TR-46

TECHNICAL REPORT

OCEANOGRAPHIC SURVEY RESULTS BERING SEA AREA WINTER AND SPRING 1955

Oceanographic Survey Branch
Division of Oceanography

APRIL 1958

U. S. NAVY HYDROGRAPHIC OFFICE
WASHINGTON, D. C.

ABSTRACT

This report contains the analysis and tabulation of 79 oceanographic stations occupied by the USCGC NORTHWIND (WAGB-282) and USS BURTON ISLAND (AGB-1) in the Bering Sea during the winter and spring of 1955. Additional oceanographic data presented include representative bathythermograms, analysis of 55 bottom samples, summaries of ice and weather conditions, transparency measurements, and a surface current chart.

During the winter, surface temperatures ranged from −1.85°C just inside the ice pack to 3.4°C in the open water just north of Unimak Pass. In the vicinity of the ice edge temperatures were near 0°C. During the spring, surface temperatures ranged from −1.80°C near Bering Strait to 4.04°C near the Alaskan Peninsula. In the open water north of Unimak Pass the surface water temperature was about 1.7°C warmer on 27 May than it was on 21 April. The 0°C isotherm which approximated the position of the ice edge during the winter had moved about one degree northward during the spring survey.

In the shoal shelf areas, the vertical temperature distribution approaching and underneath the pack ice was isothermal, where the influence of the pack ice was felt to the bottom. In the deeper waters of the survey area, positive vertical gradients were found when approaching the ice boundary and beneath the pack ice for some distance to the north. This condition is the result of warmer waters from the south forming a wedge beneath the cold surface water and pack ice.

During the winter and spring, surface sound velocities ranged from 4,700 ft./sec. within the ice pack to approximately 4,780 ft./sec. south of the ice pack. No definite sound channels could be defined.

The Air Force and Navy participated in a joint project for the photographic identification of sea ice. Simultaneous photographs of sea ice were taken from the ship and reconnaissance aircraft on 5 occasions.

1 Bucket temperature reading.

USNHO—WASH., D. C.

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FOREWORD

This volume presents the cruise narratives and analyses of oceanographic data collected by the icebreaker USCGC NORTHWIND (WAGB-282) and USS BURTON ISLAND (AGB-1) in the Bering Sea area during winter and spring 1955.

H. C. Daniel

H. C. DANIEL
Rear Admiral, U. S. Navy
Hydrographer

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I. INTRODUCTION

A. Purpose

The winter and spring 1955 operations by the USCGC NORTHWIND (WAGB-282) and the USS BURTON ISLAND (AGB-1) were confined to the Bering Sea and the Gulf of Alaska. Collection of oceanographic data was a primary objective essential to sound propagation studies and, at higher latitudes, to ice studies and ice forecasting, the latter data being essential to the support of high latitude operations during summer 1955. Special ice-edge studies required the ships to pass in and out of the ice along the ice boundary. A joint Air Force-Navy project for the photographic identification of sea ice required taking photographs from the ship and from reconnaissance aircraft simultaneously.

In addition to the oceanographic survey program, hydrographic and geophysical surveys were completed, and a research project on the physics of sea ice was conducted by the Navy Electronics Laboratory.

B. Summary of Oceanographic Operations

1. USCGC NORTHWIND - 18 February to 27 April 1955

The NORTHWIND departed San Diego on 18 February 1955 and arrived at Kodiak 26 February. Two oceanographers from the Hydrographic Office were aboard. On 27 February, four scientists from the U. S. Navy Electronics Laboratory and a geophysicist from the Hydrographic Office reported on board. Final arrangements for the joint Air Force-Navy sea-ice photographic project were completed on 1 March. On 2 March the NORTHWIND departed Kodiak enroute to the Bering Sea via Unimak Pass.

It was originally planned that the ship would proceed to the ice edge in the vicinity of the International Date Line and occupy oceanographic stations along a course that penetrated into and out of the ice. However, as high winds and heavy seas were present when the NORTHWIND entered the Bering Sea, it was decided to work the line of ice penetration stations from the eastern end so that the ship would enter the ice pack sooner and thus minimize excessive rolling.

Oceanographic station 1 was occupied on 5 March[1] just inside the edge of the ice pack (Fig. 1). Station 2 was occupied on 6 March when it was necessary for the ship to heave to while repairing the engines. Stations 3 and 4 were made on 7 March after considerable maneuvering to clear ice for the casts.

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1 Date of oceanographic station occupation referred to local mean time. Date recorded on oceanographic station data tabulation in the Appendix is referenced on Greenwich mean time.

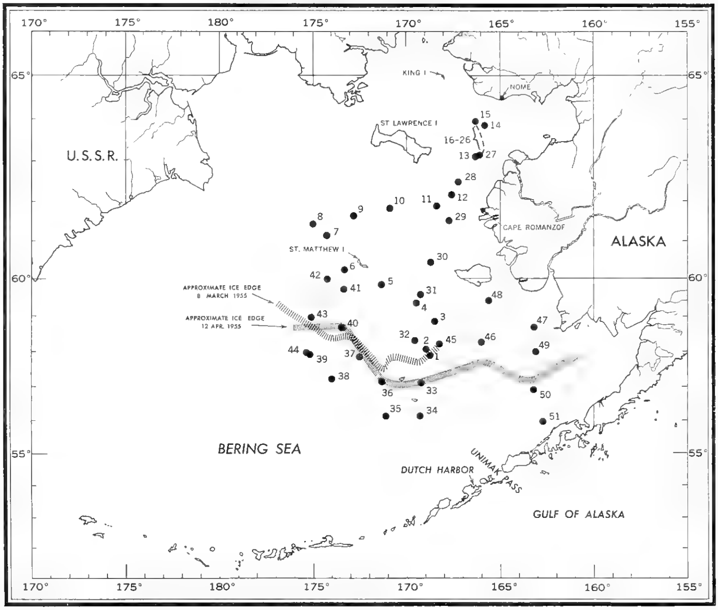

FIGURE 1. STATION LOCATIONS—USCGC NORTHWIND—WINTER 1955

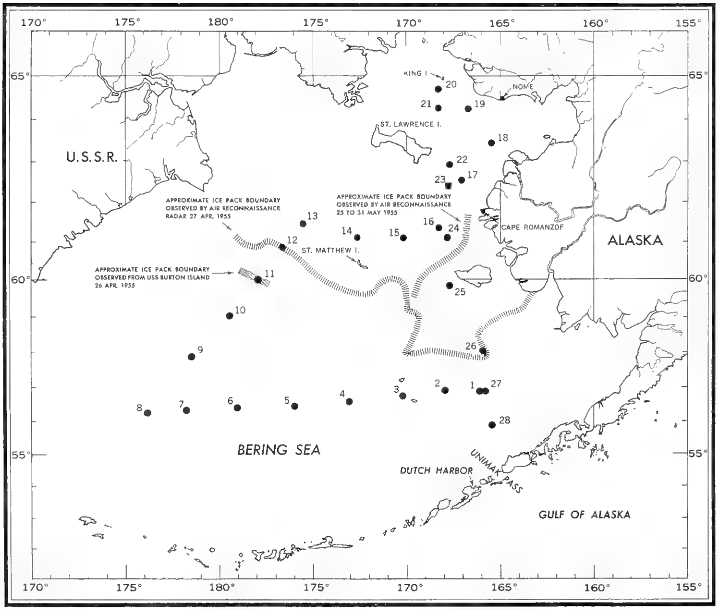

FIGURE 2. STATION LOCATIONS—USS BURTON ISLAND— SPRING 1955

On 8 March the NORTHWIND encountered 50-knot winds and 20-foot swells when 80 miles inside the ice. The breaking up of ice by swell action was an unusual phenomenon to witness. Owing to heavy swells and the danger of ice blocks being washed aboard, it was considered inadvisable to take the planned ice-edge stations, and the ship headed into firm ice. Only the northern stations (5 through 8) of the ice-edge penetration track were taken at this time. Taking advantage of the extensive ice breakup, the NORTHWIND proceeded to Cape Romanzof, taking stations 9 through 11 at 60-mile intervals, and then towards Nome, taking stations 12 through 14 every 60 miles.

The first sea-ice photography flight was made on 18 March, when the ship was approximately 12 miles south of Nome. While the aircraft made its photo runs, the ship's photographers took photographs of the ice around the ship with infrared and Ektachrome film, giving a 360° coverage. Progress through the ice in the vicinity of Nome was very slow, as the thickness of the ice was approximately 4 feet with 1 foot of snow cover. Plans to put in at Nome were given up and the NORTHWIND proceeded to the NEL ice site. Enroute, the second photo flight was made on 22 March.

The ship arrived at the NEL ice site (approximately 40 miles southwest of Nome) on 22 March and was made fast in a 1-mile ice floe about 2½ feet thick where it remained until 5 April. During this period, 13 oceanographic casts (stations 15 through 26) and the remaining sea ice photographic flights (24 March, 1 and 5 April) were made. Several attempts were made to obtain current measurements with an Ekman current meter, but no revolutions were observed due to the ship's drifting with the ice pack.

After completing the NEL ice research work on 5 April, the NORTHWIND proceeded south towards the edge of the ice pack, taking stations 27 through 32 enroute. Oceanographic stations 33 through 44 were taken along the ice penetration track as originally planned. Stations 45 through 51 were occupied subsequently, the latter on 18 April before proceeding to Dutch Harbor for a scheduled rendezvous with the BURTON ISLAND. After the transfer of equipment and oceanographic gear to the BURTON ISLAND, the NORTHWIND departed for San Diego, arriving at the Naval Air Station on 27 April 1955.

2. USS BURTON ISLAND - 5 April to 6 June 1955

The BURTON ISLAND departed San Diego on 5 April 1955, and arrived at Kodiak on 14 April. One oceanographer from the Hydrographic Office and two civilian scientists from the U. S. Navy Electronics Laboratory were on board. On 17 April the BURTON ISLAND departed Kodiak for Dutch Harbor. Following a scheduled rendezvous with the NORTHWIND at Dutch Harbor on 19 April, the BURTON ISLAND commenced oceanographic operations in the Bering Sea (fig. 2). Stations 1 through 9 were taken during the period 21 April through 25 April. On 26 April the ship entered the ice pack and remained until 26 May. Stations 10 through 18 were taken during this period. Stations 6 through 10 were the westernmost and deepest casts obtained during the winter and spring oceanographic operations in the Bering Sea. Ice observations at 6-hour intervals were reported to Fleet Weather Central at Kodiak and the Hydrographic Office. Ice charts were received the day after long-range reconnaissance flights were made from Kodiak. The location of the southern ice boundary and ice conditions found throughout the pack coincided generally with those reported by Fleet Weather Central (Kodiak) observers. On 4 May the ship was moored to fast ice 4½ miles from Nome.

On 8 May the ship departed Nome and headed northwest, occupying station 19 on 10 May. From 10 to 16 May, hardly any progress was made due to heavy pack ice ranging from 4 to 6 feet thick. Station 20 was occupied about 20 miles south of King Island on 16 May. At this point the ship headed southeast for more navigable waters, taking stations 21 through 27. Ice conditions were more severe in this area than they were the previous spring. The ice was thicker and less broken. The spring breakup, which was complete in late May 1954, was only commencing at this time in 1955.

On 25 May extreme pressure from the ice pack was relieved by the spring breakup, and a normal course was again resumed. Station 28 was occupied on 27 May to complete the oceanographic stations. The cruise was completed with the arrival of the BURTON ISLAND at San Diego on 6 June.

3. Accomplishments

Bathythermograph observations generally were taken hourly in the operational area, except when stopped on oceanographic stations or when ice conditions reduced the ship's progress, at which time they were taken at 10-mile intervals. Along the ice penetration track followed by the NORTHWIND, BT lowerings were increased to every 15 minutes when approaching and leaving the ice edge, ice conditions permitting. Transparency measurements were made on each oceanographic station during daylight hours by means of a 30-centimeter white Secchi disc. Hourly weather observations, 6-hourly ice observations while in the ice, and continuous sonic soundings while underway, were recorded.

Despite adverse weather, sea, and ice conditions, 51 oceanographic stations were occupied by the NORTHWIND between 5 March and 18 April, and 269 BT observations were obtained. A total of 247 salinity samples was sent to the Hydrographic Office for analysis. In addition, 238 oxygen samples were analyzed aboard ship, and 33 bottom samples were secured using a Dietz-LaFond bottom sampler. Photographs of sea ice were taken simultaneously from the ship and from reconnaissance aircraft on 5 occasions.

The BURTON ISLAND occupied 28 oceanographic stations between 21 April and 27 May, seven of these required double Nansen casts. A total of 210 bathythermograph observations was obtained, and approximately 192 salinity samples were returned to the Hydrographic Office for analysis. Twenty-two bottom samples were secured with a Dietz-LaFond bottom sampler. Since only one Hydrographic Office representative was aboard, oxygen analyses and current measurements were omitted. The spring phase of the sea-ice photography project was not carried out, owing to limited visibility and low ceilings whenever the reconnaissance planes were in the area.

C. Participating Personnel

The following civilian scientists took part in the winter and spring 1955 Bering Sea operations:

USCGC NORTHWIND

Dr. Edward M. Little (Sr. NEL representative)	- Naval Electronics Lab.
Norman C. Hicks	- Naval Electronics Lab.
James N. Brown	- Naval Electronics Lab.
Edward E. Howick	- Naval Electronics Lab.
Melvin Light (Sr. NHO representative)	- Navy Hydrographic Office
Rhea A. Dail	- Navy Hydrographic Office
Paul E. Jamison	- Navy Hydrographic Office

USS BURTON ISLAND

Lloyd W. Wilson	- Navy Hydrographic Office
Robert T. Brackett	- Naval Electronics Lab.

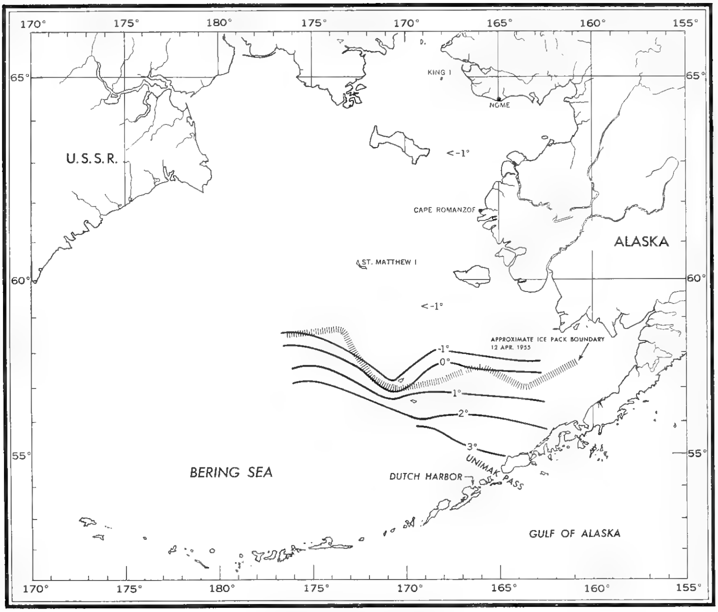

FIGURE 3. SURFACE TEMPERATURE DISTRIBUTION (°C) — WINTER 1955

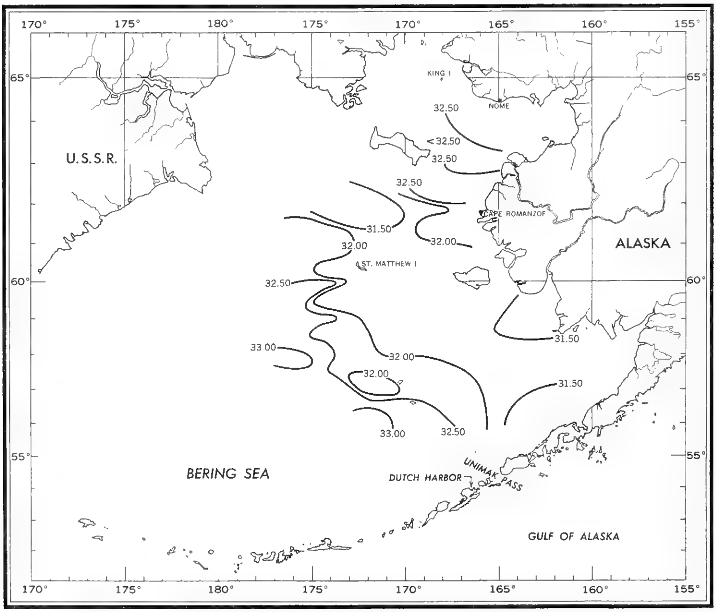

FIGURE 4. SURFACE SALINITY DISTRIBUTION (°/₀₀) — WINTER 1955

II. BERING SEA - OCEANOGRAPHY

A. General

The Bering Sea is bounded on the north by Bering Strait, on the east by Alaska, on the west by Siberia, and on the south by the Komandorski and Aleutian Islands. In the deeper southern portion of the Bering Sea, water masses are found which are similar to subarctic water masses in the North Pacific Ocean. To the east and north, waters over the shallow shelf areas are characterized by lower salinity caused by dilution from river runoff. Ice is found in the Bering Sea at least eight months of the year.

B. Physical Properties - Winter 1955

Surface temperatures and salinities observed in the Bering Sea during March and April are shown in Figures 3 and 4. Surface temperatures are based on observations taken with reversing thermometers at oceanographic stations, supplemented by thermometer readings from bucket samples taken while the ship was underway. Salinity values are based on the surface sample from the Nansen casts. Sections depicting vertical distribution of temperature, salinity, density, and sound velocity characteristics are presented in Figures 5 through 10.

1. Temperature

Surface temperatures observed in the Bering Sea (Fig. 3) ranged from -1.85°C at station 3 inside the ice pack to 3.4°C[1] in the open water just north of Unimak Pass. Progressing northward, surface temperatures decreased to near 0°C in the vicinity of the ice edge.

Vertical distribution of temperature within the ice pack was nearly isothermal (Figs. 5 and 6), ranging from a maximum of -1.66°C at the surface to a minimum of -1.80°C at approximately 50 meters depth, except at station 3 where the lowest observed temperature in the area occurred at the surface.

The temperature structure across the ice boundary is shown in Figures 7 through 10. In these sections, sharp horizontal surface gradients are present near the boundary of the pack ice. Vertically, the temperature distribution approaching and underneath the pack ice is characterized by two distinct structures. In the first type (Figs. 7 and 8), the water is isothermal with depth, but sharp horizontal gradients are found at all depths from the surface to the bottom within a zone near the ice boundary. Waters having these characteristics are found over the shoal shelf areas where the influence of the pack ice is felt to the bottom. In the second type (Figs. 9 and 10), warmer water

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[1] Bucket temperature reading

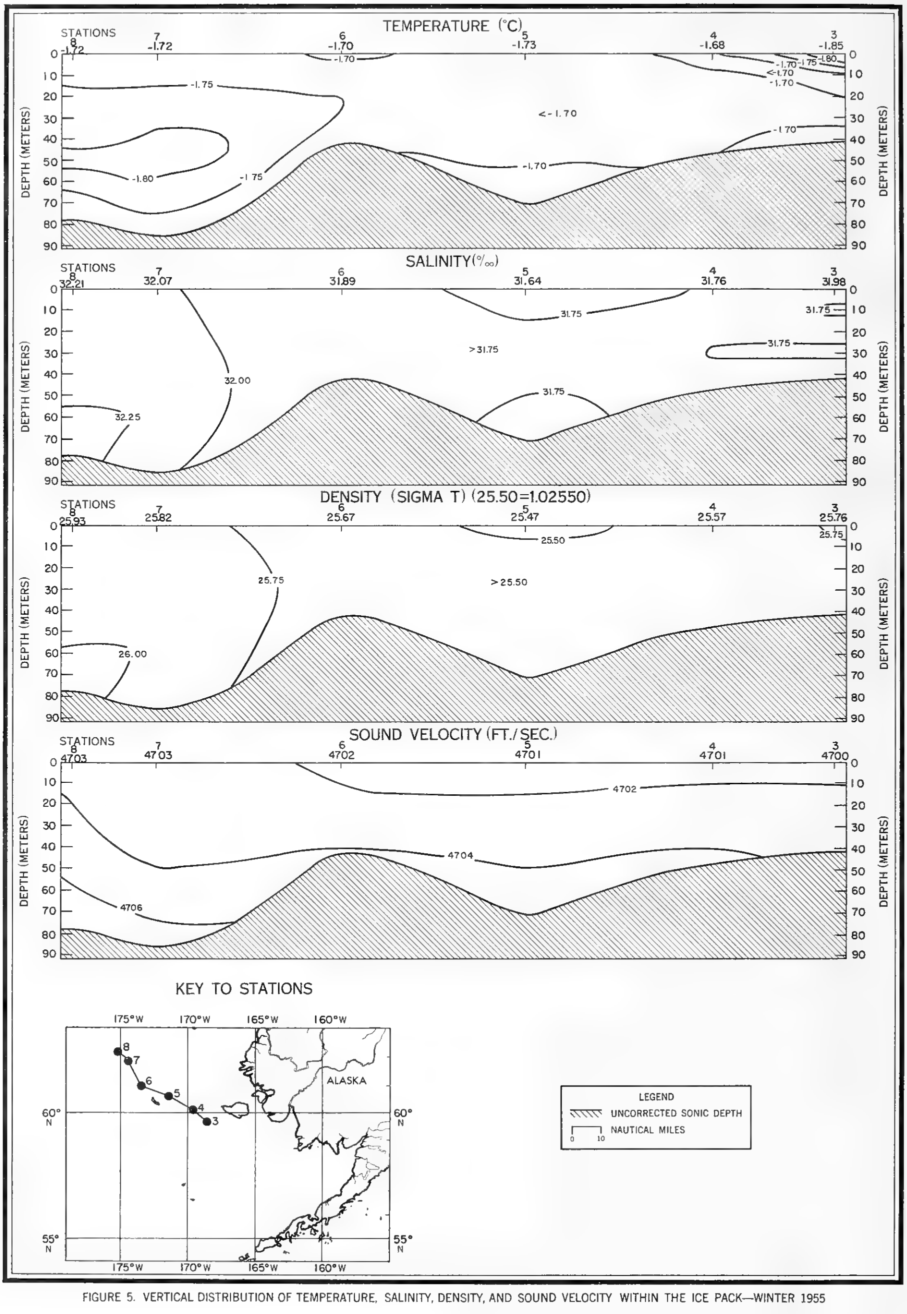


FIGURE 5. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY WITHIN THE ICE PACK—WINTER 1955

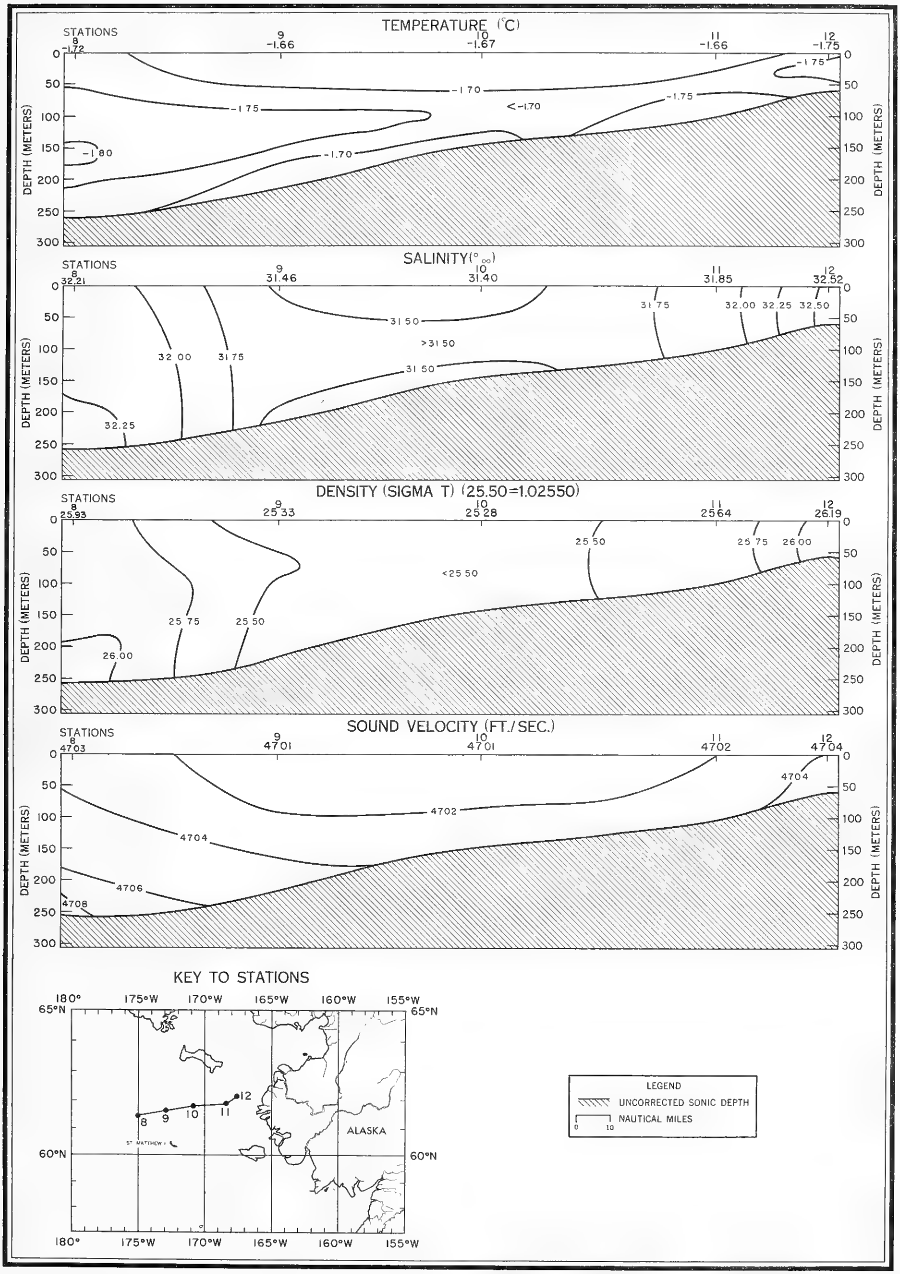


FIGURE 6. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY WITHIN THE ICE PACK—WINTER 1955

