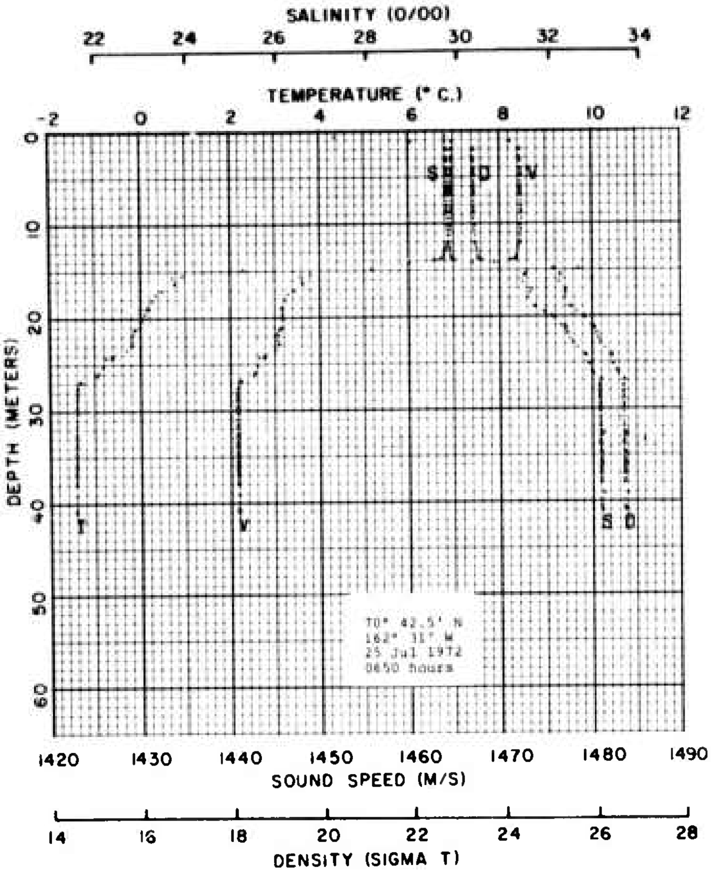
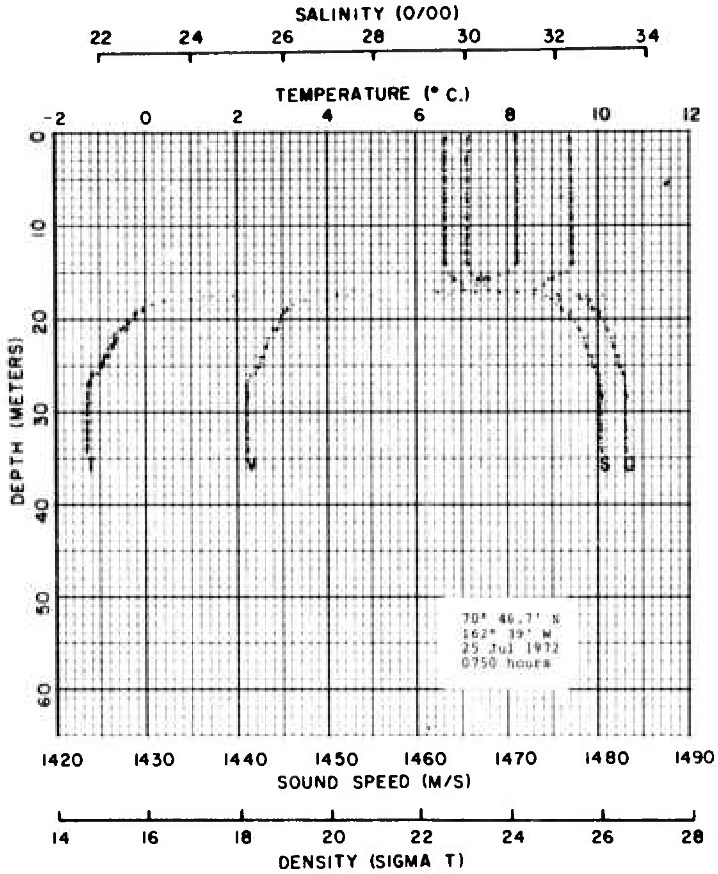
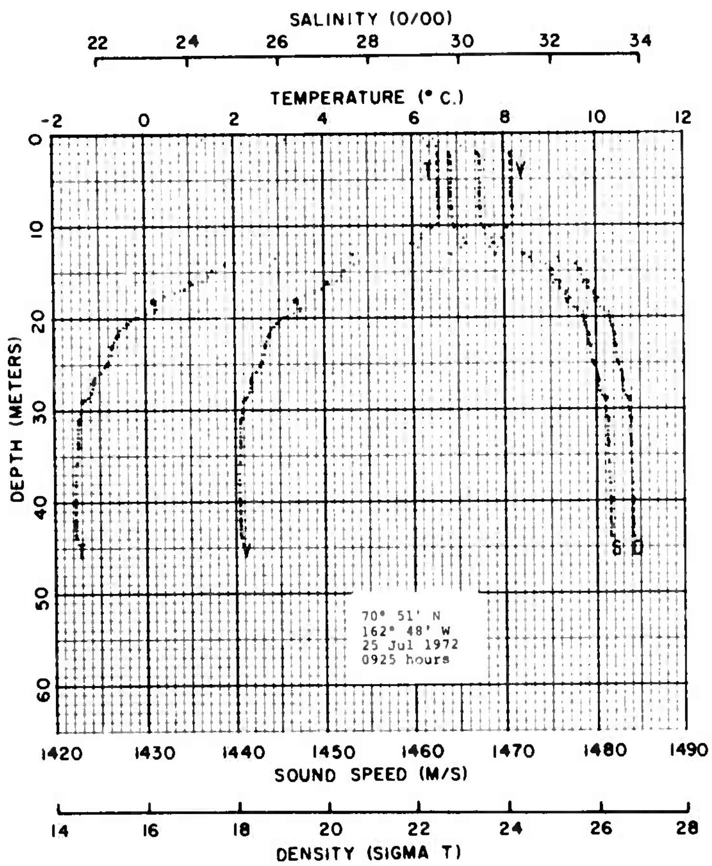
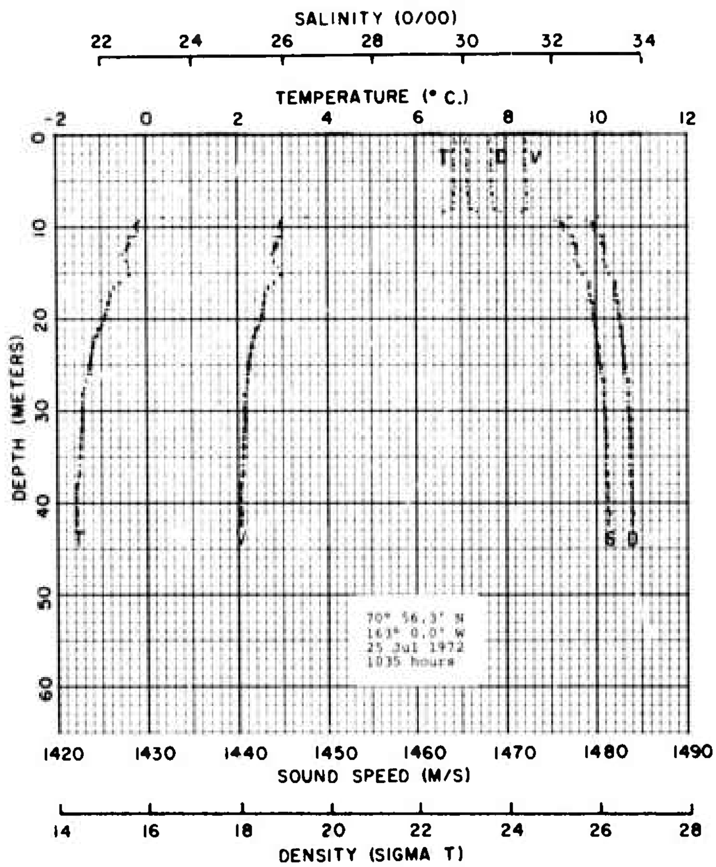
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
S T V V S D
70° 37' N
162° 18' W
25 Jul 1972
0320 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

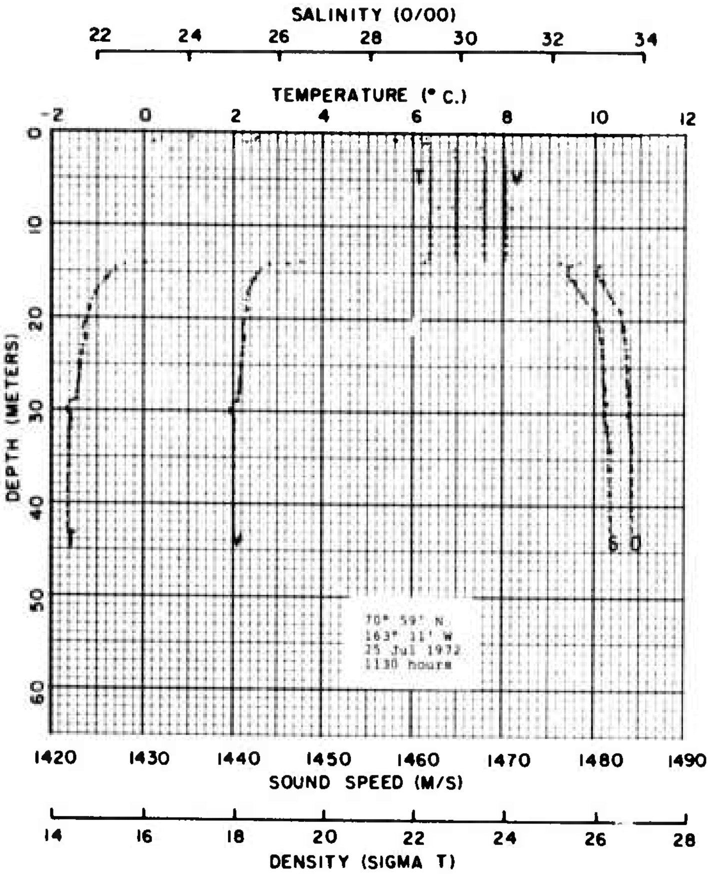

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
V S D
70° 39' N
162° 24' W
25 Jul 1972
0535 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

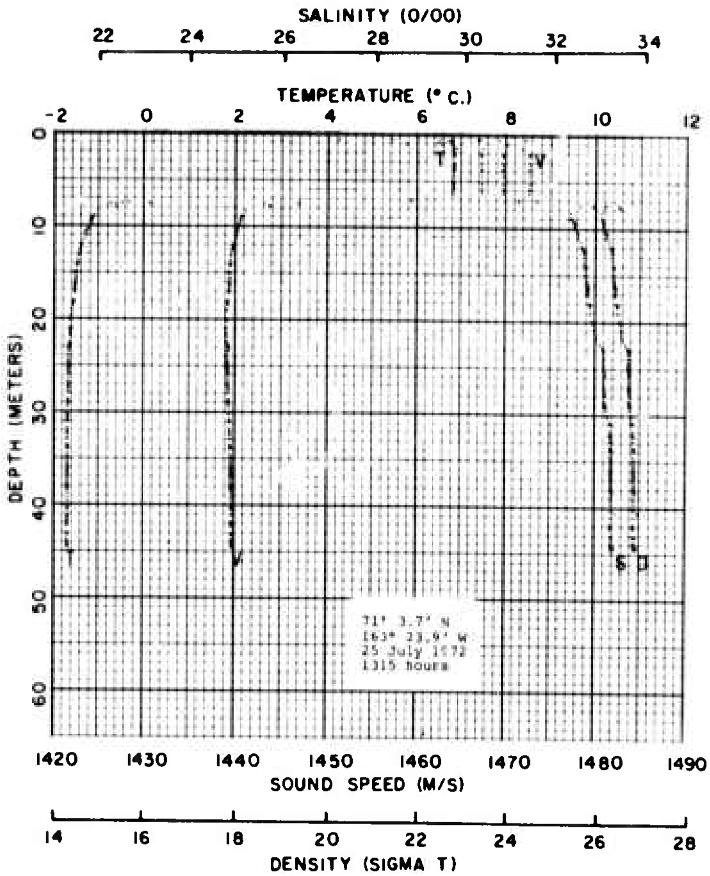

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
S D V
T V S D
70° 42.5' N
162° 31' W
25 Jul 1972
0650 hours

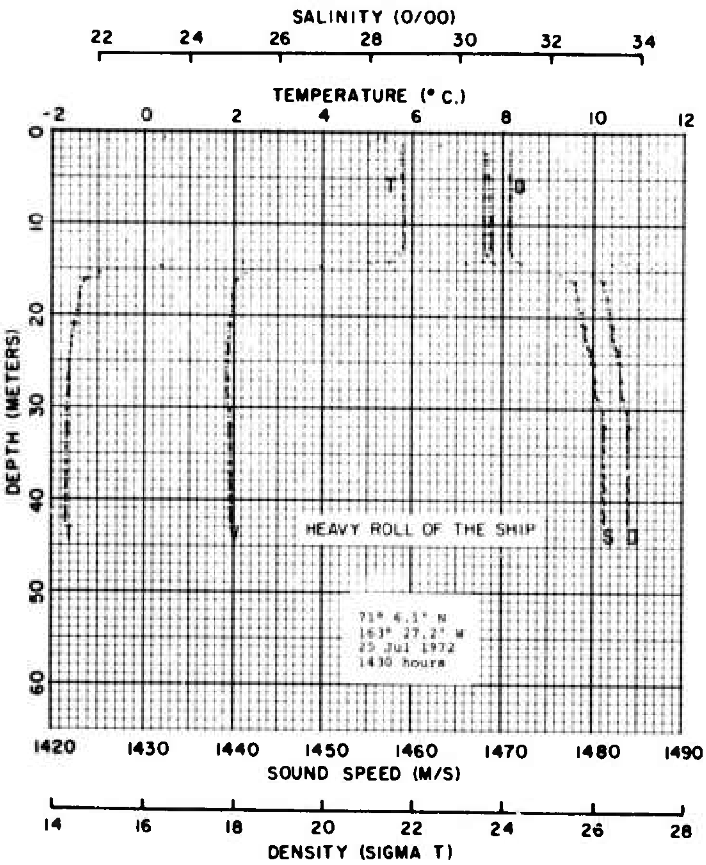

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
V S D
70° 46.7' N
162° 39' W
25 Jul 1972
0750 hours

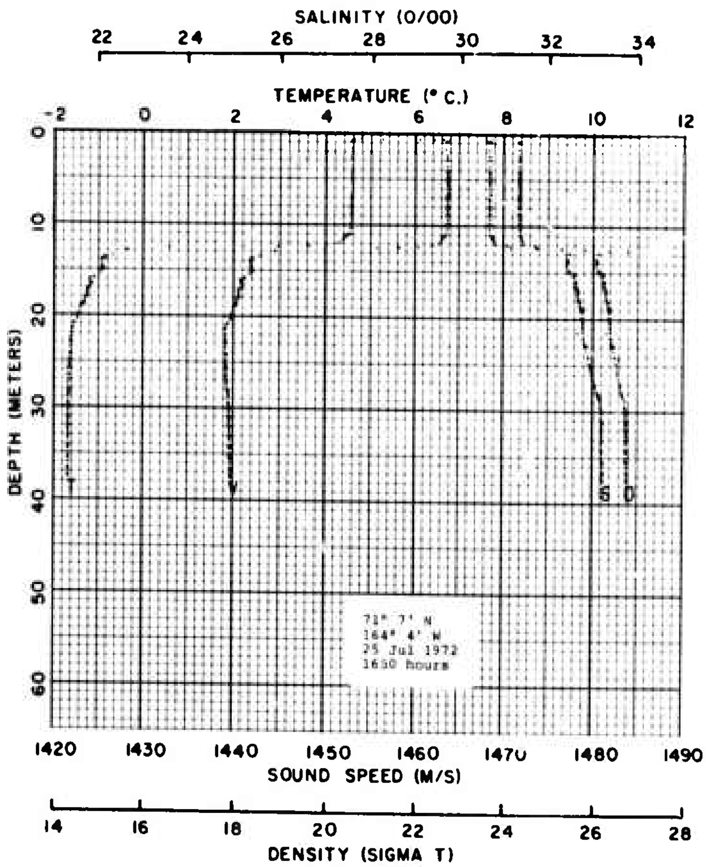

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T V
V S D
70° 51' N
162° 48' W
25 Jul 1972
0925 hours

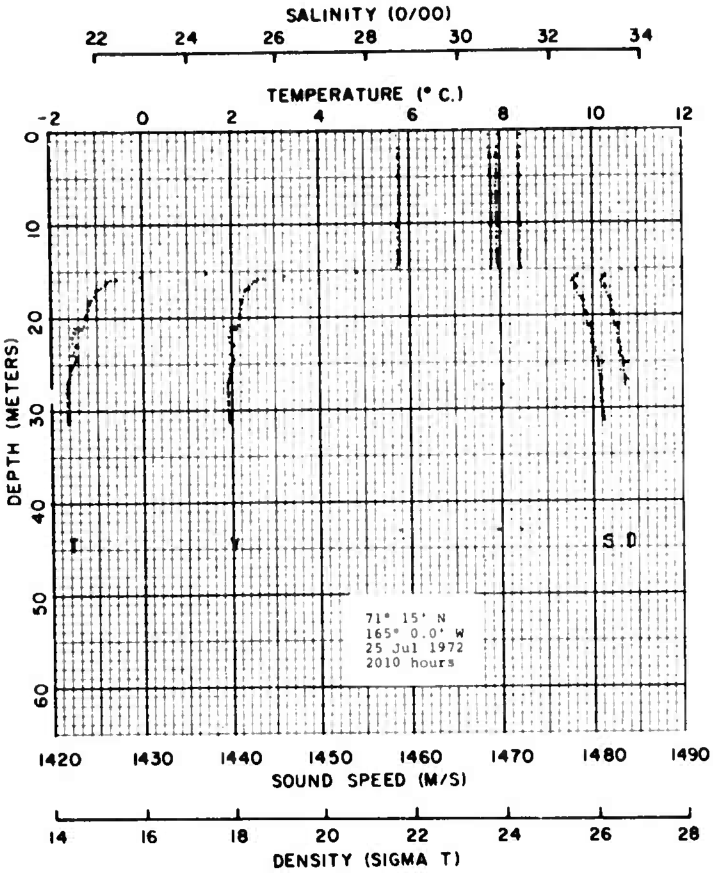

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T D V
S D
70° 56.3' N
163° 0.0' W
25 Jul 1972
1035 hours

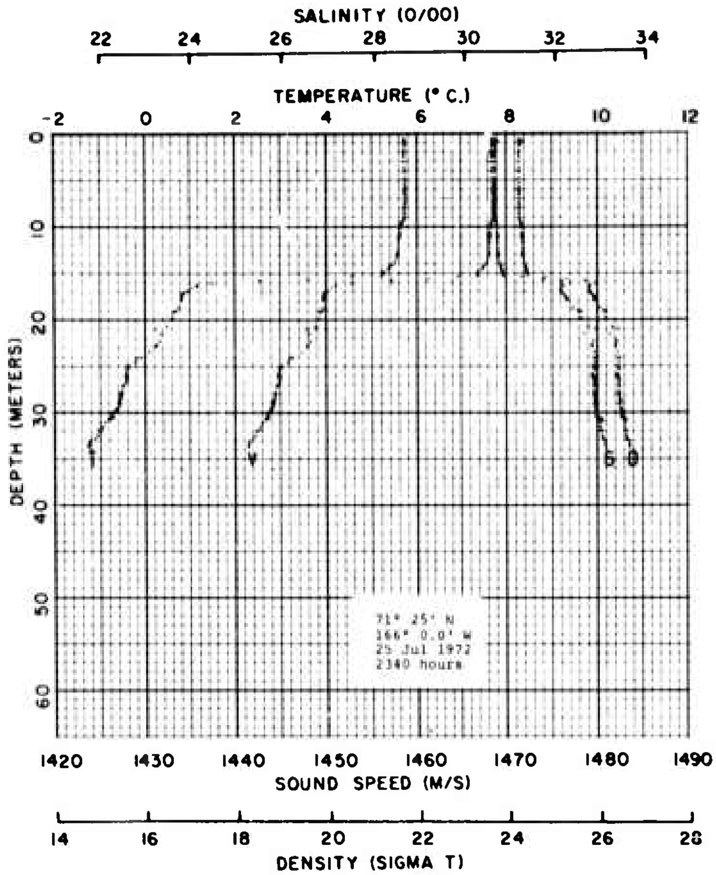

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
70° 59' N
163° 31' W
25 Jul 1972
1130 hours

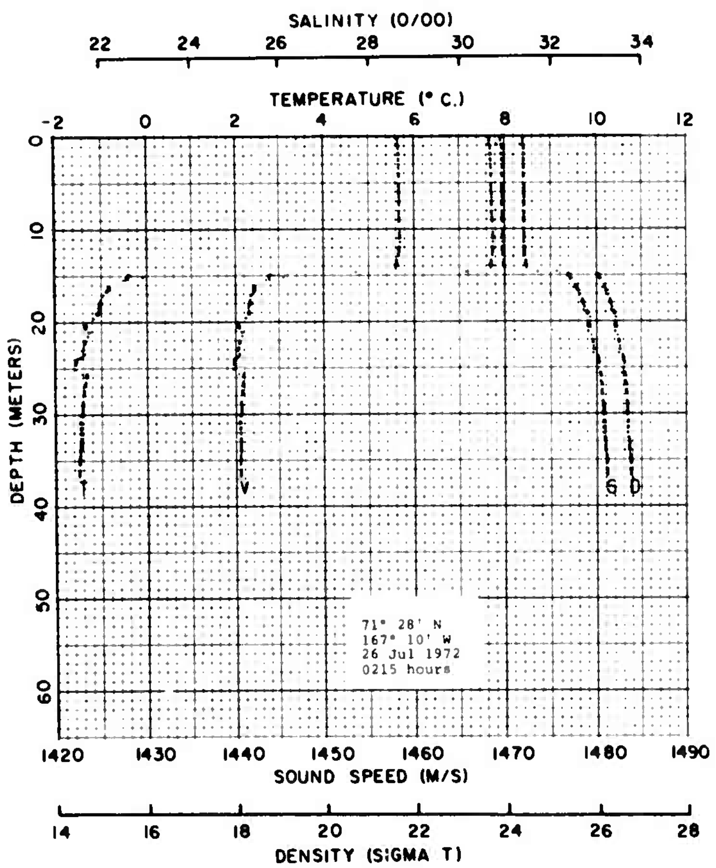

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
71° 3.7' N
163° 23.9' W
25 July 1972
1315 hours

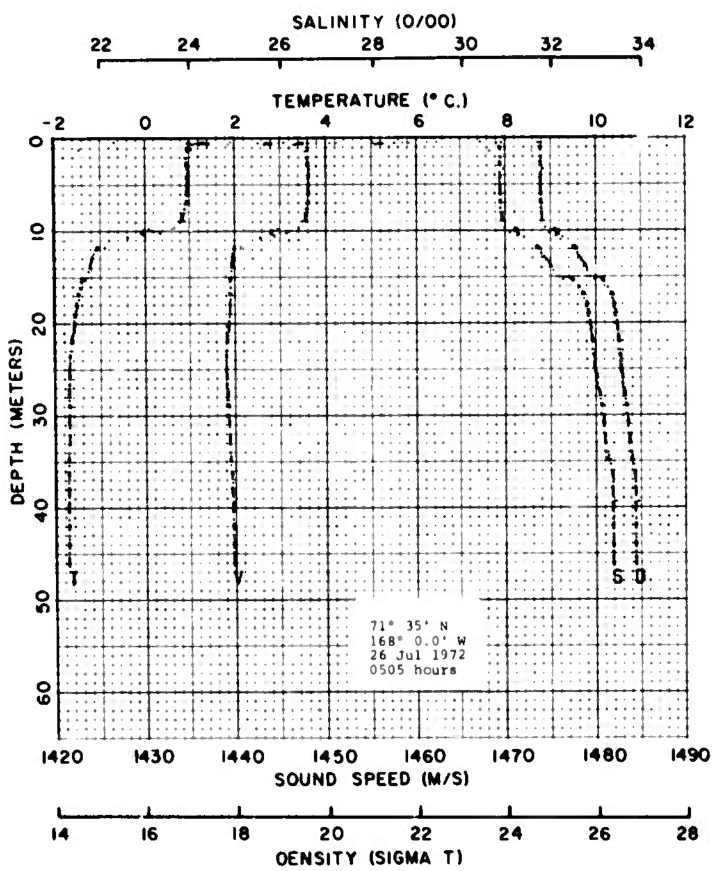

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
D
V
S
HEAVY ROLL OF THE SHIP
71° 6.1' N
163° 27.2' W
25 Jul 1972
1430 hours

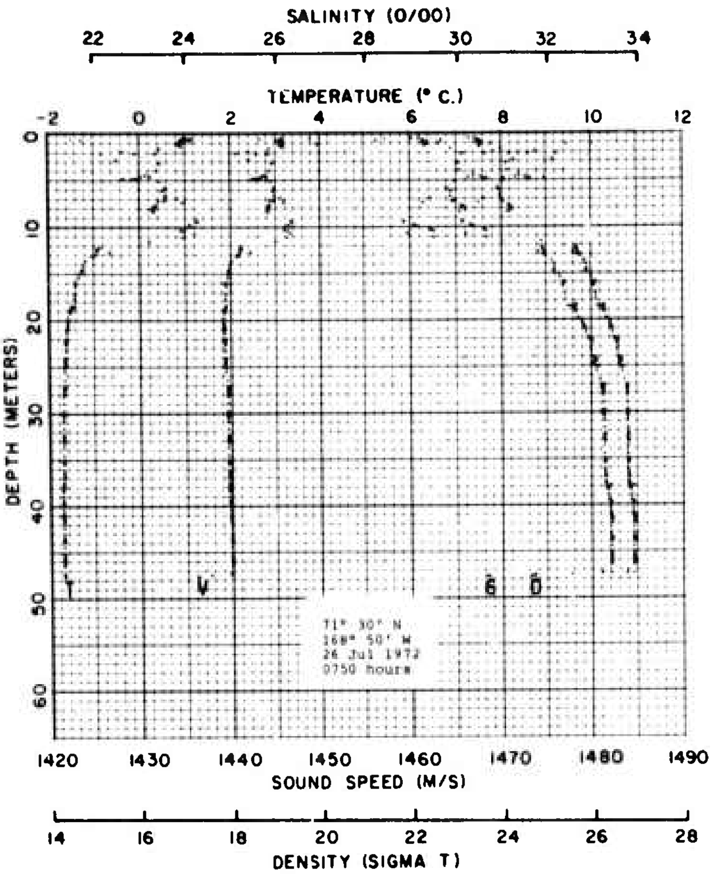

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
S
D
71° 7' N
164° 4' W
25 Jul 1972
1630 hours

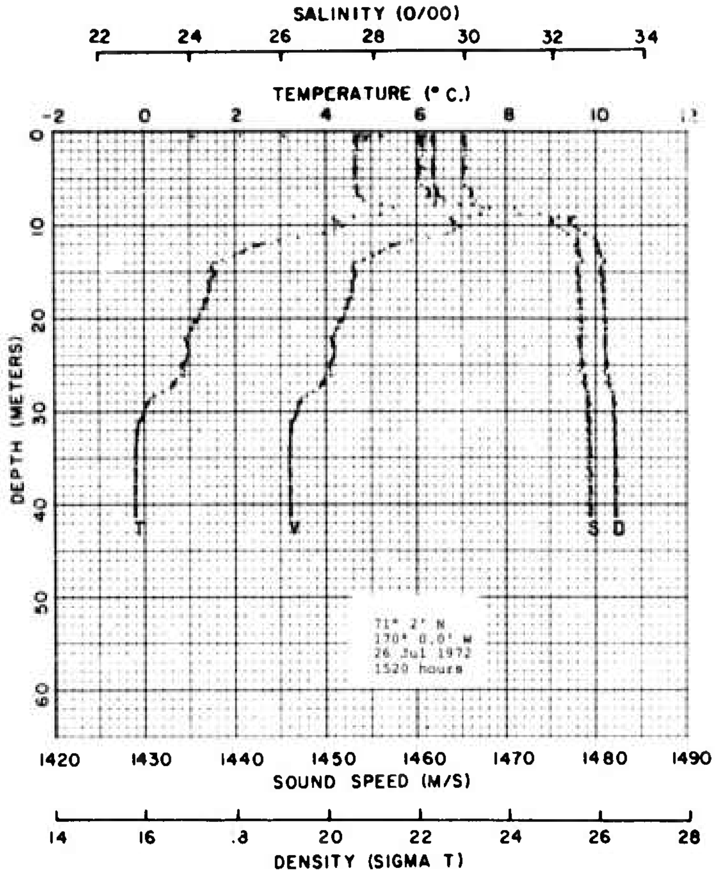

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T
S D
71° 15' N
165° 0.0' W
25 Jul 1972
2010 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

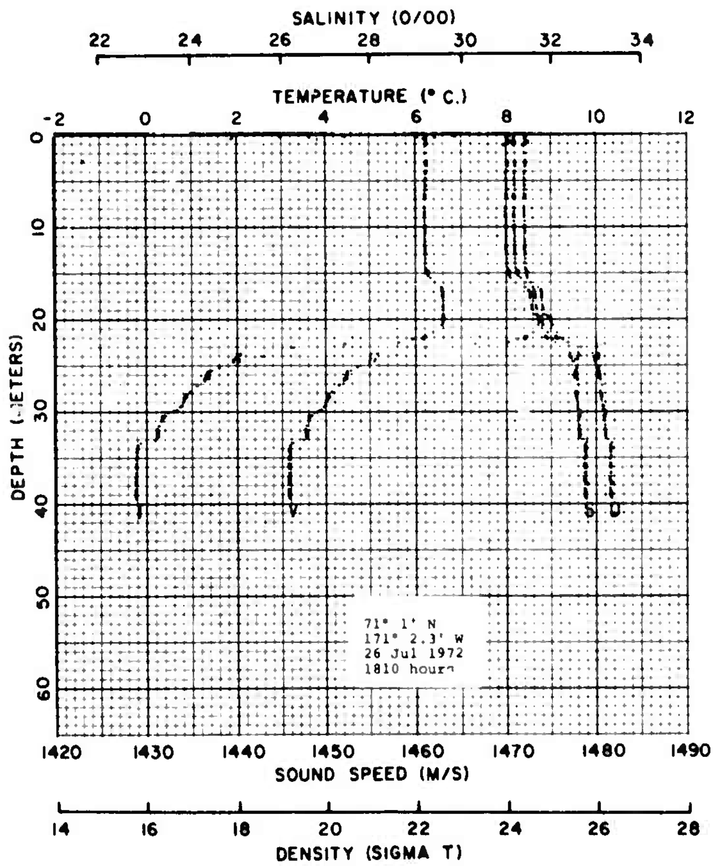

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
S D
71° 25' N
166° 0.0' W
25 Jul 1972
2340 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

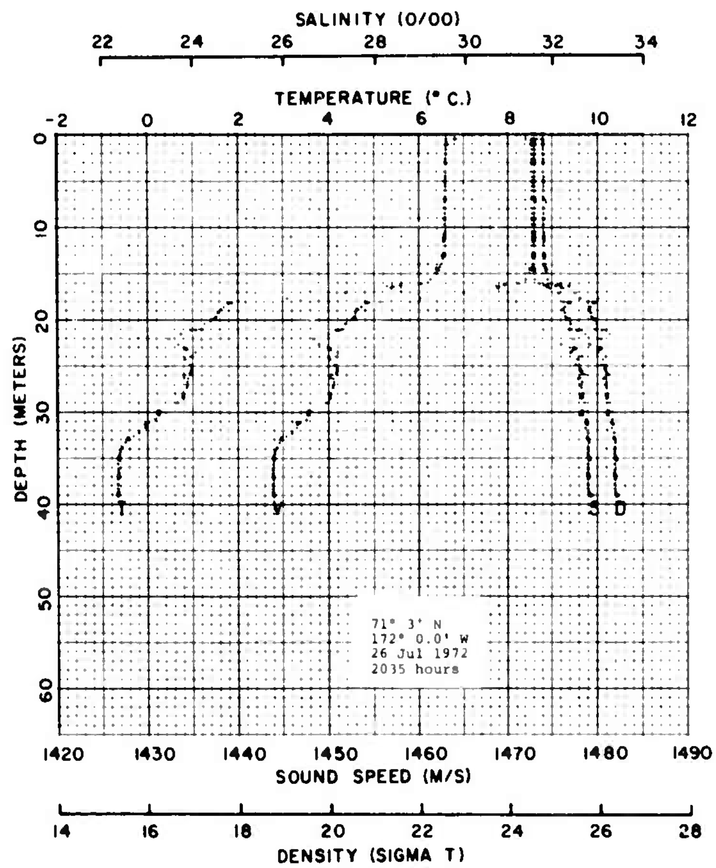

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
S D
71° 28' N
167° 10' W
26 Jul 1972
0215 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

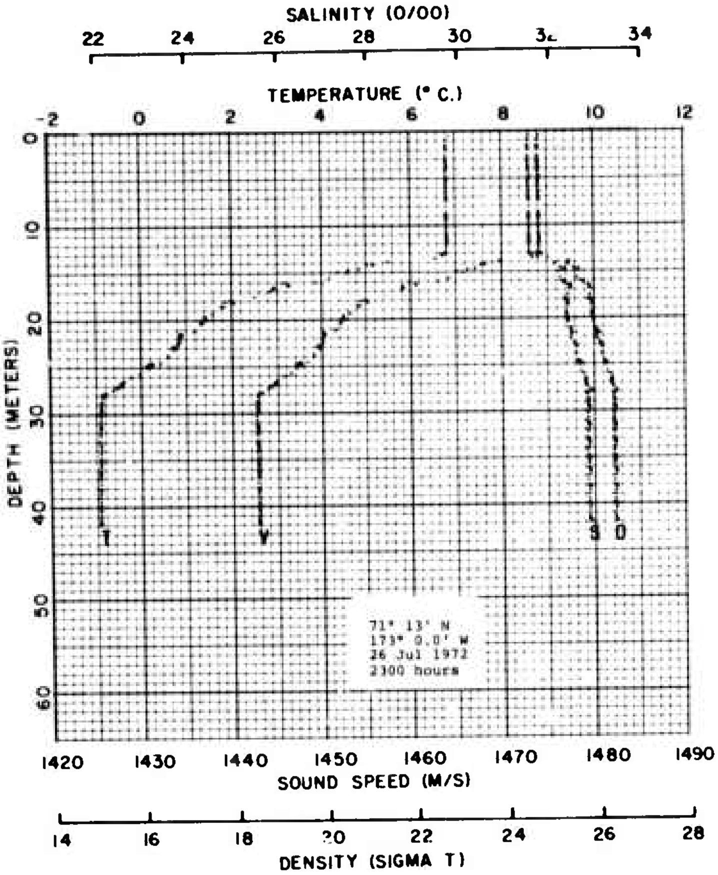

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T
S D
71° 35' N
168° 0.0' W
26 Jul 1972
0505 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

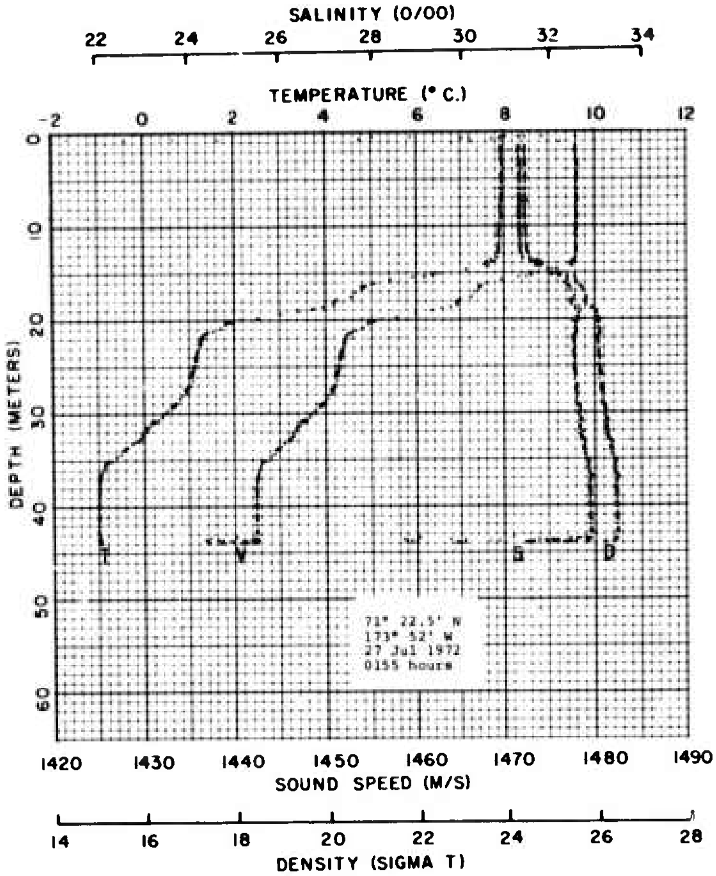

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
71° 30' N
168° 50' W
26 Jul 1972
0750 hours

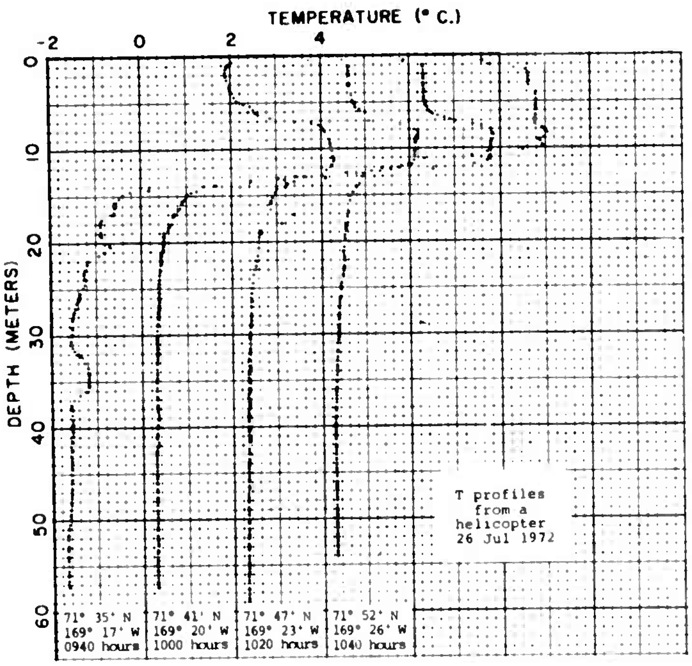

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
71° 2' N
170° 0.0' W
26 Jul 1972
1520 hours

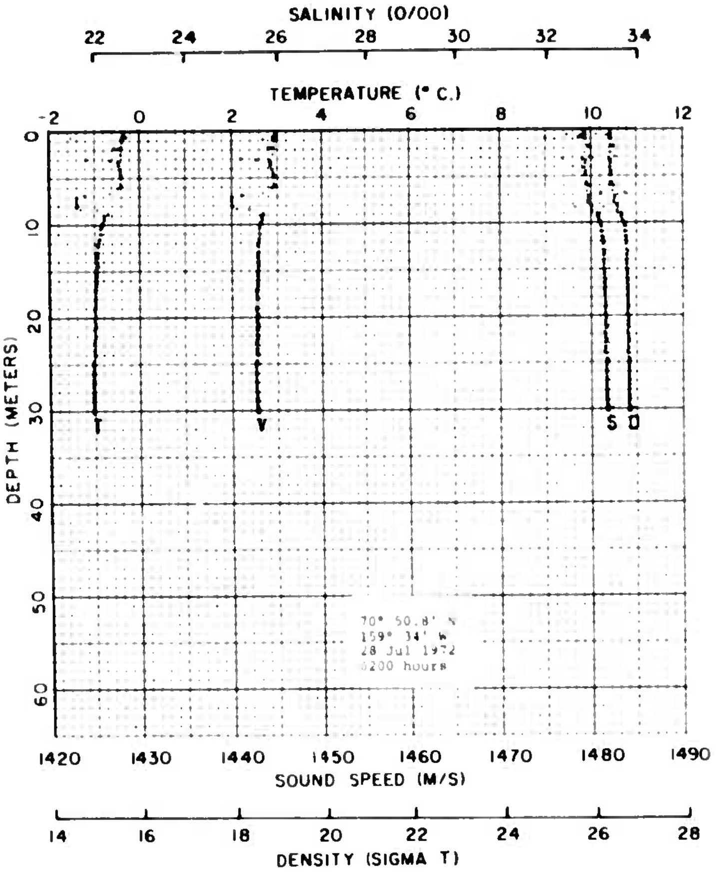

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
V
S
D
71° 1' N
171° 2.3' W
26 Jul 1972
1810 hours

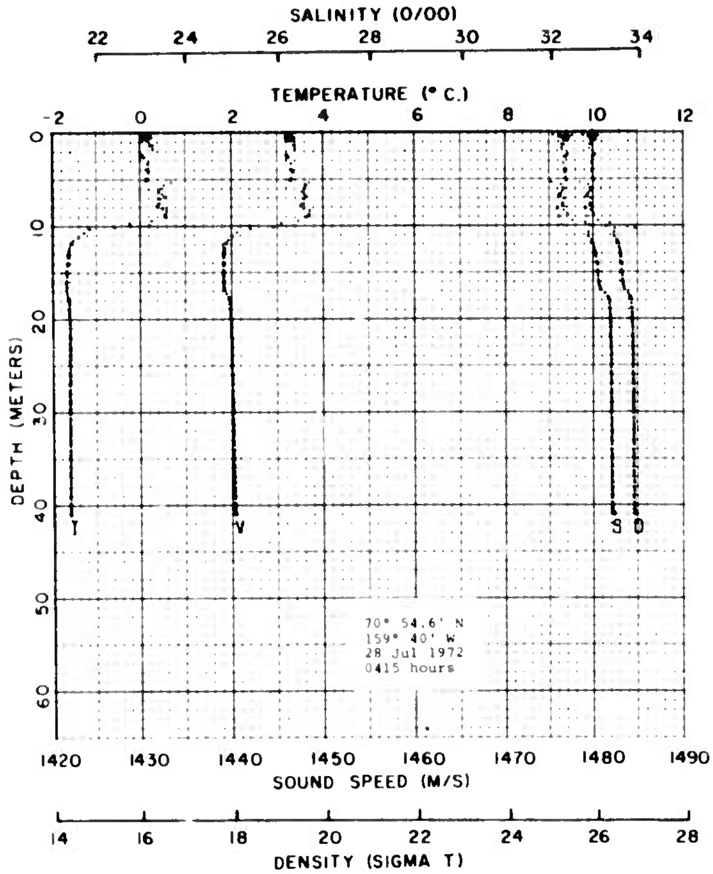

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
71° 3' N
172° 0.0' W
26 Jul 1972
2035 hours

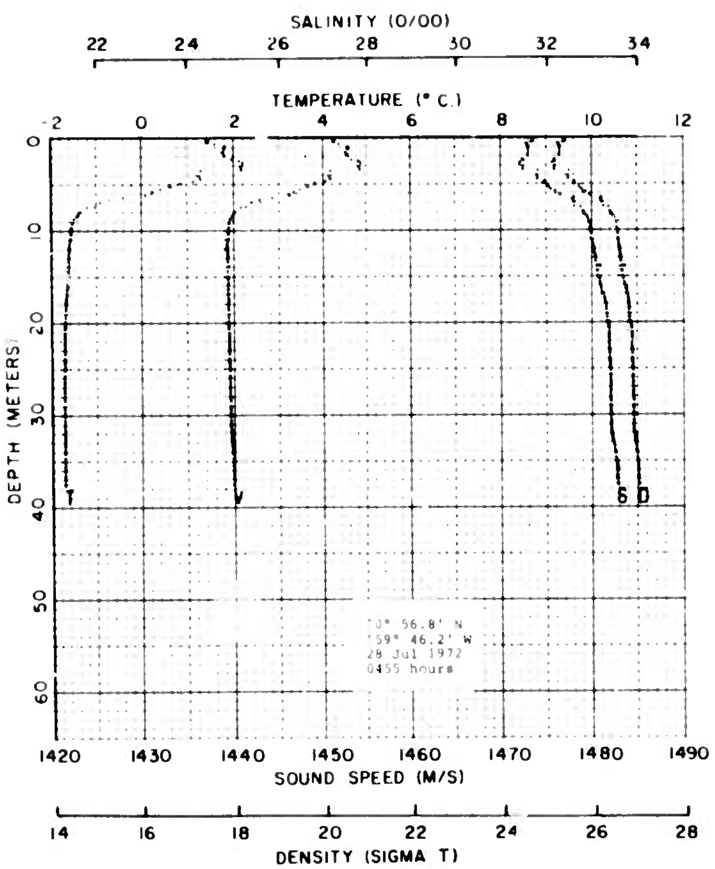

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 13' N
173° 0.0' W
26 Jul 1972
2300 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

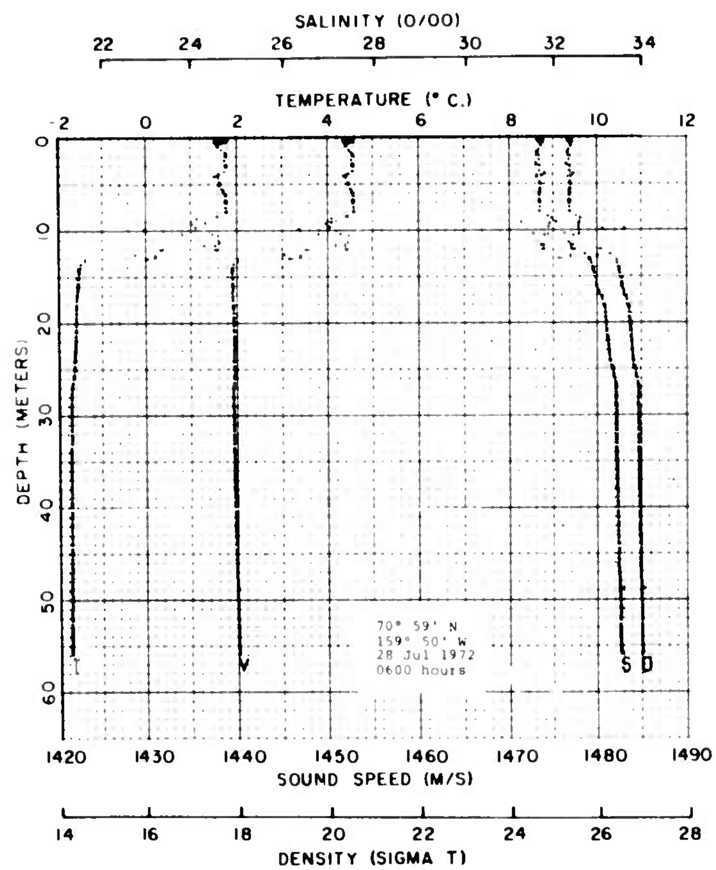

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 22.5' N
173° 52' W
27 Jul 1972
0155 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

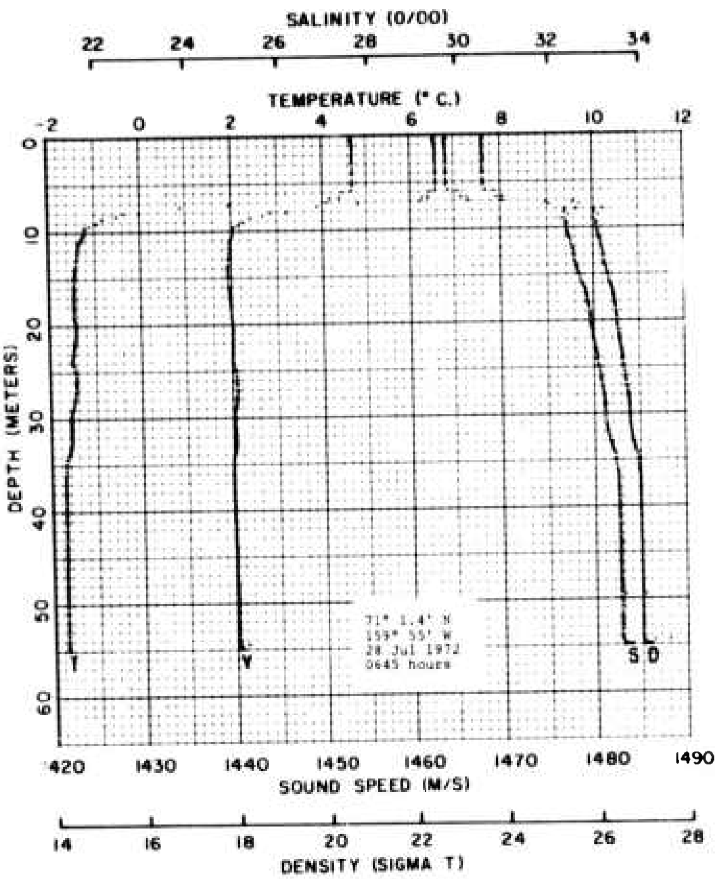

TEMPERATURE (° C.)
-2 0 2 4
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
from a
helicopter
26 Jul 1972
71° 35' N
169° 17' W
0940 hours
71° 41' N
169° 20' W
1000 hours
71° 47' N
169° 23' W
1020 hours
71° 52' N
169° 26' W
1040 hours

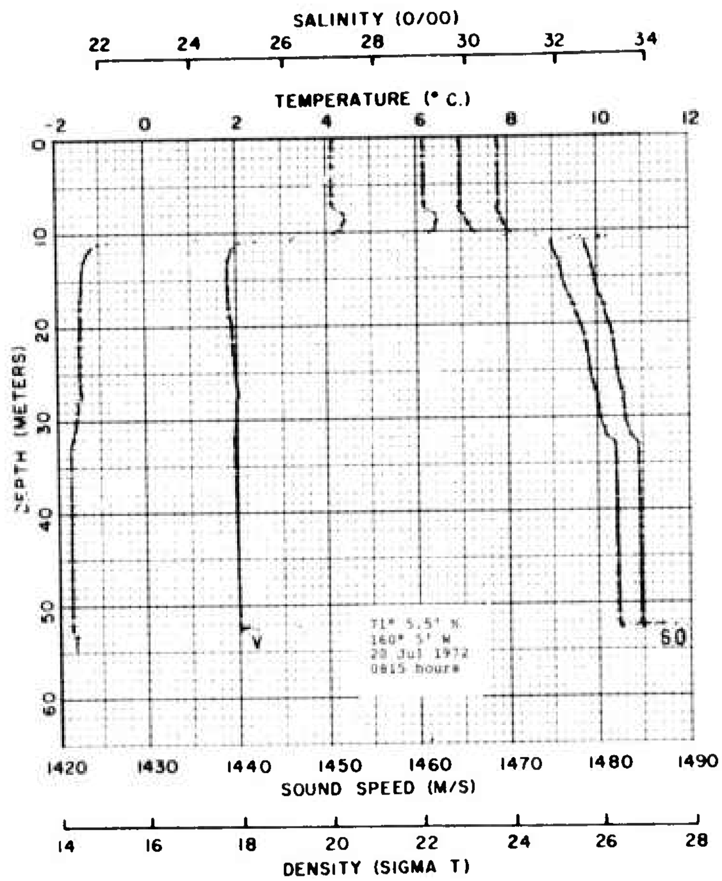

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
T
V
S D
70° 50.8' N
159° 34' W
28 Jul 1972
0200 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

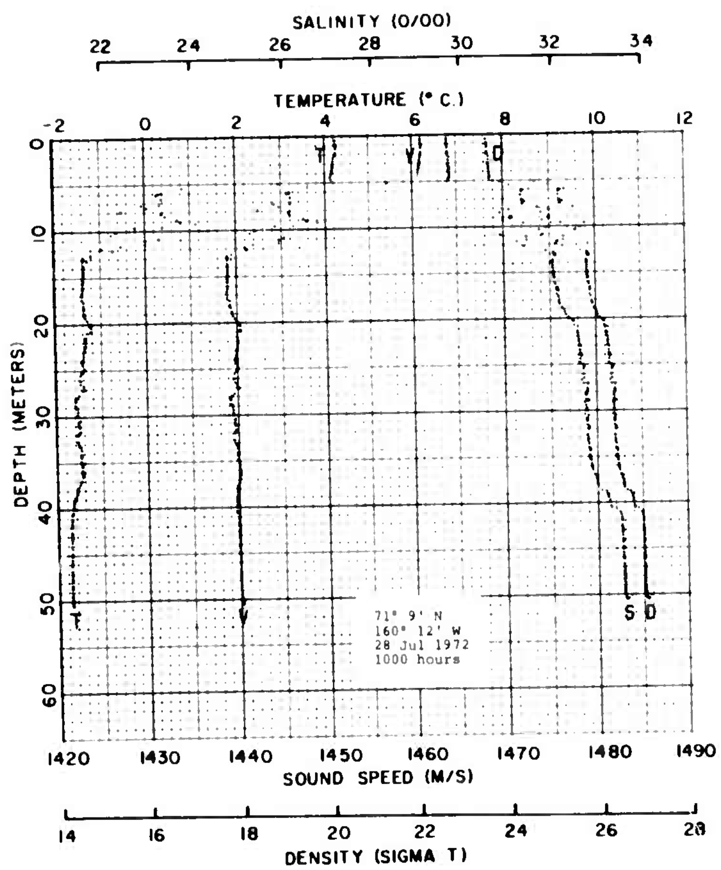

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
T
V
S D
70° 54.6' N
159° 40' W
28 Jul 1972
0415 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

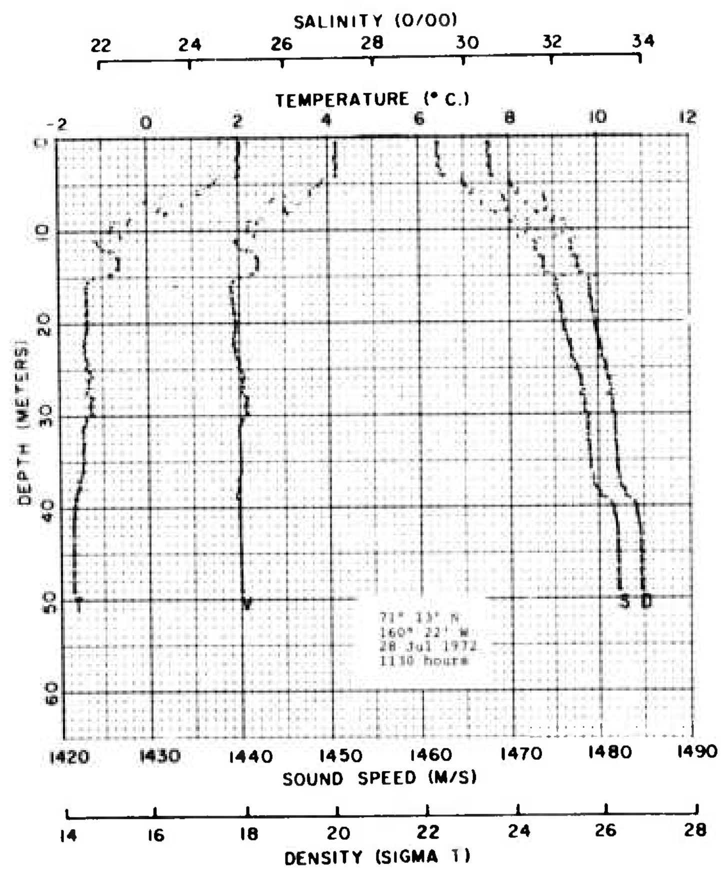

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
T
V
S D
70° 56.8' N
159° 46.2' W
28 Jul 1972
0455 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

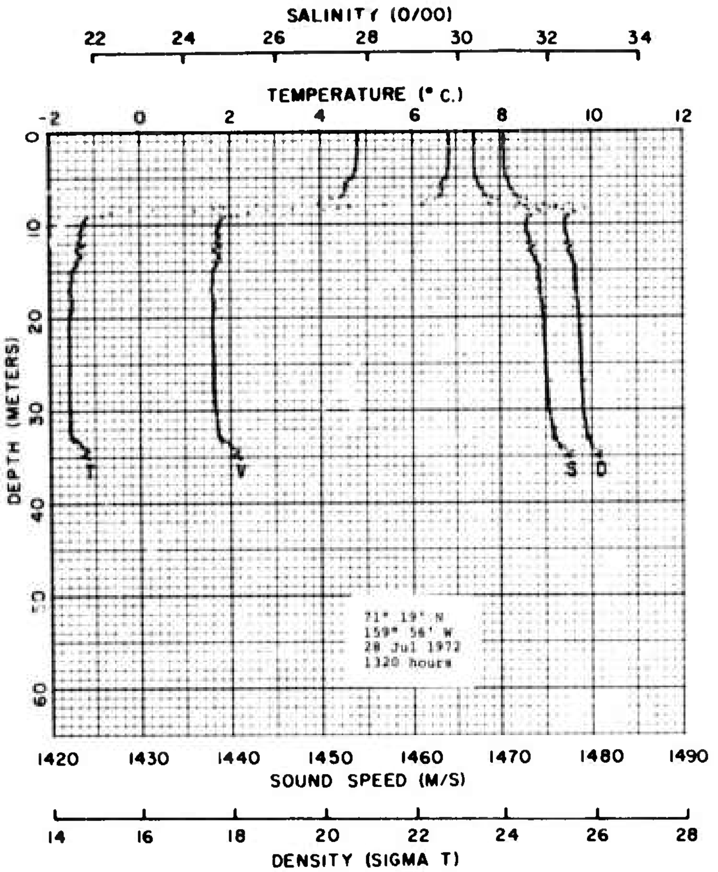

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
T
V
S D
70° 59' N
159° 50' W
28 Jul 1972
0600 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

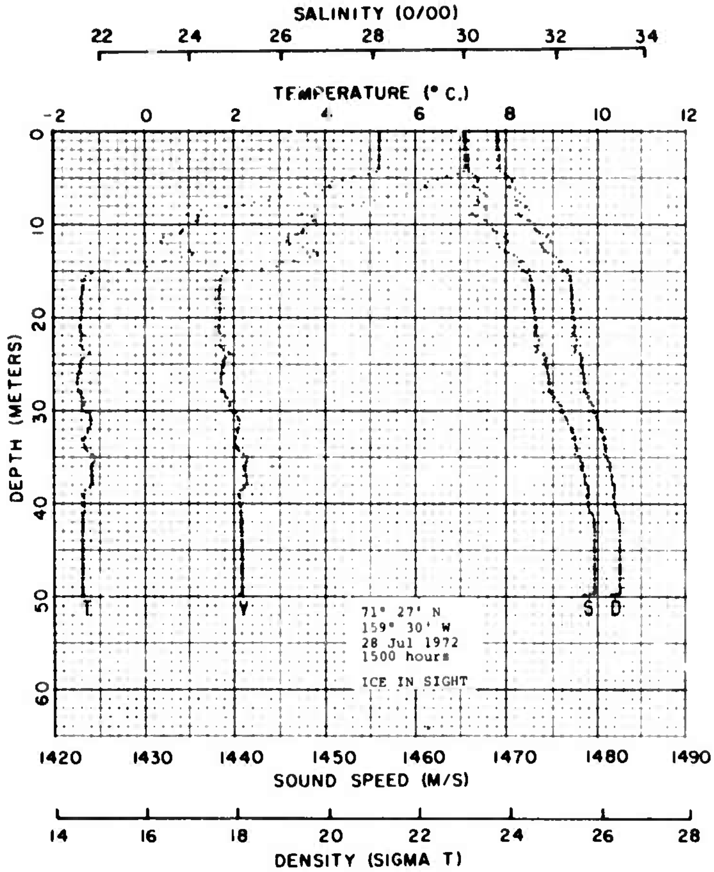

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 1.4' N
159° 55' W
28 Jul 1972
0645 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

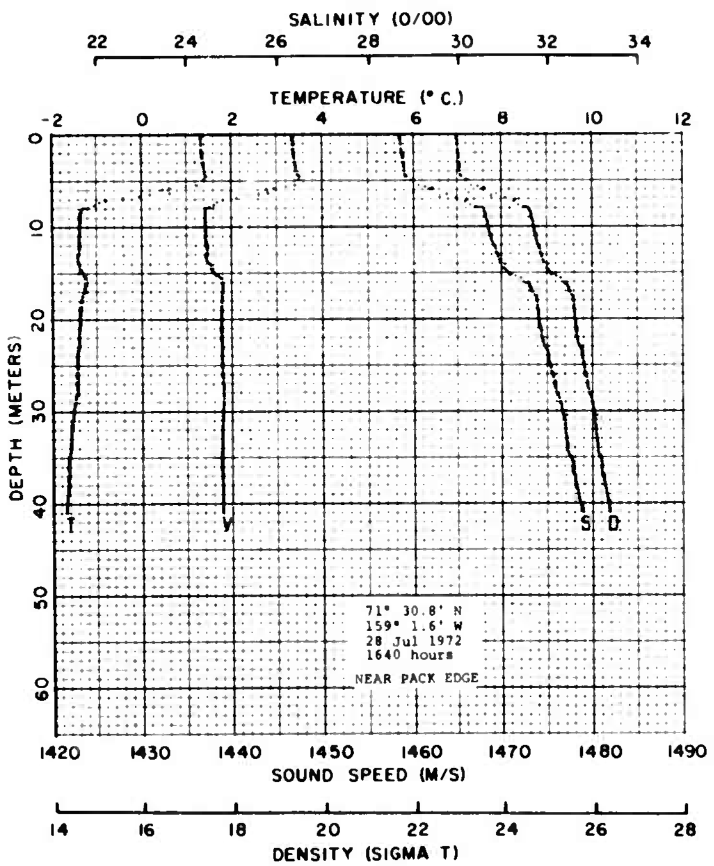

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 5.5' N
160° 5' W
28 Jul 1972
0815 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

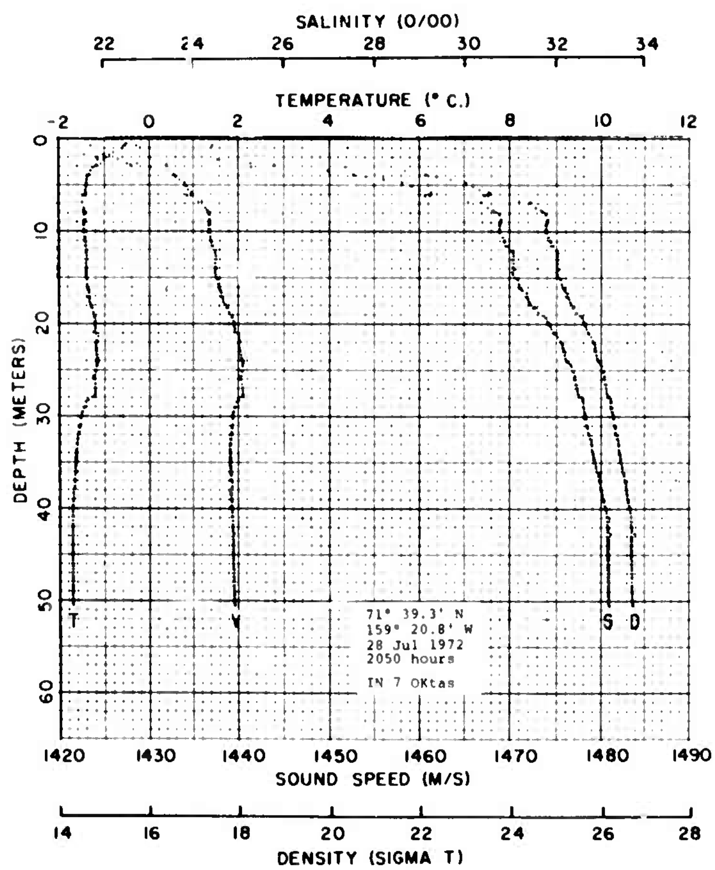

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 9' N
160° 12' W
28 Jul 1972
1000 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

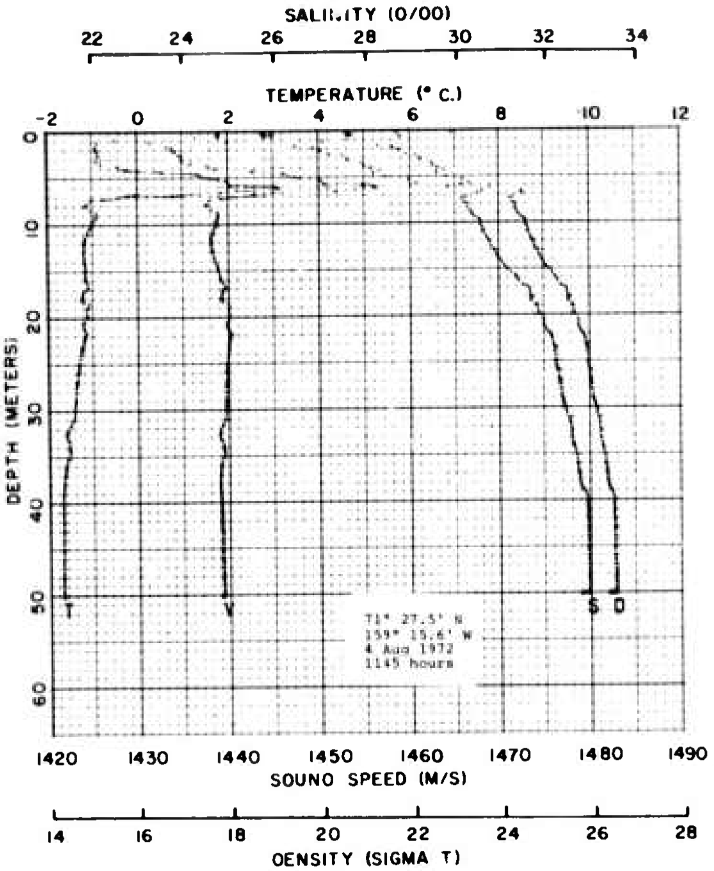

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 13' N
160° 22' W
28 Jul 1972
1130 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

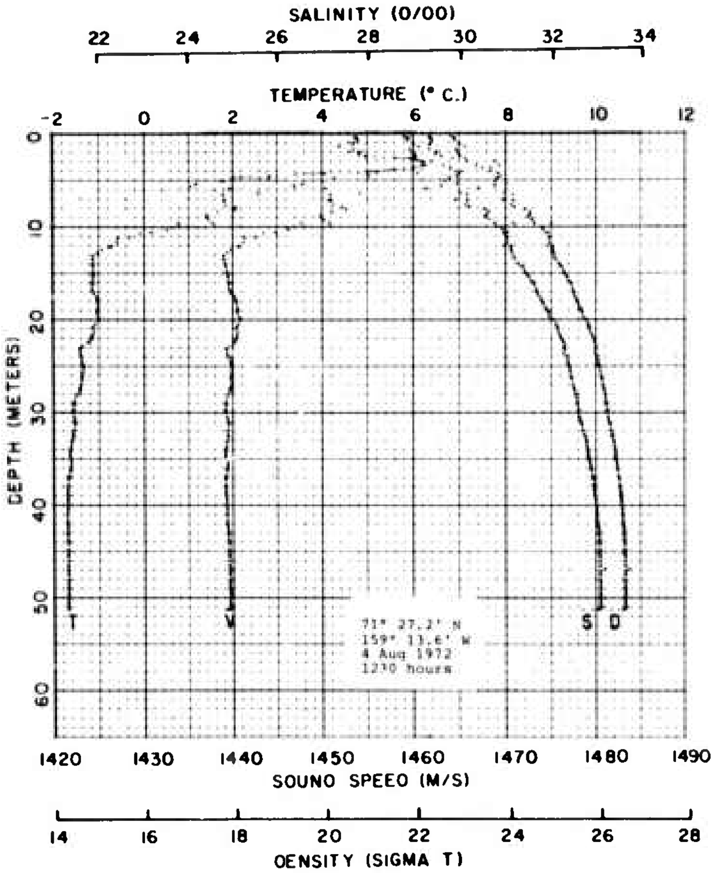

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
71° 19' N
159° 56' W
28 Jul 1972
1320 hours

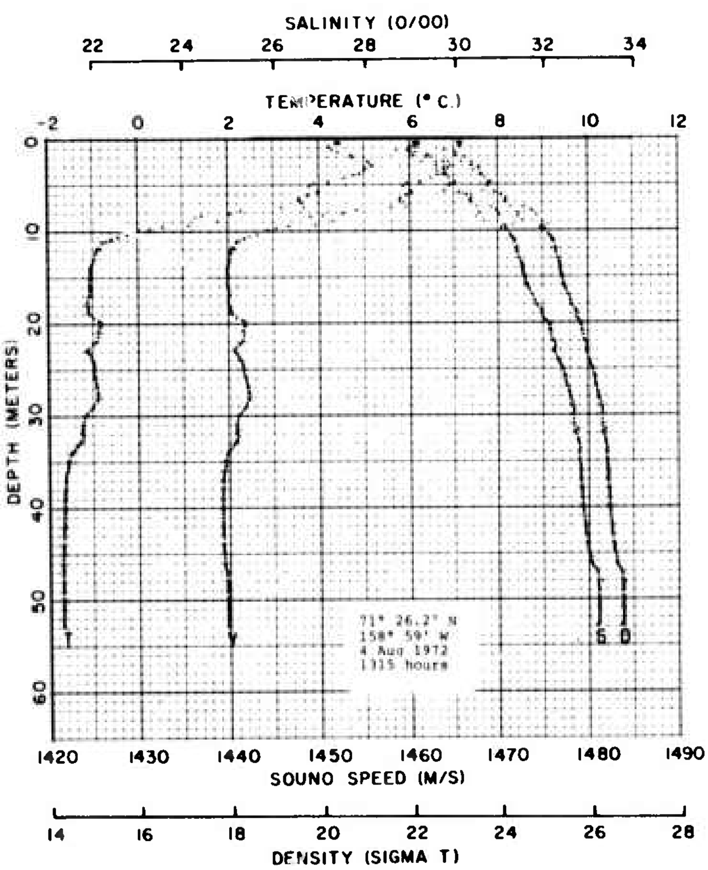

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
71° 27' N
159° 30' W
28 Jul 1972
1500 hours
ICE IN SIGHT

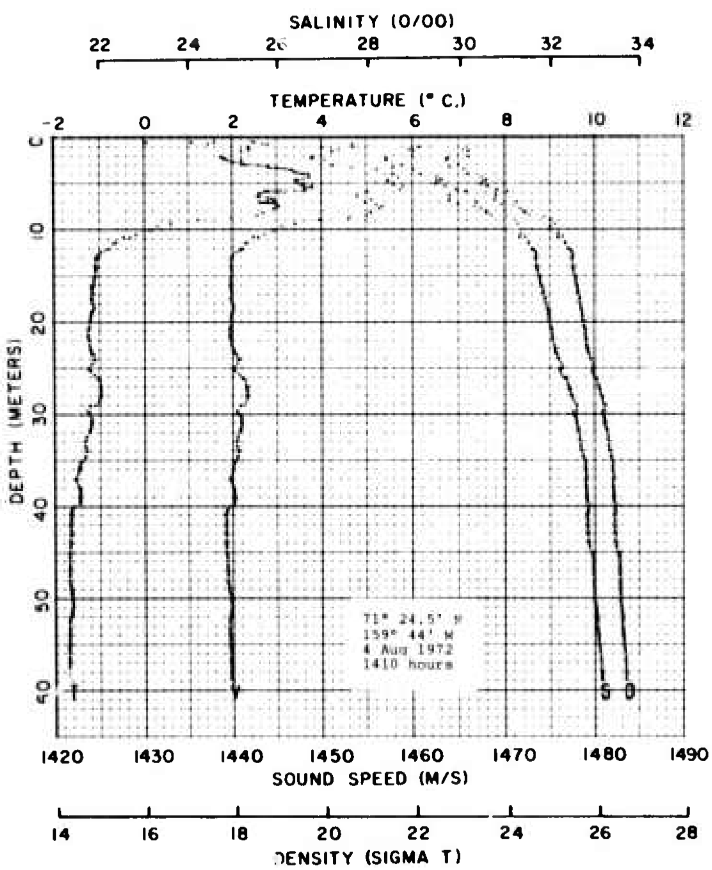

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
71° 30.8' N
159° 1.6' W
28 Jul 1972
1640 hours
NEAR PACK EDGE

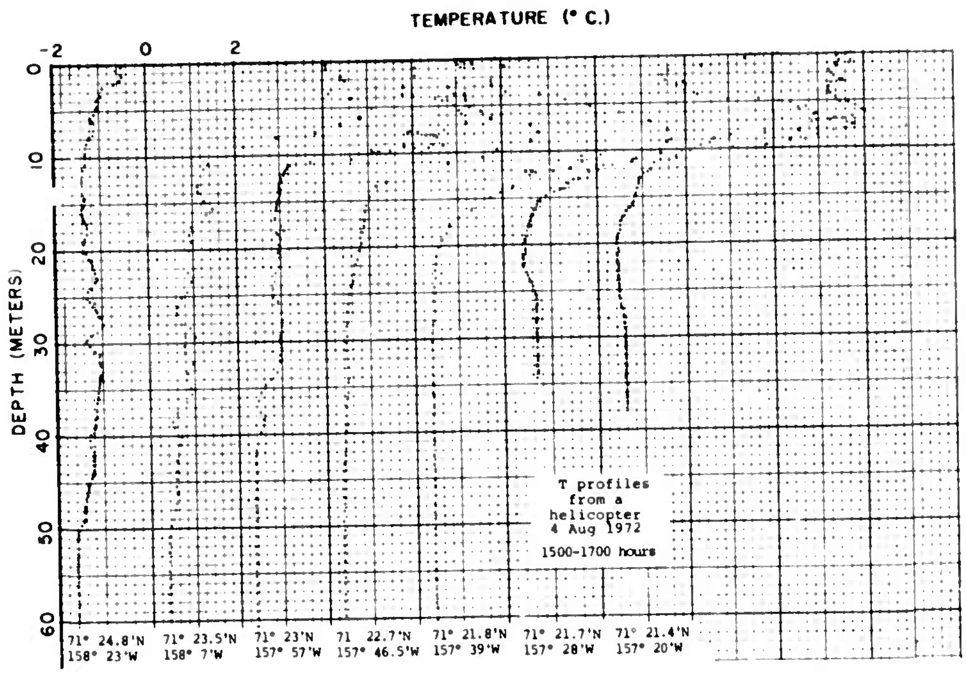

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
T
V
S
D
71° 39.3' N
159° 20.8' W
28 Jul 1972
2050 hours
IN 7 OKtas

