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# Oceanographic Observations During Fisheries Research Surveys Off the British Columbia Coast in 1979

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## Canadian Data Report of Fisheries and Aquatic Sciences No. 210

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Canadian Data Report of Fisheries  
and Aquatic Sciences No. 210

May 1980

OCEANOGRAPHIC OBSERVATIONS DURING FISHERIES RESEARCH  
SURVEYS OFF THE BRITISH COLUMBIA COAST IN 1979

by

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ABSTRACT

Dodimead, A. J. and A. Ballantyne. 1980. Oceanographic observations during fisheries research surveys off the British Columbia coast in 1979. Can. Data Rep. Fish. Aquat. Sci. No. 210:90p.

Oceanographic data collected during fisheries research surveys off the British Columbia Coast in 1979 are reported by cruise. A general description and an assessment of oceanographic conditions are also provided.

Key words: Oceanographic data, British Columbia coast, environmental conditions.

RÉSUMÉ

Dodimead, A. J. and A. Ballantyne. 1980. Oceanographic observations during fisheries research surveys off the British Columbia coast in 1979. Can. Data Rep. Fish. Aquat. Sci. No. 210:90 p.

Les données océanographiques recueillies au cours de levés de recherche sur les pêches effectués en 1979 au large de la côte de la Colombie-Britannique sont présentées selon les résultats obtenus lors de chaque expédition. Le rapport comporte aussi une description et une évaluation générales des conditions océanographiques.

Mots clés: Données océanographiques, côte de la Colombie-Britannique, état de l'environnement.

## INTRODUCTION

The collection of oceanographic data by personnel conducting fisheries research surveys off the British Columbia coast was continued during 1979. The oceanographic observations were primarily those of temperature vs. depth using mechanical bathythermographs (MBT) and expendable bathythermographs (XBT). Temperature and salinity at depth were occasionally observed by means of Nansen bottles and deep-sea reversing thermometers.

The MBT and XBT traces were manually digitized, generally at standard oceanographic depths and/or inflection points. Tables listing the oceanographic and associated data were prepared. A chart showing the approximate positions of the stations, together with tables of data, are presented by cruise in chronological order. Vertical and horizontal distributions and a brief description of oceanographic conditions, including comparisons with those of other periods, are also provided, if the data are adequate.

The format of this report is similar to that used in presenting oceanographic data collected in 1977 (Dodimead et al. 1979a) and in 1978 (Dodimead et al. 1979b).

The surveys reported here are:

1. Hydroacoustic Survey - Dixon Entrance - ARCTIC HARVESTER, January 27-February 6, 1979.
2. Groundfish Surveys - West coast of Vancouver Island - PACIFIC EAGLE, February 19-21, 1979 and March 9-12, 1979.
3. Pollock Survey - Northern B.C. waters - M/V SCOTIA BAY, March 13-29, 1979.
4. Shrimp Survey - West coast of Vancouver Island and Queen Charlotte Sound - G.B. REED, May 2-16, 1979.
5. Groundfish Survey - Queen Charlotte Sound to Dixon Entrance - G.B. REED, June 22-July 12, 1979.
6. Squid Survey - West coast of Vancouver Island - G.B. REED, August 16-23, 1979.
7. Groundfish Survey - Queen Charlotte Sound to Dixon Entrance - G.B. REED, September 7-20, 1979.



1. Hydroacoustic Survey - Dixon Entrance - ARCTIC HARVESTER,  
January 27-February 6, 1979





1. Hydroacoustic Survey - Dixon Entrance - ARCTIC HARVESTER, January 27-February 6, 1979

Stations at which XBT observations were made are shown in Fig. 1 and a summary of the data is provided in Table 1.