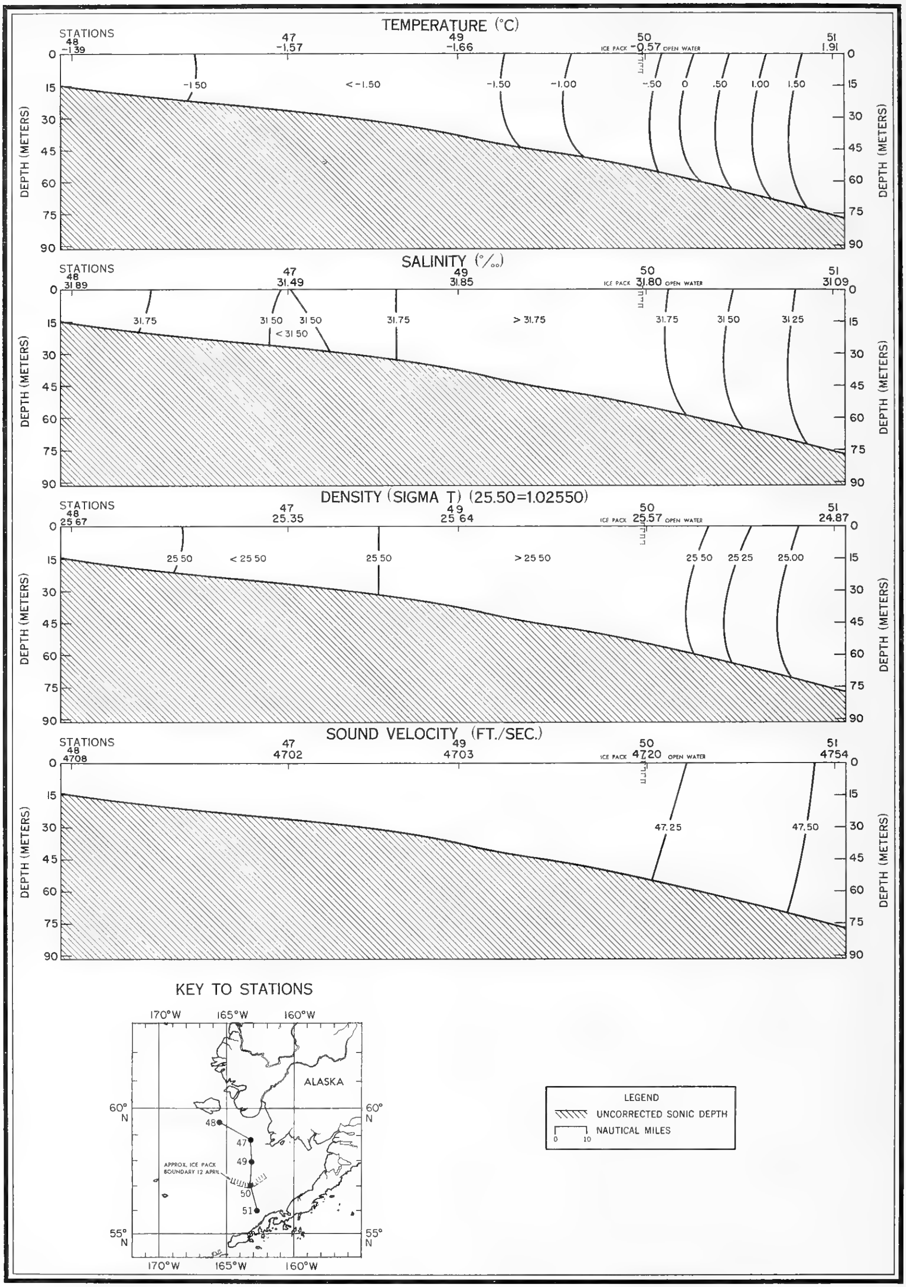


FIGURE 7. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY ACROSS ICE BOUNDARY (SHELF AREA)—WINTER 1955

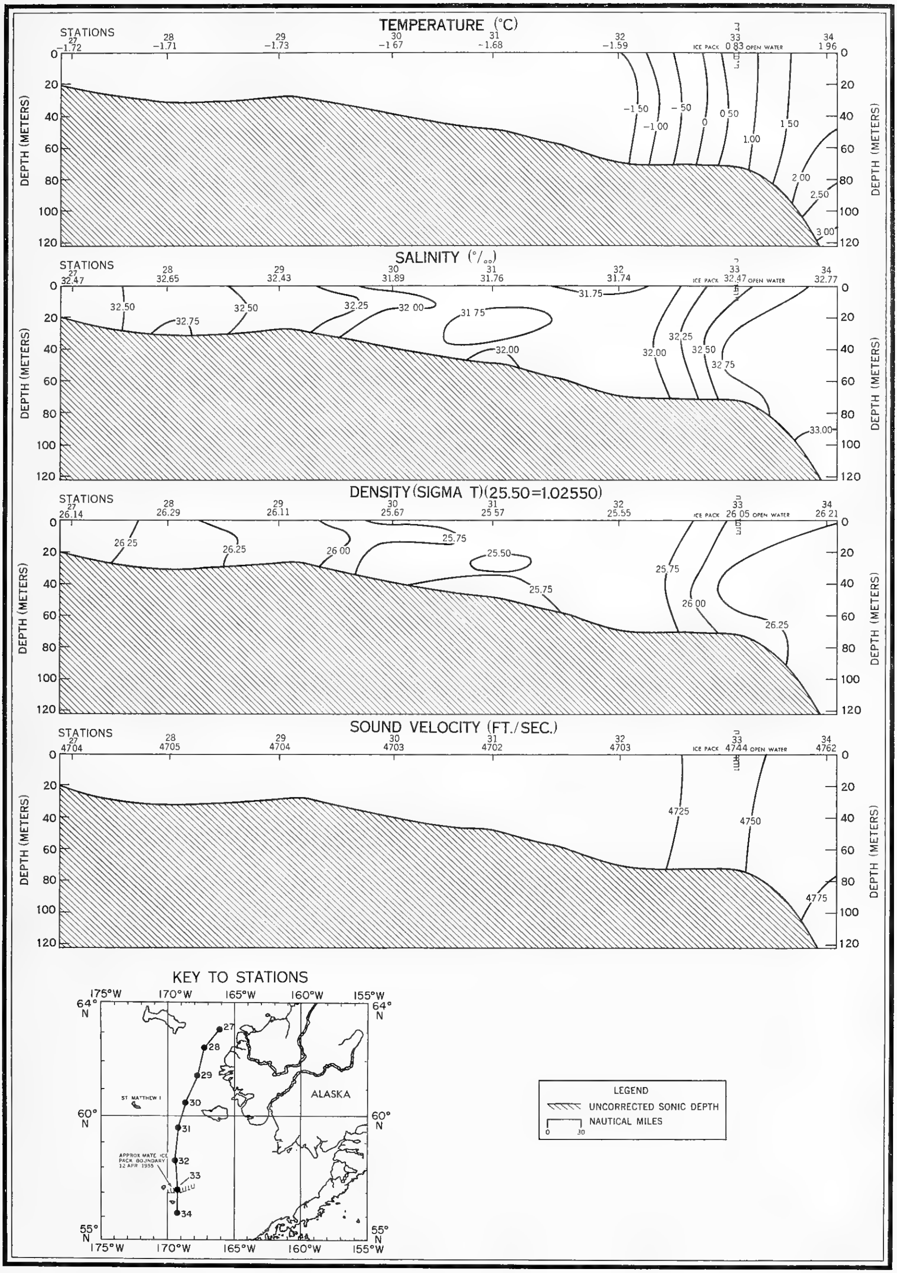


FIGURE 8. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY ACROSS ICE BOUNDARY (SHELF AREA)—WINTER 1955

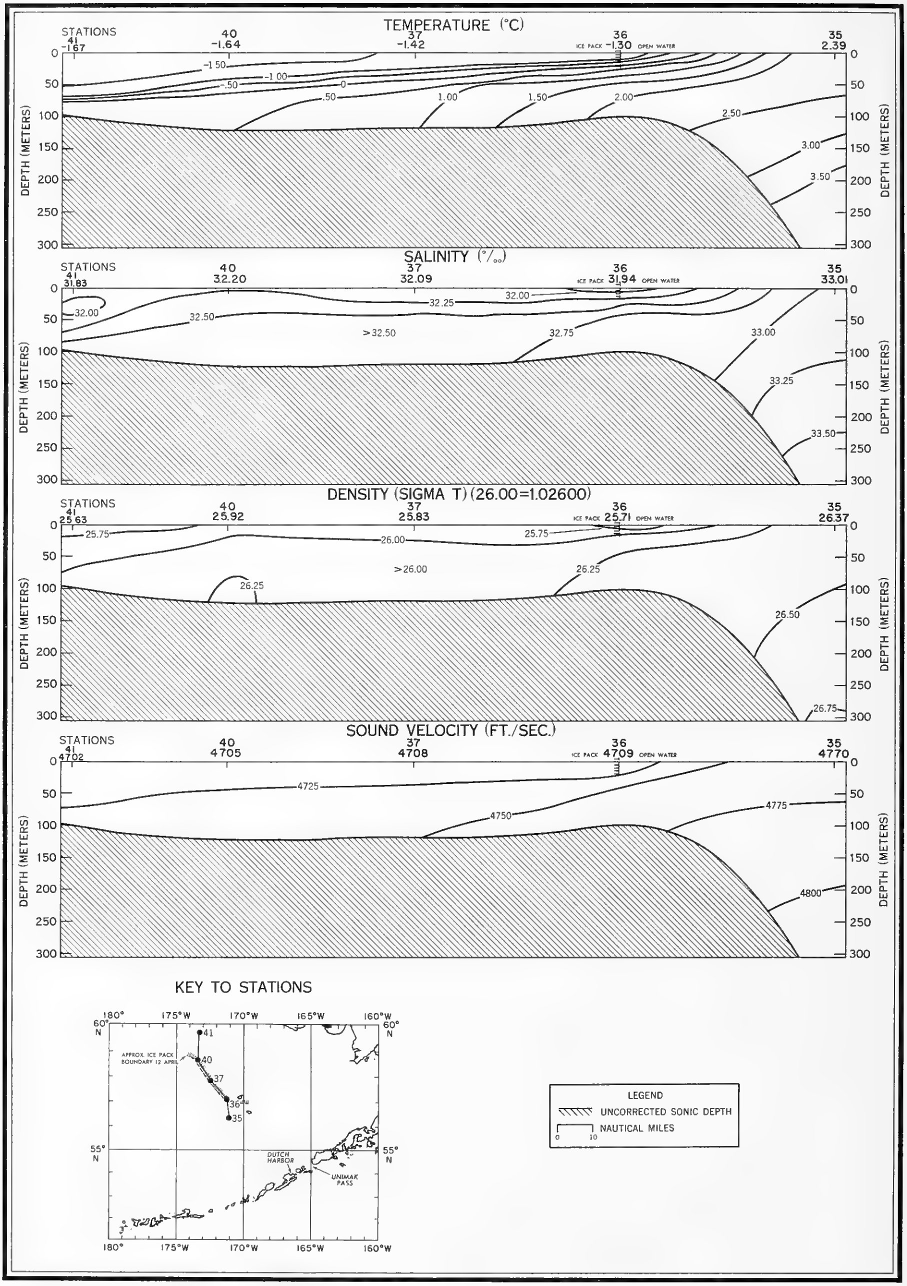


FIGURE 9. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY ACROSS ICE BOUNDARY (DEEP AREA)—SPRING 1955

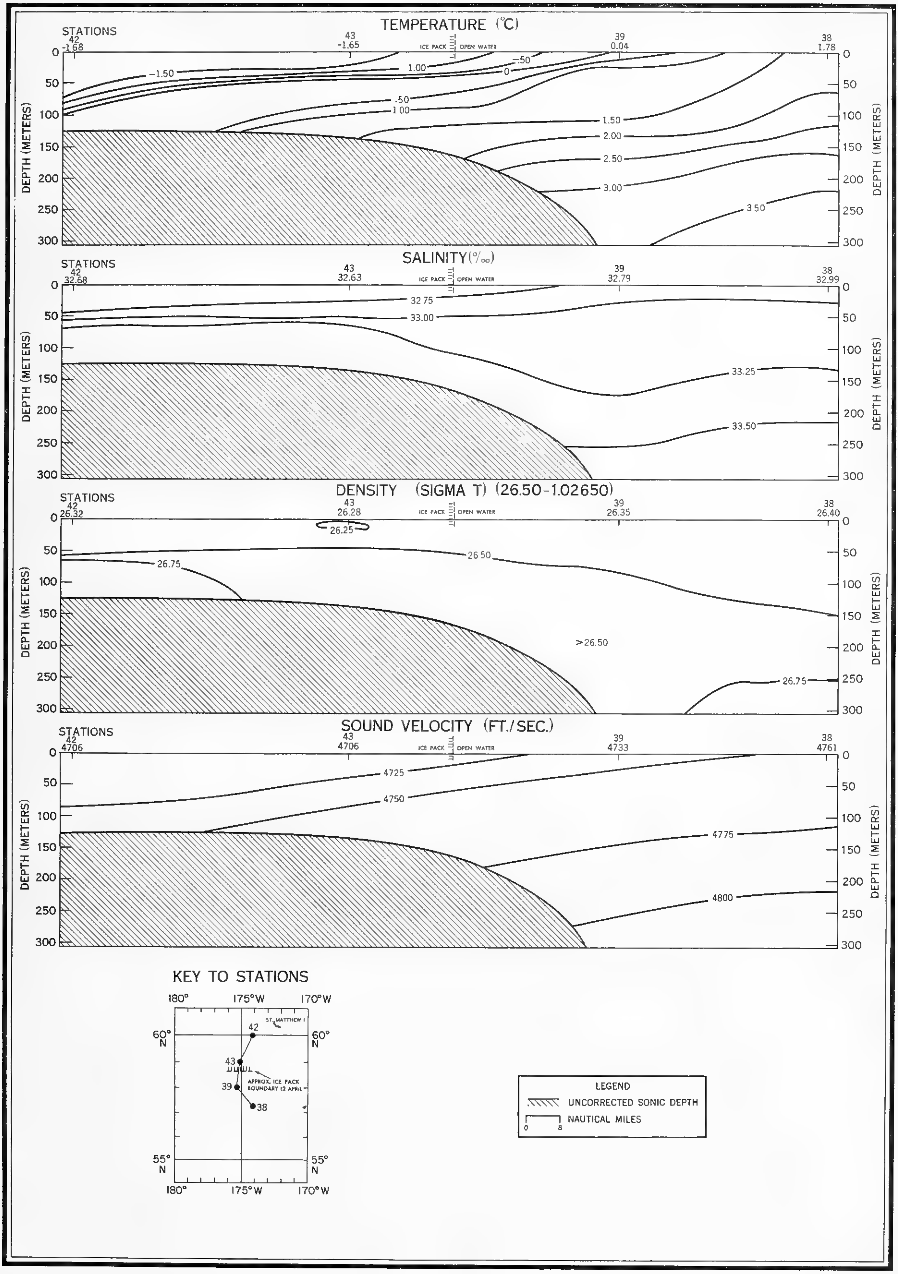


FIGURE 10. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY ACROSS ICE BOUNDARY (DEEP AREA)—WINTER 1955

from the south forms a wedge beneath the cold surface water and pack ice. This phenomenon takes place in the deeper waters of the survey area. As a result, positive vertical gradients are found in these areas when approaching the ice boundary and beneath the pack ice for some distance to the north.

2. Salinity

Surface salinity values (Fig. 4) ranged from 31.09 $^{o}/oo$ in open water near the Alaskan Penisula to 33.08 $^{o}/oo$ in the southwestern part of the survey area. Higher salinity values were found in the open waters, particularly south of the ice boundary. Salinity values tended to be lower in the shallow waters overlying the shelf where dilution from river runoff occurred. Figures 5 through 10 show the vertical distribution of salinity to be variable in shallow water and to increase with depth where deep water is present.

3. Density

The pattern of density distribution shown in Figures 5 through 10 is similar to that of salinity. Variable conditions are typical of the shoal areas. An increase in density with depth is found where the greater depths occur.

4. Sound Velocity

Surface sound velocities ranged from 4,700 ft./sec. at station 3 within the pack ice to 4,770 ft./sec. at station 35 in open water south of the ice boundary (Figs. 5 through 10). Due to the shallow nature of the area, no definite sound channel could be defined. In each section sound velocity increased with depth, the rate of increase being greatest in the deep water areas. The maximum sound velocity observed was 4,808 ft./sec. at a depth of 300 meters (station 38).

C. Physical Properties - Spring 1955

Surface temperatures and salinities observed in the Bering Sea between 20 April and 27 May are shown in Figures 11 and 12. Sections depicting the vertical distribution of physical properties during this period are presented in Figures 13 through 16.

1. Temperature

Surface temperatures during the spring of 1955 are shown in Figure 11. The 0°C isotherm which approximated the position of the ice edge during the winter had moved about one degree northward. Isothermal surface water (having temperatures less than -1.0°C) is primarily confined to the area north of St. Matthew Island.

Surface temperatures ranged from -1.80°C near Bering Strait to 4.04°C

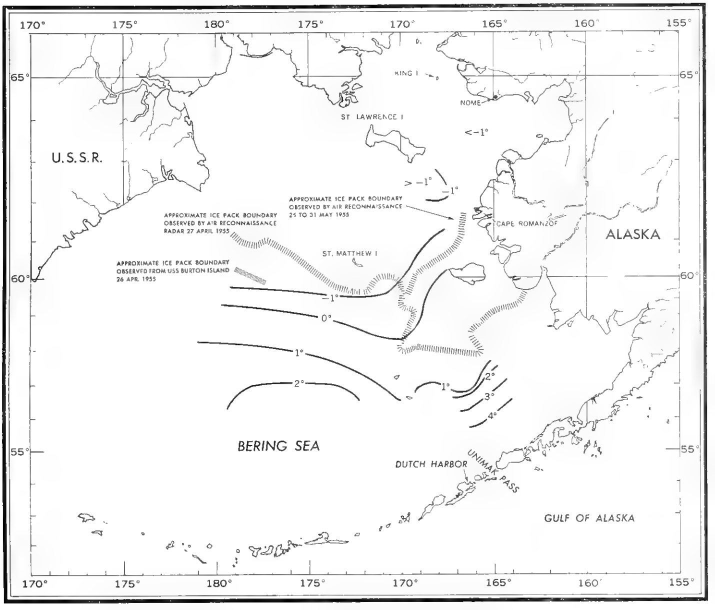


FIGURE 11. SURFACE TEMPERATURE DISTRIBUTION (°C)— SPRING 1955

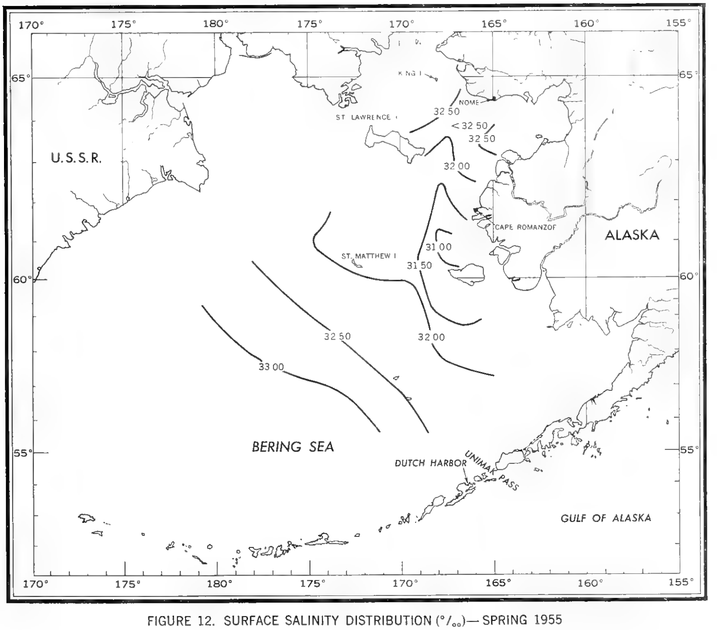


FIGURE 12. SURFACE SALINITY DISTRIBUTION (°/₀₀)— SPRING 1955

near the Alaskan Peninsula. In the open water north of Unimak Pass the surface water temperature was approximately 1.7°C warmer on 27 May (station 27) than it was on 21 April (station 1). Vertically, temperatures in the open water south of the ice pack (Fig. 13) increase with depth to 500 meters. In the deep water off the shelf the positive vertical gradient is steepest at depths of 150 to 250 meters. Below this depth water temperatures decrease gradually. The temperature structure across the ice boundary in spring (Figs. 14 and 15) is similar to that observed in winter. In the deeper waters (Fig. 14), positive vertical gradients were observed beneath the ice and south of the ice boundary. Over the shelf areas (Fig. 15), isothermal conditions prevailed with strong horizontal gradients south of the ice boundary. Within the ice pack (Fig. 16) temperature conditions remained isothermal.

2. Salinity

Surface salinity distribution during spring 1955 is shown in Figure 12. Salinity decreases from the southwest to the east and northeast. This change from the deeper waters of the southwest to the shallow waters over the shelf is similar to that observed in winter, but the values at given positions are higher in spring, indicating the northward penetration of more saline water following the retreating ice edge. Little seasonal change is evident northeast of St. Lawrence Island, where salinity values tend to remain slightly higher than those observed southeast of the island.

Cross sections depicting the vertical distribution of salinity are presented in Figures 13 through 16. In deep water, salinity increases with depth. In shallow water, salinity conditions are nearly isohaline.

The higher values northeast of St. Lawrence Island are apparent in Figure 15 (stations 20, 21, and 22).

3. Density

Density characteristics during spring follow much the same pattern in shallow and deep waters as observed during the winter season (Figs. 13 through 16).

4. Sound Velocity

Surface sound velocity (Figs. 13 through 16) ranged from 4,702 ft./sec. (stations 13, 14, and 15) to 4,789 ft./sec. (station 28) in open water south of the ice pack. The maximum subsurface sound velocity observed was 4,947 ft./sec. at a depth of 3,068 meters (station 6). No definite sound channel could be defined.

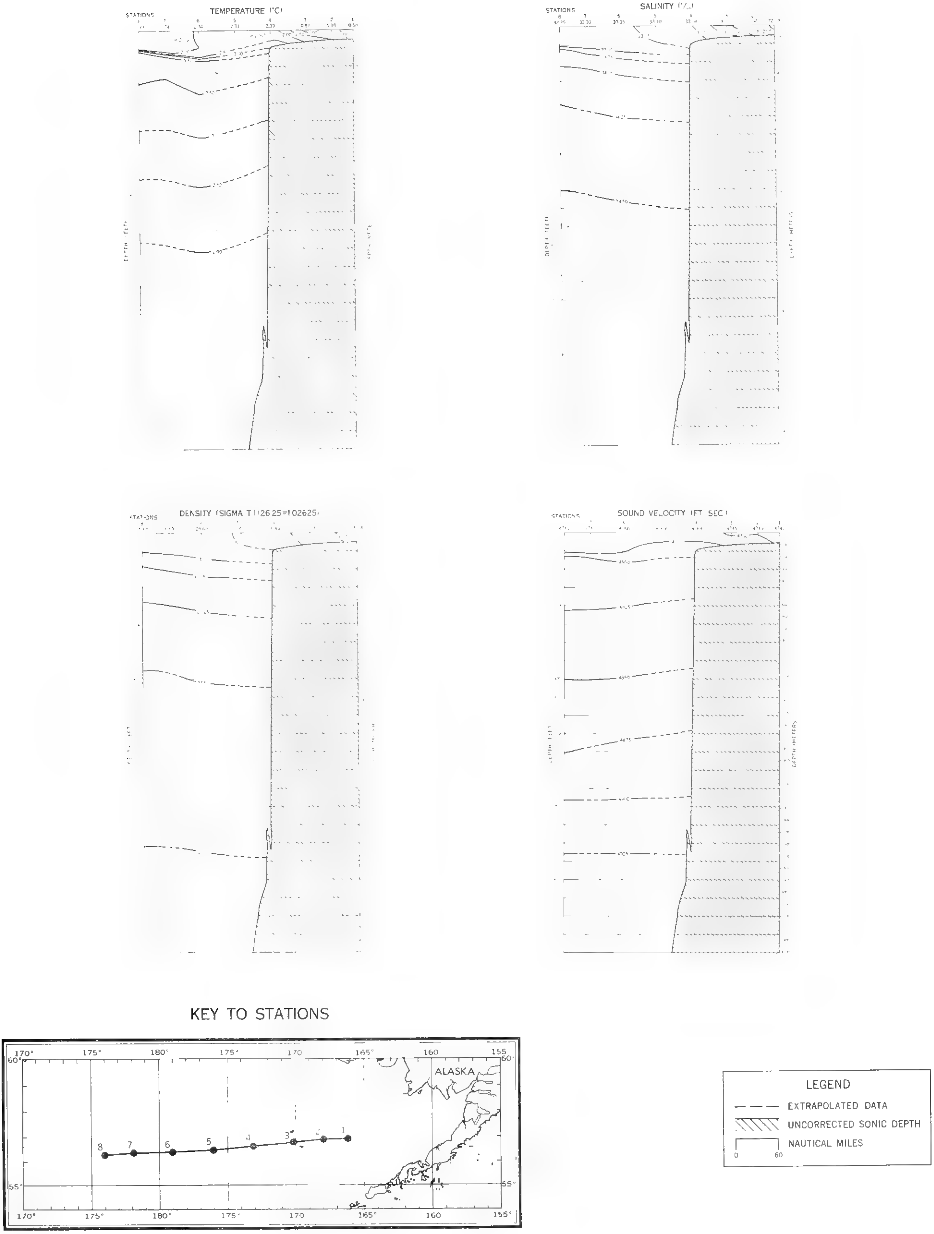


FIGURE 13. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY IN OPEN WATER AREA—SPRING 1955