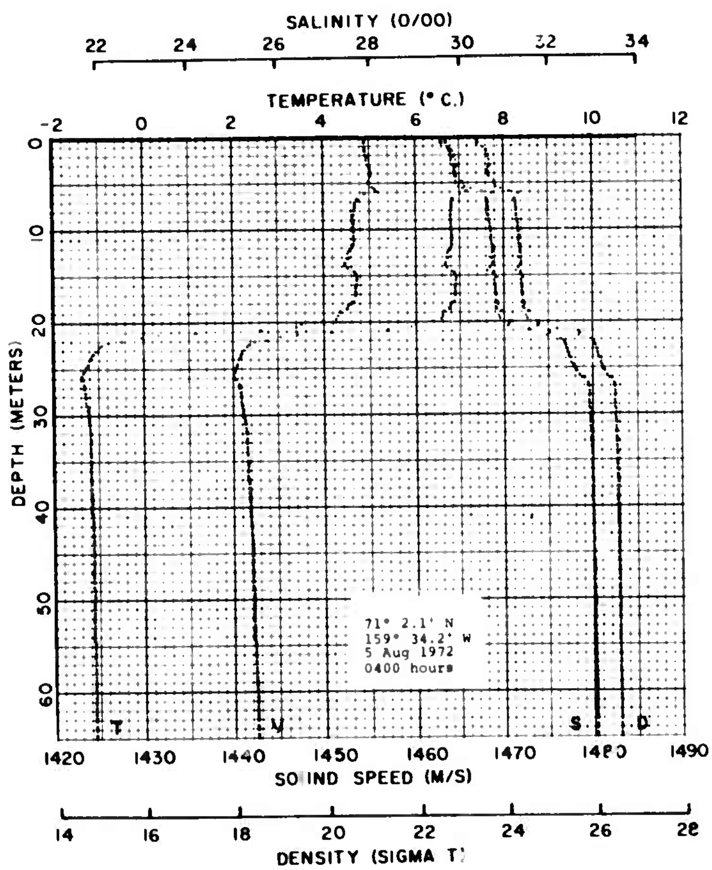

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T
V
S D
71° 27.5' N
159° 15.6' W
4 Aug 1972
1145 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

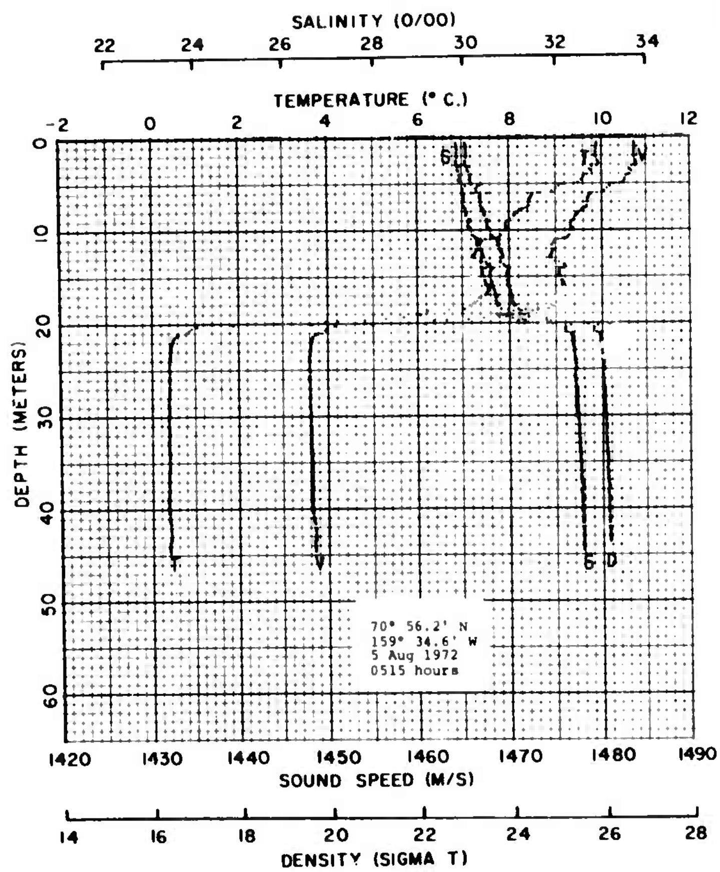

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T
V
S D
71° 27.2' N
159° 11.6' W
4 Aug 1972
1230 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

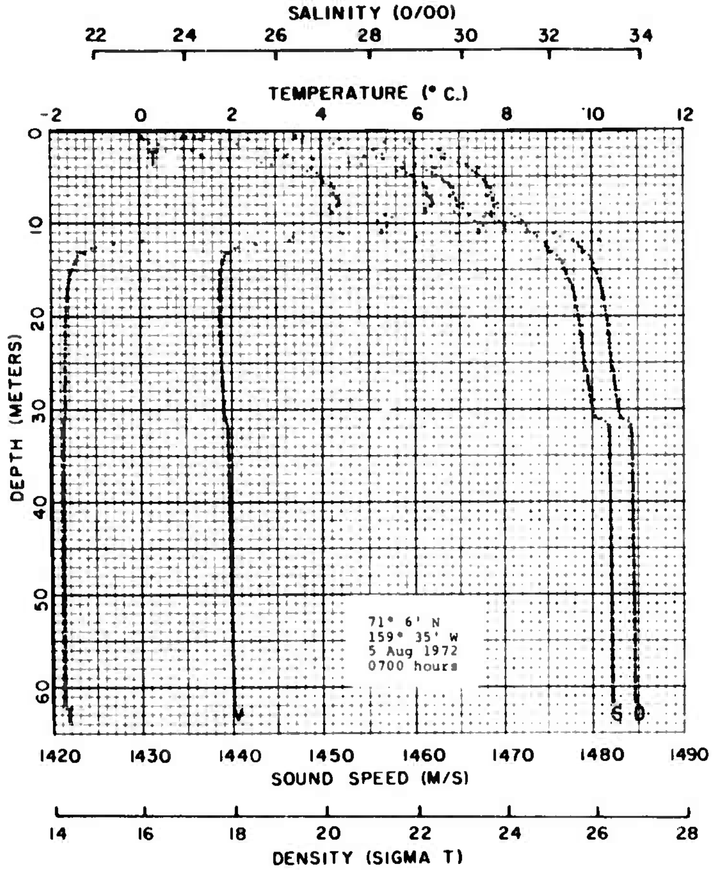

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T
V
S D
71° 26.2' N
158° 59' W
4 Aug 1972
1315 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

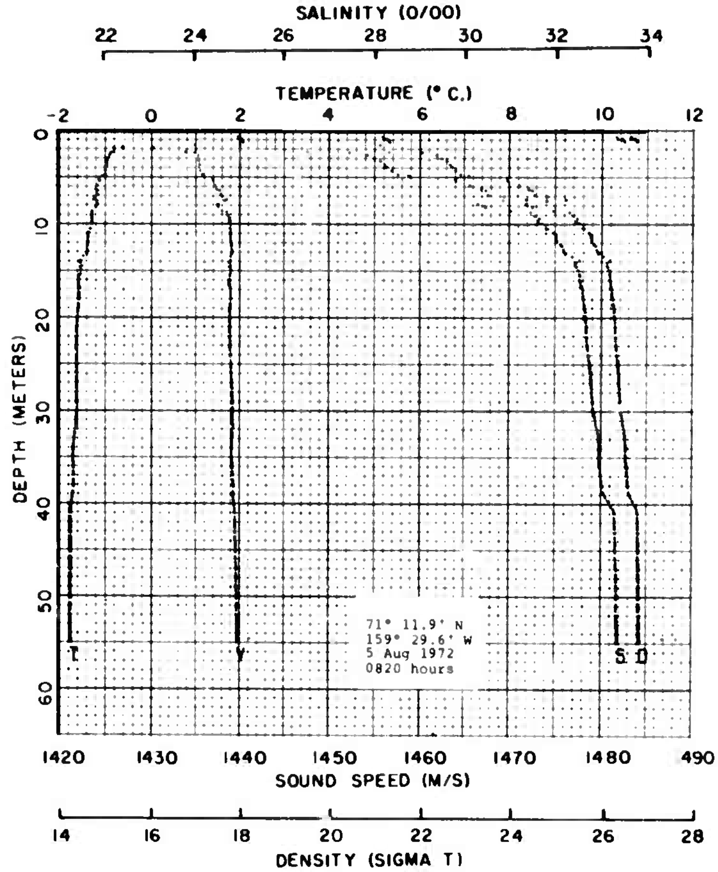

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T
V
S D
71° 24.5' N
159° 44' W
4 Aug 1972
1410 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

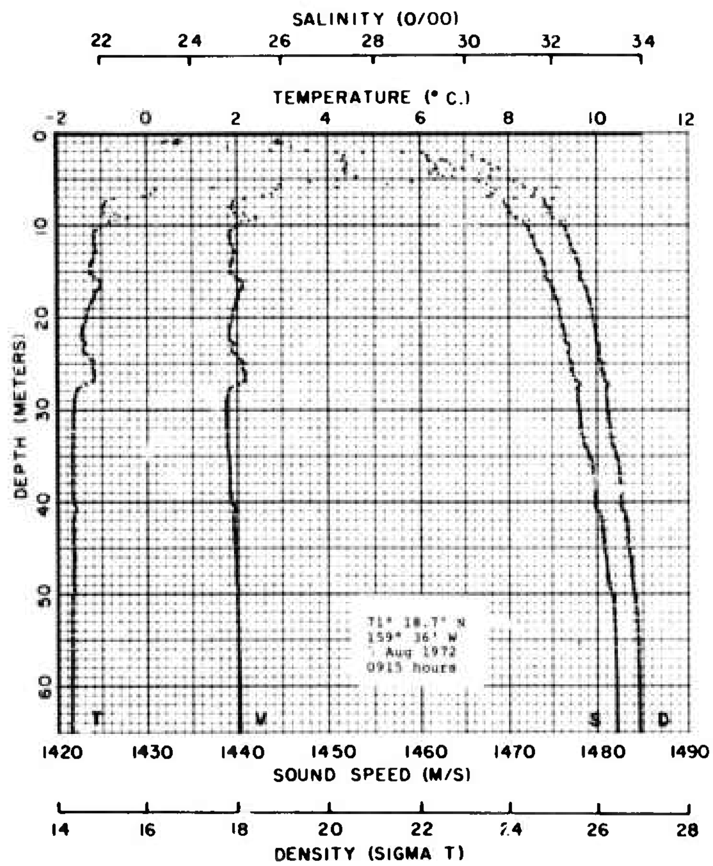

TEMPERATURE (° C.)
DEPTH (METERS)
T profiles
from a
helicopter
4 Aug 1972
1500-1700 hours
71° 24.8'N 158° 23'W
71° 23.5'N 158° 7'W
71° 23'N 157° 57'W
71 22.7'N 157° 46.5'W
71° 21.8'N 157° 39'W
71° 21.7'N 157° 28'W
71° 21.4'N 157° 20'W

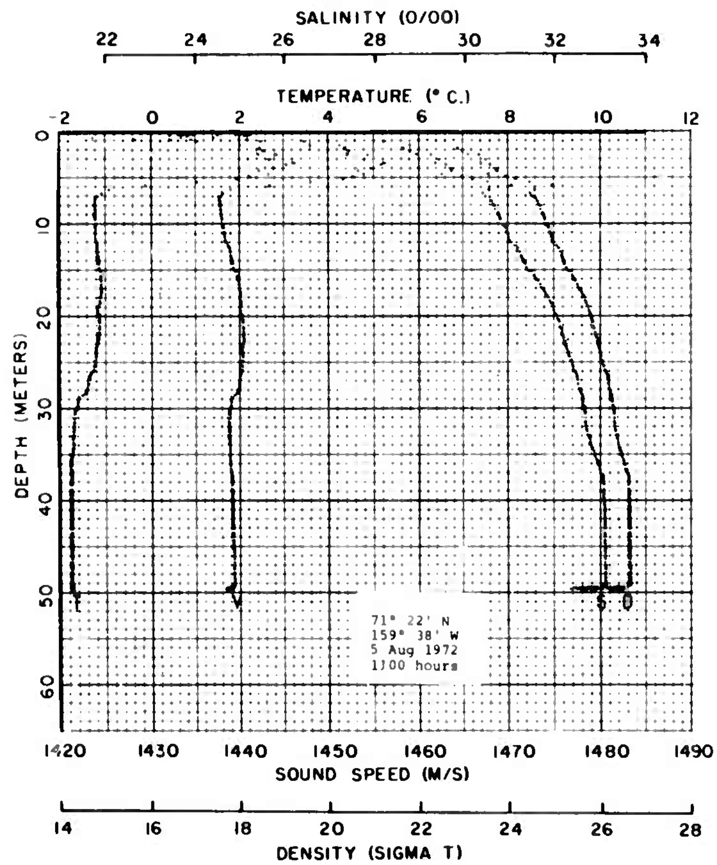

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 2.1' N
159° 34.2' W
5 Aug 1972
0400 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

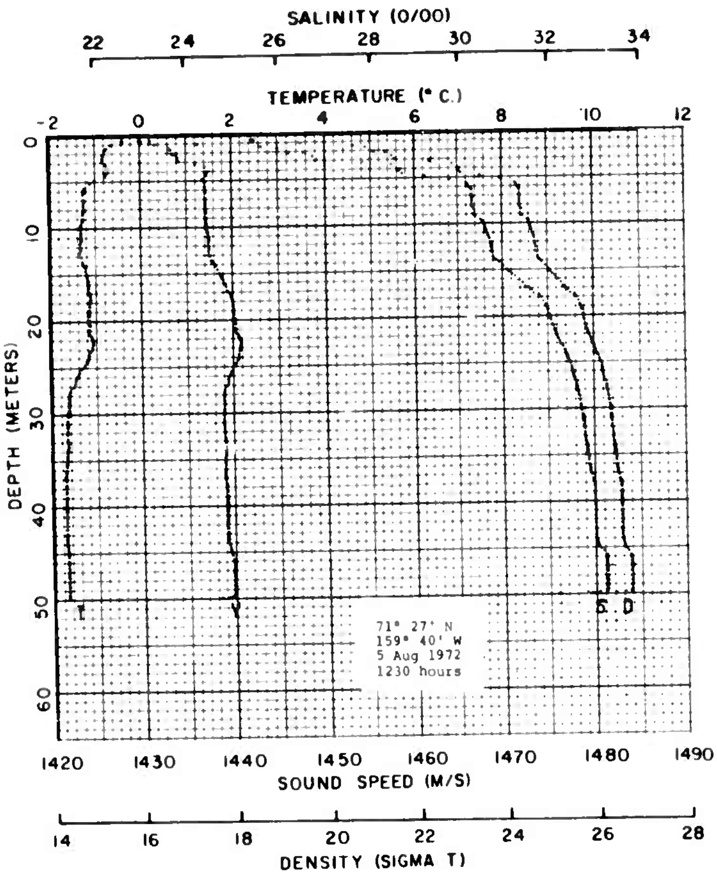

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
70° 56.2' N
159° 34.6' W
5 Aug 1972
0515 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

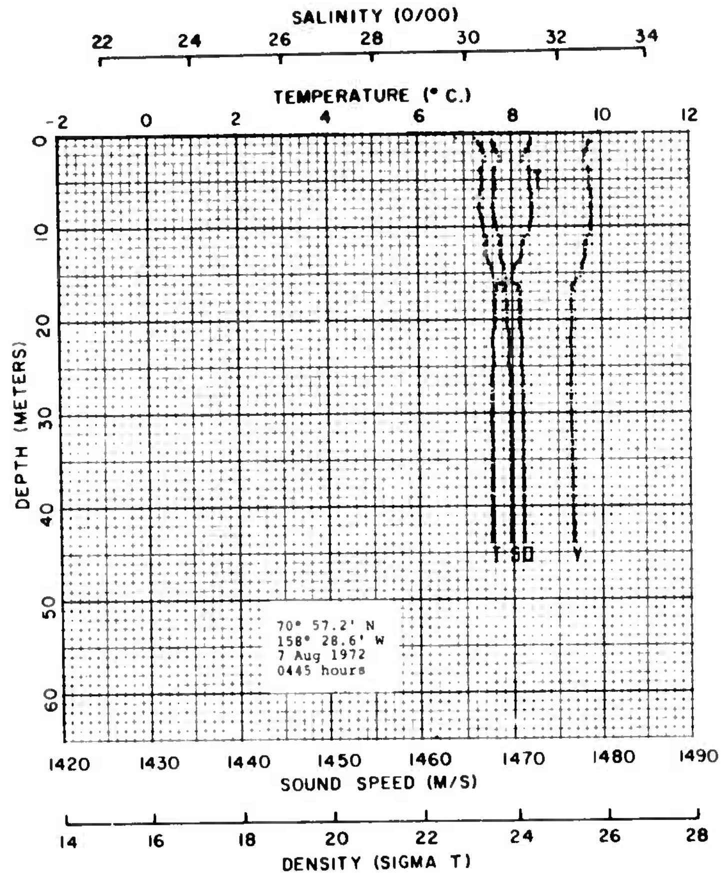

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 6' N
159° 35' W
5 Aug 1972
0700 hours
T
V
S D
SOUND SPEED (M/S)
DENSITY (SIGMA T)

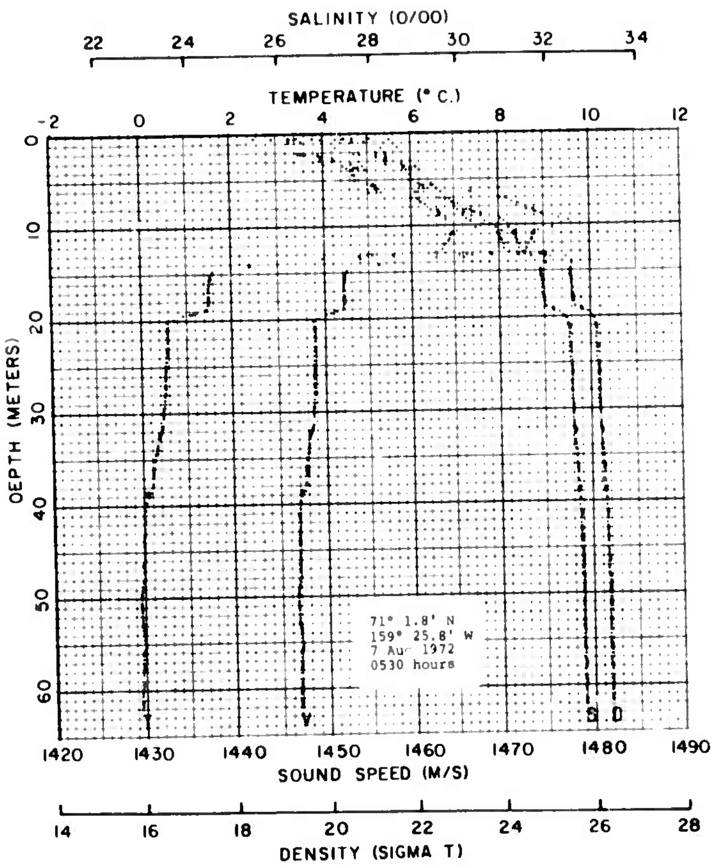

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 11.9' N
159° 29.6' W
5 Aug 1972
0820 hours
T
V
S D
SOUND SPEED (M/S)
DENSITY (SIGMA T)

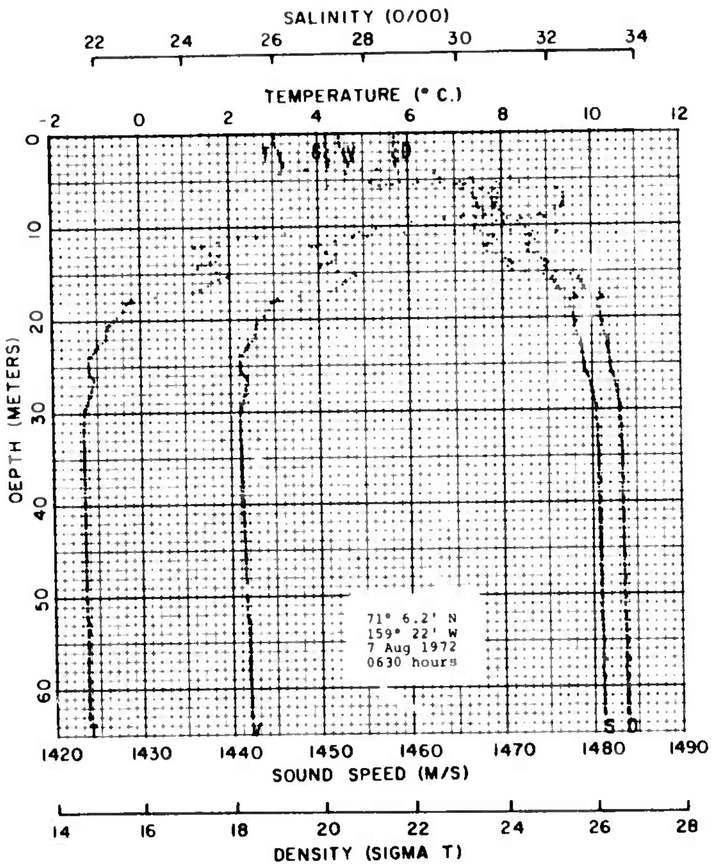

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 18.7' N
159° 36' W
Aug 1972
0915 hours
T
V
S
D
SOUND SPEED (M/S)
DENSITY (SIGMA T)

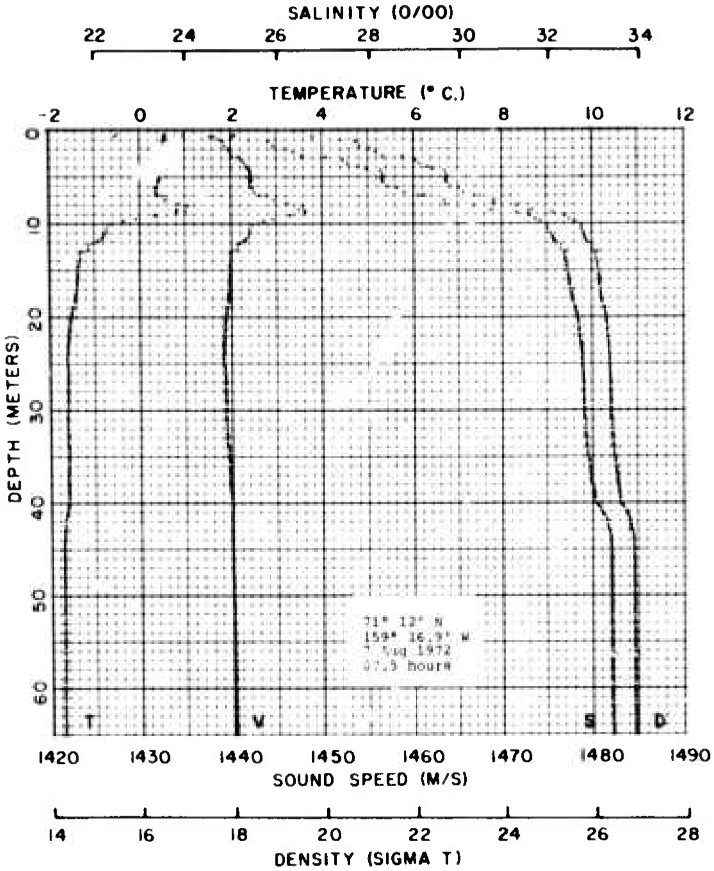

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 22' N
159° 38' W
5 Aug 1972
1100 hours
S D
SOUND SPEED (M/S)
DENSITY (SIGMA T)

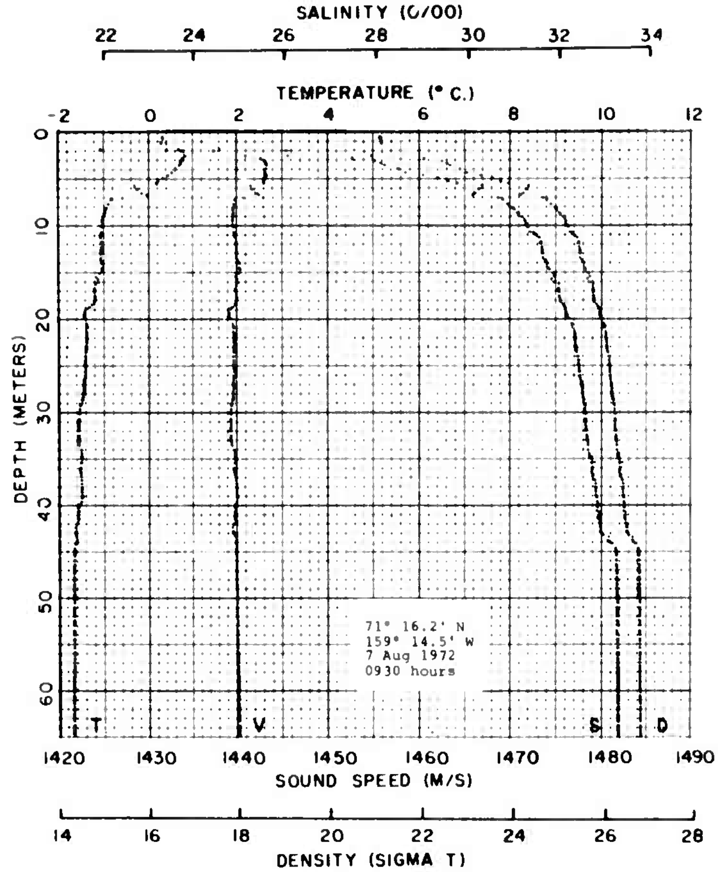

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 27' N
159° 40' W
5 Aug 1972
1230 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

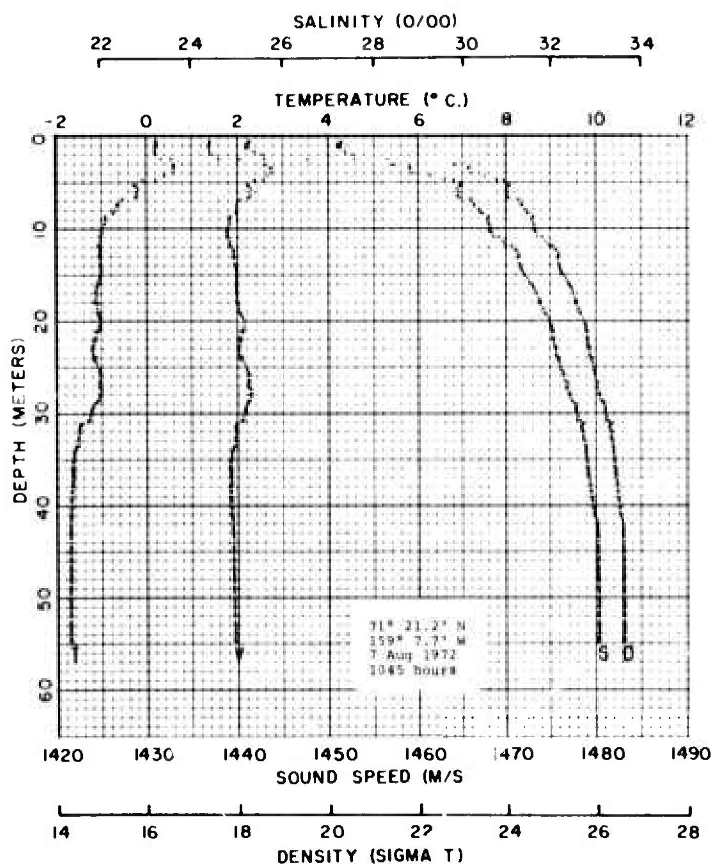

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T S D V
70° 57.2' N
158° 28.6' W
7 Aug 1972
0445 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

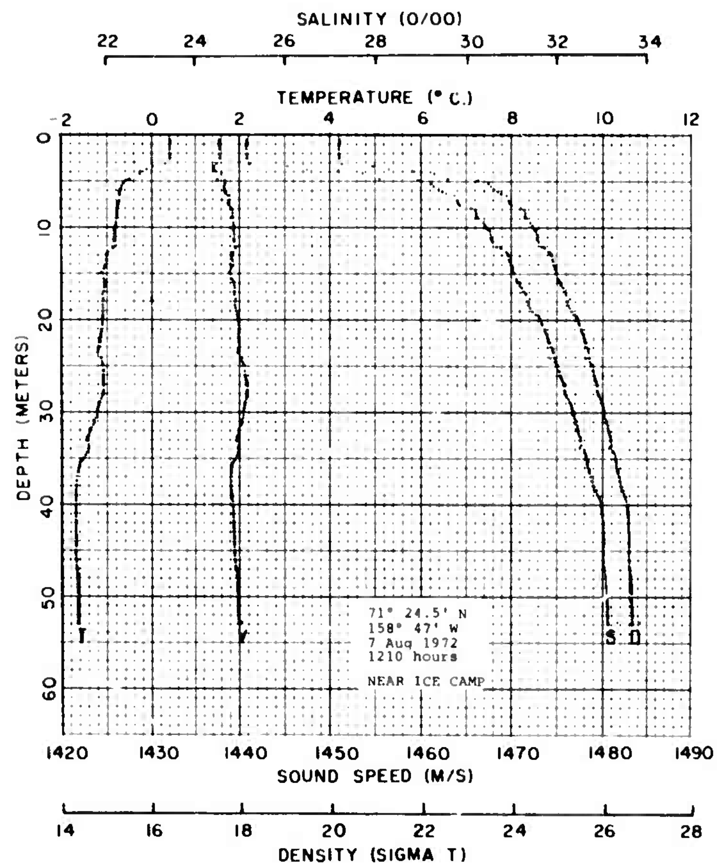

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 1.8' N
159° 25.8' W
0530 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

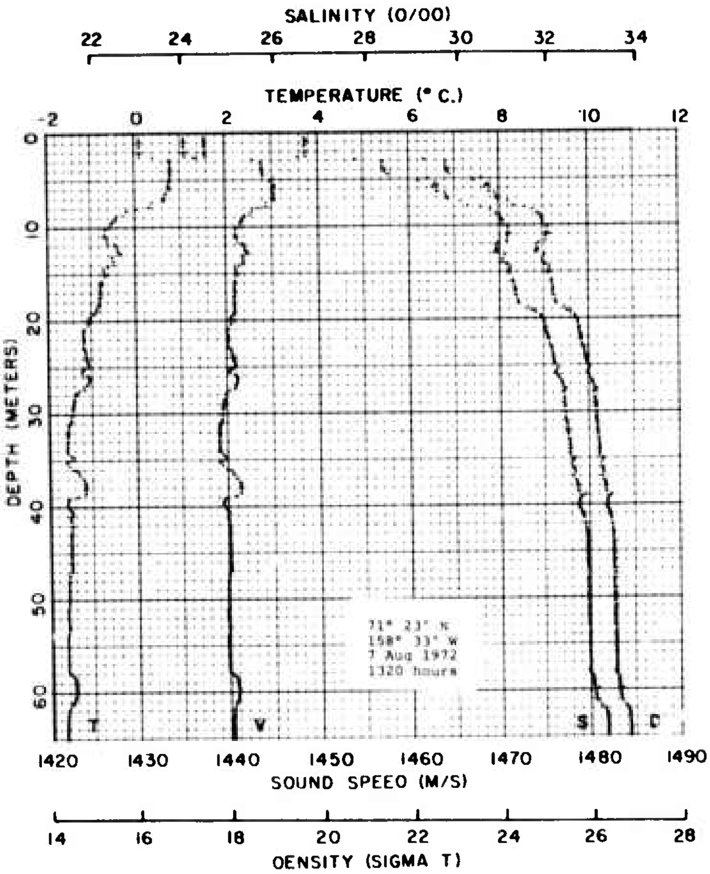

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
V S D
71° 6.2' N
159° 22' W
7 Aug 1972
0630 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

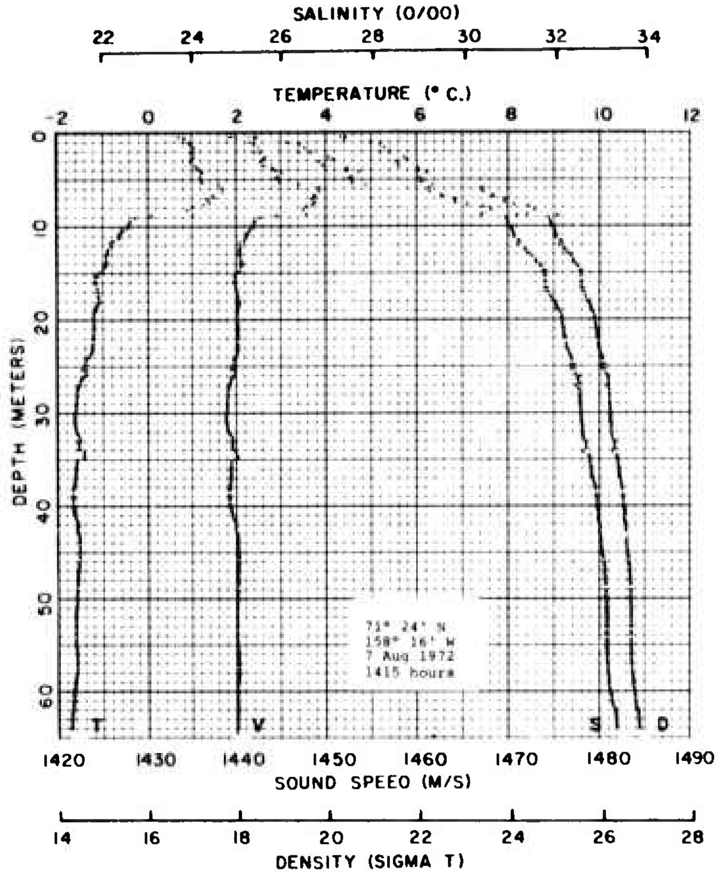

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 12' N
159° 16.9' W
7 Aug 1972
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

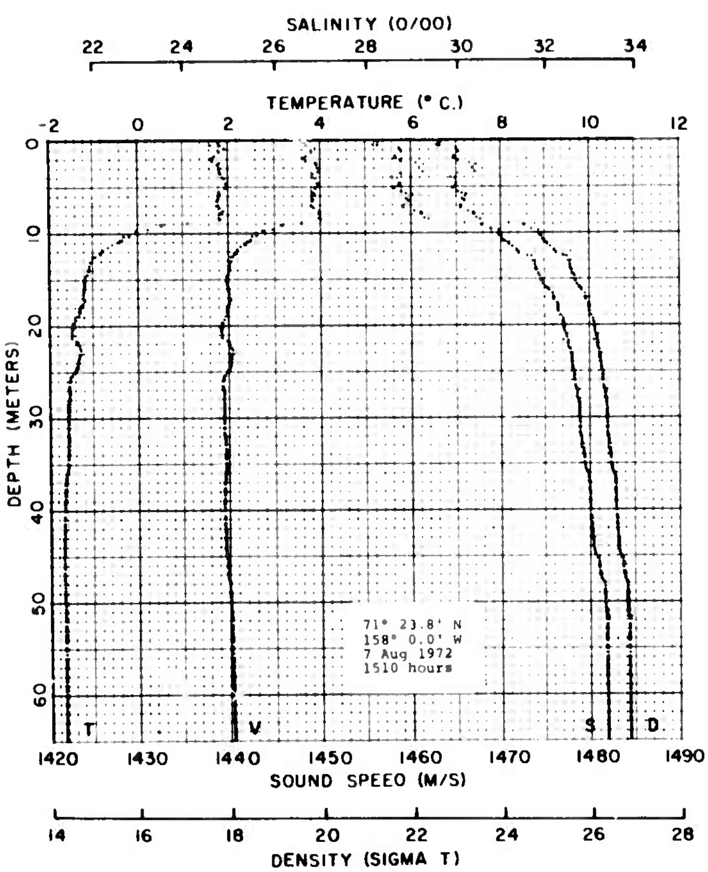

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 16.2' N
159° 14.5' W
7 Aug 1972
0930 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

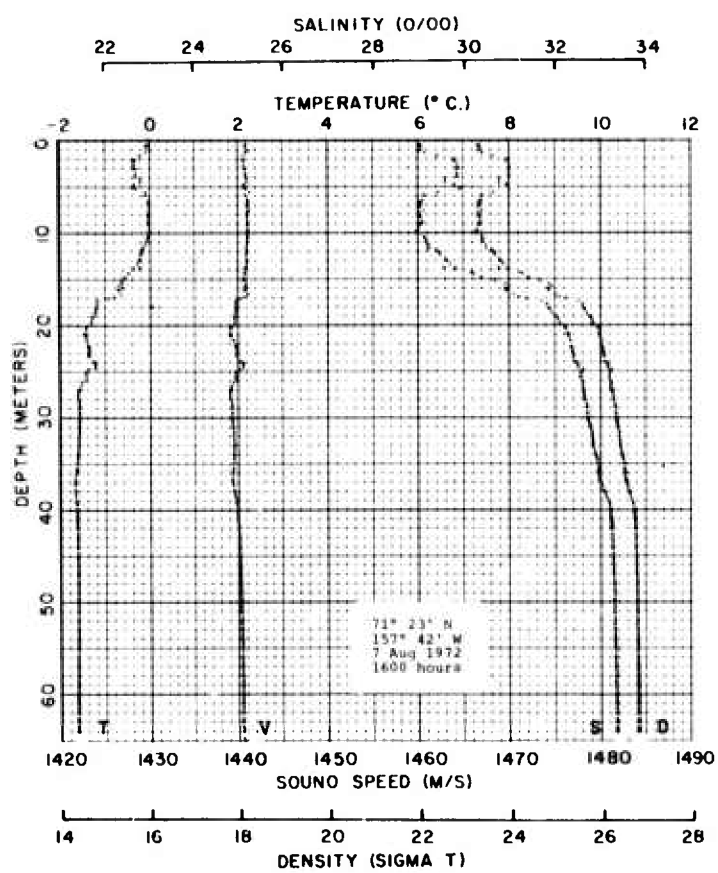

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 21.2' N
159° 7.7' W
7 Aug 1972
1045 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

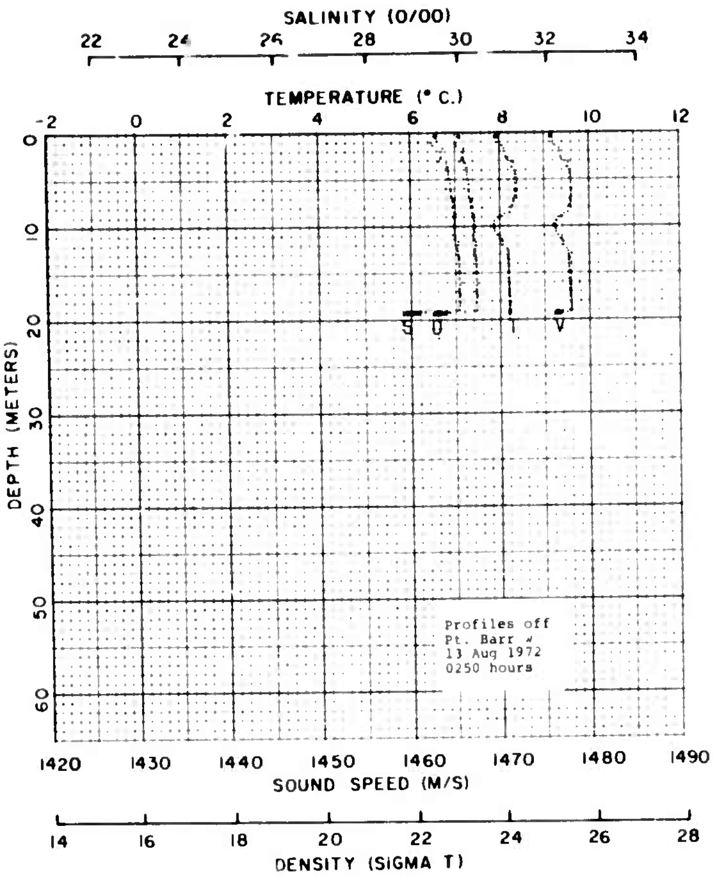

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 24.5' N
158° 47' W
7 Aug 1972
1210 hours
NEAR ICE CAMP
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

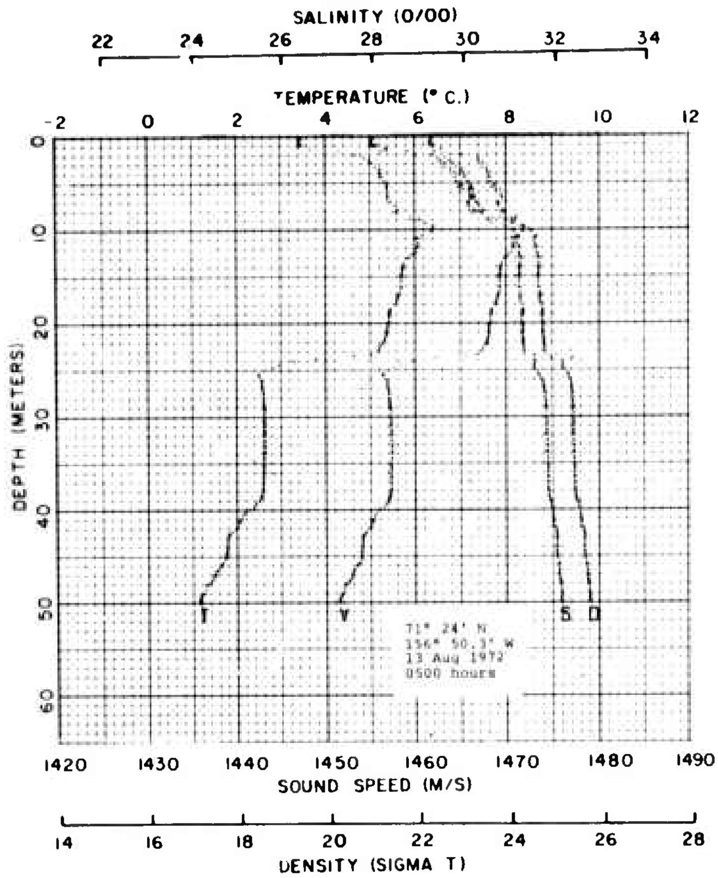

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 23' N
158° 33' W
7 Aug 1972
1320 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

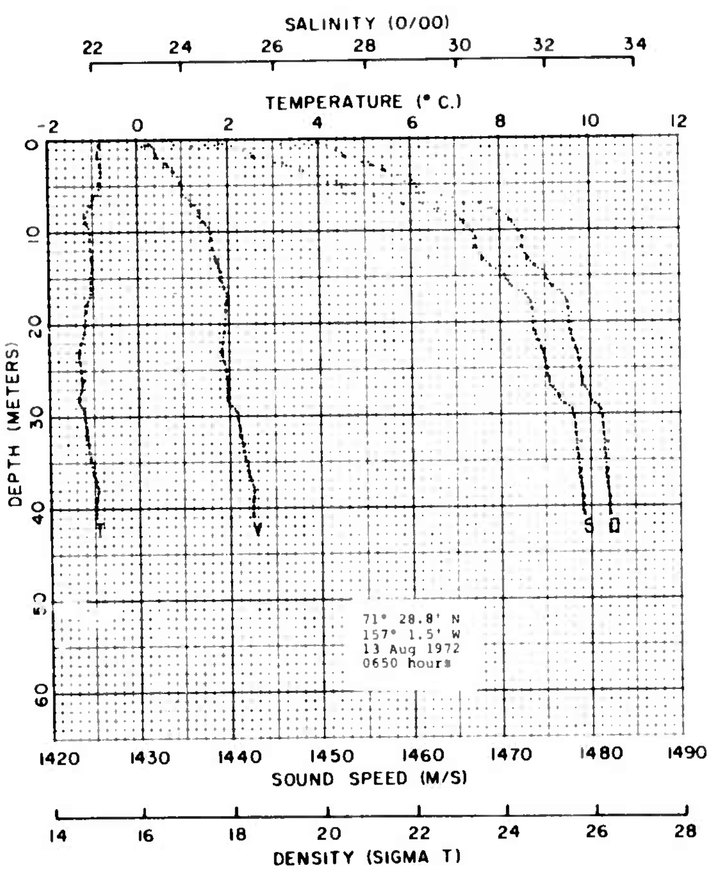

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 24' N
158° 16' W
7 Aug 1972
1415 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

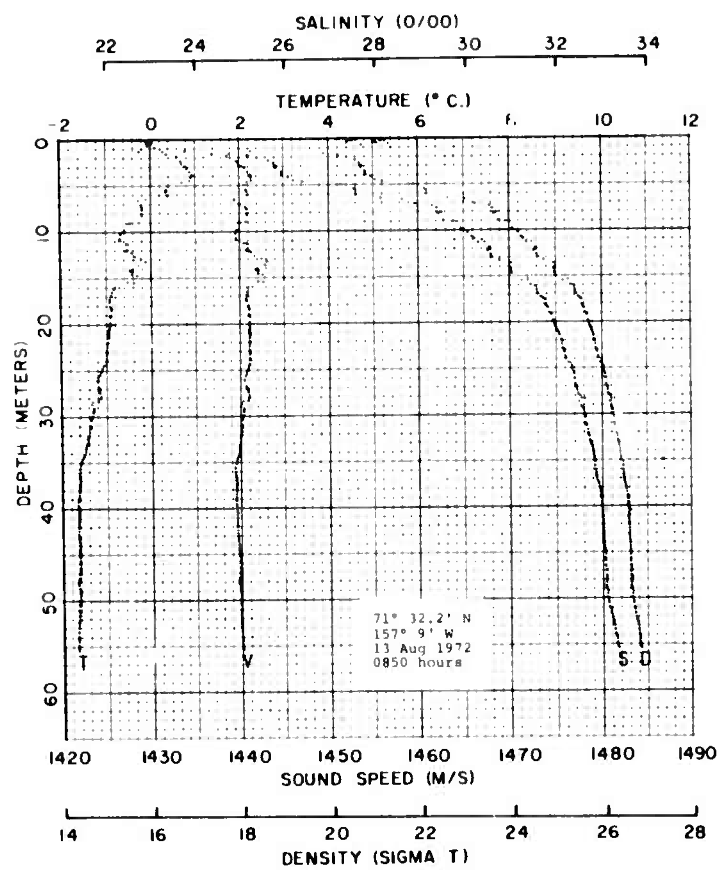

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 23.8' N
158° 0.0' W
7 Aug 1972
1510 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

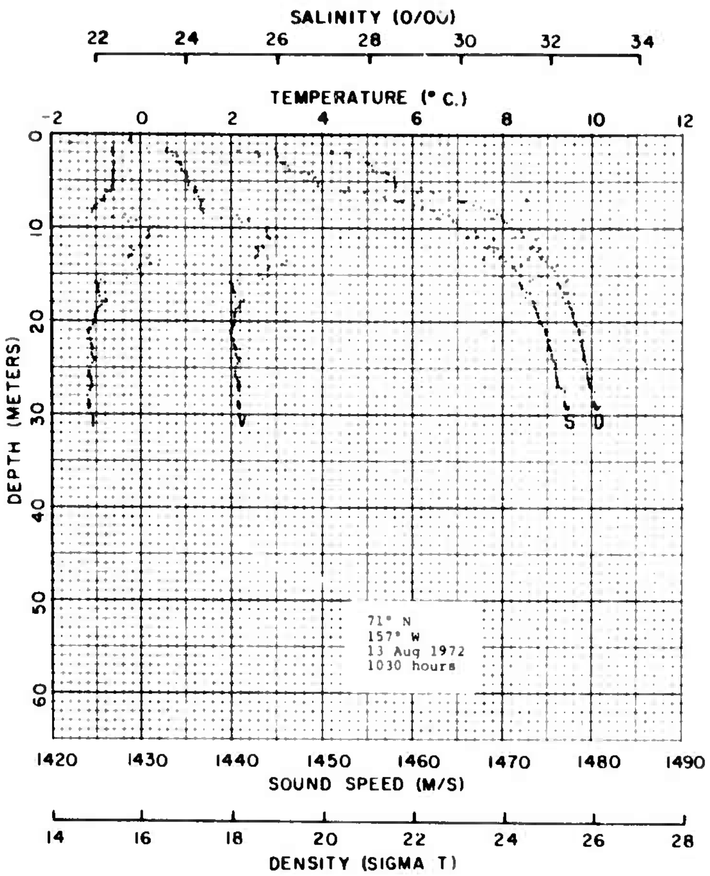

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
71° 23' N
157° 42' W
7 Aug 1972
1600 hours
T V S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

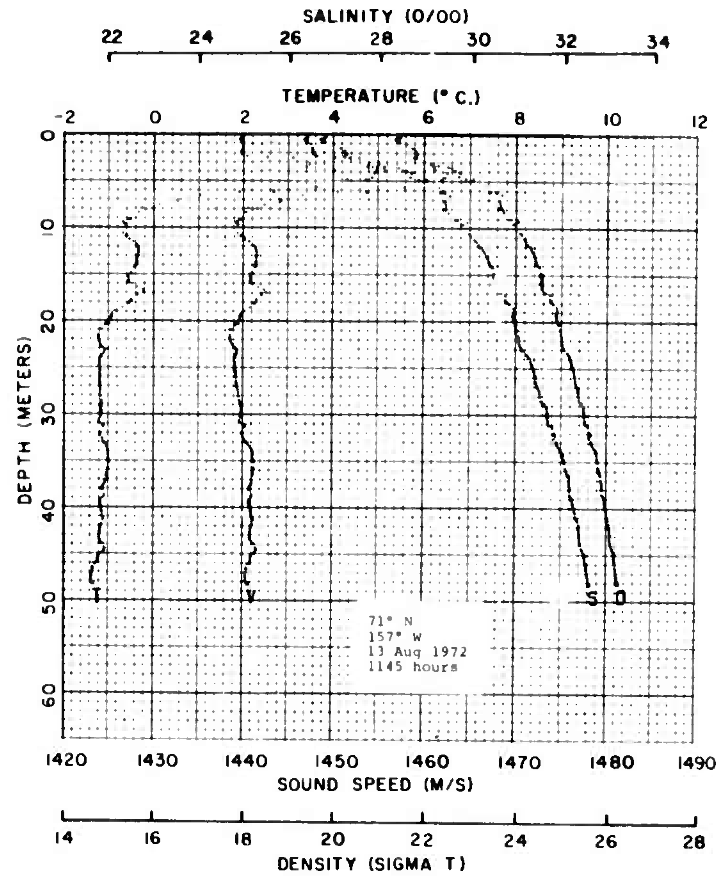

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Profiles off
Pt. Barrow
13 Aug 1972
0250 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

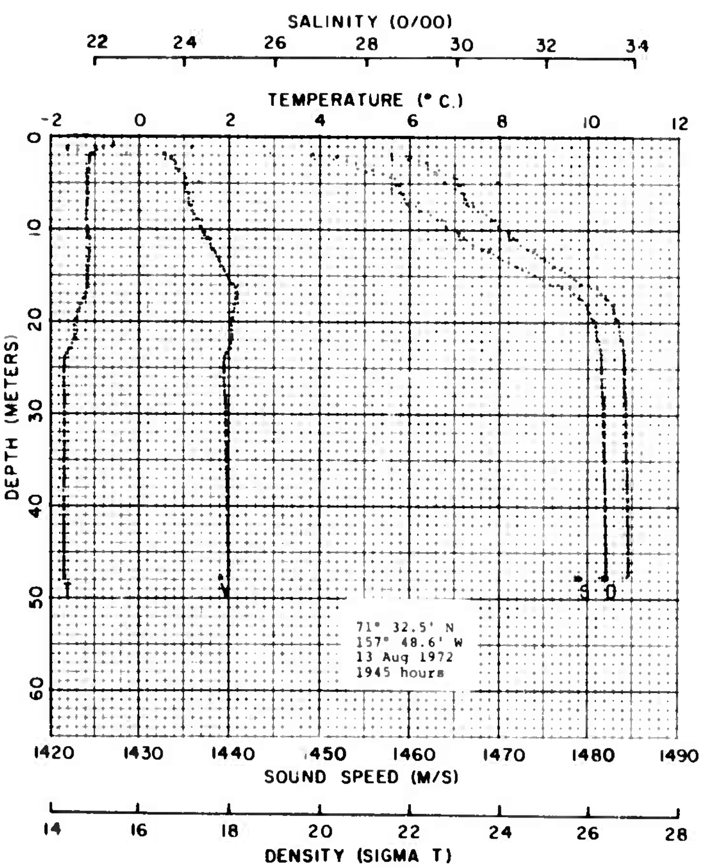

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 24' N
156° 50.3' W
13 Aug 1972
0500 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

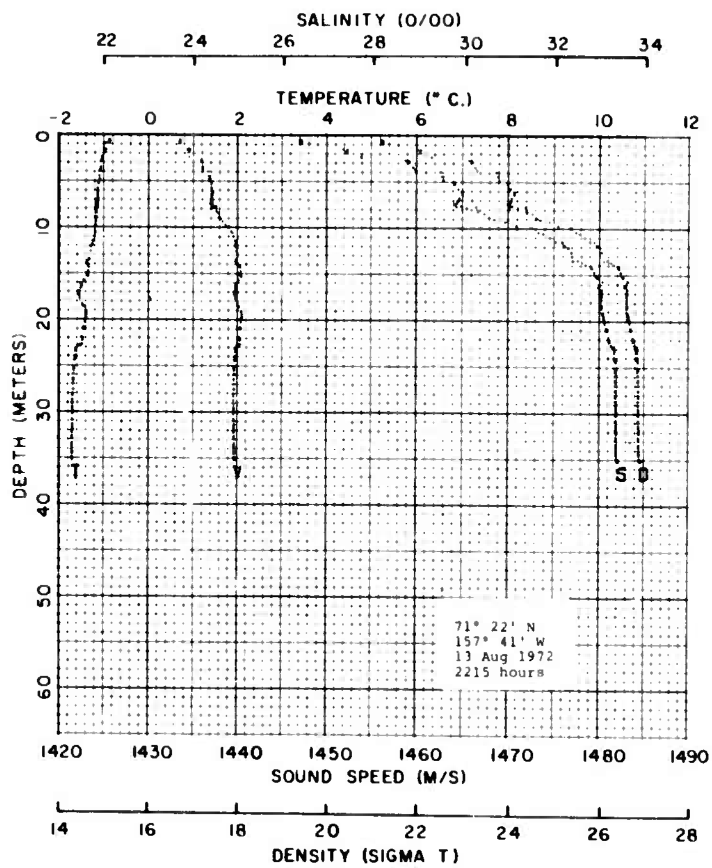

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 28.8' N
157° 1.5' W
13 Aug 1972
0650 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

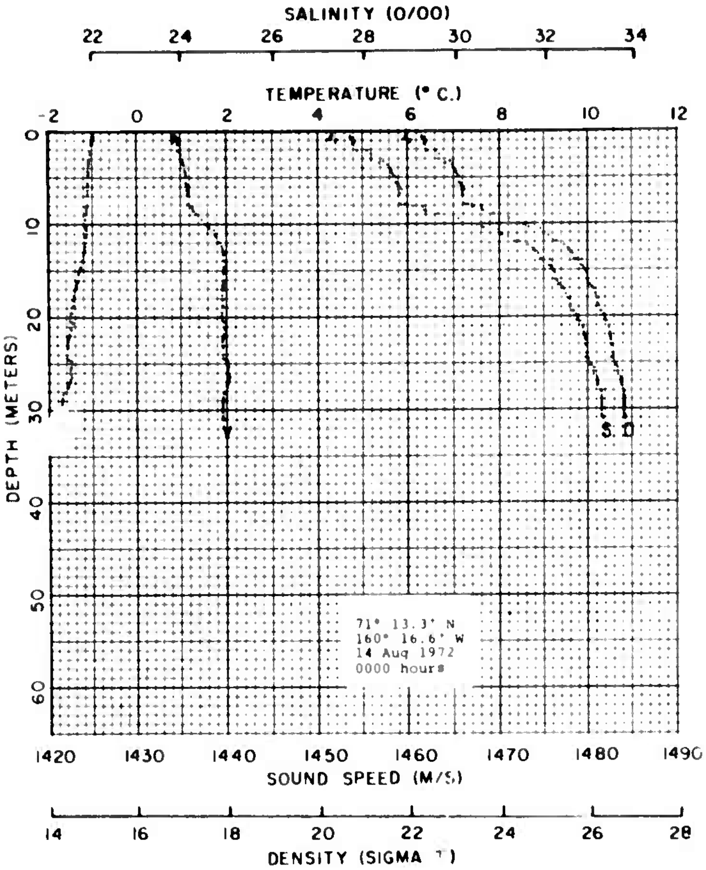

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 32.2' N
157° 9' W
13 Aug 1972
0850 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

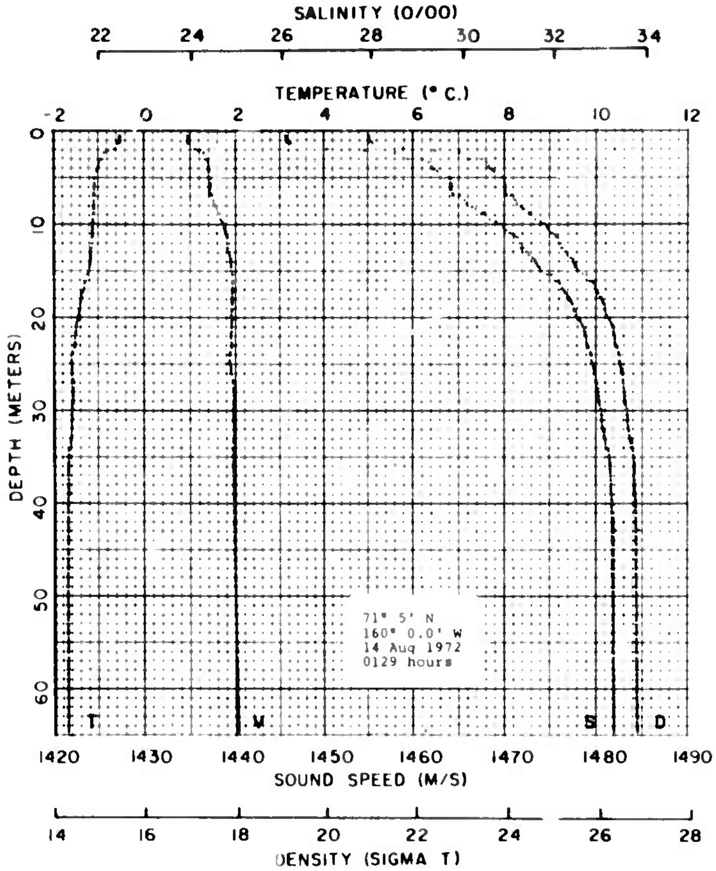

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° N
157° W
13 Aug 1972
1030 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

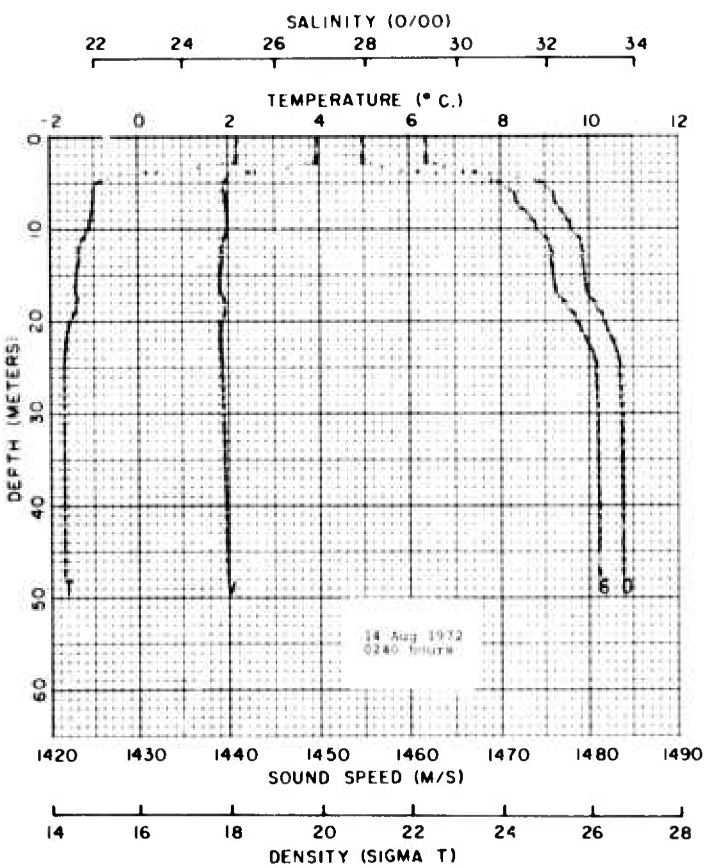

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° N
157° W
13 Aug 1972
1145 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

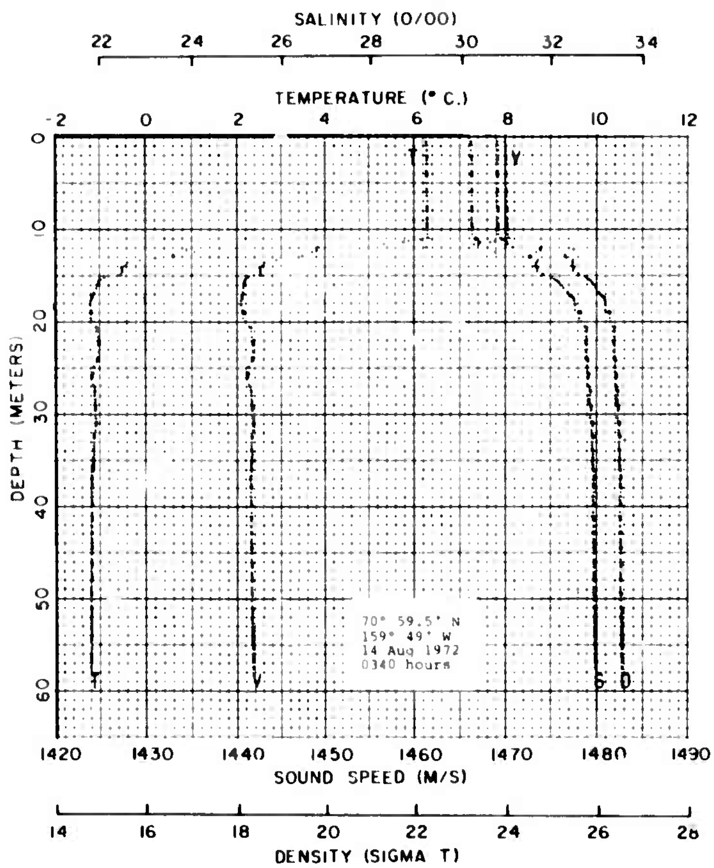

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 32.5' N
157° 48.6' W
13 Aug 1972
1945 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

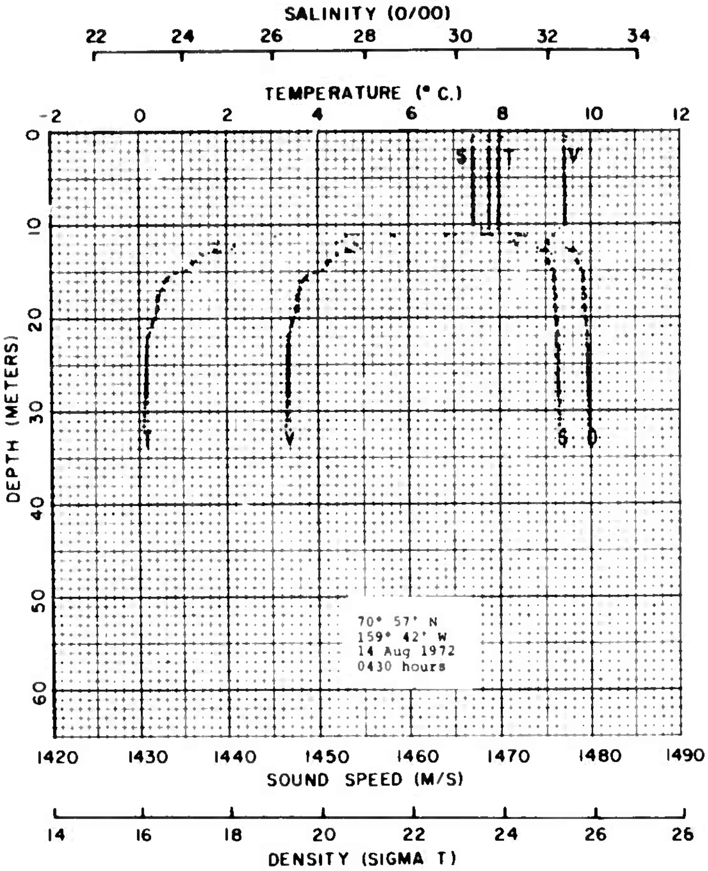

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
71° 22' N
157° 41' W
13 Aug 1972
2215 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

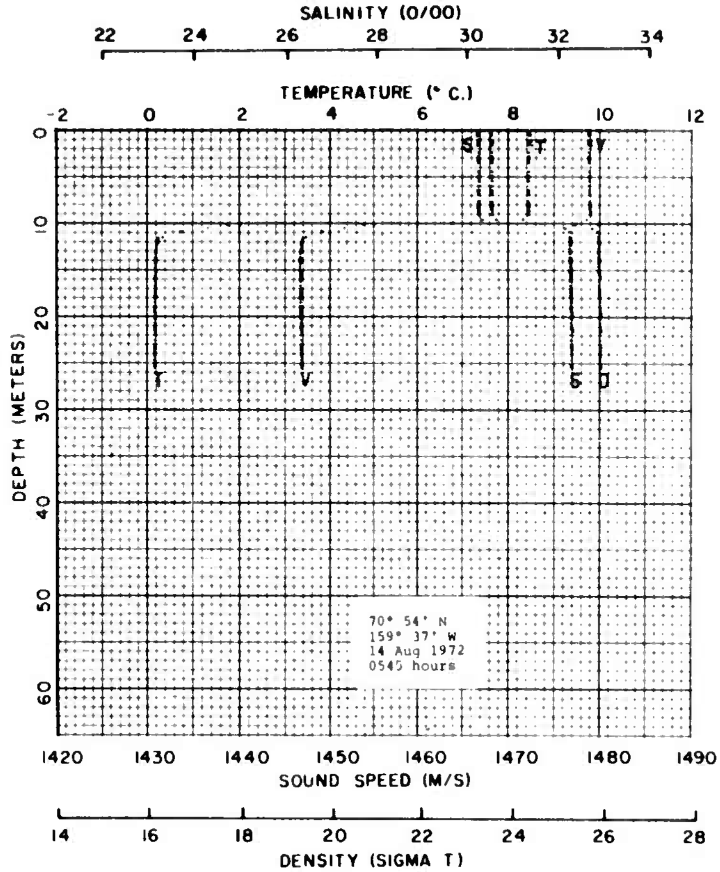

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 13.3' N
160° 16.6' W
14 Aug 1972
0000 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

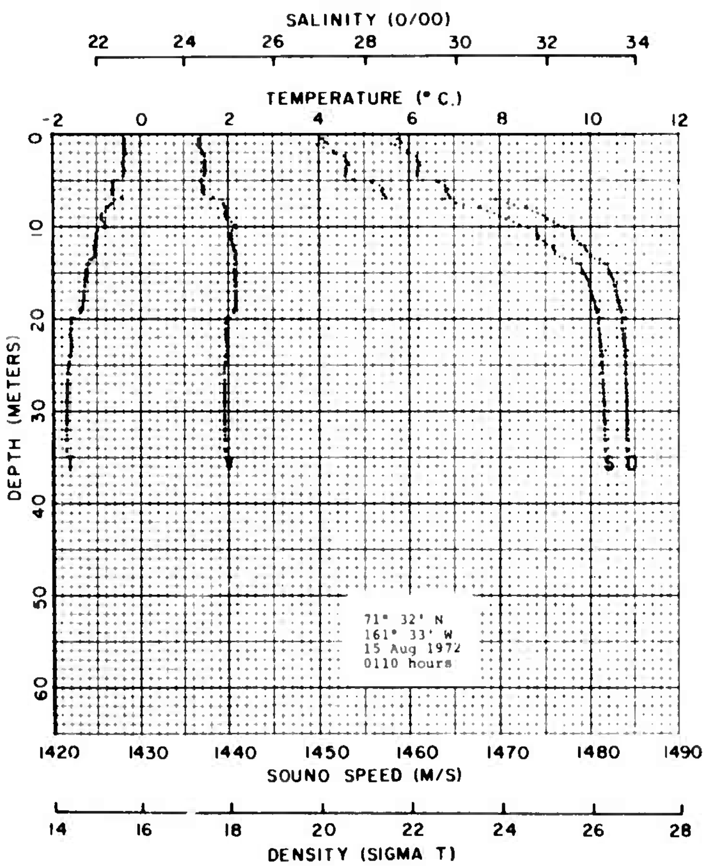

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 5' N
160° 0.0' W
14 Aug 1972
0129 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

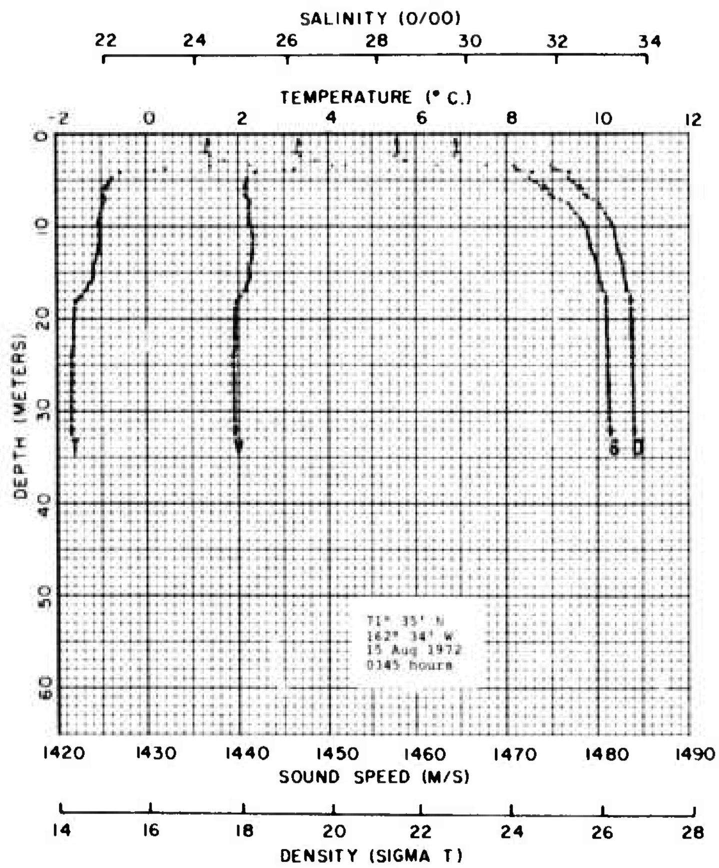

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
14 Aug 1972
0240 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

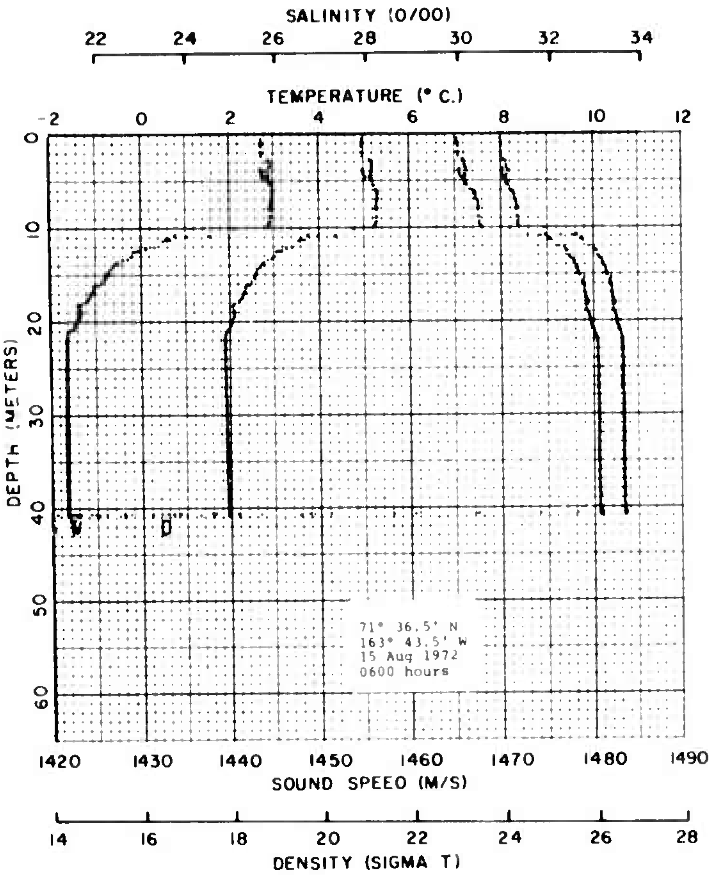

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
70° 59.5' N
159° 49' W
14 Aug 1972
0340 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

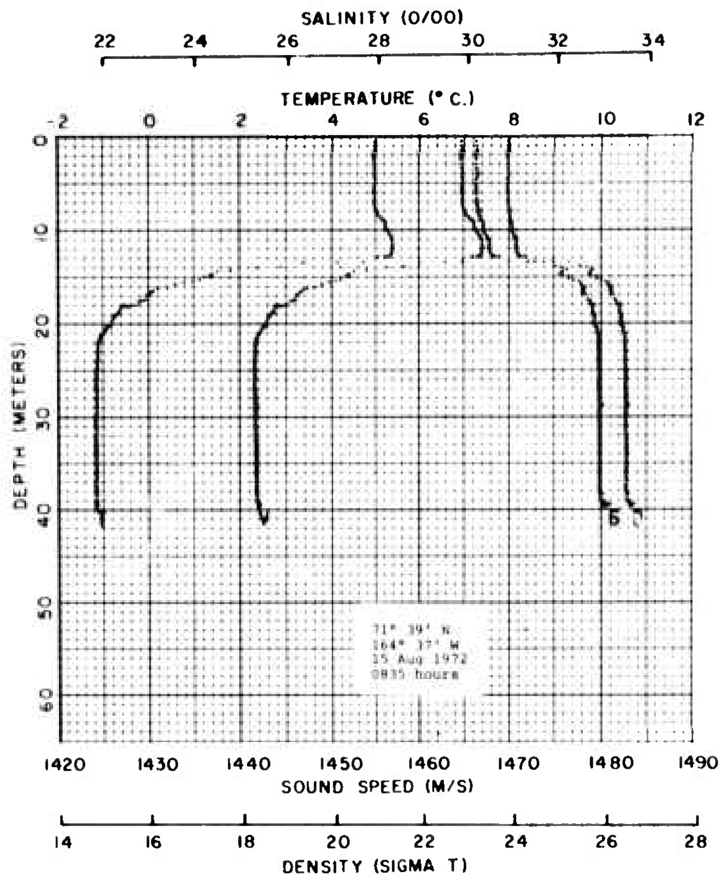

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
70° 57' N
159° 42' W
14 Aug 1972
0430 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

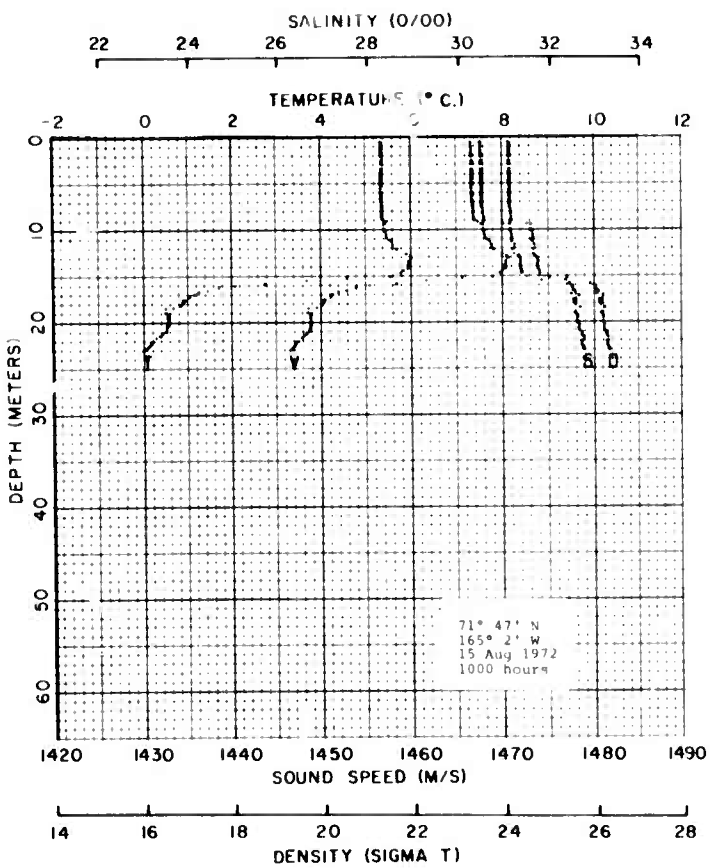

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
70° 54' N
159° 37' W
14 Aug 1972
0545 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