Isothermal conditions occurred from the surface to depths of about 20 to 100 m. The temperatures of the isothermal layers ranged from 4.5 to 5.8°C, and are considered to be relatively low for this area; temperatures were about 1.2°C below average, as indicated by the long-term monthly means of sea surface temperature for January (6.8°C) and February (6.5°C) at Triple Island (Hollister and Sandnes 1972). Below the isothermal layer, temperatures generally increased slightly with depth.

Mean bottom water temperatures in eastern Dixon Entrance were 5.5-6.1°C at depths between 36 and 218 m (Table 2) (see Fig. 1 for data included in Table 2). Bottom temperatures were also relatively low, and appear to be lower than those observed in March 1978 at depths between 36 and 108 m, but generally similar at deeper depths in this general area. However, the observations were too few in March 1978 (Dodimead et al. 1979b) for a meaningful comparison to be made.

The relatively low mixed-layer temperatures in late January and early February were associated with a relatively low January monthly mean sea level at Prince Rupert, B.C. (Table 3).

Table 1. Summary of temperature data.

AREA: Eastern Dixon Entrance

DATE: January 27-February 6, 1979

VESSEL: ARCTIC HARVESTER

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)														Depth (m) Salinity (‰)		
			Lat. N	Long. W		0	10	50	60	75	100											
1	27/1	1655	54°09'	131°04'	100	0	10	50	60	75	100											
						4.5	4.5	4.5	5.2	5.6	5.7											
2	"	1840	54°08'	131°04'	82	0	10	28	40	50	60	70	75	80	82							
						5.0	5.0	5.0	5.4	5.5	5.5	5.7	5.7	6.0	6.0							
3	28/1	0030	54°19'	131°16'	108	0	10	80	90	100	108											
						5.4	5.4	5.4	5.5	5.5	5.5											
4	"	0344	54°24'	131°17'	162	0	10	70	80	90	115	120	140	162								
						5.3	5.3	5.3	5.5	5.8	6.0	6.1	6.1	6.1								
5	"	1653	54°13'	131°45'	100	0	10	20	50	65	75	85	100									
						5.1	5.1	5.1	5.3	5.3	5.5	6.0	6.7									
6	"	1830	54°16'	131°39'	138	0	10	40	50	60	75	100	125	138								
						5.3	5.3	5.3	5.6	6.1	6.2	6.4	6.8	6.8								
7	"	2033	54°19'	131°33'	170	0	10	25	40	50	60	75	100	125	150	170						
						5.4	5.3	5.3	5.9	6.0	6.0	6.2	6.2	6.2	6.2	6.2	6.2					
8	"	2346	54°24'	131°14'	130	0	10	40	50	60	75	100	125	130								
						5.0	5.0	5.1	5.3	5.4	5.8	6.0	6.0	6.0								
9	29/1	1752	54°27'	131°05'	150	0	10	100	110	125	150											
						5.5	5.5	5.5	5.6	5.8	6.0											
10	"	2125	54°30'	131°17'	95	0	10	28	50	75	95											
						5.0	5.0	5.1	5.4	5.7	5.8											
11	30/1	0100	54°24'	131°19'	-	0																
						5.4																
12	"	0100	54°37'	131°28'	175	0	10	20	30	40	50	75	100	125	150	175						
						5.2	5.2	5.2	5.3	5.3	5.4	5.5	5.7	5.9	6.0	6.0						
13	"	2140	54°39'	131°37'	178	0	10	50	75	100	125	150	178									
						5.4	5.4	5.4	5.7	5.8	6.0	6.0	5.9									
14	"	0025	54°38'	132°00'	-	0	10	20	30	50												
						5.1	5.1	5.1	5.2	5.4												
15	31/1	0507	54°38'	132°05'	60	0	10	20	30	40	50	60										
						5.1	5.1	5.1	5.3	5.4	5.4	5.5										

Table 1 (cont'd)