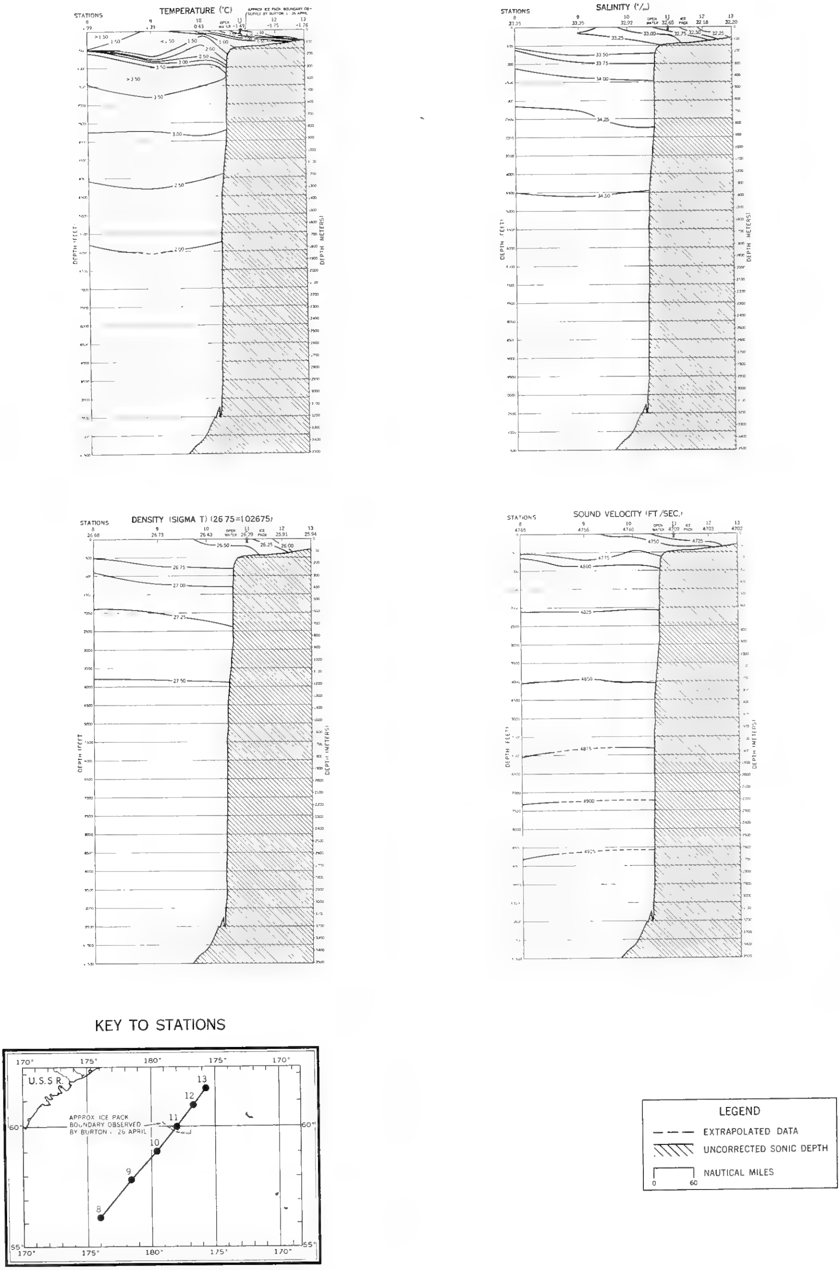


FIGURE 14. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY ACROSS THE ICE BOUNDARY (DEEP AREA)—SPRING 1955

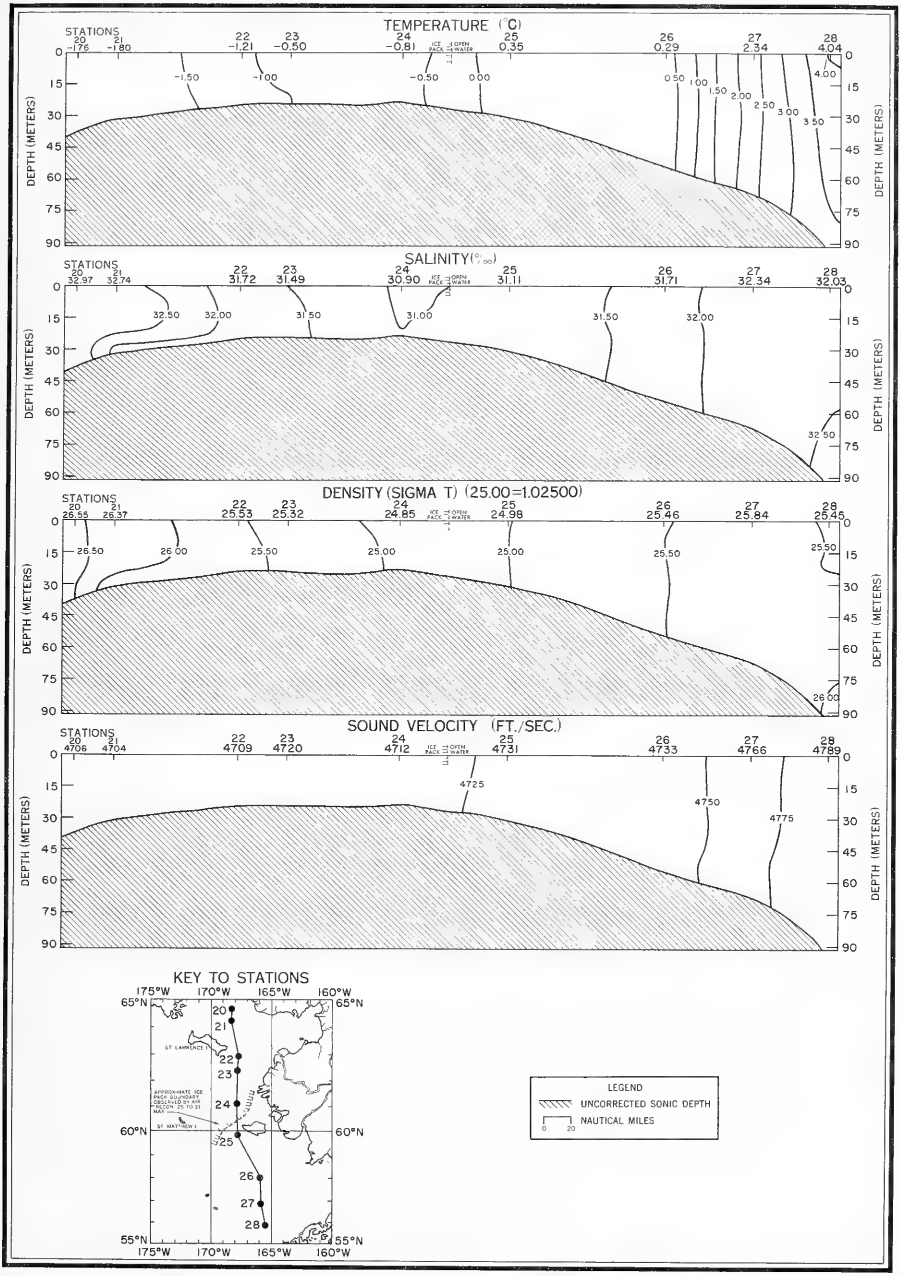


FIGURE 15. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY ACROSS ICE BOUNDARY (SHELF AREA)—SPRING 1955

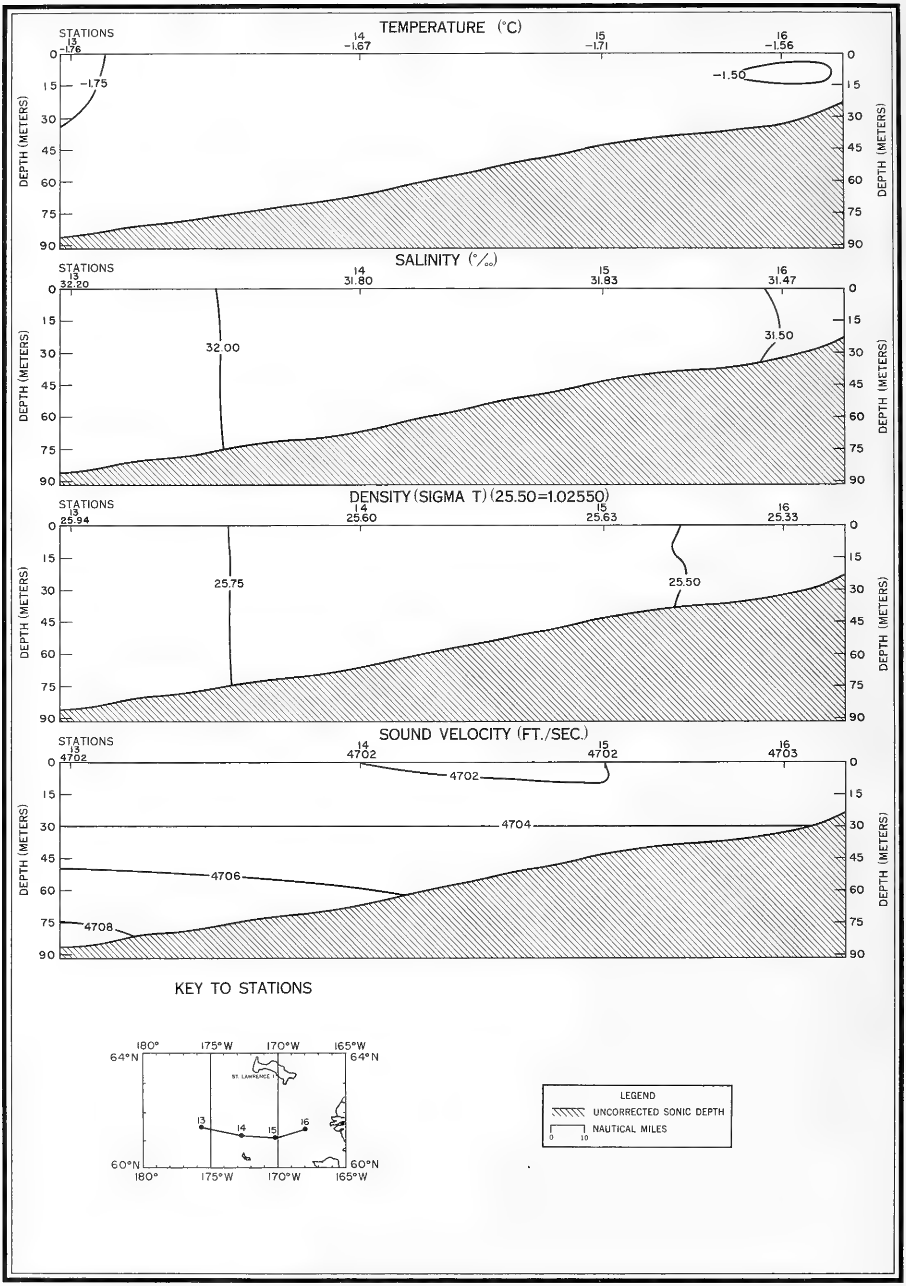


FIGURE 16. VERTICAL DISTRIBUTION OF TEMPERATURE, SALINITY, DENSITY, AND SOUND VELOCITY WITHIN THE ICE PACK—SPRING 1955

III. MISCELLANEOUS

A. Ice Conditions

1. Winter 1955 - USCGC NORTHWIND

Ice conditions observed from the NORTHWIND during the winter months are shown in Figures 17 and 18. Observations were recorded in the ship's ice log at 6-hour intervals wherever sea ice was encountered. Weekly summaries of these observations are presented in Table 1.

The southern boundary of the ice pack was first encountered on 5 March in the vicinity of 58°N, 169°W. Large patches of slush ice extended south from the edge of the pack. Station 1 was occupied just within the ice pack, which consisted of 7/10 to 8/10 concentration of winter and young ice 1 to 2 feet thick. On 8 March the NORTHWIND had penetrated the ice about 80 miles. At this point the pack was observed to be breaking up under the influence of 50-knot winds and 20-foot swells. Progressing northward, the concentration of ice increased to 10/10 with thicknesses of 4 to 6 feet. Numerous cracks and leads and a few polynyas were scattered throughout the ice pack. Generally, ice was rafted and ridged with a snow cover varying from 6 inches to 2 feet. Heavily ridged ice of 10/10 concentration, 4 feet thick, with 1 to $1\frac{1}{2}$ feet of snow cover was encountered about 6 miles off Nome. This ice prevented the vessel from putting in for logistics, and considerably slowed down the progress of the vessel. When the ice boundary was encountered again in April, it had moved southward.

Figure 19 presents an aerial photograph of the NORTHWIND taken on 1 April when the ship was fast in an ice floe. The position of the ship was approximately 40 miles southwest of Nome. Photographs taken from the ship simultaneously with the aerial photograph are also shown. The floe consisted of 9/10 concentration of winter and young ice about $2\frac{1}{2}$ feet thick with a 1- to 2-foot snow cover. Some rafting was evident.

2. Spring 1955 - USS BURTON ISLAND

Ice conditions observed from the BURTON ISLAND during the spring months are shown in Figures 20 and 21. Observations were made at 6-hour intervals. A daily summary of ice conditions is presented in Table 2.

The ice pack was first encountered ty the BURTON ISLAND on 26 April at approximately 60°N, 178°W. The pack consisted of 10/10 concentration of winter and young ice 3 feet thick. Some plankton discolored ice was observed at this time. This same general condition persisted along the ship's track until approximately 2 May (63°N), the ice concentration varying from 6/10 to 10/10. To the south and west of Nome, the ice con-

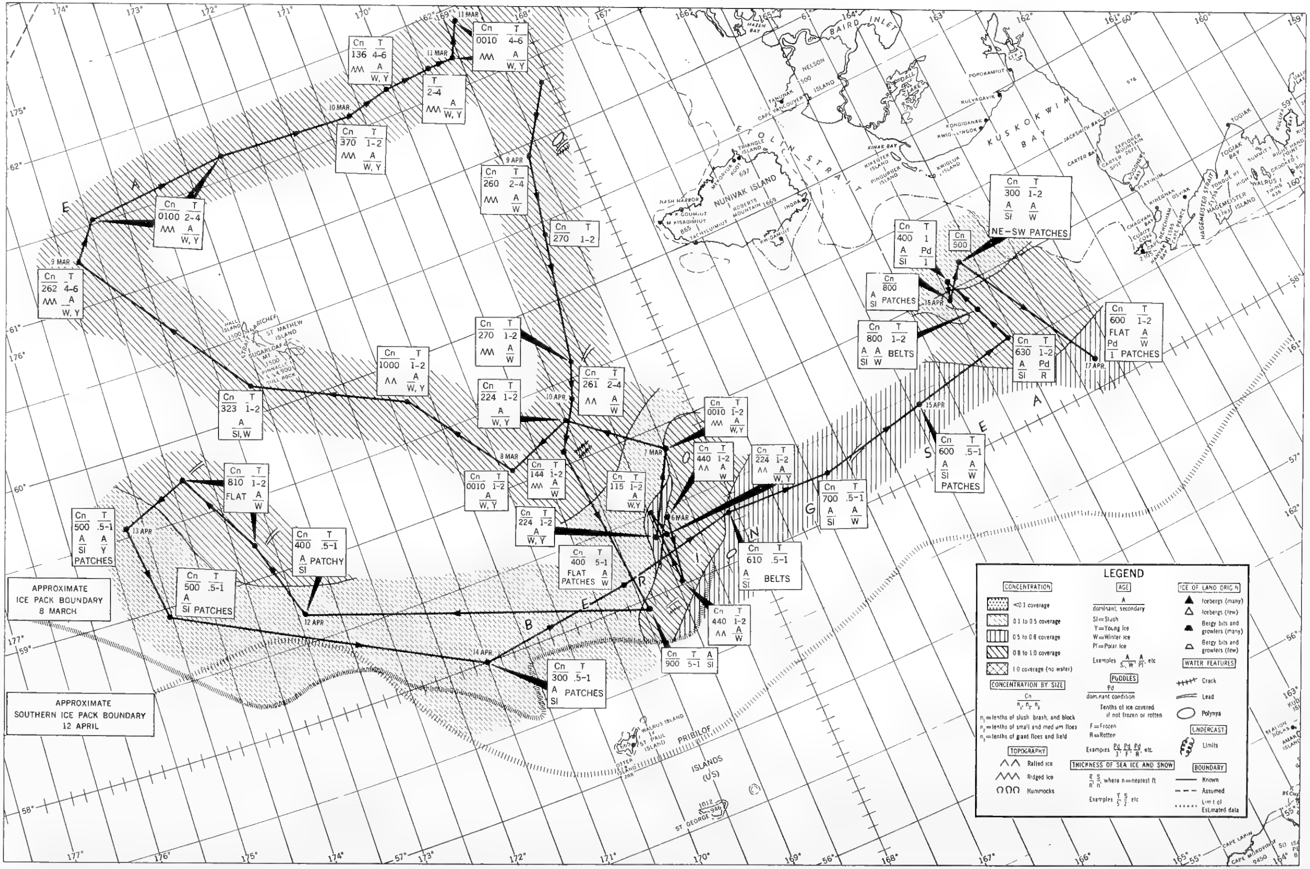


FIGURE 17. ICE TRACK CHART USCGC NORTHWIND, BERING SEA (SOUTHERN PORTION)—MARCH AND APRIL 1955

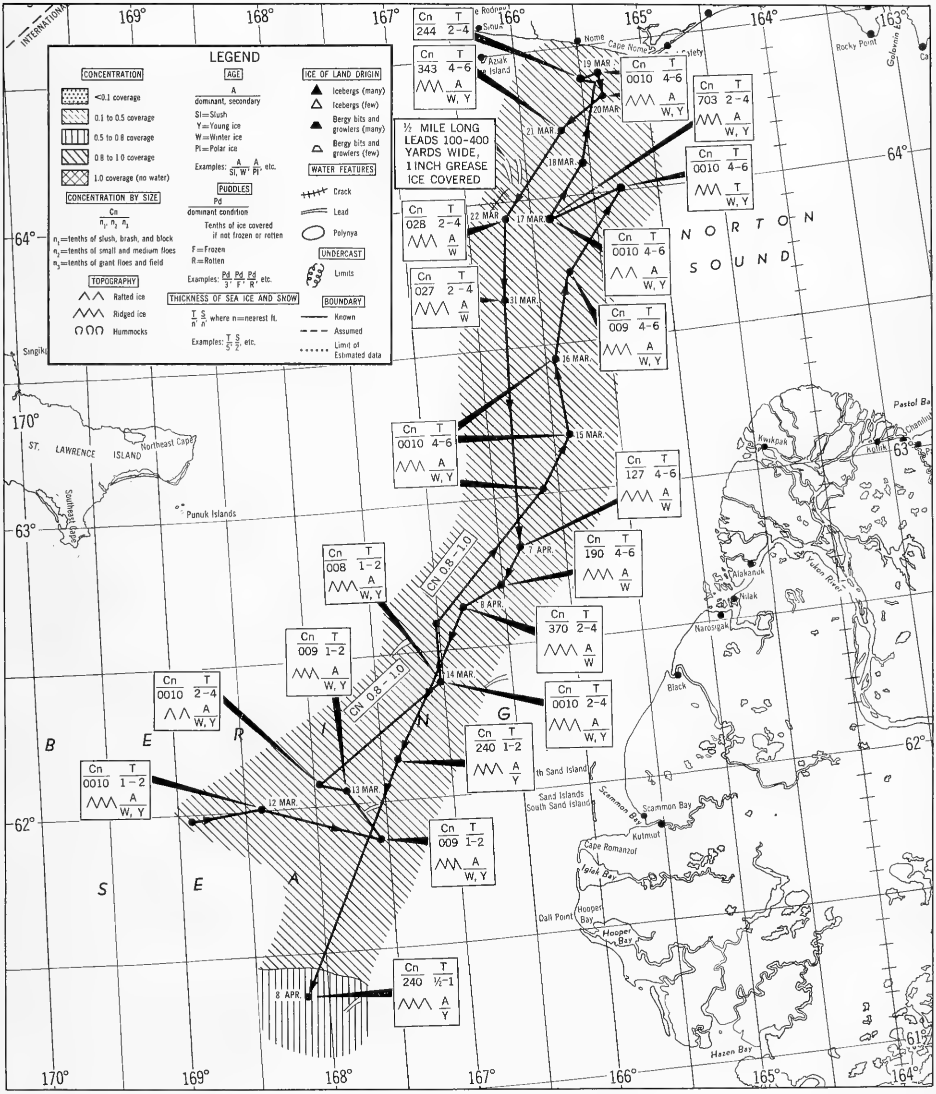
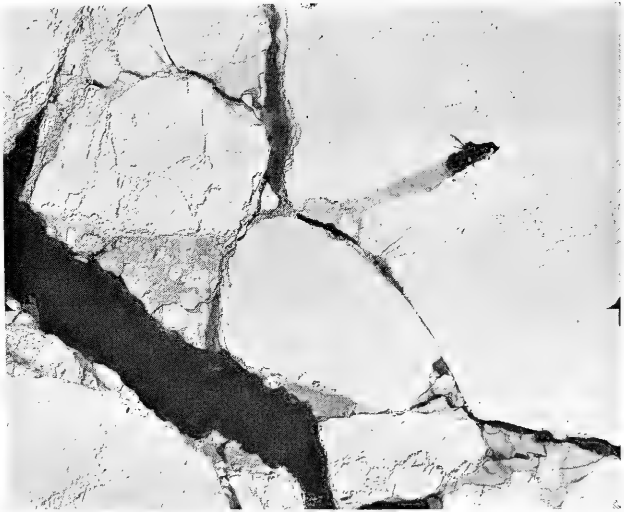


FIGURE 18. ICE TRACK CHART USCGC NORTHWIND, BERING SEA (NORTHERN PORTION)—MARCH AND APRIL 1955

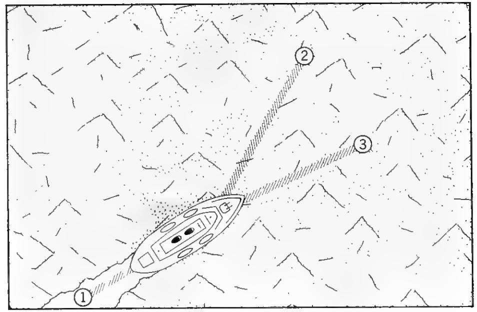
TABLE 1. Summary of Ice Conditions Encountered

by the USCGC NORTHWIND - 6 March through 16 April 1955

	March 6-12	March 13-19	March 20-26	March 27 April 2	April 3-9	April 10-16
Number of observations	28	28	28	28	28	20
Total concentration (tenths)						
Consolidated ice (10)	18	23	11	11	5	0
Close ice (8-10)	7	5	17	17	21	5
Broken ice (5-8)	3	0	0	0	2	5
Scattered ice (1-5)	0	0	0	0	0	7
Open water (0-1)	0	0	0	0	0	3
Predominant size						
Giant floes field	16	25	15	25	11	0
Small & Medium floes	5	1	5	0	14	1
Slush, brash & block	3	1	5	0	0	17
All sizes	4	1	3	3	3	1
Thickness of sea ice (feet)						
4 - 6	8	23	12	28	4	0
1 - 4	20	5	16	0	23	0
Less than 1	0	0	0	0	1	0
Topography						
Rafted ice	7	5	2	0	0	1
Ridged ice	15	20	22	28	28	1
Flat ice	5	0	0	0	0	8
Slush or cake ice	1	0	0	0	0	10
Hummocks	0	3	4	0	0	0
Age						
Winter ice only	2	2	0	0	0	0
Young ice only	1	0	2	0	0	0
Winter ice predominant Young ice secondary	23	26	26	28	28	7
Young ice predominant Brash & slush secondary	1	0	0	0	0	2
Slush, brash & pancake	1	0	0	0	0	11
Orientation of cracks and leads						
NW-SE	3	0	1	0	3	18
NE-SW	0	2	0	0	1	2
N-S	1	0	16	6	5	0
E-W	0	4	4	0	1	0
No distinct orientation	24	22	7	22	18	0

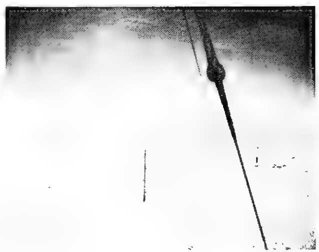


AERIAL PHOTOGRAPH



CAMERA ANGLE FROM SHIP

PHOTOGRAPH 1



PHOTOGRAPH 2

PHOTOGRAPH 3

FIGURE 19. AERIAL ICE RECONNAISSANCE PHOTOGRAPH OF USCGC NORTHWIND AND ICE PHOTOGRAPHS TAKEN FROM USCGC NORTHWIND, 1 APRIL 1955

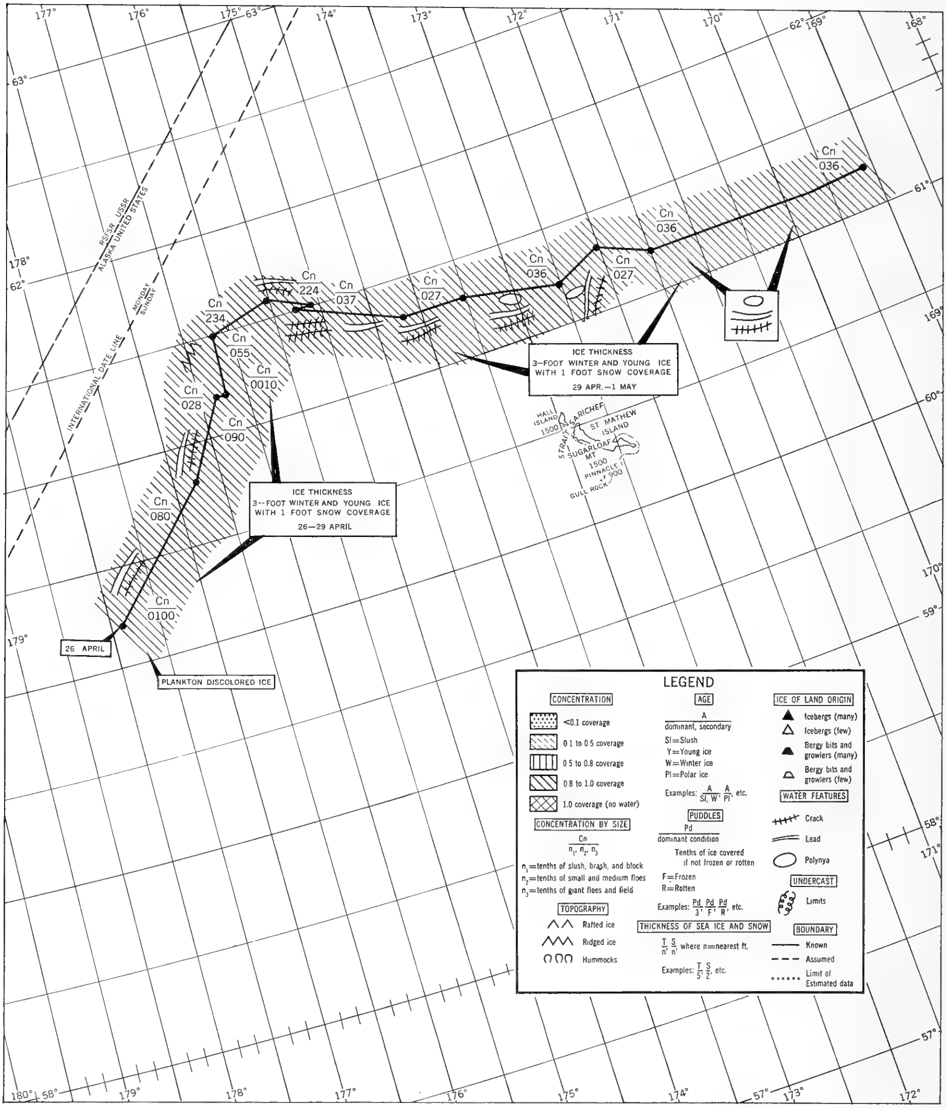


FIGURE 20. ICE TRACK CHART USS BURTON ISLAND, BERING SEA (SOUTHERN PORTION)—APRIL AND MAY 1955

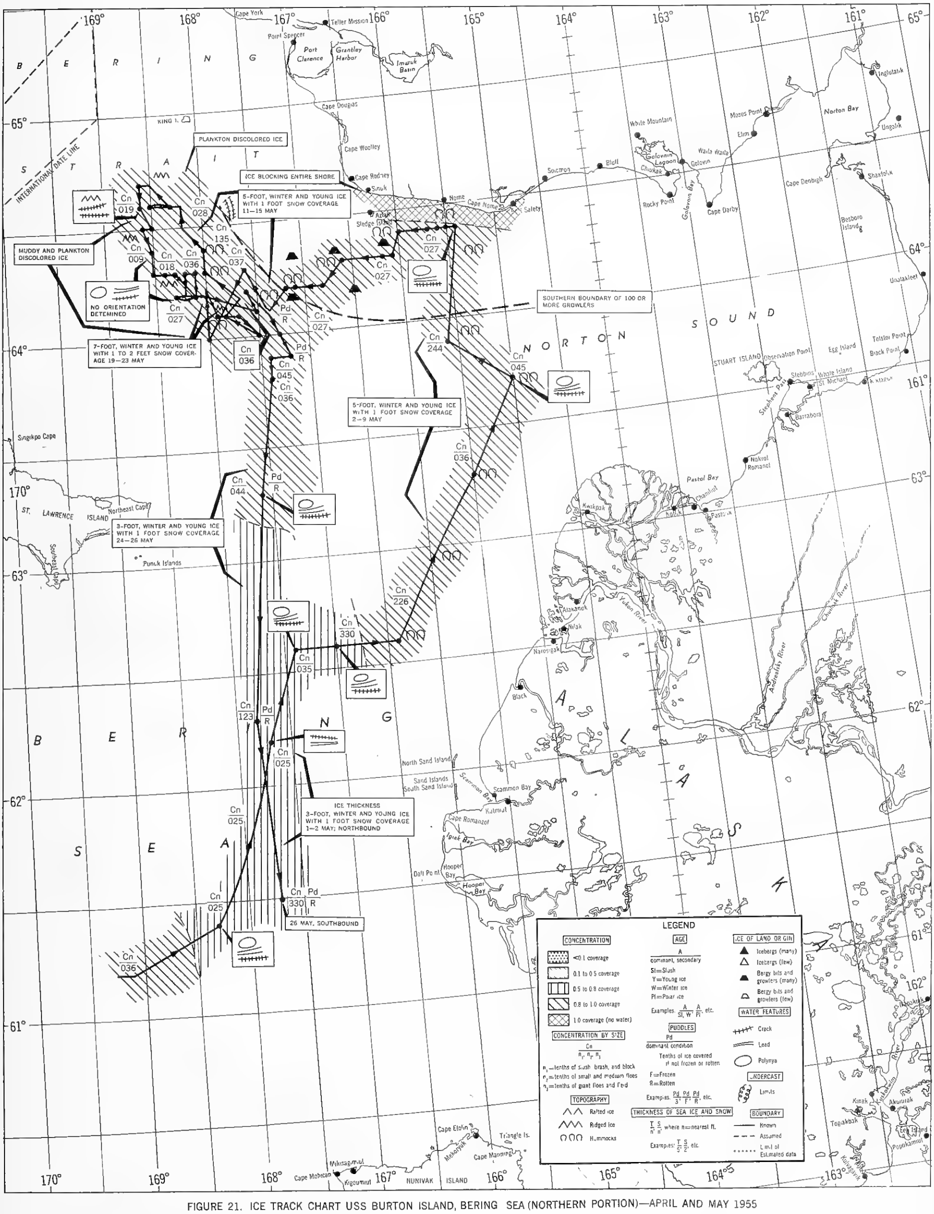


FIGURE 21. ICE TRACK CHART USS BURTON ISLAND, BERING SEA (NORTHERN PORTION)—APRIL AND MAY 1955

TABLE 2.