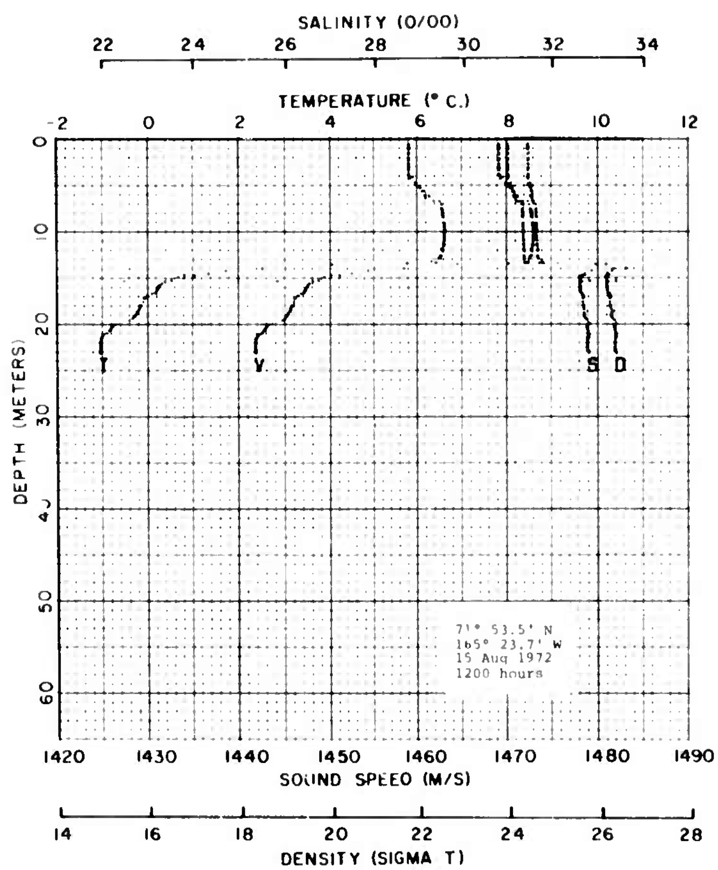

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 32' N
161° 33' W
15 Aug 1972
0110 hours
SOUNO SPEED (M/S)
DENSITY (SIGMA T)

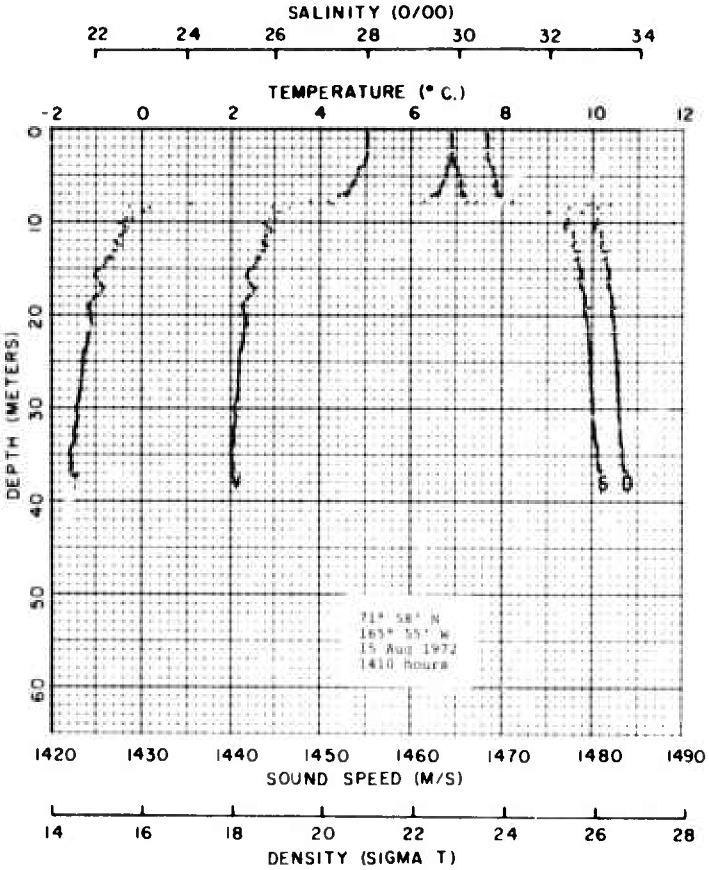

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 35' N
162° 34' W
15 Aug 1972
0345 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

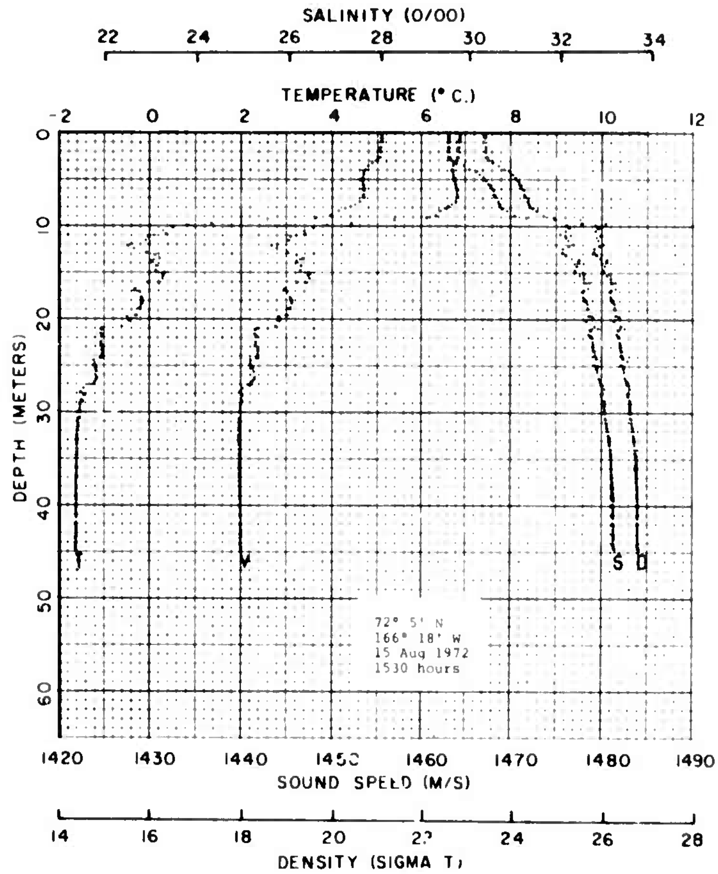

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
V D
71° 36.5' N
163° 43.5' W
15 Aug 1972
0600 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

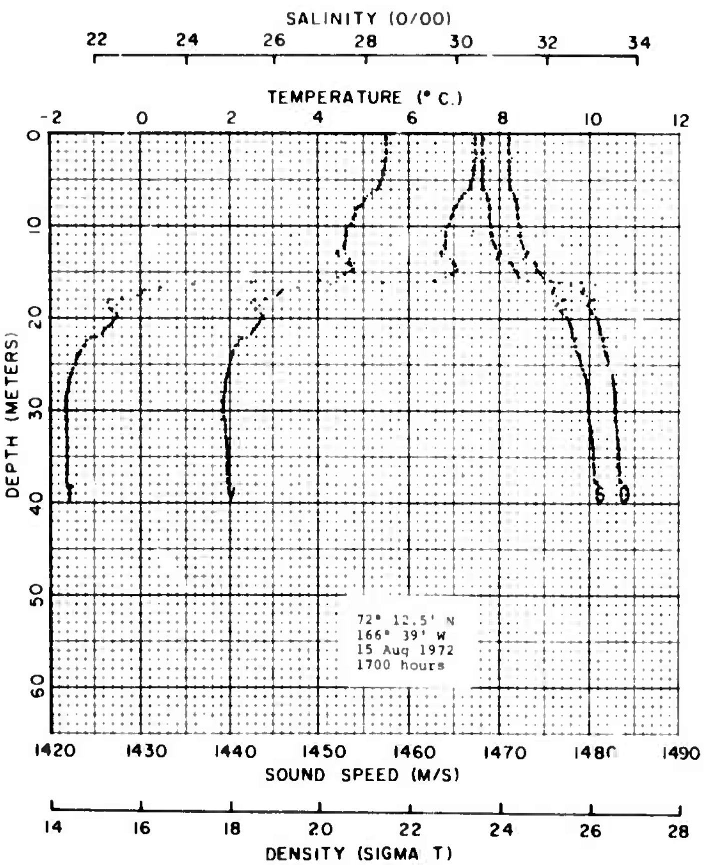

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
S
71° 39' N
164° 37' W
15 Aug 1972
0835 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

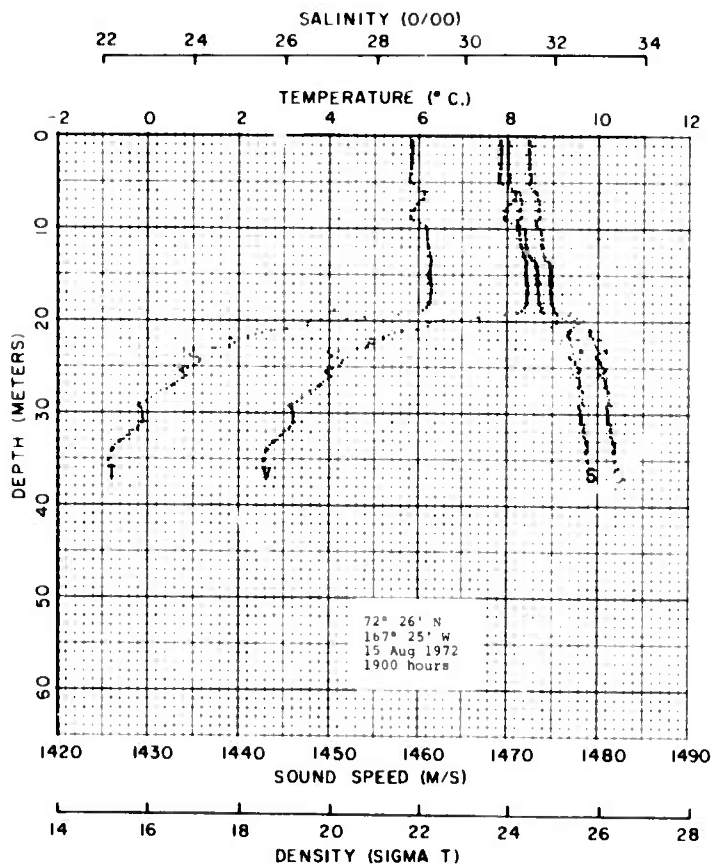

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 8 10 12
DEPTH (METERS)
0 10 20 30 40 50 60
V V S D
71° 47' N
165° 2' W
15 Aug 1972
1000 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

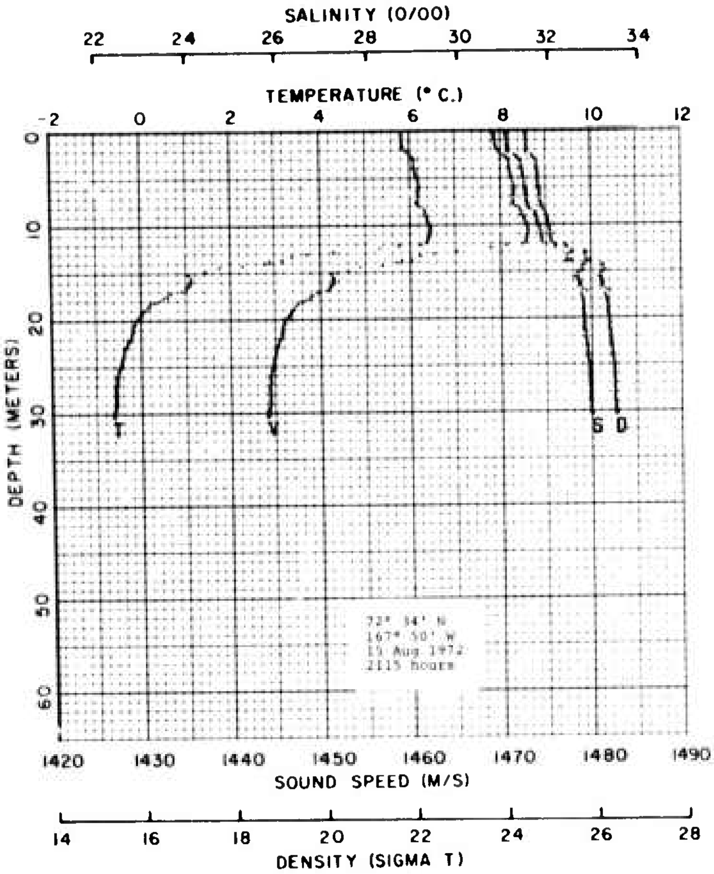

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2 0 2 4 6 8 10 12
DEPTH (METERS)
0 10 20 30 50 60
V V S D
71° 53.5' N
165° 23.7' W
15 Aug 1972
1200 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

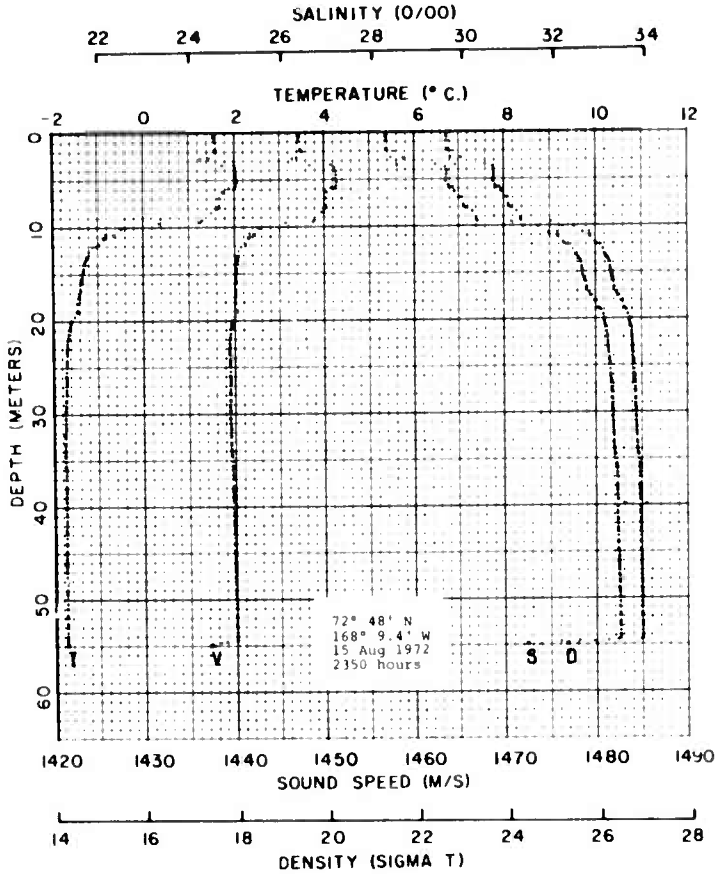

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
71° 58' N
165° 55' W
15 Aug 1972
1410 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

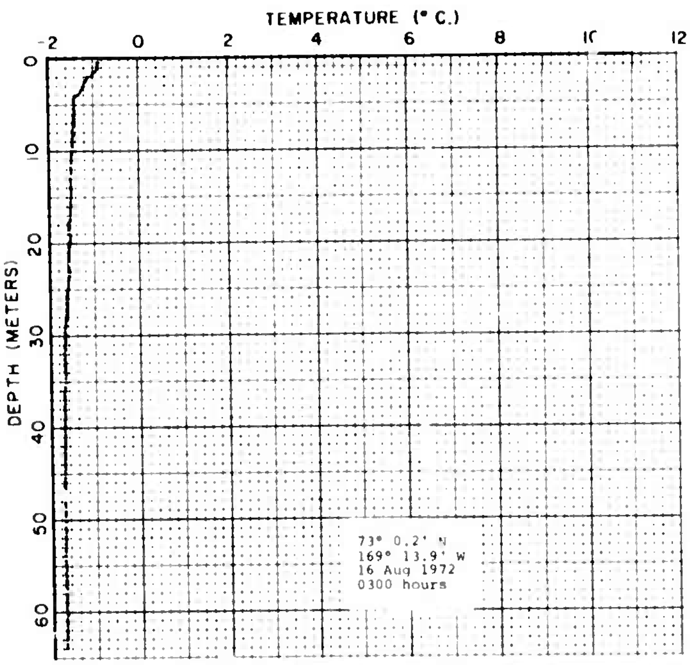

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
72° 5' N
166° 18' W
15 Aug 1972
1530 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
72° 12.5' N
166° 39' W
15 Aug 1972
1700 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
72° 26' N
167° 25' W
15 Aug 1972
1900 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)


SALINITY (0/00)
22
24
26
28
30
32
34
TEMPERATURE (° C.)
-2
0
2
4
6
8
10
12
DEPTH (METERS)
0
10
20
30
40
50
60
T
V
S
D
72° 34' N
167° 50' W
15 Aug 1972
2115 hours
1420
1430
1440
1450
1460
1470
1480
1490
SOUND SPEED (M/S)
14
16
18
20
22
24
26
28
DENSITY (SIGMA T)


SALINITY (0/00)
22
24
26
28
30
32
34
TEMPERATURE (° C.)
-2
0
2
4
6
8
10
12
DEPTH (METERS)
0
10
20
30
40
50
60
T
V
S
D
72° 48' N
168° 9.4' W
15 Aug 1972
2350 hours
1420
1430
1440
1450
1460
1470
1480
1490
SOUND SPEED (M/S)
14
16
18
20
22
24
26
28
DENSITY (SIGMA T)

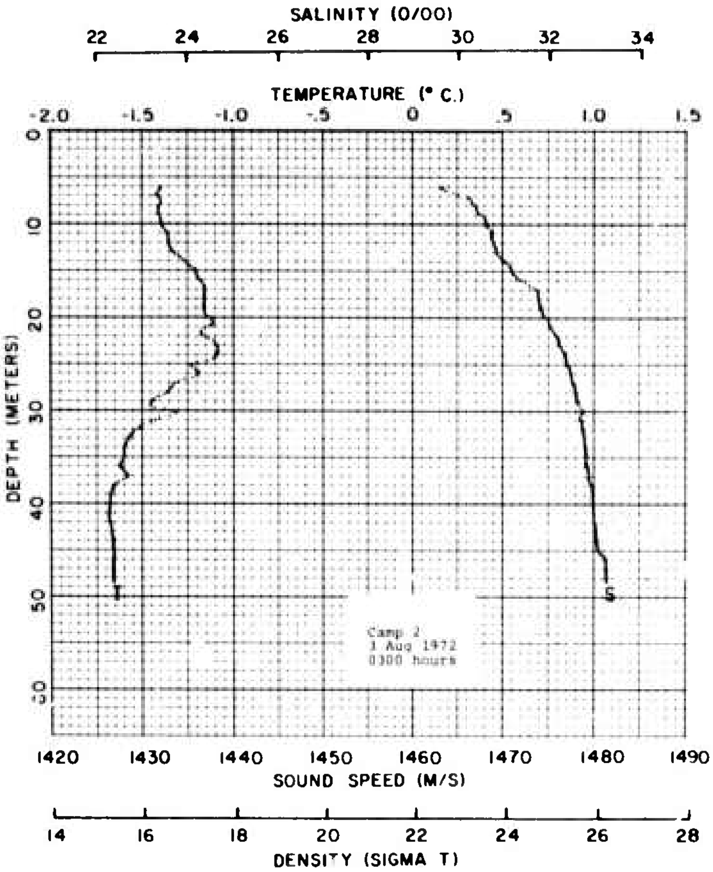

TEMPERATURE (° C.)
-2
0
2
4
6
8
10
12
DEPTH (METERS)
0
10
20
30
40
50
60
73° 0.2' N
169° 13.9' W
16 Aug 1972
0300 hours

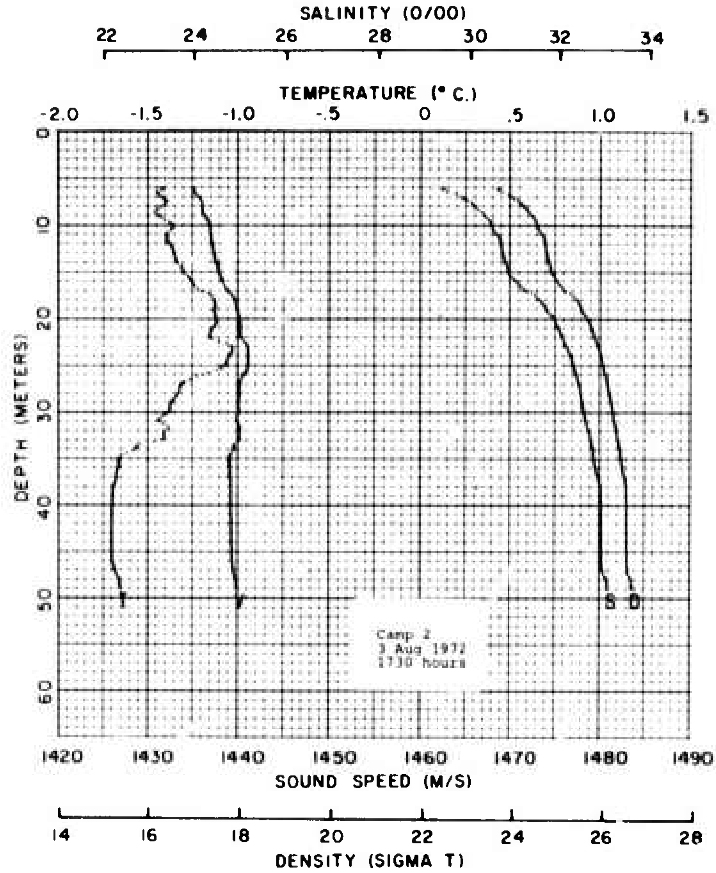
APPENDIX B

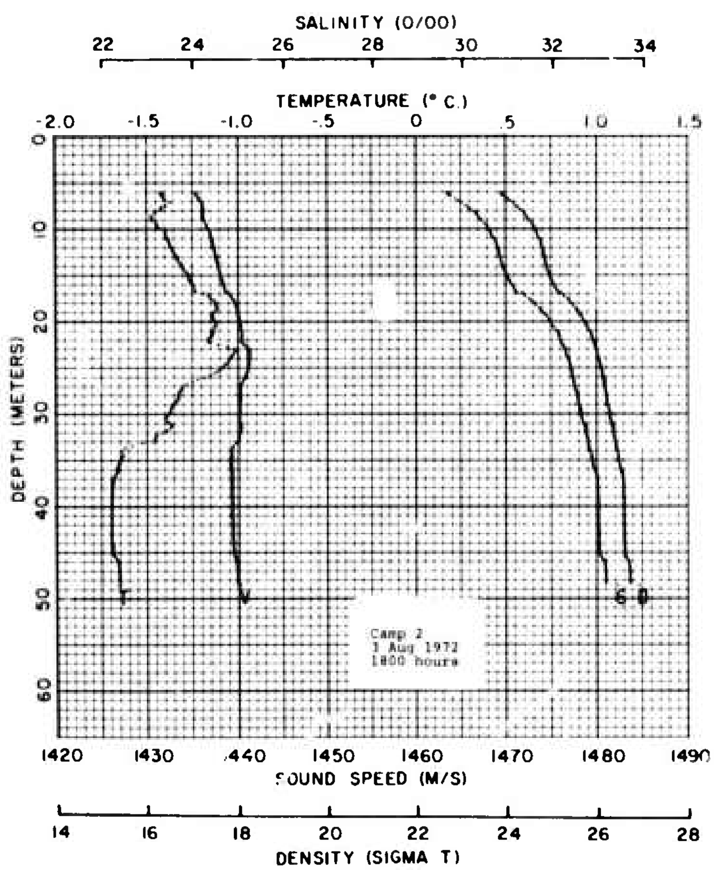
TEMPERATURE AND SALINITY PROFILES AT CAMP 2

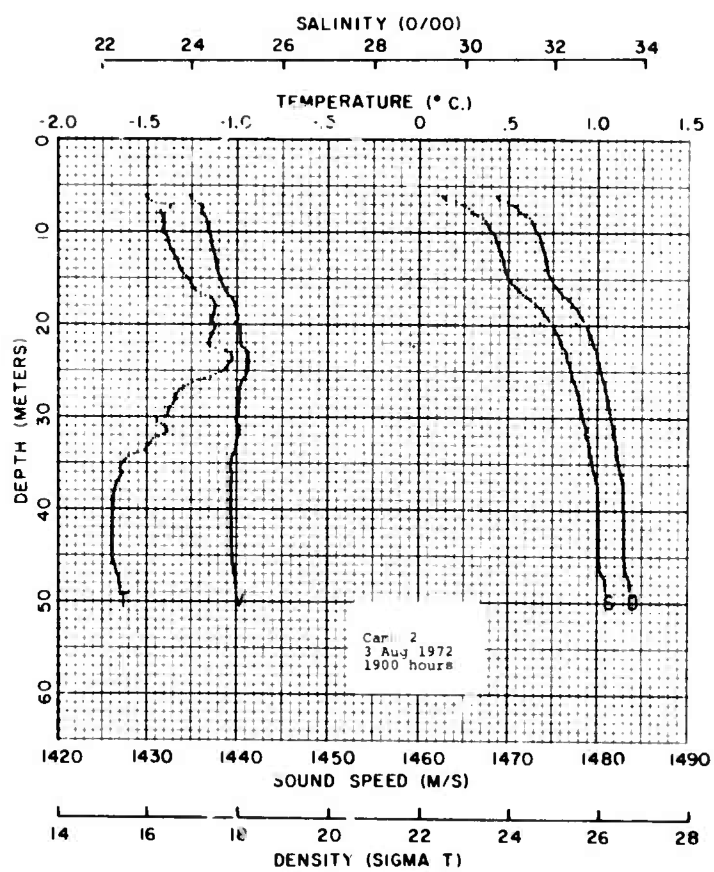
The automatic profiler was set up at Camp 2 and operated throughout most of the ice floe occupancy. The profiles were plotted at the following times.

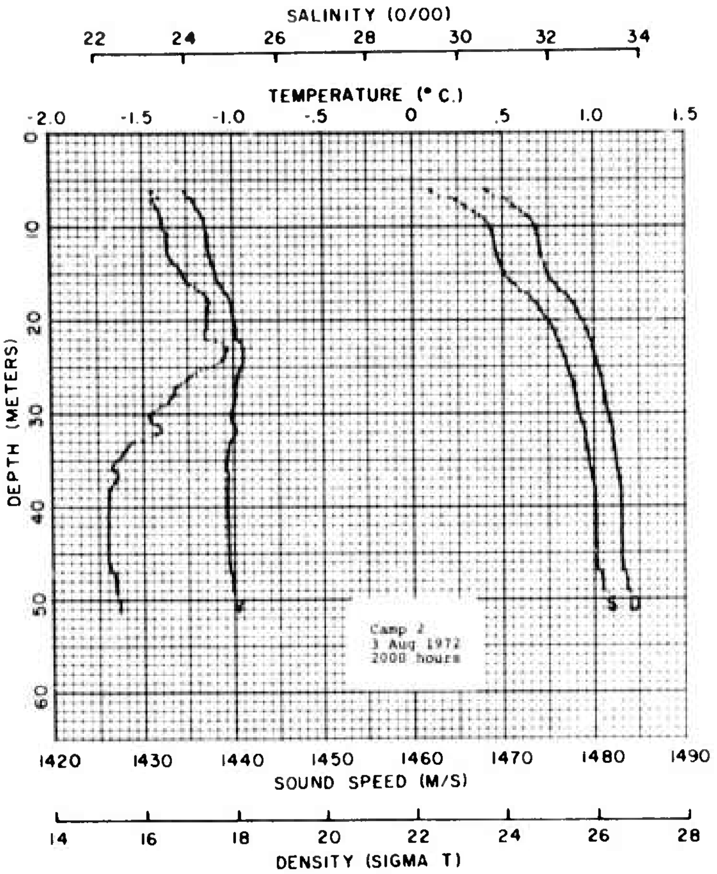
3 Aug			0300									
					1730	1800	1900	2000	2100	2200	2300	2400
4 Aug	0100	0200									1120	1200
	1300	1400	1500	1600	1700	1800	1900	2000 2010	2100	2200	2300	2400
5 Aug	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000		1200
	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
6 Aug	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
	1300	1400	1500									
7 Aug												1200
	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
8 Aug	0100	0200	0300	0400	0500	0600	0700	0800				
9 Aug								2015	2110	2215	2300	
								2040	2125	2230	2315	
								2050	2128	2245	2345	
									2145			
10 Aug	0000											
	0015											
	0030											
	0045											
	0130											
	0145											

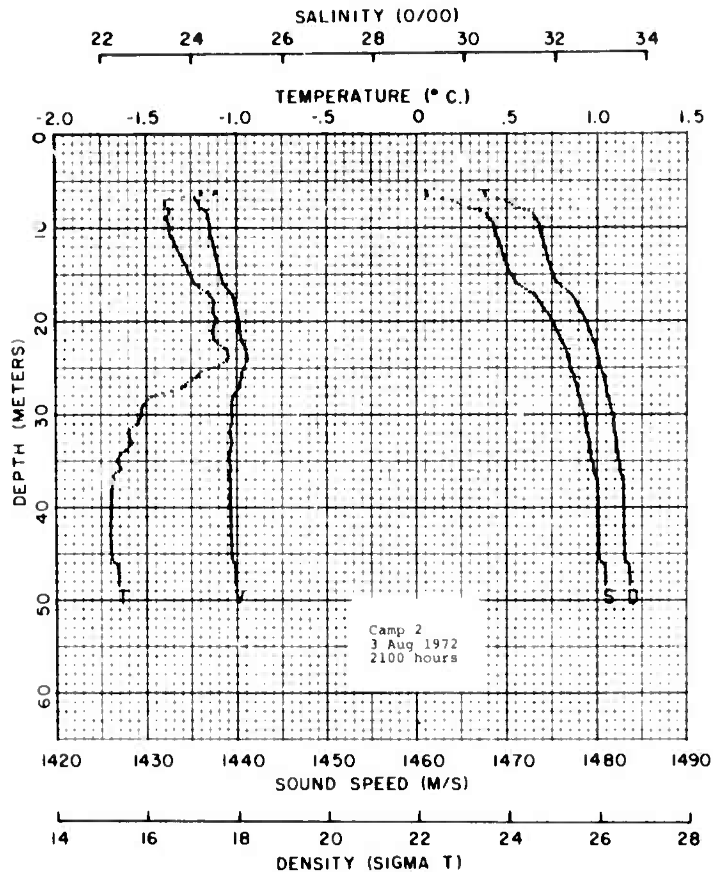

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
3 Aug 1972
0300 hours

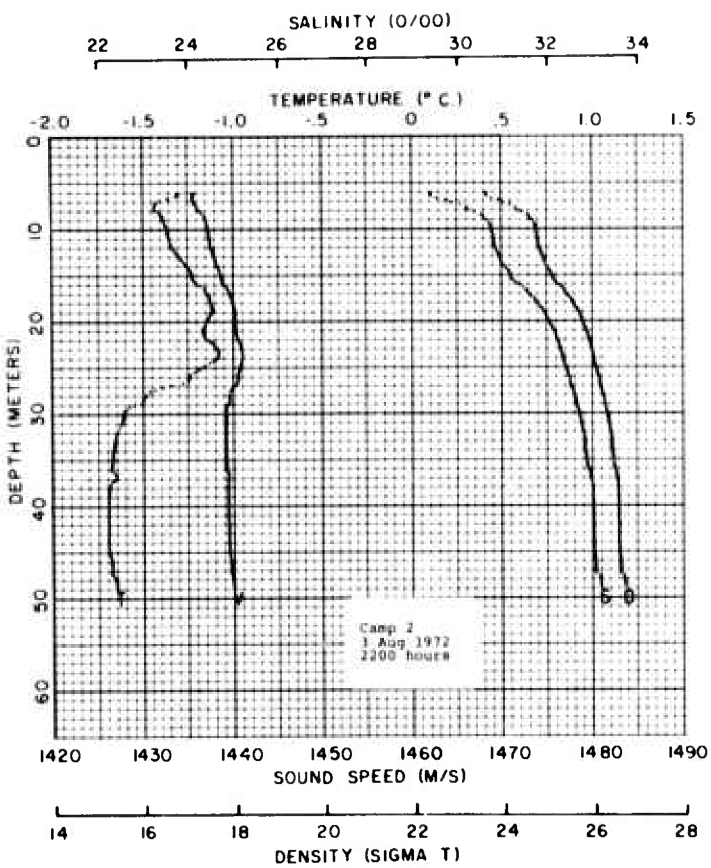

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
3 Aug 1972
1730 hours

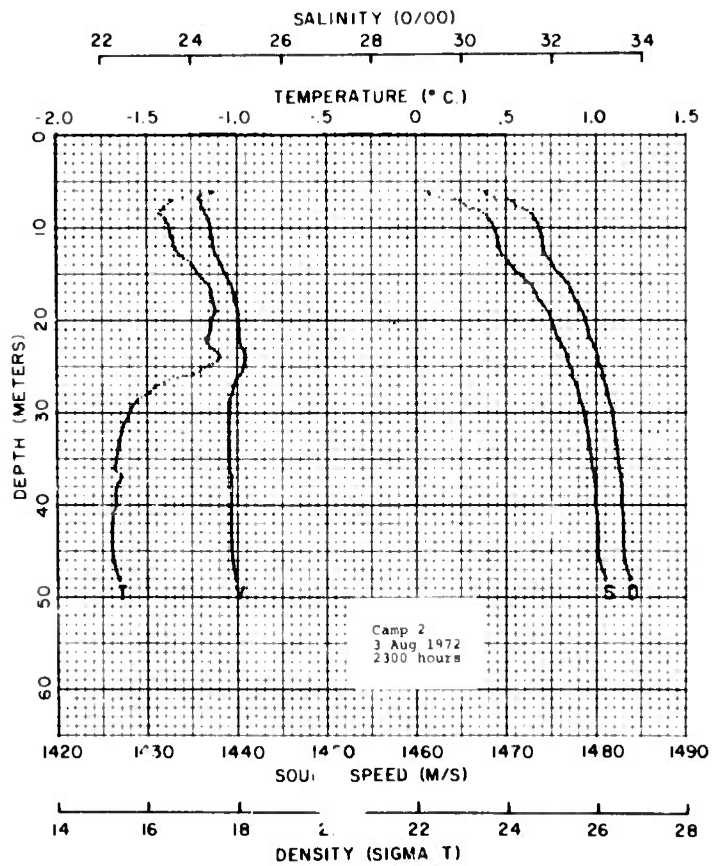

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
3 Aug 1972
1800 hours

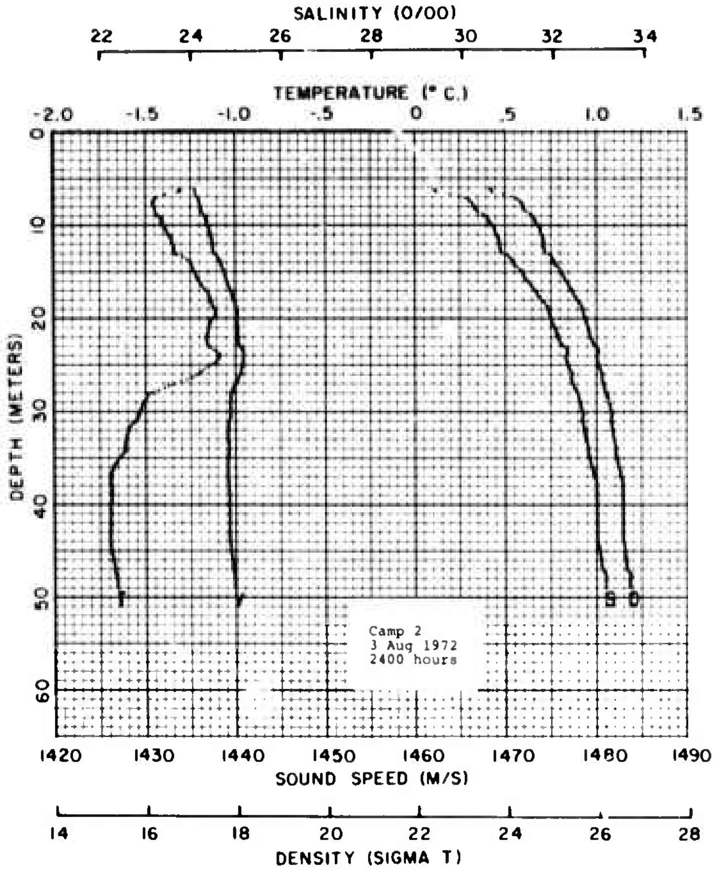

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
3 Aug 1972
1900 hours

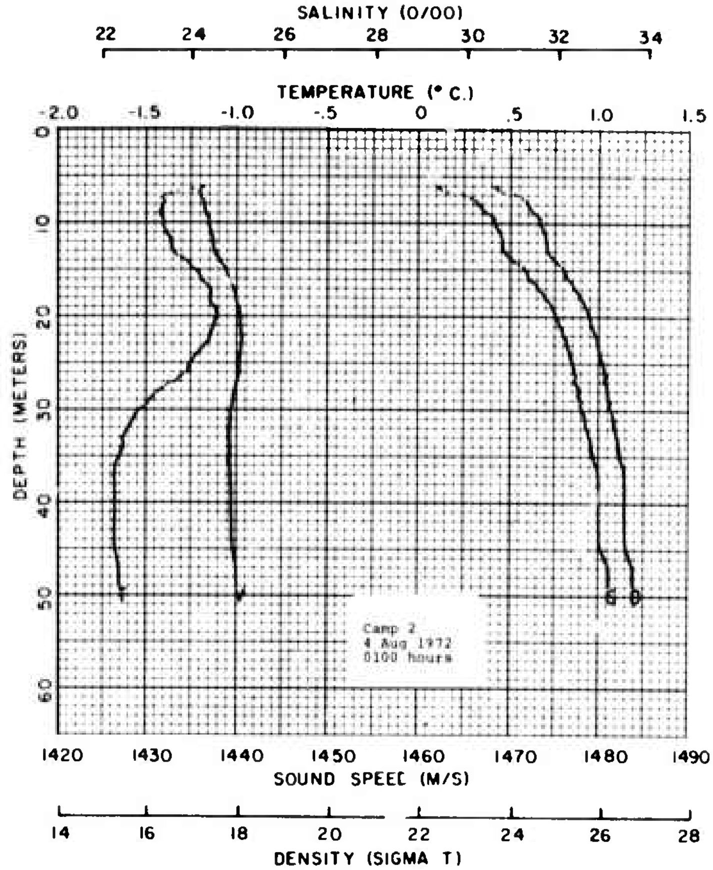

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
3 Aug 1972
2000 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

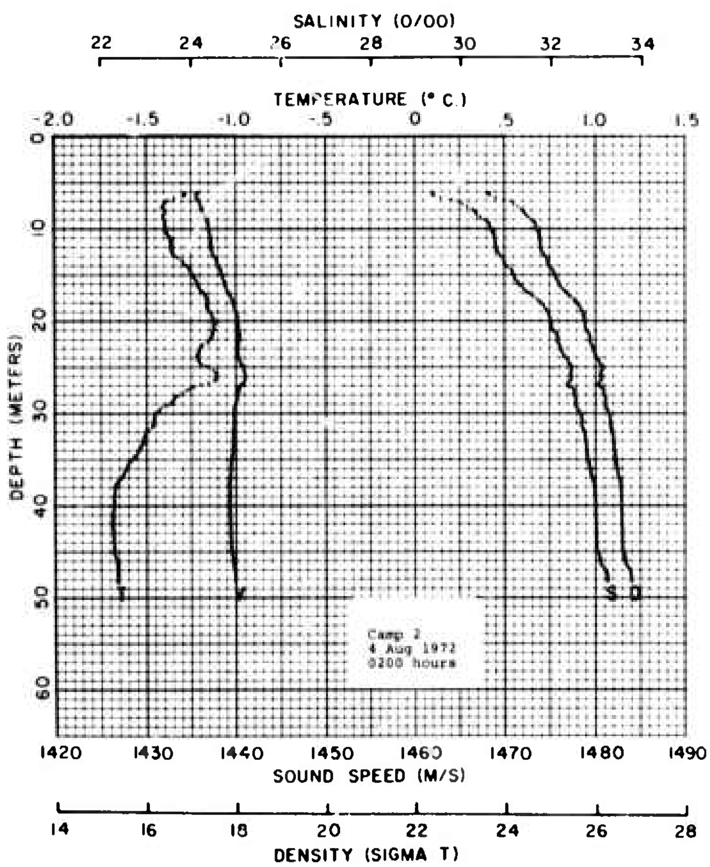

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 20 30 40 50 60
T V S D
Camp 2
3 Aug 1972
2100 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

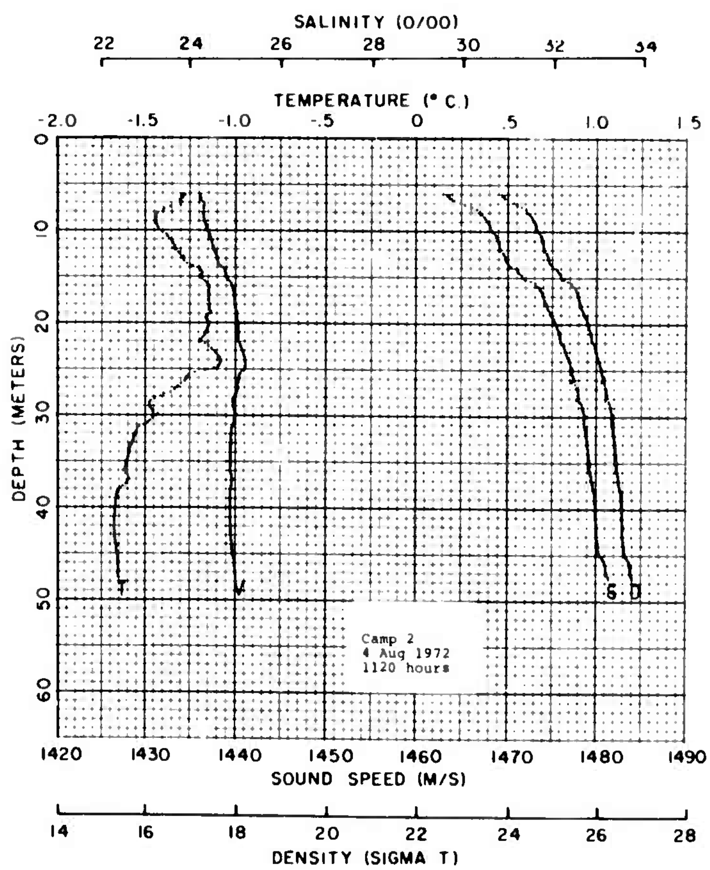

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
V S D
Camp 2
3 Aug 1972
2200 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

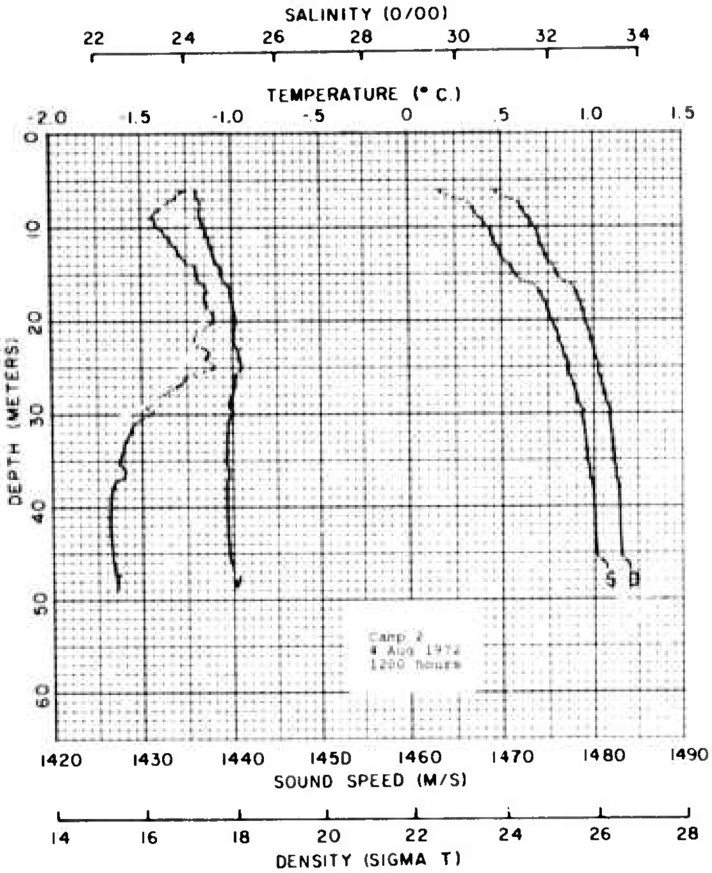

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
3 Aug 1972
2300 hours
1420 1440 1460 1470 1480 1490
SPEED (M/S)
14 16 18 22 24 26 28
DENSITY (SIGMA T)

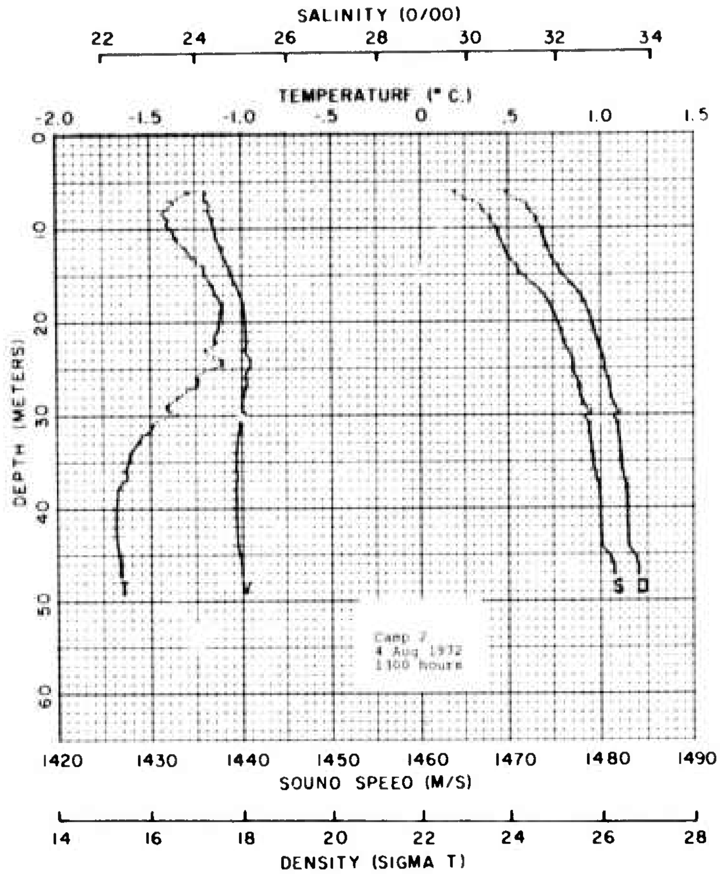

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
3 Aug 1972
2400 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

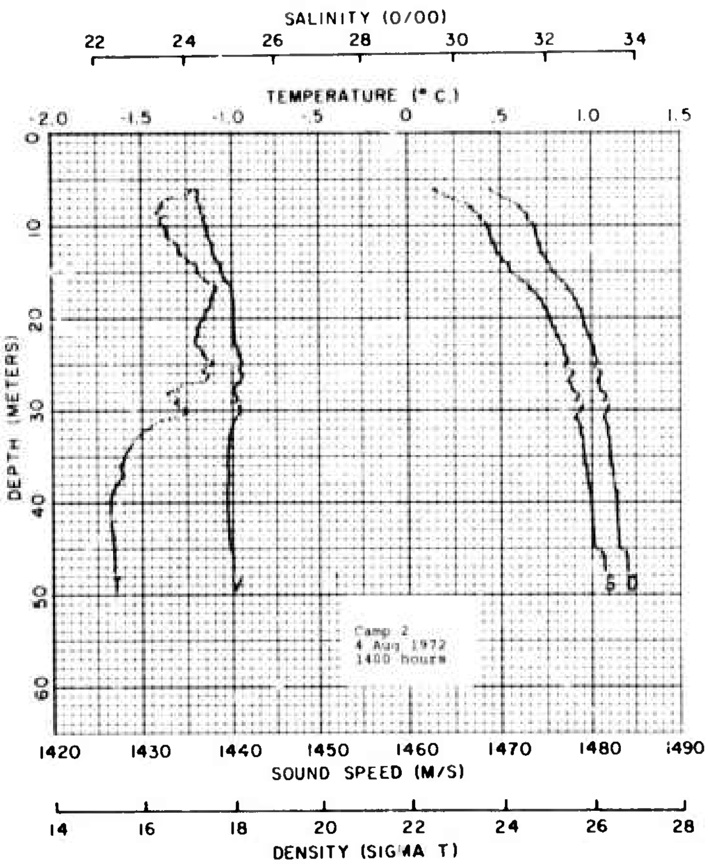

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
S D
Camp 2
4 Aug 1972
0100 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

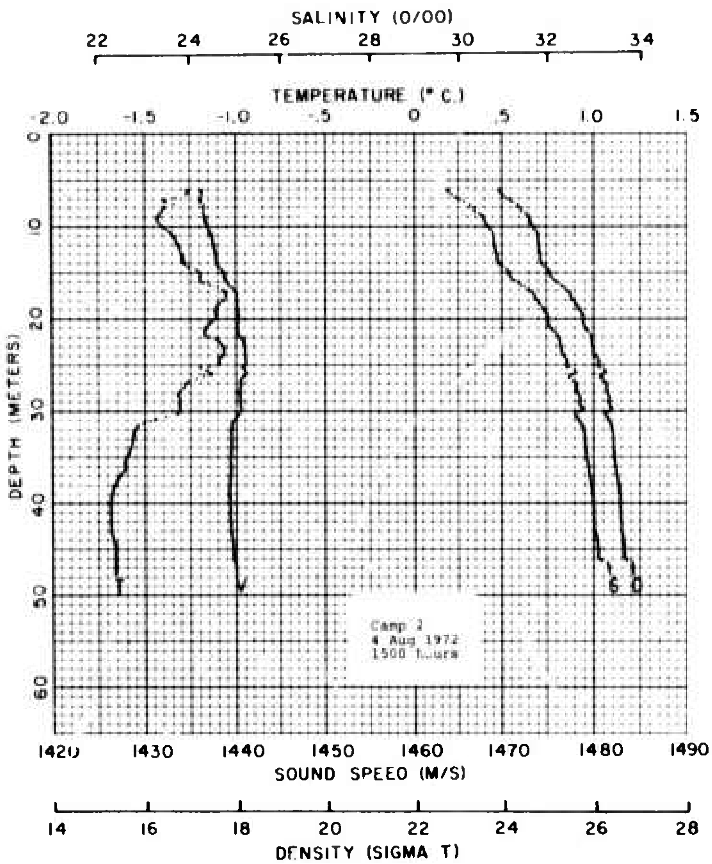

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
4 Aug 1972
0200 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

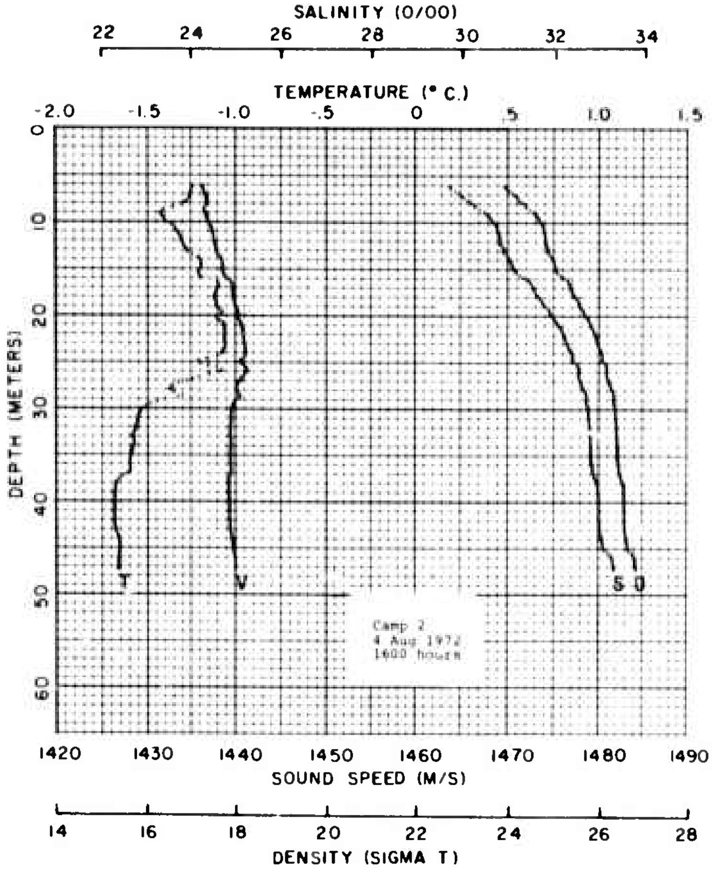

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
S D
Camp 2
4 Aug 1972
1120 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

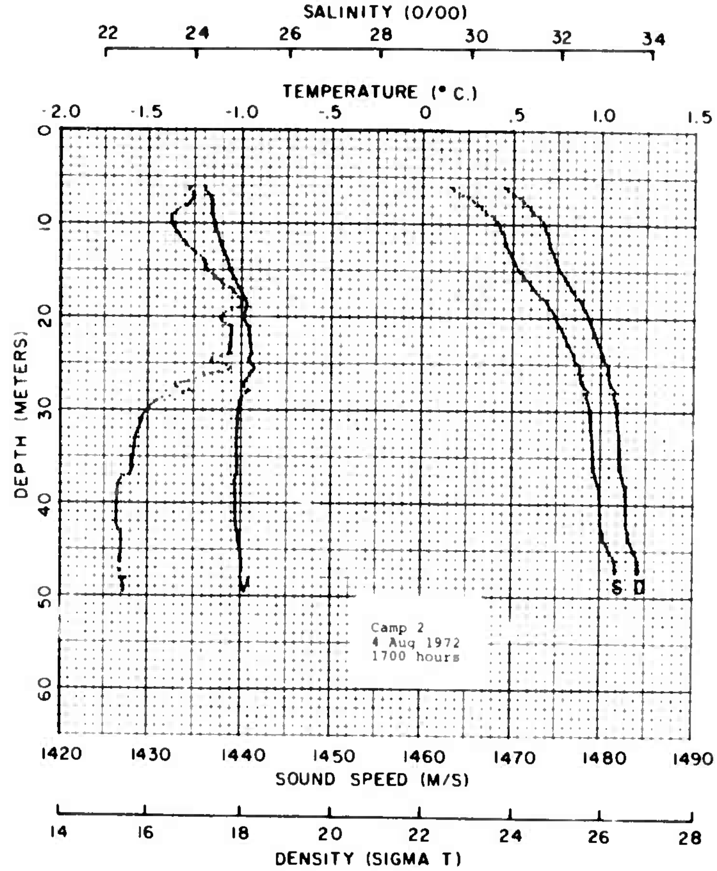

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
4 Aug 1972
1200 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

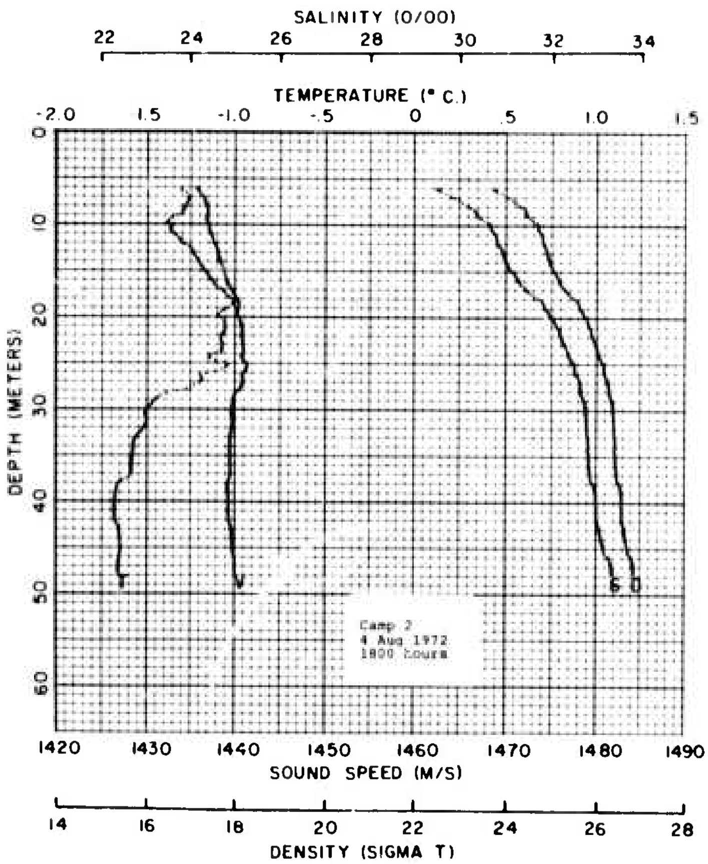

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
4 Aug 1972
1300 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

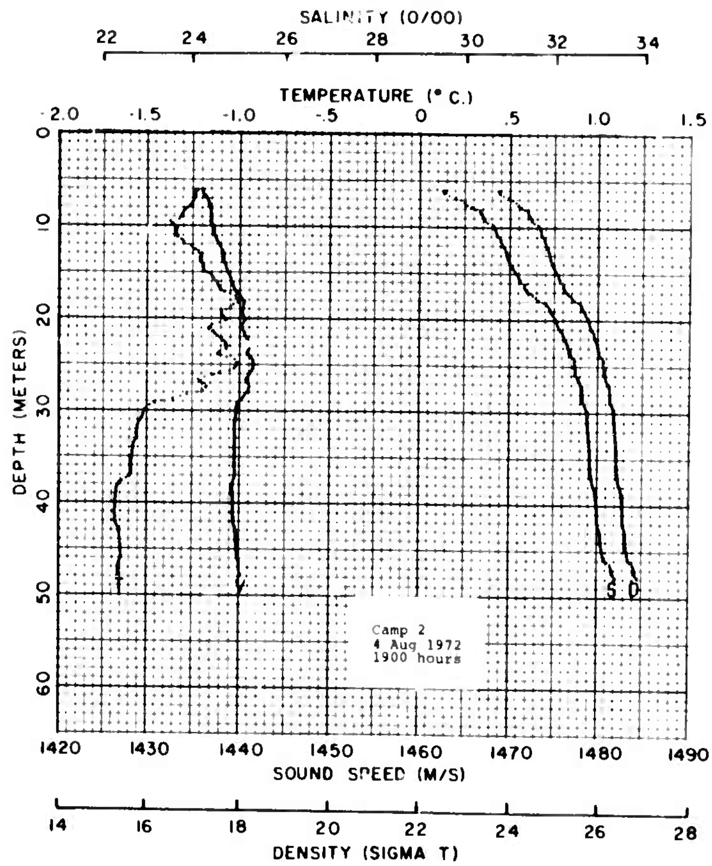

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
4 Aug 1972
1400 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

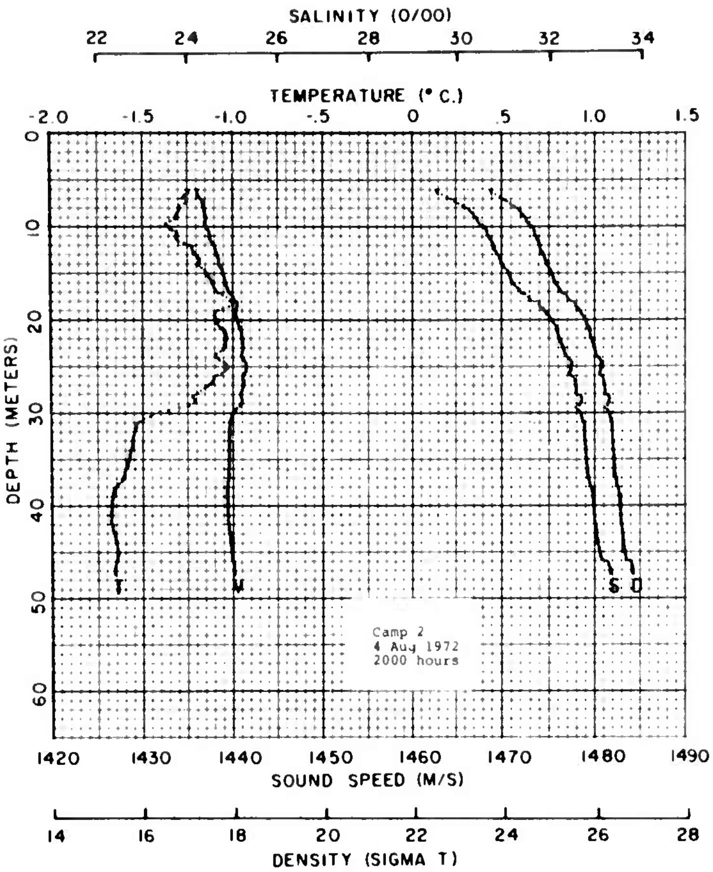

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
V S D
Camp 2
4 Aug 1972
1500 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

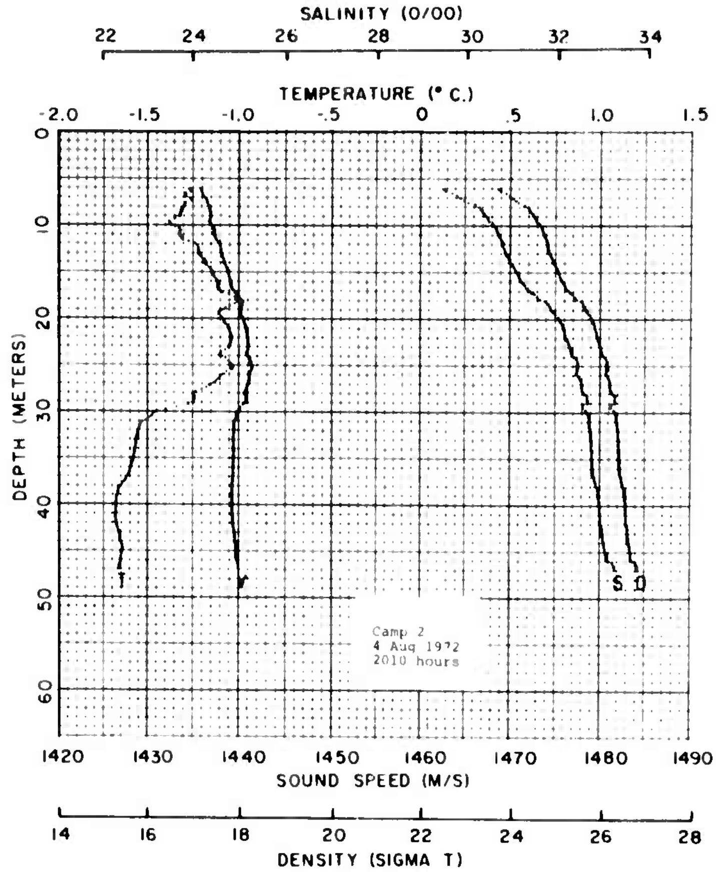

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
4 Aug 1972
1600 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

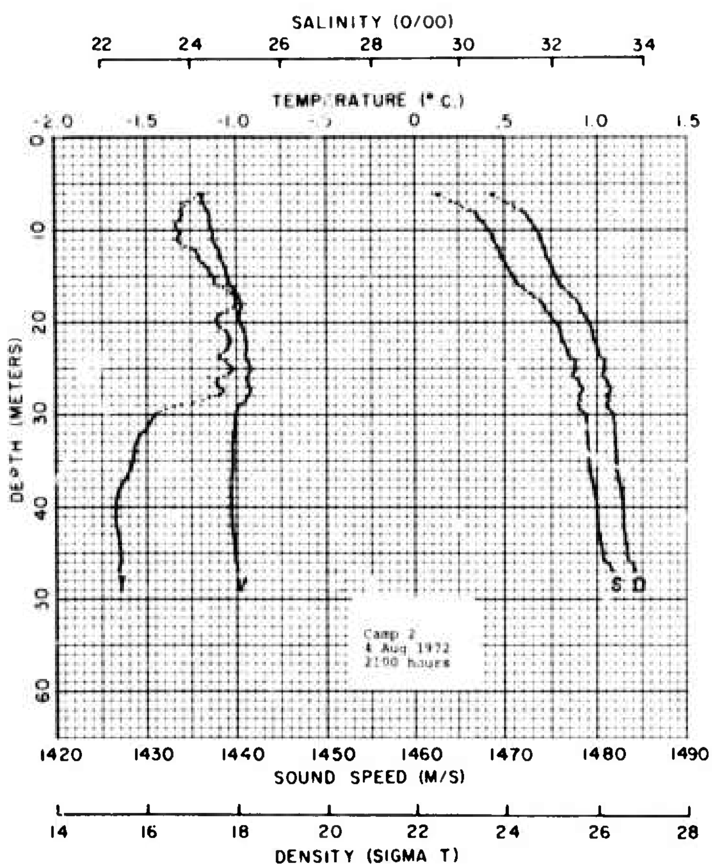

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
S D
Camp 2
4 Aug 1972
1700 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

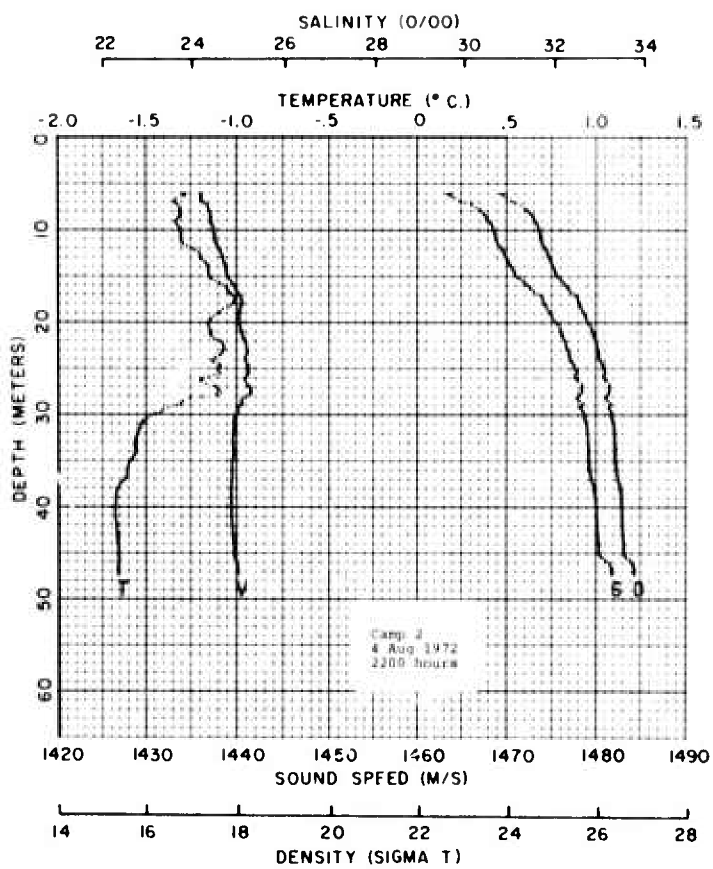

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
S D
Camp 2
4 Aug 1972
1800 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

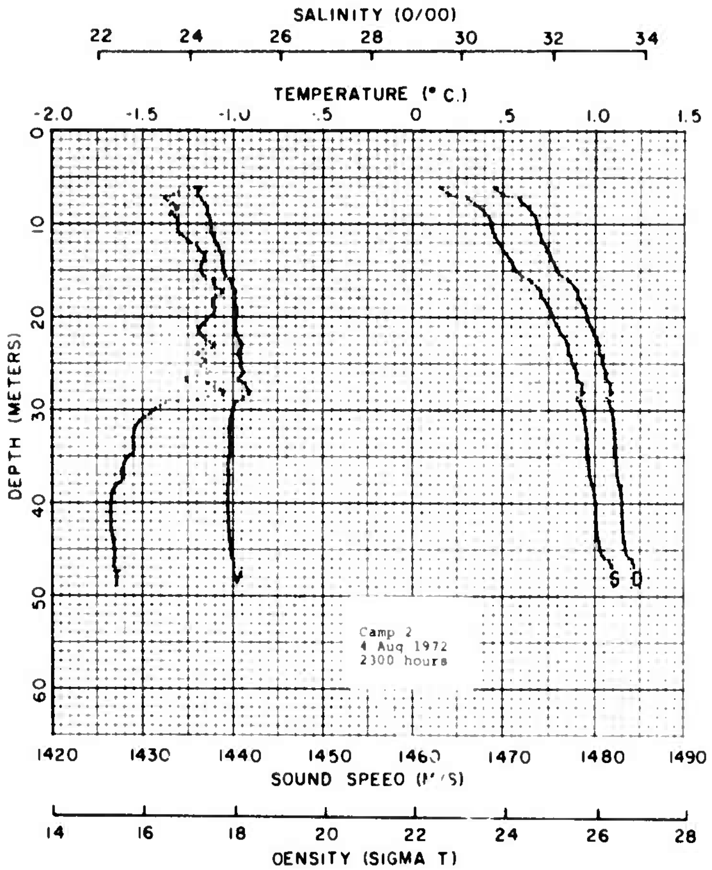

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
S D
Camp 2
4 Aug 1972
1900 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

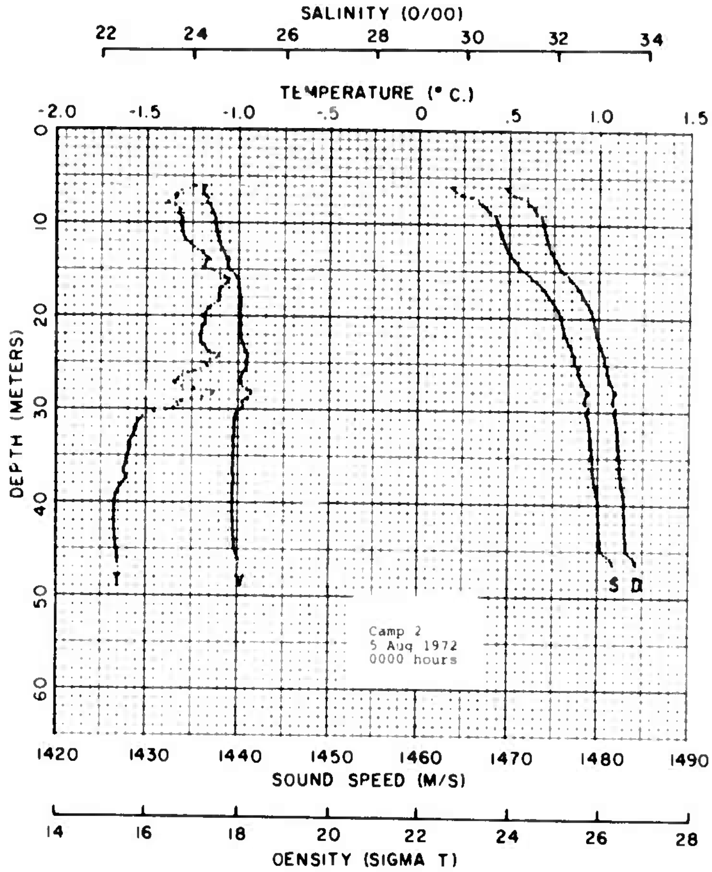

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
4 Aug 1972
2000 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

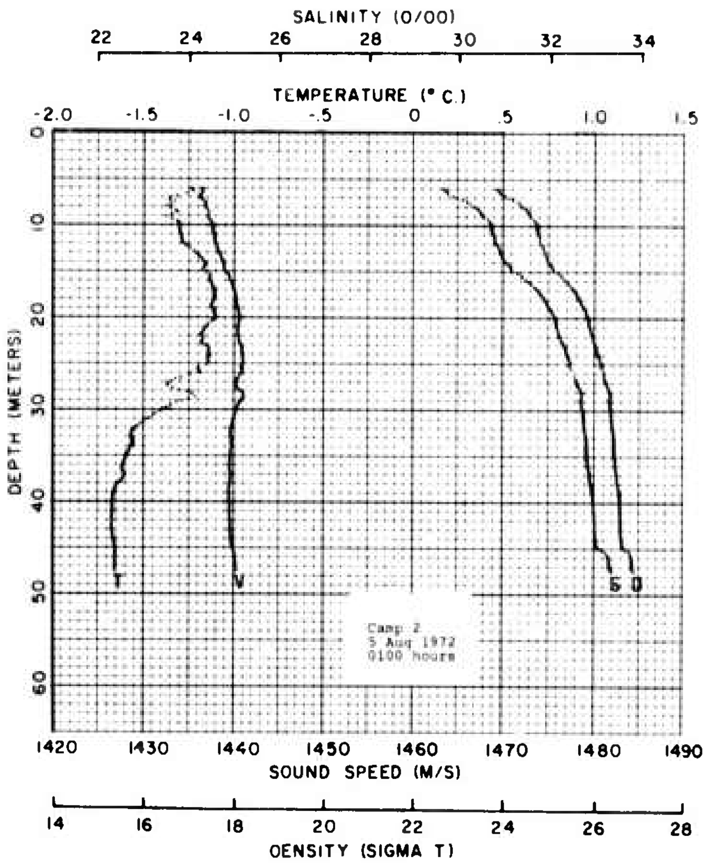

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
4 Aug 1972
2010 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

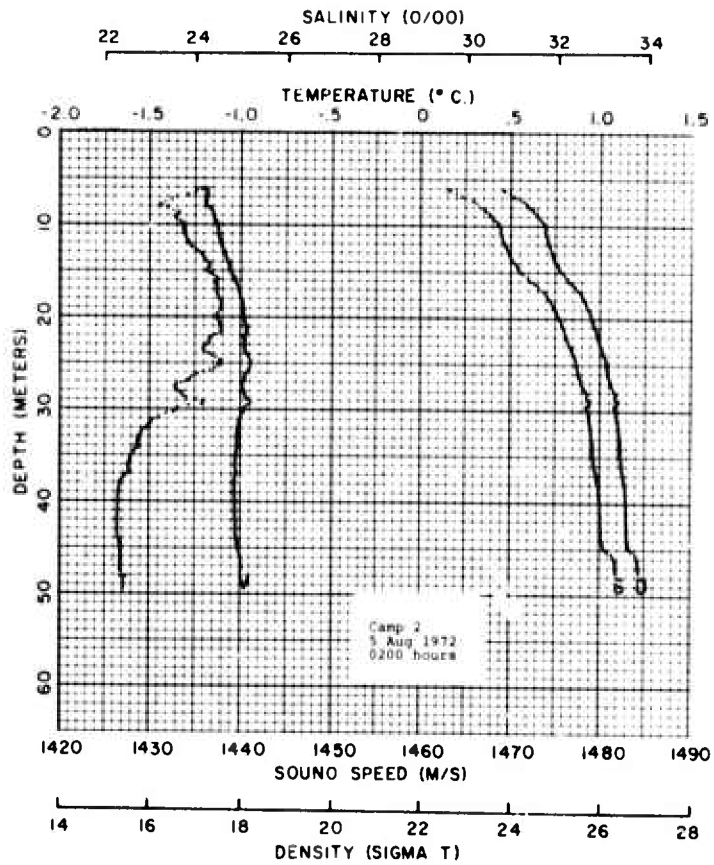

SALINITY (0/00)
22 24 26 28 30 32 34
-2.0 -1.5 -1.0 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 60
T V S D
Camp 2
4 Aug 1972
2100 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