AREA: Eastern Dixon Entrance

DATE: January 27-February 6, 1979

VESSEL: ARCTIC HARVESTER

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)														Depth (m) Salinity (‰)						
			Lat. N	Long. W		0	10	20	30	35	40	50														
16	01/2	1800	54°15'	131°34'	50	0	10	20	30	35	40	50														
						5.0	5.0	5.2	5.5	6.0	6.0	6.0														
17	"	1953	54°19'	131°28'	144	0	10	20	30	40	50	60	75	100	110	125	144									
						5.0	5.0	5.2	5.3	5.5	5.5	5.6	5.6	5.8	6.0	6.0	6.0									
18	"	2247	54°25'	131°17'	210	0	10	20	30	50	60	67	82	90	100	125	150	175	200	210						
						4.6	4.6	4.6	4.7	4.8	5.0	5.6	6.0	6.3	6.9	6.3	6.3	6.3	6.2	6.2						
19	"	2355	54°23'	131°20'	155	0	10	20	30	50	60	75	100	125	155											
						5.2	5.2	5.3	5.5	5.5	6.0	6.1	6.1	6.2	6.2											
20	"	0222	54°21'	131°25'	200	0	10	20	50	75	100	125	150	175	200											
						5.0	5.0	5.2	5.7	5.8	6.0	6.0	6.0	6.0	6.0											
21	"	2217	54°09'	131°03'	97	0	10	25	40	50	75	97														
						5.8	5.8	5.9	6.0	6.0	6.0	6.3														
23	03/2	1958	54°21'	131°07'	91	0	10	50	60	75	91															
						5.0	5.0	5.0	5.1	5.5	5.8															
24	"	2158	54°24'	131°16'	90	0	10	45	50	60	75	90														
						4.7	4.7	4.7	5.0	5.2	5.3	5.5														
25	"	2358	54°19'	131°17'	95	0	10	20	50	65	70	75	95													
						5.1	5.2	5.3	5.6	5.7	6.0	6.0	6.1													
26	04/2	1637	54°09'	131°48'	40	0	10	20	30	40																
						5.4	5.5	5.5	5.5	5.6																
27	"	1855	54°12'	131°48'	108	0	10	35	50	70	75	100	108													
						5.5	5.5	5.5	5.8	6.0	6.0	6.1	6.1													
28	"	1906	54°13'	131°53'	131	0	10	45	50	75	100	131														
						5.5	5.5	5.5	5.6	6.0	6.1	6.1														
29	05/2	1945	54°16'	131°18'	129	0	10	20	50	70	100	129														
						5.5	5.5	5.5	5.7	5.9	6.2	6.4														
30a	"	2030	54°23'	131°20'	180	0	10	50	65	90	100	110	125	150	180											
						5.2	5.2	5.2	5.3	5.4	5.6	5.8	6.0	6.0	6.0											