Daily Summary of Ice Condition Encountered by the USS BURTON ISLAND-26 April through 26 May 1955

Date	Location	Concentration	Thickness	Physical Features
26 April	60°13'N, 177°55'W	>9/10	2-4 ft.	leads in combination with cracks
27 April	61°25'N, 176°00'W	10/10	2-4 ft.	ice evenly distributed
28 April	61°15'N, 176°15'W	10/10	2-4 ft.	ice evenly distributed
29 April	61°30'N, 175°10'W	10/10	2-4 ft.	ice evenly distributed
30 April	61°21'N, 173°31'W	9/10	2-4 ft.	polynyas in combination with cracks and leads
1 May	61°13'N, 170°40'W	9/10	2-4 ft.	leads in combination with cracks
2 May	62°34'N, 167°27'W	8/10	2-4 ft.	polynyas with cracks and leads
3 May	63°40'N, 165°02'W	8/10	4-6 ft.	polynyas with cracks and leads
4 May	64°26'N, 165°24'W	9/10	4-6 ft.	polynyas with cracks and leads
5 May	64°25'N, 165°24'W	9/10	4-6 ft.	polynyas with cracks and leads
6 May	64°25'N, 165°23'W	9/10	4-6 ft.	polynyas with cracks and leads
7 May	64°25'N, 165°24'W	9/10	4-6 ft.	polynyas with cracks and leads
8 May	64°26'N, 165°32'W	9/10	4-6 ft.	polynyas with cracks and leads
9 May	64°25'N, 165°43'W	9/10	4-6 ft.	leads in combination with cracks
10 May	64°19'N, 166°08'W	9/10	4-6 ft.	leads in combination with cracks
11 May	64°09'N, 167°24'W	9/10	2-4 ft.	polynyas in combination with cracks and leads
12 May	64°12'N, 168°03'W	9/10	4-6 ft.	polynyas in combination with cracks and leads
13 May	64°16'N, 167°59'W	>9/10	4-6 ft.	2 or more cracks
14 May	64°23'N, 167°59'W	10/10	4-6 ft.	ice evenly distributed
15 May	64°37'N, 168°18'W	10/10	4-6 ft.	ice evenly distributed
16 May	64°42'N, 168°34'W	>9/10	4-6 ft.	2 or more cracks
17 May	64°31'N, 168°33'W	9/10	4-6 ft.	2 or more cracks
18 May	64°18'N, 168°28'W	9/10	4-6 ft.	2 or more cracks
19 May	64°16'N, 168°22'W	9/10	4-6 ft.	leads in combination with cracks
20 May	64°14'N, 168°06'W	9/10	6-8 ft.	polynyas in combination with cracks and leads
21 May	64°15'N, 168°14'W	9/10	6-8 ft.	polynyas in combination with cracks and leads
22 May	64°12'N, 168°01'W	9/10	6-8 ft.	polynyas in combination with cracks and leads
23 May	64°08'N, 167°48'W	9/10	6-8 ft.	polynyas in combination with cracks and leads
24 May	64°00'N, 167°18'W	8/10	2-4 ft.	polynyas in combination with cracks and leads
25 May	63°20'N, 167°36'W	8/10	2-4 ft.	polynyas in combination with cracks and leads
26 May	No Ice			

sisted of 9/10 concentration of winter and young ice 5 to 7 feet thick. A snow cover 1 to 2 feet thick was observed. Many hummocks, bergy bits, and growlers were present in this area, in addition to some muddy and plankton discolored ice. South of King Island extreme ice conditions were encountered; a 10/10 concentration of ice up to 10 feet thick was observed, with greater thicknesses in pressure ridges. Progress was extremely slow in this area.

Ice conditions were more severe than those observed during the spring of 1954. Ice was thicker and less broken and the spring breakup, which was complete in late May in 1954, was only commencing at this time in 1955.

B. Bathythermograph Observations

1. Winter

Bathythermograph observations were made hourly while underway in the Bering Sea and at all oceanographic stations. Observations were increased to 15-minute intervals over a 30-mile distance when approaching and departing the ice boundary, ice conditions permitting. Representative BT traces depicting typical March and April conditions in the Bering Sea are shown in Figure 22. In the shoal areas over the continental shelf the water is essentially isothermal with depth, but a negative horizontal gradient across the ice boundary is evident. In the deeper areas, where warm water is found beneath the colder surface water, positive vertical gradients are present in the surface and near-surface layer approaching the ice pack; within the ice pack positive gradients are found below a layer of isothermal water. Progressing northward, the temperature inversion is found at greater depths, below which isothermal conditions extend to the bottom.

2. Spring

Bathythermograph casts were made at each oceanographic station. Observations were generally obtained hourly while underway. When ice conditions slowed the ship, they were obtained at 10-mile intervals. Figure 23 shows representative BT traces depicting April and May conditions. In the deep central portion of the Bering Sea distinct positive gradients are found, commencing at depths between 100 and 700 feet. Over the continental shelf, the vertical structure is isothermal. Traces taken on 21 April and 27 May, show a gradual warming of the water column.

C. Meteorology

Weather conditions in the Bering Sea off North America are primarily the result of the cyclonic circulation of the Aleutian <u>low</u> during the winter and spring seasons. The intensity and extent of this pressure system depends upon the predominance and direction of movement of intense migratory depressions. Warm, moist Pacific air, and cold, dry Arctic air

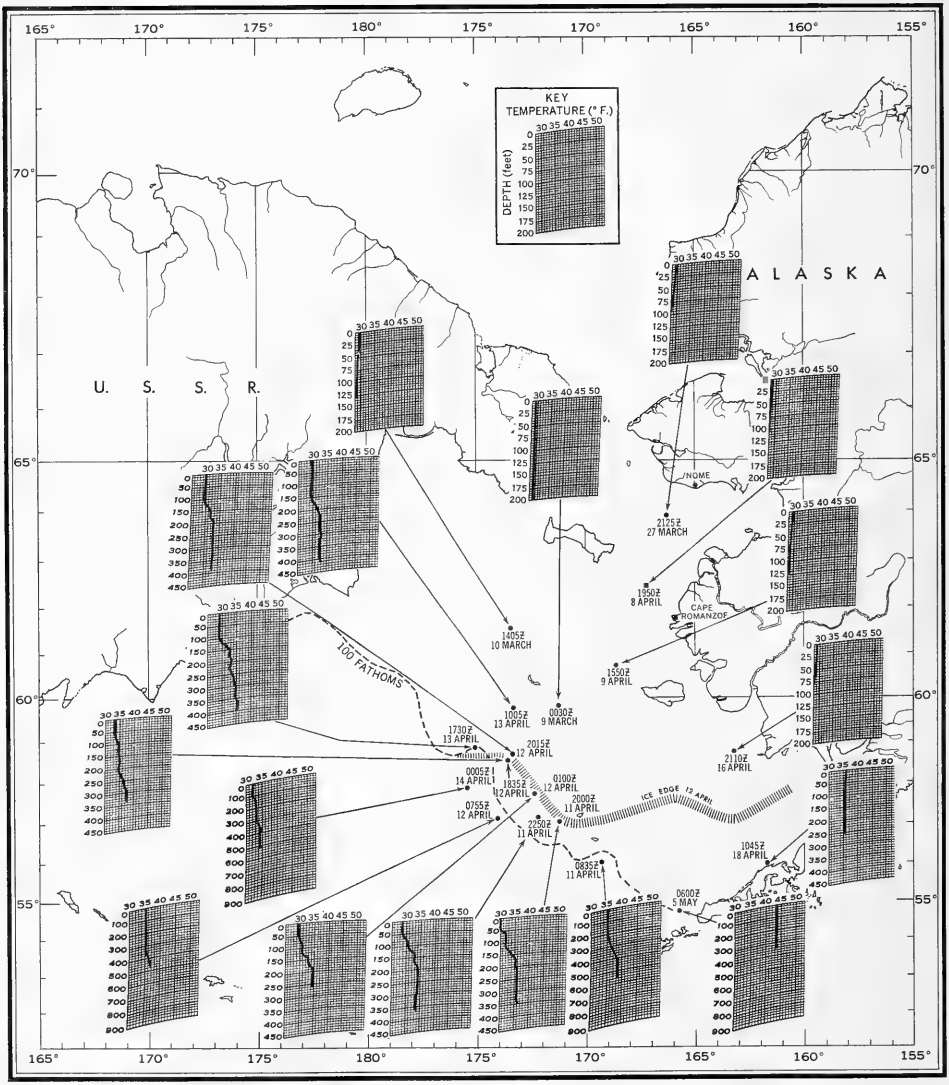


FIGURE 22. REPRESENTATIVE BATHYTHERMOGRAMS—WINTER 1955

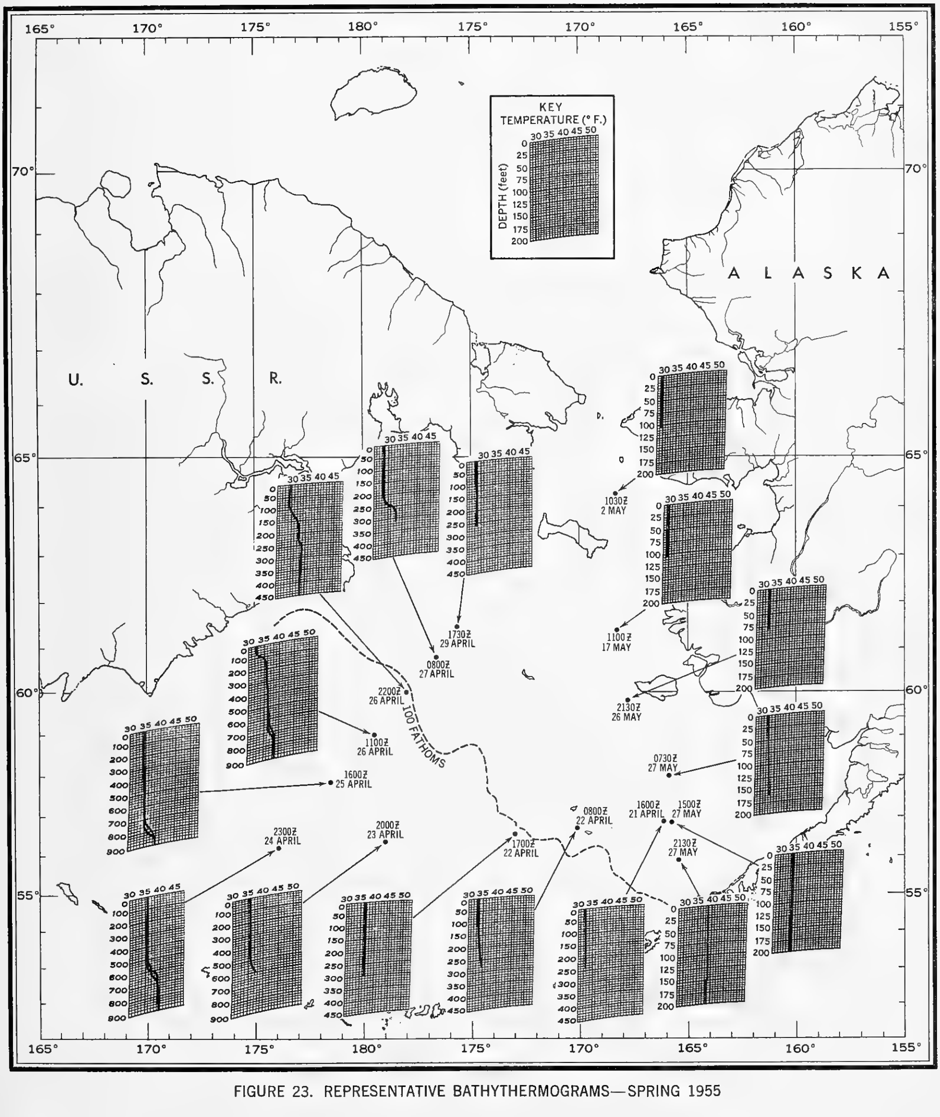


FIGURE 23. REPRESENTATIVE BATHYTHERMOGRAMS—SPRING 1955

are the significant air masses associated with the circulation. The Pacific polar front and the Arctic front are the zones of interaction associated with cyclogenesis. The stronger Pacific polar front lies to the south of the area in winter, but retreats northward over the area as summer approaches.

Meteorological conditions encountered in the Bering Sea by the NORTHWIND between 5 March and 18 April 1955, and by the BURTON ISLAND between 21 April and 27 May 1955 are shown on composite charts in Figures 24 through 33. These charts represent more of a climatic pattern than a climatic mean. Data were obtained from oceanographers' logs and oceanographic log sheets. Summaries of the meteorological data, taken from the ships' report, are presented in Tables 3 and 4.

D. Currents

Prevailing surface currents during the summer are shown in Figure 34. They are based on current observations during summer cruises, ice movement, and the distribution of physical properties. Changing wind conditions and tidal currents produce large day-to-day variations.

Several attempts were made to record currents with an Ekman current meter, but no revolutions of the impeller were observed. Figure 35 (plotted by Dr. Edward M. Little, of NEL) shows the ship's drift while fast in a 1-mile ice floe from 22 March to 5 April. The drift track is based on daily positions at 0800, 1200, and 2000 (local time). Drift was predominantly south but variations observed along the route suggest the influence of tidal currents.

NOTE: Drift track was evidently based upon more than 3 daily positions, for numerous changes in course are plotted between these points. Also, positions at other hours are plotted.

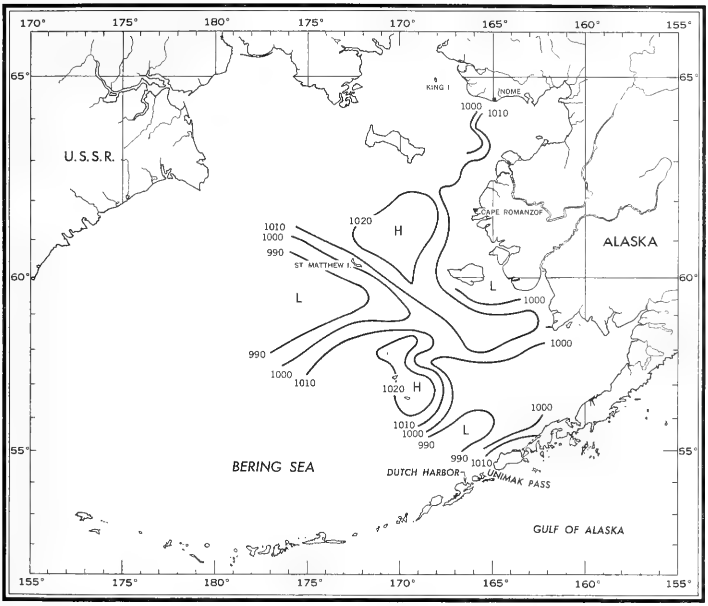


FIGURE 24. COMPOSITE BAROMETRIC PRESSURE (MILLIBARS)—WINTER 1955 (5 MARCH THROUGH 18 APRIL)

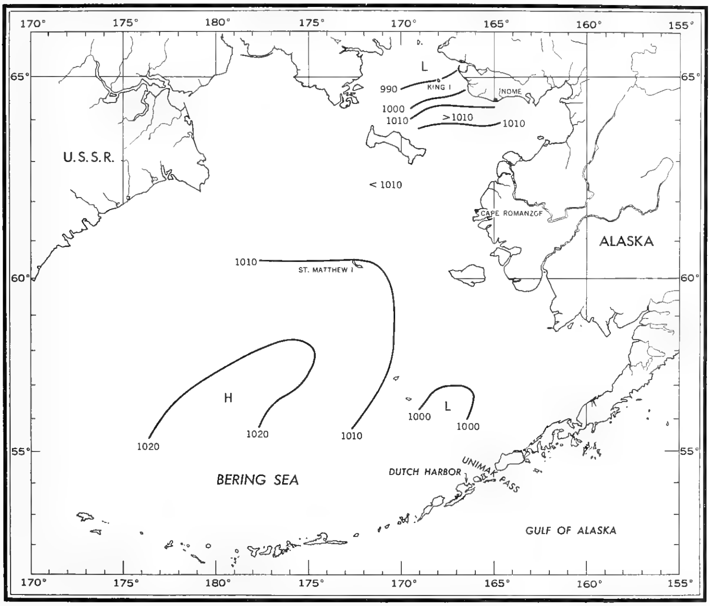


FIGURE 25. COMPOSITE BAROMETRIC PRESSURE (MILLIBARS)—SPRING 1955 (21 APRIL THROUGH 27 MAY)

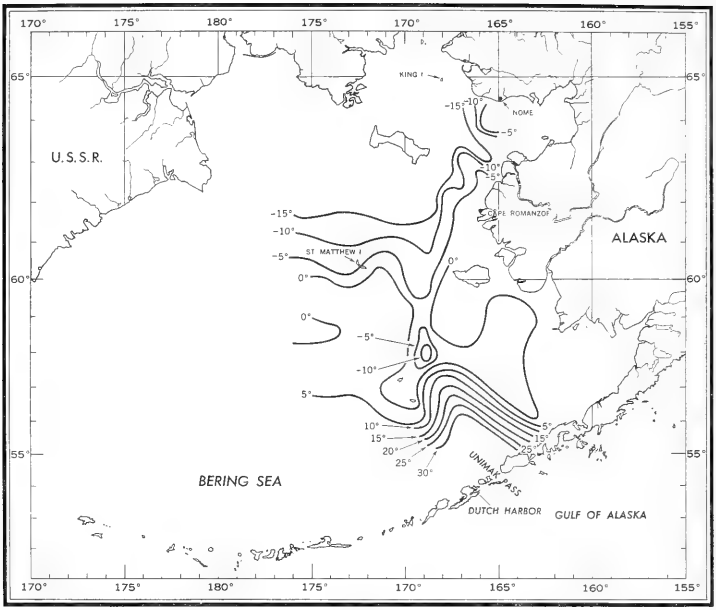


FIGURE 26. COMPOSITE AIR TEMPERATURE (°F.)--WINTER 1955 (5 MARCH THROUGH 18 APRIL)

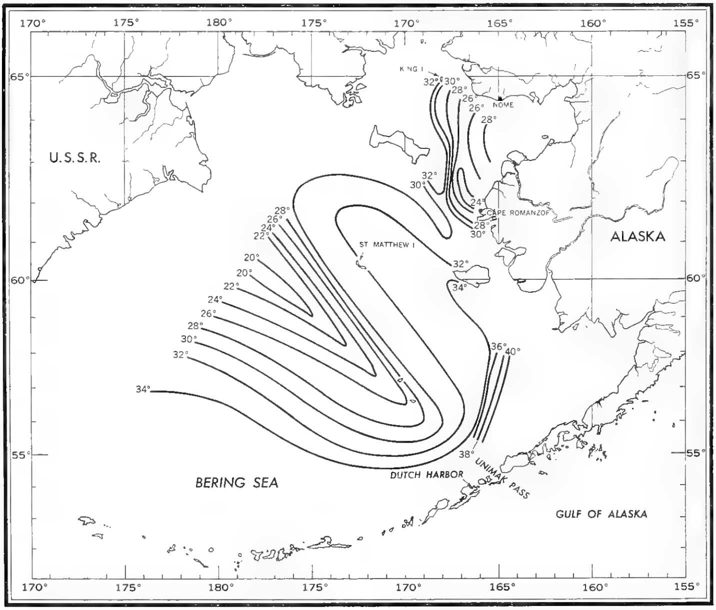


FIGURE 27. COMPOSITE AIR TEMPERATURE (°F.)—SPRING 1955 (21 APRIL THROUGH 27 MAY)

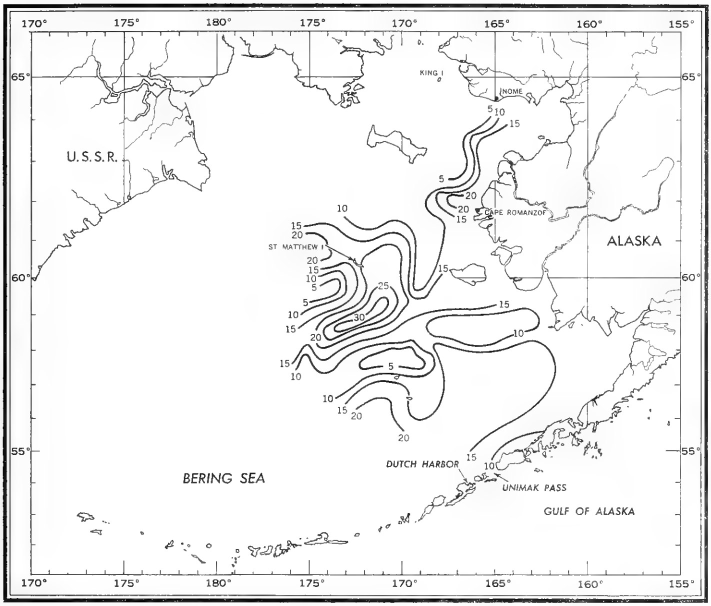


FIGURE 28. COMPOSITE WIND SPEED (KNOTS)—WINTER 1955 (5 MARCH THROUGH 18 APRIL)

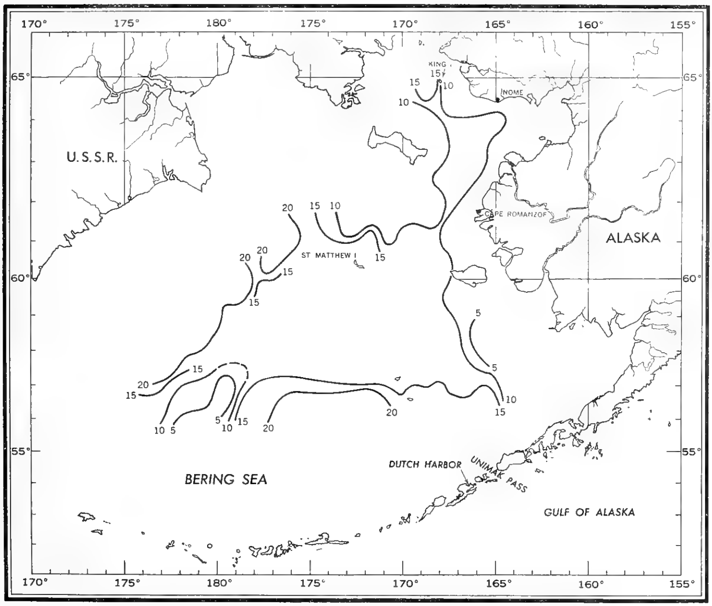


FIGURE 29. COMPOSITE WIND SPEED (KNOTS)—SPRING 1955 (21 APRIL THROUGH 27 MAY)

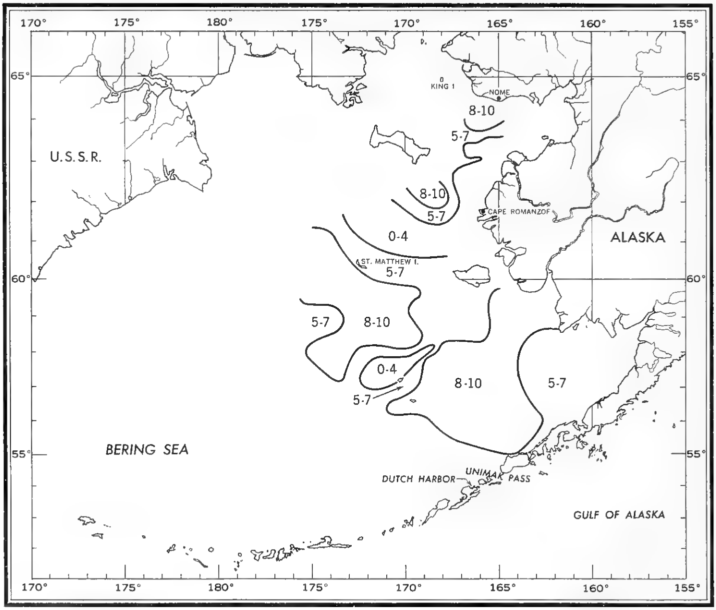


FIGURE 30. COMPOSITE CLOUDINESS (TENTHS)—WINTER 1955 (5 MARCH THROUGH 18 APRIL)

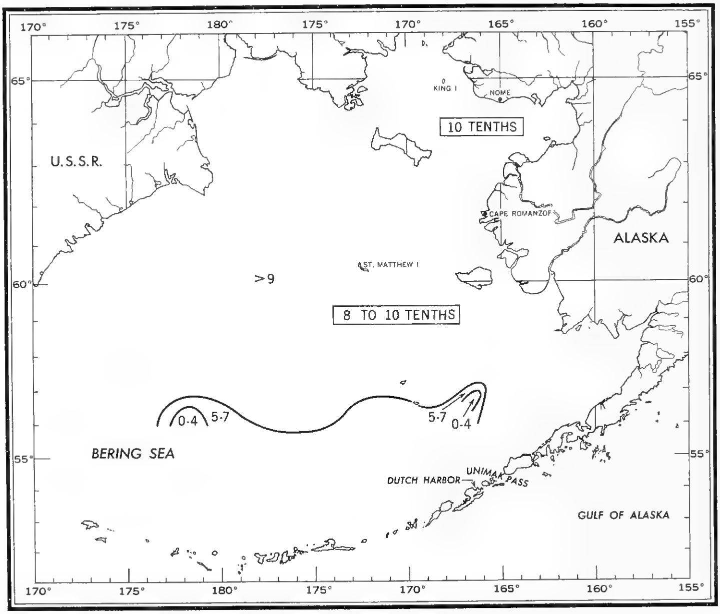


FIGURE 31. COMPOSITE CLOUDINESS (TENTHS)—SPRING 1955 (21 APRIL THROUGH 27 MAY)

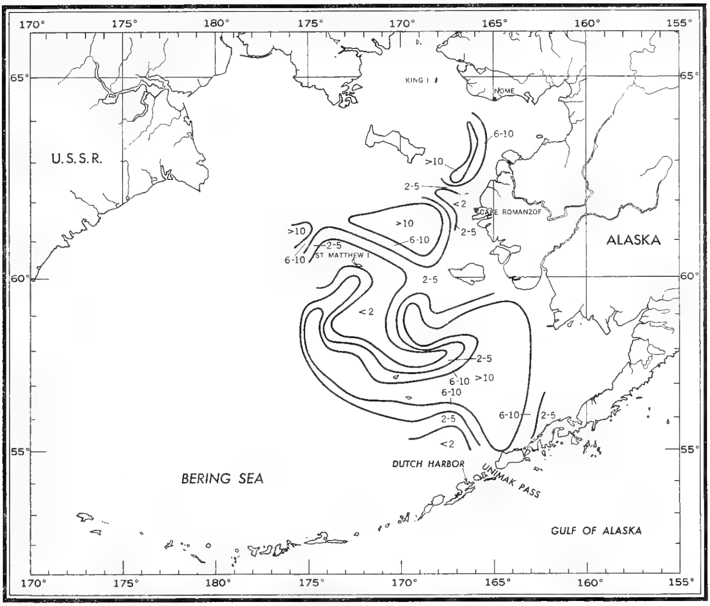


FIGURE 32. COMPOSITE VISIBILITY (MILES)—WINTER 1955 (5 MARCH THROUGH 18 APRIL)

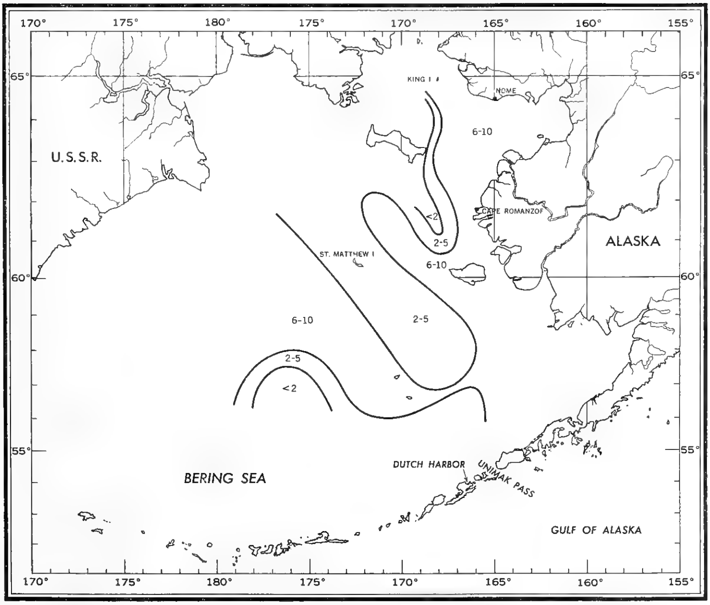


FIGURE 33. COMPOSITE VISIBILITY (MILES)—SPRING 1955 (21 APRIL THROUGH 27 MAY)

TABLE 3.