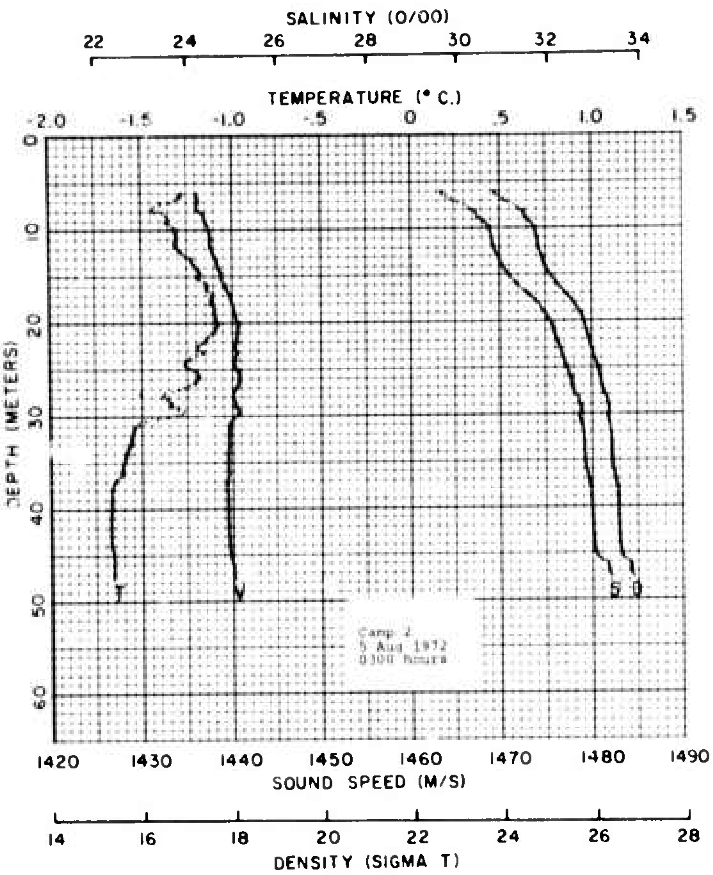

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
T V S D
Camp 2
4 Aug 1972
2200 hours
1420 1430 1440 1460 1470 1480 1490
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

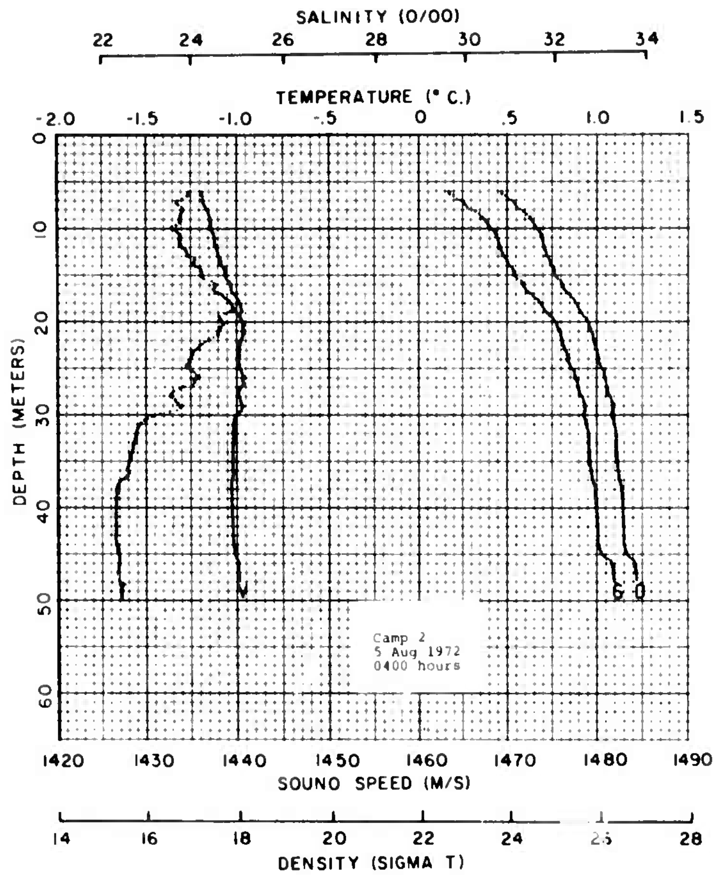

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
S D
Camp 2
4 Aug 1972
2300 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
S D
Camp 2
5 Aug 1972
0000 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
S D
Camp 2
5 Aug 1972
0100 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
S D
Camp 2
5 Aug 1972
0200 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
0300 hours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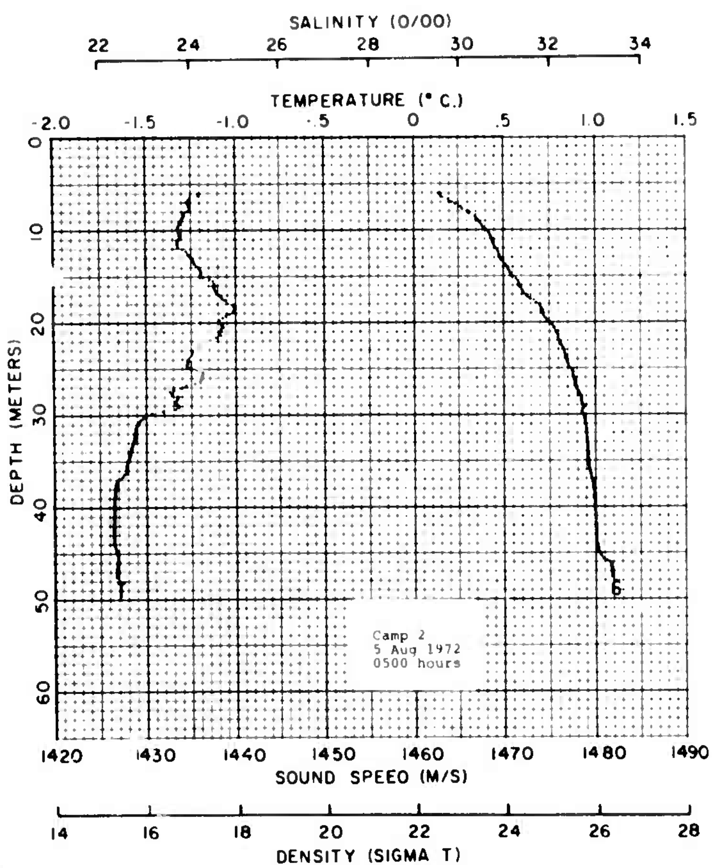
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
0400 hours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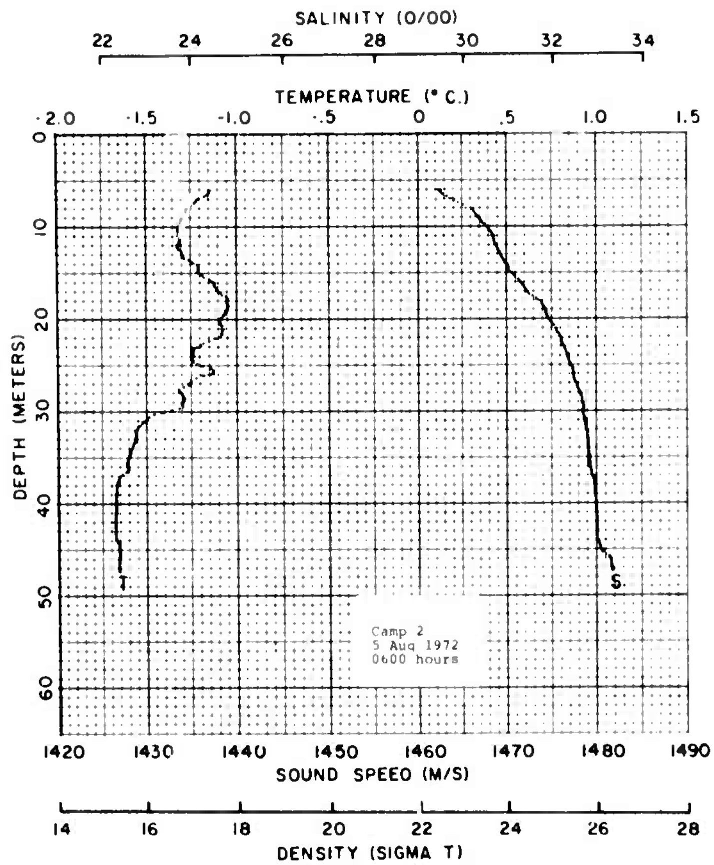
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
0500 hours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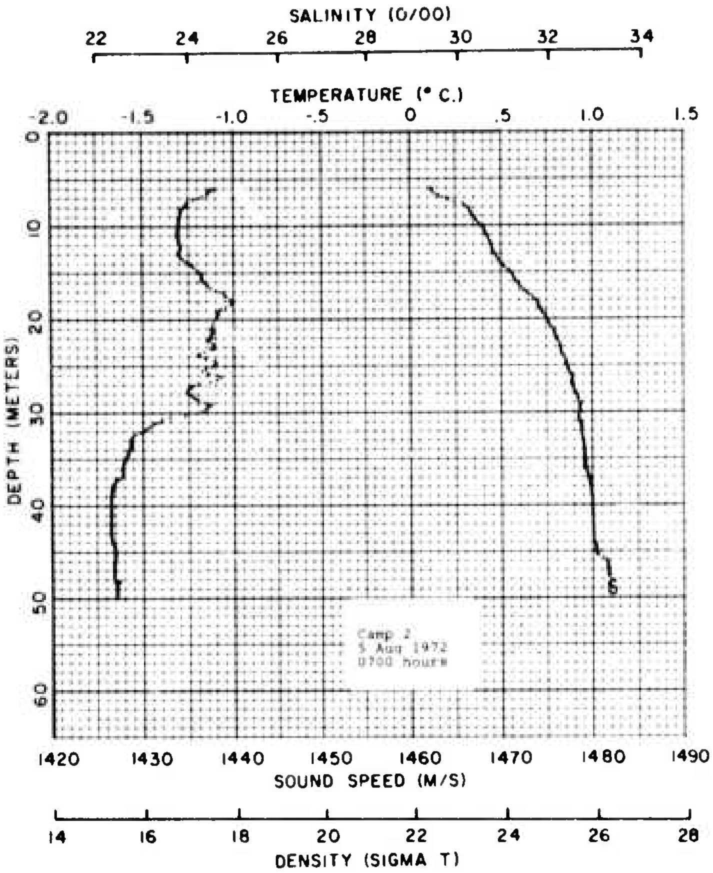
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
0600 hours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DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
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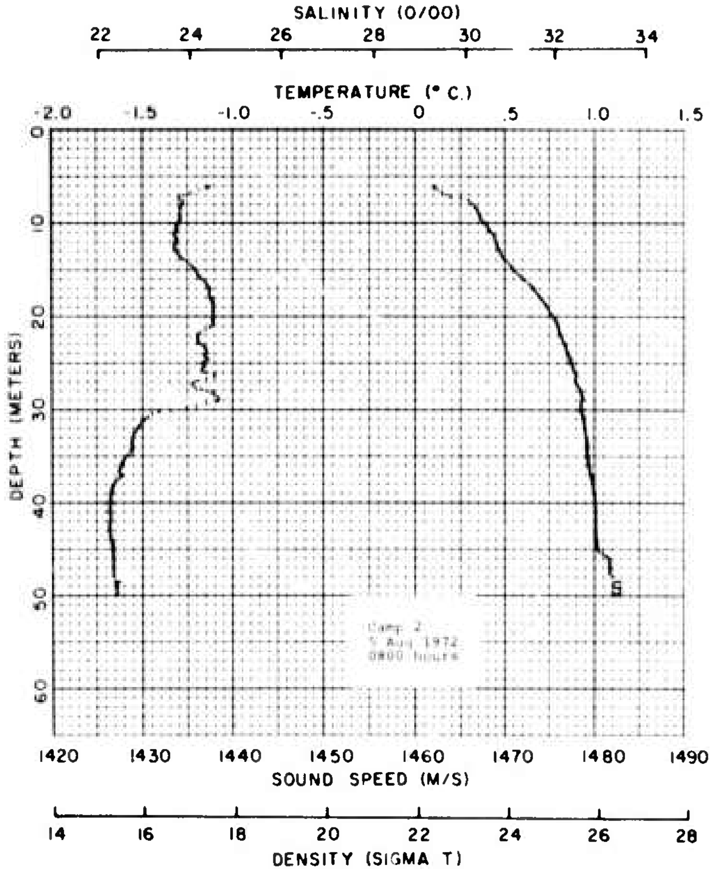
0700 hours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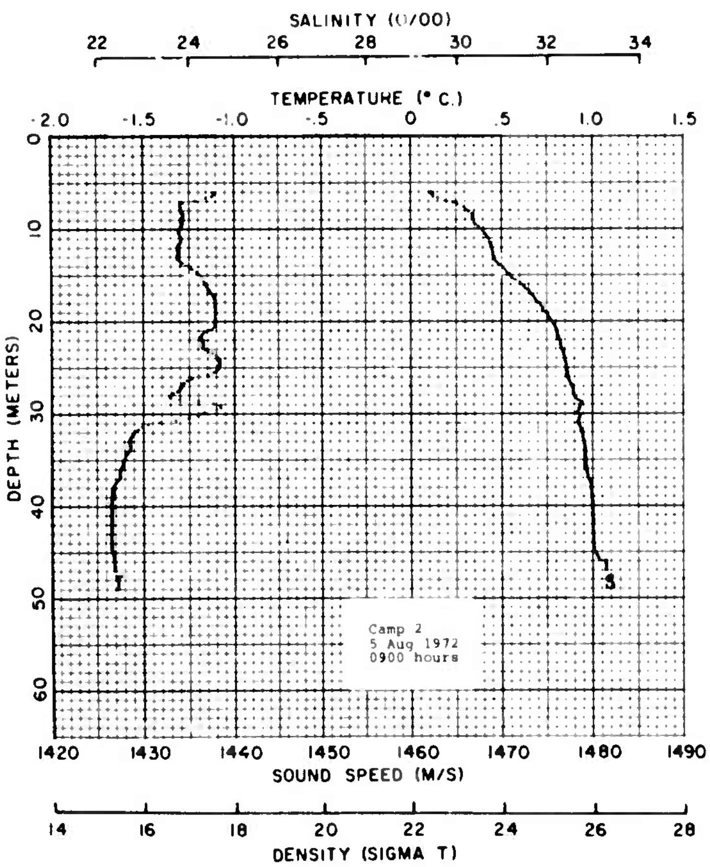
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
0800 hours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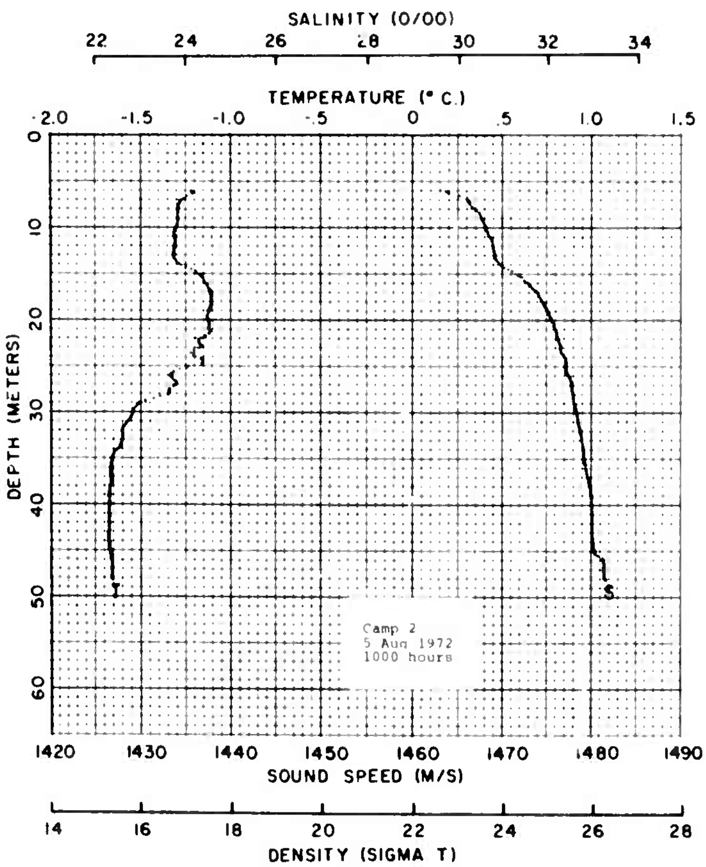
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
0900 hours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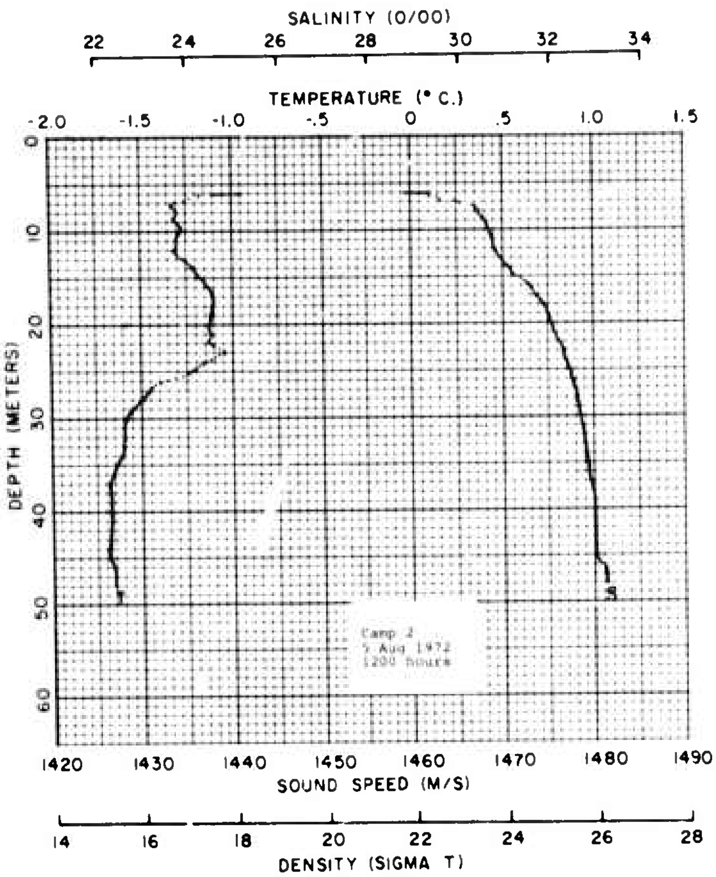
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
1000 hours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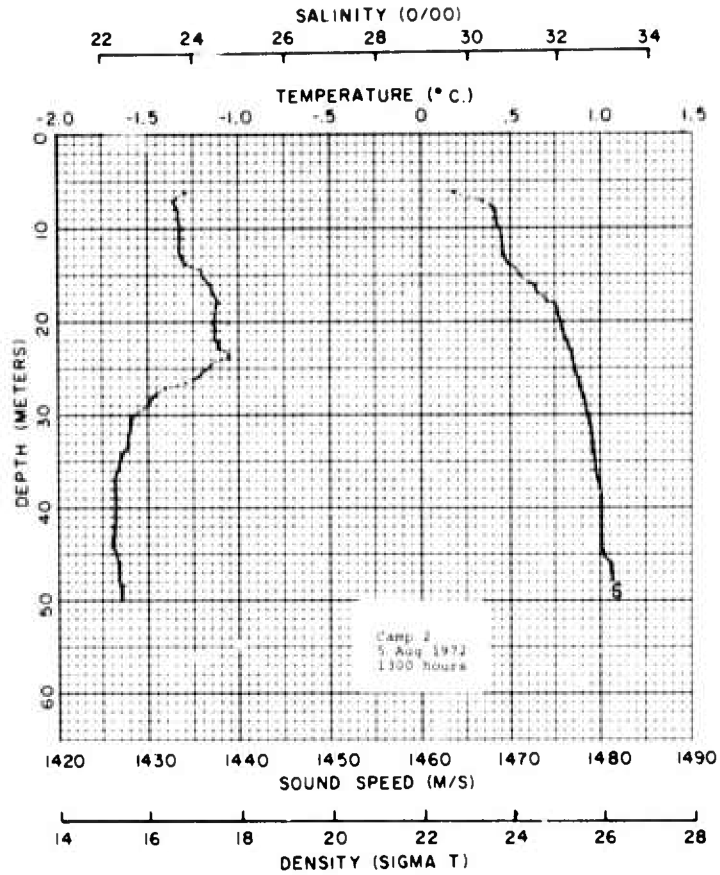
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
1200 hours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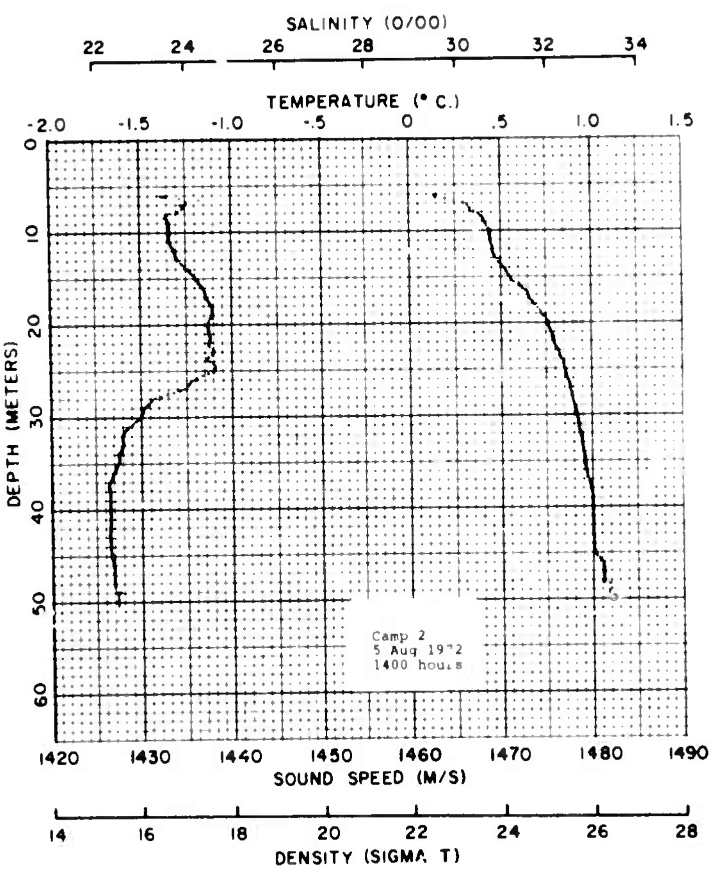
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
1300 hours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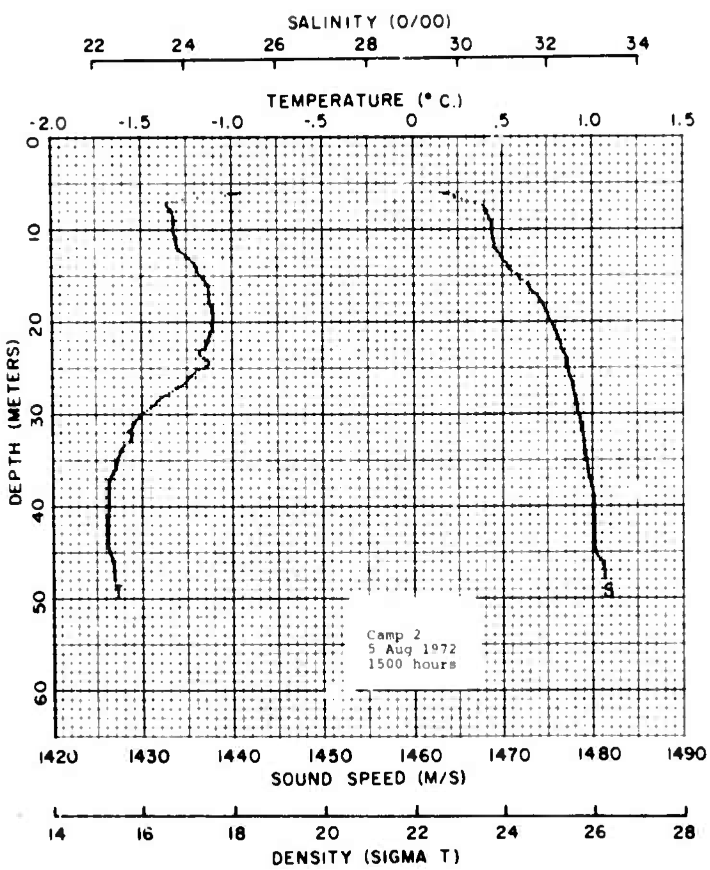
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
1400 hours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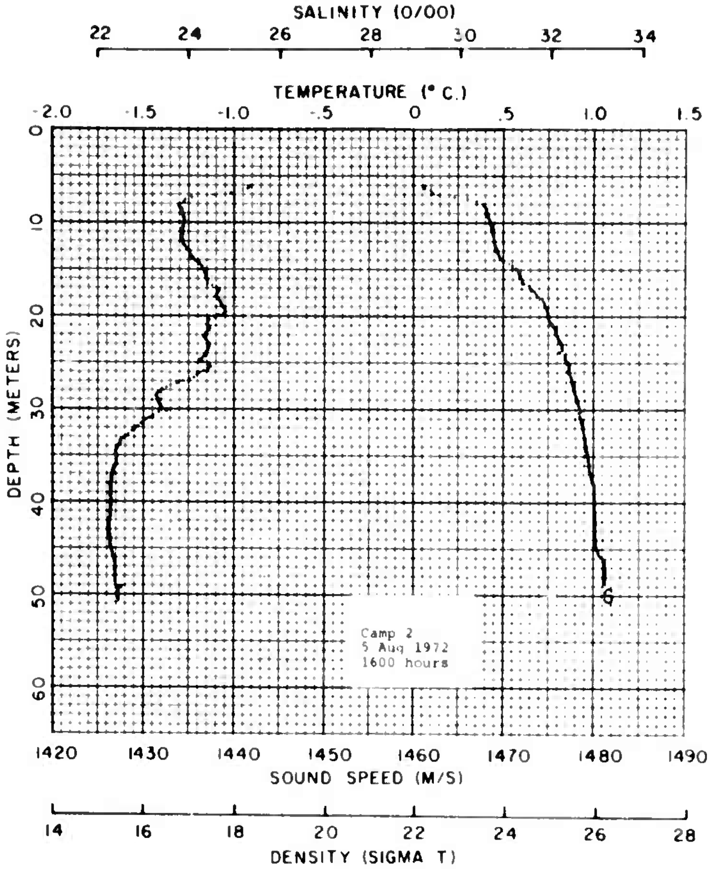
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
1500 hours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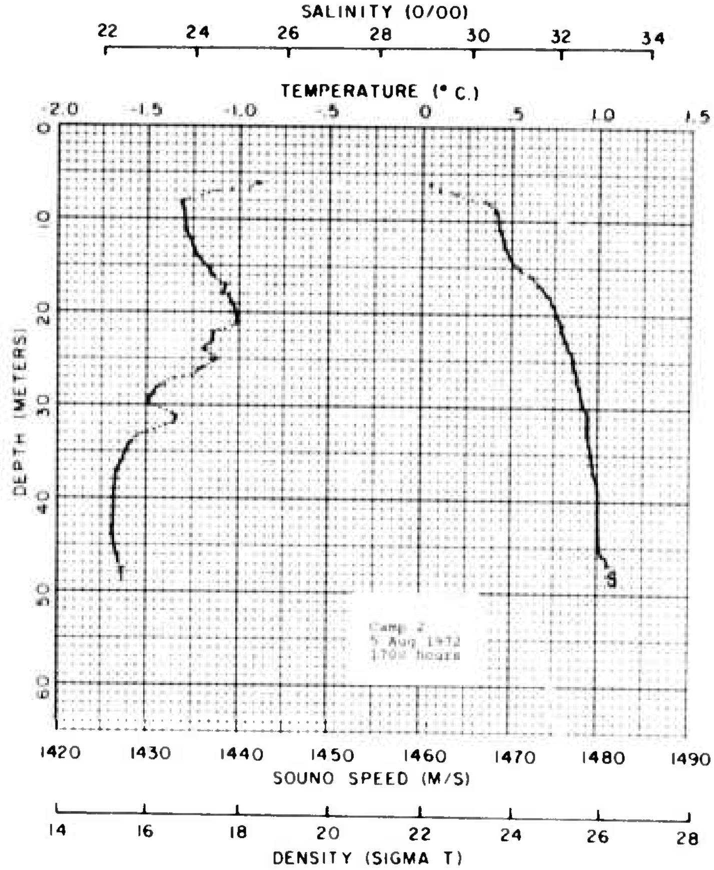
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
5 Aug 1972
1600 hours
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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DEPTH (METERS)
0 10 20 30 40 50 60
T
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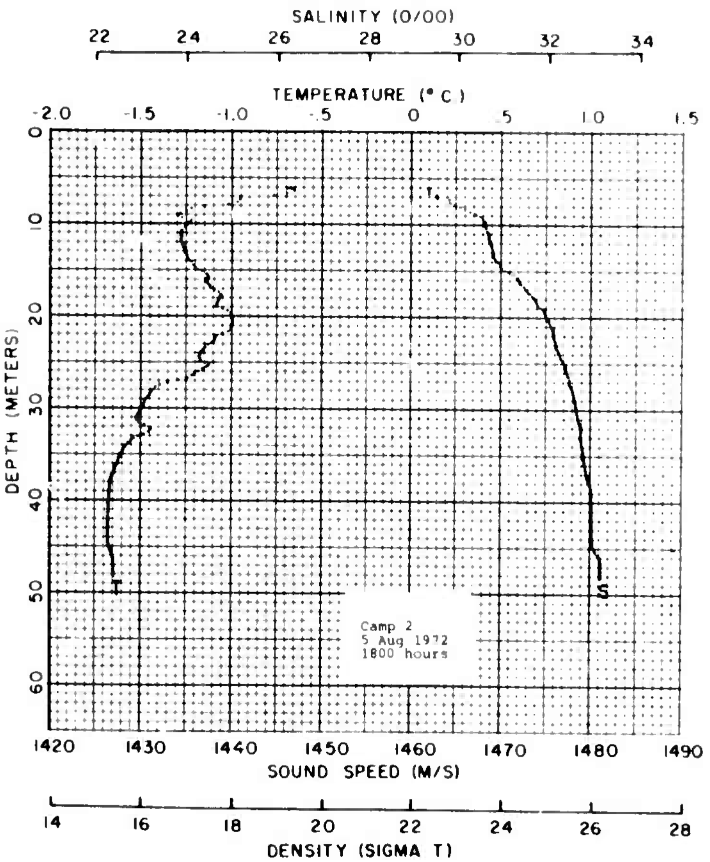
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
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T
S
Camp 2
5 Aug 1972
1800 hours
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SOUND SPEED (M/S)
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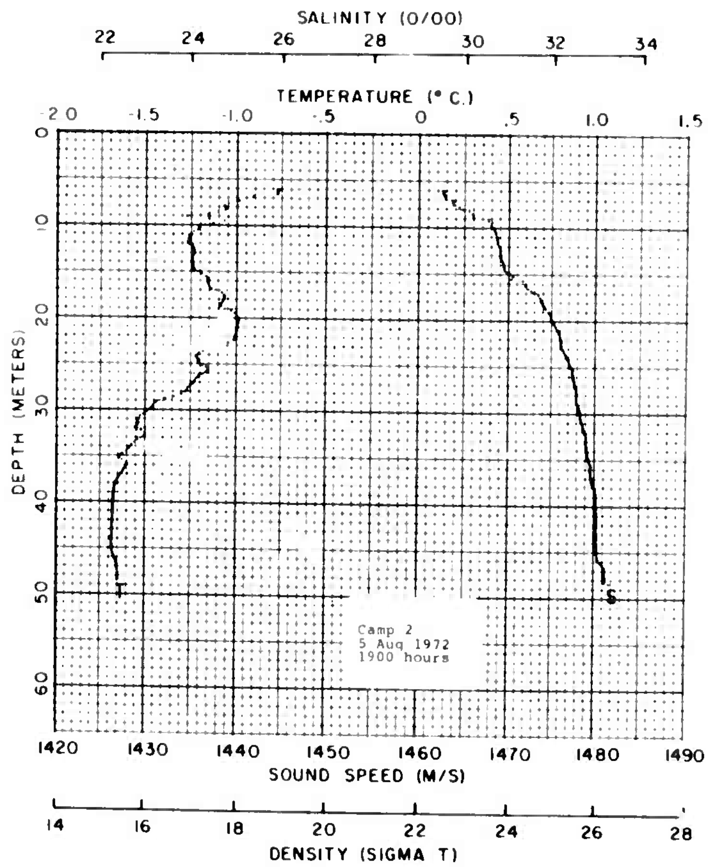
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
0 10 20 30 40 50 60
T
S
Camp 2
5 Aug 1972
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SOUND SPEED (M/S)
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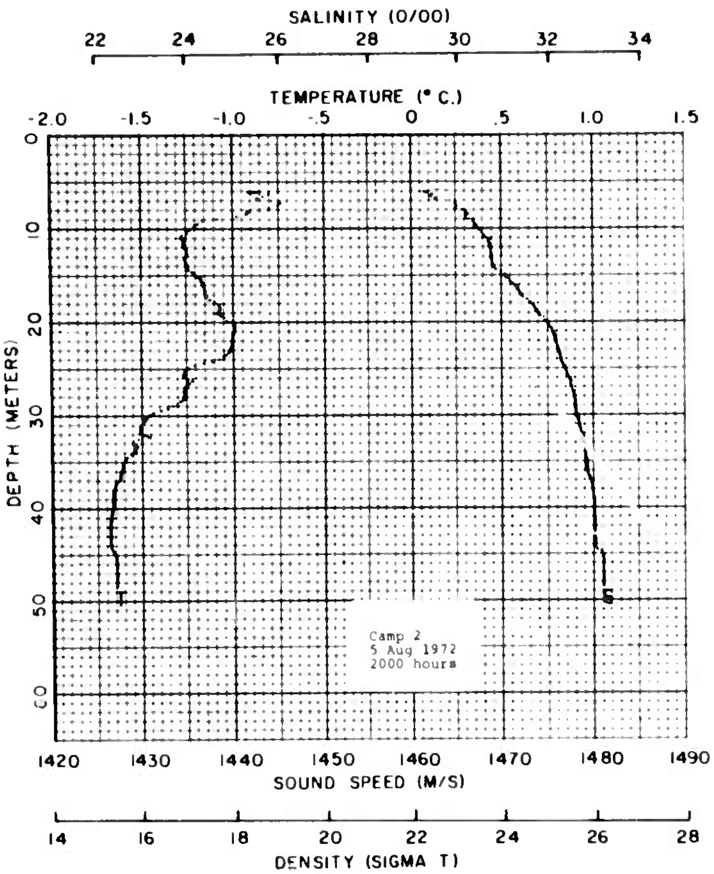
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
0 10 20 30 40 50 60
T
S
Camp 2
5 Aug 1972
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SOUND SPEED (M/S)
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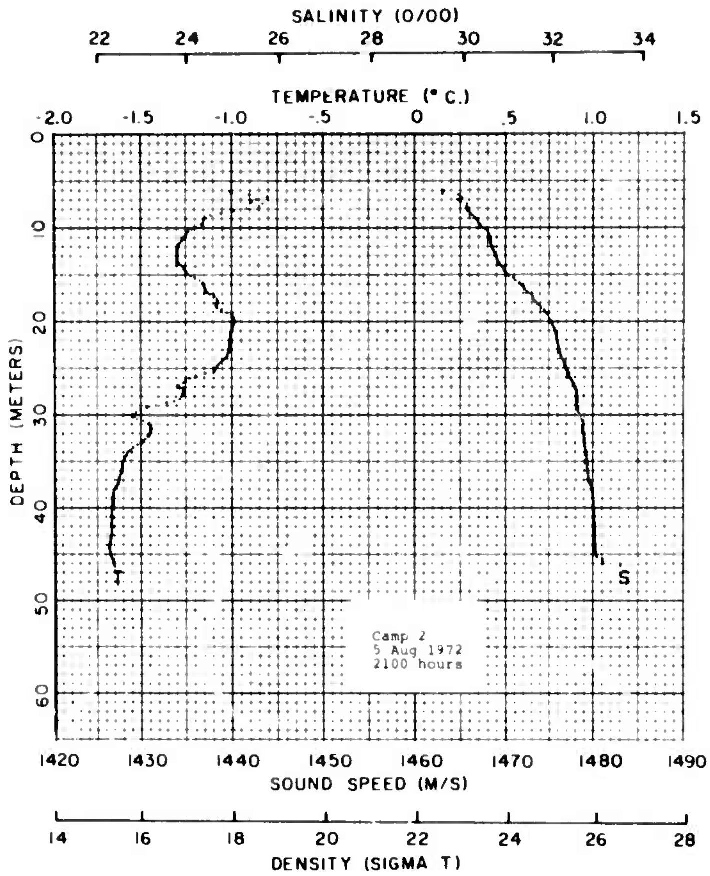
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
0 10 20 30 40 50 60
S
Camp 2
5 Aug 1972
2100 hours
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SOUND SPEED (M/S)
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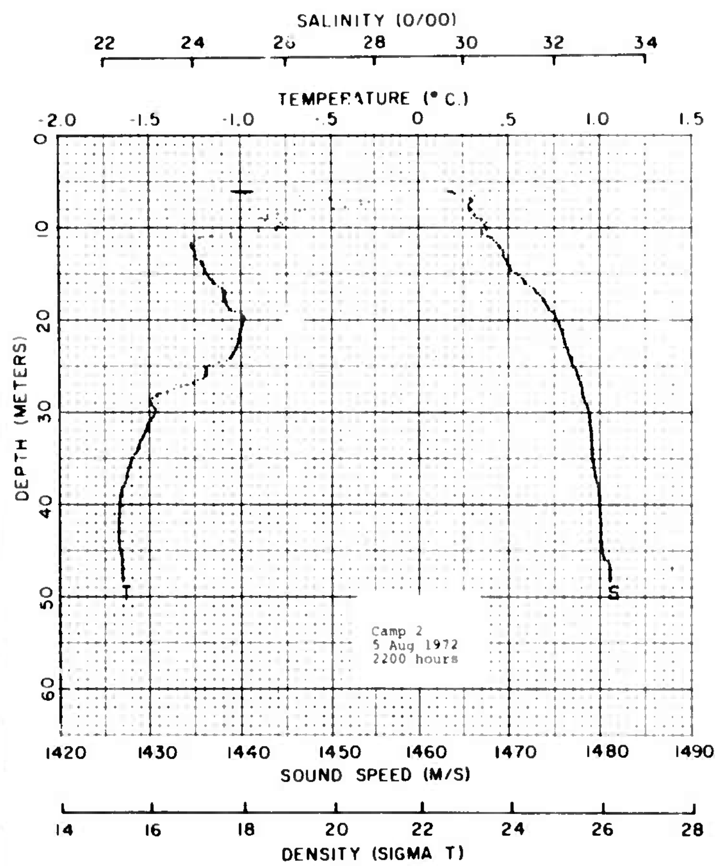
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
0 10 20 30 40 50 60
T
S
Camp 2
5 Aug 1972
2200 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
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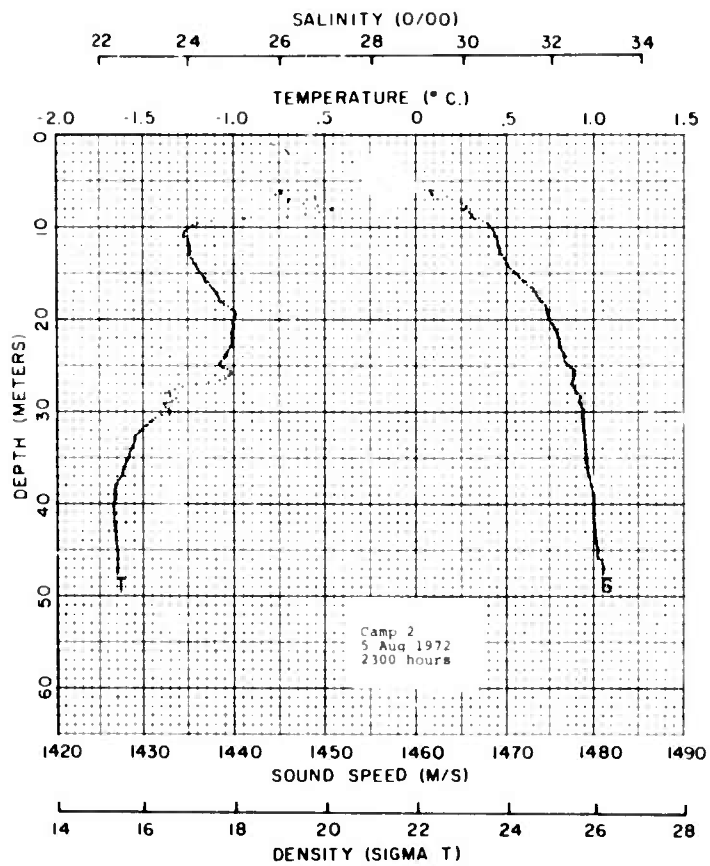
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
0 10 20 30 40 50 60
T
S
Camp 2
5 Aug 1972
2300 hours
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SOUND SPEED (M/S)
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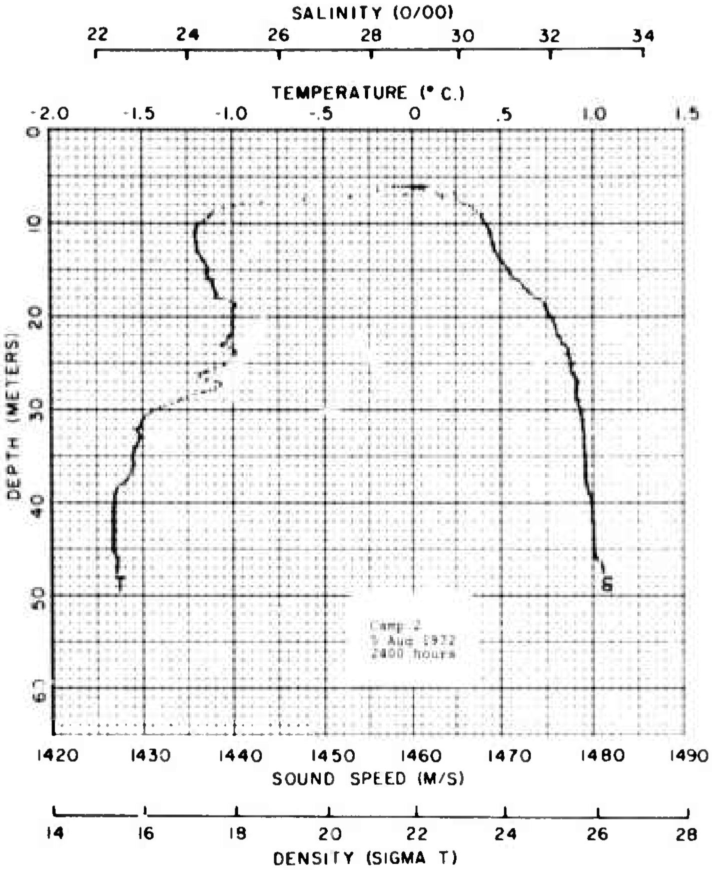
DENSITY (SIGMA T)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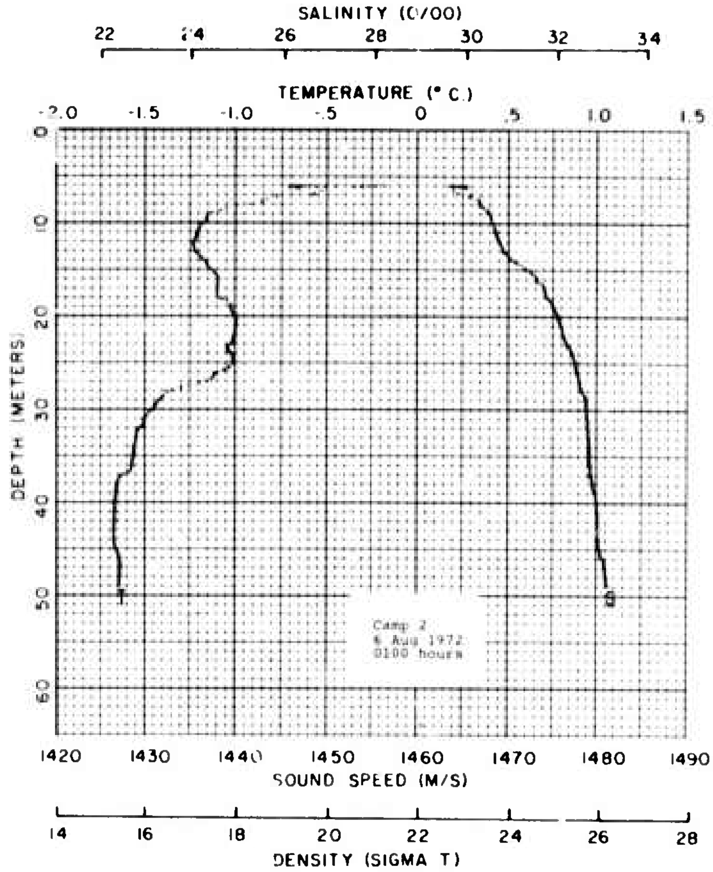
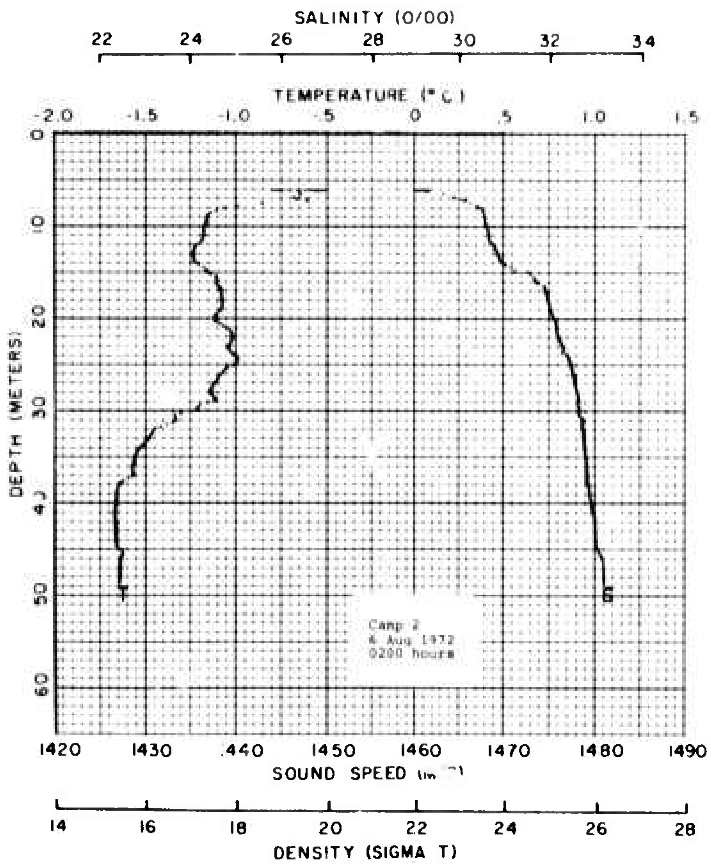
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
5 Aug 1972
2400 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
6 Aug 1972
0100 hours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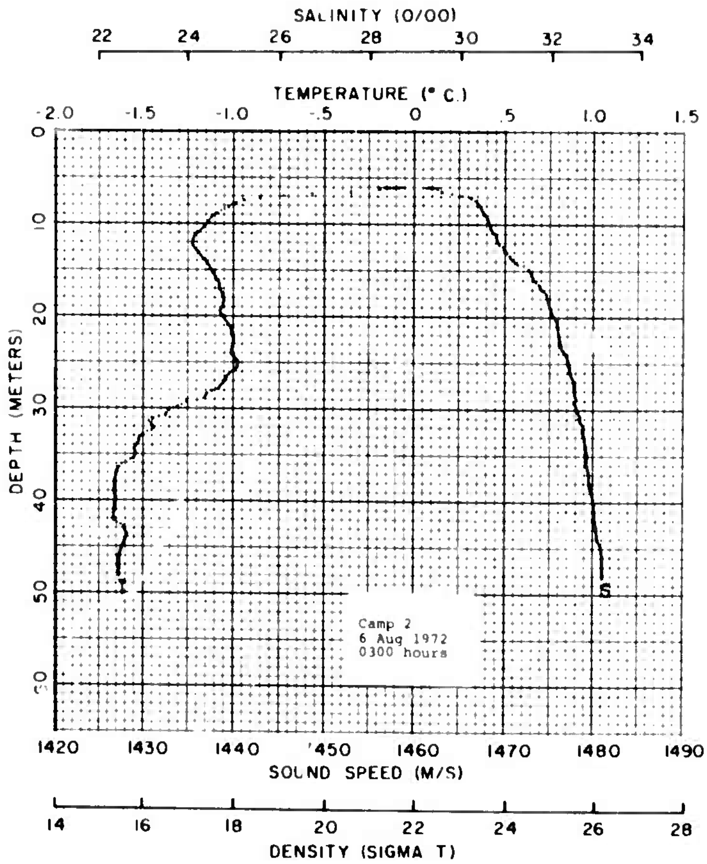
TEMPERATURE (° C.)
DEPTH (METERS)
DENSITY (SIGMA T)
Camp 2
6 Aug 1972
0200 hours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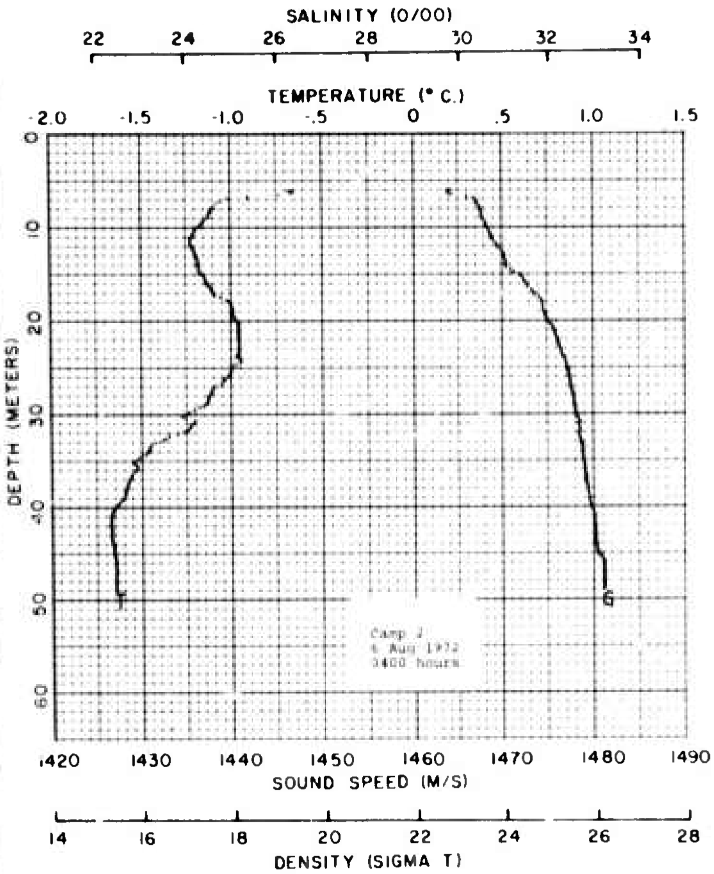
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
6 Aug 1972
0300 hours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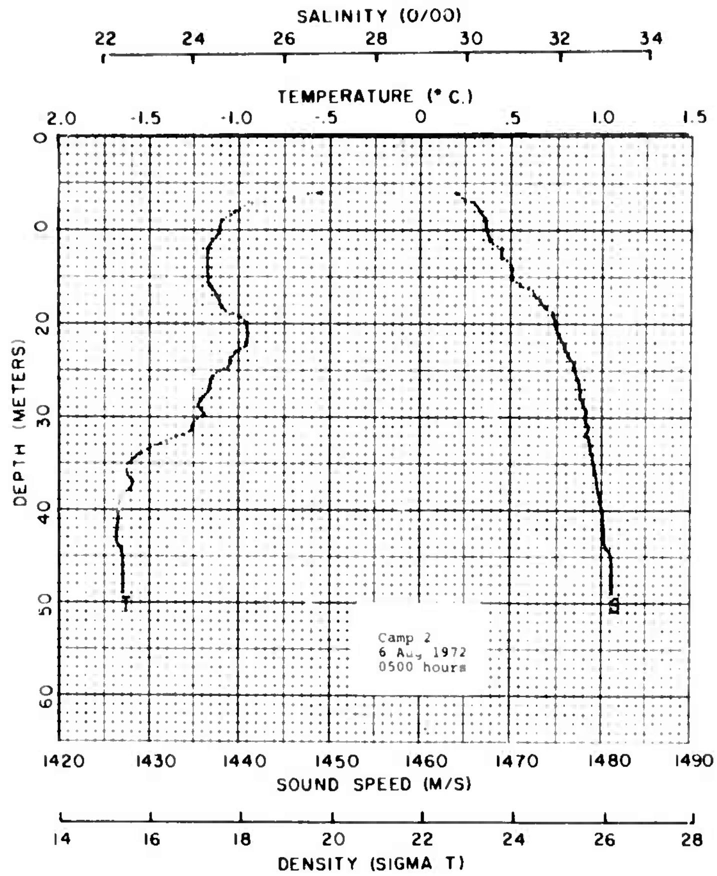
DENSITY (SIGMA T)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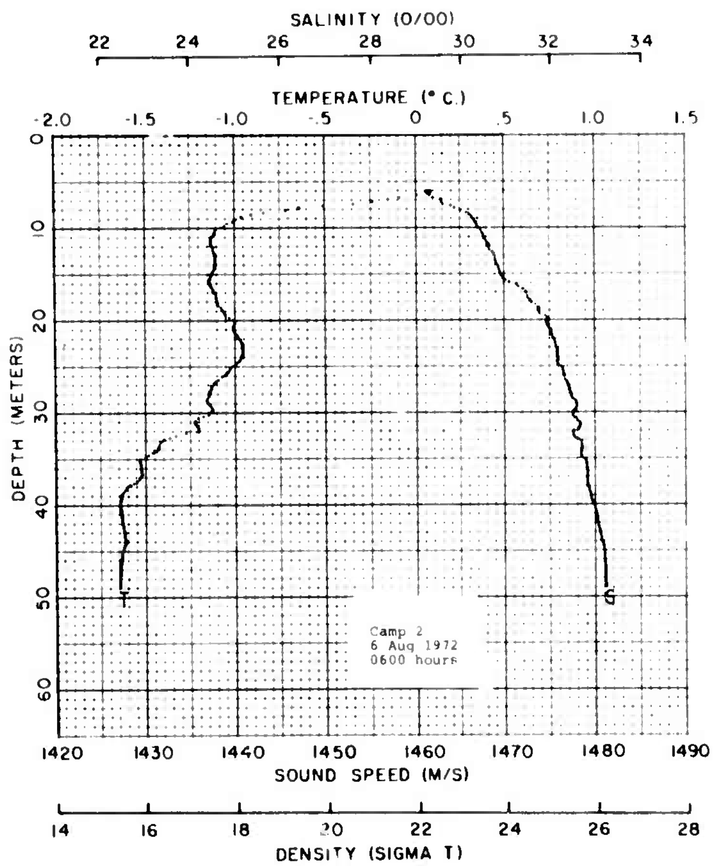
DEPTH (METERS)
Camp 2
0500 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)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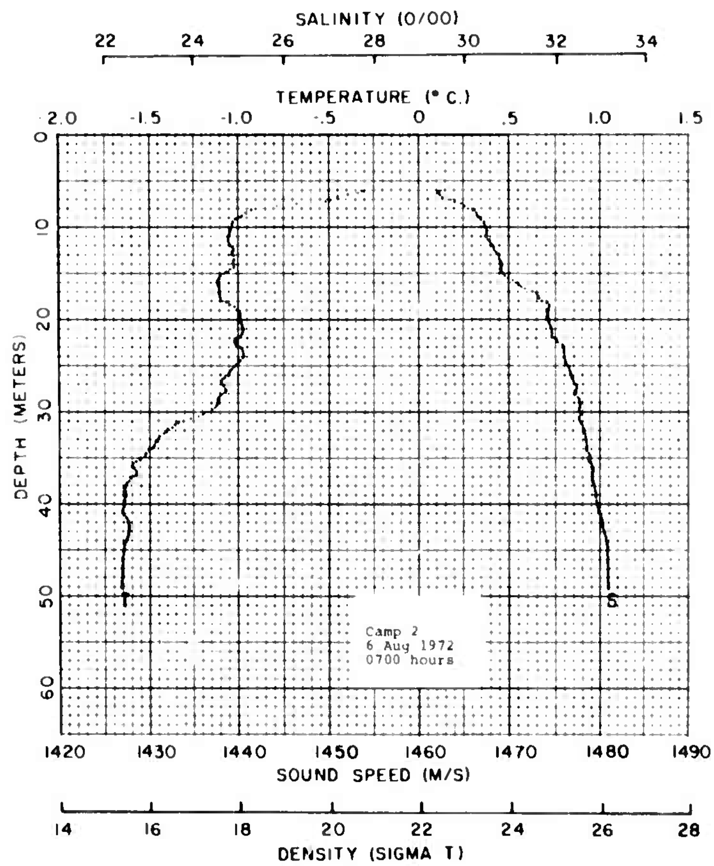
DEPTH (METERS)
Camp 2
6 Aug 1972
0600 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)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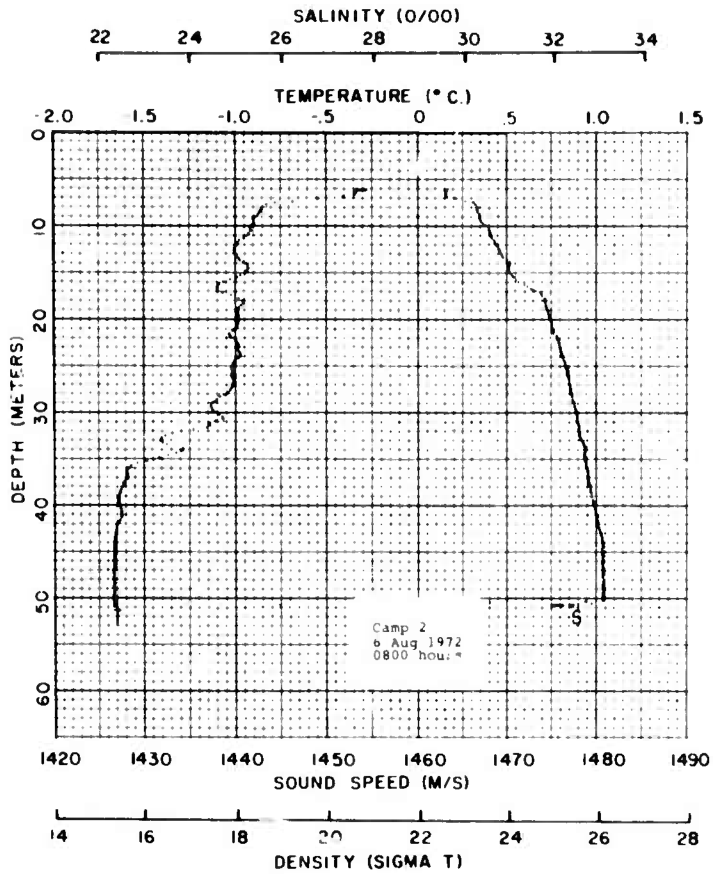
DEPTH (METERS)
Camp 2
6 Aug 1972
0700 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)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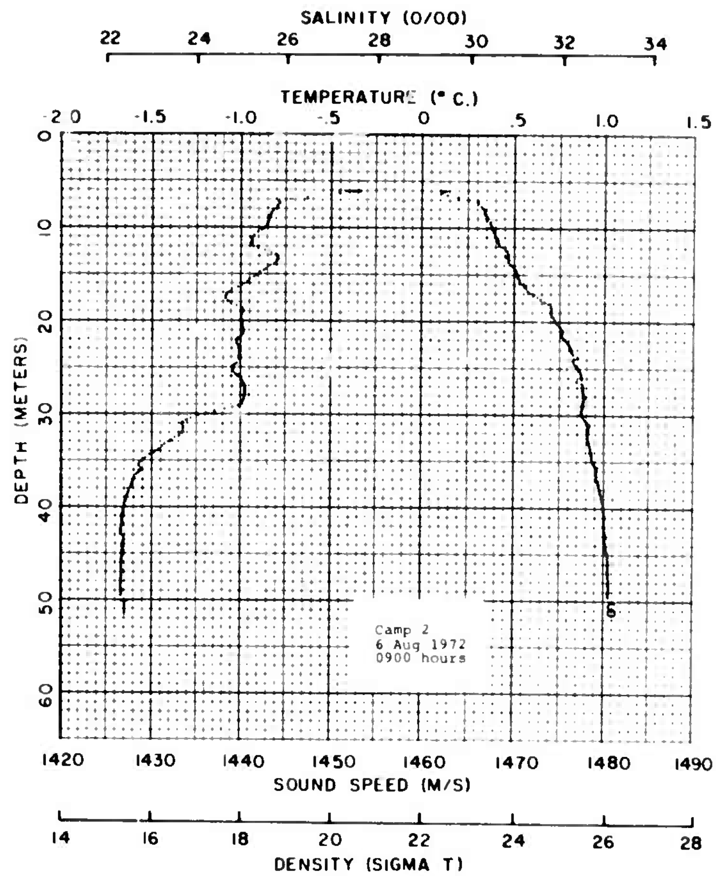
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
6 Aug 1972
0800 hours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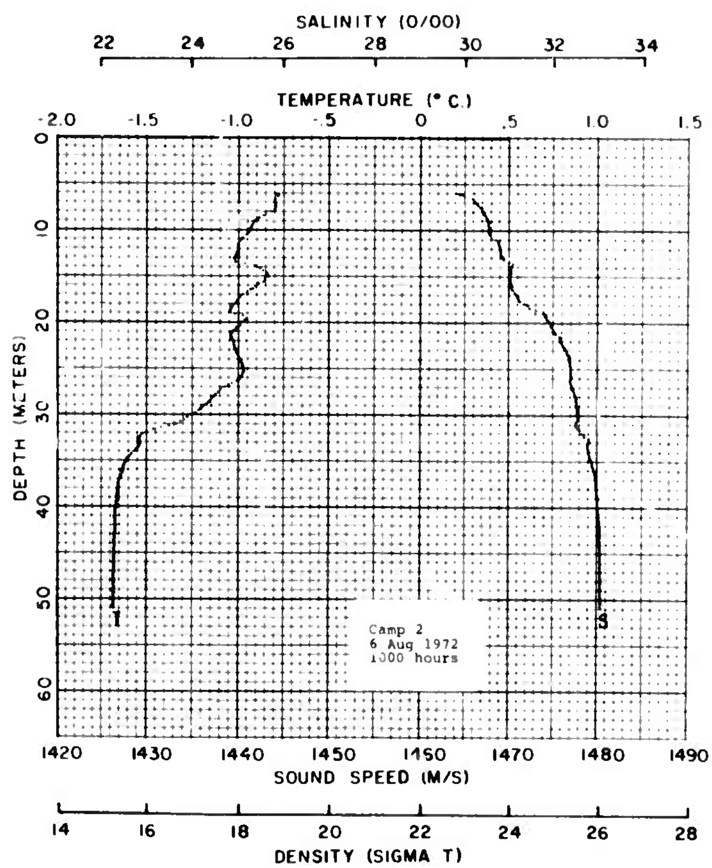
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
6 Aug 1972
0900 hours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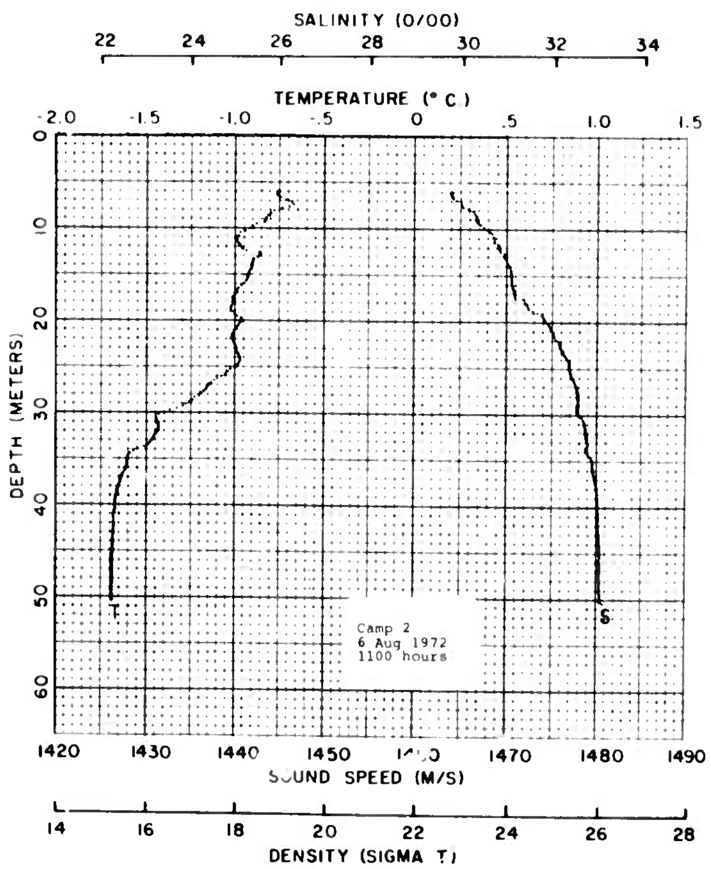
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
6 Aug 1972
1000 hours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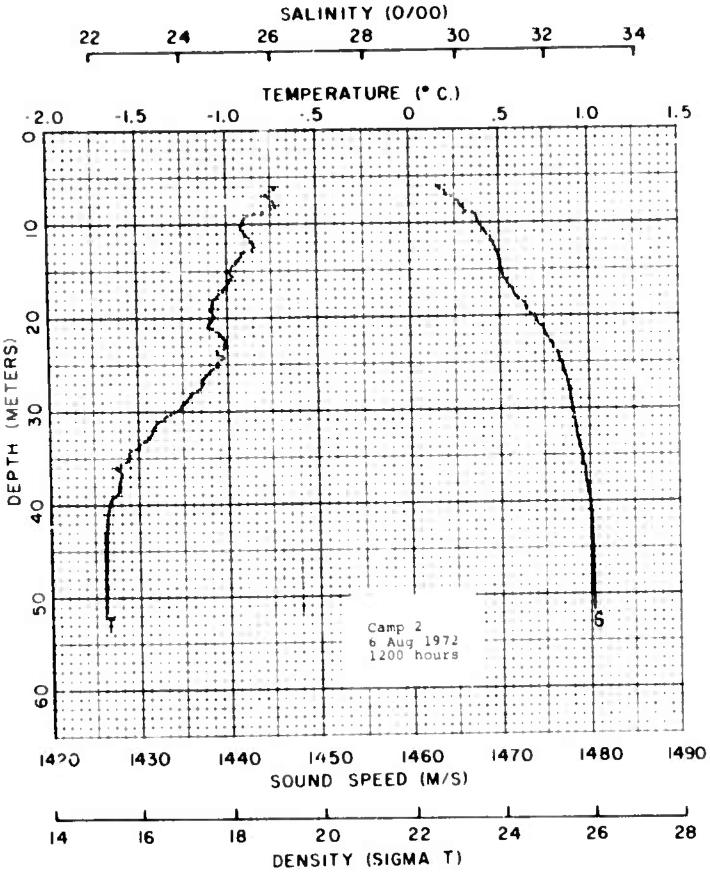
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
6 Aug 1972
1100 hours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TEMPERATURE (° C.)
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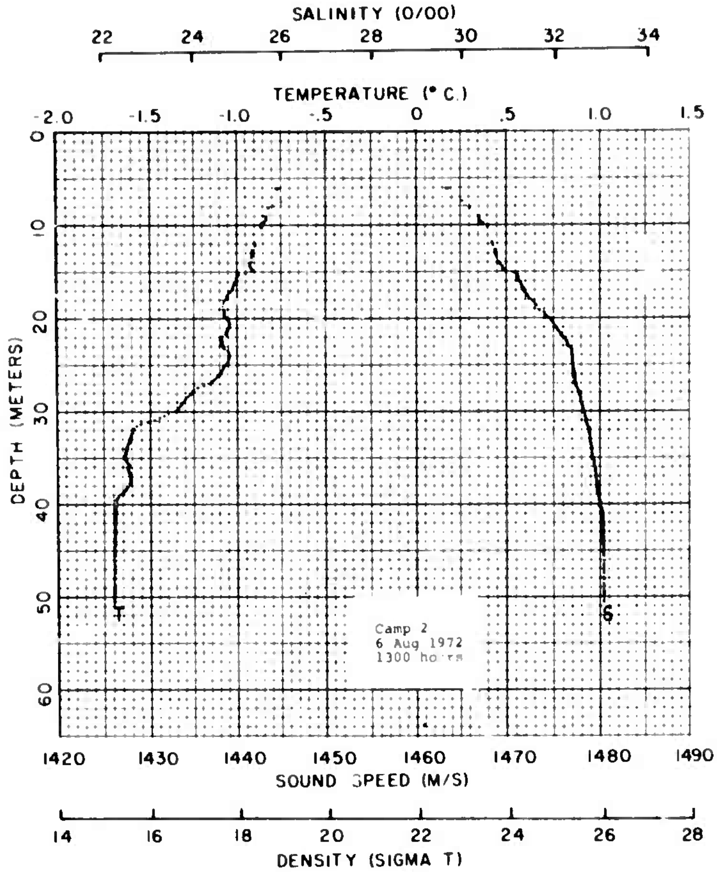
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
6 Aug 1972
1200 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)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DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
6 Aug 1972
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
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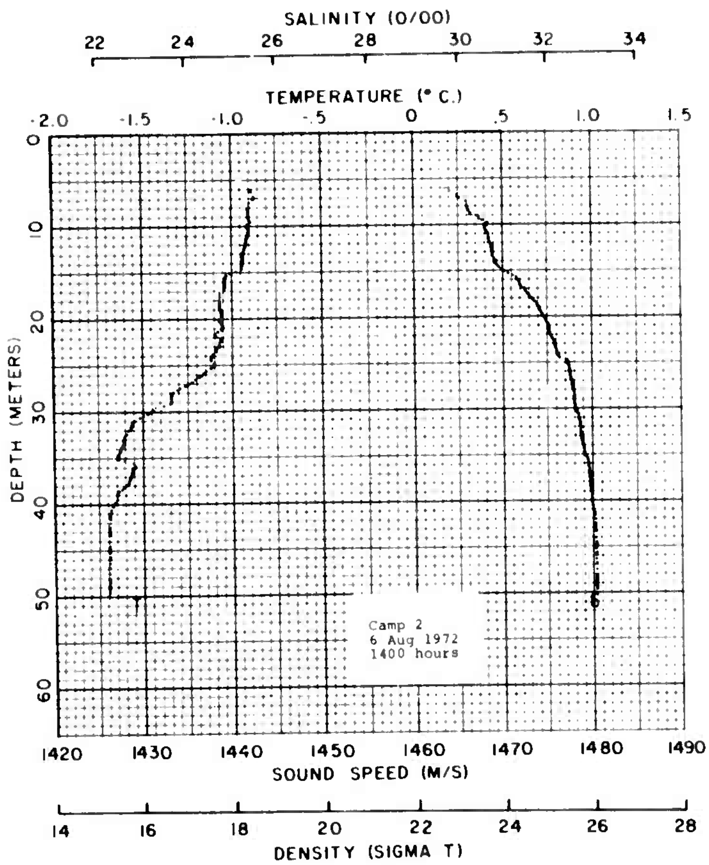
DENSITY (SIGMA T)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DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
6 Aug 1972
1400 hours
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SOUND SPEED (M/S)
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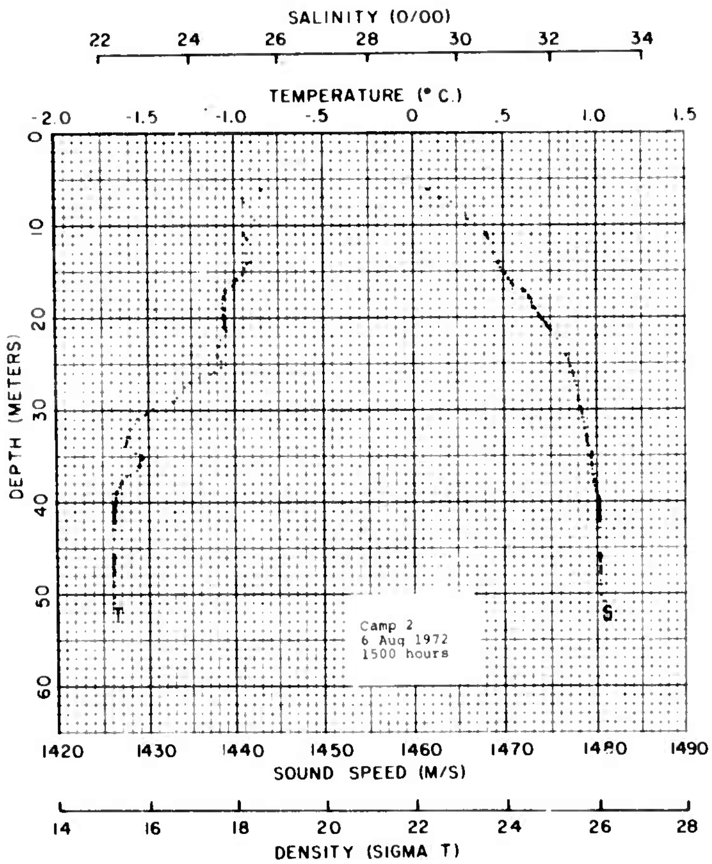
DENSITY (SIGMA T)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DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
6 Aug 1972
1500 hours
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SOUND SPEED (M/S)
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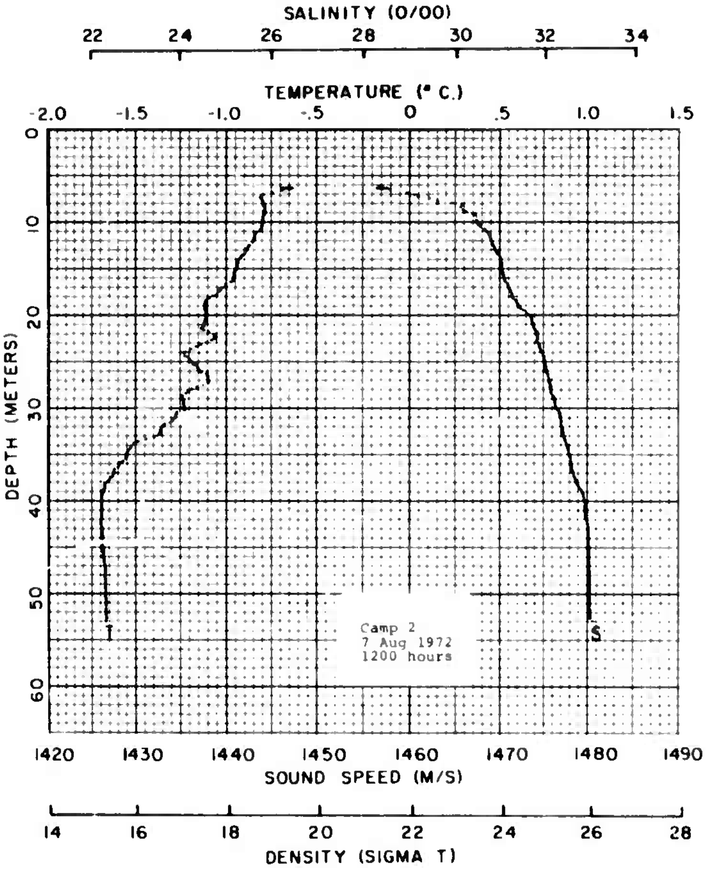
DENSITY (SIGMA T)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DEPTH (METERS)
0 10 20 30 40 50 60
T
S
Camp 2
7 Aug 1972
1200 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
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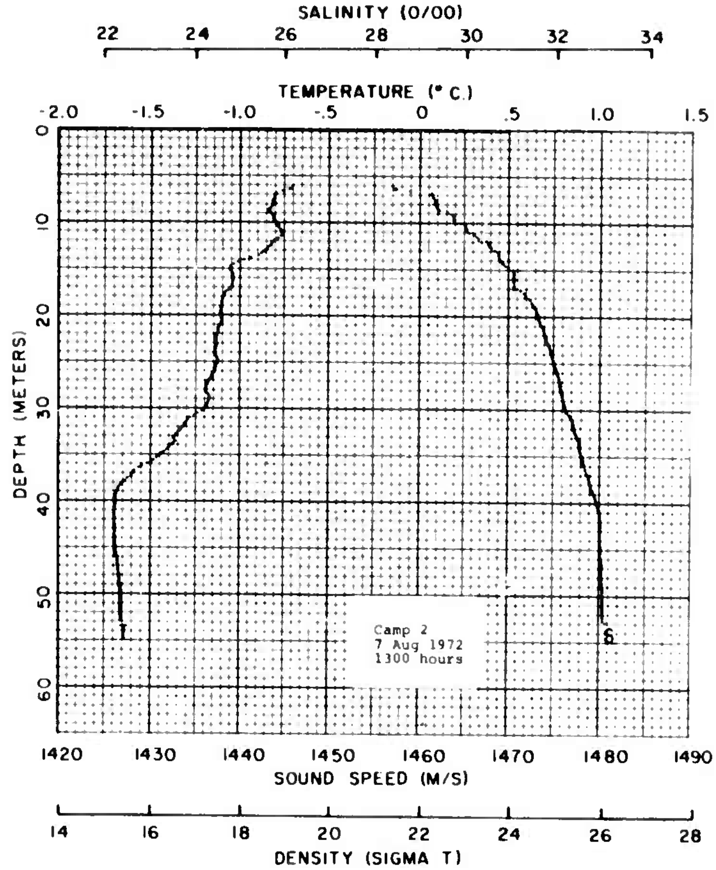
DENSITY (SIGMA T)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T
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Camp 2
7 Aug 1972
1300 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
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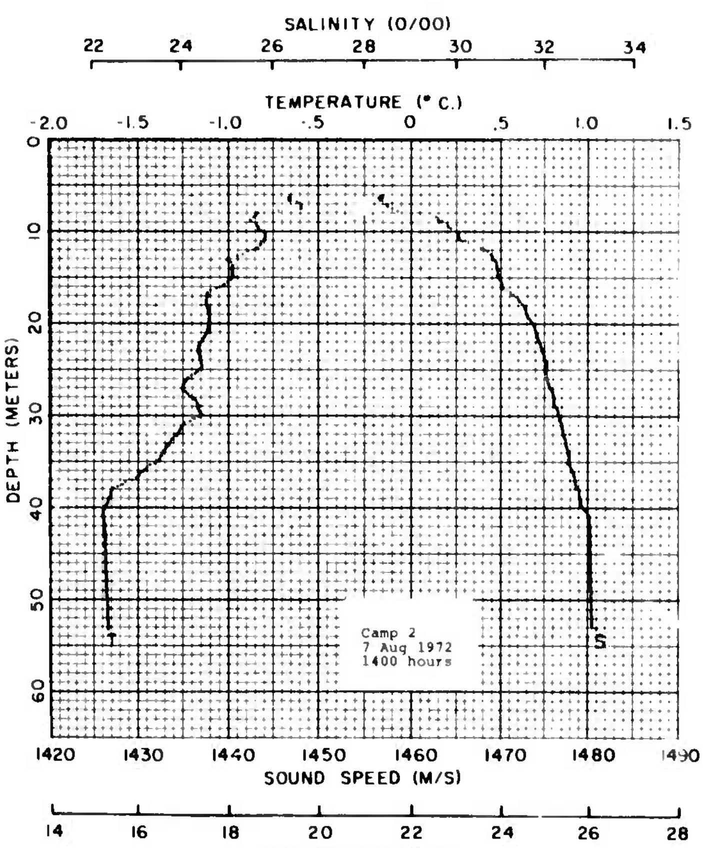
DENSITY (SIGMA T)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DEPTH (METERS)
0 10 20 30 40 50 60
T
S
Camp 2
7 Aug 1972
1400 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
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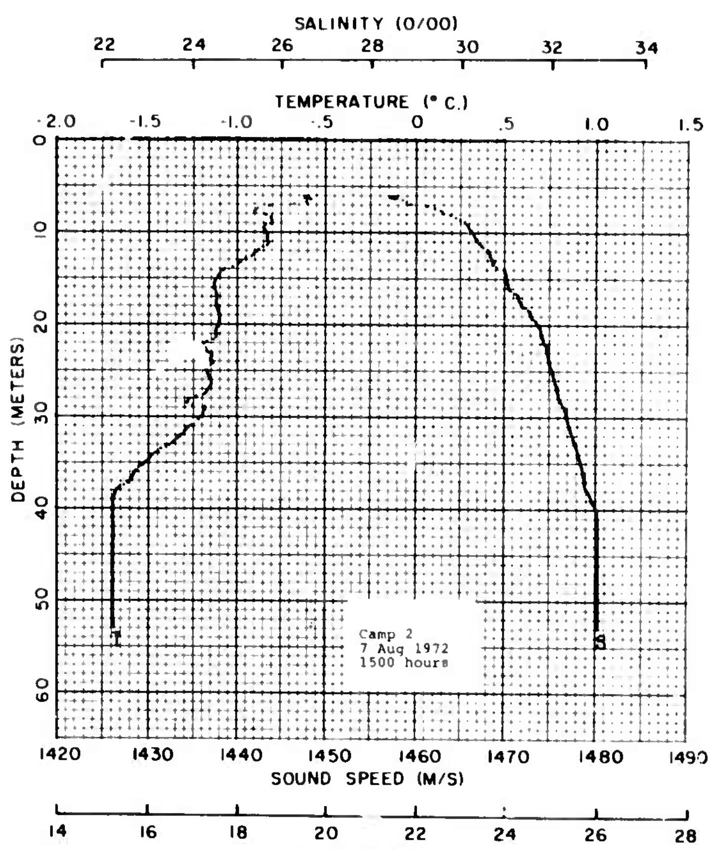
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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DEPTH (METERS)
0 10 20 30 40 50 60
T
S
Camp 2
7 Aug 1972
1500 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
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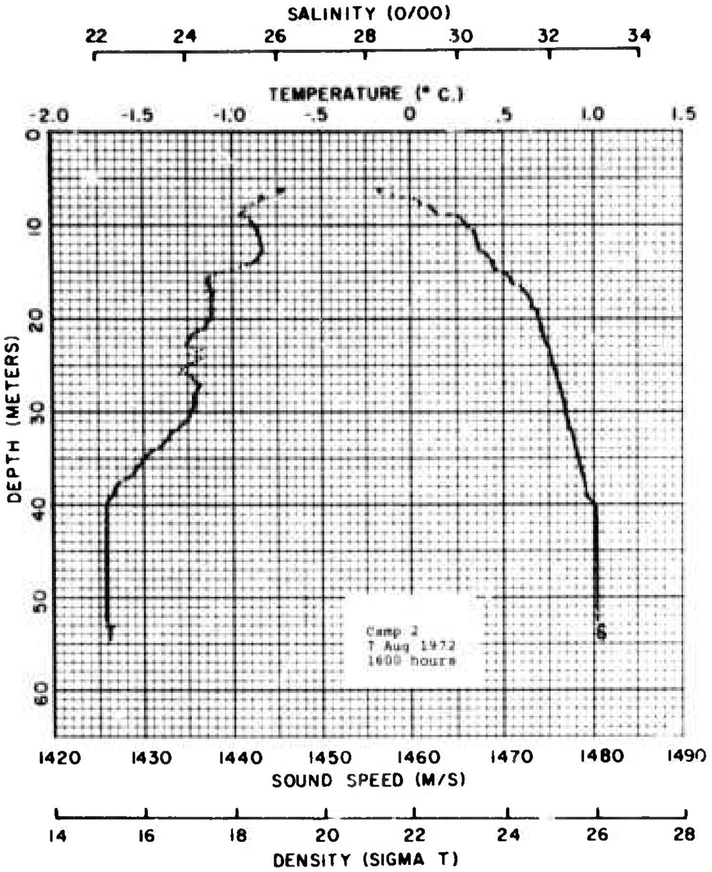
DENSITY (SIGMA T)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DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
7 Aug 1972
1600 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
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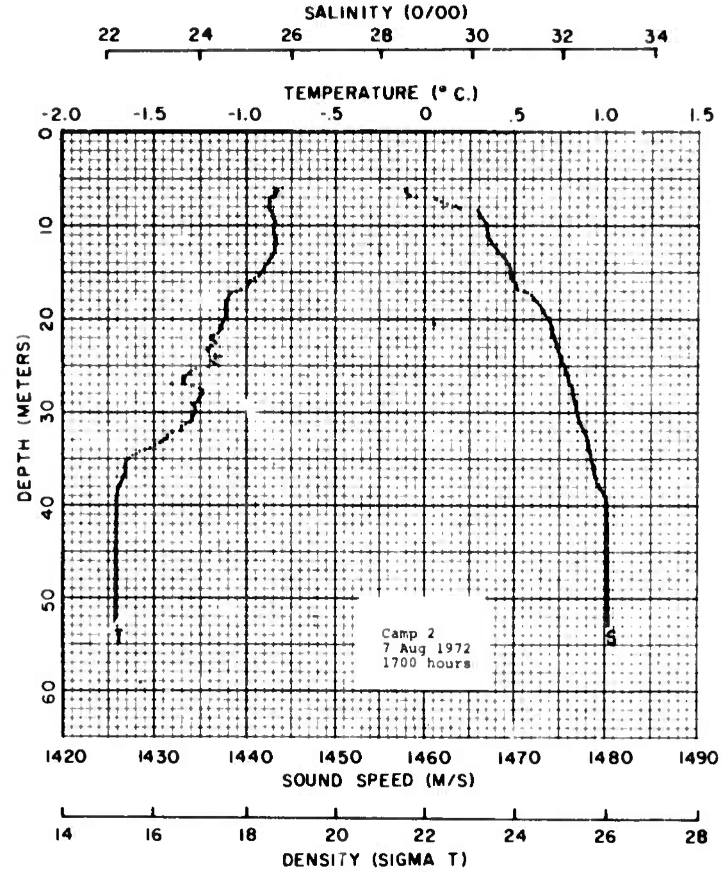
DENSITY (SIGMA T)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TEMPERATURE (° C.)
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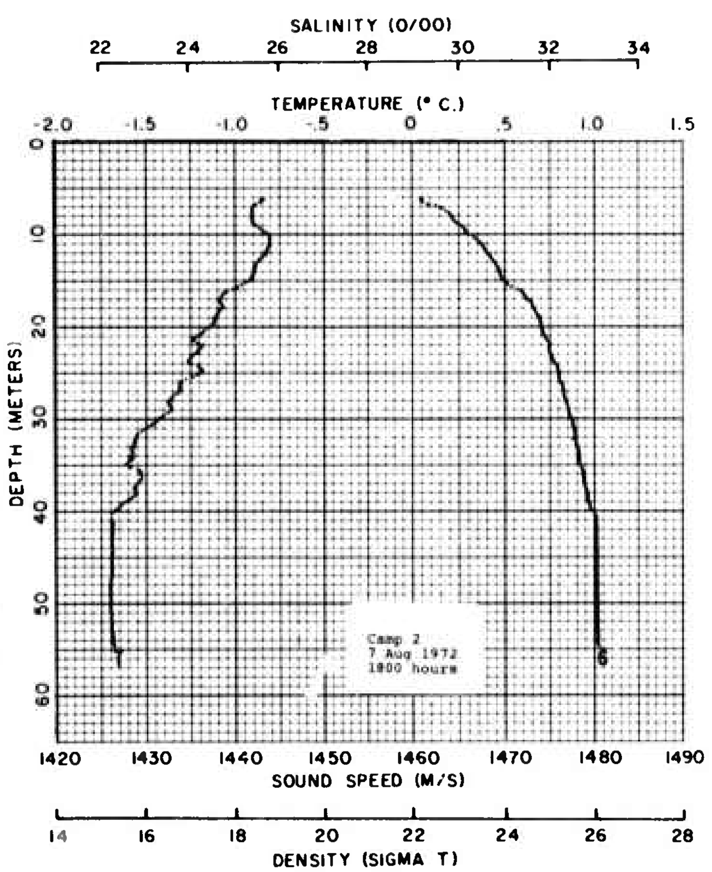
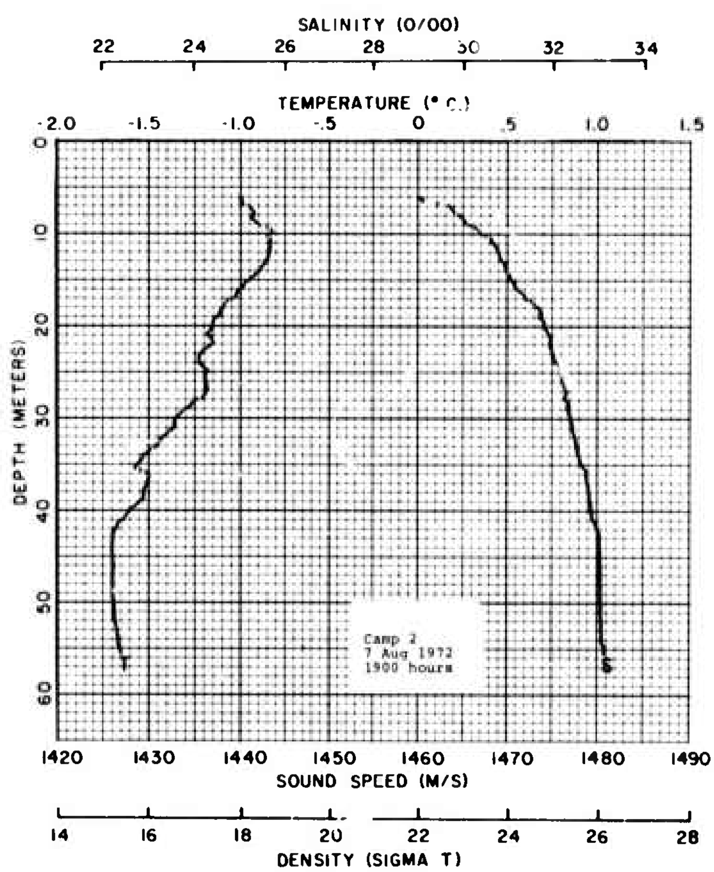
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
7 Aug 1972
1700 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
7 Aug 1972
1800 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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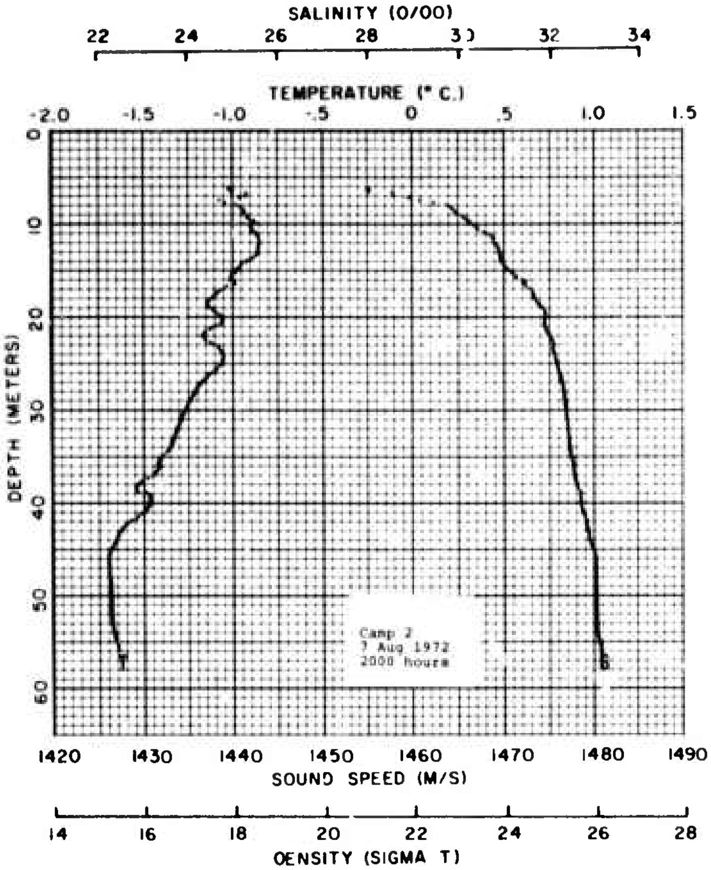
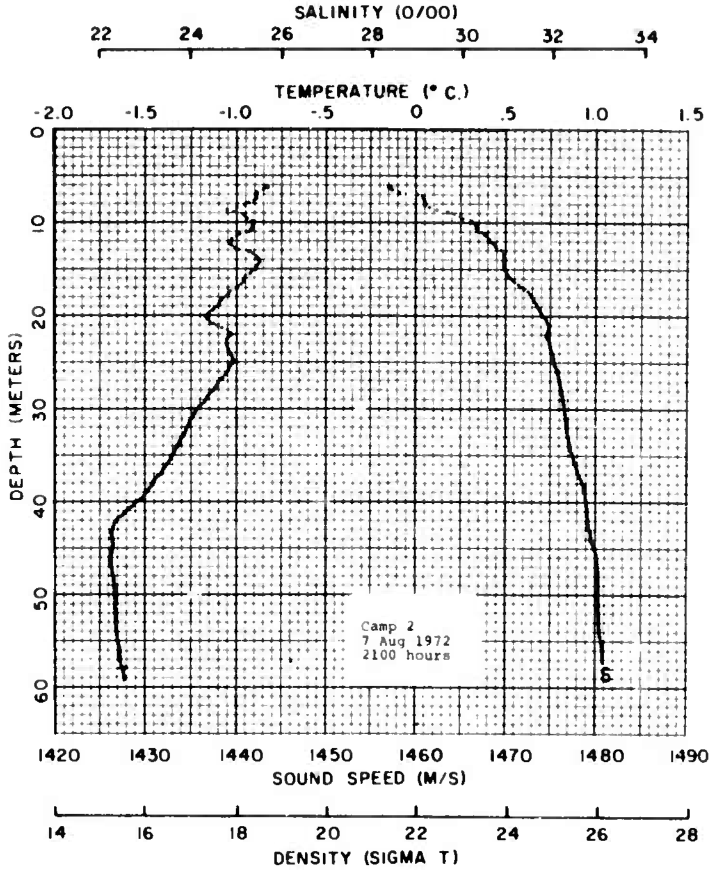
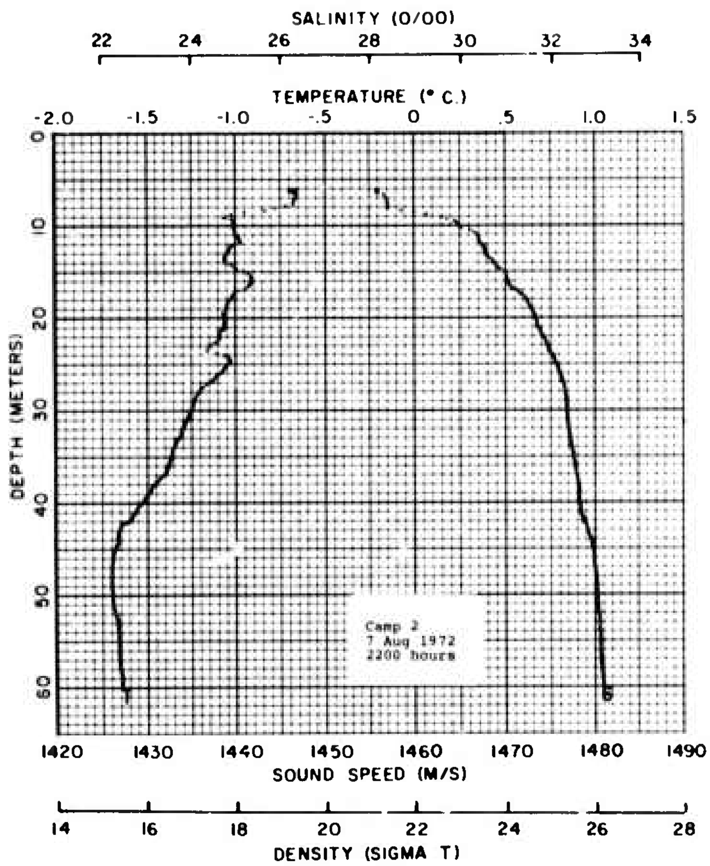
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
7 Aug 1972
1900 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
7 Aug 1972
2000 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
7 Aug 1972
2100 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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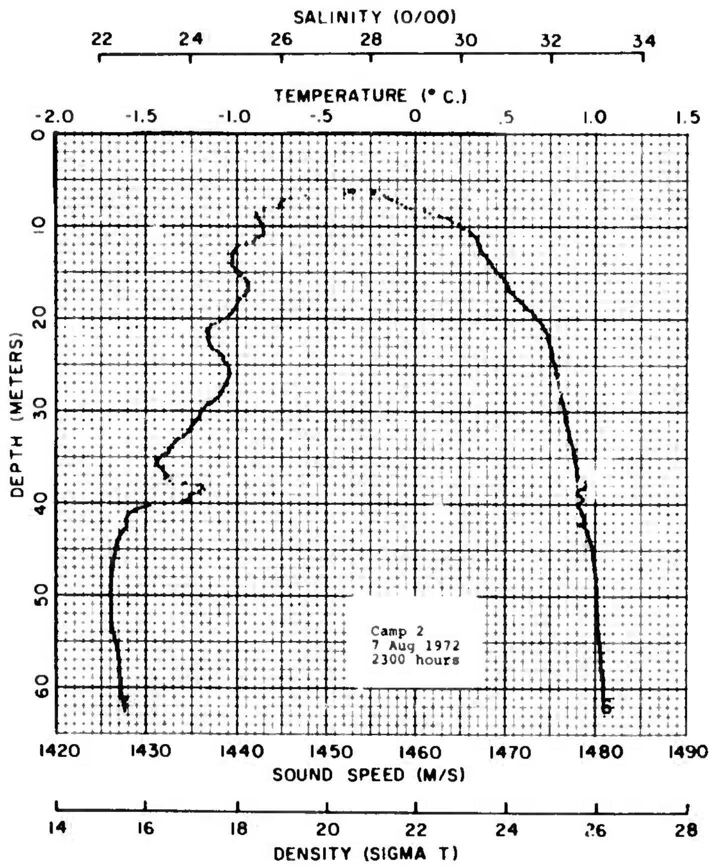
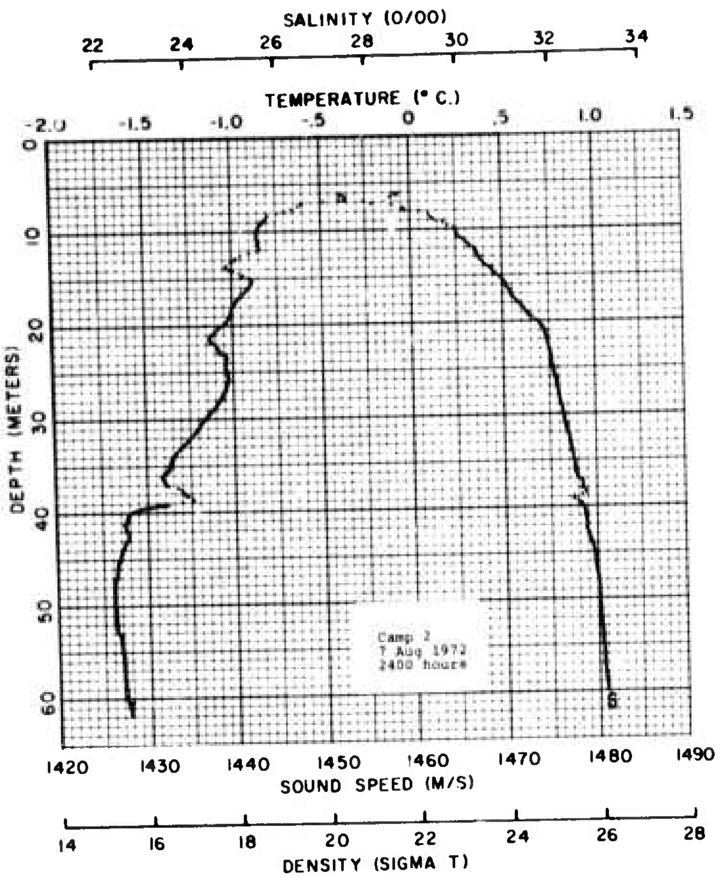
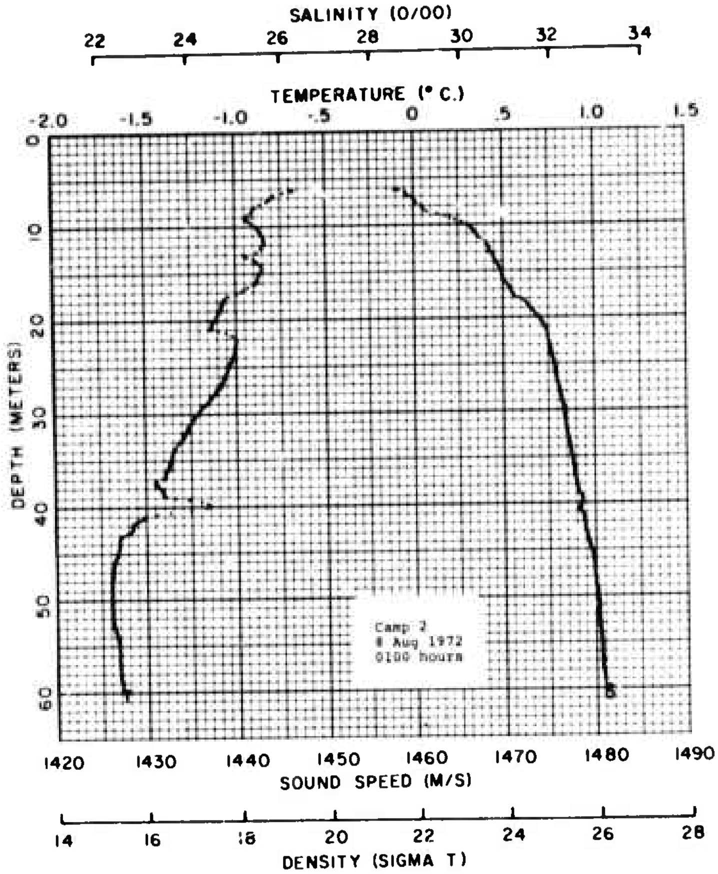
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
7 Aug 1972
2200 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
7 Aug 1972
2300 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
7 Aug 1972
2400 hours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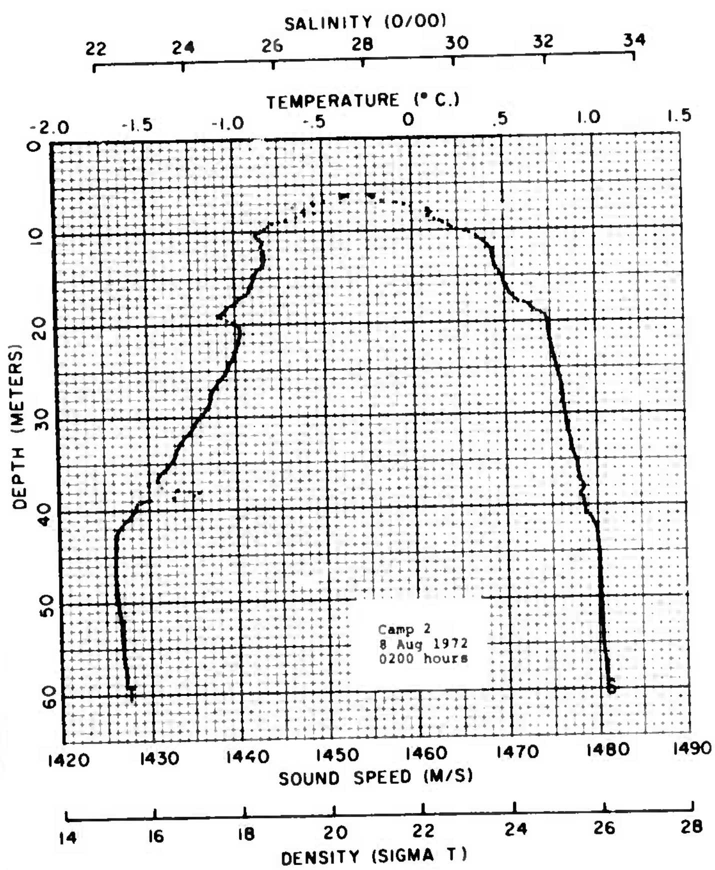
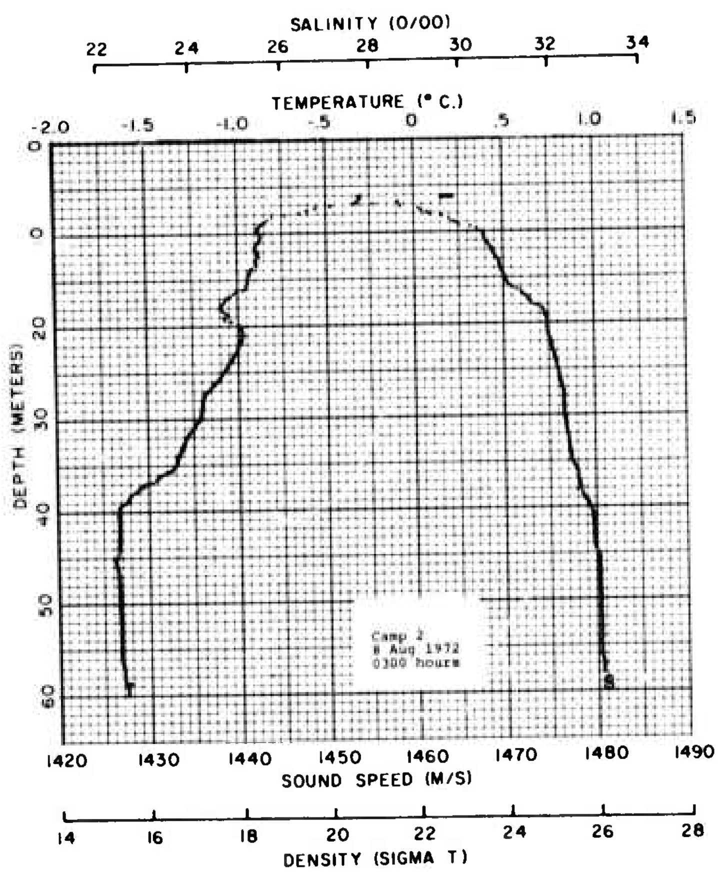
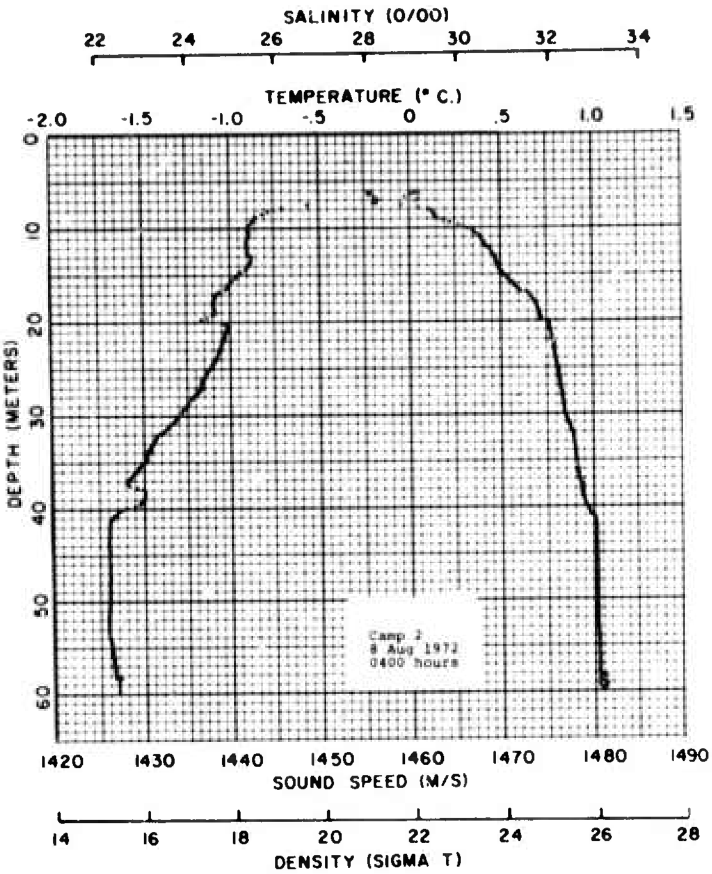
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
8 Aug 1972
0100 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
8 Aug 1972
0200 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Camp 2
8 Aug 1972
0300 hours