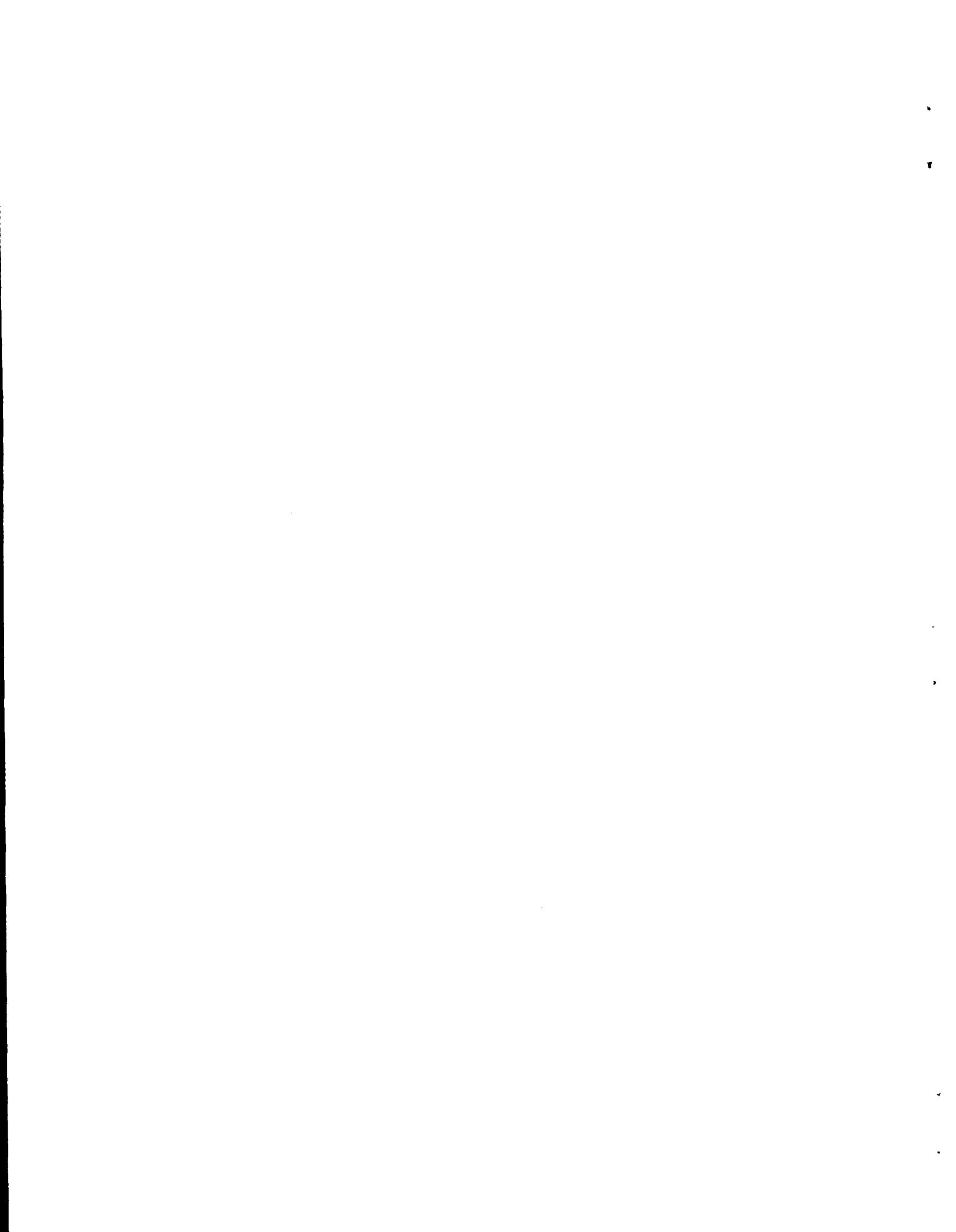
Table 2. Summary of bottom water temperatures (°C) by depth interval in eastern Dixon Entrance, January 27-February 6, 1979 (see Fig. 1 for stations included in table).

(m)	Depth (fm)	Range	Mean
36-71	20-39	-	5.5(1)
72-108	40-59	5.3-6.3	5.7(10)
109-145	60-79	5.9-6.4	6.1(4)
146-182	80-99	6.0-6.2	6.1(4)
183-218	100-119	6.0-6.2	6.1(2)

Numbers in brackets indicate number of observations.

Table 3. Monthly mean sea level (ft) at Prince Rupert B.C., January-March, 1979.

Year	January	February	March
1979	12.63	12.89	12.57
1943-77 Mean	12.82	12.75	12.56
Difference	-0.19	+0.14	+0.01