Summary of Weather Conditions Encountered by the USCGC NORTHWIND - 4 March through 18 April 1955

	March 4-12	March 13-19	March 20-26	March 27 April 2	April 3-9	April 10-16	April 17-18
Total number of observations	217	168	169	168	168	168	41
No. of observations by direction:							
N	15	3	11	35	57	6	0
NE	22	1	52	10	15	0	0
E	10	2	22	10	8	5	0
SE	47	40	12	8	0	24	0
S	8	11	2	3	0	35	0
SW	31	67	1	0	11	50	22
W	9	9	2	10	17	40	12
NW	75	7	38	60	37	5	4
Calm	0	28	29	32	23	3	3
Average wind velocity (knots)	13	9	5	5	5	9	9
Mean air pressure (inches)	29.78	30.05	29.86	29.76	30.03	29.65	29.41
Extreme max. air pressure (inches)	30.45	30.79	30.66	30.26	30.22	30.26	29.59
Extreme min. air pressure (inches)	29.12	29.32	29.27	29.27	29.84	29.04	29.34
Mean air temperature (°F)	16.0	14.0	17.5	14.5	12.5	34.0	37.5
Extreme max. air temperature (°F)	44.0	32.0	38.0	28.0	28.0	41.0	44.0
Extreme min. air temperature (°F)	-12.0	-4.0	-3.0	1.0	-3.0	27.0	31.0
Mean sea temperature (°F)	32.75	28.5	28.0	29.0	28.75	32.5	33.5
Extreme max. sea temperature (°F)	38.0	29.0	29.0	29.0	29.0	36.0	37.0
Extreme min. sea temperature (°F)	27.5	28.0	27.0	29.0	28.5	29.0	30.0
Number of observations with sky:							
Overcast	106	88	29	40	6	133	13
Mostly cloudy	23	10	28	19	21	13	12
Partly cloudy	68	44	70	74	73	20	13
Clear	20	26	41	35	68	2	0
Average cloud amount (tenths)	7	7	7	4	3	9	7
No. of observations with snow	31	57	0	28	4	31	4
Number of observations with visibility less than one mile	16	41	14	3	0	10	5

TABLE 4.

Daily Summary of Weather Conditions Encountered by USS BURTON ISLAND - 18 April through 27 May 1955

Date	Noon Position	State of Sky	Weather*	Press. (mbs.) Max.	Press. (mbs.) Min.	Air Temp. (°F) Max.	Air Temp. (°F) Min.	Average Water Temp. (°F)	Max. Wind (kts.) Vel.	Max. Wind (kts.) Dir.
April 18	54°36'N, 159°27'W	BRKN	S,R	1006.2	998.2	40	35	39	25	SSW
19	Dutch Harbor	OVC	S,R	1002.3	998.0	47	33	38	40	WSW
20	54°32'N, 166°22'W	BRKN	SW,R,S	1011.0	1002.8	43	34	39	19	SW
21	56°51'N, 167°51'W	BRKN	S,SP,SW	1010.0	1000.0	38	32	36	27	W
22	56°33'N, 174°43'W	BRKN	S	1013.3	1000.9	33	24	35	28	NW
23	56°21'N, 179°03'W	BRKN	S	1026.1	1013.8	36	30	36	40	WSW
24	56°17'N, 176°21'E	BRKN	S	1028.8	1021.6	37	34	36	12	E
25	58°02'N, 178°42'E	OVC	S	1020.5	1020.5	35	31	35	29	NE
26	60°03'N, 177°58'W	BRKN	-	1016.8	1012.0	31	19	33	26	NNE
27	61°24'N, 176°00'W	OVC	S	1011.5	1004.5	27	19	29	29	NNE
28	61°15'N, 176°14'W	OVC	S,R	1004.5	998.6	35	28	28	28	NE
29	61°32'N, 175°23'W	OVC	S,R,F	1003.2	1000.3	33	29	29	22	NE
30	61°16'N, 173°27'W	OVC	S	1009.7	1002.7	35	32	31	19	NE
May 1	61°16'N, 170°50'W	OVC	S,F	1011.8	1010.0	34	24	31	18	E
2	62°29'N, 167°30'W	OVC	S,F	1010.6	1008.9	35	24	30	21	N
3	63°38'N, 165°02'W	OVC	S,SW,SG	1010.5	1004.7	30	23	30	23	E
4	64°26'N, 165°25'W	OVC	-	1004.5	1002.2	33	28	30	18	NE
5-8	Secured at Nome									
9	64°24'N, 165°43'W	BRKN	-	1009.6	1006.4	37	28	29	6	N
10	64°19'N, 166°08'W	SCTD	GF	1013.7	1009.8	37	18	29	13	W
11	64°09'N, 167°20'W	OVC	F	1014.5	1013.5	31	19	29	10	WNW
12	64°17'N, 168°08'W	OVC	S	1013.9	1006.4	32	23	30	10	NW
13	64°16'N, 167°59'W	OVC	S,F	1005.7	994.5	34	28	30	14	N
14	64°23'N, 167°59'W	OVC	S,R	994.5	990.9	38	31	30	14	NE
15	64°39'N, 168°18'W	OVC	S,F	997.5	993.1	36	29	32	13	E
16	64°42'N, 168°34'W	OVC	S,F	997.6	995.5	36	31	31	28	N
17	64°31'N, 168°36'W	OVC	-	999.5	995.9	32	27	29	31	NNW
18	64°18'N, 168°28'W	OVC	IC	1007.0	1000.0	32	27	30	25	NNW
19	64°14'N, 168°22'W	OVC	S	1015.0	1007.3	36	30	31	11	WNW
20	64°16'N, 168°17'W	OVC	S	1022.5	1015.3	34	28	31	7	WNW
21	64°15'N, 168°14'W	OVC	S	1022.5	1018.0	36	29	31	5	W
22	64°12'N, 168°01'W	OVC	S,F	1017.7	1005.4	38	28	31	10	NNE
23	64°09'N, 167°41'W	OVC	S,R,F	1005.1	997.9	39	32	30	13	E
24	63°50'N, 167°16'W	OVC	S,R,LF	997.4	992.5	36	32	31	14	N
25	63°31'N, 167°40'W	OVC	R,LF	999.9	993.1	36	32	31	13	NNW
26	59°35'N, 167°35'W	OVC	LF	1006.7	1000.4	34	30	32	12	NW
27	55°41'N, 165°24'W	OVC	S,R	1007.1	1003.0	40	33	34	19	S

*Codes: F - Fog, GF - Ground fog, H - Haze, IC - Ice crystals, LF - Drizzle and fog, R - Rain, S - Snow, SG - Snow grains, SP - Snow pellets, SW - Snow showers

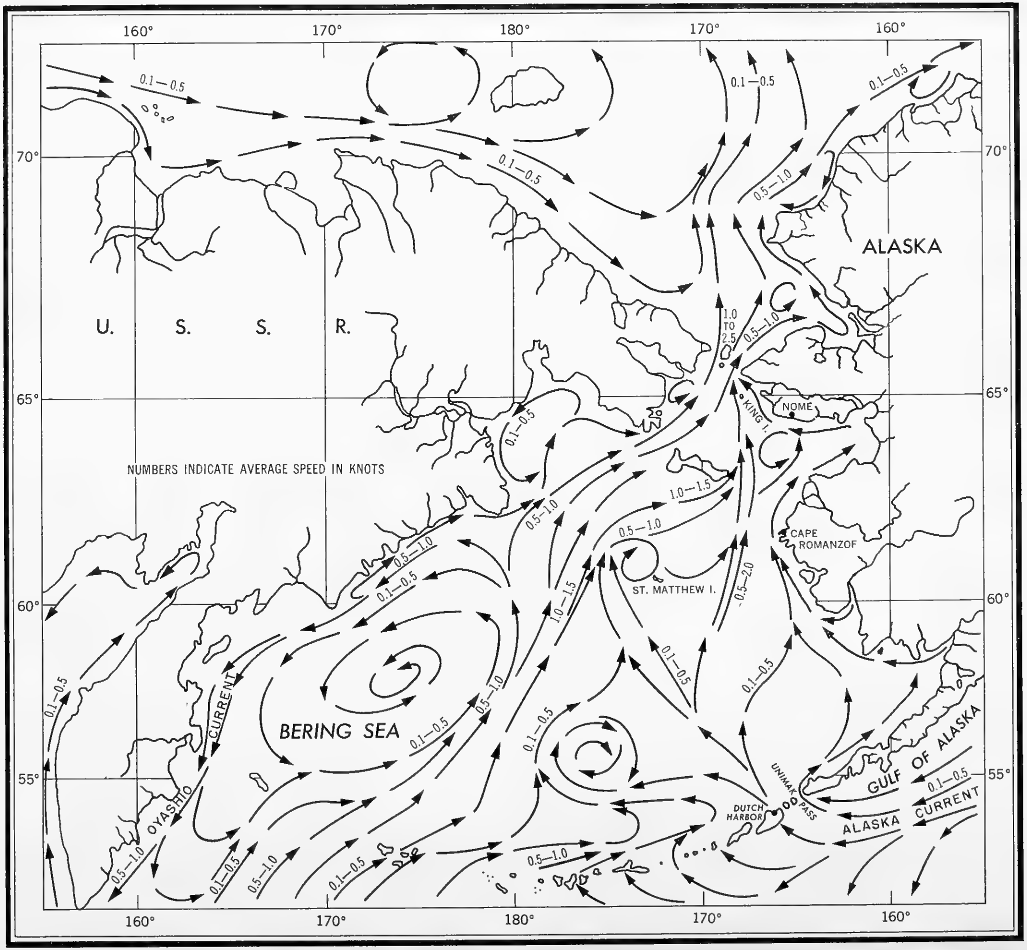


FIGURE 34. PREVAILING SURFACE CURRENTS—SUMMER

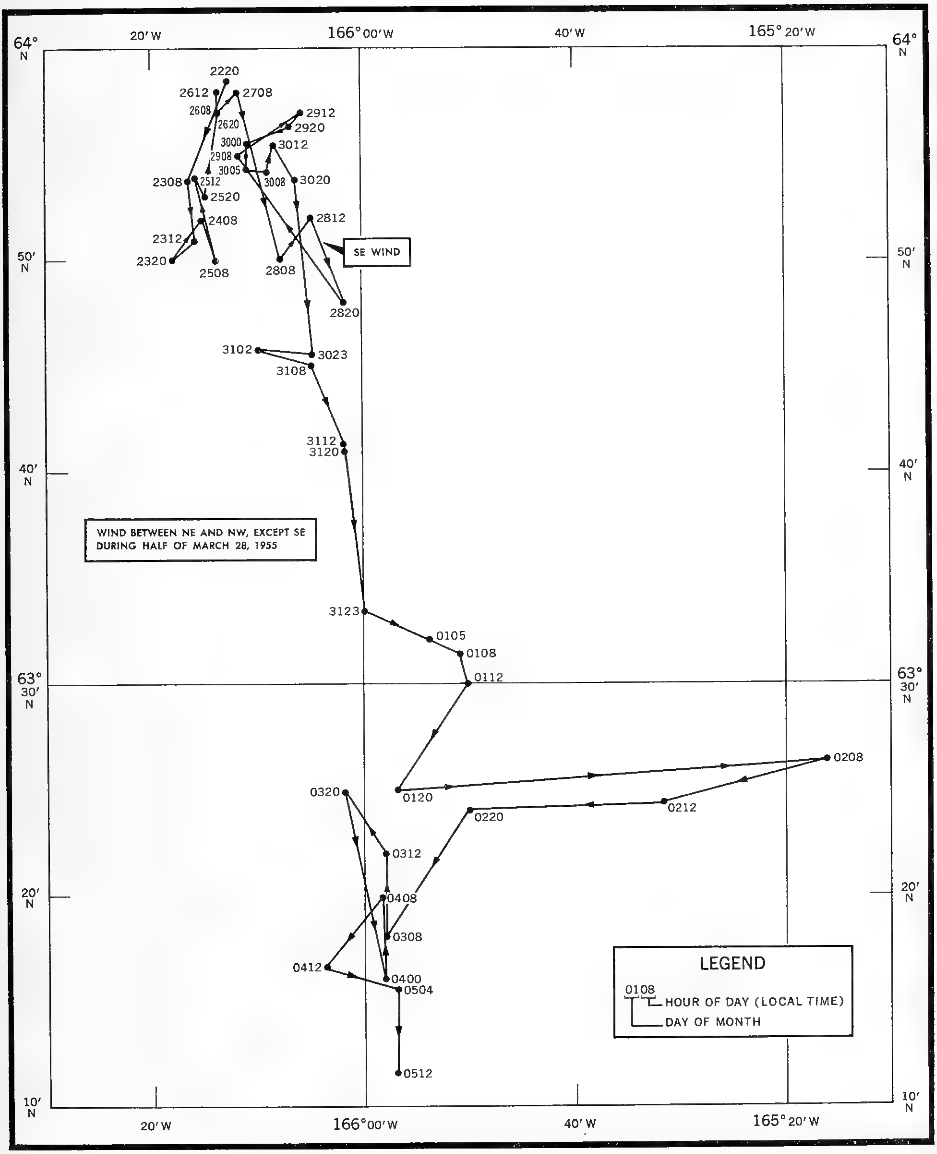


FIGURE 35. DRIFT OF USCGC NORTHWIND IN BERING SEA ICE FLOE— 22 MARCH TO 5 APRIL 1955

E. Submarine Geology

During the winter and spring cruises, the NORTHWIND collected 33 bottom samples and the BURTON ISLAND collected 22 (Fig. 36) with the Dietz-LaFond bottom sampler. The samples were stored in Mason jars to prevent excessive loss of moisture and shipped to the Hydrographic Office laboratory for analysis. Results of the analysis are presented in Tables 5 and 6. Classification of the sediments was based upon the modified Trefethen bottom sediment classification triangle (Fig. 37).

A microscopic examination of the sand-size fraction of the samples showed the dominant mineral to be quartz grains of medium low sphericity and subangular roundness, with either a polished, smooth, or dull-frosted surface. BURTON ISLAND samples 4, 5, and 7 consisted almost entirely of diatom tests, while sample 6 and NORTHWIND sample 30 contained large percentages of diatom tests. Sorting coefficients, where determined, indicated that all samples were well sorted.

F. Transparency

Transparency measurements were made at oceanographic stations during daylight hours with a white Secchi disc 30 centimeters in diameter. Figure 38 presents the results of 15 measurements obtained by the NORTHWIND and 17 measurements by the BURTON ISLAND. Maximum values were observed in the open waters south and southwest of the ice boundary. Low values, obtained within the ice pack, possibly are due to the increased amount of impurities deposited in the waters during icemelt.

G. Oxygen

Approximately 238 analyses for dissolved oxygen content were made using the modified Winkler method. The samples were obtained at 48 oceanographic stations occupied by the NORTHWIND. Stations 22 and 24 were omitted, and only a surface sample was analyzed for station 51. Analyses for stations 1 through 29 did not show any definite vertical distribution. Values for stations 1 through 21 were low, ranging from 1.5 to 3.9 ml/l. The oxygen content was higher at station 23 and stations 25 through 28 where values ranged from 3.8 to 7.7 ml/l. At stations 30 through 50 oxygen values followed a more definite pattern, the greatest oxygen content being observed in the upper 100 meters. Oxygen content within this layer ranged from 6.6 to 10.1 ml/l, and decreased fairly regularly below this layer. The tabulation of these data are presented in the Appendix.

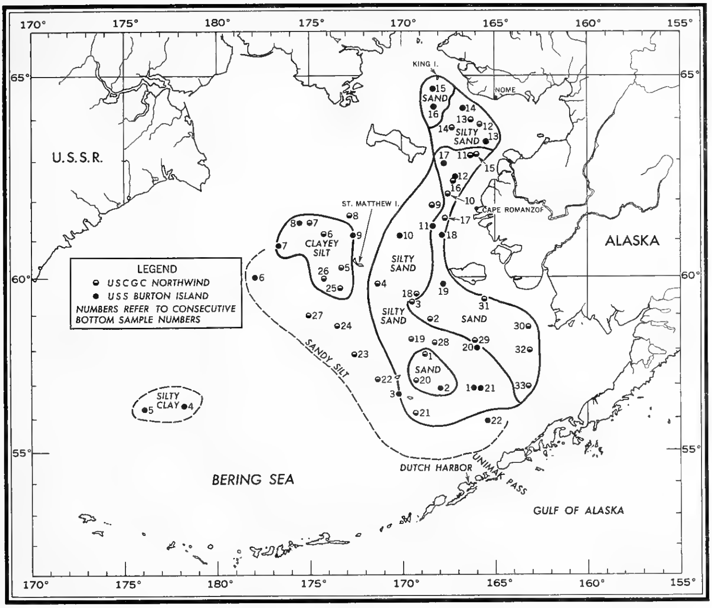


FIGURE 36. BOTTOM SAMPLE POSITIONS

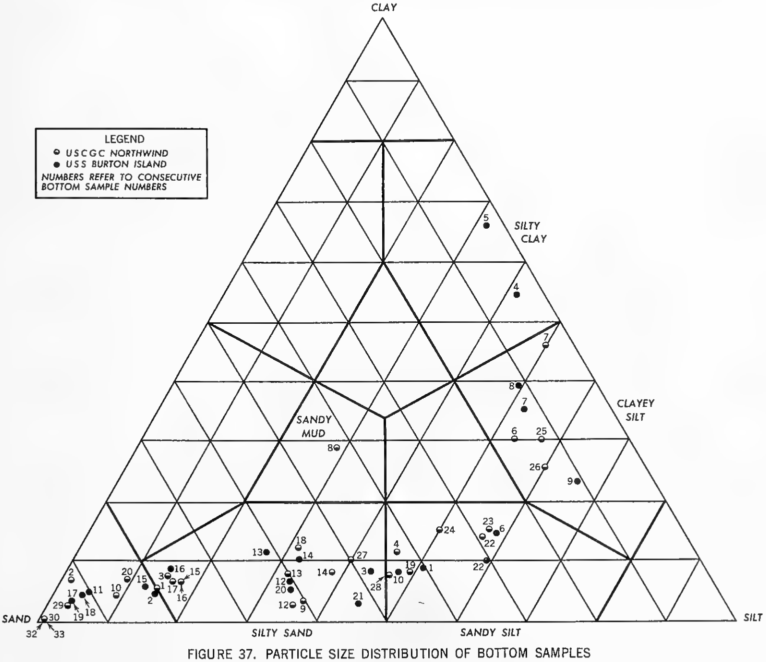


FIGURE 37. PARTICLE SIZE DISTRIBUTION OF BOTTOM SAMPLES

TABLE 5

Results of Laboratory Analysis of Bottom Samples Obtained by USCGC NORTHWIND

Ocean Station No.	Core No.	Position	Water Depth (fms.)	Sand (%)	Silt (%)	Clay (%)	Median Diameter (ø units)	Quartiles Q1 (ø units)	Quartiles Q3 (ø units)	Sorting Coefficient (ø units)	Skewness (ø units)	Color	Dominant Mineral (%)	Remarks
1	1	57°53'N, 168°50'W	34	80	14	6	3.20	2.75	3.80	0.53	0.08	greenish black	quartz 85	shells up to 15mm. diameter, weight 0.25 gram; slight H_2S odor
3	2	58°50'N, 168°29'W	23	92	3	6	2.80	2.45	2.98	0.28	-0.08	greenish black	quartz 80	
4	3	59°17'N, 169°31'W	26	78	15	8	3.10	2.65	3.83	0.59	0.14	greenish black	quartz 85	
5	4	59°51'N, 171°19'W	39	43	46	11	--	--	--	--	--	greenish black	quartz 85	
6	5	60°11'N, 173°22'W	23	--	--	--	--	--	--	--	--	grey	--	one gray pebble, dimensions 25x20x10 mm; trace of silt and sand
7	6	61°06'N, 174°15'W	47	17	53	30	--	--	--	--	--	greenish black	quartz 80	
8	7	61°29'N, 175°00'W	43	4	50	46	--	--	--	--	--	greenish black	quartz 85	sand 4%; slight H_2S odor
9	8	61°37'N, 172°56'W	36	43	29	29	--	--	--	--	--	greenish black	quartz	shells up to 22 mm. diameter, weight 0.55 gram; slight H_2S odor
11	9	61°49'N, 168°27'W	17	60	37	3	3.93	3.58	--	--	--	greenish black	quartz 85	
12	10	62°08'N, 167°37'W	10	87	9	3	2.99	2.80	3.34	0.27	0.08	greenish black	quartz 85	
13	11	63°04'N, 166°06'W	7	--	--	--	--	--	--	--	--	--	--	trace of sandy mud on sampler; no sample obtained
14	12	63°52'N, 165°50'W	9	62	35	2	3.05	2.85	--	--	--	greenish black	quartz 85	slight H_2S odor
15	13	63°58'N, 166°12'W	17	60	32	8	3.41	2.86	--	--	--	greenish black	quartz 85	
19	14	63°50'N, 166°14'W	15½	54	38	8	3.72	2.90	--	--	--	greenish black	quartz 85	
27	15	63°07'N, 166°02'W	11½	76	17	6	3.20	2.87	3.93	0.54	0.20	greenish black	quartz 85	
28	16	62°29'N, 167°10'W	17	77	16	7	2.93	2.60	3.68	0.54	0.21	greenish black	quartz 80	
29	17	61°30'N, 167°47'W	15	78	16	7	3.10	2.78	3.85	0.54	0.22	greenish black	quartz 80	
31	18	59°36'N, 169°10'W	26	57	31	11	3.74	2.93	--	--	--	greenish black	quartz 85	slight H_2S odor
32	19	58°24'N, 169°32'W	38	43	49	7	--	--	--	--	--	greenish black	quartz 85	slight H_2S odor
33	20	57°05'N, 169°22'W	39	84	9	6	3.00	2.75	3.40	0.33	0.08	greenish black	quartz 65	slight H_2S odor
34	21	56°04'N, 169°19'W	176	--	--	--	--	--	--	--	--	gray	--	gray fine sand.only small trace; no sample received for analysis
36	22	57°06'N, 171°12'W	55	29	56	14	--	--	--	--	--	greenish black	quartz 85	H_2S odor
37	23	57°49'N, 172°32'W	64	28	57	15	--	--	--	--	--	greenish black	quartz 80	shells up to 16 mm. diameter, weight 0.15 gram; not included in size analysis
40	24	58°40'N, 173°30'W	66	34	50	15	--	--	--	--	--	greenish black	quartz 80	slight H_2S odor
41	25	59°41'N, 173°24'W	50	12	57	30	--	--	--	--	--	greenish black	quartz 85	slight H_2S odor
42	26	59°59'N, 174°08'W	68	14	60	25	--	--	--	--	--	greenish black	quartz 80	
43	27	58°57'N, 175°04'W	73	50	40	10	4.00	3.25	--	--	--	greenish black	quartz 80	
45	28	58°18'N, 168°07'W	34	46	46	7	--	--	--	--	--	greenish black	quartz 85	H_2S odor
46	29	58°20'N, 166°00'W	25	95	3	2	2.92	2.68	3.00	0.17	-0.08	greenish black	quartz 80	
47	30	58°45'N, 163°14'W	11	100	(1)		2.52	2.07	2.81	0.37	-0.08	greenish black	quartz 55 diatoms 30	shells up to 18 mm. diameter, weight 0.40 gram; H_2S odor
48	31	59°25'N, 165°37'W	9	--	--	--	--	--	--	--	--	--	--	shell remains of 2 sand dollars 45 mm. diameter; heavy H_2S odor
49	32	58°00'N, 163°05'W	23	99	0	0	2.70	2.35	2.90	0.27	-0.07	greenish black	quartz 80	
50	33	56°59'N 163°11'W	30	99	(1)		2.93	2.65	3.00	0.18	-0.10	greenish black	quartz 85	

TABLE 6

Results of Laboratory Analysis of Bottom Samples Obtained by USS BURTON ISLAND

Ocean Station No.	Core No.	Position	Water Depth (fms.)	Sand (%)	Silt (%)	Clay (%)	Median Diameter (ø units)	Quartiles Q1 (ø units)	Quartiles Q3 (ø units)	Sorting Coefficient (ø units)	Skewness (ø units)	Color	Dominant Mineral (%)	Remarks
1	1	56°54.6'N 166°05.4'W	40	40.3	50.3	9.3	4.10	3.40	5.25	0.93	0.23	dark gray	quartz 90	
2	2	56°52.2'N 167°58.0'W	46	80.6	14.8	4.7	2.85	2.45	3.70	0.62	0.23	olive gray	quartz 85	
3	3	56°45.7'N 170°07.8'W	50	48.1	43.7	8.1	4.10	3.25	5.15	0.94	0.10	olive gray	quartz 85	
7	4	56°22.4'N 178°11.4'E	2050	4.7	41.3	53.8	--	6.80	--	--	--	moderate yellowish brown	diatoms 95	particles of mineral fraction stick to each other as if magnetic (not magnetic)
8	5	56°16.3'N 176°00.7'E	2100	2.6	31.7	65.7	--	--	7.45	--	--	moderate yellowish brown	diatoms 95	particles of mineral fraction stick to each other as if magnetic (not magnetic)
11	6	60°00.6'N 177°59.5'W	77	27.0	58.6	13.9	4.60	3.85	6.00	1.07	0.33	olive gray	diatoms 50 quartz 45	
12	7	60°51.6'N 176°40.0'W	65	12.8	51.5	35.6	6.85	5.00	--	--	--	olive gray	diatoms 90	trace of shell
13	8	61°29.4'N 175°42.0'W	47	11.2	49.6	39.5	7.15	5.40	--	--	--	olive grey	predominantly shell	shell is the predominant mineral; positive identification cannot be made because of fine particles (shell) clinging to the larger grains
14	9	61°13.4'N 172°42.3'W	37	10.9	65.5	23.6	5.95	4.70	7.75	1.52	0.28	olive gray	quartz & diatoms 95	positive identification of mineral components cannot be made because of fine shell particles clinging to the larger grains
15	10	61°10.3'N 170°12.3'W	28	45.1	47.1	7.9	4.15	3.00	5.35	1.17	0.03	grayish olive green	quartz 90	
16	11	61°23.5'N 168°20.2'W	19	90	(	8)	3.08	2.83	3.45	0.31	0.06	grayish olive	quartz 90	2% gramites, trace of shell
17	12	62°34.1'N 167°06.5'W	19	60.4	32.9	6.6	3.60	2.75	4.70	0.97	0.13	grayish olive green	quartz 95	trace of shell
18	13	63°25.3'N 165°30.0'W	13	61.3	27.5	11.0	3.73	3.25	5.25	1.00	0.52	grayish olive to moderate olive brown	quartz 90	trace of shell
19	14	64°15.2'N 166°40.0'W	10	57.8	32.0	10.2	3.20	2.35	5.50	1.57	0.73	olive gray to moderate olive brown	quartz 95	trace of shell
20	15	64°41.7'N 168°22.8'W	21	81.7	11.9	6.2	2.55	2.25	3.00	0.38	0.08	grayish black	quartz 95	trace of shell; pungent odor
21	16	64°16.6'N 168°20.0'W	22	77.6	14.0	8.1	2.75	2.48	3.70	0.62	0.34	grayish black	quartz 95	
22	17	62°57.8'N 167°44.3'W	16	94.0	(	4.0)	3.10	2.80	3.45	0.33	0.03	grayish olive green	quartz 95	2% granules; several large shell fragments and some magnetic material; trace of shell
24	18	61°07.4'N 167°52.7'W	13	91.0	(	8.0)	3.23	2.80	3.65	0.43	0.0	moderate olive brown to grayish olive	quartz 95	2% granules
25	19	59°49.8'N 167°45.7'W	17	94.0	(	1.0)	2.75	2.55	3.10	0.28	0.08	olive gray to moderate olive brown	quartz 90	5% granules; several large shell fragments and magnetic material present in mineral fraction; trace of shell
26	20	58°03.3'N 165°59.0'W	30	60.7	33.7	5.6	3.60	2.75	4.70	0.98	0.13	dark gray	quartz 90	trace of shell
27	21	56°53.2'N 165°51.9'W	43	53.0	44.3	2.7	3.90	3.00	4.85	0.92	0.03	dark gray	quartz 95	
28	22	55°53.8'N 165°30.3'W	56	30.2	59.5	10.3	4.70	3.80	5.80	1.00	0.10	grayish olive green	quartz 90	some magnetic material, probably magnetite

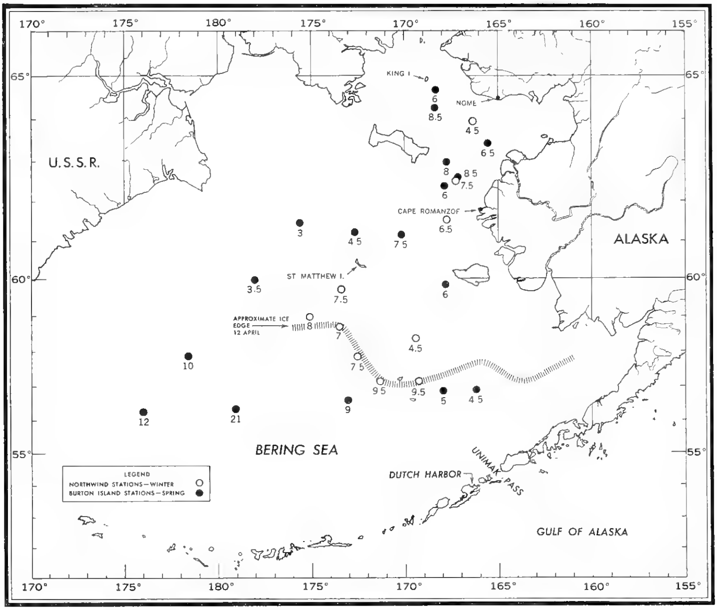


FIGURE 38. WATER TRANSPARENCY MEASUREMENTS (METERS)—WINTER AND SPRING 1955

APPENDIX

OCEANOGRAPHIC STATION DATA

EXPLANATION OF DATA PAGES

GENERAL

Each of the items appearing on the data pages is explained below. The vertical arrows shown in some of the column headings indicate the location of decimal points. The presence of an asterisk to the left of the data indicates that data as doubtful, hence it was not used in the construction of the curve from which the interpolated values (standard depth values) were derived. Observed values which were obviously false were omitted entirely.