SALINITY (0/00)
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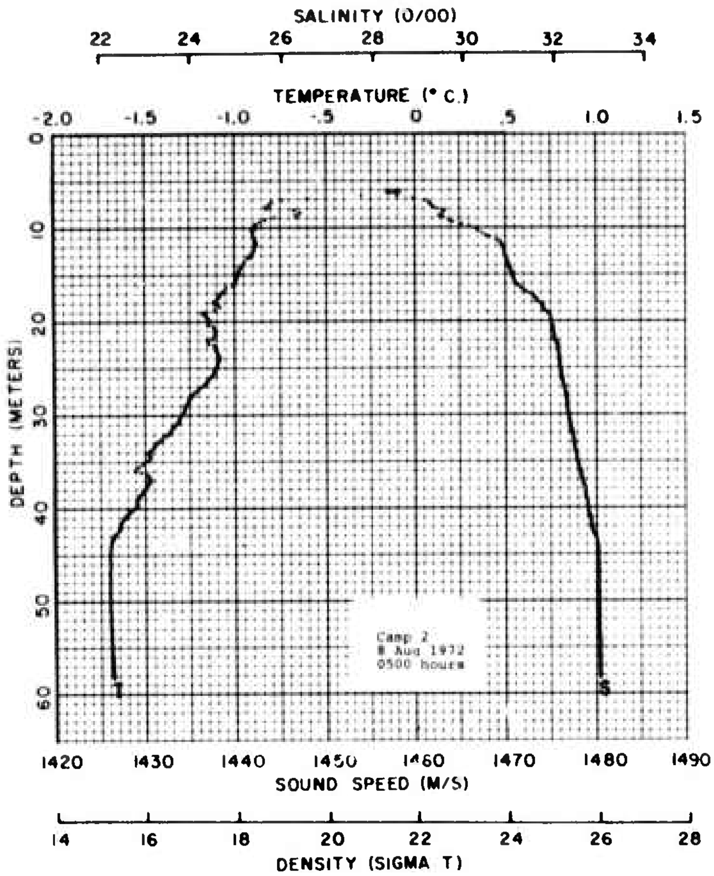
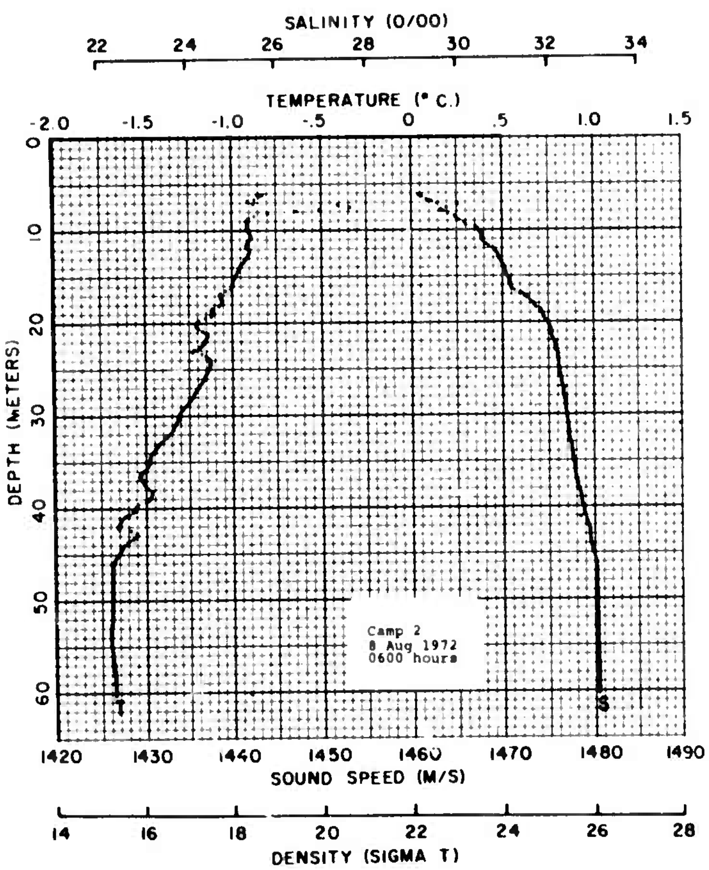
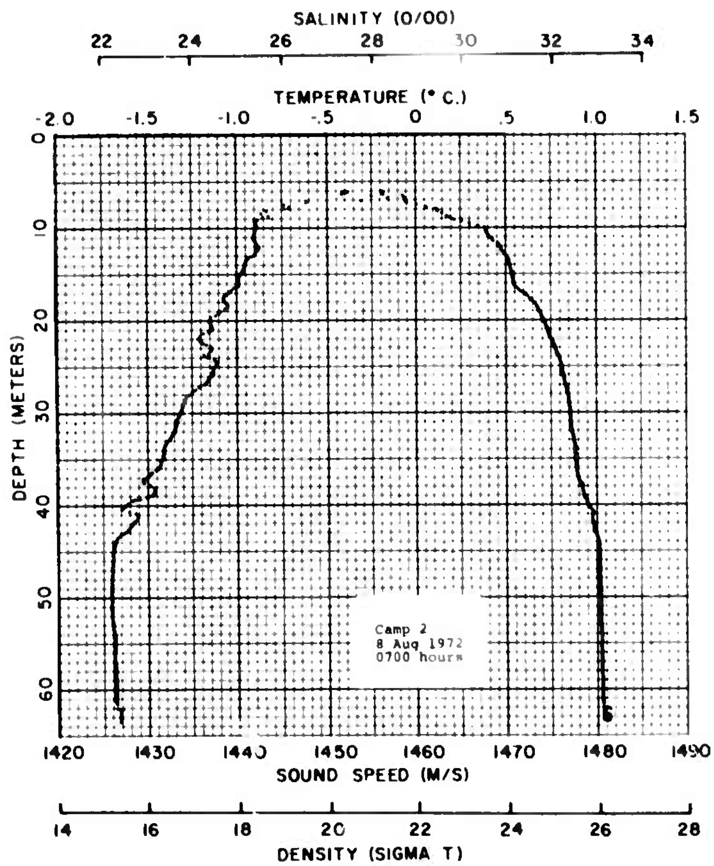
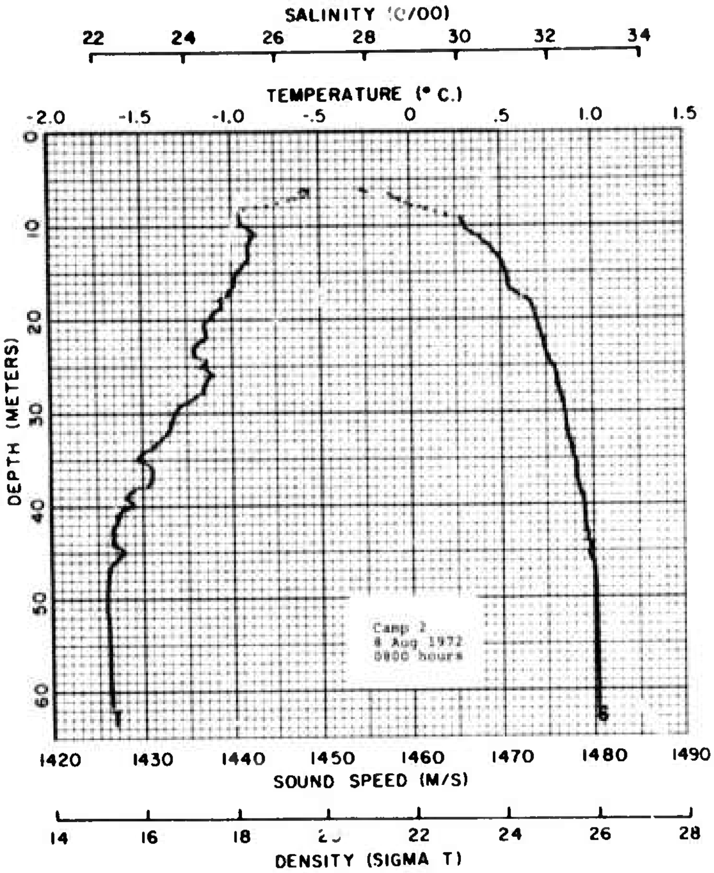
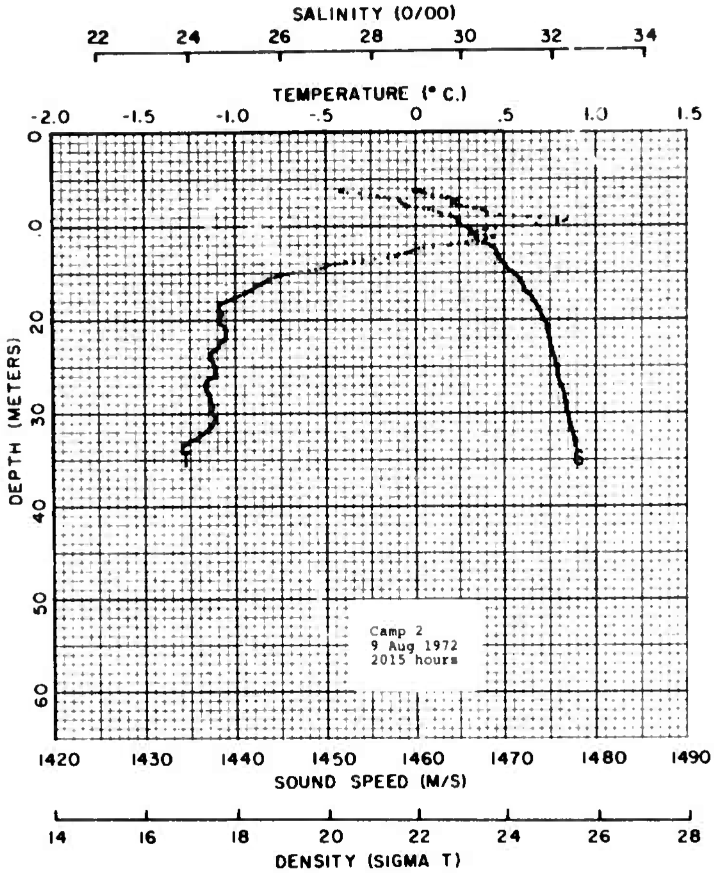
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
8 Aug 1972
0400 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

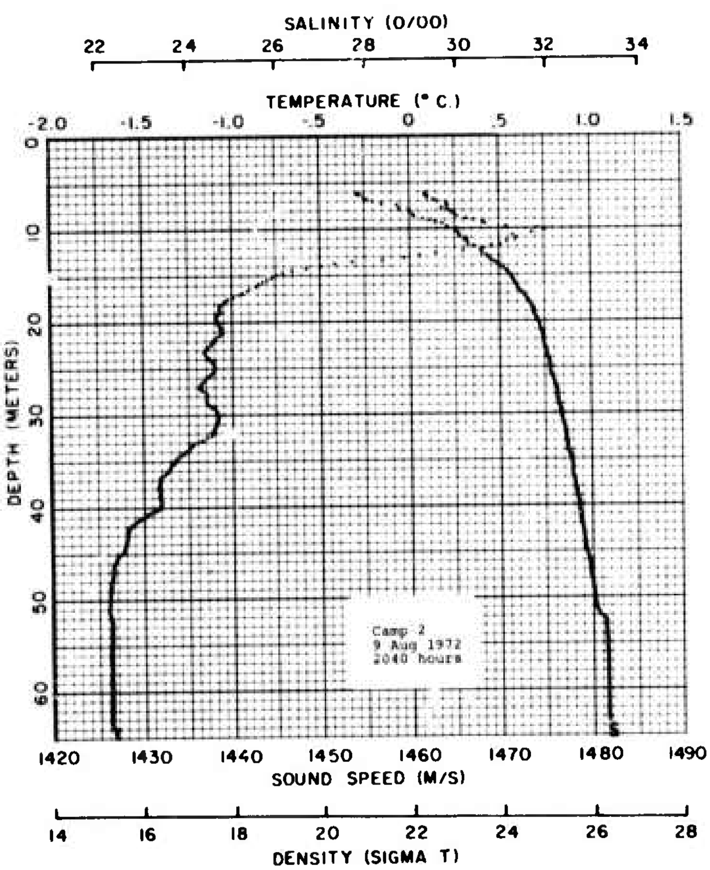

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
8 Aug 1972
0500 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

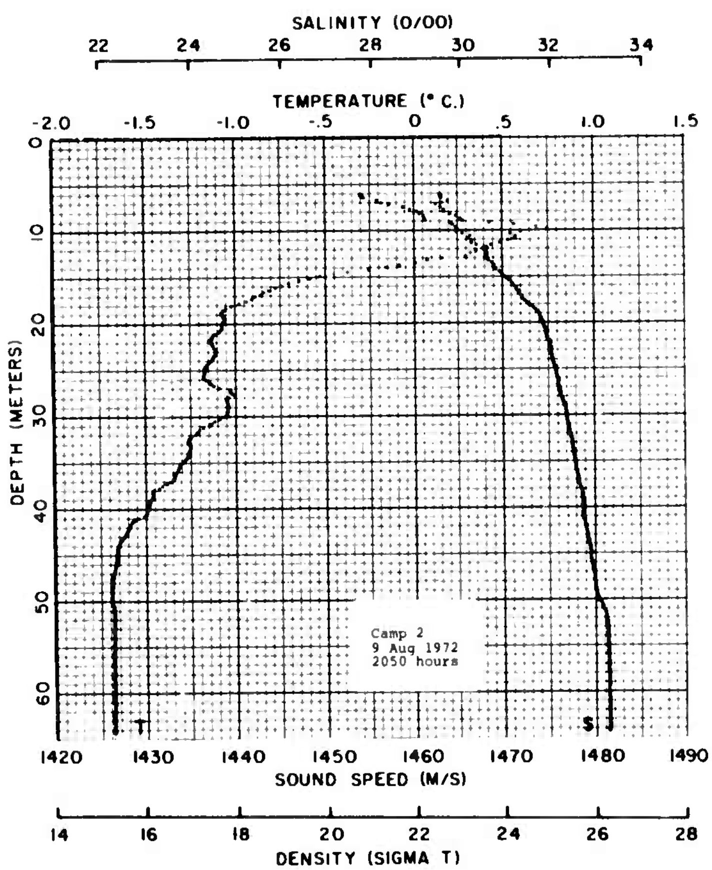

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
8 Aug 1972
0600 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

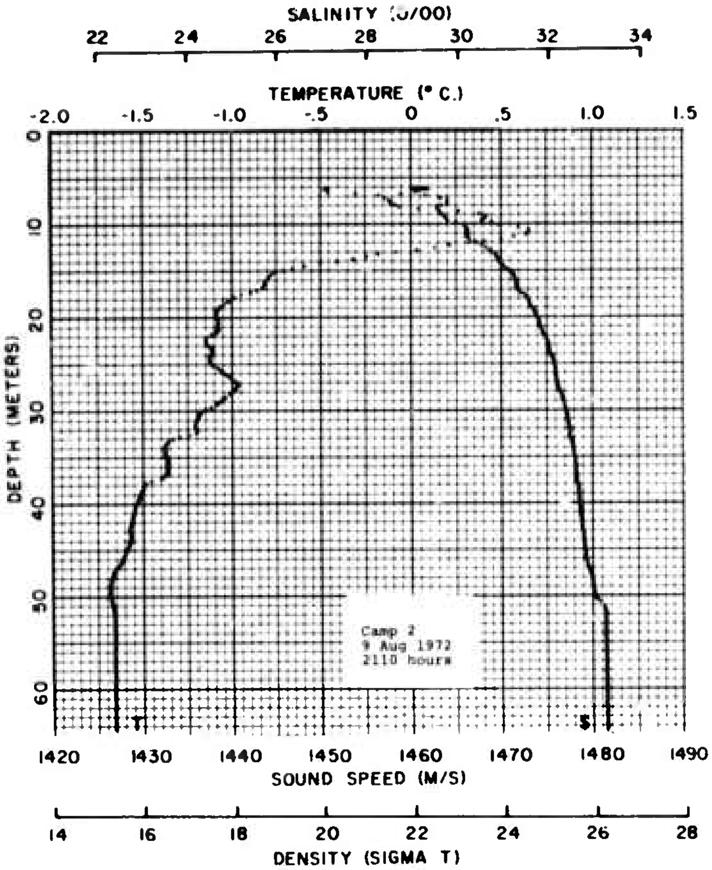

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
8 Aug 1972
0700 hours
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

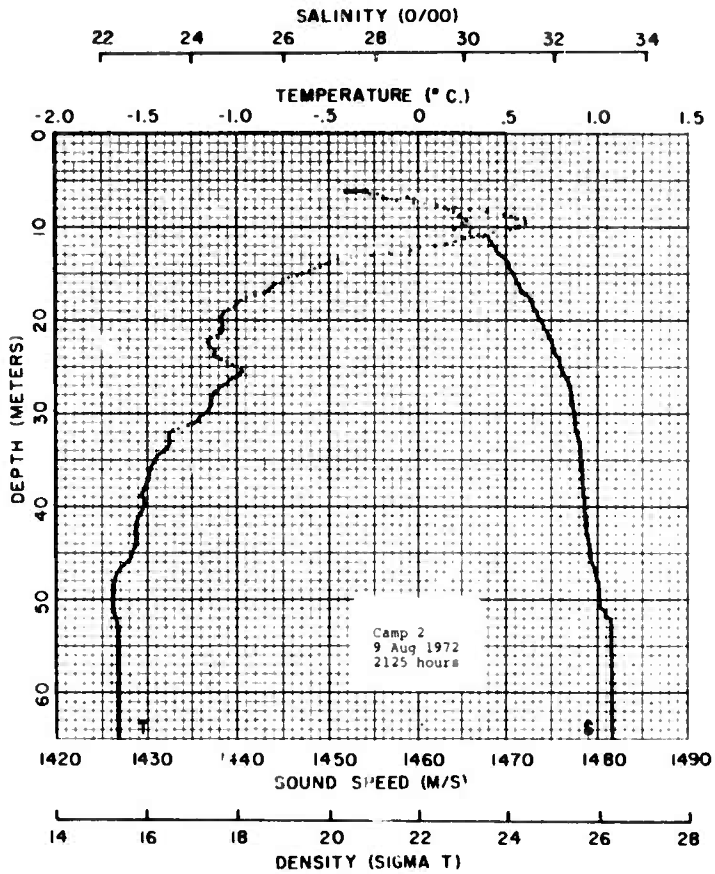

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 2
8 Aug 1972
0800 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

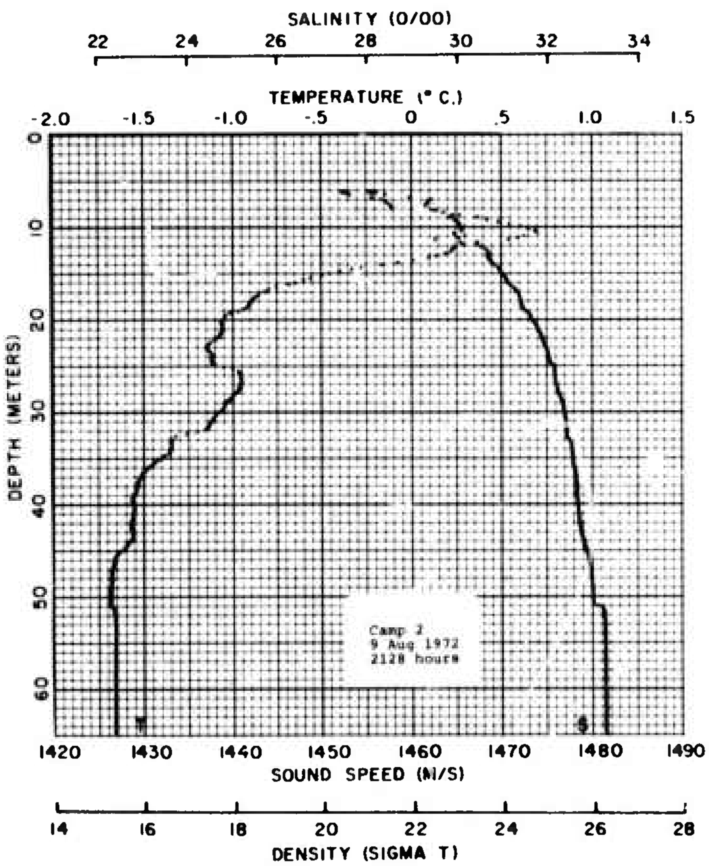

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 2
9 Aug 1972
2015 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

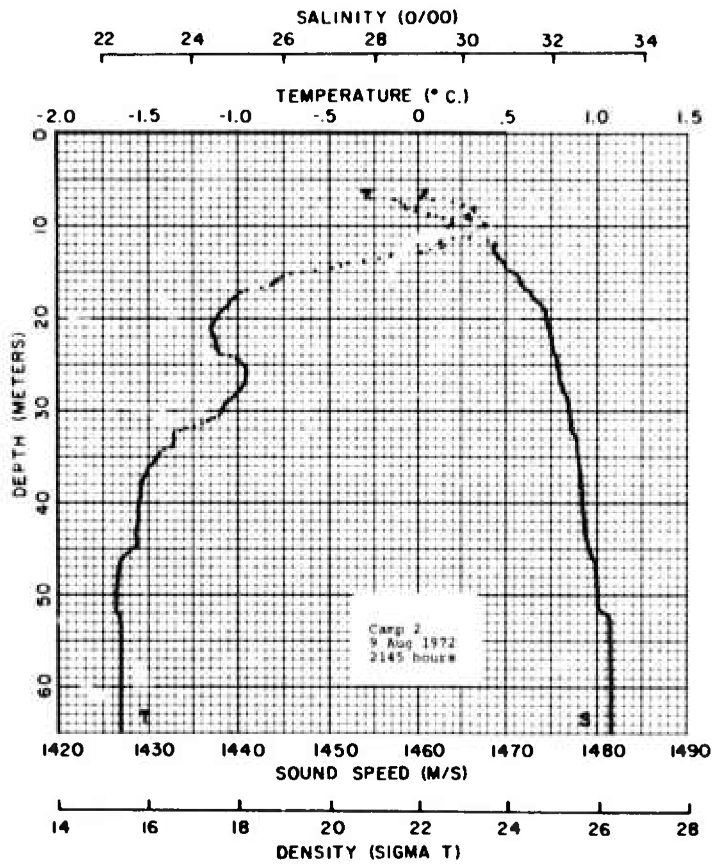

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 2
9 Aug 1972
2040 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

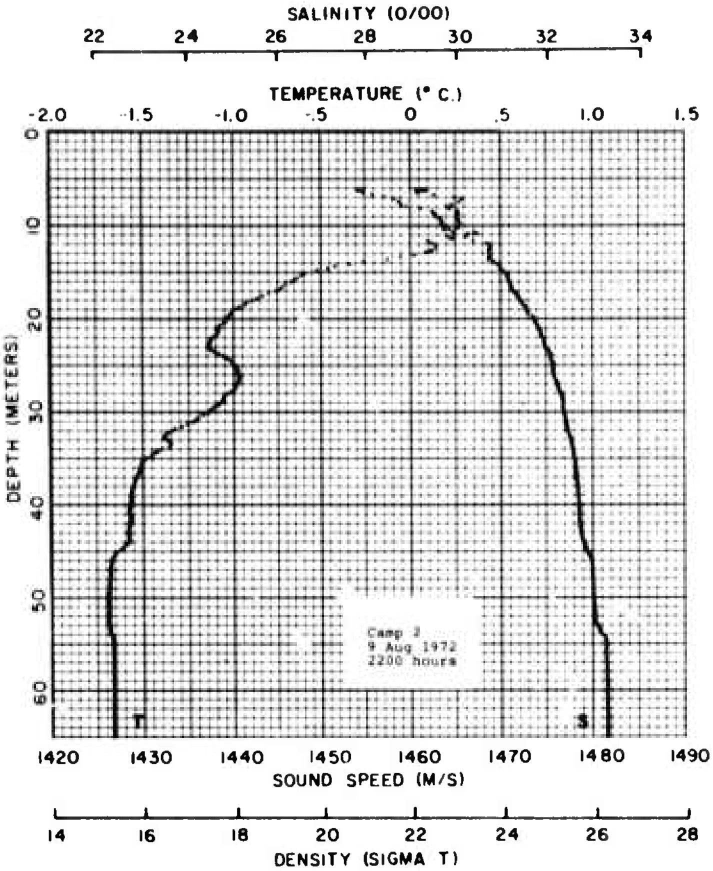

SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 2
9 Aug 1972
2050 hours
SOUND SPEED (M/S)
DENSITY (SIGMA T)

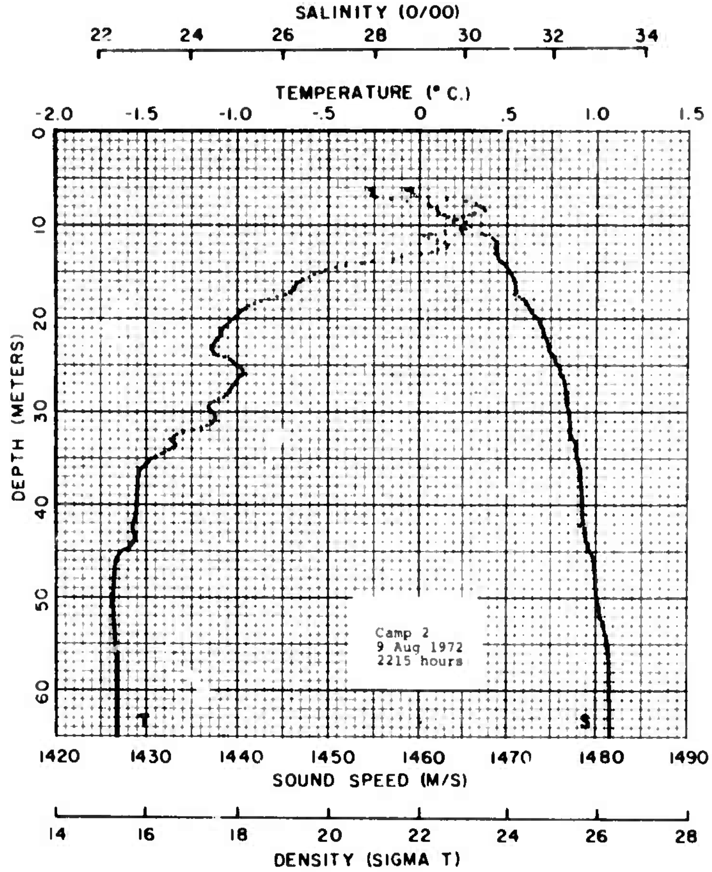

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2110 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2125 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2128 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2145 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2200 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
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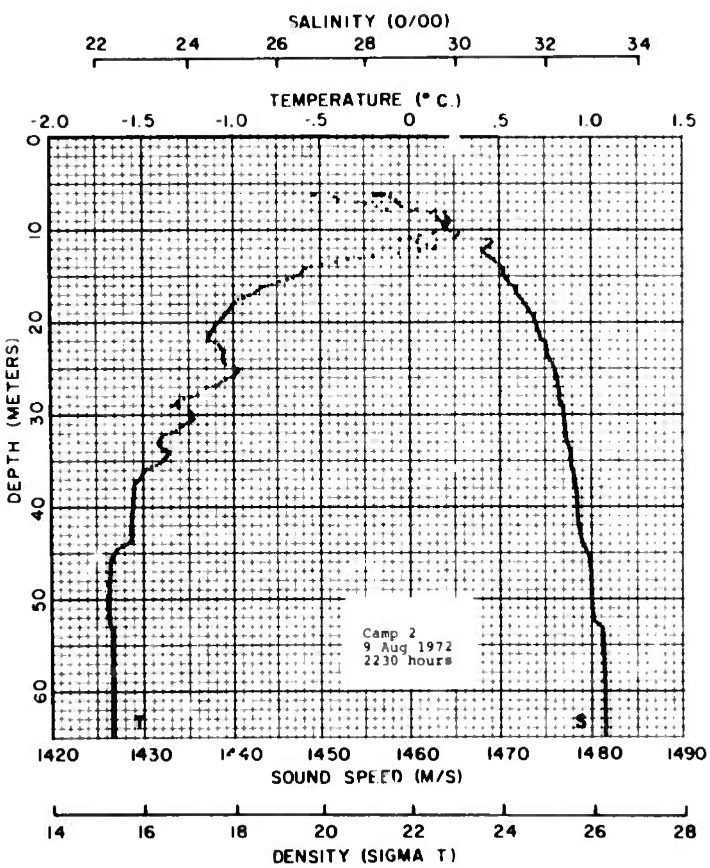
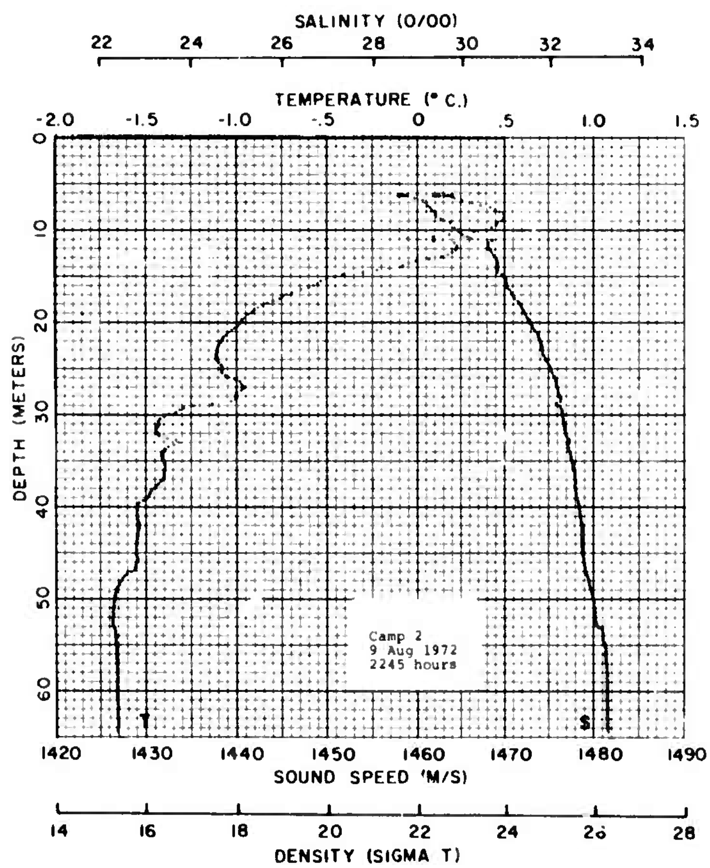
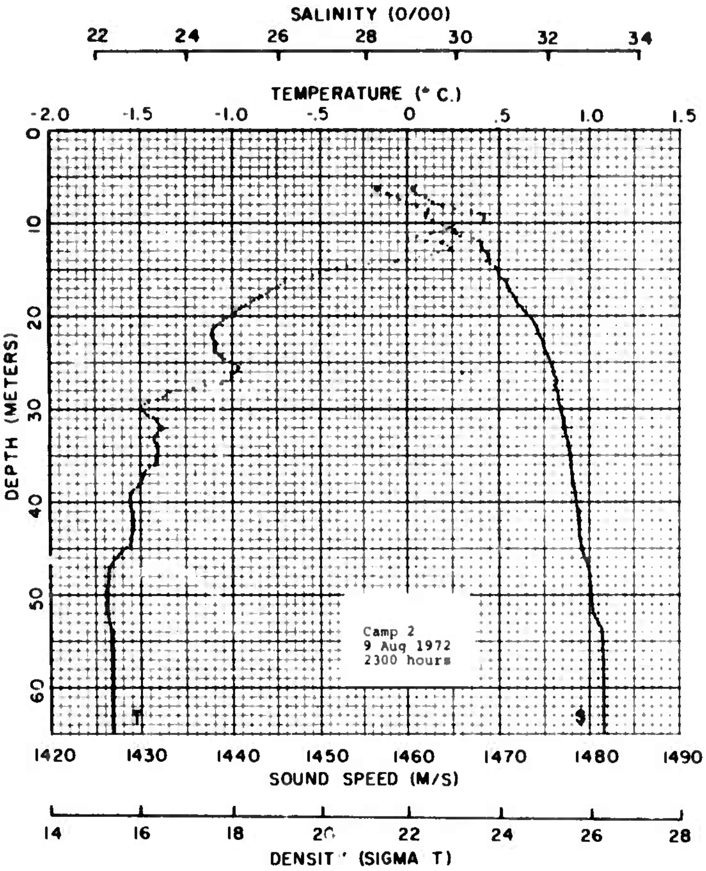
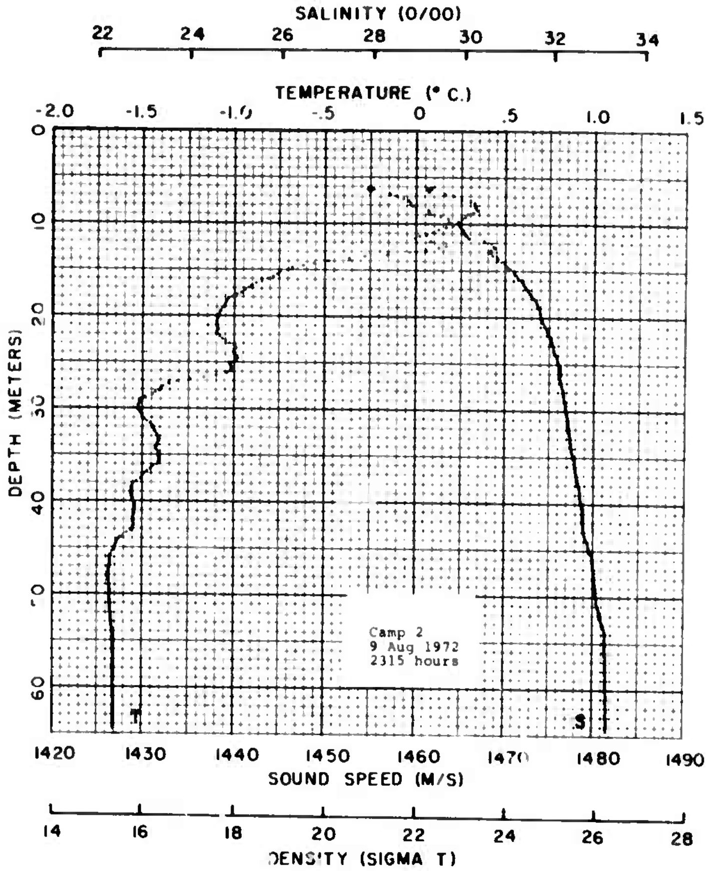
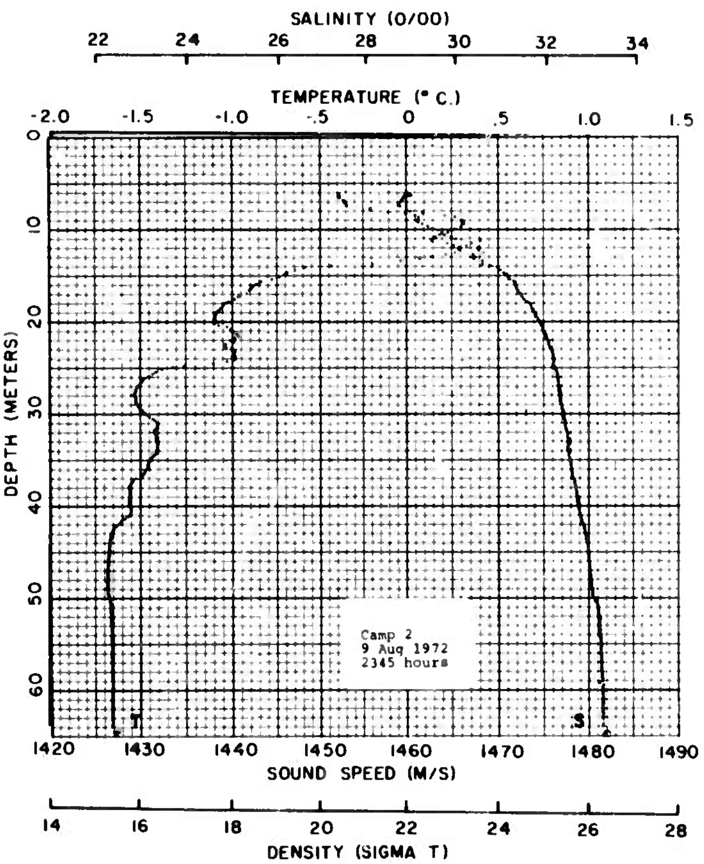
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2215 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

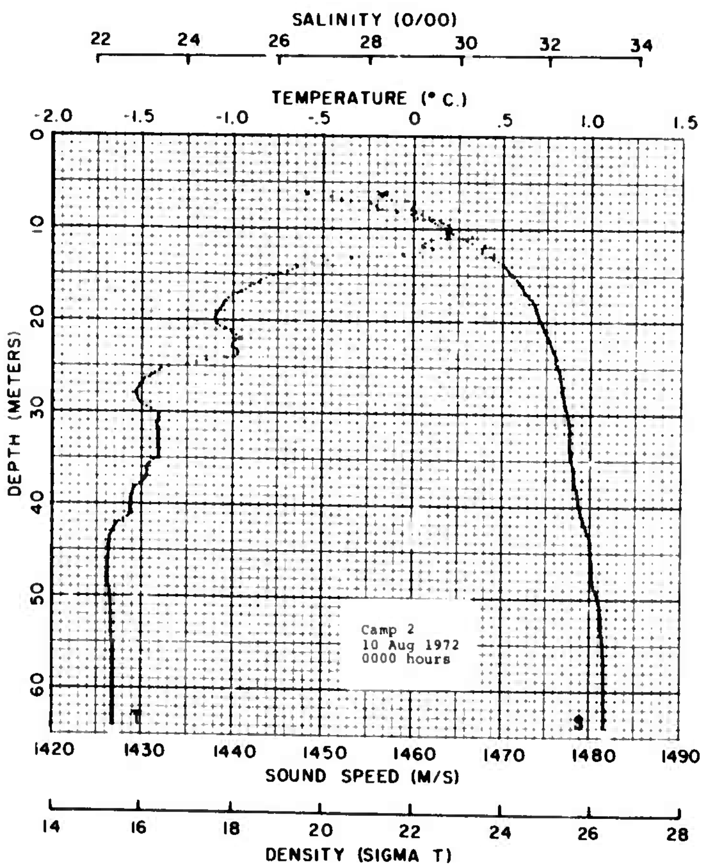

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2230 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

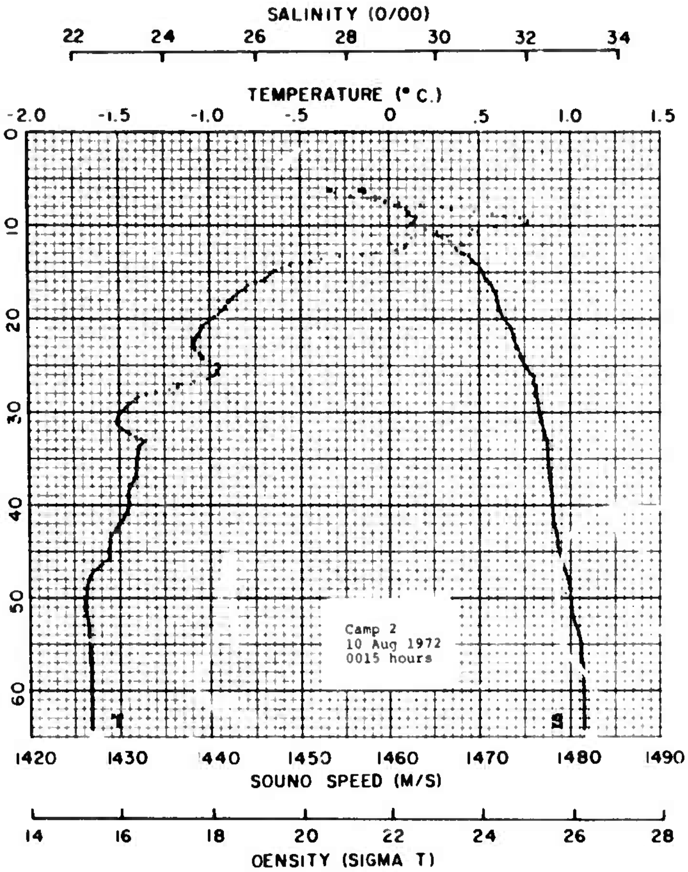

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2245 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

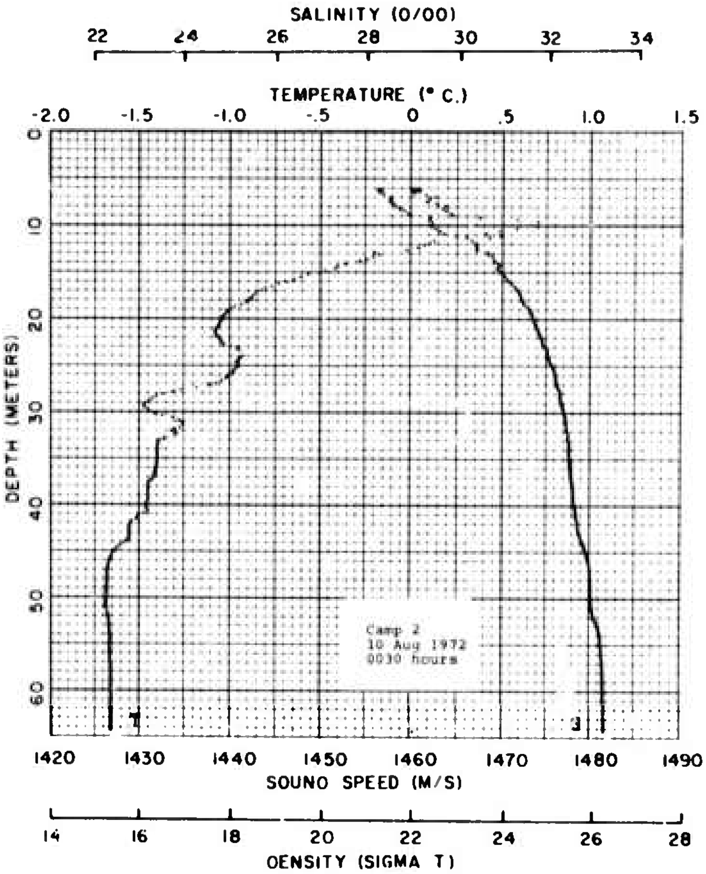

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2300 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

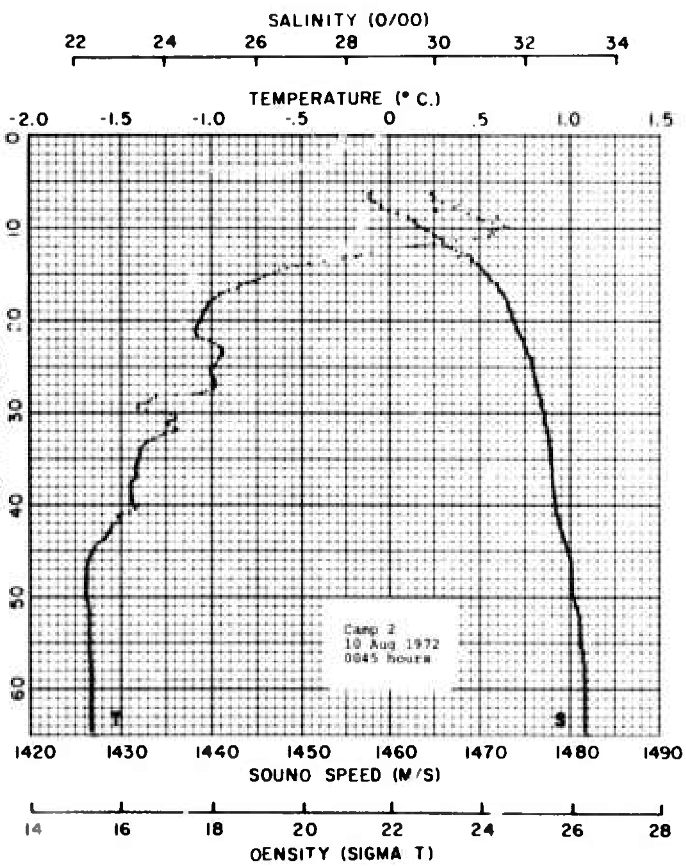

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2315 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

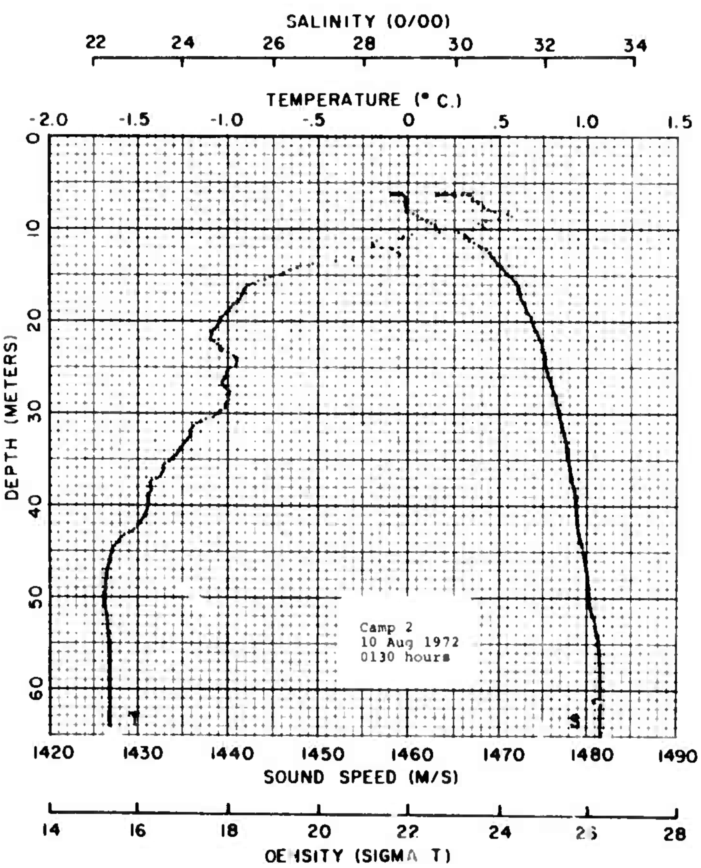

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
9 Aug 1972
2345 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

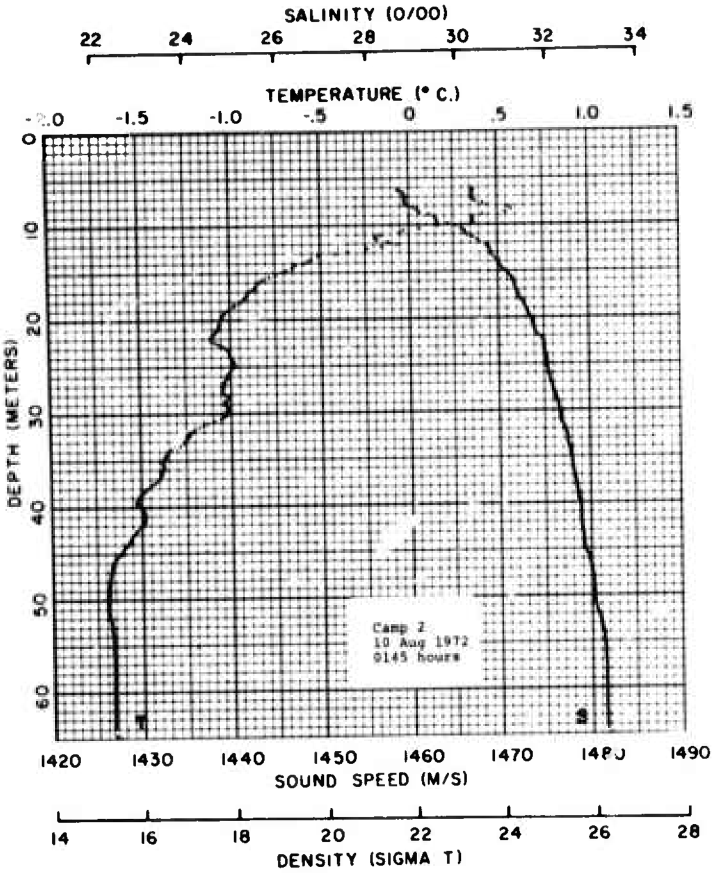

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
10 Aug 1972
0000 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 2
10 Aug 1972
0015 hours
SOUNO SPEED (M/S)
OENSITY (SIGMA T)


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 2
10 Aug 1972
0030 hours
SOUNO SPEED (M/S)
OENSITY (SIGMA T)


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 2
10 Aug 1972
0045 hours
SOUNO SPEED (M/S)
OENSITY (SIGMA T)


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 2
10 Aug 1972
0130 hours
SOUND SPEED (M/S)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 2
10 Aug 1972
0145 hours
T
S
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

APPENDIX C

TEMPERATURE AND SOUND INTENSITY PROFILES AT CAMP 1
(at constant range)

An acoustic transducer, a depth probe and a temperature probe were combined and lowered over the edge of the floe to obtain temperature profiles and profiles of the acoustic signal received from a source at another location on the floe.