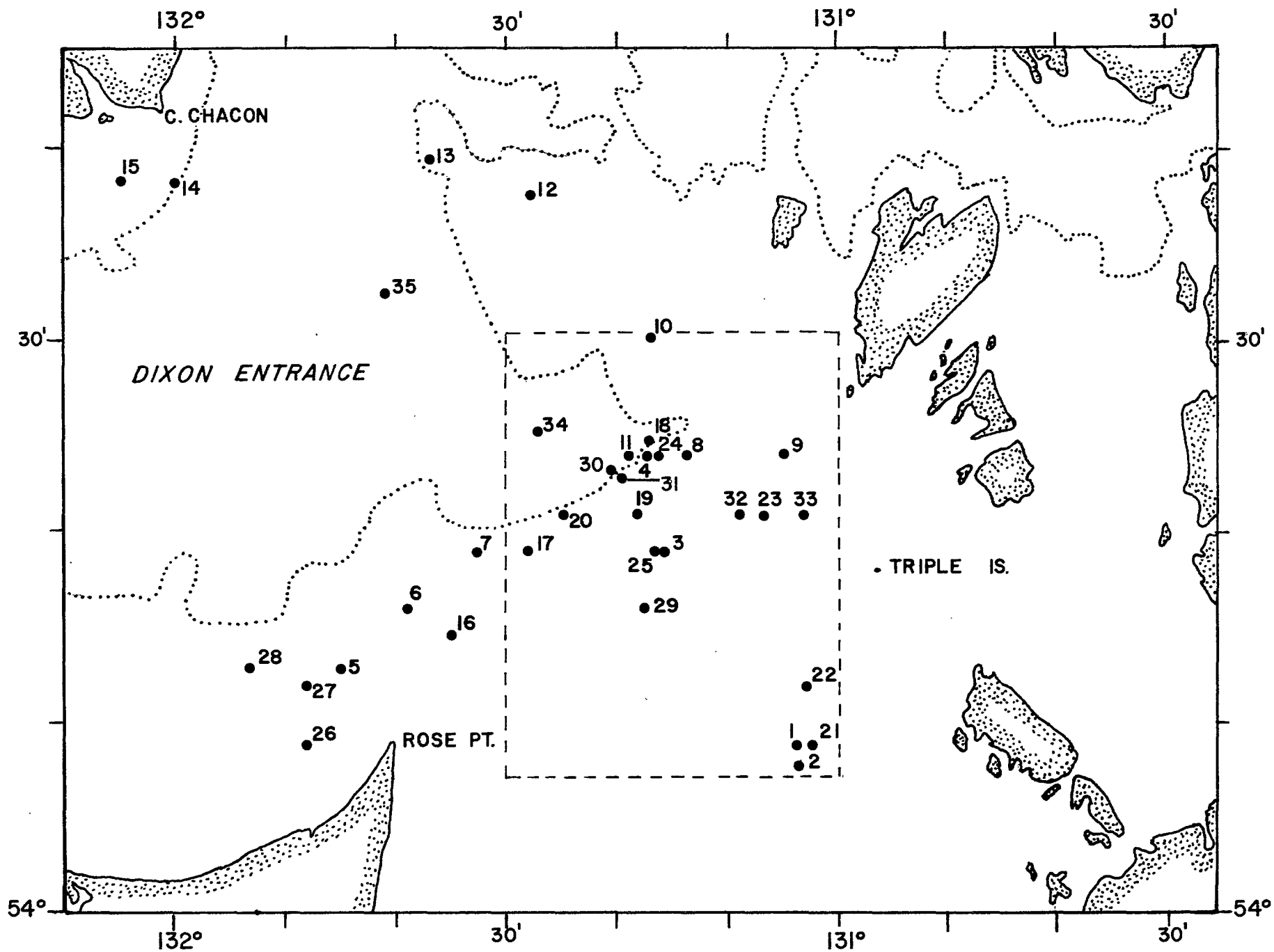