SURFACE OBSERVATIONS

1. Cruise Number. This number is arbitrarily assigned. It identifies the cruise and provides a means of sorting from the IBM files all cards pertaining to that particular cruise. Cruise number 00505 to the USS BURTON ISLAND (AGB-1).

2. Station Number. Stations are numbered consecutively, starting with one, at the beginning of each cruise. Therefore, for a complete identification of a particular station, both cruise and station number are necessary.

3. Date. Month and day are given in Arabic numerals. The last three figures of the year are indicated. The hour is Greenwich Mean Time and is that hour nearest to the start of the first cast.

4. Latitude and Longitude. The position of the station is given in degrees and minutes.

5. Sonic Depth. Sonic Depth is the uncorrected sounding for the station, recorded in meters.

6. Maximum Sample Depth. The maximum depth from which a water sample was obtained at the station is given to the nearest 100 meters.

7. Wind. Wind speed is given in meters per second. Direction from which the wind blows is coded in degrees ture to the nearest ten degrees. The last zero is omitted. North is 36 on this scale and calm is 0. See Tables Defining Code Symbols - I, Compass Direction Conversion Table for Wind, Sea, and Swell Directions.

8. Anemometer Height. The height of the anemometer above the waterline is given in meters.

9. Barometric Pressure. Barometric pressure is coded in millibars, neglecting the 900 or 1000. Thus, 996 millibars is coded as 96 and 1008 millibars is coded as 08.

10. Air Temperature. Dry bulb and wet bulb temperatures are entered to the nearest tenth of a degree (centigrade). A negative temperature is coded by dropping the minus sign and adding 50; thus -10° is coded as 60.

11. Humidity. The percent of humidity is coded directly, 100 percent being coded as 99.

12. Weather. Weather is coded as indicated under Tables Defining Code Symbols - II, Numerical Weather Codes - Present Weather.

13. Cloud. Cloud type and amount are coded as indicated under Tables Defining Code Symbols - III and IV, respectively.

14. Sea. Sea direction and amount are coded as indicated under Tables Defining Code Symbols - I and V, respectively.

15. Swell. Swell direction and amount are coded as indicated under Tables Defining Code Symbols - I and VI, respectively.

16. Visibility. Visibility is coded as indicated under Tables Defining Code Symbols - VII, Visibility.

17. Water Color. Water color is coded as indicated under Tables Defining Code Symbols - VIII, Water Color.

18. Water Transparency. Water transparency is coded in whole meters from observations taken with a white Secchi disc (30 cm. diameter).

SUBSURFACE OBSERVATIONS

1. Sample Depth. Observed (actual) depth of each sample is given in meters. Interpolated values at standard depths are also given. The standard depths, in meters, are: 0, 10, 20, 30, 50, 75, 100, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 2000, 2500, 3000, and thence every 1000 meters.

2. Temperature. The centigrade temperature is given in degrees and hundredths.

3. Salinity. Salinity is given in parts per thousand (by weight) to two decimal places.

4. Sigma-t. To convert to density divide by 1000 and add 1. Thus, a sigma-t value of 22.35 converts to a density of 1.02235.

5. Delta-D. The values in the columns are the anomalies of dynamic depths from the surface to each level in dynamic meters. Each entry is the cumulative sum of the anomalies of dynamic depth of the layer above. These values have been computed for the standard depths only, and serve to identify computed points.

6. Dissolved Oxygen. These values are given in milliliters per liter to two decimal places. Values of 10.00 or above rarely occur and are coded as 9.99.

7. Sound Velocity. Sound velocity is given in feet per second to one decimal place, corrected for pressure at each depth.

TABLES DEFINING CODE SYMBOLS

I. Compass Direction Conversion Table for Wind, Sea, and Swell Directions

Code	Direction
00	Calm
01	5° to 14°
02	15° to 24° NNE
03	25° to 34°
04	35° to 44°
05	45° to 54° NE
06	55° to 64°
07	65° to 74° ENE
08	75° to 84°
09	85° to 94° E
10	95° to 104°
11	105° to 114° ESE
12	115° to 124°
13	125° to 134°
14	135° to 144° SE
15	145° to 154°
16	155° to 164° SSE
17	165° to 174°
18	175° to 184° S
19	185° to 194°
20	195° to 204° SSW
21	205° to 214°
22	215° to 224°
23	225° to 234° SW
24	235° to 244°
25	245° to 254° WSW
26	255° to 264°
27	265° to 274° W
28	275° to 284°
29	285° to 294° WNW
30	295° to 304°
31	305° to 314°
32	315° to 324° NW
33	325° to 334°
34	335° to 344° NNW
35	345° to 354°
36	355° to 4° N

TABLE II. NUMERICAL WEATHER CODES—PRESENT WEATHER

00 Cloud development NOT observed or NOT observable during past hour.	**01** Clouds generally dissolving or becoming less developed during past hour.	**02** State of sky on the whole unchanged during past hour.	**03** Clouds generally forming or developing during past hour.	**04** Visibility reduced by smoke.	**05** Haze.	**06** Widespread dust in suspension in the air, NOT raised by wind, at time of observation.	**07** Dust or sand raised by wind, at time of observation.	**08** Well developed dust devil(s) within past hour.	**09** Duststorm or sand storm within sight of or at station during past hour.
10 Light fog	**11** Patches of shallow fog at station, NOT deeper than 6 feet on land.	**12** More or less continuous shallow fog at station, NOT deeper than 6 feet on land.	**13** Lightning visible, no thunder heard.	**14** Precipitation within sight, but NOT reaching the ground.	**15** Precipitation within sight, reaching the ground, but distant from station.	**16** Precipitation within sight, reaching the ground, near to but NOT at station.	**17** Thunder heard, but no precipitation at the station.	**18** Squall(s) within sight during past hour.	**19** Funnel cloud(s) with in sight during past hour.
20 Drizzle (NOT freezing and NOT falling as showers) during past hour, but NOT at time of ob.	**21** Rain (NOT freezing and NOT falling as showers) during past hour, but NOT at time of ob.	**22** Snow (NOT falling as showers) during past hour, but NOT at time of observation.	**23** Rain and snow (NOT falling as showers) during past hour, but NOT at time of observation.	**24** Freezing drizzle or freezing rain (NOT falling as showers) during past hour, but NOT at time of observation.	**25** Showers of rain during past hour, but NOT at time of observation.	**26** Showers of snow, or of rain and snow, during past hour, but NOT at time of observation.	**27** Showers of hail, or of hail and rain, during past hour, but NOT at time of observation.	**28** Fog during past hour, but NOT at time of observation.	**29** Thunderstorm (with or without precipitation) during past hour, but NOT at time of observation.
30 Slight or moderate duststorm or sandstorm has decreased during past hour.	**31** Slight or moderate duststorm or sandstorm no appreciable change during past hour.	**32** Slight or moderate duststorm or sandstorm has increased during past hour.	**33** Severe duststorm or sandstorm, has decreased during past hour.	**34** Severe duststorm or sandstorm, no appreciable change during past hour.	**35** Severe duststorm or sandstorm, has increased during past hour.	**36** Slight or moderate drifting snow, generally low.	**37** Heavy drifting snow, generally low.	**38** Slight or moderate drifting snow, generally high.	**39** Heavy drifting snow, generally high.
40 Fog at distance at time of observation, but NOT at station during past hour.	**41** Fog in patches.	**42** Fog, sky discernible, has become thinner during past hour.	**43** Fog, sky NOT discernible, has become thinner during past hour.	**44** Fog, sky discernible, no appreciable change during past hour.	**45** Fog, sky NOT discernible no appreciable change during past hour.	**46** Fog, sky discernible, has begun or become thicker during past hour.	**47** Fog, sky NOT discernible, has begun or become thicker during past hour.	**48** Fog, depositing rime, sky discernible.	**49** Fog, depositing rime, sky not discernible
50 Intermittent drizzle (NOT freezing) slight at time of observation.	**51** Continuous drizzle (NOT freezing) slight at time of observation.	**52** Intermittent drizzle (NOT freezing) moderate at time of ob.	**53** Continuous drizzle (NOT freezing), moderate at time of ob.	**54** Intermittent drizzle (NOT freezing), thick at time of observation.	**55** Continuous drizzle (NOT freezing), thick at time of observation.	**56** Slight freezing drizzle.	**57** Moderate or thick freezing drizzle.	**58** Drizzle and rain, slight.	**59** Drizzle and rain, moderate or heavy
60 Intermittent rain (NOT freezing), slight at time of observation.	**61** Continuous rain (NOT freezing), slight at time of observation.	**62** Intermittent rain (NOT freezing), moderate at time of ob.	**63** Continuous rain (NOT freezing), moderate at time of observation.	**64** Intermittent rain (NOT freezing), heavy at time of observation.	**65** Continuous rain (NOT freezing), heavy at time of observation.	**66** Slight freezing rain.	**67** Moderate or heavy freezing rain.	**68** Rain or drizzle and snow, slight.	**69** Rain or drizzle and snow, moderate or heavy.
70 Intermittent fall of snowflakes, slight at time of observation.	**71** Continuous fall of snowflakes, slight at time of observation.	**72** Intermittent fall of snowflakes, moderate at time of observation.	**73** Continuous fall of snowflakes, moderate at time of observation.	**74** Intermittent fall of snowflakes, heavy at time of observation.	**75** Continuous fall of snowflakes, heavy at time of observation.	**76** Ice needles (with or without fog).	**77** Granular snow (with or without fog).	**78** Isolated starlike snow crystals (with or without fog).	**79** Ice pellets (sleet, U. S. definition).
80 Slight rain shower(s).	**81** Moderate or heavy rain shower(s).	**82** Violent rain shower(s).	**83** Slight shower(s) of rain and snow mixed.	**84** Moderate or heavy shower(s) of rain and snow mixed.	**85** Slight snow shower(s).	**86** Moderate or heavy snow shower(s).	**87** Slight shower(s) of soft or small hail with or without rain or rain and snow mixed.	**88** Moderate or heavy shower(s) of soft or small hail with or without rain or rain and snow mixed.	**89** Slight shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder
90 Moderate or heavy shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder.	**91** Slight rain at time of ob.; thunderstorm during past hour, but NOT at time of observation.	**92** Moderate or heavy rain at time of ob.; thunderstorm during past hour, but NOT at time of observation.	**93** Slight snow or rain and snow mixed or hail at time of observation.; thunderstorm during past hour, but not at time of observations.	**94** Mod. or heavy snow, or rain and snow mixed or hail at time of ob.; thunderstorm during past hour, but NOT at time of observation.	**95** Slight or mod. thunderstorm without hail, but with rain and/or snow at time of observation.	**96** Slight or moderate thunderstorm, with hail at time of observation.	**97** Heavy thunderstorm, without hail, but with rain and/or snow at time of observation.	**98** Thunderstorm combined with duststorm or sandstorm at time of observation.	**99** Heavy thunderstorm with hail at time of observation.

III. Cloud Type

Code	
0	Stratus or Fractostratus
1	Cirrus
2	Cirrostratus
3	Cirrocumulus
4	Altocumulus
5	Altostratus
6	Stratuscumulus
7	Nimbostratus
8	Cumulus or Fractocumulus
9	Cumulonumbus

IV. Cloud Amount

Code	
0	No clouds
1	Less than 1/10 or 1/10
2	2/10 and 3/10
3	4/10
4	5/10
5	6/10
6	7/10 and 8/10
7	9/10 and 9/10 plus
8	10/10
9	Sky obscured

V. Sea Amount

Code	Approximate Height (feet)	Description
0	-------	Calm
1	Less than 1	Smooth
2	1 to 3	Slight
3	3 to 5	Moderate
4	5 to 8	Rough
5	8 to 12	Very rough
6	12 to 20	High
7	20 to 40	Very High
8	40 and over	Mountainous
9	-------	Very rough confused sea

VI. Swell Amount

Code	Approximate Height (ft)	Description		Approximate Length (ft)
0	-------	No Swell		-------
1	1 to 6	Low Swell	Short or Average	0 to 600
2			Long	Above 600
3	6 to 12	Moderate	Short	0 to 300
4			Average	300 to 600
5			Long	Above 600
6	Greater than 12	High	Short	0 to 300
7			Average	300 to 600
8			Long	Above 600
9	-------	Confused		------

VII. Visibility

Code		
0	Dense Fog	50 yards
1	Thick Fog	200 yards
2	Fog	400 yards
3	Moderate fog	1000 yards
4	Thin fog or mist	1 mile
5	Visibility poor	2 miles
6	Visibility moderate	5 miles
7	Visibility good	10 miles
8	Visibility very good	30 miles
9	Visibility excellent	Over 30 miles

VIII. Water Color

Code (Percent yellow)	Description
00	Deep blue
10	Blue
20	Greenish-blue (or green blue)
30	Bluish-green (or blue green)
40	Green
50	Light Green
60	Yellowish-green
70	Yellow green
80	Green yellow
90	Greenish-yellow
99	Yellow

DATA TABULATIONS

USCGC NORTHWIND (WAGB-2)

BERING SEA AREA

WINTER 1955

(IBM Cruise No. 501)

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0001	03	06	955	07	57	53N	168	50W	0062	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
12	02		02	62 3	62 3	99	71	0	8	35	2			3		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	00 60	32 45	26 04	0 000	3 81	4740 6
0000	00 60	32 45	26 04		3 81	4740 6
0010	00 67	32 43	26 02	0 020	2 66	4742 2
0010	00 67	32 43	26 02		2 66	4742 2
0020	00 74	32 43	26 02	0 040	2 57	4743 8
0020	00 74	32 43	26 02		*2 21	*4743 8
0030	00 64	32 47	26 06	0 060	2 51	4743 1
0030	00 64	32 47	26 06		2 51	4743 1
0050	00 68	32 48	26 06	0 099	2 52	4744 9
0050	00 68	32 48	26 06		2 52	4744 9

Note: Surface temperature obtained from Bathythermograph

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0002	03	07	955	00	58	02N	168	56W	0062	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
07	36		17	66 8	66 9	91	02	6	2					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 40	31 85	25 64	0 000	2 23	4707 1
0000	-01 40	31 85	25 64		2 23	4707 1
0010	-01 35	31 92	25 69	0 023	2 25	4708 8
0010	-01 35	31 92	25 69		2 25	4708 8
0020	-00 72	32 29	25 97	0 045	1 93	4720 9
0020	-00 72	32 29	25 97		1 93	4720 9
0030	-00 22	32 30	25 96	0 066	1 91	4729 3
0030	-00 22	32 30	25 96		*1 44	*4729 3
0040	-00 12	32 30	25 96		1 90	4731 4
0050	-00 21	32 24	25 91	0 107	2 53	4730 3
0050	-00 21	*31 98	*25 70		2 53	*4729 2
0055	-00 07	32 18	25 86		*2 41	*4732 5

Note: Surface temperature obtained from Bathythermograph

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0003	03	08	955	01	58	50N	168	29W	0042	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
04	16		03	02 2	01 4	86	03	6	5					6		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/₀₀	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 85	31 98	25 75	0 000		4700 5
0000	-01 85	31 98	25 75			4700 5
0010	-01 68	31 74	25 55	0 023		4702 8
0010	-01 68	31 74	25 55			4702 8
0020	-01 70	31 78	25 59	0 048	2 17	4703 2
0020	-01 70	31 78	25 59		2 .17	4703 2
0030	-01 73	31 74	25 55	0 072	2 01	4703 2
0030	-01 73	31 74	25 55		2 01	4703 2
0035	-01 70	31 76	25 57			4704 0

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0004	03	08	955	08	59	17N	169	31W	0047	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
12	20		01	00 0	50 4	89	03	6	8					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/₀₀	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 68	31 76	25 57	0 000	2 59	4702 3
0000	-01 68	31 76	25 57		2 59	4702 3
0010	-01 71	31 80	25 60	0 024	2 63	4702 6
0010	-01 71	31 80	25 60		2 63	4702 6
0020	-01 72	31 78	25 59	0 048	2 49	4702 9
0020	-01 72	31 78	25 59		*2 09	*4702 9
0030	-01 74	31 74	25 55	0 072	2 15	4703 0
0030	-01 74	31 74	25 55		2 15	4703 0
0040	-01 73	31 78	25 59		*2 73	*4703 9

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0005	03	09	955	00	59	51N	171	19W	0071	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
09	22		98	00 7	00 3	91	45	0	8			20	6	4		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 73	31 64	25 47	0 000	2 26	4701 0
0000	-01 73	31 64	25 47		2 26	4701 0
0010	-01 72	31 67	25 50	0 025	1 84	4701 8
0010	-01 72	31 67	25 50		1 84	4701 8
0020	-01 74	31 78	25 59	0 050	2 12	4702 6
0020	-01 74	31 78	25 59		2 12	4702 6
0030	-01 74	31 76	25 57	0 074	2 09	4703 1
0040		31 76			2 06	
0050	-01 71	31 75	25 56	0 122	2 00	4704 7
0060	-01 68	31 74	25 55		1 93	4705 7

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0006	03	09	955	06	60	11N	173	22W	0042	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	32		99	53 4	53 9	90	45	0	8			16	4	5		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 70	31 89	25 67	0 000	2 65	4702 5
0000	-01 70	31 89	25 67		2 65	4702 5
0010	-01 72	31 82	25 62	0 024	2 82	4702 5
0010	-01 72	31 82	25 62		2 82	4702 5
0020	-01 75	31 85	25 64	0 047	2 09	4702 7
0020	-01 75	31 85	25 64		2 09	4702 7
0030	-01 79	31 89	25 68	0 071	1 68	4702 9
0030	-01 79	31 89	25 68		1 68	4702 9
0040	-01 71	31 85	25 64		1 94	4704 6

SURFACE OBSERVATIONS												
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0007	03	09	955	15	61	06N	174	15W	0086	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
10	32		10	63 3	63 6	90	36	0	8					6		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 72	32 07	25 82	0 000	1 90	4703 0
0000	-01 72	32 07	25 82		1 90	4703 0
0010	-01 74	32 09	25 84	0 022	2 54	4703 4
0010	-01 74	32 09	25 84		2 54	4703 4
0020	-01 76	32 05	25 81	0 044	2 10	4703 5
0020	-01 76	32 05	25 81		2 10	4703 5
0030	-01 79	32 14	25 88	0 065	2 10	4704 0
0050	-01 83	32 20	25 93	0 107	2 09	4704 8
0050	-01 83	32 20	25 93		2 09	4704 8
0075	-01 76	32 06	25 81	0 161	2 22	4706 8
0080	-01 72	32 03	25 79		2 25	4707 6

SURFACE OBSERVATIONS												
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0008	03	09	955	23	61	29N	175	00W	0078	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	27		18	65 3	65 6	86	.02	0	4					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 72	32 21	25 93	0 000	*2 00	*4703 6
0000	-01 72	32 21	25 93		2 00	4703 6
0010	-01 72	32 23	25 95	0 021	2 00	4704 3
0010	-01 72	32 23	25 95		2 00	4704 3
0020	-01 77	32 18	25 91	0 042	2 00	4703 9
0020	-01 77	32 18	25 91		2 00	4703 9
0030	-01 79	32 18	25 91	0 062	1 96	4704 1
0050	-01 80	32 18	25 91	0 104	1 83	4705 2
0050	-01 80	32 18	25 91		1 83	4705 2
0070	-01 72	32 45	26 13		1 82	4708 8

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0009	03	10	955	03	61	37N	172	56W	0065	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
05	27		18	65 6	65 8	86	02	4	2					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 66	31 46	25 33	0 000	1 79	4701 3
0000	-01 66	31 46	25 33		1 79	4701 3
0010	-01 67	31 53	25 38	0 026	2 05	4702 0
0010	-01 67	31 53	25 38		2 05	4702 0
0020	-01 72	31 69	25 51	0 052	2 03	4702 5
0020	-01 72	31 69	25 51		2 03	4702 5
0030	-01 77	31 64	25 47	0 077	1 96	4702 1
0040	-01 77	31 58	25 42		1 89	4702 4
0050	-01 70	31 53	25 38	0 128	1 91	4703 9
0060	-01 66	31 49	25 35		1 93	4705 0

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0010	03	10	955	11	61	47N	170	53W	0043	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
07	34		20	66 7	67 2	70	02	4	1					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 67	31 40	25 28	0 000	2 22	4700 9
0000	-01 67	31 40	25 28		2 22	4700 9
0010	-01 67	31 40	25 28	0 027	2 42	4701 5
0010	-01 67	31 40	25 28		2 42	4701 5
0020	-01 71	31 64	25 47	0 053	1 54	4702 5
0020	-01 71	*34 96	*28 16		1 54	*4716 9
0030	-01 74	31 64	25 47	0 078	2 25	4702 6
0030	-01 74	31 64	25 47		2 25	4702 6
0040	-01 69	31 40	25 28		1 83	4702 9

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE	LONGITUDE	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	° ′	° ′		
00501	0011	03	12	955	03	61 49N	168 27W	0031	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
08	11		28	66 7	66 8	94	02	0	8					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 66	31 85	25 64	0 000		4703 0
0000	-01 66	31 85	25 64		*1 95	*4703 0
0010	-01 74	31 89	25 68	0 023	2 03	4702 5
0010	*-01 72	31 89	*25 68		2 03	*4702 8
0020	-01 77	31 83	25 63	0 047		4702 3
0020	-01 77	31 83	25 63			4702 3

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE	LONGITUDE	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	° ′	° ′		
00501	0012	03	13	955	22	62 08N	167 37W	0018	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
13	14		01	55 8	55 8	99	36	0	8					3		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 73	32 52	26 19	0 000	1 93	4704 8
0000	-01 73	32 52	26 19		1 93	4704 8
0010	-01 78	32 54	26 20	0 018	1 77	4704 7
0010	-01 78	32 54	26 20		1 77	4704 7
0015	-01 74	32 56	26 22		1 99	4705 7

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE	LONGITUDE	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	° ′	° ′		
00501	0013	03	15	955	07	63 04N	166 06W	0012	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
03	14		12	57 9	58 3	87	02	2	7					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 72	32 43	26 11	0 000		4704 6
0000	-01 72	32 43	26 11		*1 91	*4704 6
0010	-01 77	32 45	26 13	0 019	1 94	4704 4
0010	-01 77	32 45	26 13		1 94	4704 4

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE °	LATITUDE ′	LONGITUDE °	LONGITUDE ′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0014	03	17	955	06	63	52N	165	50W	0016	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
05	25		05	54 8	55 1	93	70	6	3					6		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S ‰	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 70	32 56	26 22	0 000	1 72	4705 4
0000	-01 70	32 56	26 22		1 72	4705 4
0010	-01 77	32 45	26 13	0 019	2 05	4704 4
0010	-01 77	32 45	26 13		2 05	4704 4

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE °	LATITUDE ′	LONGITUDE °	LONGITUDE ′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0015	03	23	955	06	63	58N	166	12W	0031	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
00	00		28	62 2	62 3	96	02	4	5					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S ‰	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 83	32 54	26 20	0 000	1 60	4703 3
0000	-01 83	32 54	26 20		1 60	4703 3
0010	-01 77	32 50	26 17	0 018	1 81	4704 7
0010	-01 77	32 50	26 17			4704 7
0020	-01 77	32 50	26 17	0 037	2 03	4705 3
0020	-01 77	32 50	26 17		2 03	4705 3
0030	-01 74	32 56	26 22	0 055	2 06	4706 6
0030	-01 74	32 56	26 22		2 26	4706 6

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE °	LATITUDE ′	LONGITUDE °	LONGITUDE ′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0016	03	24	955	02	63	51N	166	18W	0037	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
04	04		22	61 1	61 4	88	00		0					7		05

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S ‰	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 70	32 50	26 17	0 000	2 30	4705 2
0000	-01 70	32 50	26 17		2 30	4705 2
0010	-01 76	32 52	26 19	0 018	1 91	4704 9
0010	-01 76	32 52	26 19		1 91	4704 9
0020	-01 78	32 45	26 13	0 037	1 83	4704 9
0020	-01 78	32 45	26 13		1 83	4704 9
0030	-01 77	32 43	26 11	0 056	2 19	4705 5
0030	-01 77	32 43	26 11		2 19	4705 5

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0017	03	24	955	21	63 52N	166 15W	0036	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
08	07		14	55 3	55 7	90	02	6	6					7		05

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 76	32 56	26 22	0 000	2 07	4704 5
0000	-01 76	32 56	26 22		2 07	4704 5
0010	-01 73	32 56	26 22	0 018	2 02	4705 6
0010	-01 73	32 56	26 22		*1 99	*4705 6
0020	-01 76	32 54	26 20	0 036	1 98	4705 6
0020	-01 76	32 54	26 20		1 98	4705 6
0030	-01 77	32 56	26 22	0 054	2 06	4706 1
0030	-01 77	32 56	26 22		2 06	4706 1