The times of the routine measurements taken at a range of 219 or 239 yards from a transmitter at a depth of 33 m are listed below.

Date	Time											
4 Aug							0700*	0800	0900*	1000*	1100	1200
	1300	1400	1500*	1600*	1700	1800	1900	2000	2100	2200*	2300*	2400
5 Aug	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
	1300*	1400	1500*	1600*	1700*	1800	1900	2000	2130	2200	2300	2401
6 Aug	0100	0200	0300	0410	0500	0600	0700	0800*	0900*	1000*	1100	1200
	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
7 Aug	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
	1300*	1400	1500	1600	1700	1800	1900	2000	2100	2200	2310	2400
8 Aug	0100	0200	0300	0400	0500	0600	0700	0800	See 15 min series			
				1600	1700	1800	1900	2000	2100	2200	2300	2400
9 Aug	0100					0600	0700	0800	See 15 min series			
				1600	1700	1800	1900*					

Another series at range 179 yd and source depth 30 m was taken during the latter part of the floe occupancy.

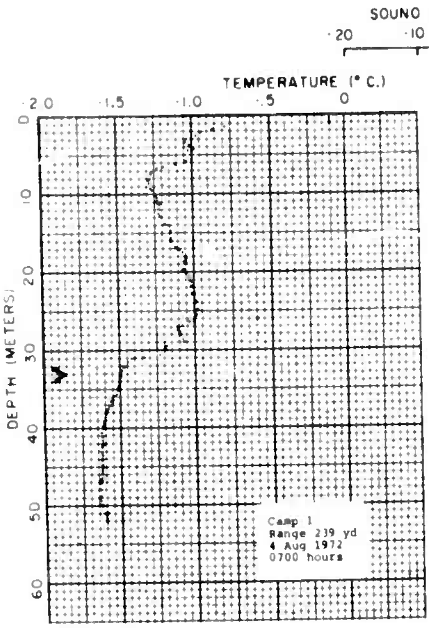
Date	Time								
10 Aug	1435†	1500	1530	1600	1737†	1805†	1830†	1935†	2000†
	2030†	2100†	2200†	2300†	2400†				
11 Aug	0100†	0200*	0300*	0400*	0500*	0600*	0700*	0800*	0900†	1000†

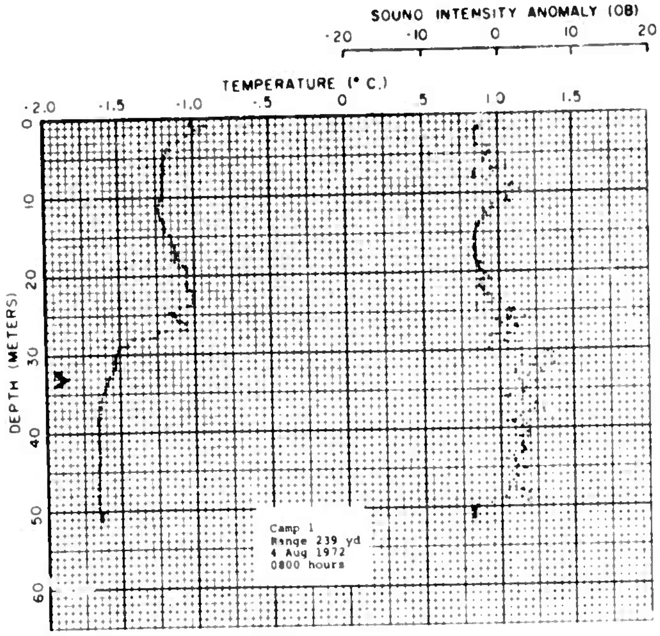
*The intensity recording system failed. Only the temperature profile is shown.

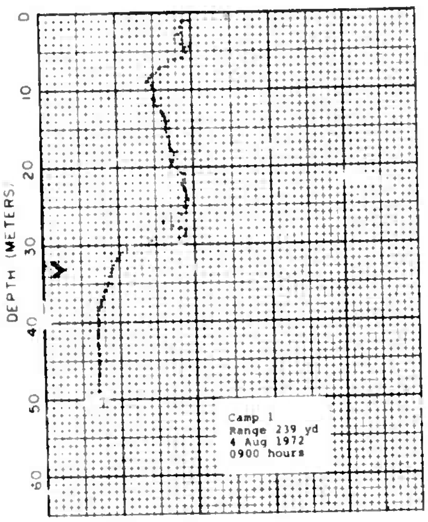
†Measurements were made as the transducer was lowered and when it was raised. Both plots are included.

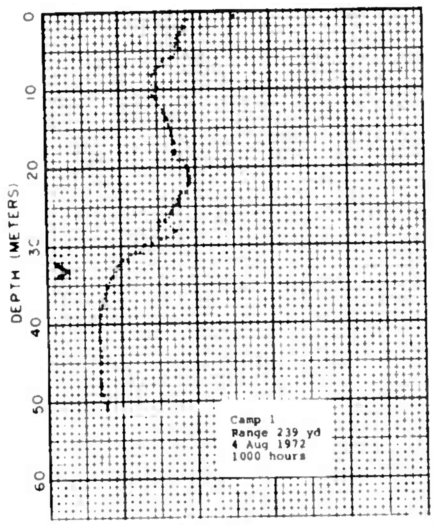
A few series of temperature profiles were taken at Camp 1.

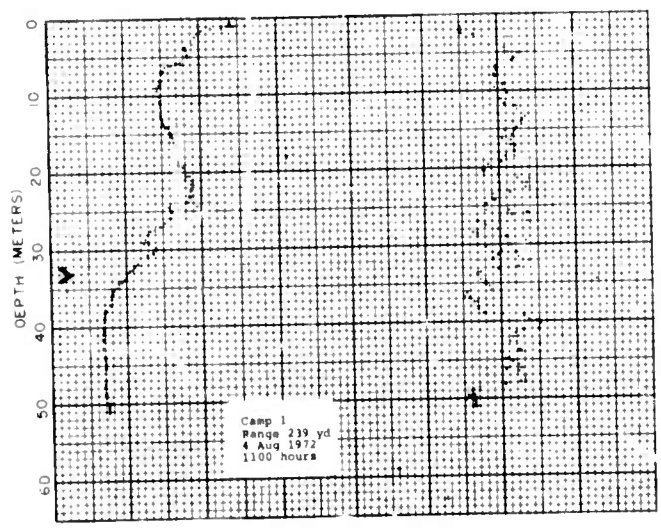
Date	Time
2 Aug	1010-1350
2-3 Aug	1430-1105
3 Aug	1400-1845
3-4 Aug	2100-0600

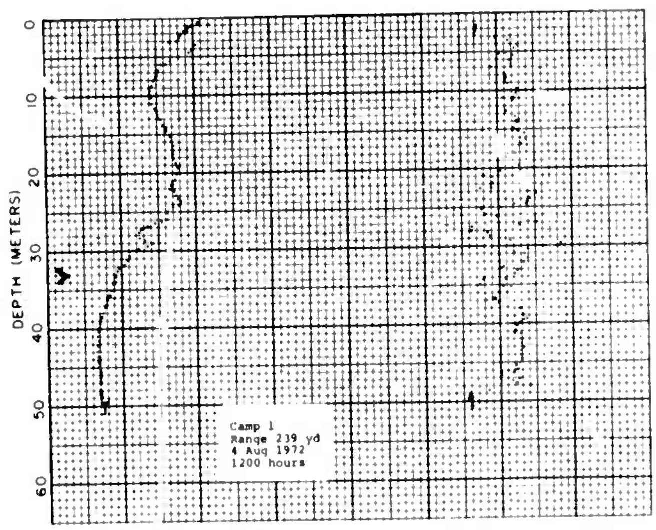












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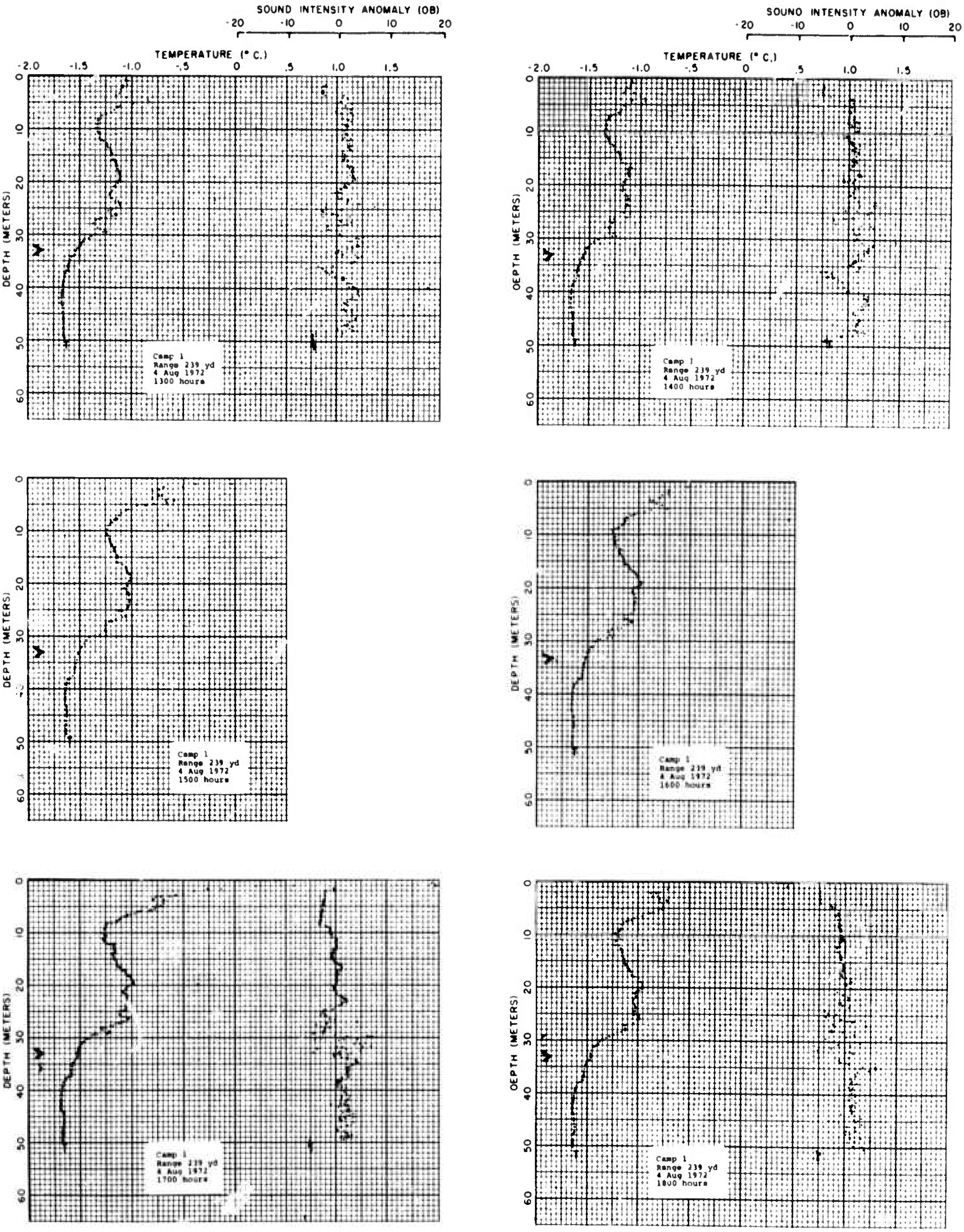

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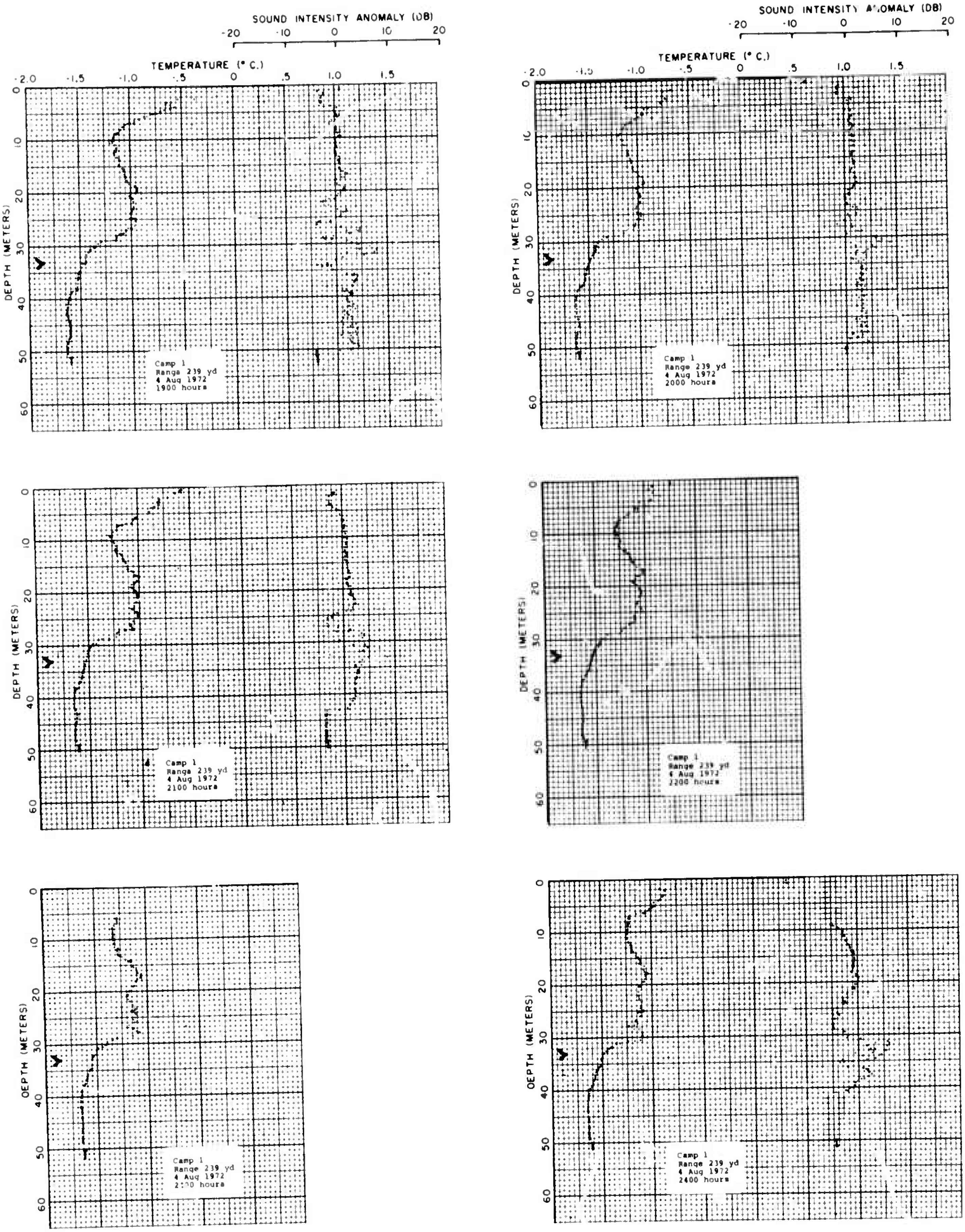

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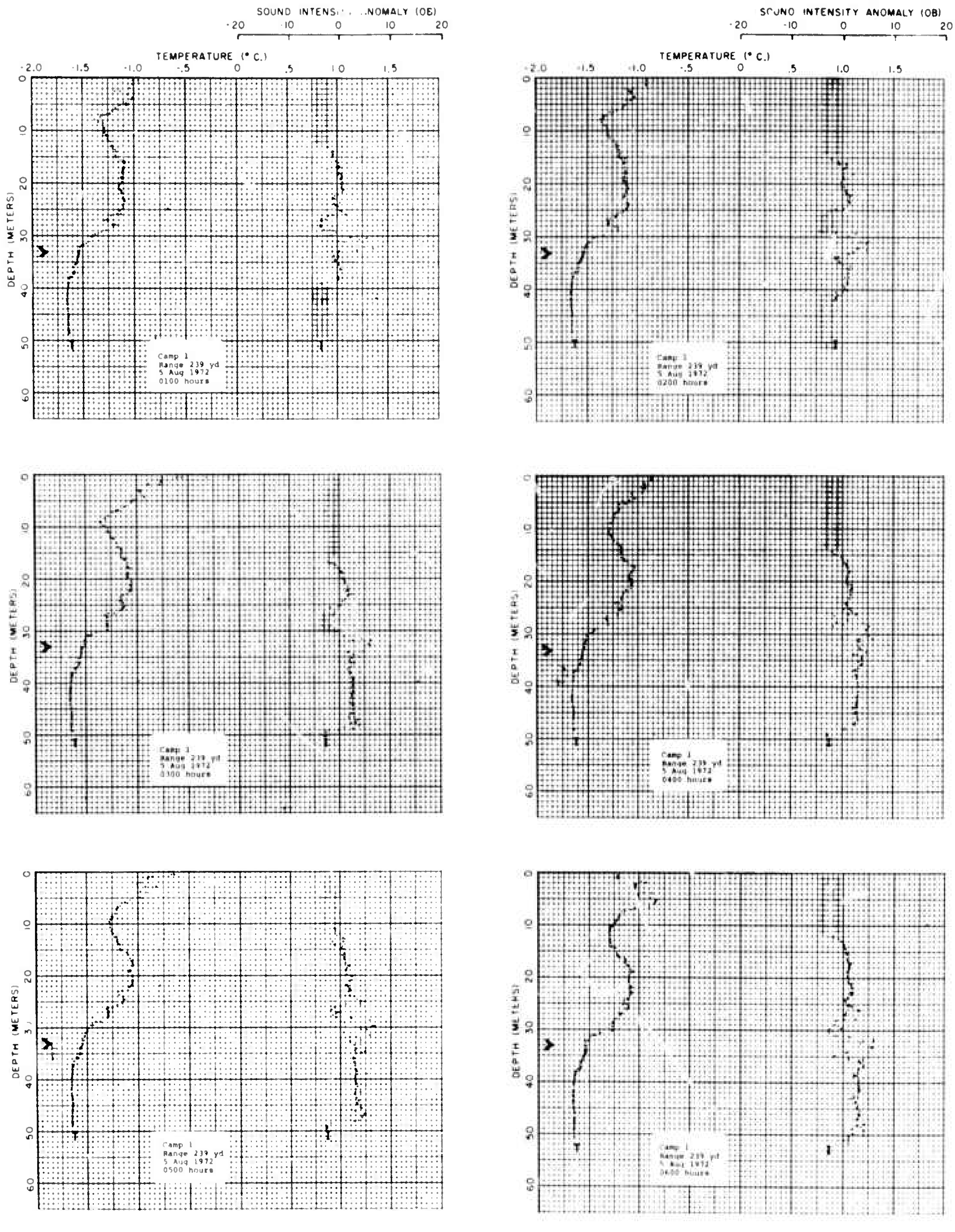

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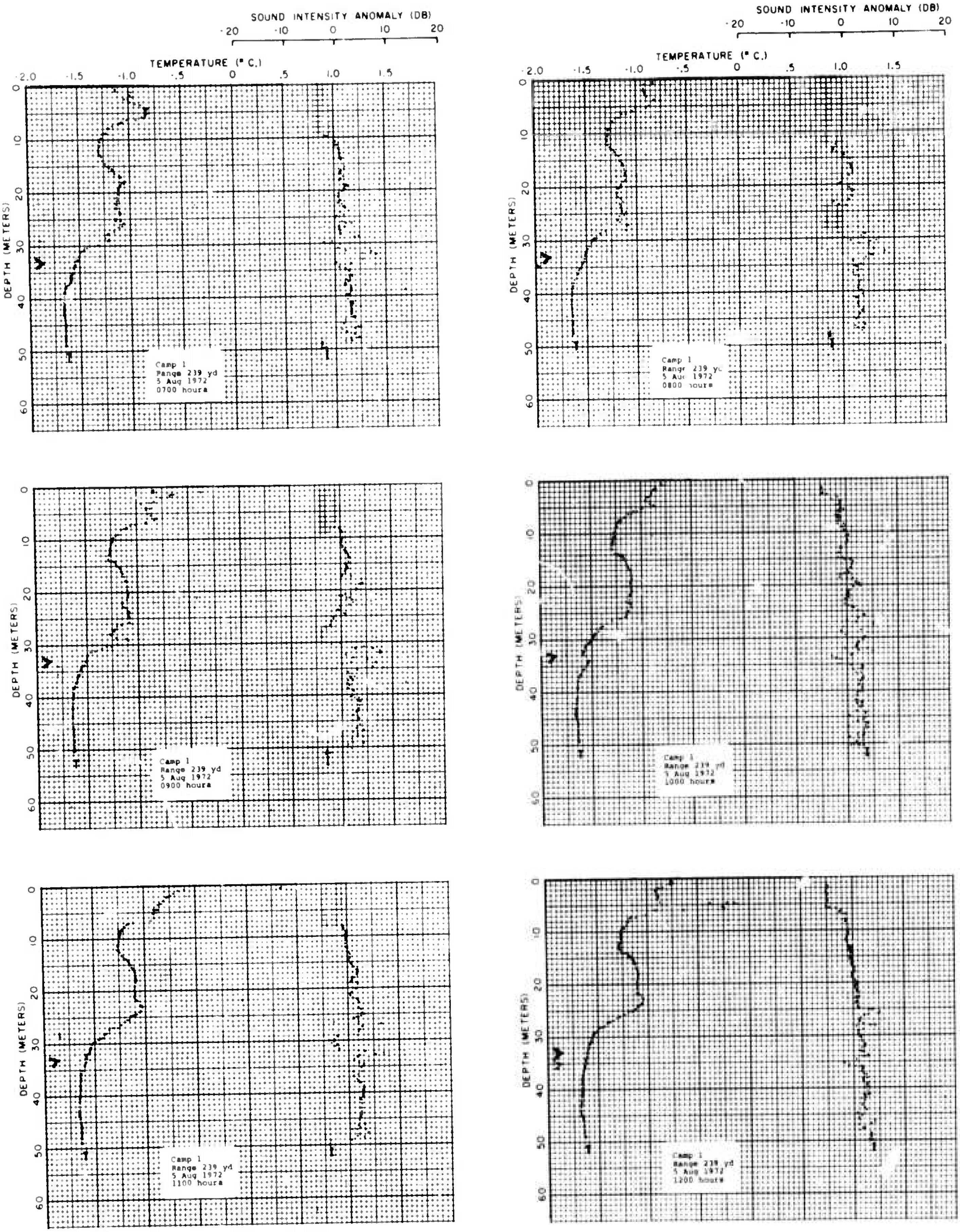

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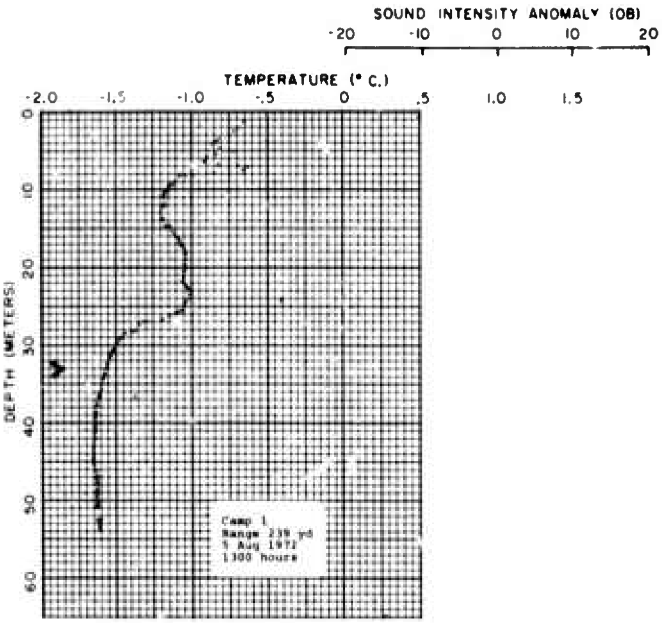

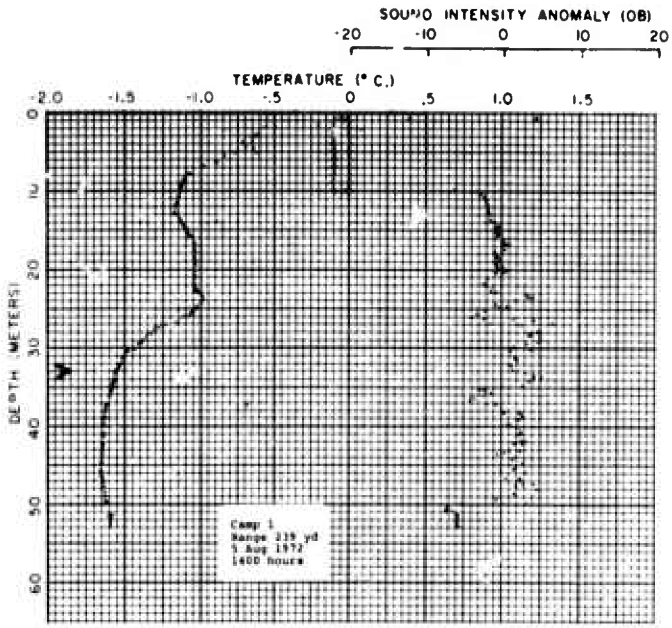

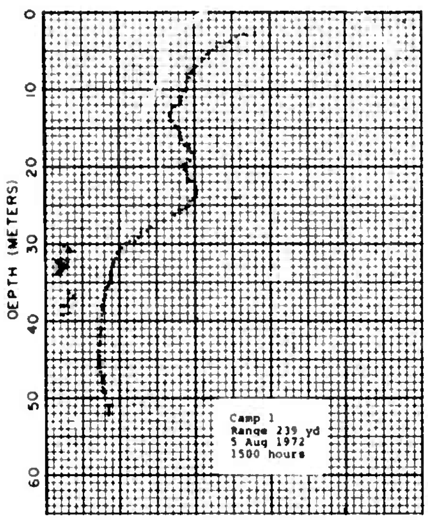

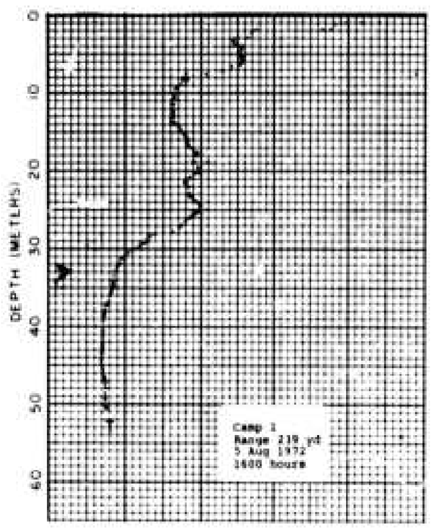

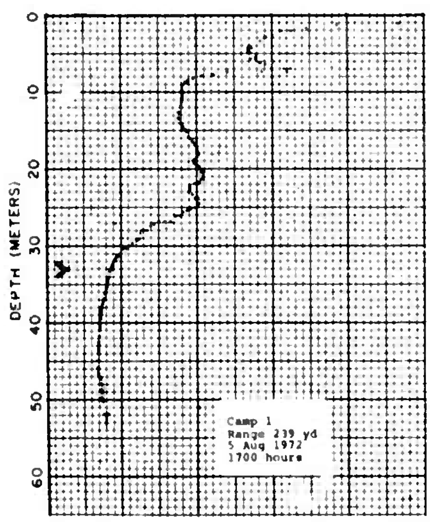

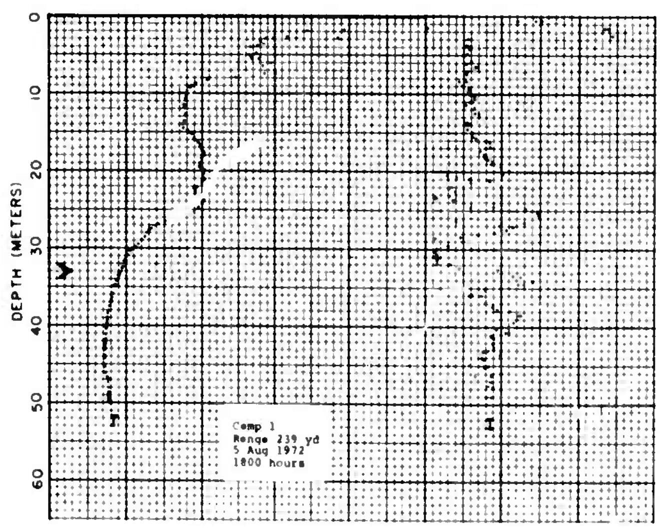

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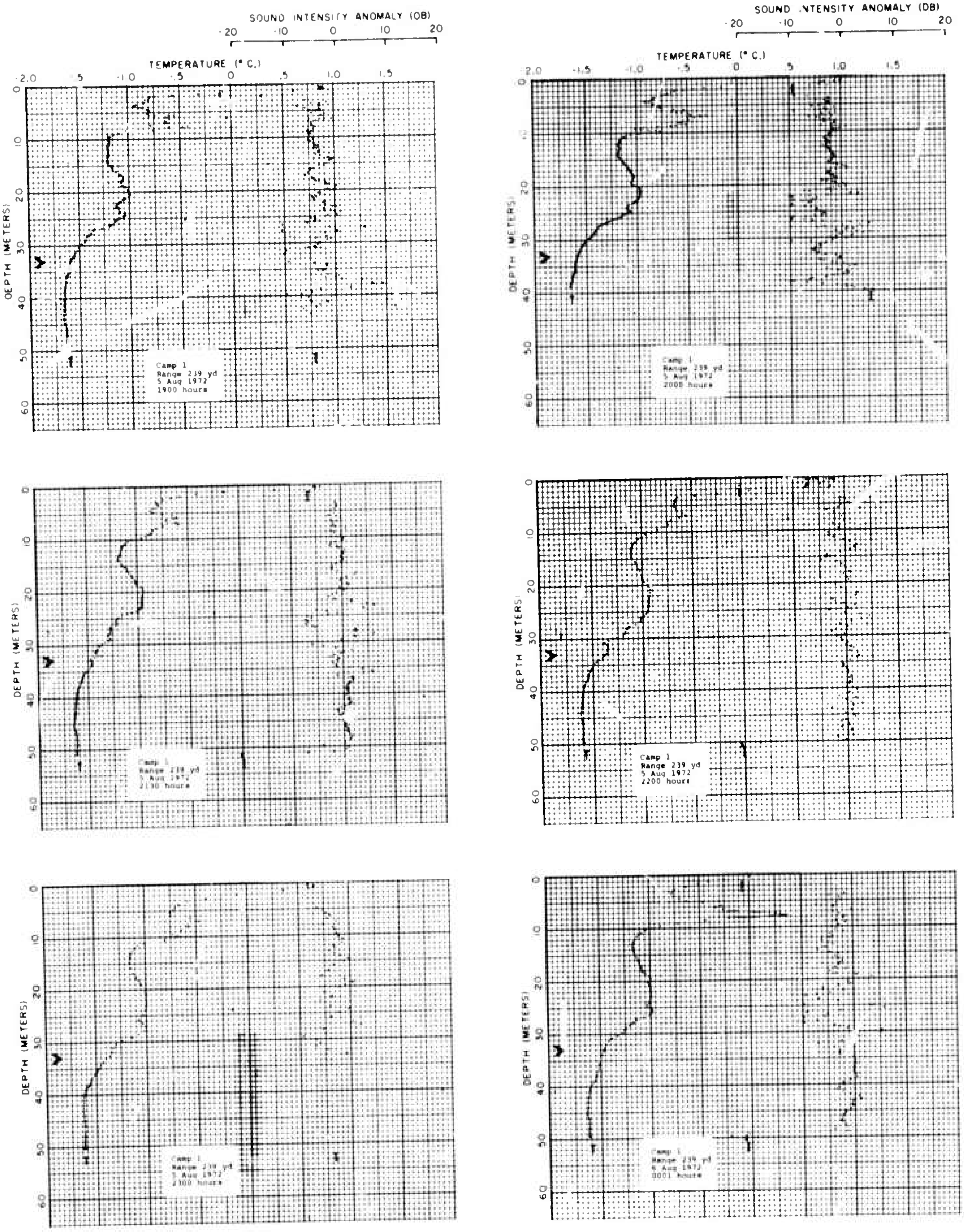

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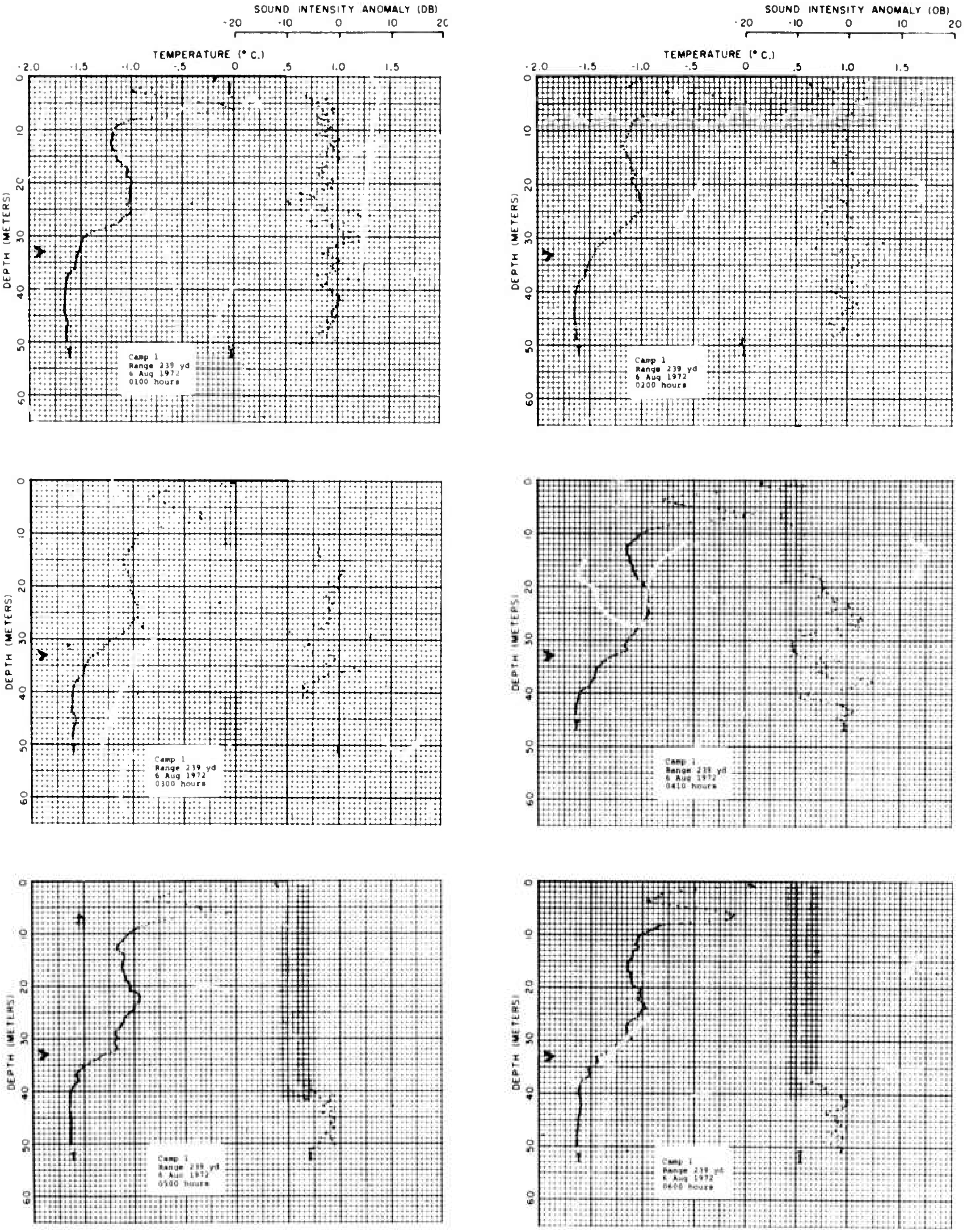

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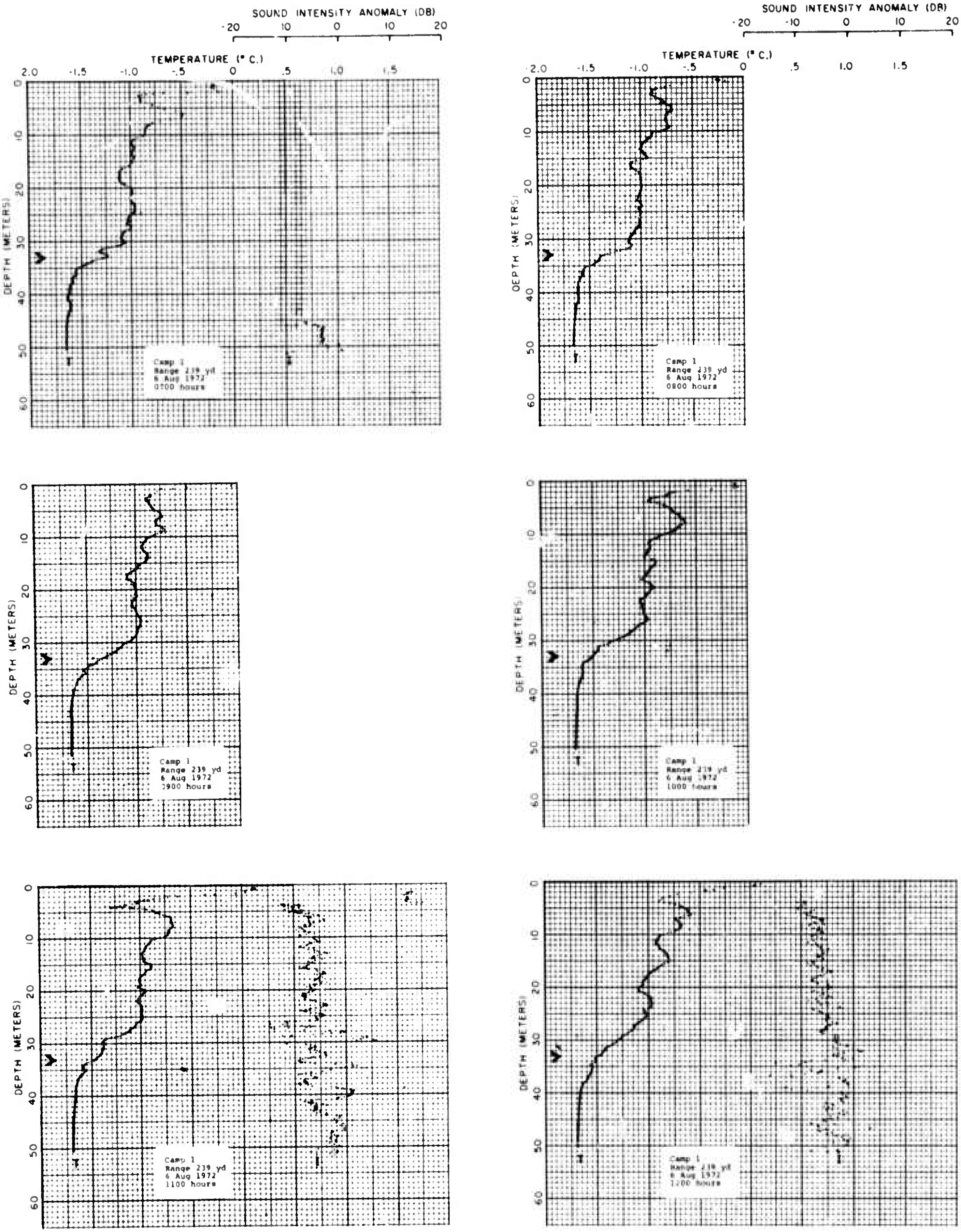

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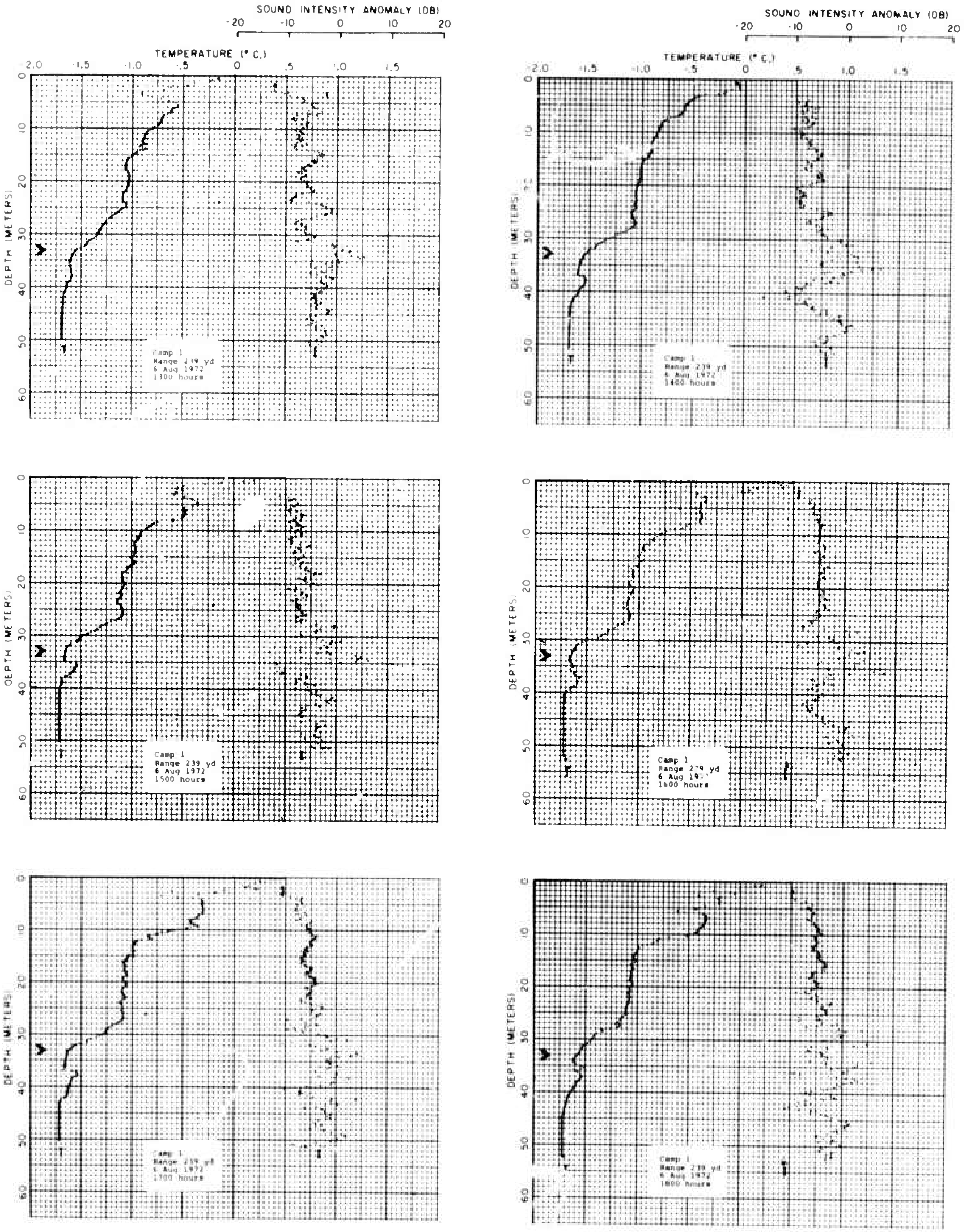

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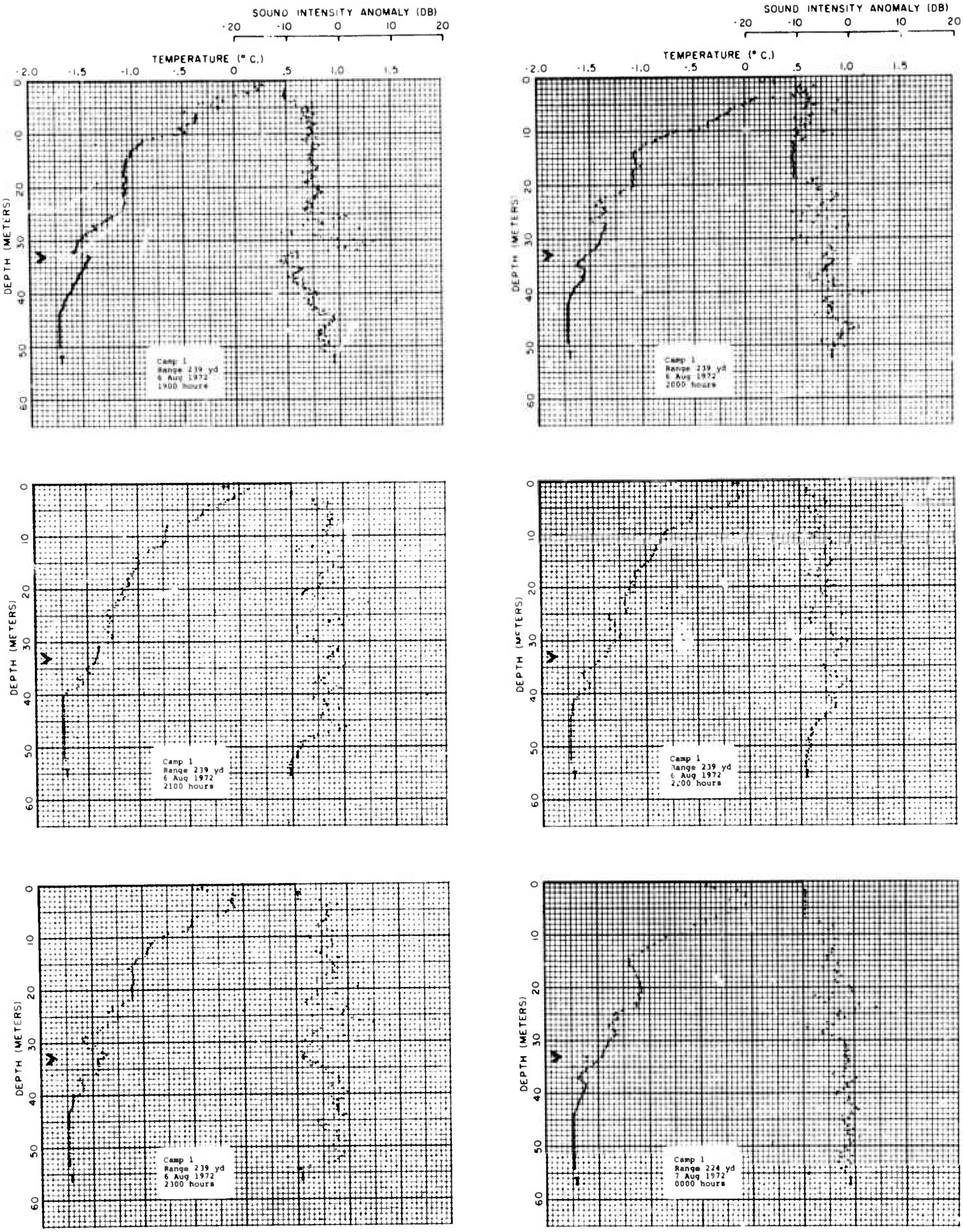

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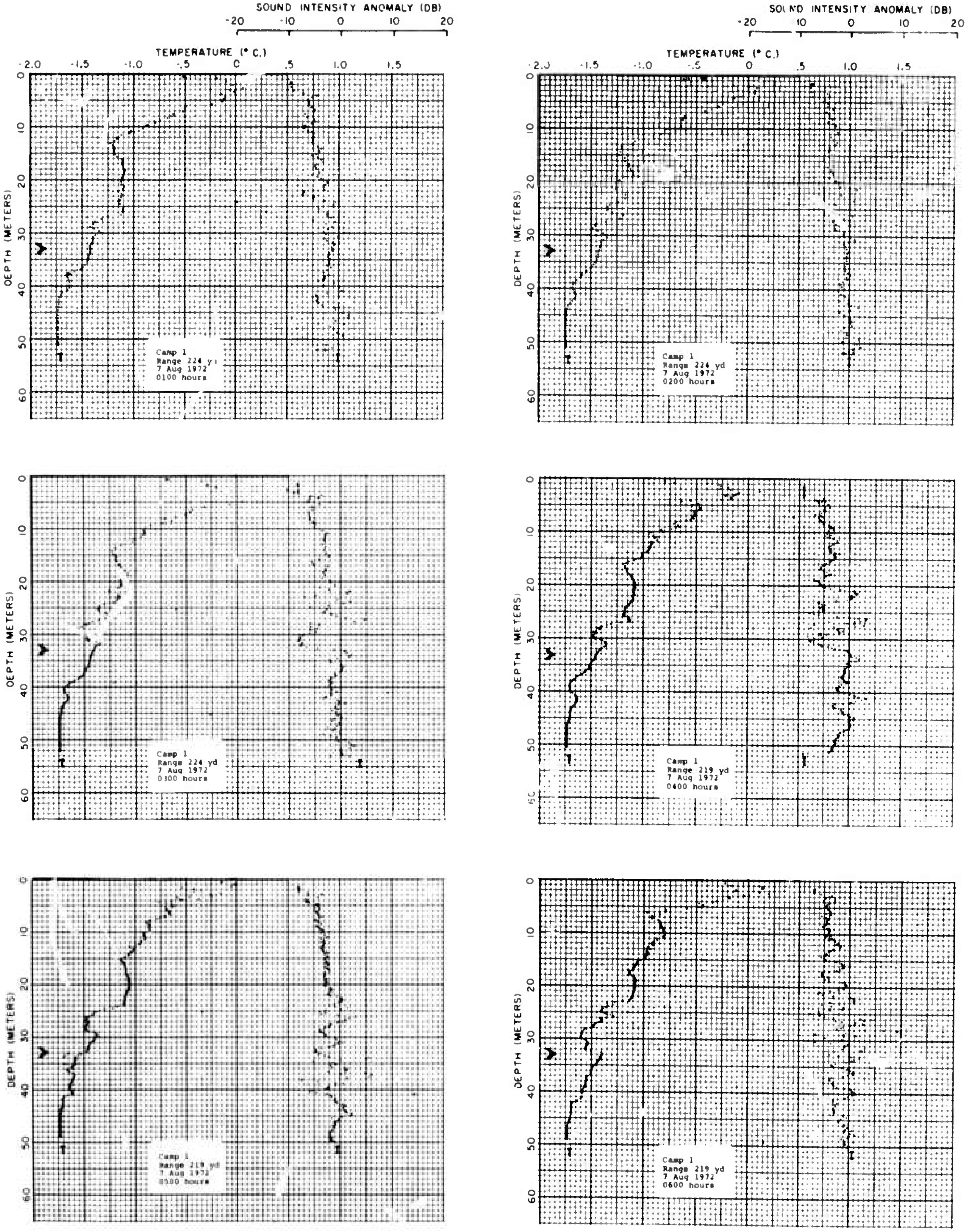

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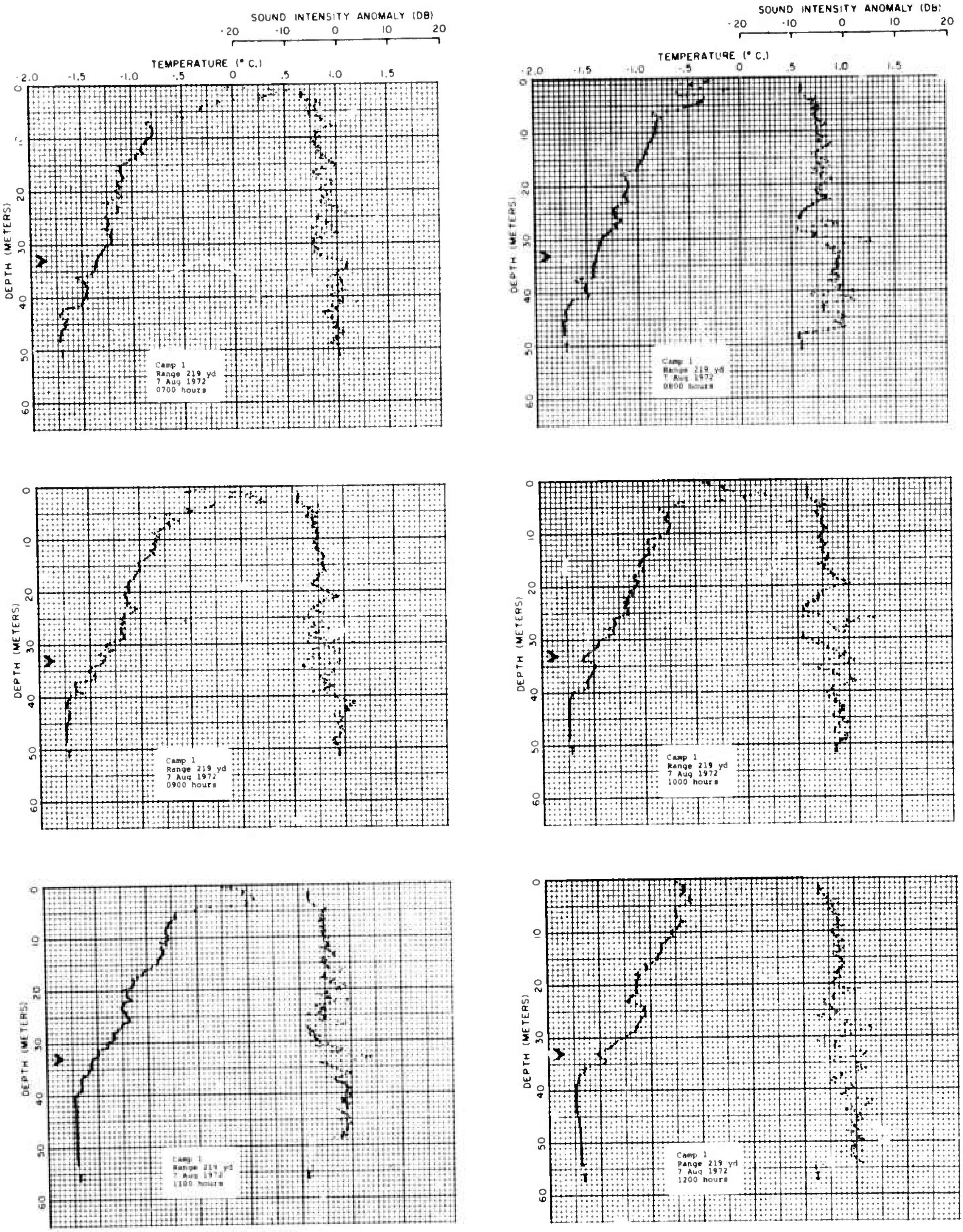

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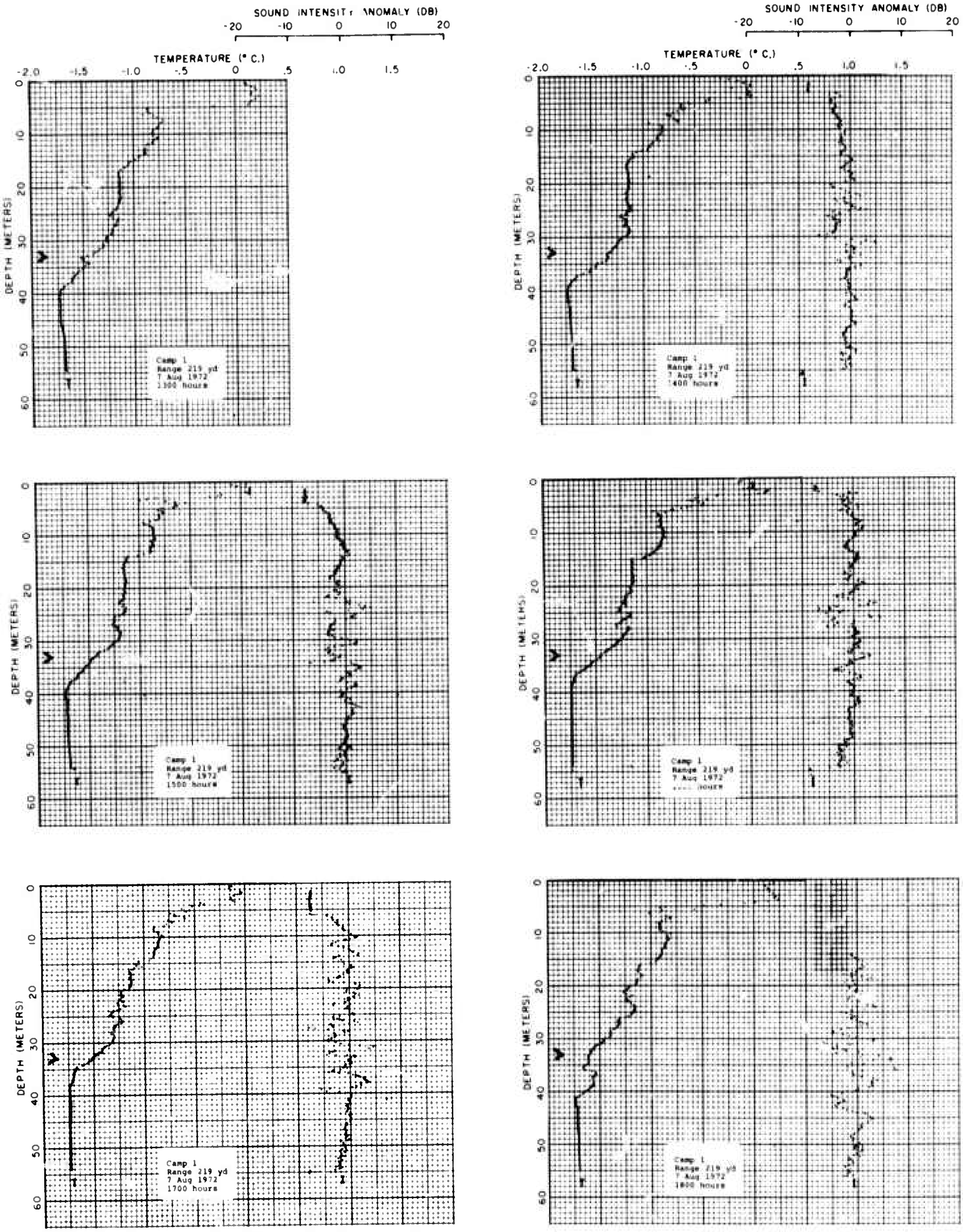

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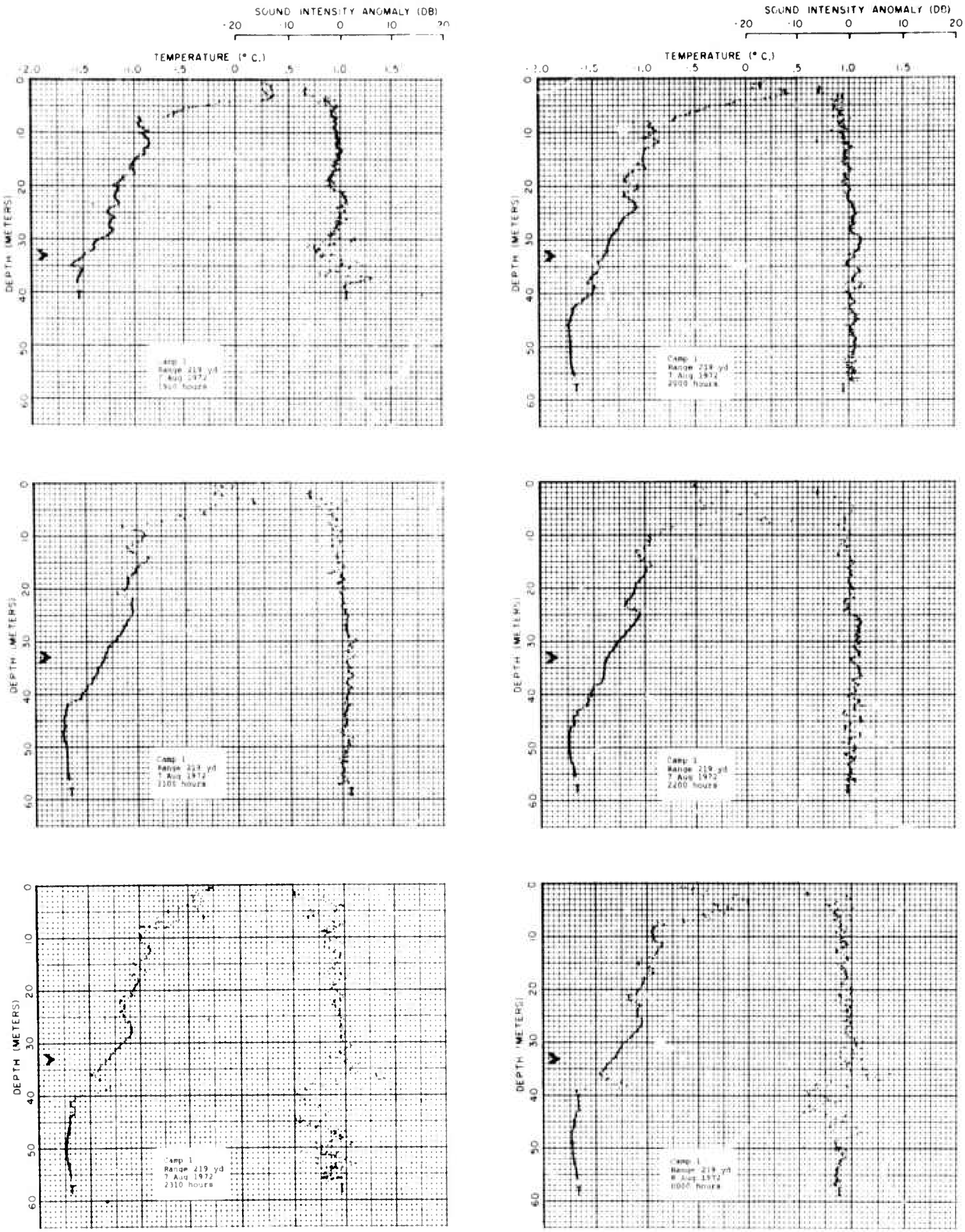

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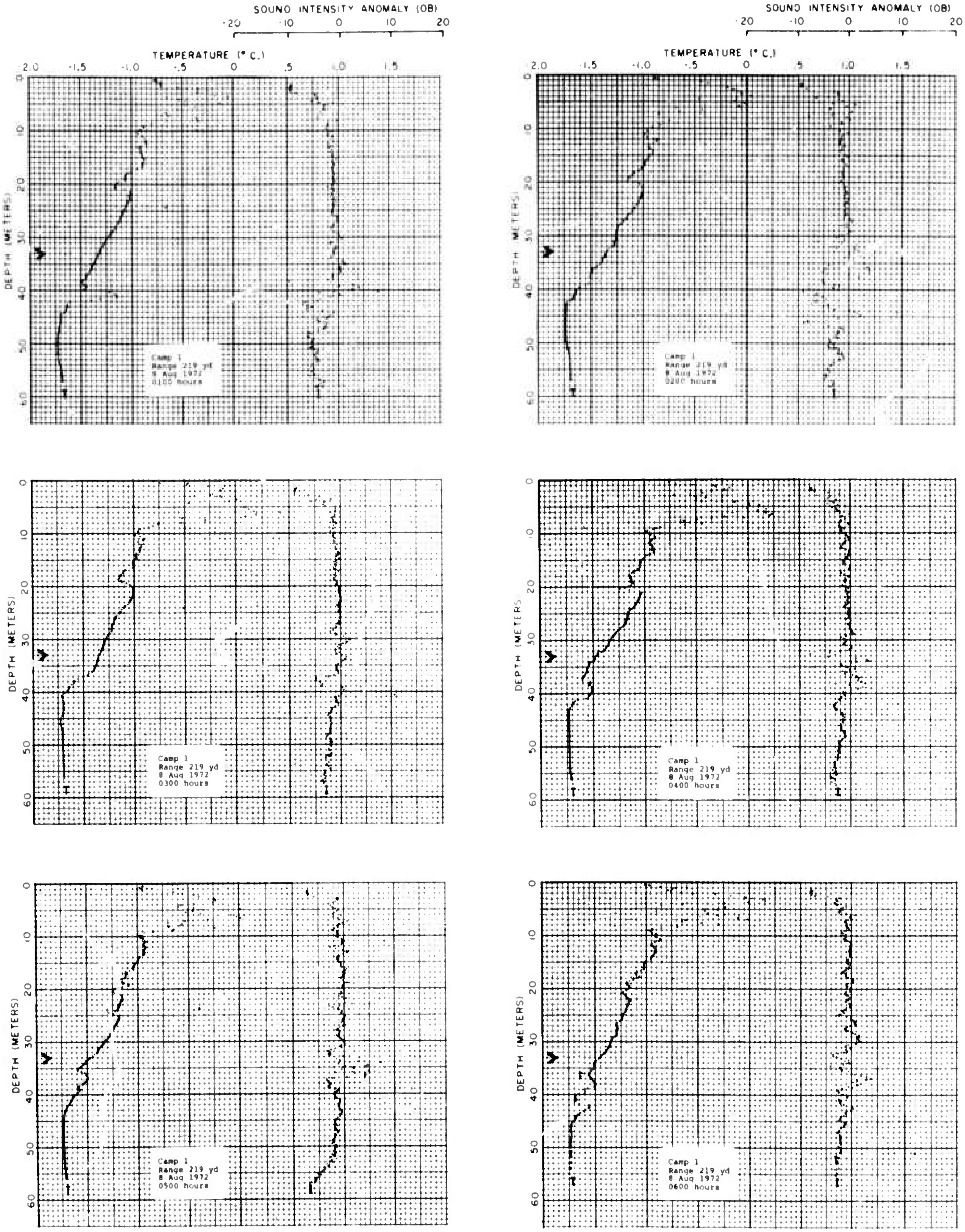

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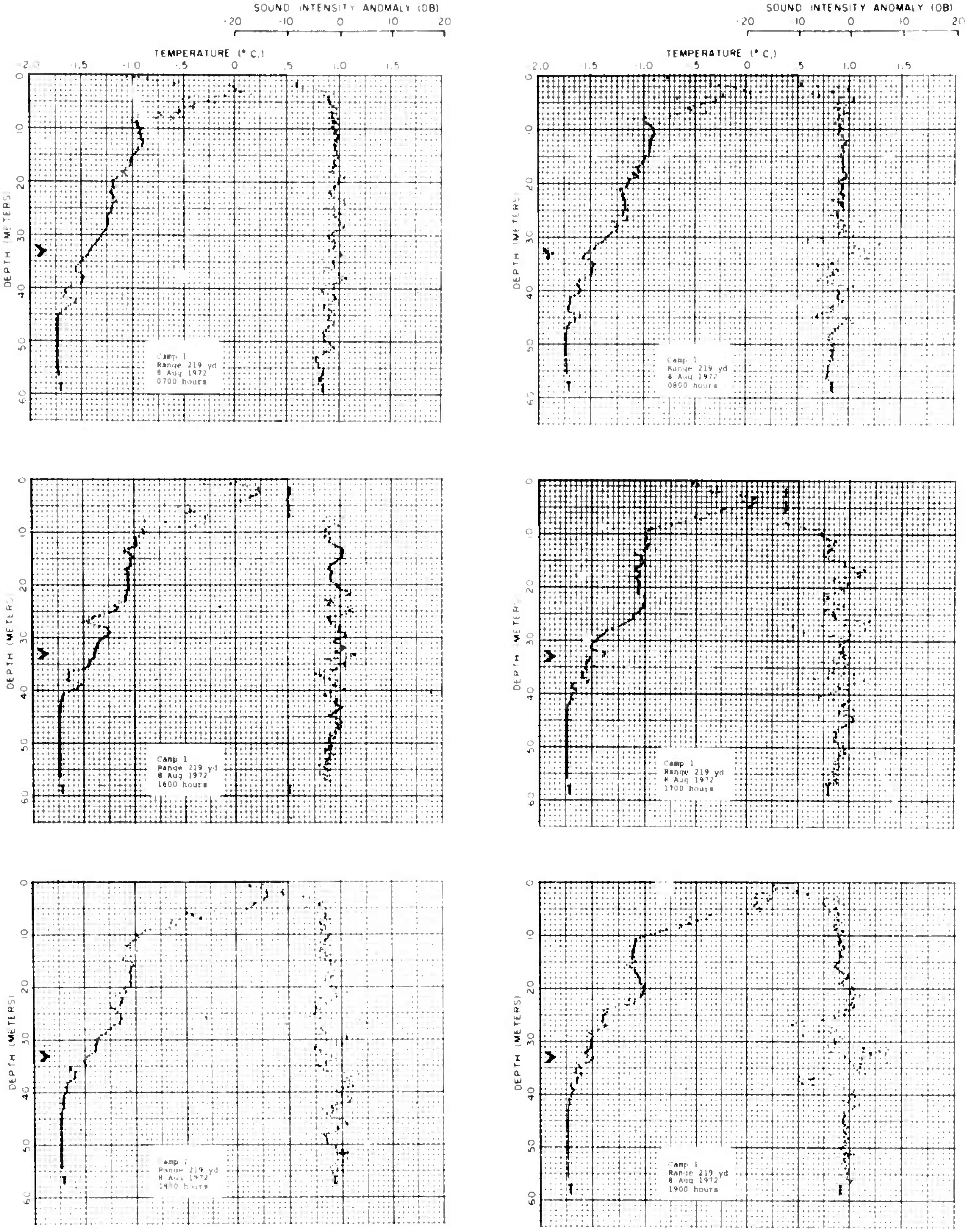