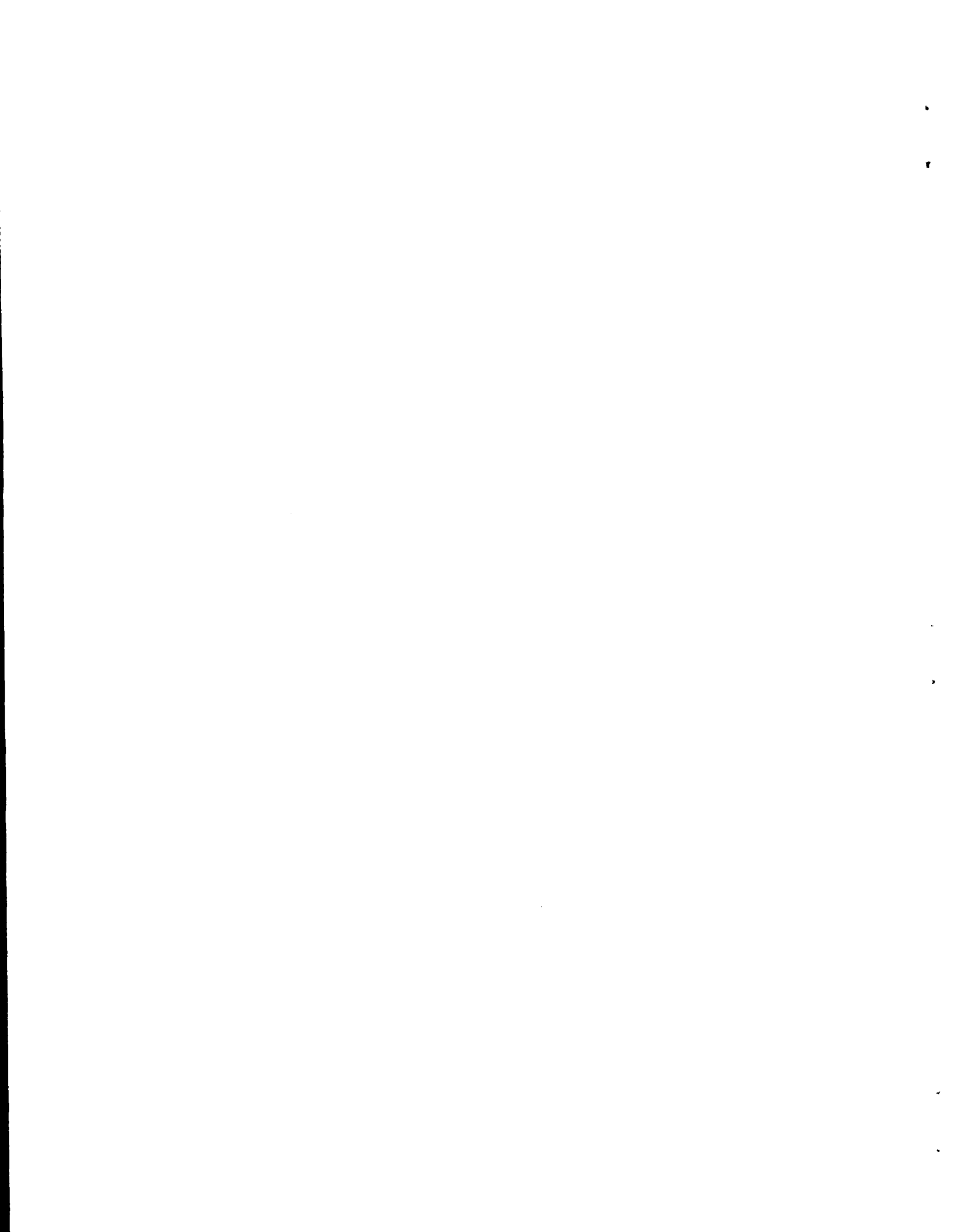