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0018	03	25	955	10	63 52N	166 15W		00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
06	04		08	55 6	56 1	86	02	4	3					7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 76	32 54	26 20	0 000	2 24	4704 4
0000	-01 76	32 54	26 20		2 24	4704 4
0010	-01 79	32 54	26 20	0 018	2 40	4704 5
0010	-01 79	32 54	26 20		2 40	4704 5
0020	-01 81	32 56	26 22	0 036	2 43	4704 9
0020	-01 81	32 56	26 22		2 43	4704 9
0030	-01 77	32 54	26 20	0 054	2 38	4706 0
0030	-01 77	32 54	26 20		2 38	4706 0

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0019	03	25	955	21	63 50N	166 14W		00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
04	36		04	58 6	59 0	87	02	2	3					7		04

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 68	32 52	26 18	0 000	2 96	4705 6
0000	-01 68	32 52	26 18		2 96	4705 6
0010	-01 77	32 56	26 22	0 018	2 63	4704 9
0010	-01 77	32 56	26 22		2 63	4704 9
0020	-01 76	32 52	26 19	0 036	2 71	4705 5
0020	-01 76	32 52	26 19		2 71	4705 5
0030	-01 77	32 54	26 20	0 055		4706 0
0030	-01 77	32 54	26 20		*2 63	*4706 0

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0020	03	26	955	22	63	57N	166	14W	0027	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
10	34		97	62 0	62 2	91	02	5	5					7		05

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 75	32 50	26 17	0 000	3 30	4704 4
0000	-01 75	32 50	26 17		3 30	4704 4
0010	-01 77	32 48	26 15	0 019	3 96	4704 6
0010	-01 77	32 48	26 15		3 96	4704 6
0015	-01 75	32 48	26 15		3 63	4705 2
0020	-01 77	32 50	26 17	0 037	5 55	4705 3
0020	-01 77	32 50	26 17		5 55	4705 3

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0021	03	27	955	21	63	57N	166	12W	0028	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
07	34		94	65 8	66 0	89	02	4	1					7		04

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 70	32 34	26 04	0 000	2 45	4704 5
0000	-01 70	32 34	26 04		2 45	4704 5
0010	-01 73	32 36	26 06	0 020	2 91	4704 7
0010	-01 73	32 36	26 06		2 91	4704 7
0020	-01 81	32 38	26 07	0 039	2 36	4704 1
0020	-01 81	32 38	26 07			4704 1
0025	-01 77	32 36	26 06		2 09	4704 9

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0022	03	28	955	21	63	50N	166	08W	0028	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
03	14		06	62 1	62 4	89	70	0	8					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 74	32 38	26 07	0 000		4704 0
0000	-01 74	32 38	26 07			4704 0
0010	-01 76	32 38	26 07	0 019		4704 3
0010	-01 76	32 38	26 07			4704 3
0020	-01 80	32 45	26 13	0 039		4704 6
0020	-01 80	32 45	26 13			4704 6
0025	-01 77	32 45	26 13			4705 3

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE °	LATITUDE '	LONGITUDE °	LONGITUDE '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0023	03	29	955	21	63	55N	166	12W	0028	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
01	22		08	62 2	62 8	78	02	6	1					7		04

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 62	32 32	26 02	0 000	5 97	4705 7
0000	-01 62	32 32	26 02		5 97	4705 7
0010	-01 78	32 41	26 10	0 020	6 78	4704 1
0010	-01 78	32 41	26 10		6 78	4704 1
0020	-01 80	32 45	26 13	0 039	5 69	4704 6
0020	-01 80	32 45	26 13		5 69	4704 6
0025	-01 75	32 45	26 13			4705 7

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE °	LATITUDE '	LONGITUDE °	LONGITUDE '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0024	03	30	955	21	63	54N	166	09W	0028	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
05	32		12	64 4	65 0	74	02	4	1					7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 71	32 36	26 06	0 000		4704 4
0000	-01 71	32 36	26 06			4704 4
0010	-01 77	32 39	26 08	0 020		4704 2
0010	-01 77	32 39	26 08			4704 2
0020	-01 77	32 41	26 10	0 039		4704 9
0020	-01 77	32 41	26 10			4704 9
0025	-01 76	32 43	26 11			4705 4

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE °	LATITUDE '	LONGITUDE °	LONGITUDE '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0025	04	01	955	21	63	31N	165	51W	0023	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
06	04		23	64 1	64 4	82	02	4	2					7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 64	32 39	26 08	0 000	6 43	4705 7
0000	-01 64	32 39	26 08		6 43	4705 7
0010	-01 77	32 43	26 11	0 019		4704 4
0010	-01 77	32 43	26 11			4704 4
0015	-01 78	32 39	26 08			4704 3
0020	-01 81	32 39	26 08	0 038	3 77	4704 1
0020	-01 81	32 39	26 08		3 77	4704 1

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0026	04	04	955	00	63	55N	165	58W	0023	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
05	07		24	65 8	66 2	78	00		0					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 73	32 36	26 06	0 000	7 69	4704 1
0000	-01 73	32 36	26 06		7 69	4704 1
0010	-01 75	32 38	26 07	0 020	6 51	4704 5
0010	-01 75	32 38	26 07			4704 5
0015	-01 75	32 41	26 10		5 84	4704 9
0020	-01 76	32 41	26 10	0 039	6 39	4705 0
0020	-01 76	32 41	26 10		6 39	4705 0

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0027	04	05	955	21	63	07N	166	02W	0022	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
07	36		19	66 0	66 4	77	00	6	1					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 72	32 47	26 14	0 000		4704 7
0000	-01 72	32 47	26 14			4704 7
0010	-01 78	32 45	26 13	0 019	7 74	4704 3
0010	-01 78	32 45	26 13		7 74	4704 3
0015	-01 78	32 45	26 13		5 18	4704 6
0020	-01 76	32 47	26 15	0 038	7 73	4705 3
0020	-01 76	32 47	26 15		7 73	4705 3

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0028	04	08	955	20	62	29N	167	10W	0031	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
03	36		14	64 5	64 7	90	02	4	1					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 71	32 65	26 29	0 000	4 40	4705 7
0000	-01 71	32 65	26 29		4 40	4705 7
0010	-01 76	32 63	26 28	0 017	6 67	4705 4
0010	-01 76	32 63	26 28		6 67	4705 4
0015	-01 76	32 74	26 36		3 44	4706 2
0020	-01 76	32 75	26 37	0 035	4 76	4706 5
0025	-01 76	32 75	26 37		4 76	4706 8

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	'	LONGITUDE °	'	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0029	04	09	955	03	61	30N	167	47W	0027	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
00	00		16	60 7	60 7	99	02	0	3					7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 73	32 43	26 11	0 000	7 70	4704 4
0000	-01 73	32 43	26 11		7 70	4704 4
0010	-01 75	32 43	26 11	0 019	7 71	4704 7
0010	-01 75	32 43	26 11		7 71	4704 7
0020	-01 74	32 45	26 13	0 038	7 45	4705 5
0020	-01 74	32 45	26 13		7 45	4705 5
0025	-01 73	32 45	26 13		7 72	4706 0

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	'	LONGITUDE °	'	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0030	04	09	955	23	60	28N	168	47W	0038	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
06	25		18	60 2	60 4	92	02		0					7		07

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 67	31 89	25 67	0 000	7 69	4703 0
0000	-01 67	31 89	25 67		7 69	4703 0
0010	-01 68	31 90	25 68	0 023	7 69	4703 5
0010	-01 73	*32 16	*25 89		7 69	*4703 8
0020	-01 70	31 91	25 69	0 046	7 65	4703 8
0020	-01 70	31 91	25 69		7 65	4703 8
0030	-01 69	31 85	25 64	0 070	7 25	4704 3
0030	-01 69	31 85	25 64		7 25	4704 3

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	'	LONGITUDE °	'	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0031	04	10	955	06	59	36N	169	10W	0047	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
05	25		19	55 7	55 9	93	71	6	8					2		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 68	31 76	25 57	0 000	7 77	4702 3
0000	-01 68	31 76	25 57		7 77	4702 3
0010	-01 71	31 91	25 69	0 024	7 69	4703 1
0010	-01 71	31 91	25 69		7 69	4703 1
0020	-01 71	31 79	25 59	0 047	7 50	4703 1
0020	-01 71	*32 95	*26 53		7 50	*4708 2
0030	-01 70	31 67	25 50	0 072	7 75	4703 4
0030	-01 70	31 67	25 50		7 75	4703 4
0040	-01 72	32 00	25 76		8 77	4705 1

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0032	04	10	955	21	58	24N	169	32W	0069	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
05	27		24	52 5	53 1	88	01	4	7					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 59	31 74	25 55	0 000	7 93	4703 6
0000	-01 59	31 74	25 55		7 93	4703 6
0010	-01 69	31 80	25 60	0 024	7 86	4702 9
0010	-01 69	31 80	25 60		7 86	4702 9
0020	-01 69	31 83	25 63	0 048	7 86	4703 6
0030	-01 70	31 85	25 64	0 072	7 86	4704 1
0030	-01 70	31 85	25 64		7 86	4704 1
0050		31 87			7 75	
0050		31 87			7 75	
0065	*-01 49	31 83	*25 62		7 77	*4709 5

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0033	04	11	955	03	57	05N	169	22W	0071	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	22		25	01 1	50 6	71	02	6	8					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	00 83	32 47	26 05	0 000	7 64	4744 2
0000	00 83	32 47	26 05		7 64	4744 2
0010	00 77	32 52	26 09	0 020	7 43	4744 1
0010	*00 32	32 52	*26 11			*4737 3
0020	00 72	32 66	26 21	0 038	7 22	4744 5
0020	*01 24	32 66	*26 17		7 22	*4752 3
0030	00 70	32 76	26 29	0 056	7 43	4745 2
0030	00 70				*5 96	
0050	00 74	32 92	26 41	0 090	7 46	4747 7
0050	00 74	32 92	26 41		7 46	4747 7
0065	00 76	32 65	26 19		*6 07	*4747 7

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	′	LONGITUDE °	′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0034	04	11	955	09	56	04N	169	19W	0292	02

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
07	22		24	01 7	01 1	91	60	6	8	22	2			7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	01 96	32 77	26 21	0 000	7 33	4762 2
0000	01 96	32 77	26 21		7 33	4762 2
0008	01 95	32 88	26 30		7 27	4763 0
0010	01 94	32 88	26 30	0 018	7 24	4762 9
0016		*32 57			7 14	
0020	01 93	32 89	26 31	0 035		4763 4
0030	01 94	32 89	26 31	0 052		4764 2
0039	01 97	32 90	26 32			4765 2
0050	02 06	32 89	26 30	0 087		4767 1
0075	02 32	32 91	26 30	0 130		4772 4
0079	02 37	32 92	26 30		7 05	4773 5
0100	02 74	33 03	26 36	0 173	6 75	4780 5
0120	03 03	33 12	26 41		6 45	4786 2
0150	03 37	33 24	26 47	0 254	5 77	4793 3
0200	03 54	33 40	26 58	0 330	4 74	4799 3
0236	03 65	33 48	26 64		4 02	4803 3

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	′	LONGITUDE °	′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0035	04	11	955	15	56	14N	171	02W		04

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
15	22		17	02 5	02 2	95	02	6	8	21	4			7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	02 39	33 01	26 37	0 000	7 25	4769 4
0000	02 39	33 01	26 37		7 25	4769 4
0010	02 38	33 08	26 43	0 016	7 22	4770 2
0018	02 38	33 12	26 46		7 22	4770 8
0020	02 38	33 12	26 46	0 032	7 22	4770 9
0030	02 40	33 12	26 46	0 048	7 23	4771 8
0046	02 44	33 10	26 44		7 23	4773 3
0050	02 45	33 10	26 44	0 080	7 22	4773 6
0075	02 51	33 11	26 44	0 120	7 22	4776 0
0093	02 57	33 15	26 47		7 21	4778 1
0100	02 62	33 18	26 49	0 159	7 16	4779 4
0140	03 04	33 31	26 56		6 62	4788 3
0150	03 16	33 31	26 55	0 236	6 33	4790 6
0187	03 57	*33 30	*26 50		5 49	*4798 6
0200	03 57	33 44	26 61	0 310	5 31	4799 9
0250	03 57	33 53	26 68	0 381	4 65	4803 3
0282	03 56	33 58	26 72		4 27	4805 2
0300	03 56	33 61	26 75	0 448	4 02	4806 4
0378	03 62	33 73	26 84		2 63	4812 4

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0036	04	11	955	20	57	06N	171	12W	0100	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
09	27		16	00 6	00 0	90	02	6	2			22	4	7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 30	31 94	25 71	0 000	8 18	4709 1
0000	-01 30	31 94	25 71		8 18	4709 1
0010	-01 29	32 05	25 80	0 023	8 02	4710 3
0010	-01 29	32 05	25 80		8 02	4710 3
0020	-00 59	32 41	26 06	0 043	7 91	4723 4
0020	-00 59	32 41	26 06		7 91	4723 4
0030	00 12	32 65	26 23	0 062	7 69	4736 0
0050	01 56	32 79	26 26	0 098	7 25	4759 4
0050	01 56	32 79	26 26		7 25	4759 4
0075	02 00				7 17	
0075	02 00	*32 65	*26 11		7 17	*4766 7

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0037	04	12	955	02	57	49N	172	32W	0117	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	29		16	00 8	00 3	90	01	6	5			20	4	7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 42	32 09	25 83	0 000	8 19	4707 8
0000	-01 42	32 09	25 83		8 19	4707 8
0010	-01 44	32 07	25 82	0 022	8 33	4708 0
0010	-01 44	32 07	25 82		8 33	4708 0
0019	-01 25	32 20	25 92		8 17	4712 1
0020	-01 22	32 21	25 92	0 043	8 16	4712 7
0030	-00 82	32 33	26 01	0 064	7 69	4720 1
0047	00 19	32 50	26 10		7 69	4737 4
0050	00 30	32 52	26 11	0 103	7 67	4739 3
0071	00 82	32 61	26 16		7 59	4748 8
0075	00 82	32 62	26 17	0 150	7 57	4749 1
0095	00 81	32 63	26 18		7 46	4750 2

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0038	04	12	955	08	57	11N	174	00W		04

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
05	20		16	01 7	01 1	91	02	6	8			18	3	7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_f
0000	01 78	32 99	26 40	0 000	7 41	4760 5
0000	01 78	32 99	26 40		7 41	4760 5
0010	01 77	32 99	26 40	0 016	7 39	4760 9
0010	01 77	32 99	26 40		7 39	4760 9
0020	01 81	33 00	26 41	0 033	7 28	4762 1
0030	01 85	33 00	26 40	0 049	7 17	4763 3
0050	01 95	33 01	26 41	0 082	6 97	4766 0
0050	01 95	33 01	26 41		6 97	4766 0
0075	02 02	33 02	26 41	0 122	7 13	4768 6
0100	02 07	33 04	26 42	0 163	7 28	4770 9
0100	02 07	33 04	26 42		7 28	4770 9
0150	02 97	33 22	26 49	0 242	5 91	4787 5
0150	02 97	33 22	26 49		5 91	4787 5
0200	03 43	33 46	26 64	0 317	4 99	4798 0
0200	03 43	33 46	26 64		4 99	4798 0
0250	03 60	33 59	26 73	0 386	4 29	4803 9
0300	03 66	33 69	26 80	0 451	3 73	4808 2
0300	03 66	33 69	26 80		3 73	4808 2
0400	03 56	33 84	26 93	0 573	2 13	4813 3
0400	03 56	33 84	26 93		2 13	4813 3

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0039	04	12	955	13	57	57N	175	11W	2378	03

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	32		08	01 7	01 1	91	73	6	8	13	3			6		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_f
0000	00 04	32 79	26 34	0 000	7 78	4733 6
0000	00 04	32 79	26 34		7 78	4733 6
0006	00 06	*32 75	*26 31		7 73	*4734 1
0010	00 55	32 87	26 38	0 017	7 69	4742 2
0020	00 96	32 95	26 42	0 033	7 60	4749 3
0030	01 26	33 00	26 45	0 049	7 52	4754 6
0032	01 31	33 01	26 45		7 50	4755 5
0050	01 45	33 01	26 44	0 081	7 38	4758 7
0065	*01 51	*33 08	*26 49		7 29	*4760 7
0075	01 46	33 01	26 44	0 121	7 31	4760 3
0098	01 49	33 01	26 44		7 34	4762 1
0100	01 52	33 01	26 44	0 161	7 34	4762 7
0132	01 94	33 08	26 46		7 17	4771 0
0150	02 24	33 12	26 47	0 240	6 93	4776 6
0200	02 91	33 26	26 53	0 318	6 01	4789 8
0203	02 94					
0250	03 32	33 43	26 63	0 392	4 90	4799 3
0286	03 47	33 57	26 72		4 04	4804 2

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0040	04	12	955	20	58	40N	173	30W	0120	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY ↓	WET ↓			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
08	11		00	50 4	50 4	99	77	0	8			14	4	4		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C ↓	S°/.. ↓	σ_t ↓	ΣΔD ↓	O_2ml/l ↓	V_f ↓
0000	-01 64	32 20	25 92	0 000	8 46	4704 8
0000	-01 64	32 20	25 92		8 46	4704 8
0008	-01 64	32 25	25 97		8 55	4705 5
0010	-01 64	32 26	25 97	0 021	8 54	4705 7
0017	-01 64	*32 18	*25 91		8 53	*4705 8
0020	-01 55	32 31	26 01	0 041	8 40	4707 9
0030	-01 17	32 38	26 06	0 061	8 27	4714 8
0042	-00 68	32 47	26 12		7 98	4723 6
0050	-00 34	32 54	26 16	0 099	7 85	4729 6
0063	00 13	32 61	26 20		7 68	4737 9
0075	00 24	32 66	26 23	0 145	7 66	4740 5
0085	00 31	32 68	26 24		7 64	4742 3

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00501	0041	04	13	955	03	59	41N	173	24W	0098	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY ↓	WET ↓			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
13	14		90	00 6	00 3	95	73	0	8					6		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C ↓	S°/.. ↓	σ_t ↓	ΣΔD ↓	O_2ml/l ↓	V_f ↓
0000	-01 67	31 83	25 63	0 000	8 02	4702 7
0000	-01 67	31 83	25 63		8 02	4702 7
0008	-01 68	31 98	25 75		8 02	4703 7
0010	-01 68	31 99	25 76	0 023	7 98	4703 9
0017	-01 69	32 03	25 79		7 90	4704 3
0020	-01 69	32 00	25 76	0 046	7 93	4704 4
0030	-01 69	32 00	25 76	0 068	8 01	4704 9
0043	-01 64	32 00	25 76		8 10	4706 5
0050	-01 53	32 02	25 78	0 113	7 91	4708 8
0065	-01 05	32 21	25 92		7 34	4718 1
0075	-00 27	32 40	26 04	0 165	6 78	4731 6
0079	00 52	32 50	26 09		6 56	4744 3

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE °	LATITUDE '	LONGITUDE °	LONGITUDE '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0042	04	13	955	09	59	59N	174	08W	0124	01

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
08	22		84	00 3	00 0	95	26	6	8					7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 68	32 68	26 31	0 000	9 53	4706 3
0000	-01 68	32 68	26 31		9 53	4706 3
0010	-01 69	32 61	26 26	0 017	9 46	4706 4
0010	-01 69	32 61	26 26		9 46	4706 4
0020	-01 67	32 63	26 27	0 035	9 42	4707 4
0020	-01 67	32 63	26 27		9 42	4707 4
0030	-01 65	32 65	26 29	0 053	9 24	4708 4
0050	-01 60	32 74	26 36	0 087	8 86	4710 8
0050	*-01 27	32 74	*26 35		8 86	*4716 0
0075	-01 49	33 26	26 78	0 123	7 46	4716 3
0075	-01 49	33 26	26 78		7 46	4716 3
0100	00 01	33 33	26 78	0 155	7 34	4741 4
0100	00 01	33 33	26 78		7 34	4741 4

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DATE DAY	DATE YR.	DATE HR.	LATITUDE °	LATITUDE '	LONGITUDE °	LONGITUDE '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0043	04	13	955	18	58	57N	175	04W	0133	01

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
08	20		85	00 6	00 0	90	73	6	7			23	3	7		08

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 65	32 63	26 27	0 000	8 94	4706 6
0000	-01 65	32 63	26 27		8 94	4706 6
0009	-01 66	32 59	26 24		8 94	4706 7
0010	-01 66	32 59	26 24	0 018	8 93	4706 8
0018	-01 66	32 66	26 30		8 83	4707 6
0020	-01 56	32 68	26 31	0 035	8 75	4709 4
0030	-01 02	32 78	26 38	0 052	8 33	4718 9
0046	00 05	32 92	26 45		7 78	4737 0
0050	00 10	32 97	26 49	0 084	7 76	4738 2
0069	00 32	33 28	26 72		7 68	4744 0
0075	00 42				7 59	
0100	01 02				7 30	
0116	01 47				7 06	

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0044	04	14	955	00	57	58N	175	20W	2286	04

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
10	20		86	02 2	02 2	99	72	6	8	20	5			5		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	00 04	33 08	26 58	0 000	8 12	4734 8
0000	00 04	33 08	26 58		8 12	4734 8
0010	00 04	33 03	26 54	0 015		4735 2
0015	00 04	33 01	26 52			4735 4
0020	00 14	33 05	26 55	0 030		4737 4
0030	00 33	33 14	26 61	0 045		4741 3
0038	00 46	33 22	26 67		4 29	4744 1
0050	00 76	33 32	26 73	0 072	4 98	4749 7
0075	01 19	33 44	26 80	0 104	6 90	4758 1
0076	01 20	33 46	26 82		7 02	4758 4
0100	01 50	33 46	26 80	0 136	6 98	4764 3
0150	02 01	33 46	26 76	0 200	6 85	4774 7
0154	02 05	33 46	26 76		6 83	4775 5
0200	02 83	33 59	26 80	0 264	5 88	4790 1
0233	03 38	33 69	26 83		4 87	4800 3
0250	03 42	33 67	26 81	0 327	4 64	4801 7
0300	03 51	33 65	26 78	0 391	3 83	4805 9
0313	03 53	33 64	26 77		3 63	4806 9
0394	03 58	33 75	26 86		2 38	4812 9

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0045	04	14	955	24	58	18N	168	07W	0060	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
10	27		11	50 8	51 7	83	02	6	8			22	3	7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 70	31 80	25 60	0 000	7 93	4702 1
0000	-01 70	31 80	25 60		7 93	4702 1
0010	-01 69	31 80	25 60	0 024	7 94	4702 9
0010	-01 69	31 80	25 60			4702 9
0020	-01 71	31 87	25 66	0 048	7 95	4703 5
0020	-01 71	31 87	25 66		7 95	4703 5
0030	-01 66	31 85	25 64	0 071	7 83	4704 8
0030	-01 66	31 85	25 64		7 83	4704 8
0050	-01 67	31 82	25 62	0 118	7 91	4705 7
0050	-01 67	31 82	25 62		7 91	4705 7

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE	LONGITUDE	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	° ′	° ′		
00501	0046	04	15	955	09	58 20N	166 00W	0045	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY ↓	WET ↓			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
05	27		18	50 6	51 1	89	02	6	8					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C ↓	S °/₀₀ ↓	σ_t ↓	ΣΔD ↓	O_2ml/l ↓	V_t ↓
0000	-01 69	31 71	25 53	0 000	7 96	4701 9
0000	-01 69	31 71	25 53		7 96	4701 9
0010	-01 67	31 64	25 47	0 025	7 95	4702 5
0010	-01 67	31 64	25 47		7 95	4702 5
0020	-01 68	31 74	25 55	0 050	7 93	4703 4
0020	-01 68	31 74	25 55		7 93	4703 4
0030	-01 64	31 67	25 50	0 074	8 09	4704 3
0030	-01 64	31 67	25 50		8 09	4704 3
0040	-01 67	31 64	25 47		8 05	4704 3

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE	LONGITUDE	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	° ′	° ′		
00501	0047	04	15	955	21	58 45N	163 14W	0027	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY ↓	WET ↓			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
04	16		19	50 2	51 1	84	01	6	6					7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C ↓	S °/₀₀ ↓	σ_t ↓	ΣΔD ↓	O_2ml/l ↓	V_t ↓
0000	-01 57	31 49	25 35	0 000	9 26	4702 9
0000	-01 57	31 49	25 35		9 26	4702 9
0010	-01 59	31 47	25 33	0 026	9 32	4703 0
0010	-01 59	31 47	25 33		9 32	4703 0
0015	-01 58	31 46	25 32		9 15	4703 5
0020	-01 60	31 42	25 29	0 053	9 01	4703 3
0020	-01 60	31 42	25 29		9 01	4703 3

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE	LONGITUDE	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	° ′	° ′		
00501	0048	04	16	955	11	59 25N	165 37W	0015	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY ↓	WET ↓			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
14	16		00	00 0	00 0	99	63	6	8			09	2	6		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C ↓	S °/₀₀ ↓	σ_t ↓	ΣΔD ↓	O_2ml/l ↓	V_t ↓
0000	-01 70	31 89	25 67	0 000	9 71	4702 5
0000	-01 70	31 89	25 67		9 71	4702 5
0005	-01 43	31 87	25 65		0 08	4707 0
0010	-01 43	31 85	25 64	0 023	0 07	4707 2
0010	-01 43	31 85	25 64		0 07	4707 2

Note: Surface temperature obtained from Bathythermograph

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	′	LONGITUDE °	′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0049	04	18	955	01	58	00N	163	05W	0042	00

WIND m/sec	DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	WET	HUMIDITY %	WEATHER	CLOUD TYPE	AMT.	SEA DIR.	AMT.	SWELL DIR.	AMT.	VIS.	WATER COL.	TRANS.
09	20		01	01 7	00 8	77	03	6	6	16	2			7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-01 66	31 85	25 64	0 000	8 60	4703 0
0000	-01 66	31 85	25 64		8 60	4703 0
0010	-01 57	31 80	25 60	0 024	8 48	4704 8
0010	-01 57	31 80	25 60		8 48	4704 8
0020	-01 65	31 83	25 63	0 048	8 44	4704 3
0020	-01 65	31 83	25 63		8 44	4704 3
0030	-01 63	31 91	25 69	0 071	8 39	4705 5
0030	-01 63	31 91	25 69		8 39	4705 5

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	′	LONGITUDE °	′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00501	0050	04	18	955	05	56	59N	163	11W	0054	00

WIND m/sec	DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	WET	HUMIDITY %	WEATHER	CLOUD TYPE	AMT.	SEA DIR.	AMT.	SWELL DIR.	AMT.	VIS.	WATER COL.	TRANS.
11	20		00	01 7	00 8	77	01	6	5	22	4			7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	-00 57	31 80	25 57	0 000	8 12	4719 9
0000	-00 57	31 80	25 57		8 12	4719 9
0010	-00 56	31 82	25 59	0 024	7 18	4720 8
0010	-00 56	31 82	25 59		7 18	4720 8
0020	-00 57	31 83	25 60	0 048	8 07	4721 2
0020	-00 57	31 83	25 60		8 07	4721 2
0030	-00 57	31 85	25 61	0 072	7 88	4721 9
0050	-00 54	31 92	25 67	0 119	7 69	4723 9
0050	-00 54	31 92	25 67		7 69	4723 9

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00501	0051	04	18	955	11	56	00N	162	43W	0076	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
08	22		99	02 2	01 9	95	68	6	8	22	3			7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/₀₀	σ_t	ΣΔD	O_2 ml/l	V_f
0000	01 91	31 09	24 87	0 000	7 67	4754 3
0000	01 91	31 09	24 87		7 67	4754 3
0010	01 92	31 09	24 87	0 031		4755 1
0010	01 92	31 09	24 87			4755 1
0020	01 93	31 09	24 87	0 062		4755 8
0020	01 93	31 09	24 87			4755 8
0030	01 89	31 09	24 88	0 093		4755 8
0040	01 84	31 09	24 88			4755 7
0050	01 80	31 09	24 88	0 154		4755 7
0065	01 71	31 09	24 89			4755 3