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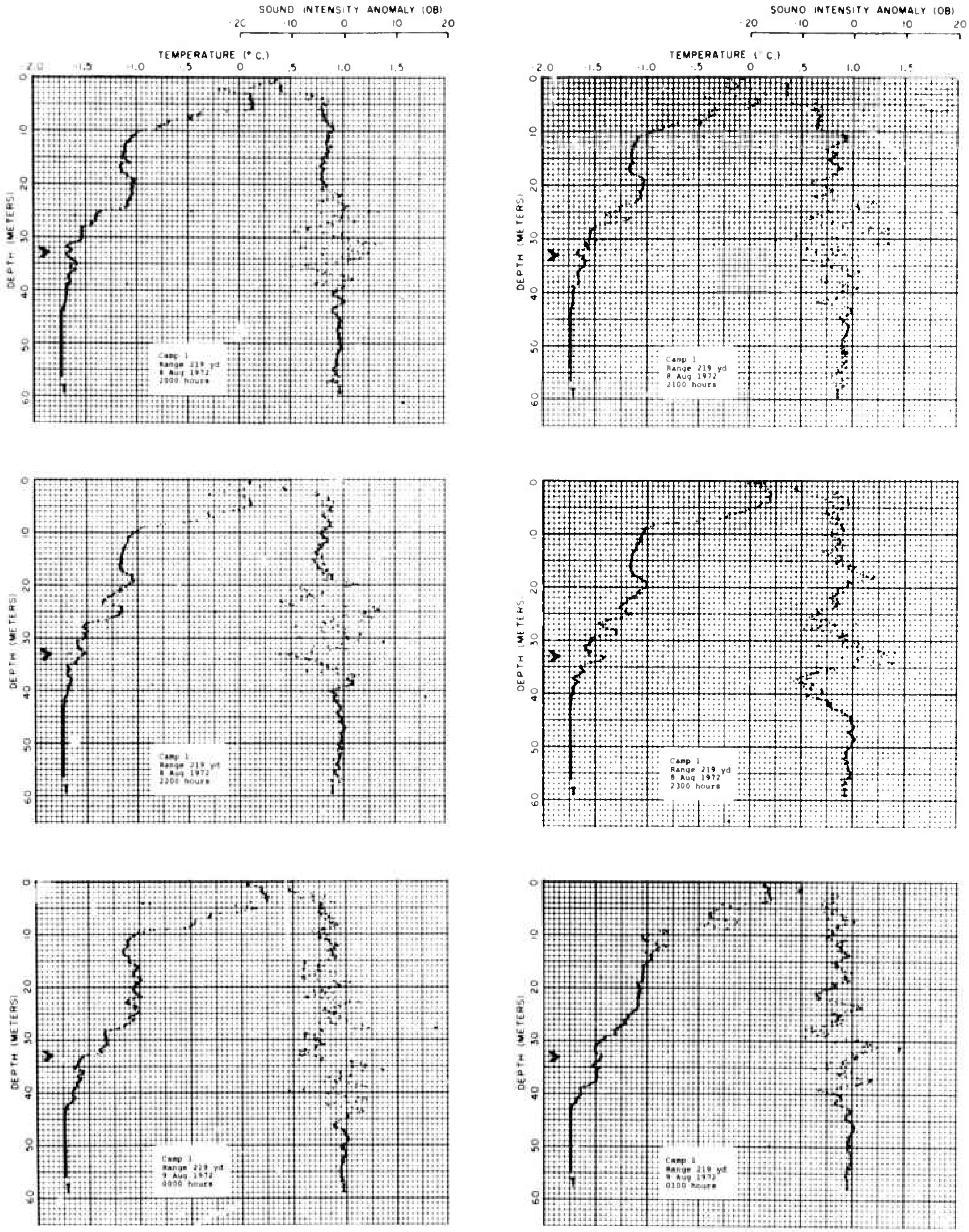

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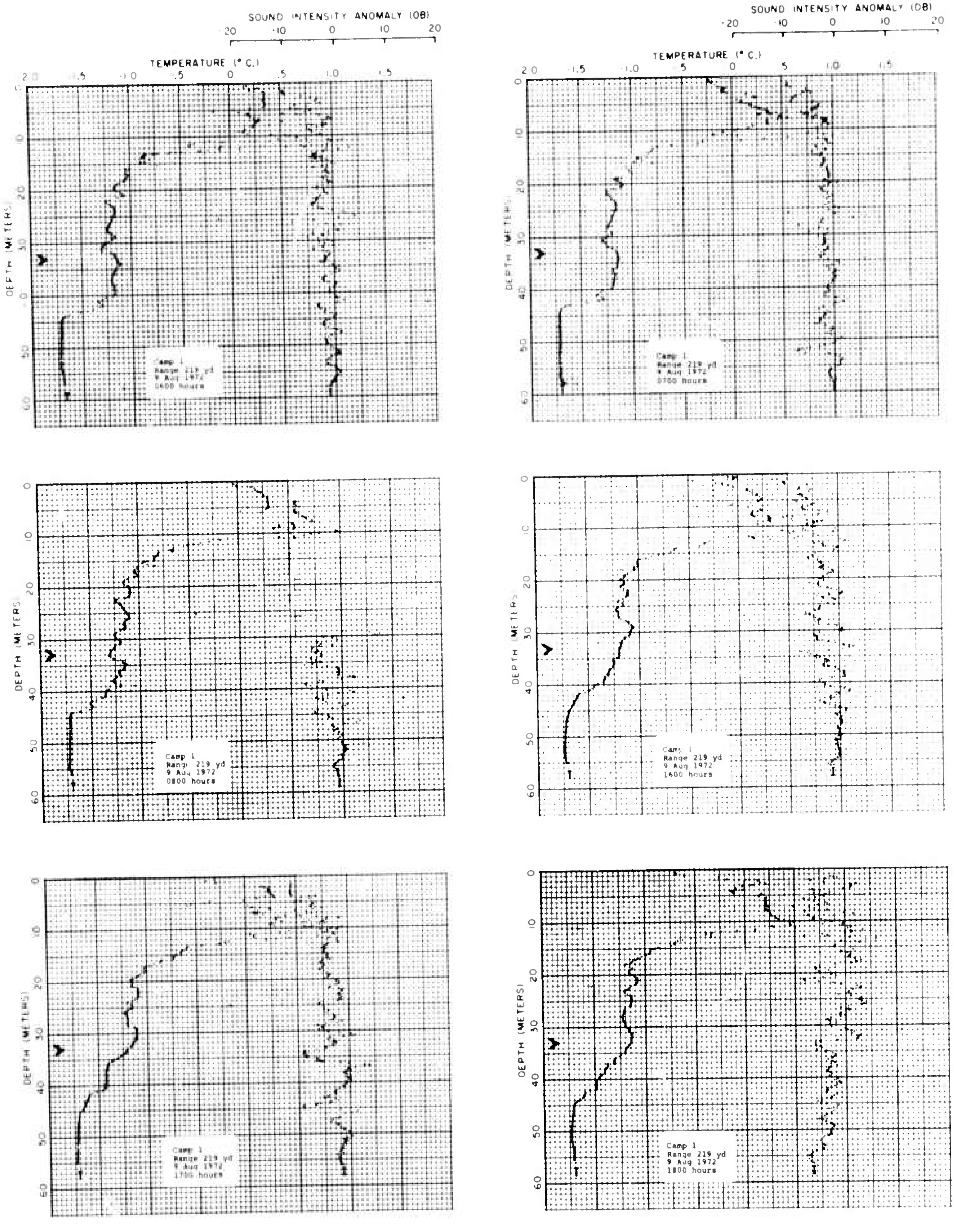

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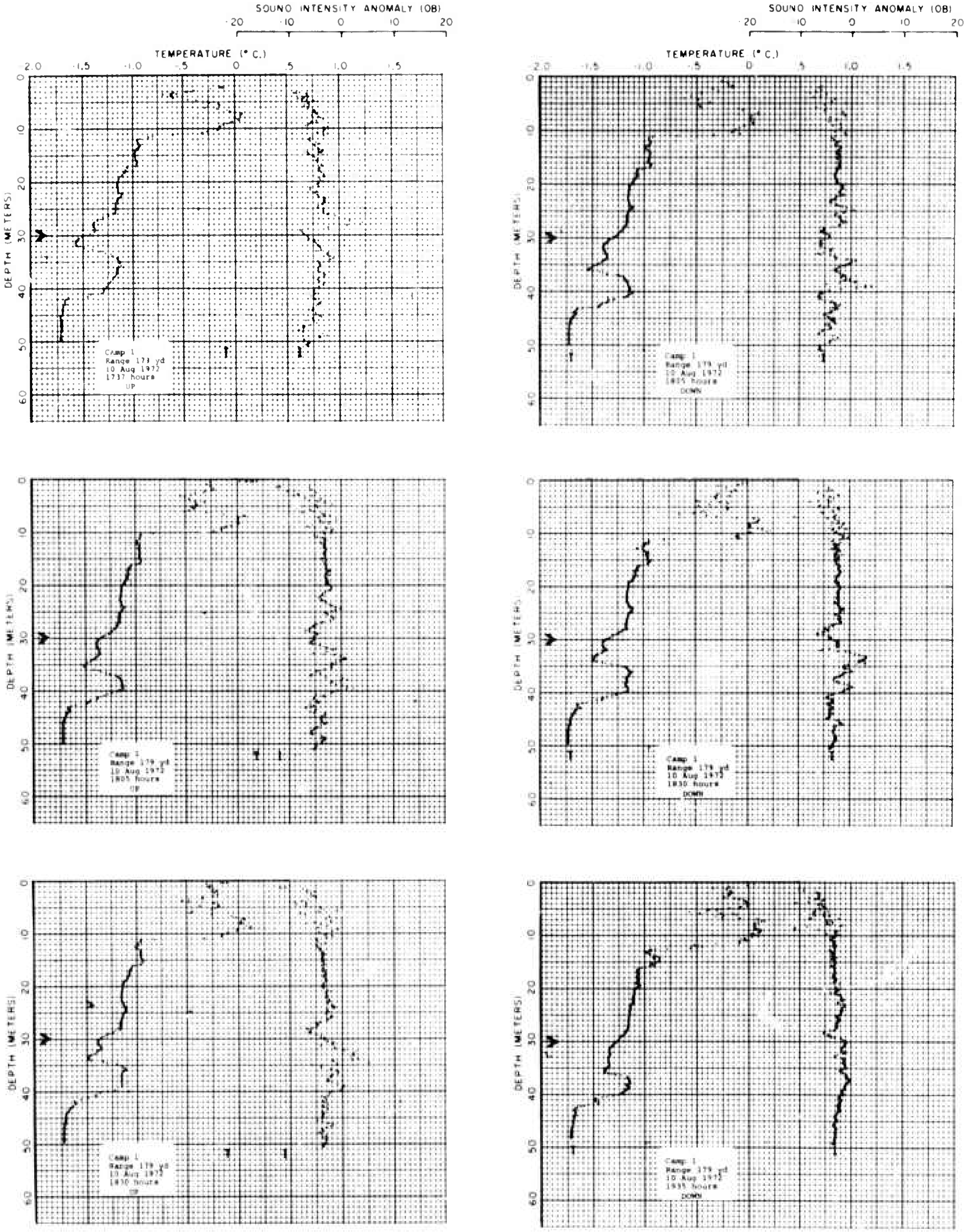

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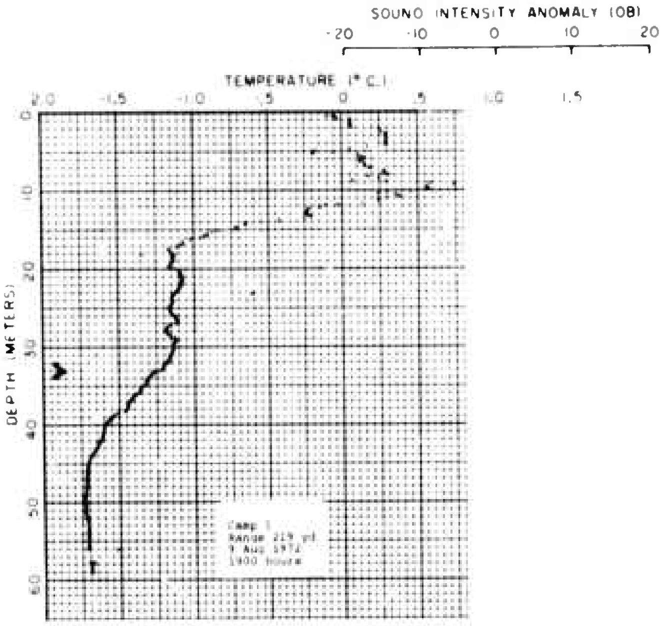

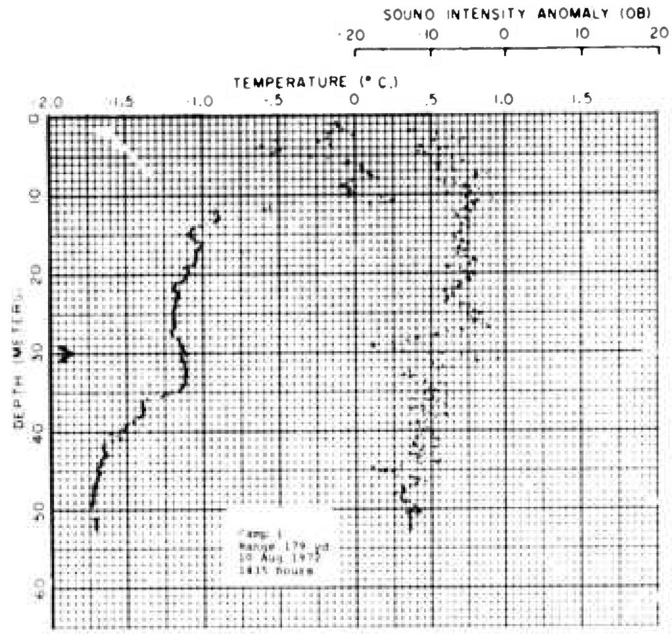

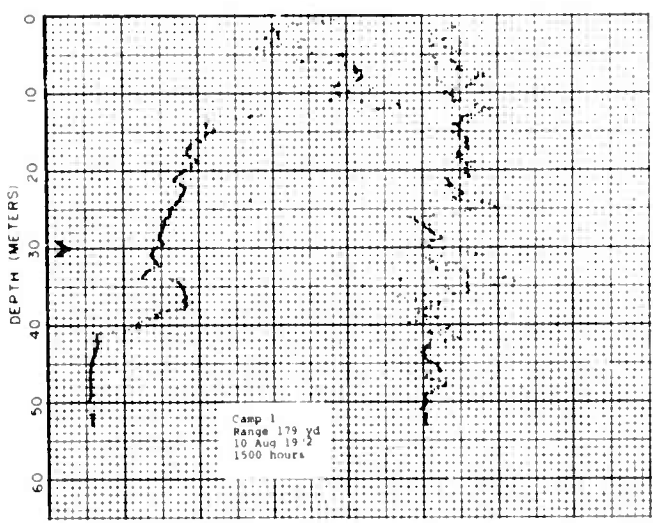

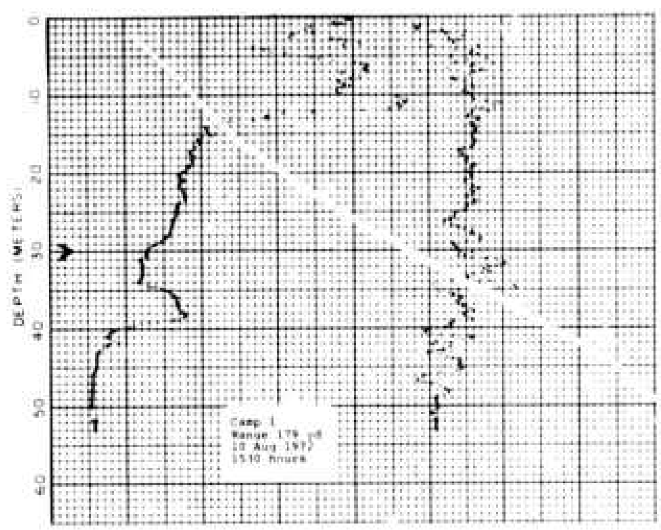

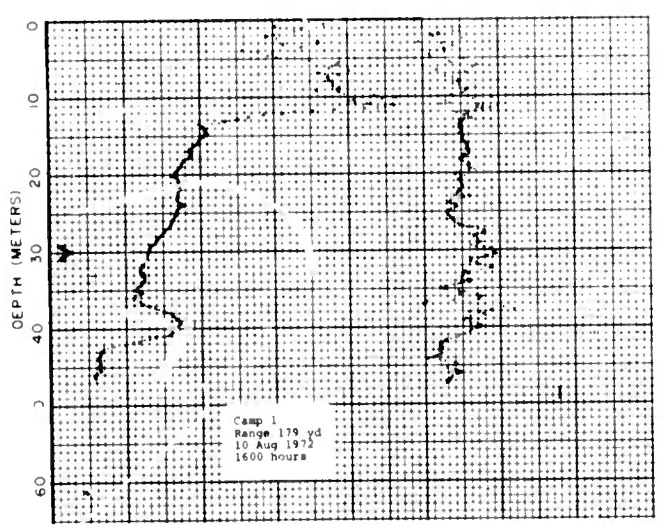

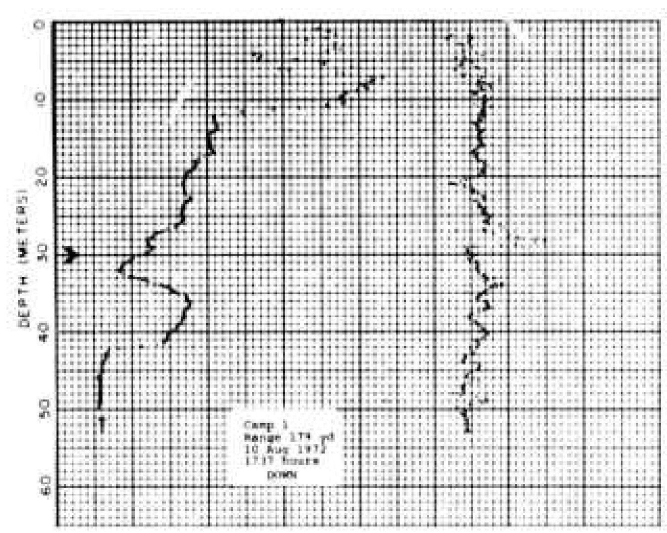

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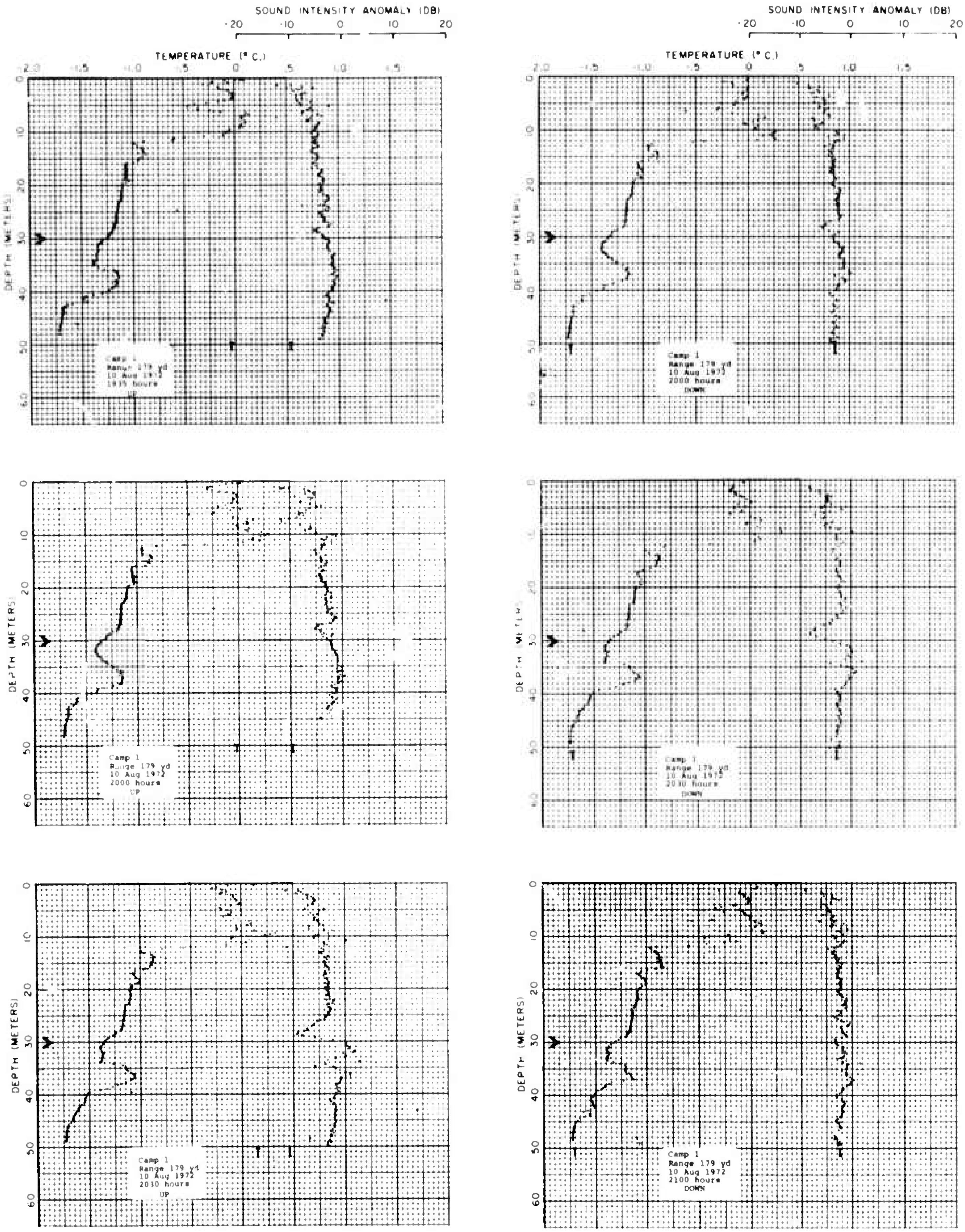

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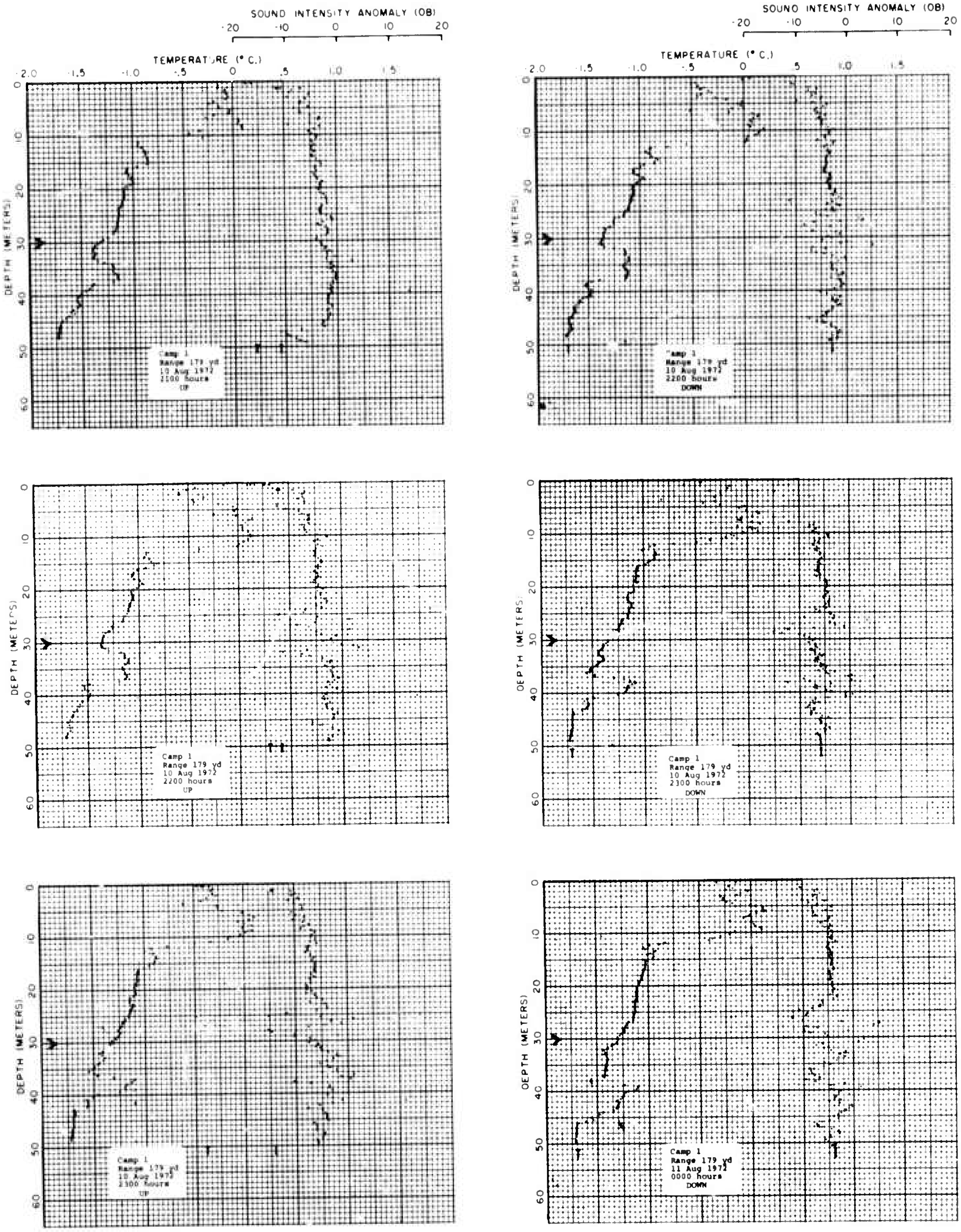
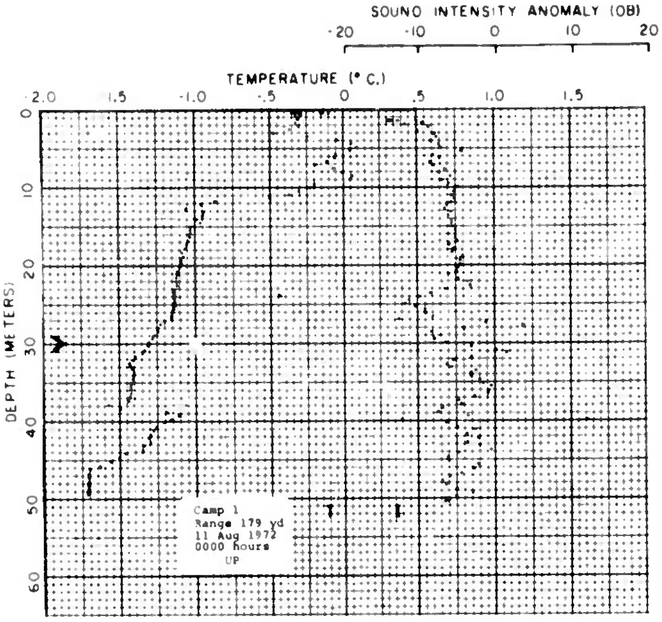
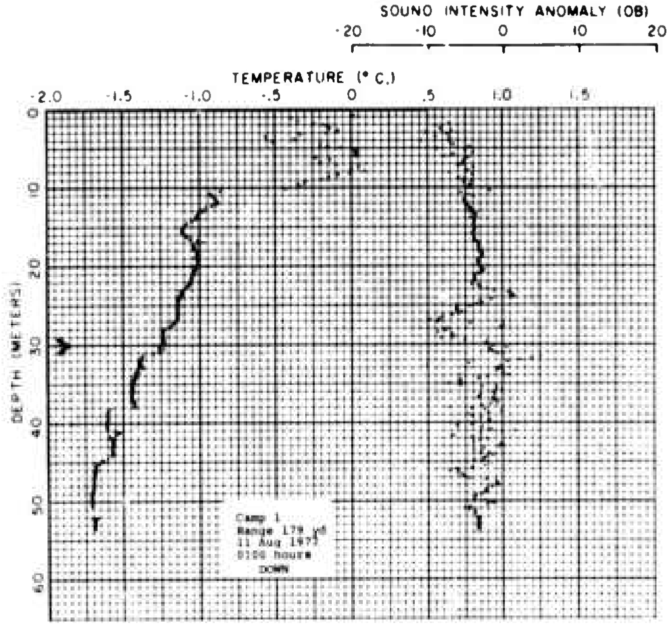
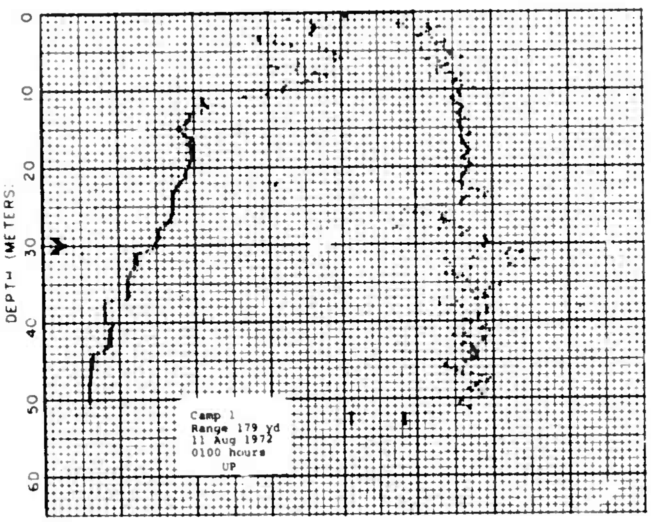
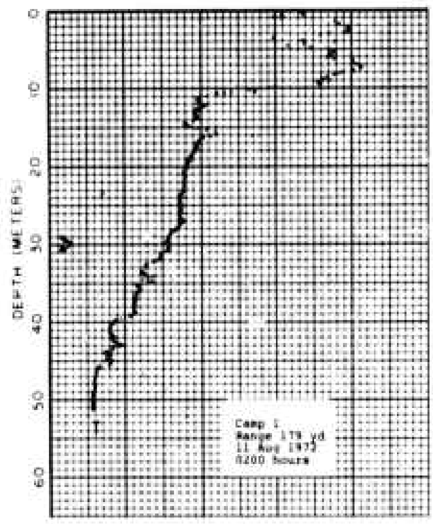


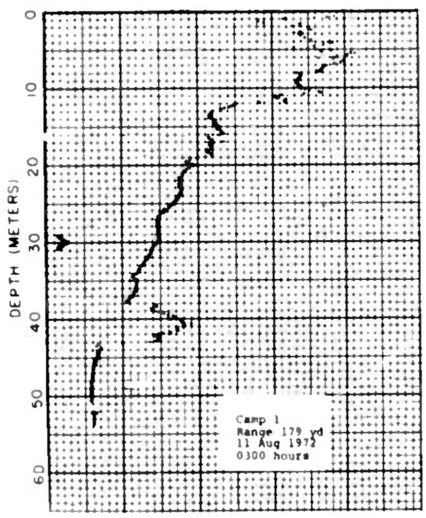
> • TRANSMITTER DEPTH

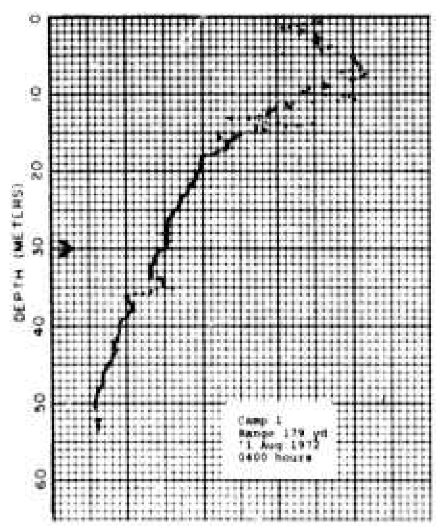












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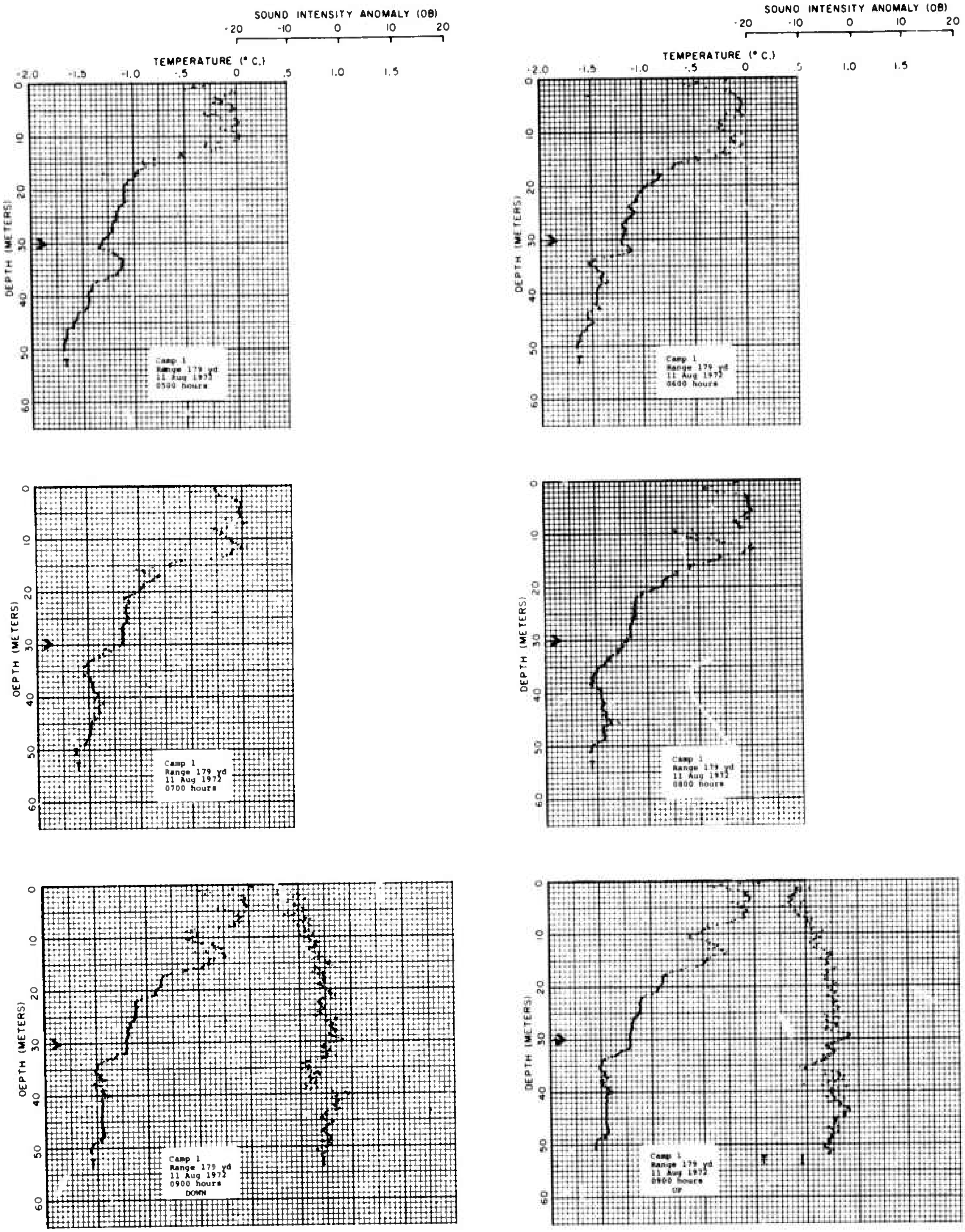
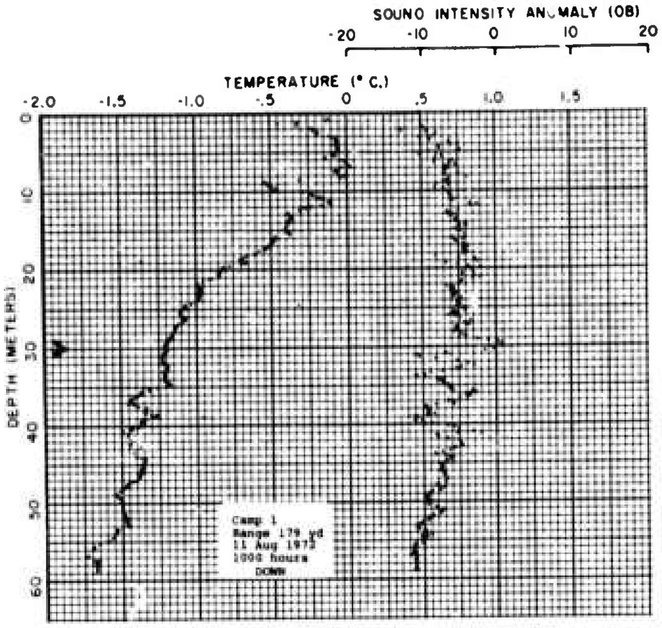
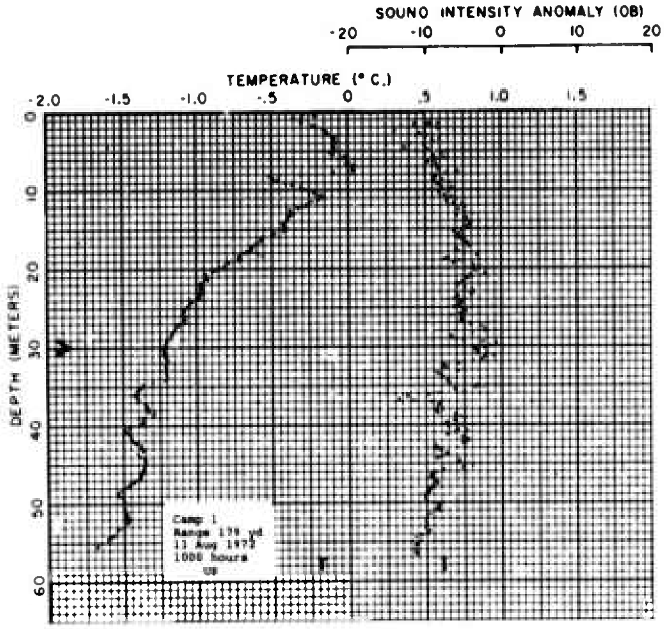
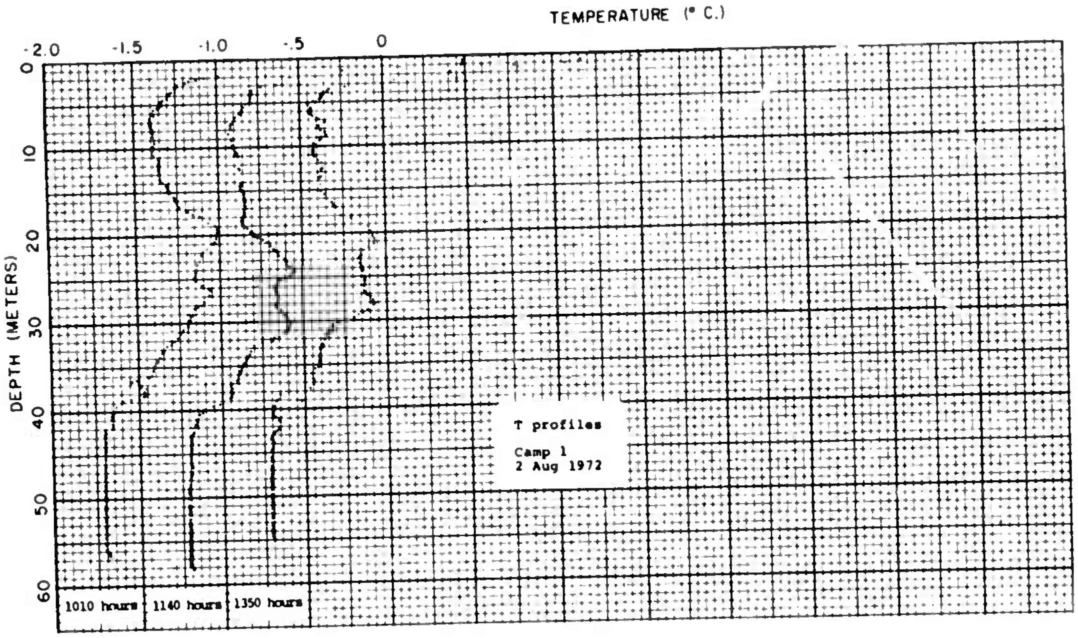
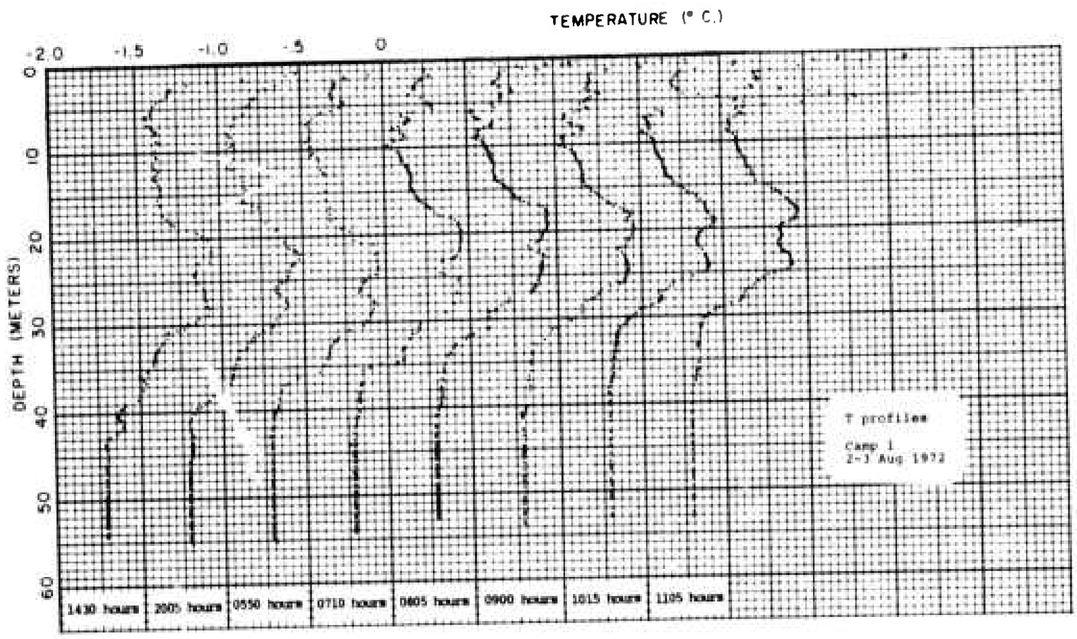


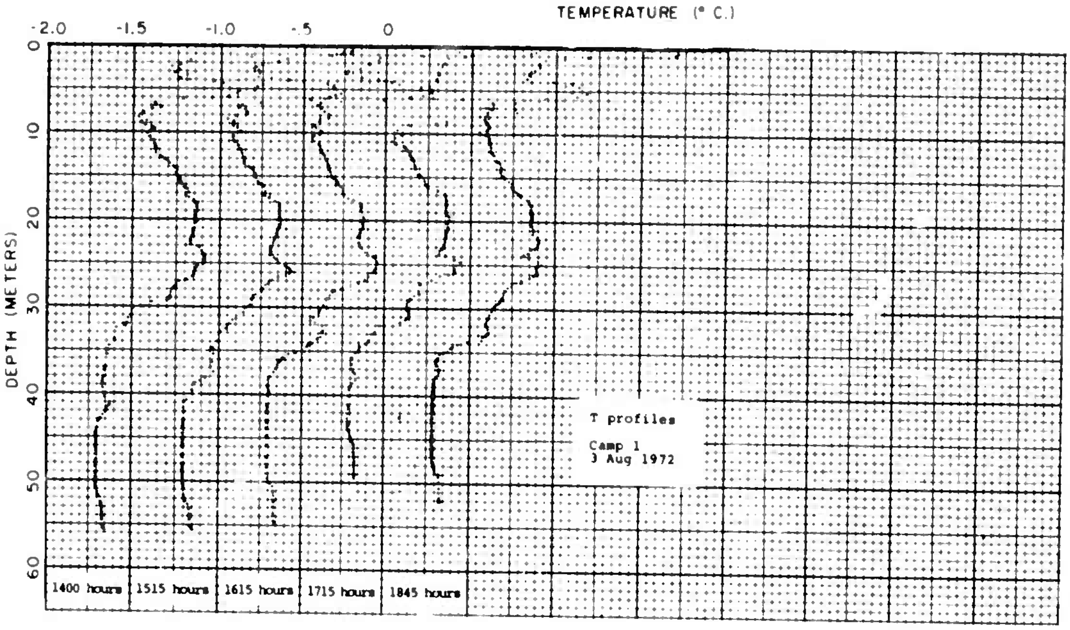
> • TRANSMITTER DEPTH

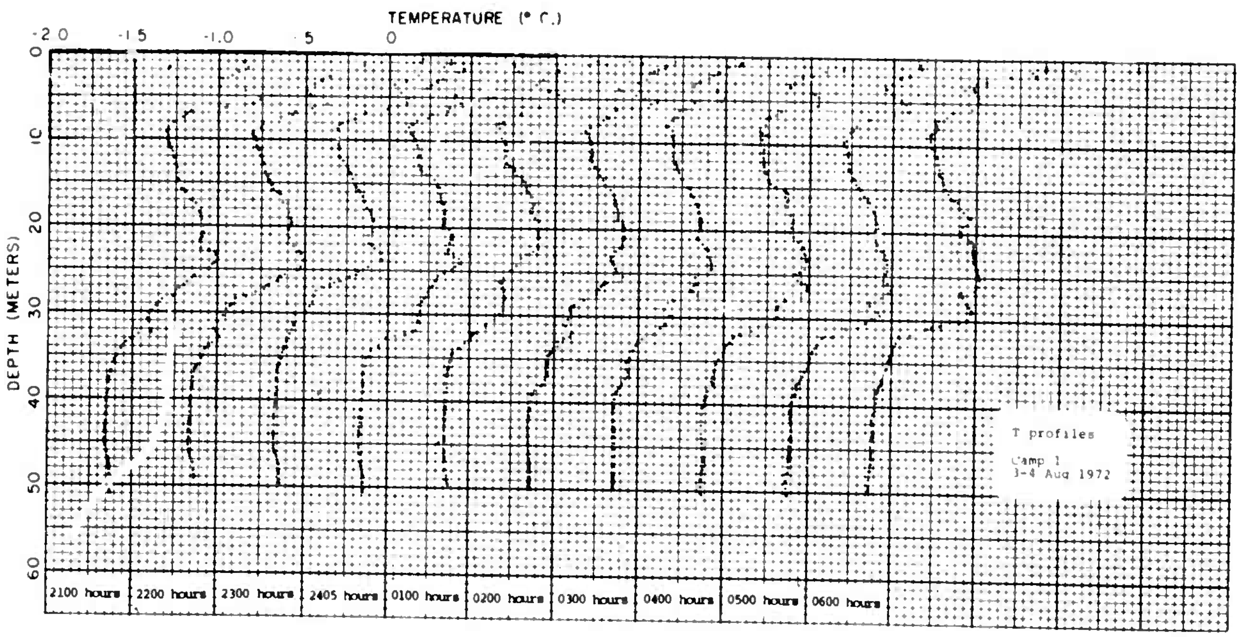

SOUNO INTENSITY ANOMALY (OB)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 1
Range 179 yd
11 Aug 1973
1000 hours
DOWN


SOUNO INTENSITY ANOMALY (OB)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 1
Range 179 yd
11 Aug 1973
1000 hours
UP


TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
DEPTH (METERS)
0
10
20
30
40
50
60
T profiles
Camp 1
2 Aug 1972
1010 hours
1140 hours
1350 hours


TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
DEPTH (METERS)
0
10
20
30
40
50
60
T profiles
Camp 1
2-3 Aug 1972
1430 hours
2005 hours
0550 hours
0710 hours
0805 hours
0900 hours
1015 hours
1105 hours


TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
Camp 1
3 Aug 1972
1400 hours
1515 hours
1615 hours
1715 hours
1845 hours

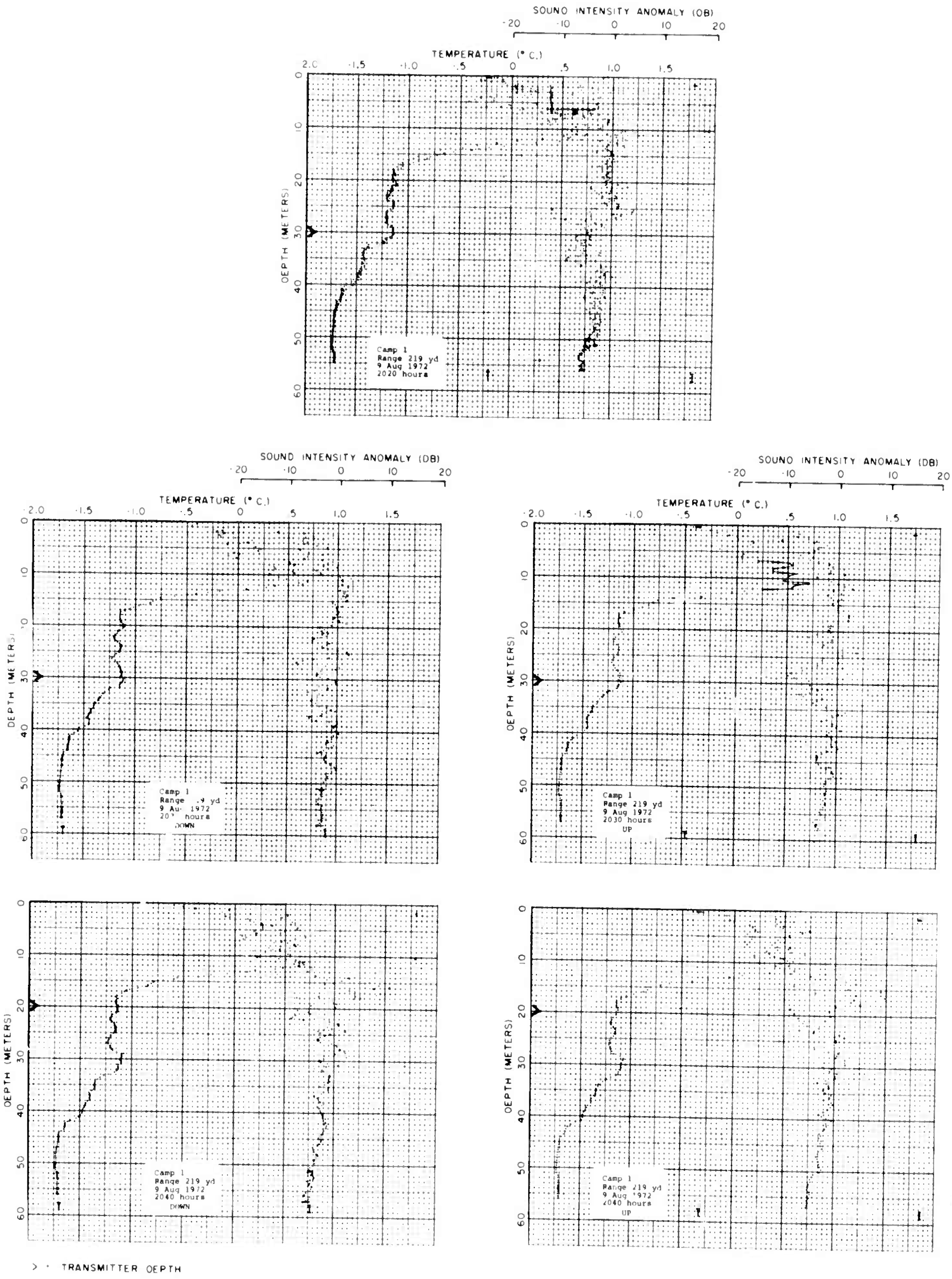

TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
Camp 1
3-4 Aug 1972
2100 hours
2200 hours
2300 hours
2405 hours
0100 hours
0200 hours
0300 hours
0400 hours
0500 hours
0600 hours

APPENDIX D

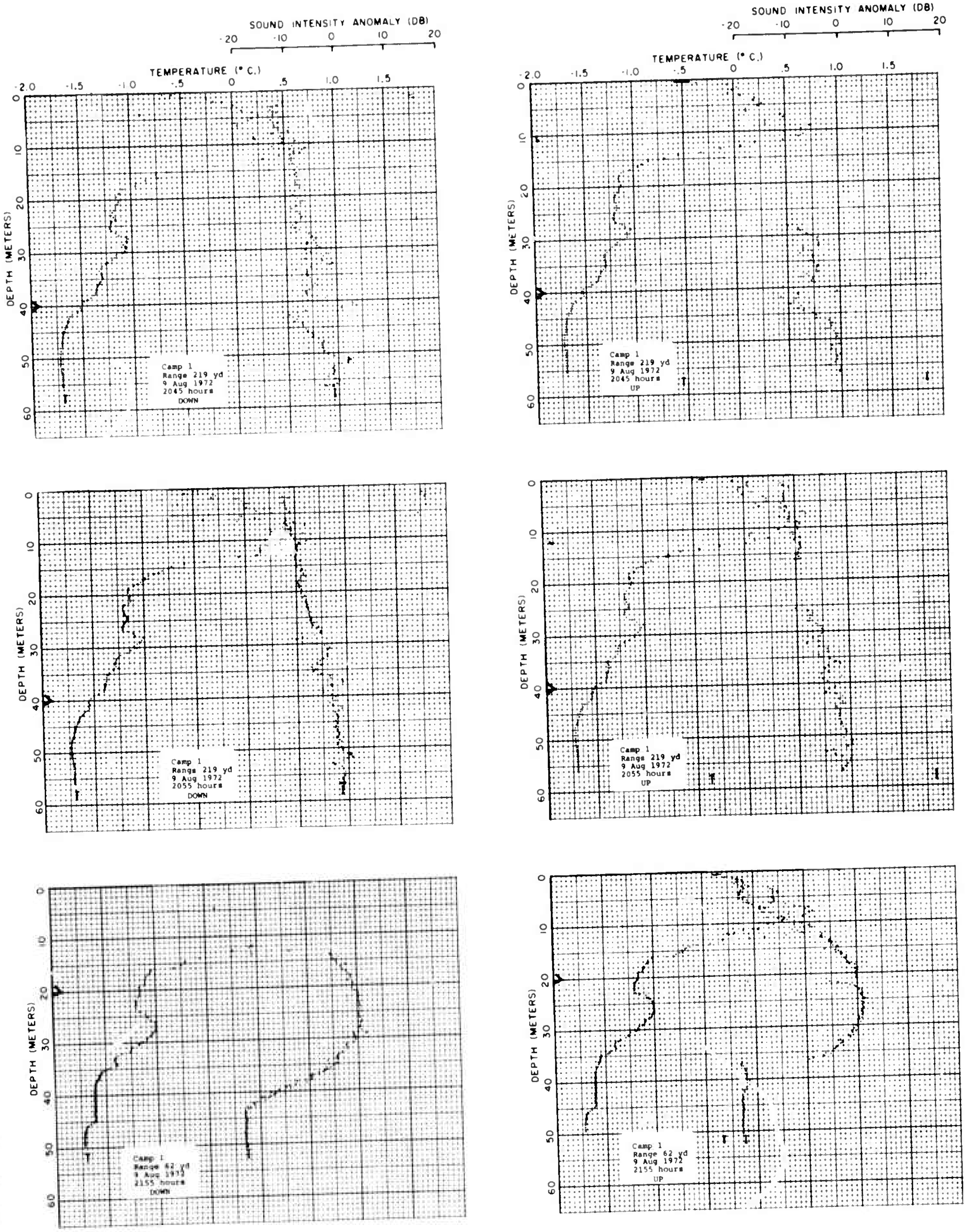
TEMPERATURE AND SOUND INTENSITY PROFILES AT CAMP 1
(at various ranges)

Several transmission measurements were made at other than the routine depths and ranges to determine acoustic anomalies for other types of thermal layers. These measurements are listed here. In some cases the intensity was measured as the probe was brought up (see "Direction").

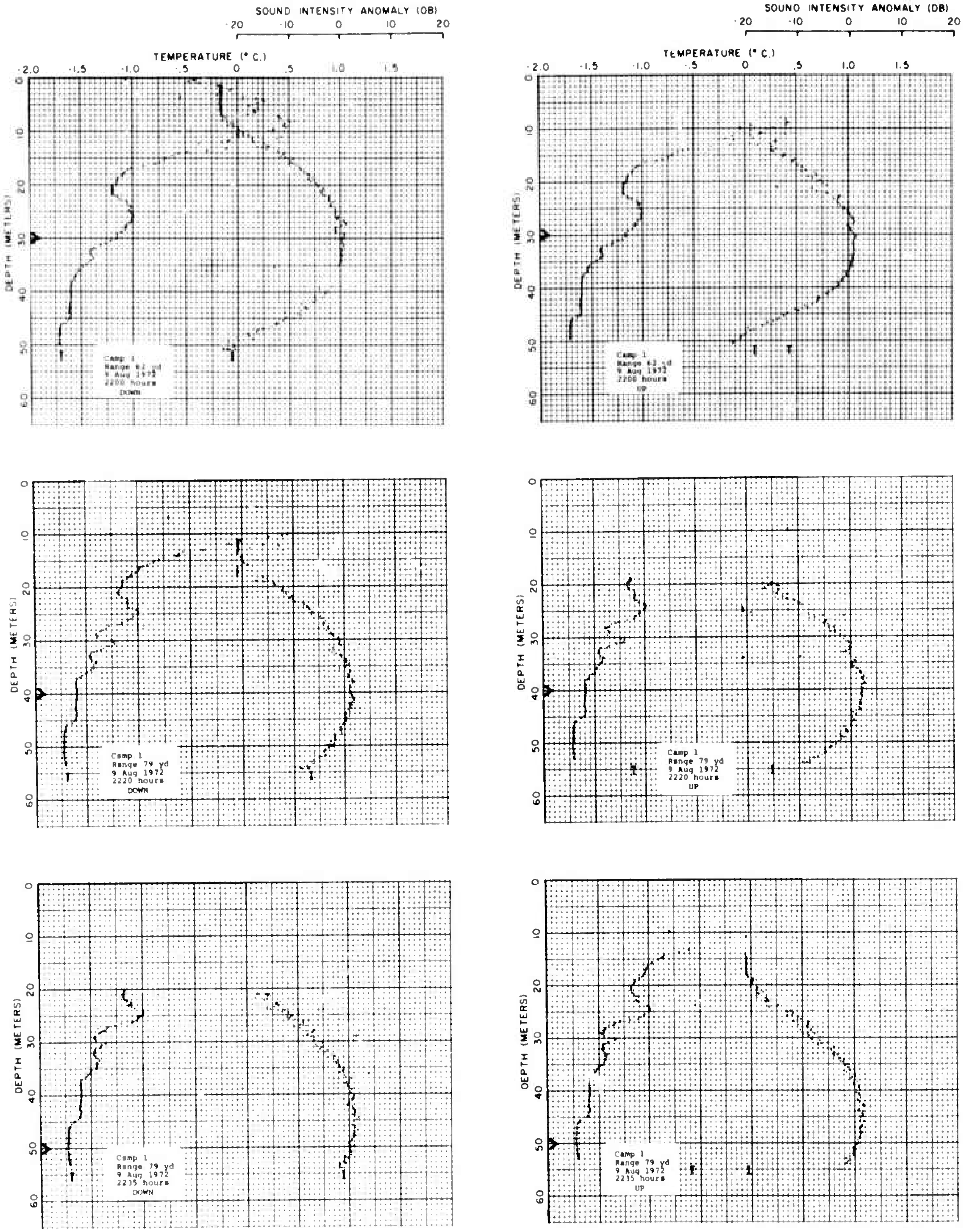
Date	Time	Range (yd)	Source Depth (m)	Direction of Probe Movement
9 Aug	2020	219	30	Down
	2030	219	30	Down
	2030	219	30	Up
	2040	219	20	Down
	2040	219	20	Up
	2045	219	40	Down
	2045	219	40	Up
	2055	219	40	Down
	2055	219	40	Up
	2155	62	20	Down
	2155	62	20	Up
	2200	62	30	Down
	2200	62	30	Up
	2220	79	40	Down
	2220	79	40	Up
	2235	79	50	Down
	2235	79	50	Up
10 Aug	0005	149	20	Down
	0005	149	20	Down
	0010	149	20	Down
	0010	149	20	Up
	0020	149	40	Down
	0055	149	50	Down
	0055	149	50	Up
	0135	397	50	Down
	0135	397	50	Up
	0140	397	40	Down
	0140	397	40	Up
	0145	397	30	Down
	0150	397	20	Down
	0150	397	20	Up



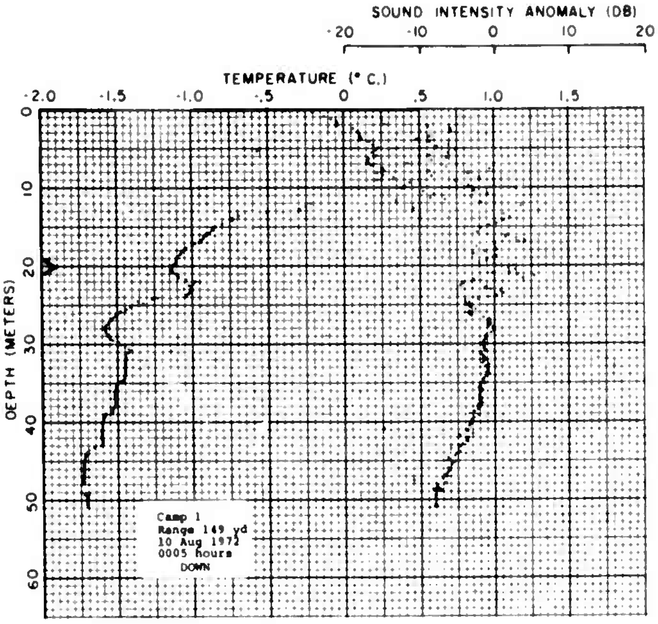
> · TRANSMITTER DEPTH

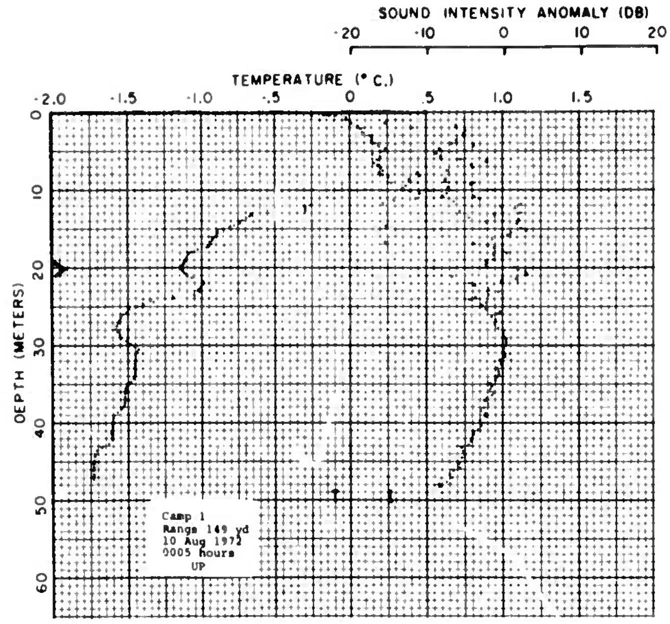


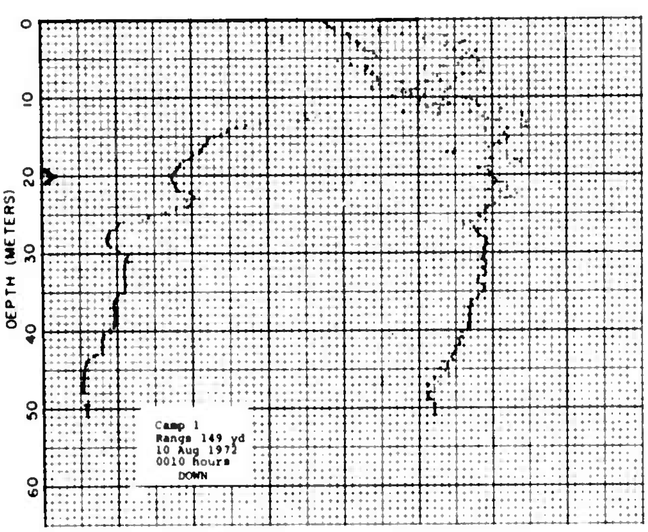
> • TRANSMITTER DEPTH

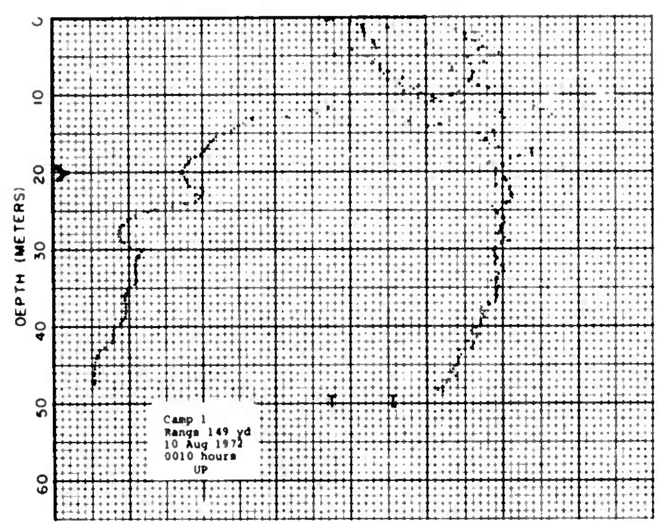


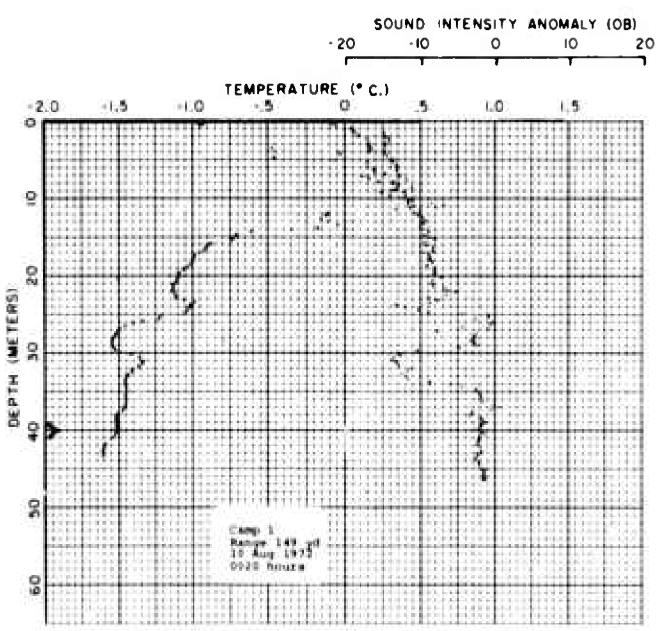
▷ = TRANSMITTER DEPTH

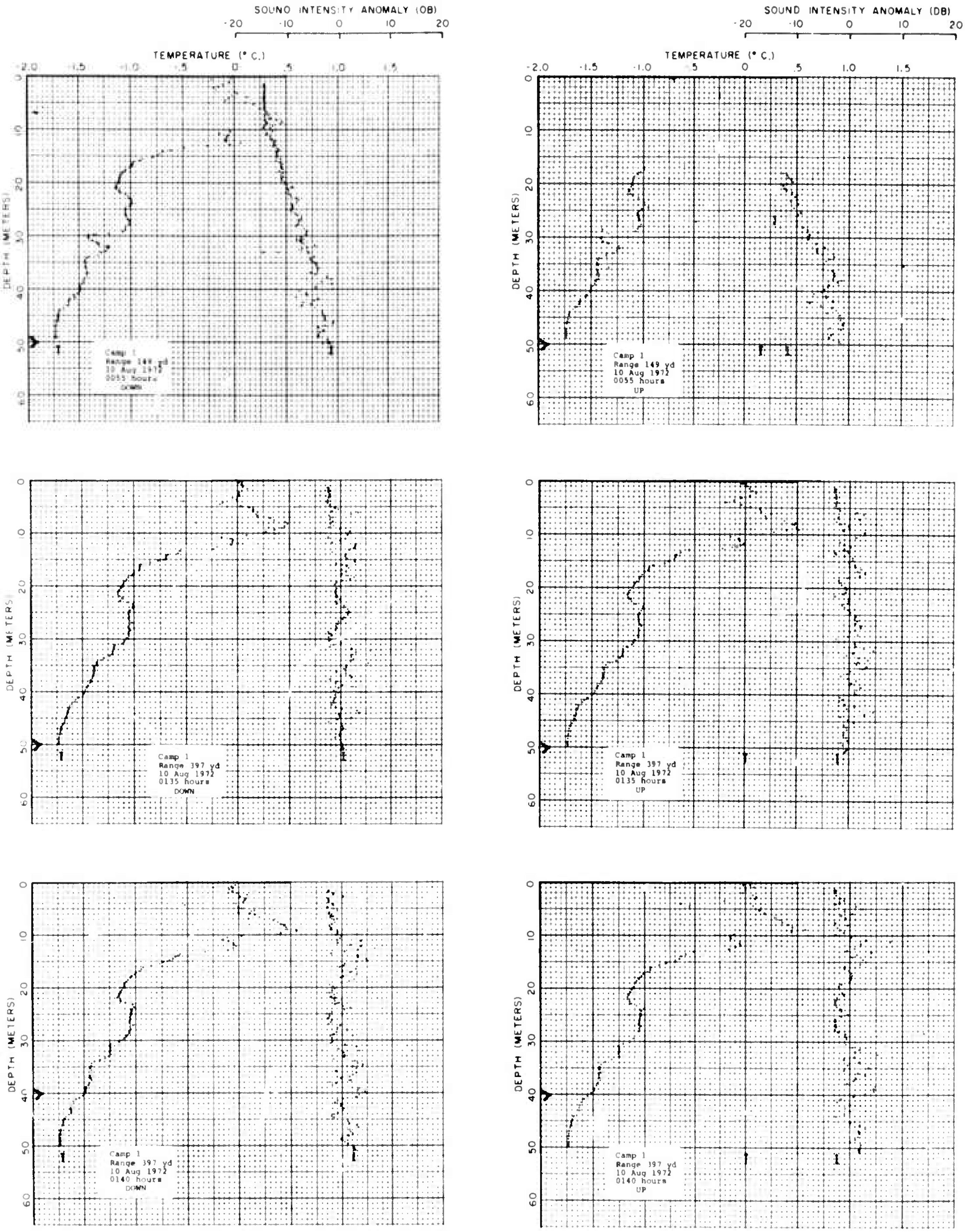

SOUND INTENSITY ANOMALY (DB)
-20 -10 0 10 20
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 1
Range 149 yd
10 Aug 1972
0005 hours
DOWN


SOUND INTENSITY ANOMALY (DB)
-20 -10 0 10 20
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 1
Range 149 yd
10 Aug 1972
0005 hours
UP

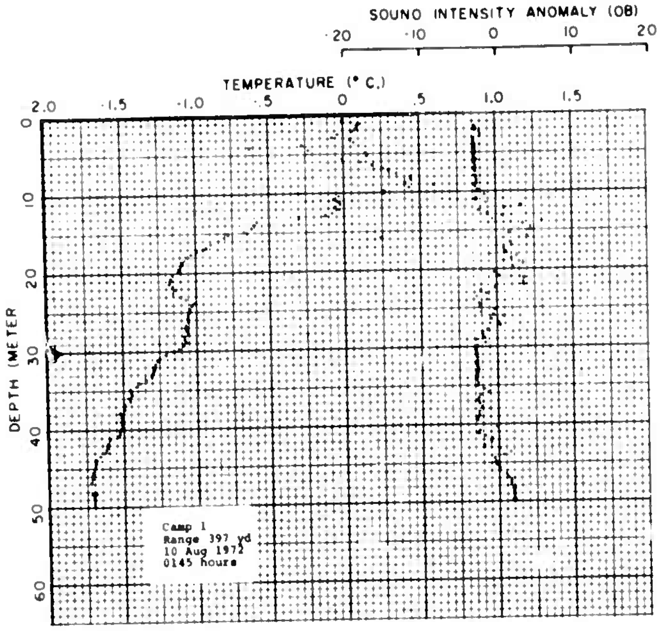

DEPTH (METERS)
0 10 20 30 40 50 60
Camp 1
Range 149 yd
10 Aug 1972
0010 hours
DOWN

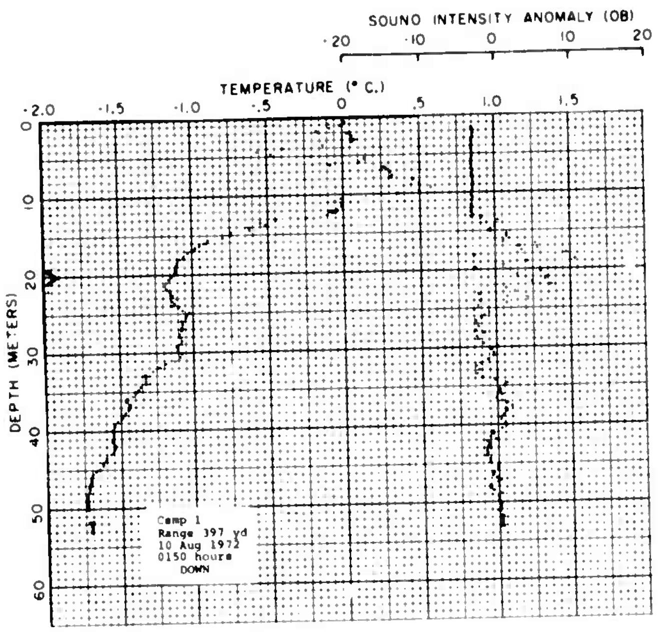

DEPTH (METERS)
0 10 20 30 40 50 60
Camp 1
Range 149 yd
10 Aug 1972
0010 hours
UP

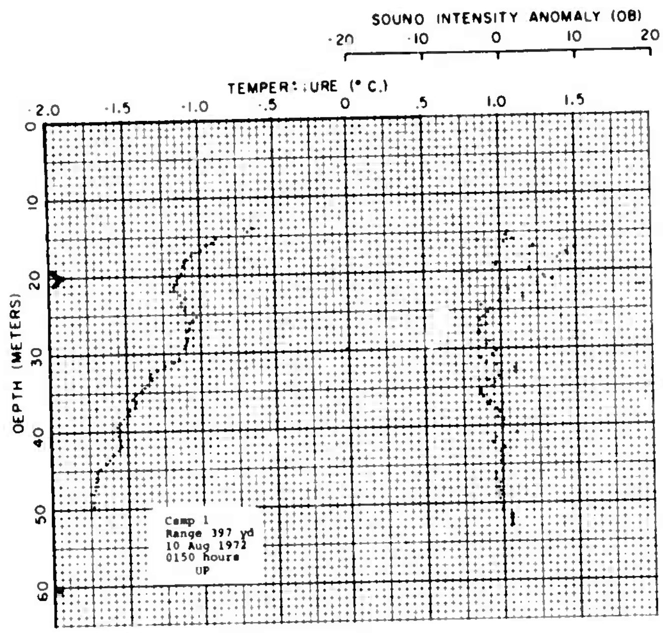

SOUND INTENSITY ANOMALY (DB)
-20 -10 0 10 20
TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Camp 1
Range 149 yd
10 Aug 1972
0020 hours



➤ = TRANSMITTER DEPTH


SOUNO INTENSITY ANOMALY (OB)
TEMPERATURE (° C.)
DEPTH (METER
Camp 1
Range 397 yd
10 Aug 1972
0145 hours


SOUNO INTENSITY ANOMALY (OB)
TEMPERATURE (° C.)
DEPTH (METERS)
Camp 1
Range 397 yd
10 Aug 1972
0150 hours
DOWN


SOUNO INTENSITY ANOMALY (OB)
DEPTH (METERS)
Camp 1
Range 397 yd
10 Aug 1972
0150 hours
UP

APPENDIX E

TEMPERATURE PROFILES AT CAMPS 3 AND 4 AND FROM ICEBREAKER

The temperature profiling equipment at Camps 3 and 4 was operated hourly except when breakdown or shortages of equipment occurred.