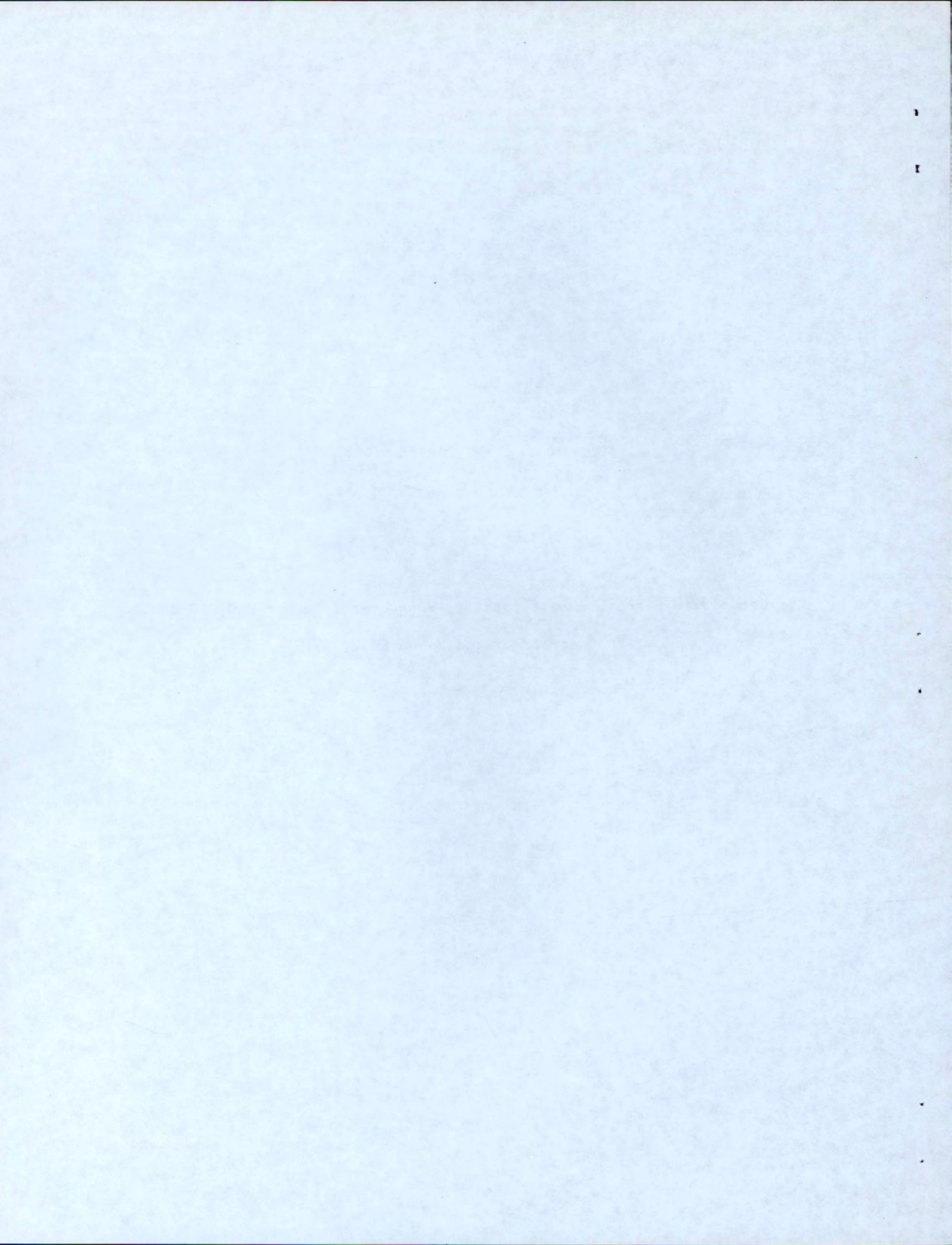