DATA TABULATIONS

USS BURTON ISLAND (AGB-1)

BERING SEA AREA

SPRING 1955

(IBM Cruise No. 505)

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0001	04	21	955	16	56	55N	166	05W	0072	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	21		03	00 0	50 6	89	03	8	2	23	1			7		04

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	00 68	32 20	25 84	0 000		4740 8
0000	00 68	32 20	25 84			4740 8
0009	00 70	32 21	25 84			4741 6
0010	00 70	32 21	25 84	0 022		4741 7
0019	00 70	32 20	25 84			4742 2
0020	00 70	32 20	25 84	0 043		4742 2
0030	00 71	32 25	25 88	0 065		4743 2
0047	00 75	32 30	25 91			4745 0
0050	00 76	32 31	25 92	0 107		4745 4
0071	00 84	32 32	25 93			4747 9

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0002	04	21	955	23	56	52N	167	58W	0084	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
09	27		01	50 3	51 1	84	71	6	8	23	3			6		05

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	01 18	32 45	26 01	0 000		4749 3
0000	01 18	32 45	26 01			4749 3
0010	01 18	32 41	25 98	0 020		4749 7
0010	01 18	32 41	25 98			4749 7
0020	01 17	32 45	26 01	0 040		4750 3
0020	01 17	32 45	26 01			4750 3
0030	01 21	32 46	26 02	0 060		4751 6
0050	01 32	32 47	26 02	0 100		4754 4
0050	01 32	32 47	26 02			4754 4
0075	01 52	32 50	26 03	0 150		4759 0
0075	01 52	32 50	26 03			4759 0

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0003	04	22	955	07	56 46N	170 08W	0091	01

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
07	28		09	53 9	54 4	87	03	6	6	30	5			7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_f
0000	00 87	32 52	26 08	0 000		4745 0
0000	00 87	32 52	26 08			4745 0
0010	00 91	32 52	26 08	0 019		4746 2
0010	00 91	32 52	26 08			4746 2
0019	01 05	32 57	26 11			4749 0
0020	01 08	32 58	26 12	0 039		4749 6
0030	01 35	32 65	26 16	0 057		4754 5
0048	01 69	32 74	26 21			4760 9
0050	01 72	32 75	26 21	0 094		4761 5
0072	01 85	32 75	26 21			4764 8

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0004	04	22	955	16	56 38N	173 03W	0137	01

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
12	28		13	53 0	54 0	76	02	6	6	27	7			7		09

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_f
0000	02 39	33 04	26 40	0 000		4769 6
0002	02 39	33 04	26 40			4769 7
0010	02 41	33 07	26 42	0 016		4770 6
0012	02 41	33 08	26 43			4770 7
0020	02 41	33 08	26 43	0 032		4771 2
0022	02 41	33 08	26 43			4771 3
0030	02 42	33 07	26 42	0 049		4771 9
0050	02 43	33 06	26 41	0 081		4773 2
0052	02 43	33 06	26 41			4773 3
0075	02 47	33 03	26 38	0 122		4775 1
0077	02 48	33 03	26 38			4775 4
0100	02 62	33 11	26 43	0 163		4779 1
0102	* 02 73	33 12	* 26 43			* 4780 8
0126	02 88	33 17	26 46			4784 6

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0005	04	23	955	07	56	29N	176	00W	3630	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
10	28		15	50 8	51 1	93	72	6	8	27	5			4		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/₀₀	σ_t	ΣΔD	O_2ml/l	V_f
0000	02 31	33 10	26 45	0 000		4768 7
0000	02 31	33 10	26 45			4768 7
0010	02 34	33 08	26 43	0 016		4769 6
0013	02 35	33 08	26 43			4769 9
0020	02 35	33 09	26 44	0 032		4770 4
0030	02 34	33 10	26 45	0 048		4770 9
0033	02 34	33 10	26 45			4771 1
0050	02 34	33 10	26 45	0 080		4772 1
0050	02 34	33 10	26 45			4772 1
0067	02 40	33 10	26 44			4773 9
0075	02 42	33 11	26 45	0 120		4774 7
0100	02 47	33 22	26 53	0 158		4777 4
0100	02 47	33 22	26 53			4777 4

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00505	0006	04	23	955	21	56	24N	179	03W	3750	31

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
03	27		25	01 1	00 0	81	03	8	6	30	2			7		21

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S ‰	σ_t	ΣΔD	O_2ml/l	V_f
0000	02 04	33 35	26 67	0 000		4765 8
0000	02 04	33 35	26 67			4765 8
0010	02 04	33 35	26 67	0 014		4766 4
0018	02 04	33 35	26 67			4766 9
0020	02 04	33 35	26 67	0 028		4767 0
0030	02 03	33 34	26 66	0 041		4767 4
0045	02 02	33 33	26 66			4768 1
0050	02 02	33 31	26 64	0 069		4768 3
0067	02 03	33 28	26 62			4769 3
0075	02 05	33 31	26 64	0 105		4770 2
0089	02 07	33 35	26 67			4771 5
0100	02 03	33 35	26 67	0 140		4771 6
0134	01 98	33 35	26 68			4772 9
0150	02 01	33 36	26 68	0 208		4774 3
0179	02 06	33 39	26 70			4776 9
0200	02 55	33 49	26 74	0 276		4785 6
0250	03 41	33 70	26 83	0 340		4801 7
0272	03 64	33 77	26 87			4806 6
0300	03 64	33 83	26 91	0 400		4808 5
0365	03 65	33 95	27 01			4813 0
0400	03 62	33 99	27 04	0 511		4814 8
0500	03 53	34 09	27 13	0 613		4819 9
0555	03 47	34 14	27 18			4822 5
0600	03 41	34 16	27 20	0 708		4824 5
0800	03 13	34 26	27 31	0 884		4832 8
0905	02 99	34 31	27 36			4837 3
1000	02 87	34 34	27 39	1 042		4841 3
1200	02 62	34 41	27 47	1 187		4850 0
1248	02 57	34 43	27 49			4852 2
1500	02 30	34 51	27 58	1 380		4863 6
1688	02 13	34 56	27 63			4872 5
2000	01 92	34 63	27 70	1 649		4888 3
2143	01 85	34 65	27 72			4895 8
2500	01 73	34 65	27 73	1 886		4915 2
2604	01 70	34 65	27 74			4920 9
3000	01 61	34 69	27 78	2 110		4943 1
3068	01 60	34 70	27 78			4947 0

SURFACE OBSERVATIONS												
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00505	0007	04	24	955	14	56	22N	178	11E	3750	07

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
03	13		27	01 7	00 6	81	02	6	1	18	2			7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	01 74	33 33	26 68	0 000		4761 3
0000	01 74	33 33	26 68			4761 3
0010	01 74	33 33	26 68	0 014		4761 9
0020	01 74	33 33	26 68	0 027		4762 5
0020	01 74	33 33	26 68			4762 5
0030	01 71	33 37	26 71	0 041		4762 8
0050	01 67	33 39	26 73	0 068		4763 5
0050	01 67	33 39	26 73			4763 5
0075	01 67	33 33	26 68	0 101		4764 8
0075	01 67	33 33	26 68			4764 8
0100	01 71	33 28	26 64	0 136		4766 6
0100	01 71	33 28	26 64			4766 6
0150	01 61	33 31	26 67	0 206		4768 2
0150	01 61	33 31	26 67			4768 2
0199	03 43	33 68	26 82			4798 9
0200	03 43	33 68	26 82	0 272		4799 0
0250	03 58	33 81	26 90	0 333		4804 6
0299	03 64	33 91	26 98			4808 7
0300	03 64	33 91	26 98	0 390		4808 8
0399	03 50	34 05	27 10			4813 3
0400	03 50	34 05	27 10	0 495		4813 4
0500	03 40	34 14	27 18	0 592		4818 3
0599	03 30	34 20	27 24			4823 0
0600	03 30	34 20	27 24	0 682		4823 1
0683	03 21	34 23	27 27			4826 9

SURFACE OBSERVATIONS												
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00505	0008	04	24	955	24	56	16N	176	01E	3840	30

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	04		19	01 7	01 1	91	02	8	8	12	2			7		12

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	01 99	33 35	26 67	0 000		4765 1
0000	01 99	33 35	26 67			4765 1
0010	01 99	33 37	26 69	0 014		4765 7
0020	01 99	33 38	26 70	0 027		4766 4
0025	01 99	33 39	26 71			4766 7
0030	01 97	33 39	26 71	0 041		4766 7
0050	01 89	33 39	26 71	0 068		4766 7
0074	01 77	33 39	26 72			4766 4
0075	01 76	33 39	26 72	0 101		4766 3
0099	01 61	33 40	26 74			4765 6
0100	01 55	33 39	26 74	0 134		4764 7
0149	01 48	33 37	26 73			4766 5
0150	01 59	33 39	26 74	0 200		4768 3
0174	03 45	33 69	26 82			4797 7
0198	03 71	33 80	26 88			4803 3
0200	03 71	33 80	26 88	0 263		4803 4
0250	03 70	33 89	26 96	0 321		4806 6
0298	03 69	33 96	27 01			4809 6
0300	03 69	33 96	27 01	0 376		4809 7
0397	03 56	34 07	27 11			4814 1
0400	03 56	34 07	27 11	0 479		4814 3
0500	03 45	34 16	27 20	0 575		4819 1
0595	03 32	34 22	27 26			4823 1
0600	03 31	34 22	27 26	0 664		4823 3
0651	03 23	34 25	27 29			4825 3
0800	03 06	34 29	27 34	0 831		4832 0
0932	02 90	34 34	27 39			4837 7
1000	02 81	34 38	27 43	0 983		4840 7
1200	02 56	34 46	27 52	1 120		4849 3
1214	02 54	34 47	27 52			4849 9
1499	02 20	34 52	27 59			4862 1
1500	02 20	34 52	27 59	1 303		4862 2
1980	01 88	34 61	27 69			4886 4
2000	01 87	34 61	27 69	1 570		4887 4
2468	01 69	34 65	27 74			4912 7
2500	01 69	34 65	27 74	1 808		4914 6
2960	01 68	34 69	27 77			4941 8

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0009	04	25	955	18	57	53N	178	30E	3750	15

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
10	03		17	50 3	50 6	95	72	6	8	05	7			7		10

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_t
0000	01 39	33 35	26 72	0 000		4756 3
0000	01 39	33 35	26 72			4756 3
0010	01 42	33 33	26 70	0 013		4757 2
0011	01 42	33 33	26 70			4757 3
0020	01 42	33 32	26 69	0 027		4757 8
0030	01 41	33 32	26 69	0 041		4758 2
0034	01 41	33 31	26 68			4758 4
0046	01 37	33 24	26 63			4758 2
0050	01 38	33 25	26 64	0 068		4758 6
0069	01 40	33 28	26 66			4760 2
0075	01 33	33 29	26 67	0 103		4759 6
0081	01 30	33 30	26 68			4759 5
0093	01 37	33 28	26 66			4761 2
0100	01 36	33 27	26 66	0 138		4761 4
0143	01 34	33 26	26 65			4763 6
0150	01 36	33 27	26 66	0 208		4764 4
0199	01 48	33 35	26 71			4769 4
0200	01 52	33 36	26 72	0 276		4770 1
0250	02 97	33 67	26 85	0 340		4795 4
0292	03 58	33 82	26 91			4807 1
0300	03 59	33 83	26 92	0 400		4807 8
0336	03 62	33 87	26 95			4810 5
0400	03 58	33 99	27 05	0 511		4814 3
0408	03 57	34 00	27 06			4814 6
0500	03 42	34 13	27 17	0 610		4818 5
0531	*03 52	34 16	*27 19			*4821 9
0600	03 28	34 20	27 24	0 701		4822 8
0660	03 20	34 23	27 27			4825 4
0800	03 04	34 30	27 35	0 868		4831 7
0888	02 94	34 34	27 39			4835 7
1000	02 81	34 39	27 44	1 019		4840 7
1160	02 64	34 45	27 50			4848 0
1200	02 60	34 46	27 51	1 155		4849 9
1482	02 35	34 52	27 58			4863 3

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.				
00505	0010	04	26	955	08	59 04N	179 31W	3380	20

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
08	04		17	53 9	54 4	87	02	6	8	05	9			7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/₀₀	σ_t	ΣΔD	O_2 ml/l	V_t
0000	00 43	32 92	26 43	0 000		4740 1
0000	00 43	32 92	26 43			4740 1
0010	00 46	32 92	26 43	0 016		4741 1
0015	00 48	32 92	26 43			4741 7
0020	00 72	32 96	26 45	0 032		4745 8
0030	01 12	33 03	26 48	0 048		4752 7
0047	01 57	33 13	26 53			4760 8
0050	01 60	33 15	26 54	0 078		4761 5
0063	01 74	33 21	26 58			4764 6
0075	01 92	33 22	26 58	0 116		4767 9
0094	02 04	33 24	26 58			4770 9
0100	01 99	33 26	26 60	0 152		4770 6
0110	01 97	33 28	26 62			4771 0
0127	02 14	33 30	26 62			4774 6
0150	02 16	33 31	26 63	0 224		4776 3
0194	02 43	33 39	26 67			4783 1
0200	02 54	33 42	26 69	0 294		4785 2
0250	03 32	33 61	26 77	0 361		4800 1
0265	03 49	33 66	26 79			4803 6
0300	03 50	33 75	26 86	0 423		4806 2
0400	03 54	33 95	27 02	0 538		4813 5
0434	03 55	34 00	27 06			4815 9
0450	03 45	34 02	27 08			4815 5
0500	03 43	34 07	27 13	0 641		4818 4
0600	03 37	34 15	27 19	0 737		4823 9
0621	03 35	34 16	27 20			4824 9
0800	03 11	34 23	27 28	0 914		4832 4
0803	03 11	34 23	27 28			4832 6
0985	02 82	34 36	27 41			4839 8
1000	02 80	34 37	27 42	1 072		4840 5
1200	02 54	34 44	27 50	1 211		4848 9
1304	02 42	34 47	27 54			4853 5
1500	02 22	34 54	27 61	1 394		4862 6
1655	02 09	34 58	27 65			4870 1
2000	01 90	34 63	27 71	1 655		4888 0
2035	01 89	34 63	27 71			4889 9

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	'	LONGITUDE °	'	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0011	04	26	955	21	60	01N	177	59W	0135	01

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
08	04		14	56 7	57 2	85	02	6	7					7		03

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 49	32 65	26 29	0 000		4709 2
0000	-01 49	32 65	26 29			4709 2
0010	-01 47	32 65	26 29	0 017		4710 1
0010		32 65				
0020	-01 45	32 65	26 28	0 035		4711 0
0020	-01 45	32 65	26 28			4711 0
0030	-01 12	32 74	26 35	0 052		4717 2
0050	-00 44	32 90	26 45	0 085		4729 6
0050	-00 44	32 90	26 45			4729 6
0075	00 48	33 08	26 56	0 123		4746 0
0075	00 48	33 08	26 56			4746 0
0099	00 62	33 08	26 55			4749 5
0100	00 63	33 08	26 55	0 160		4749 7
0124	00 73	33 08	26 54			4752 6

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	'	LONGITUDE °	'	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0012	04	27	955	08	60	52N	176	40W	0118	01

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
13	05		10	55 0	56 7	59	02	6	8					7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 75	32 18	25 91	0 000		4703 0
0000	-01 75	32 18	25 91			4703 0
0010	-01 74	32 18	25 91	0 021		4703 7
0010	-01 74	32 18	25 91			4703 7
0020	-01 74	32 20	25 93	0 042		4704 4
0020	-01 74	32 20	25 93			4704 4
0030	-01 73	32 21	25 93	0 063		4705 2
0050	-01 72	32 30	26 01	0 104		4707 0
0050	-01 72	32 30	26 01			4707 0
0075	-00 15	32 54	26 15	0 152		4734 0
0075	-00 15	32 54	26 15			4734 0
0100	00 74	32 83	26 34	0 196		4750 3
0100	00 74	32 83	26 34			4750 3

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE	LONGITUDE	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	° ′	° ′		
00505	0013	04	29	955	17	61 29N	175 42W	0086	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
09	04		03	51 1	51 4	94	02	0	8					6		03

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S ‰	σ_t	$\Sigma\Delta D$	O_2 ml/l	V_f
0000	-01 76	32 20	25 93	0 000		4702 9
0000	-01 76	32 20	25 93			4702 9
0010	-01 74	32 21	25 93	0 021		4703 9
0010	-01 74	32 21	25 93			4703 9
0020	-01 76	32 21	25 94	0 042		4704 2
0020	-01 76	32 21	25 94			4704 2
0030	-01 76	32 21	25 94	0 062		4704 7
0050	-01 74	32 21	25 93	0 104		4706 2
0050	-01 74	32 21	25 93			4706 2
0075	-01 69	32 21	25 93	0 156		4708 5
0075	-01 69	32 21	25 93			4708 5

SURFACE OBSERVATIONS									
CRUISE	STATION	DATE				LATITUDE	LONGITUDE	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	° ′	° ′		
00505	0014	05	01	955	04	61 13N	172 42W	0067	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
05	05		10	00 5	00 2	95	41	6	8					6		04

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S ‰	σ_t	$\Sigma\Delta D$	O_2 ml/l	V_f
0000	-01 67	31 80	25 60	0 000		4702 6
0000	-01 67	31 80	25 60			4702 6
0010	-01 63	31 82	25 62	0 024		4703 9
0010	-01 63	31 82	25 62			4703 9
0020	-01 72	31 82	25 62	0 048		4703 1
0020	-01 72	31 82	25 62			4703 1
0030	-01 71	31 82	25 62	0 071		4703 8
0040	-01 70	31 82	25 62			4704 6
0050	-01 69	31 81	25 61	0 119		4705 3
0060	-01 68	31 80	25 60			4706 0

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	′	LONGITUDE °	′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0015	05	02	955	02	61	10N	170	12W	0043	00

WIND m/sec	DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	WET	HUMIDITY %	WEATHER	CLOUD TYPE	AMT.	SEA DIR.	AMT.	SWELL DIR.	AMT.	VIS.	WATER COL.	TRANS.
06	07		10	00 6	50 6	80	02	6	8					7		07

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/oo	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 71	31 83	25 63	0 000		4702 1
0000	-01 71	31 83	25 63			4702 1
0010	-01 69	31 78	25 59	0 024		4702 8
0010	-01 69	31 78	25 59			4702 8
0020	-01 71	31 83	25 63	0 048		4703 3
0020	-01 71	31 83	25 63			4703 3
0030	-01 71	31 83	25 63	0 071		4703 9
0030	-01 71	31 83	25 63			4703 9
0040	-01 67	31 83	25 63			4705 1

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	′	LONGITUDE °	′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0016	05	02	955	11	61	24N	168	20W	0034	00

WIND m/sec	DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	WET	HUMIDITY %	WEATHER	CLOUD TYPE	AMT.	SEA DIR.	AMT.	SWELL DIR.	AMT.	VIS.	WATER COL.	TRANS.
01	34		09	51 1	51 7	89	10	0	8					4		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/oo	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 56	31 47	25 33	0 000		4702 9
0000	-01 56	31 47	25 33			4702 9
0010	-01 49	31 49	25 35	0 026		4704 7
0010	-01 49	31 49	25 35			4704 7
0020	-01 59	31 49	25 35	0 053		4703 7
0020	-01 59	31 49	25 35			4703 7
0030	-01 60	31 46	25 32	0 079		4704 0
0030	-01 60	31 46	25 32			4704 0

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE °	′	LONGITUDE °	′	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0017	05	03	955	05	62	34N	167	06W	0034	00

WIND m/sec	DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	WET	HUMIDITY %	WEATHER	CLOUD TYPE	AMT.	SEA DIR.	AMT.	SWELL DIR.	AMT.	VIS.	WATER COL.	TRANS.
06	02		10	55 0	55 6	93	02	5	8					7		08

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/oo	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 68	31 91	25 69	0 000		4702 9
0000	-01 68	31 91	25 69			4702 9
0010	-01 67	31 89	25 67	0 023		4703 6
0010	-01 67	31 89	25 67			4703 6
0020	-01 65	31 91	25 69	0 046		4704 6
0020	-01 65	31 91	25 69			4704 6
0025	-01 67	31 92	25 70			4704 6

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0018	05	03	955	19	63 25N	165 30W	0023	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
05	05		06	51 7	52 9	77	02	5	8					7		06

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 74	32 54	26 20	0 000		4704 7
0000	-01 74	32 54	26 20			4704 7
0010	-01 73	32 56	26 22	0 018		4705 6
0010	-01 73	32 56	26 22			4705 6
0015	-01 76	32 52	26 19			4705 2

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0019	05	11	955	08	64 15N	166 40W	0018	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
02	25		14	53 9	54 7	81	01	6	8					7		

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 74	32 32	26 02	0 000		4703 8
0000	-01 74	32 32	26 02			4703 8
0010	-01 71	32 32	26 02	0 020		4704 8
0010	-01 71	32 32	26 02			4704 8
0018	-01 73	32 32	26 02			4705 0

SURFACE OBSERVATIONS

CRUISE	STATION	DATE MO.	DAY	YR.	HR.	LATITUDE ° '	LONGITUDE ° '	SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
00505	0020	05	16	955	15	64 42N	168 23W	0038	00

WIND m/sec	WIND DIR.	ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C DRY	AIR TEMP °C WET	HUMIDITY %	WEATHER	CLOUD TYPE	CLOUD AMT.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	VIS.	WATER COL.	WATER TRANS.
08	35		96	00 0	50 6	89	71	6	8					7		06

SUBSURFACE OBSERVATIONS

SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_t
0000	-01 76	32 97	26 55	0 000		4706 3
0000	-01 76	32 97	26 55			4706 3
0010	-01 78	32 94	26 53	0 015		4706 4
0010	-01 78	32 94	26 53			4706 4
0020	-01 80	32 94	26 53	0 030		4706 7
0020	-01 80	32 94	26 53			4706 7
0030	-01 80	32 94	26 53	0 045		4707 3
0030	-01 80	32 94	26 53			4707 3
0035	-01 74	32 97	26 55			4708 7

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0021	05	19	955	15	64	17N	168	20W	0032	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
03	28		11	51 1	51 4	94	70	6	8					5		08

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 80	32 74	26 37	0 000		4704 6
0000	-01 80	32 74	26 37			4704 6
0010	-01 76	32 84	26 45	0 016		4706 3
0010	-01 76	32 84	26 45			4706 3
0020	-01 77	32 81	26 42	0 032		4706 6
0020	-01 77	32 81	26 42			4706 6
0030	-01 79					
0030	-01 79					

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0022	05	26	955	03	62	58N	167	44W	0025	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
03	31		02	00 0	51 1	79	02	6	8					7		08

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-01 22	31 74	25 54	0 000		4709 5
0002	-01 22	31 74	25 54			4709 6
0010	-01 26	31 79	25 58	0 024		4709 7
0012	-01 27	31 80	25 59			4709 7
0020	-01 31	31 82	25 61	0 048		4709 6
0022	-01 32	31 83	25 62			4709 6

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0023	05	26	955	06	62	29N	167	48W	0025	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	31		03	00 0	50 6	89	11	6	8					6		06

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	-00 50	31 49	25 32	0 000		4719 7
0000	-00 50	31 49	25 32			4719 7
0010	-00 65	31 60	25 41	0 026		4718 4
0010	-00 65	31 60	25 41			4718 4
0020	-01 00	31 62	25 44	0 052		4713 6
0020	-01 00	31 62	25 44			4713 6
0025	-01 00	31 62	25 44			4713 9

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0024	05	26	955	14	61	07N	167	53W	0023	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
04	30		04	51 4	51 7	93	44		8					5		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_f
0000	-00 81	30 90	24 85	0 000		4712 3
0000	-00 81	30 90	24 85			4712 3
0010	-00 74	30 95	24 89	0 031		4714 2
0010	-00 74	30 95	24 89			4714 2
0020	-00 70	31 00	24 93	0 061		4715 6
0020	-00 70	31 00	24 93			4715 6

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0025	05	26	955	21	59	50N	167	46W	0031	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
06	35		06	01 1	00 3	86	02	6	8	33	2			7		06

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_f
0000	00 35	31 11	24 98	0 000		4731 1
0000	00 35	31 11	24 98			4731 1
0005	00 35	31 11	24 98			4731 4
0010	00 33	31 11	24 98	0 030		4731 4
0015	00 29	31 11	24 98			4731 1

SURFACE OBSERVATIONS										
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	′	°	′		
00505	0026	05	27	955	07	58	03N	165	59W	0054	00

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
02	23		07	00 6	50 3	85	71	6	8	33	2			6		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2 ml/l	V_f
0000	00 29	31 71	25 46	0 000		4732 8
0000	00 29	31 71	25 46			4732 8
0010	00 26	31 74	25 49	0 025		4733 0
0010	00 26	31 74	25 49			4733 0
0020	00 25	31 73	25 48	0 050		4733 4
0020	00 25	31 73	25 48			4733 4
0030	00 23	31 71	25 47	0 075		4733 6
0030	00 23	31 71	25 47			4733 6
0050	00 26	31 73	25 48	0 126		4735 3
0050	00 26	31 73	25 48			4735 3

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00505	0027	05	27	955	15	56	53N	165	52W	0067	0 0

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
09	18		04	01 4	00 6	86	61	0	8	18	2			7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	02 34	32 34	25 84	0 000		4765 9
0000	02 34	32 34	25 84			4765 9
0010	02 36	32 39	25 88	0 021		4767 0
0010	02 36	32 39	25 88			4767 0
0020	02 35	32 36	25 86	0 043		4767 3
0020	02 35	32 36	25 86			4767 3
0030	02 34	32 38	25 87	0 064		4767 8
0030	02 34	32 38	25 87			4767 8
0050	02 40	32 38	25 87	0 107		4769 9
0050	02 40	32 38	25 87			4769 9

SURFACE OBSERVATIONS											
CRUISE	STATION	DATE				LATITUDE		LONGITUDE		SONIC DEPTH UNCORRECTED	MAX. SAMPLE DEPTH
		MO.	DAY	YR.	HR.	°	'	°	'		
00505	0028	05	27	955	22	55	54N	165	30W	0102	01

WIND		ANEMO. HGT.	BAR. PRESS.	AIR TEMP °C		HUMIDITY %	WEATHER	CLOUD		SEA		SWELL		VIS.	WATER	
m/sec	DIR.			DRY	WET			TYPE	AMT.	DIR.	AMT.	DIR.	AMT.		COL.	TRANS.
09	21		04	04 4	03 3	83	02	8	8	18	3			7		

SUBSURFACE OBSERVATIONS						
SAMPLE DEPTH	T °C	S °/..	σ_t	ΣΔD	O_2ml/l	V_f
0000	04 04	32 03	25 45	0 000		4788 8
0000	04 04	32 03	25 45			4788 8
0010	03 89	32 05	25 48	0 025		4787 3
0010	03 89	32 05	25 48			4787 3
0020	03 84	32 03	25 47	0 050		4787 1
0020	03 84	32 03	25 47			4787 1
0030	03 79	32 16	25 57	0 075		4787 6
0050	03 66	32 39	25 77	0 122		4787 9
0050		32 39				
0075	03 49	32 62	25 97	0 175		4787 9
0090	03 37	32 72	26 06			4787 6

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Contains the cruise narratives and analyses of oceanographic data collected by the icebreakers USCGC NORTHWIND (WAGB-282) and USS BURTON ISLAND (AGB-1) in the Bering Sea area during winter and spring 1955.

The Appendix contains a tabulation of oceanographic data from 79 stations in the Bering Sea area.

1. Bering Sea - Physical Properties
2. Oceanography - Arctic
3. Meteorology - Arctic
4. Ships - USCGC NORTHWIND
5. Ships - USS BURTON ISLAND

i. title: Oceanographic Survey Results Bering Sea Area - Winter and Spring 1955.

ii. H. O. TR-46

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2. Oceanography - Arctic
3. Meteorology - Arctic
4. Ships - USCGC NORTHWIND
5. Ships - USS BURTON ISLAND

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ii. H. O. TR-46

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