A series of hourly temperature profiles was taken at Camp 3 for the following periods.

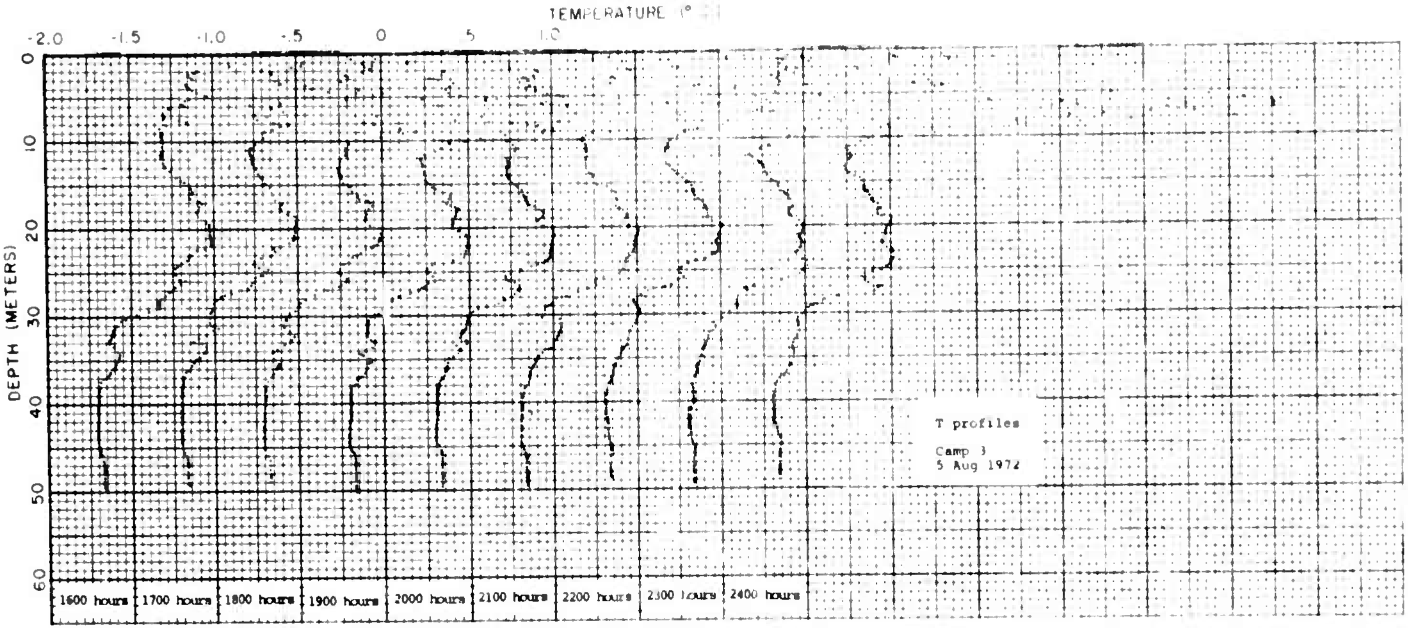
Date	Time
5 Aug	1600-2400
6 Aug	0100-1200 1300-2400
7 Aug	0100-1000
8 Aug	0000-0800

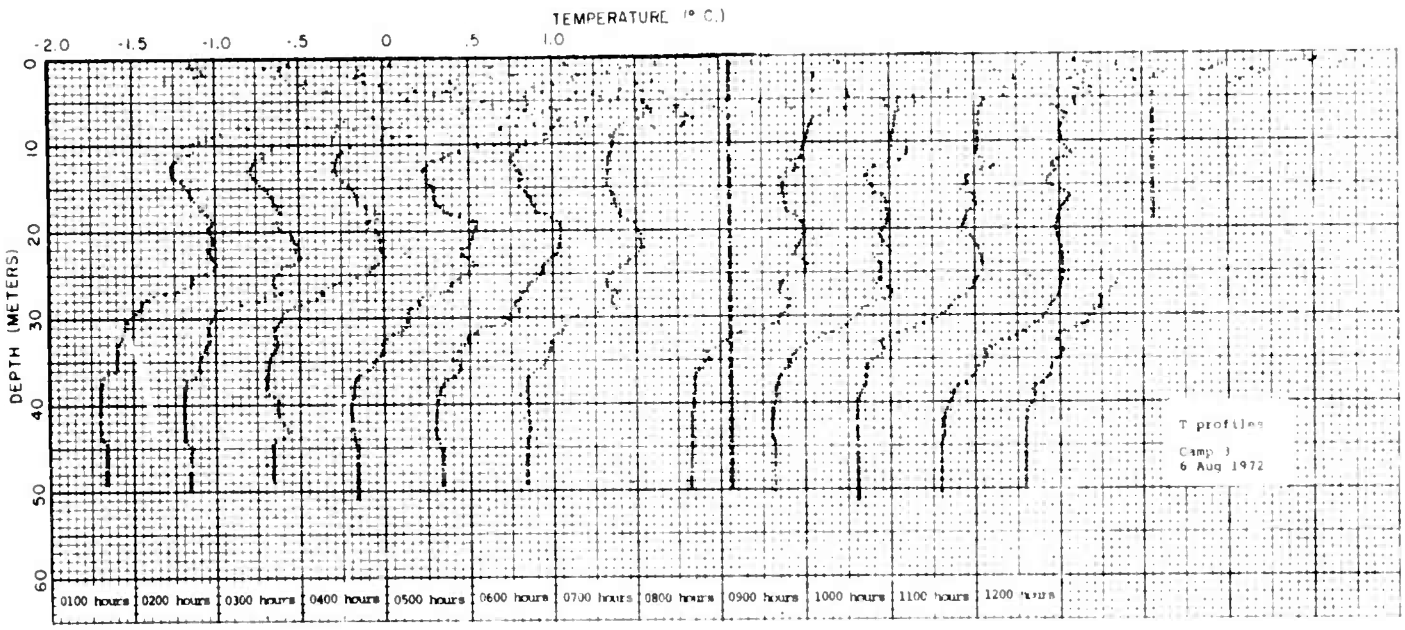
A series of hourly temperature profiles was taken at Camp 4 for the following periods.

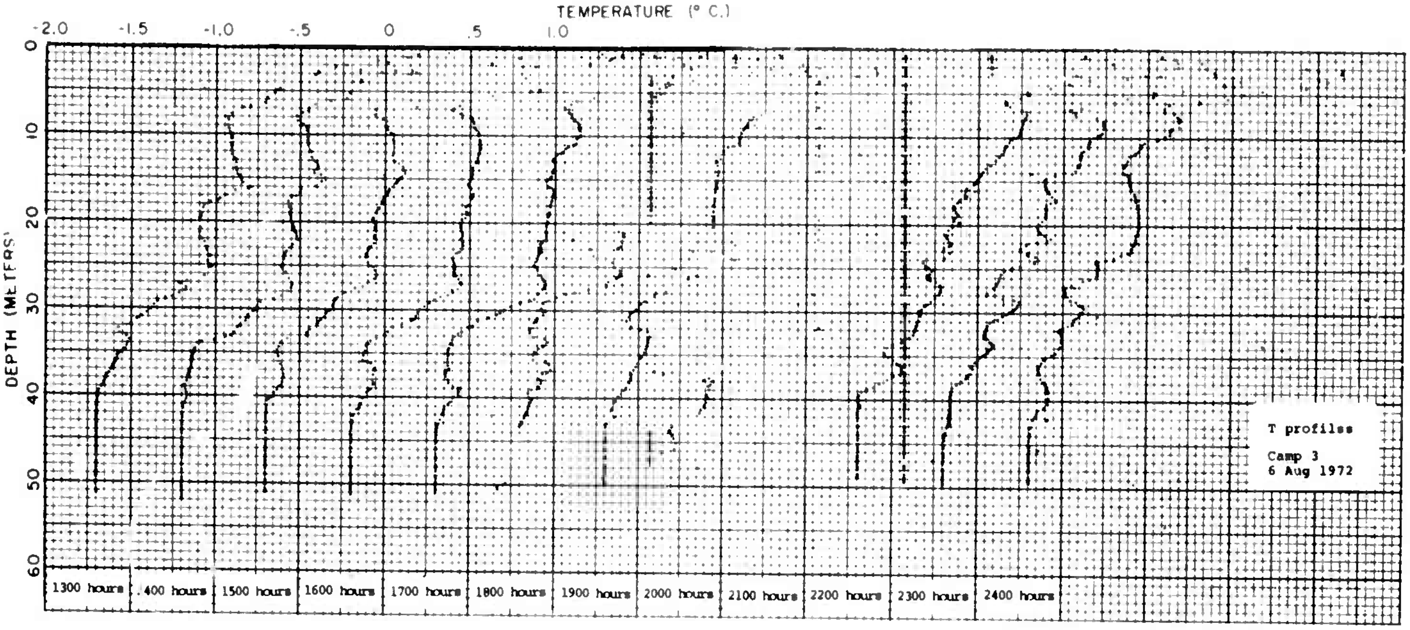
Date	Time
3 Aug	1915-2415
4 Aug	0115-0600 0700-1200 1300-2400
5 Aug	0100-1200 1300-2400
6 Aug	0100-1200 1300-2400
7 Aug	0100-1200 1300-2400
8 Aug	0100-0800
9 Aug	0200-0600
10 Aug	0315-0645 0800-1200
11 Aug	1400-1800
11-12 Aug	2100-0600

At times CTD profiles were taken from the icebreaker when it was near the instrumented floe.

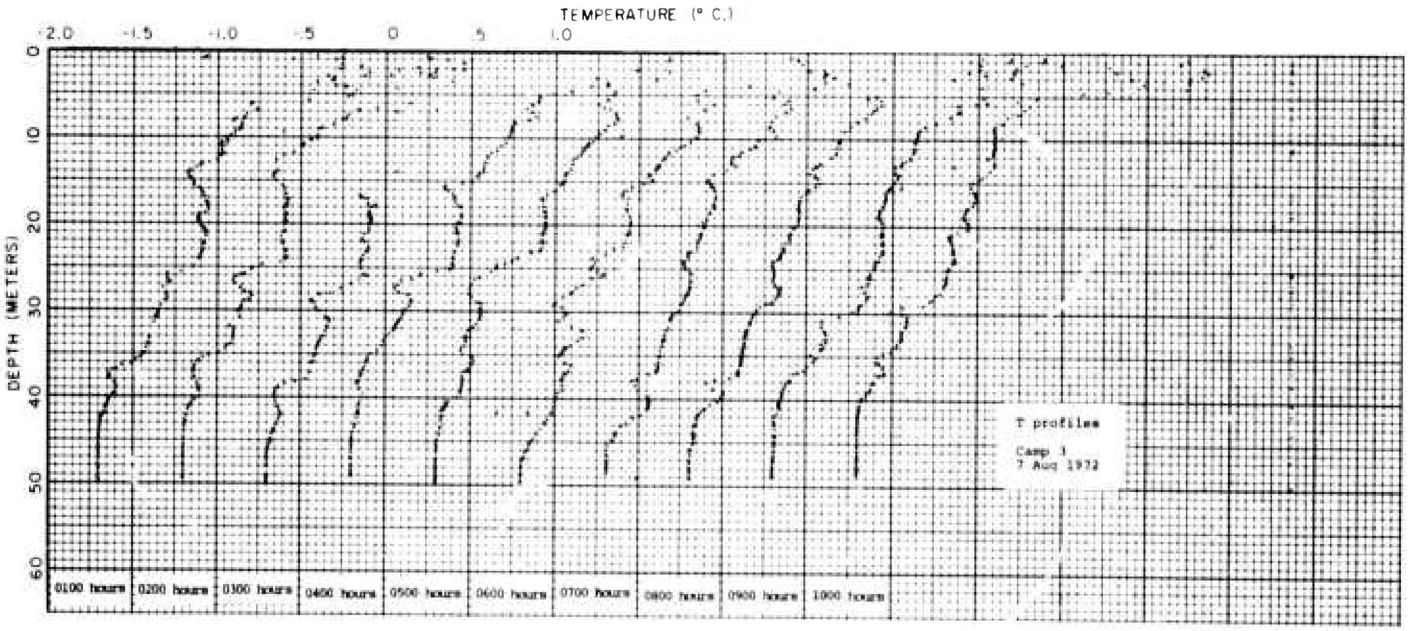
Date	Time
1 Aug	2345
2 Aug	0045, 0830, 2330
3 Aug	1000, 2315
4 Aug	0915, 1000


TEMPERATURE (° C)
-2.0
-1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
T profiles
Camp 3
5 Aug 1972
1600 hours
1700 hours
1800 hours
1900 hours
2000 hours
2100 hours
2200 hours
2300 hours
2400 hours

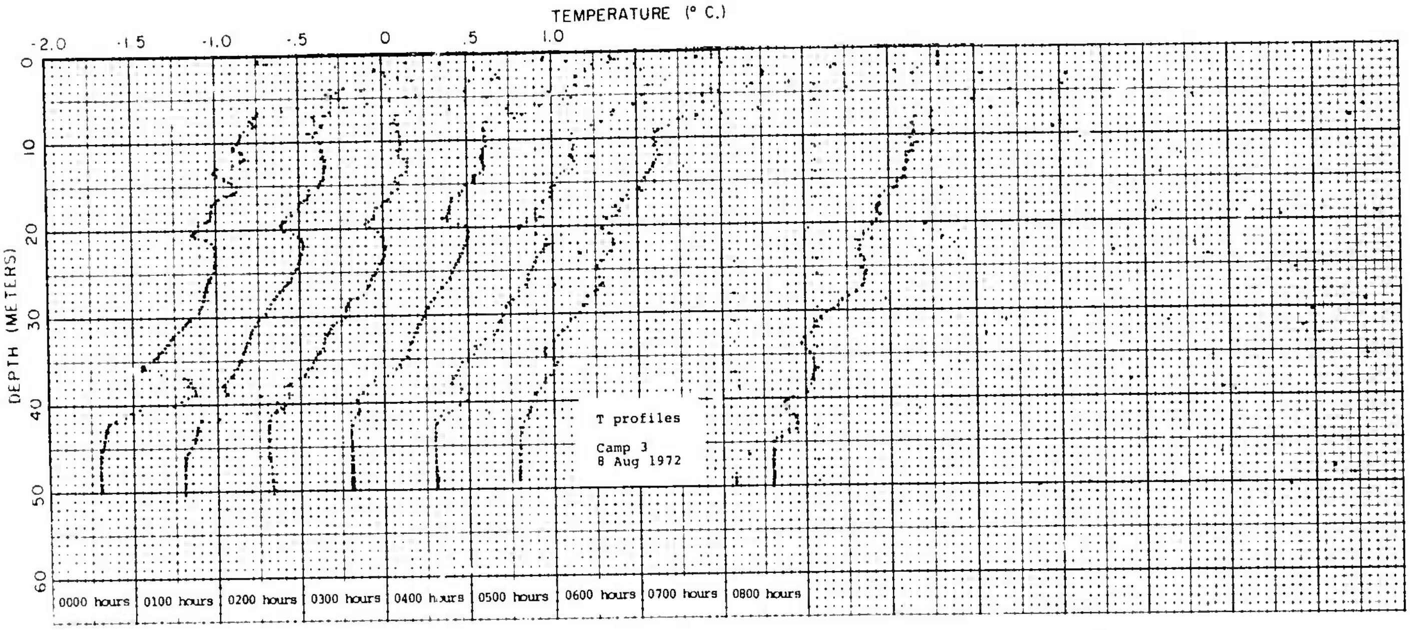

TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
T profiles
Camp 3
6 Aug 1972
0100 hours
0200 hours
0300 hours
0400 hours
0500 hours
0600 hours
0700 hours
0800 hours
0900 hours
1000 hours
1100 hours
1200 hours



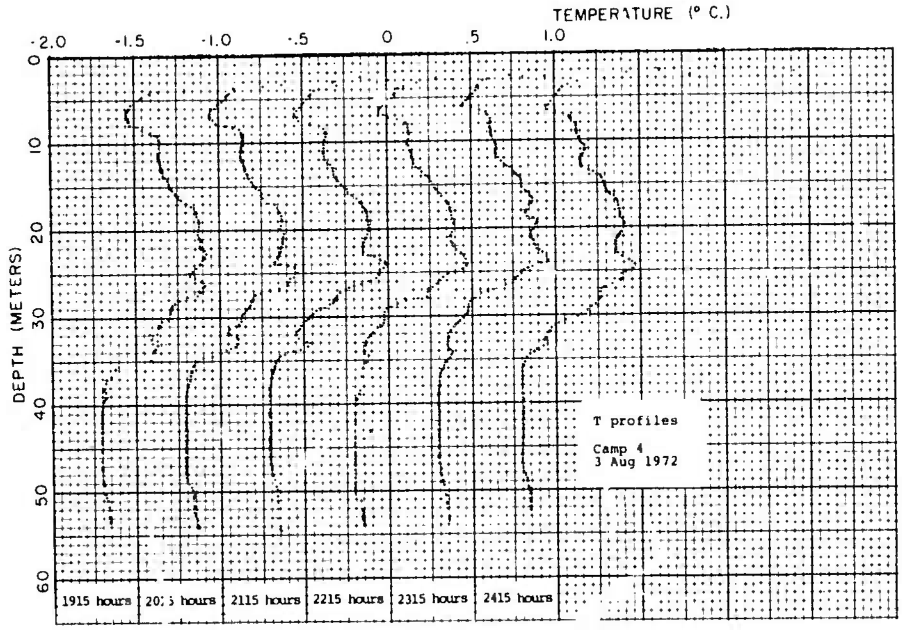
TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
T profiles
Camp 3
6 Aug 1972
1300 hours
1400 hours
1500 hours
1600 hours
1700 hours
1800 hours
1900 hours
2000 hours
2100 hours
2200 hours
2300 hours
2400 hours

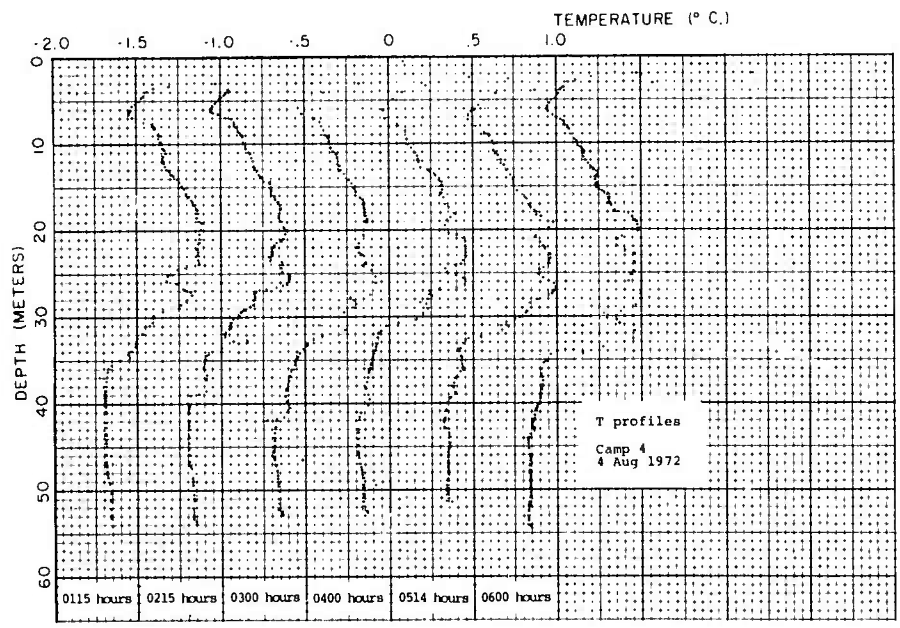


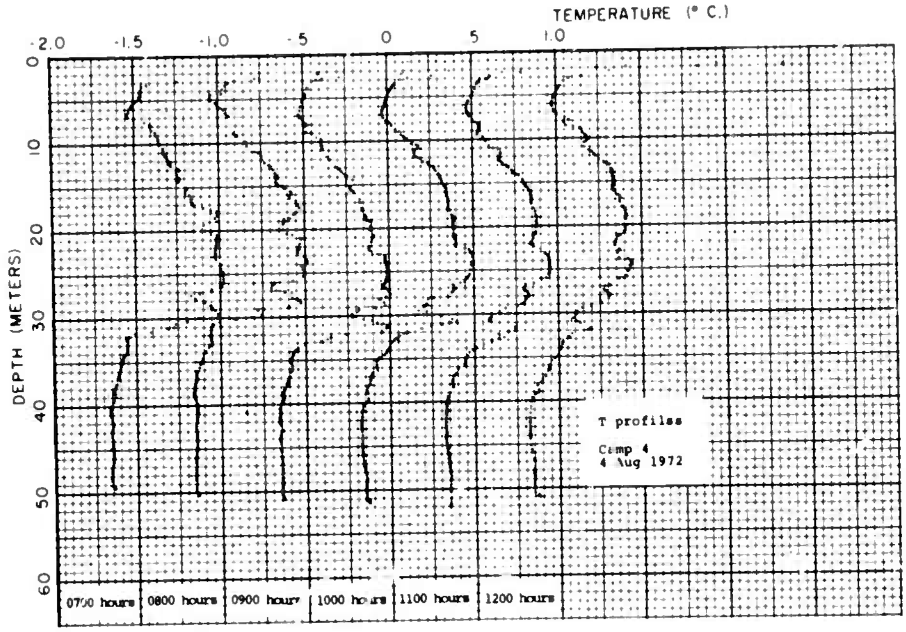
TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
T profiles
Camp 3
7 Aug 1972
0100 hours
0200 hours
0300 hours
0400 hours
0500 hours
0600 hours
0700 hours
0800 hours
0900 hours
1000 hours

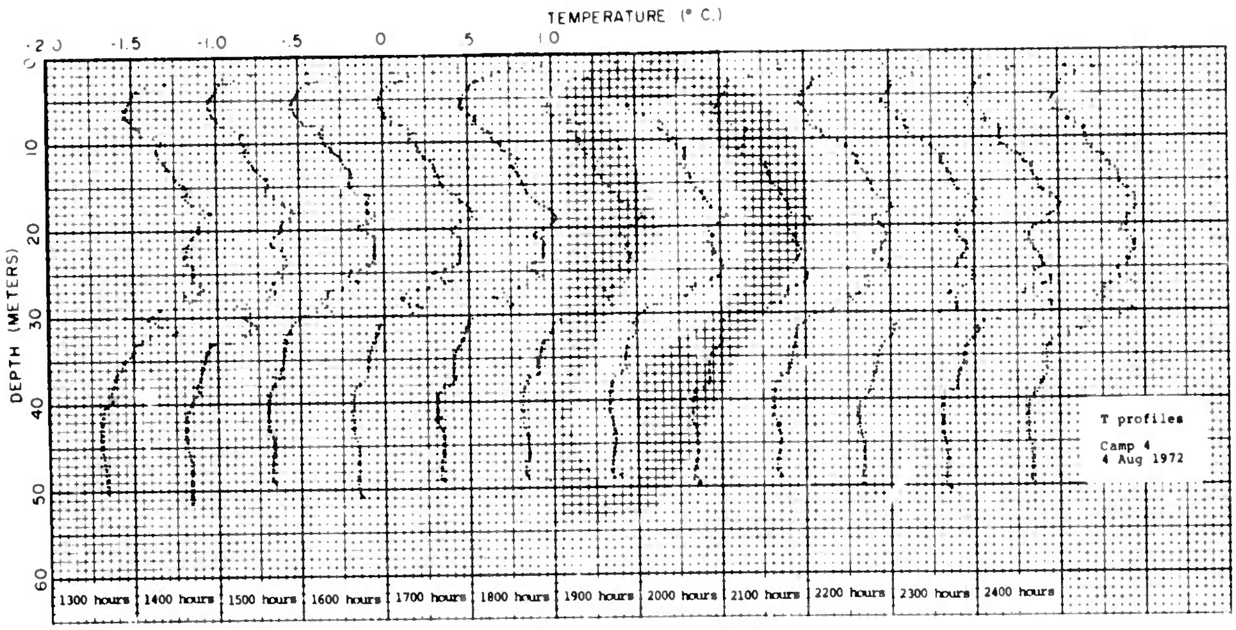


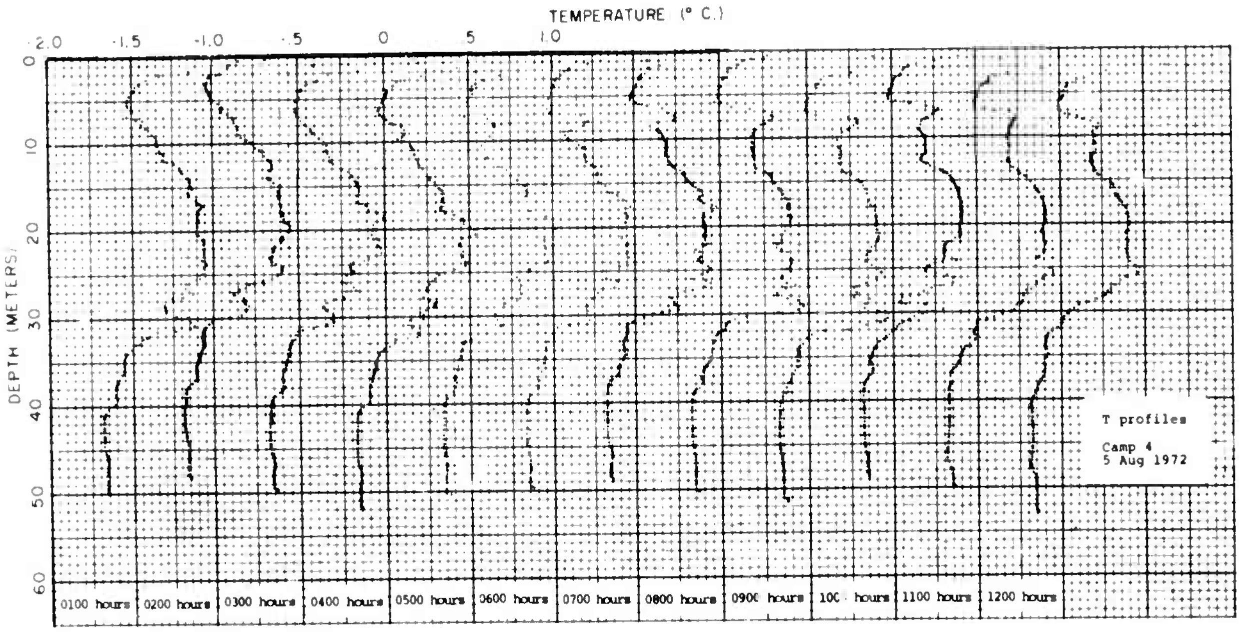
For continuation see Fig. 14b.

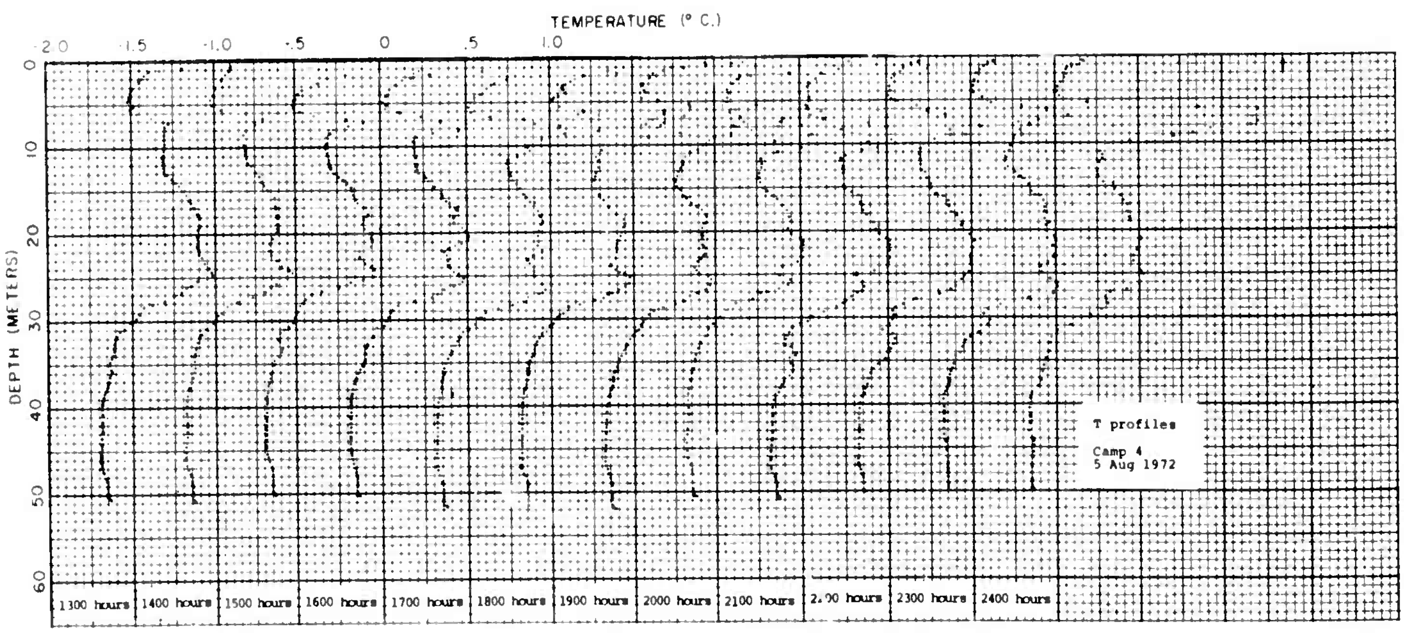

TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
Camp 4
3 Aug 1972
1915 hours
2115 hours
2215 hours
2315 hours
2415 hours

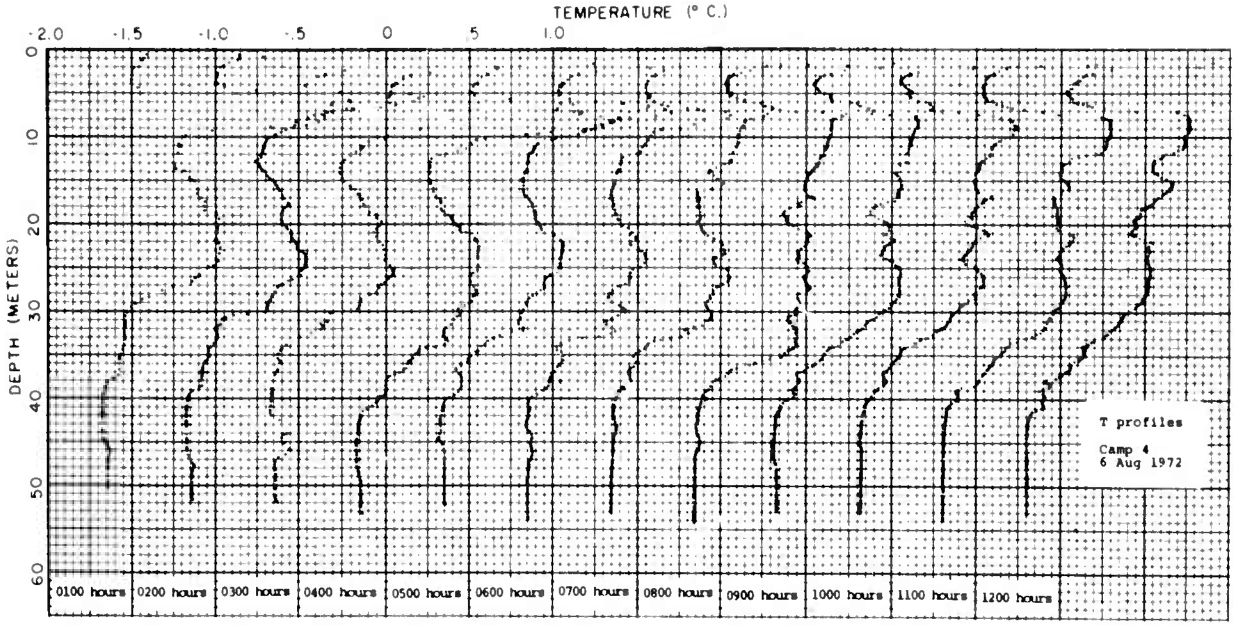

TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
Camp 4
4 Aug 1972
0115 hours
0215 hours
0300 hours
0400 hours
0514 hours
0600 hours

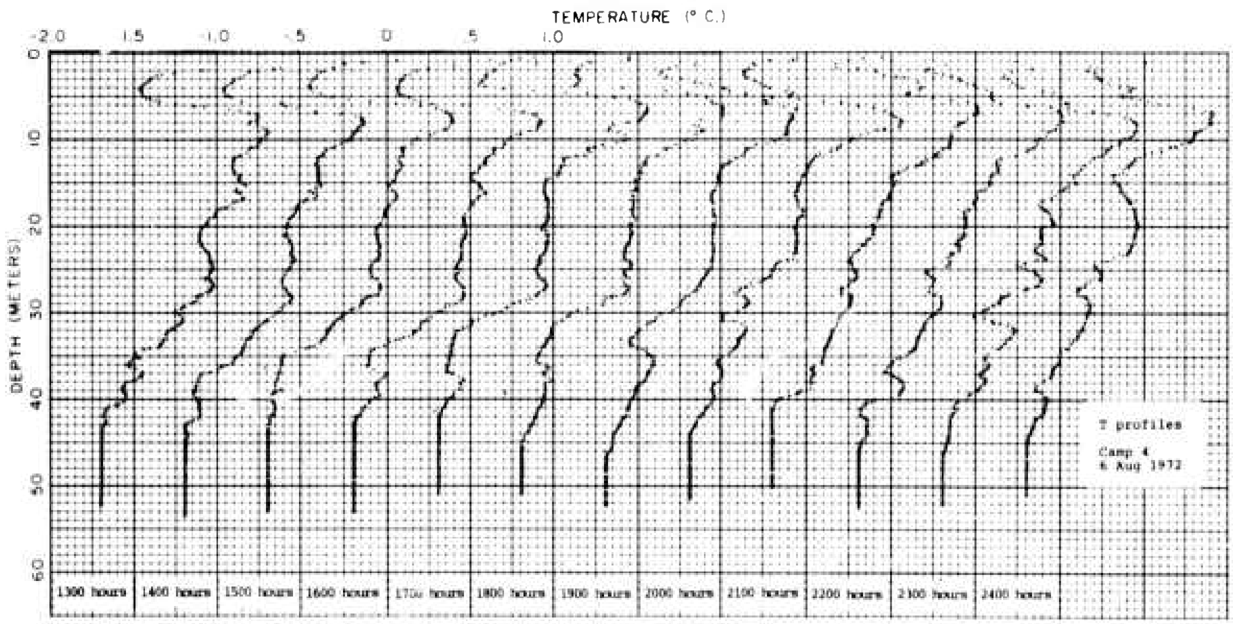

TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
Camp 4
4 Aug 1972
0700 hours
0800 hours
0900 hours
1000 hours
1100 hours
1200 hours

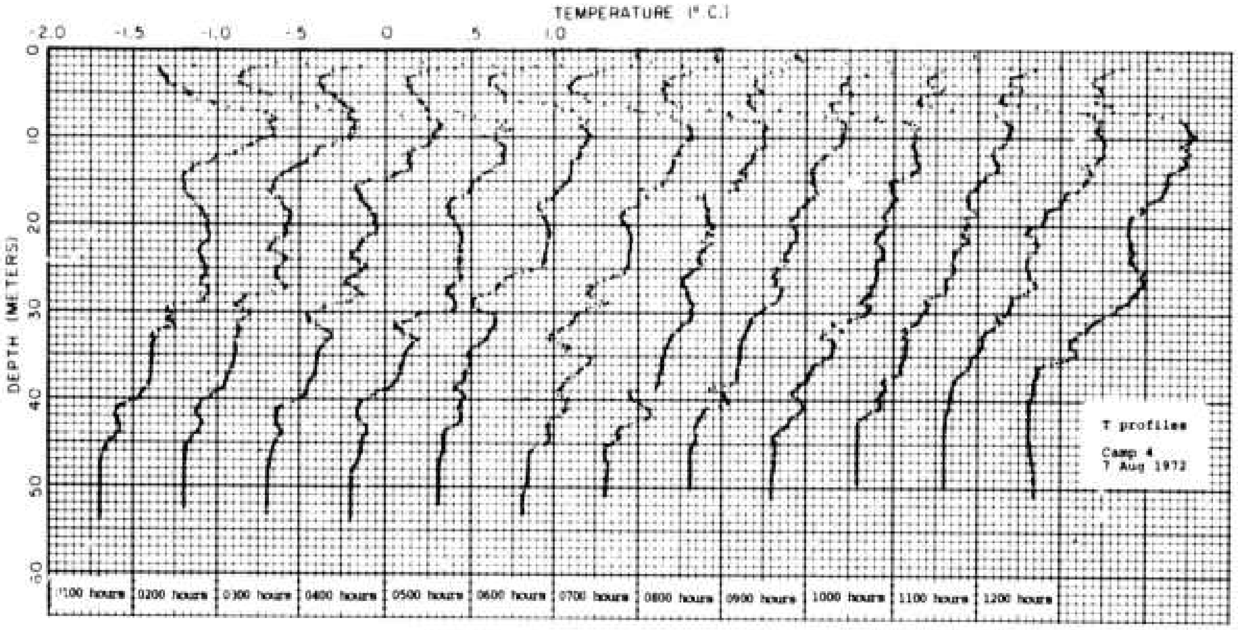

TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
Camp 4
4 Aug 1972
1300 hours
1400 hours
1500 hours
1600 hours
1700 hours
1800 hours
1900 hours
2000 hours
2100 hours
2200 hours
2300 hours
2400 hours


TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0
DEPTH (METERS)
0 10 20 30 40 50 60
0100 hours 0200 hours 0300 hours 0400 hours 0500 hours 0600 hours 0700 hours 0800 hours 0900 hours 1000 hours 1100 hours 1200 hours
T profiles
Camp 4
5 Aug 1972

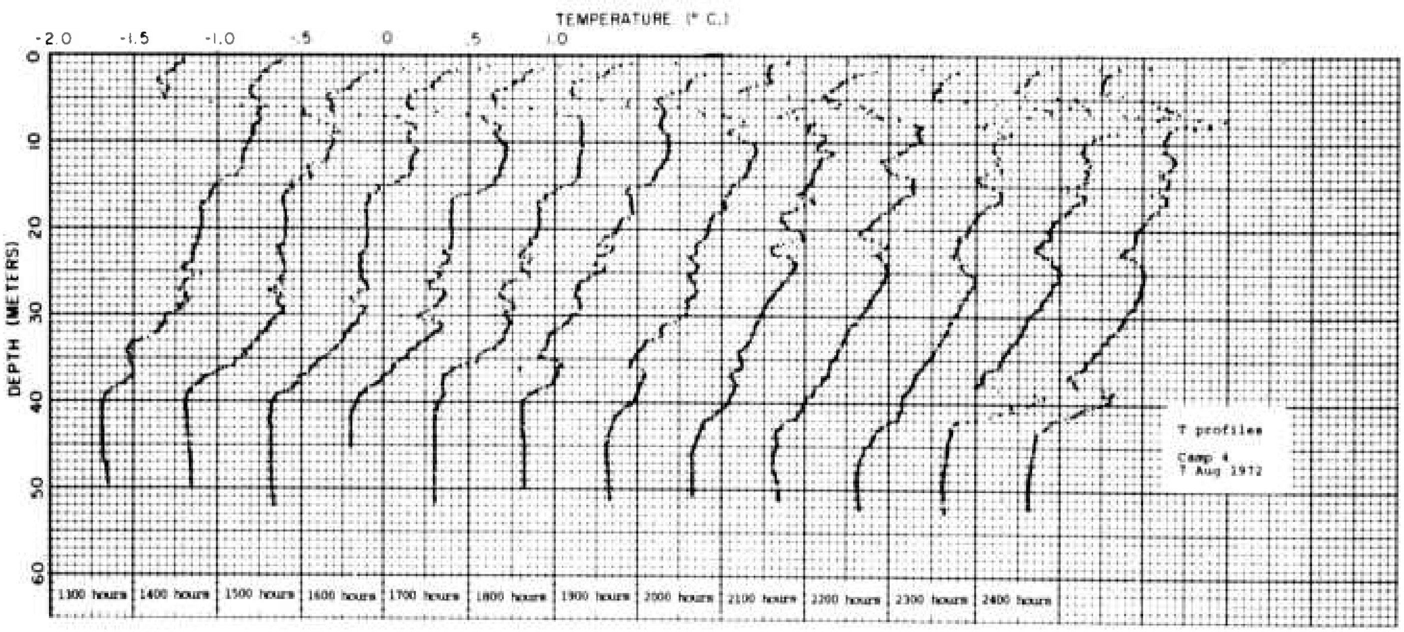

TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0
DEPTH (METERS)
0 10 20 30 40 50 60
1300 hours 1400 hours 1500 hours 1600 hours 1700 hours 1800 hours 1900 hours 2000 hours 2100 hours 2200 hours 2300 hours 2400 hours
T profiles
Camp 4
5 Aug 1972


TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
0100 hours
0200 hours
0300 hours
0400 hours
0500 hours
0600 hours
0700 hours
0800 hours
0900 hours
1000 hours
1100 hours
1200 hours
T profiles
Camp 4
6 Aug 1972

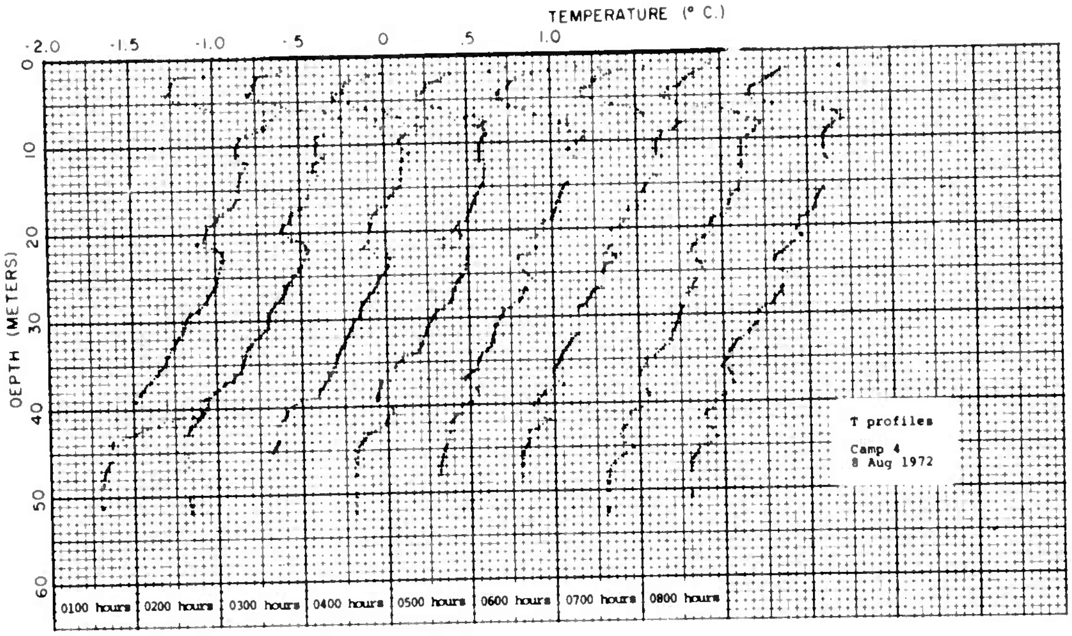

TEMPERATURE (° C.)
-2.0
1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
1300 hours
1400 hours
1500 hours
1600 hours
1700 hours
1800 hours
1900 hours
2000 hours
2100 hours
2200 hours
2300 hours
2400 hours
T profiles
Camp 4
6 Aug 1972



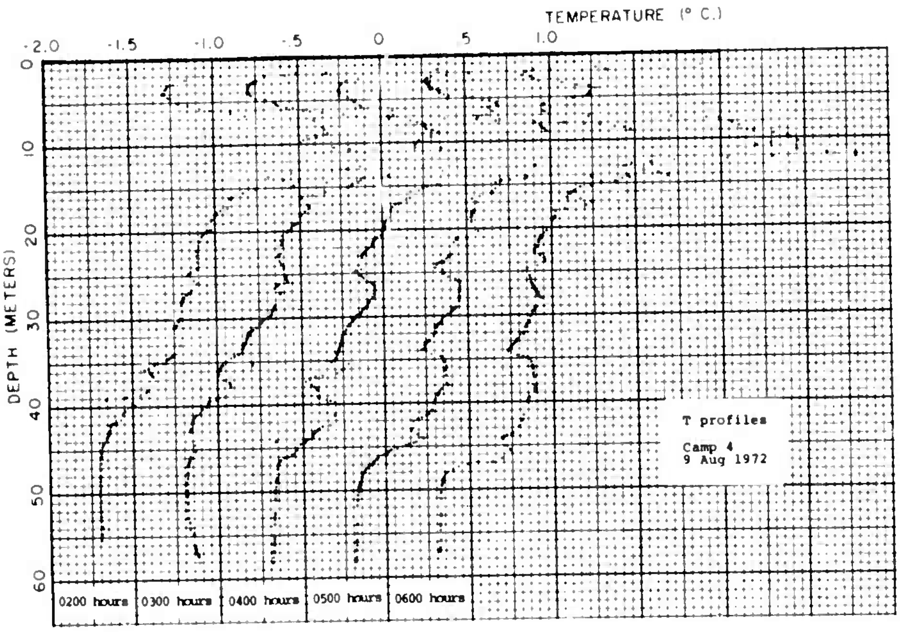
TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
0100 hours
0200 hours
0300 hours
0400 hours
0500 hours
0600 hours
0700 hours
0800 hours
0900 hours
1000 hours
1100 hours
1200 hours
T profiles
Camp 4
7 Aug 1972



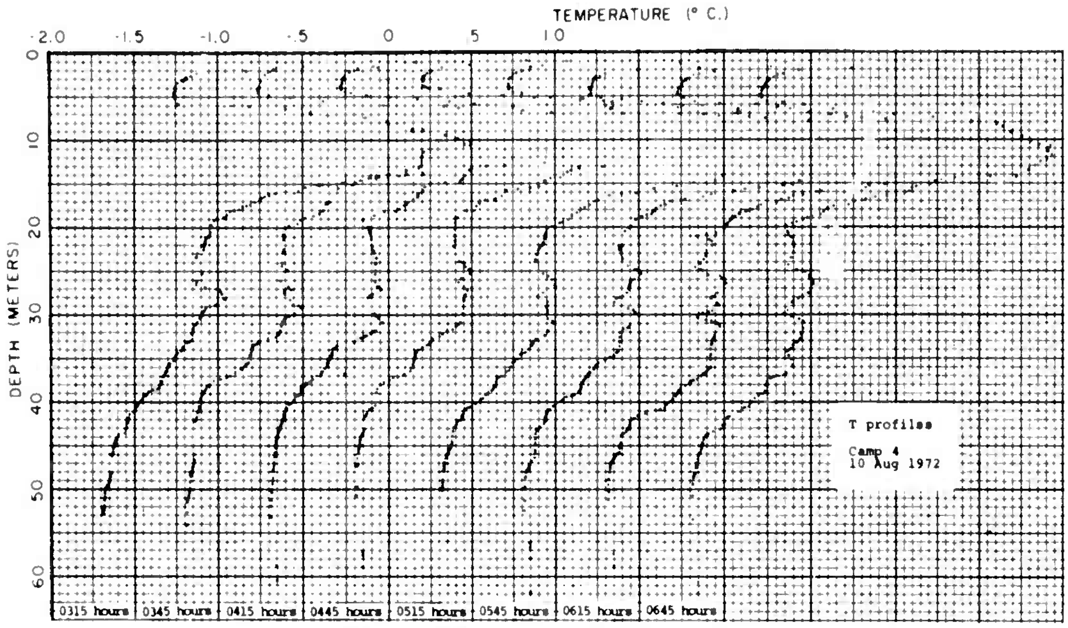
TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
1300 hours
1400 hours
1500 hours
1600 hours
1700 hours
1800 hours
1900 hours
2000 hours
2100 hours
2200 hours
2300 hours
2400 hours
T profiles
Camp 4
7 Aug 1972

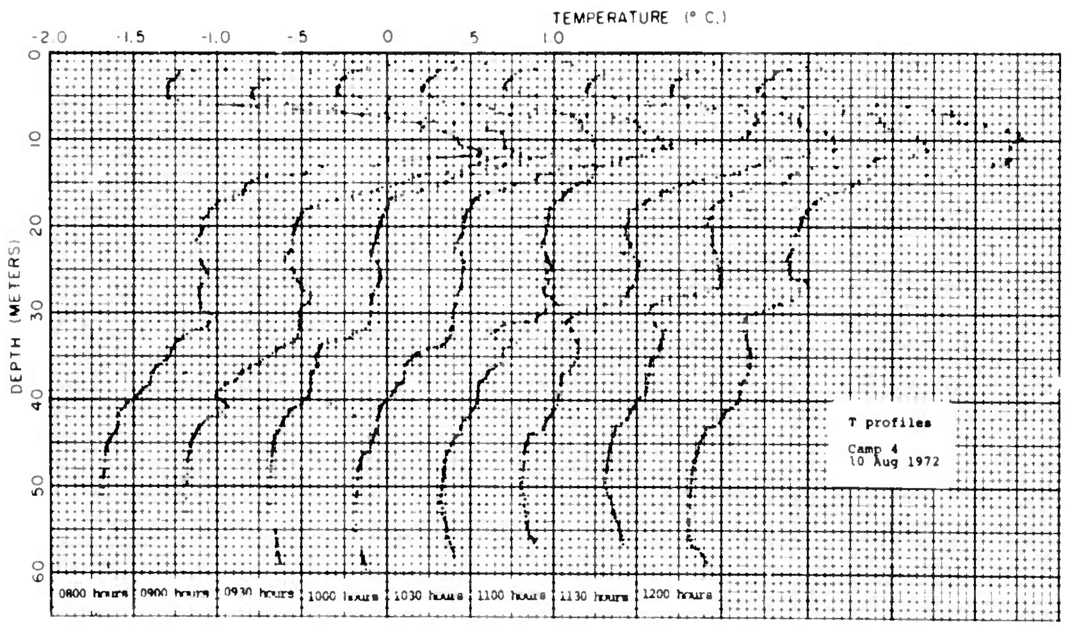


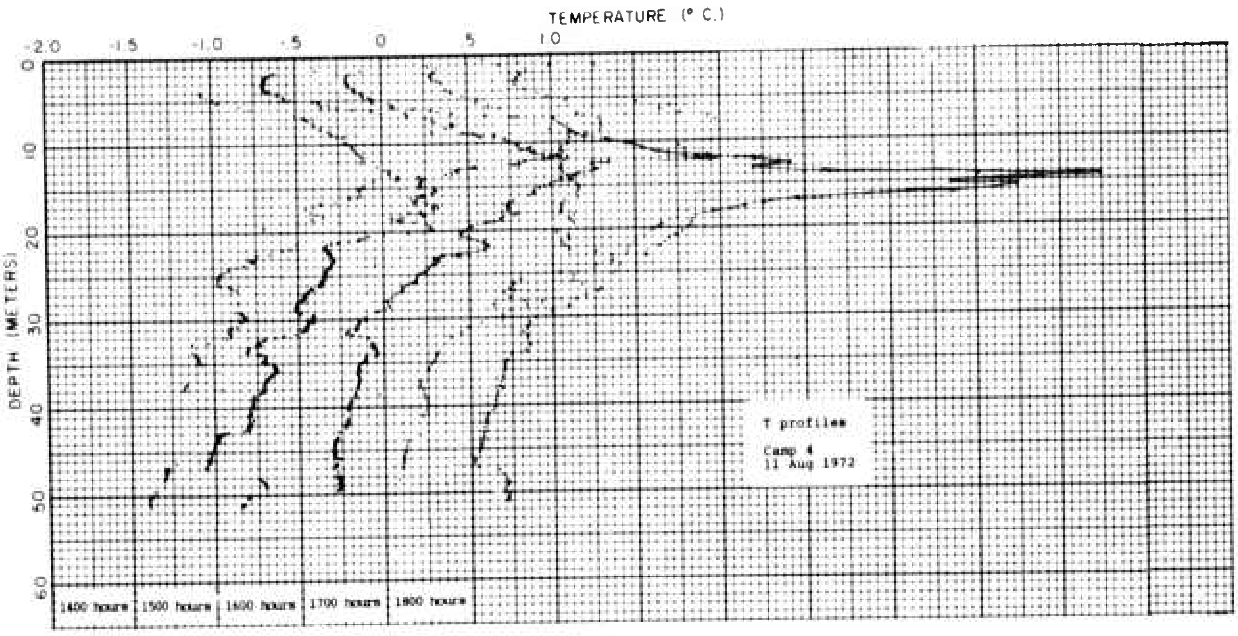
For continuation see Fig. 14b.

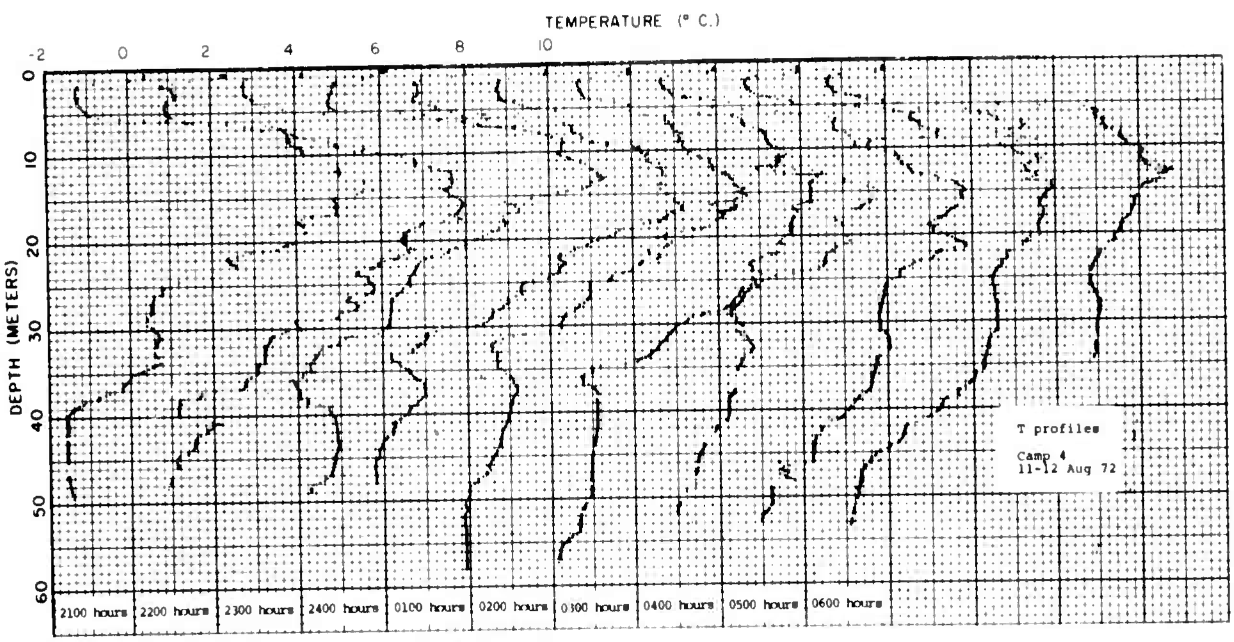


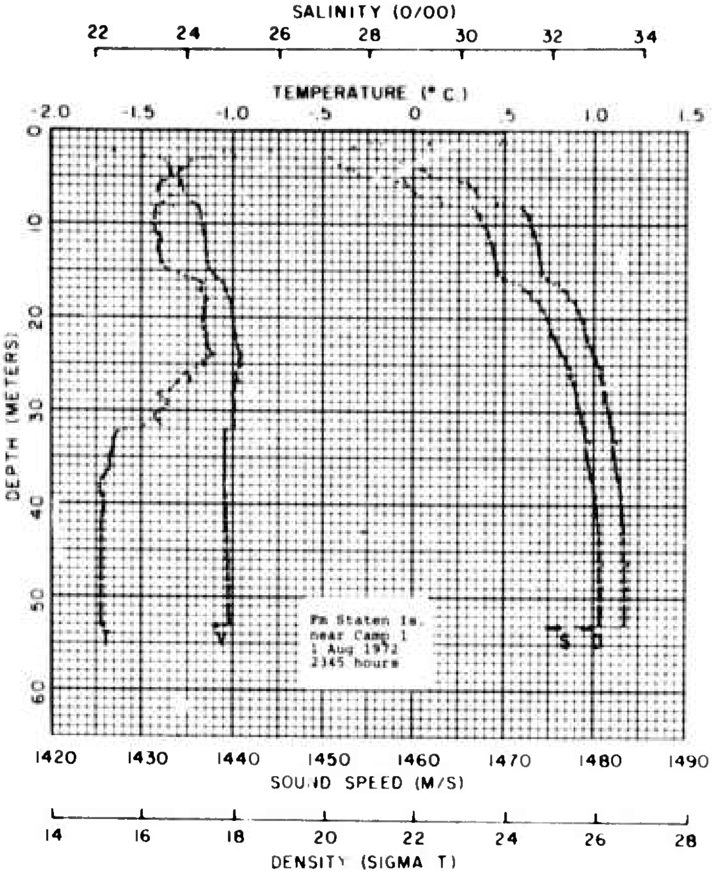
For continuation see Fig. 14b.

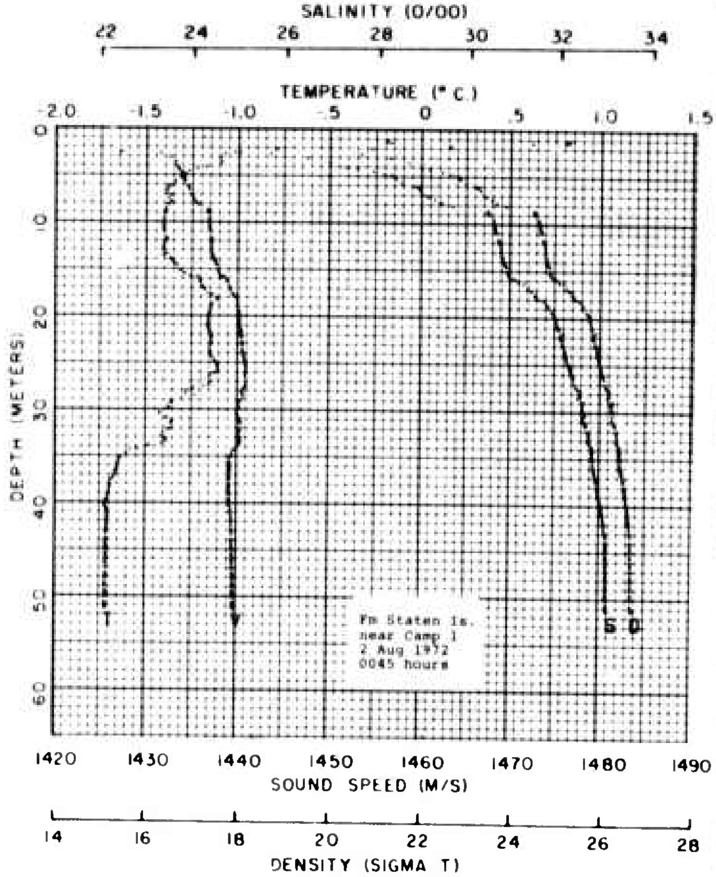

TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
Camp 4
10 Aug 1972
0315 hours 0345 hours 0415 hours 0445 hours 0515 hours 0545 hours 0615 hours 0645 hours

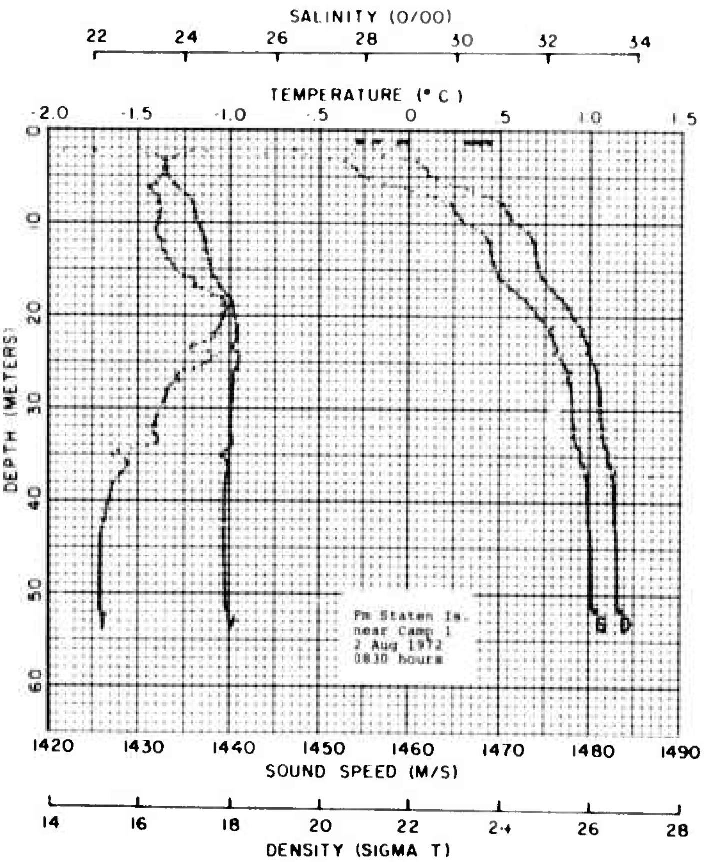

TEMPERATURE (° C.)
-2.0 -1.5 -1.0 -.5 0 .5 1.0
DEPTH (METERS)
0 10 20 30 40 50 60
T profiles
Camp 4
10 Aug 1972
0800 hours 0900 hours 0930 hours 1000 hours 1030 hours 1100 hours 1130 hours 1200 hours

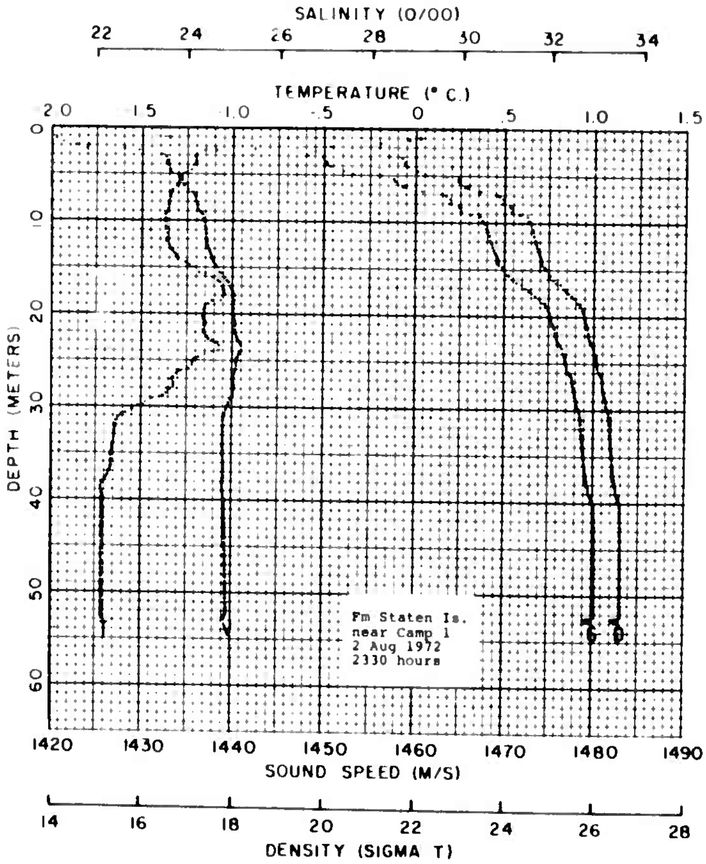

TEMPERATURE (° C.)
-2.0
-1.5
-1.0
-.5
0
.5
1.0
DEPTH (METERS)
0
10
20
30
40
50
60
T profiles
Camp 4
11 Aug 1972
1400 hours
1500 hours
1600 hours
1700 hours
1800 hours

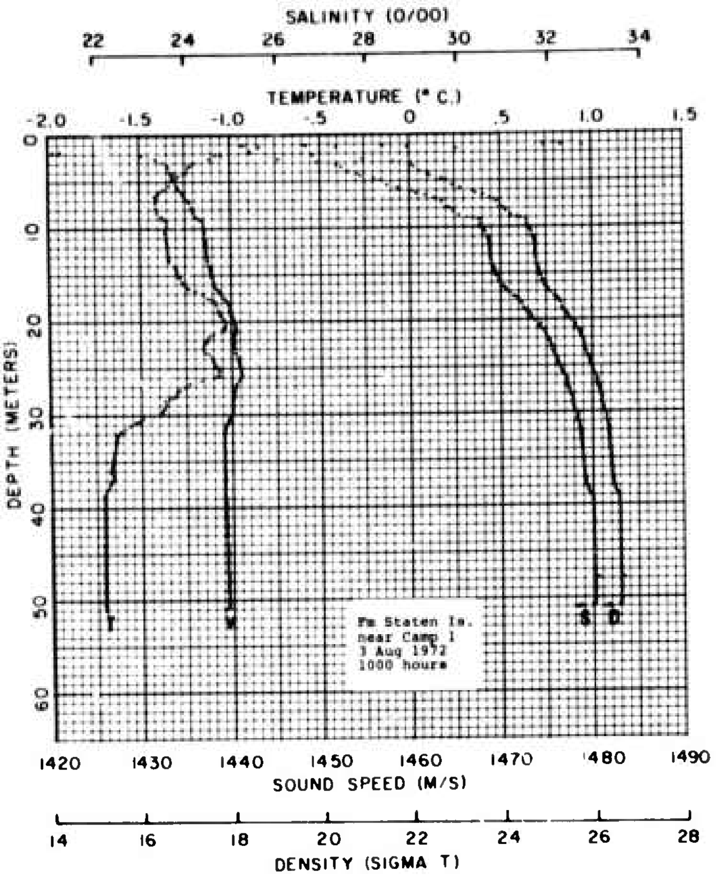

TEMPERATURE (° C.)
-2
0
2
4
6
8
10
DEPTH (METERS)
0
10
20
30
40
50
60
T profiles
Camp 4
11-12 Aug 72
2100 hours
2200 hours
2300 hours
2400 hours
0100 hours
0200 hours
0300 hours
0400 hours
0500 hours
0600 hours

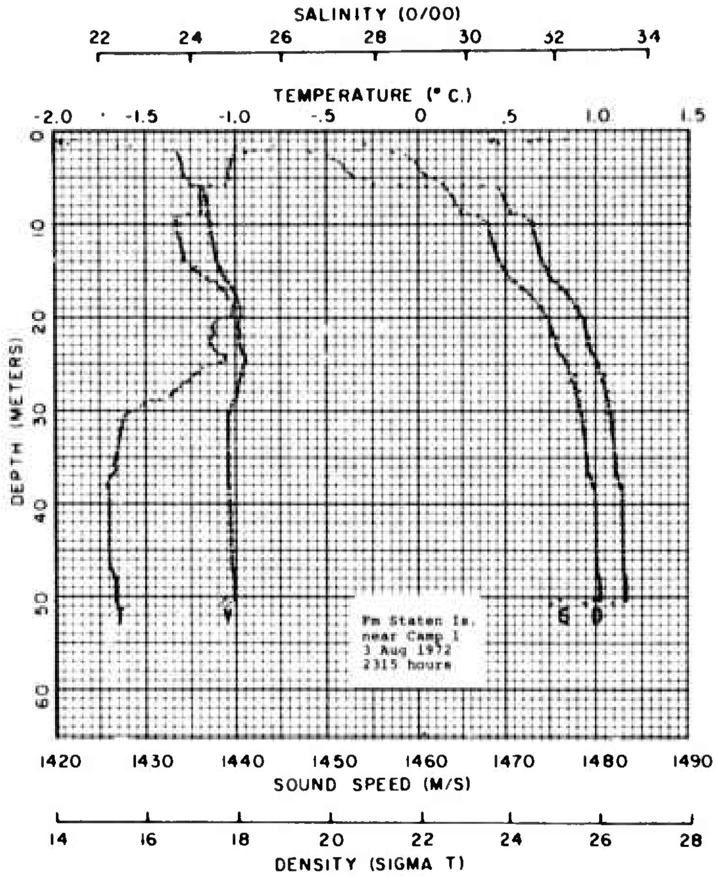

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Fm Staten Is.
near Camp 1
1 Aug 1972
2345 hours
V
S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

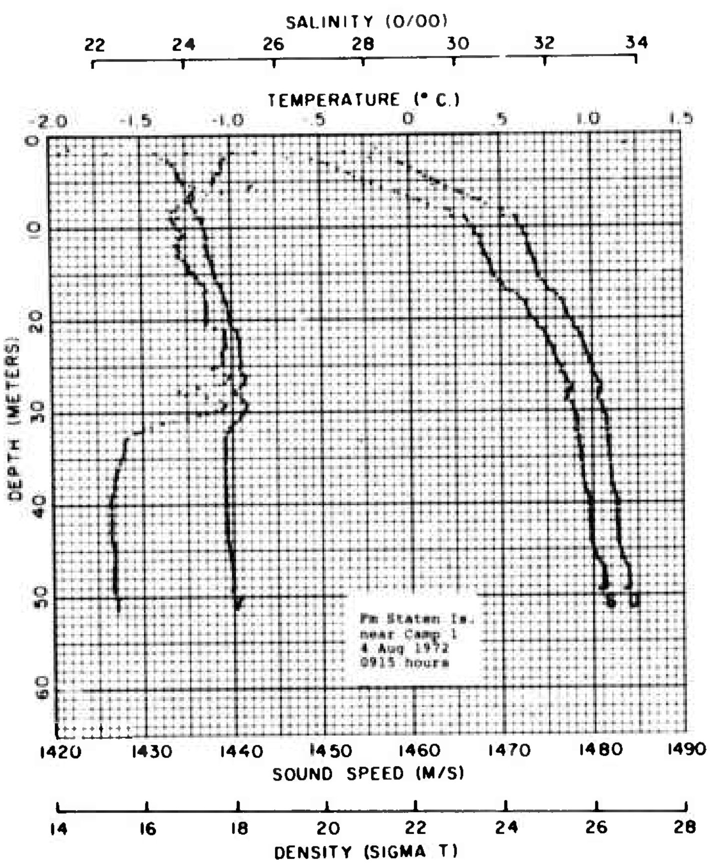

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Fm Staten Is.
near Camp 1
2 Aug 1972
0045 hours
S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)

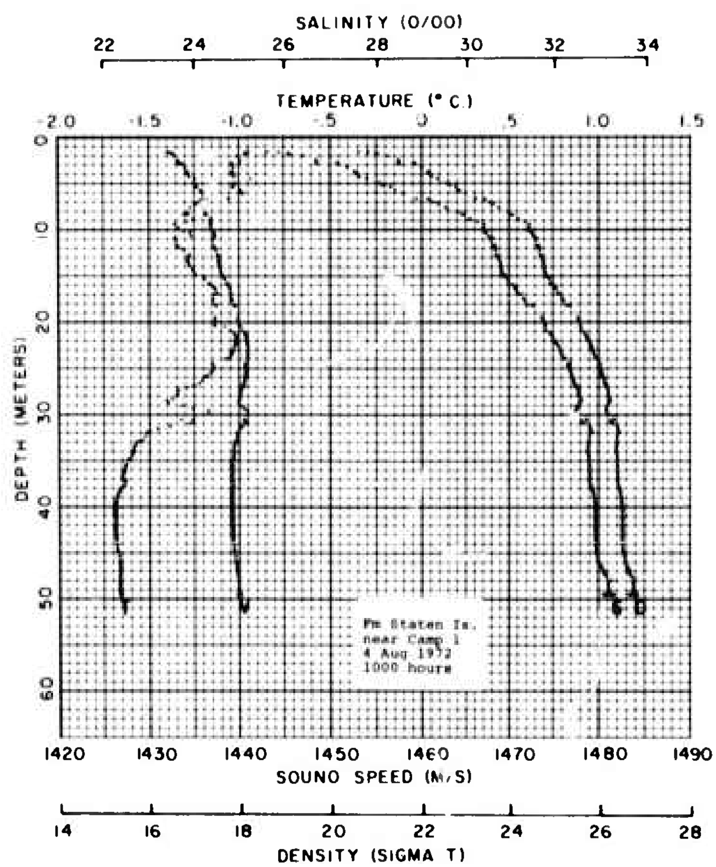

SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Fm Staten Is.
near Camp 1
2 Aug 1972
0830 hours
S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
22 24 26 28 30 32 34
TEMPERATURE (° C)
-2.0 -1.5 -1.0 -.5 0 .5 1.0 1.5
DEPTH (METERS)
0 10 20 30 40 50 60
Fm Staten Is.
near Camp 1
2 Aug 1972
2330 hours
S D
1420 1430 1440 1450 1460 1470 1480 1490
SOUND SPEED (M/S)
14 16 18 20 22 24 26 28
DENSITY (SIGMA T)


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Fm Staten Is.
near Camp 1
3 Aug 1972
1000 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Fm Staten Is.
near Camp 1
3 Aug 1972
2315 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Fm Staten Is.
near Camp 1
4 Aug 1972
0915 hours


SALINITY (0/00)
TEMPERATURE (° C.)
DEPTH (METERS)
SOUND SPEED (M/S)
DENSITY (SIGMA T)
Fm Staten Is.
near Camp 1
4 Aug 1972
1000 hours