Figure 1. Station positions, January 27-February 6, 1979 (Data from stations within the dotted lines were used in Table 2).





2. Groundfish Surveys - West coast of Vancouver Island - PACIFIC EAGLE,  
February 19-21 and March 9-12, 1979



2. Groundfish Surveys - West coast of Vancouver Island - PACIFIC EAGLE, February 19-21, 1979 and March 9-12, 1979.

The approximate locations of the stations at which bathythermograph (MBT) observations were made on two groundfish cruises are shown in Fig. 2 and 3 and summaries of the data are provided in Table 4 and 5.

Surface temperatures ranged from 6.4 to 7.6°C in late February and from 7.7 to 8.6°C in early March, with the coldest waters occurring near the coast off Amphitrite Point. The general increase in surface temperatures between these periods is also reflected in the daily seawater temperatures at Amphitrite Point (Fig. 4). The increase in surface temperature from February to March, at which time the net heat exchange between sea and air is considered to be negative, indicates that strong advection of warm surface waters occurred. Examination of previous sea surface temperature distributions show that the source of the warm water is to the southwest.

Temperatures generally increased with depth, a characteristic feature of the late-winter temperature structure in these coastal areas. Bottom water temperatures ranged from 7.2 to 7.9°C in February and from 7.9 to 8.3°C in March at depths between 36 and 145 m (Table 6). Mean bottom temperatures in March were slightly higher (0.4-0.7°C) than those in February.

In late February, temperatures throughout the water column were relatively low, as indicated by the daily sea surface temperatures at Amphitrite Point; surface temperatures were 1-1.5°C below the February long-term monthly mean (7.6°C) (Fig. 4).

Bottom water temperatures in March 1979 were about 1°C and 1.7°C lower than those observed in March 1977 and 1978, respectively (Table 6).



Table 5. Summary of temperature data.

AREA: West Coast of Vancouver Island

DATE: March 9-12, 1979

VESSEL: PACIFIC EAGLE

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)														Depth (m) Salinity (‰)
			Lat. N	Long. W		0	10	20	30	40	47									
1	9/03	1715	48°53'	125°40'	47	0	10	20	30	40	47									
						7.7	7.8	7.7	7.7	7.9	7.9									
2	9/03	1745	48°55'	125°38'	92	0	10	20	30	40	50	75	92							
						7.7	7.7	7.7	7.9	8.5	8.2	7.6	7.9							
3	-	-	48°33'	124°48'	108	0	10	20	30	40	50	65	75	100	108					
						7.9	7.6	7.5	7.5	7.3	7.1	7.3	7.8	8.1	8.1					
4	12/03	1230	48°35'	125°36'	91	0	10	20	30	40	50	75	91							
						8.6	8.6	8.5	8.2	8.3	8.3	8.3	8.3							
5	12/03	1515	48°30'	125°25'	135	0	10	20	30	40	50	75	100	125	135					
						8.6	8.6	8.3	8.3	8.3	8.2	8.1	8.1	8.1	8.1					
6	12/03	1620	48°36'	125°26'	135	0	10	20	30	40	50	75	100	125	135					
						8.2	8.4	8.5	8.4	8.4	8.3	8.2	8.2	8.2	8.2					
7	12/03	1700	48°42'	125°28'	140	0	10	20	30	40	50	75	100	125	140					
						8.0	7.6	7.4	7.3	7.3	7.7	8.4	8.5	8.4	8.1					
8	12/03	1750	48°47'	125°32'	121	0	10	20	30	40	50	75	100	114						
						8.3	7.6	7.6	7.3	7.4	7.5	7.4	8.3	8.3						

Table 6. Summary of bottom water temperatures (°C) by depth interval off the west coast of Vancouver Island, February 19-21 and March 9-12, 1979.

Depth interval		February 1979		March 1979		March 1977	March 1978
(m)	(fm)	Range	Mean	Range	Mean	Mean	Mean
36-71	20-39	7.2-7.9	7.5(4)	-	7.9(1)	8.9(7)	9.5(18)
72-108	40-59	7.2-7.5	7.4(2)	7.9-8.3	8.1(3)	8.9(2)	9.9(16)
109-145	60-79	7.7-7.9	7.8(2)	8.1-8.3	8.2(4)	-	9.9(6)

Numbers in brackets indicate number of observations.

Data for March 1977 and 1978 are from Dodimead 1979a,b.

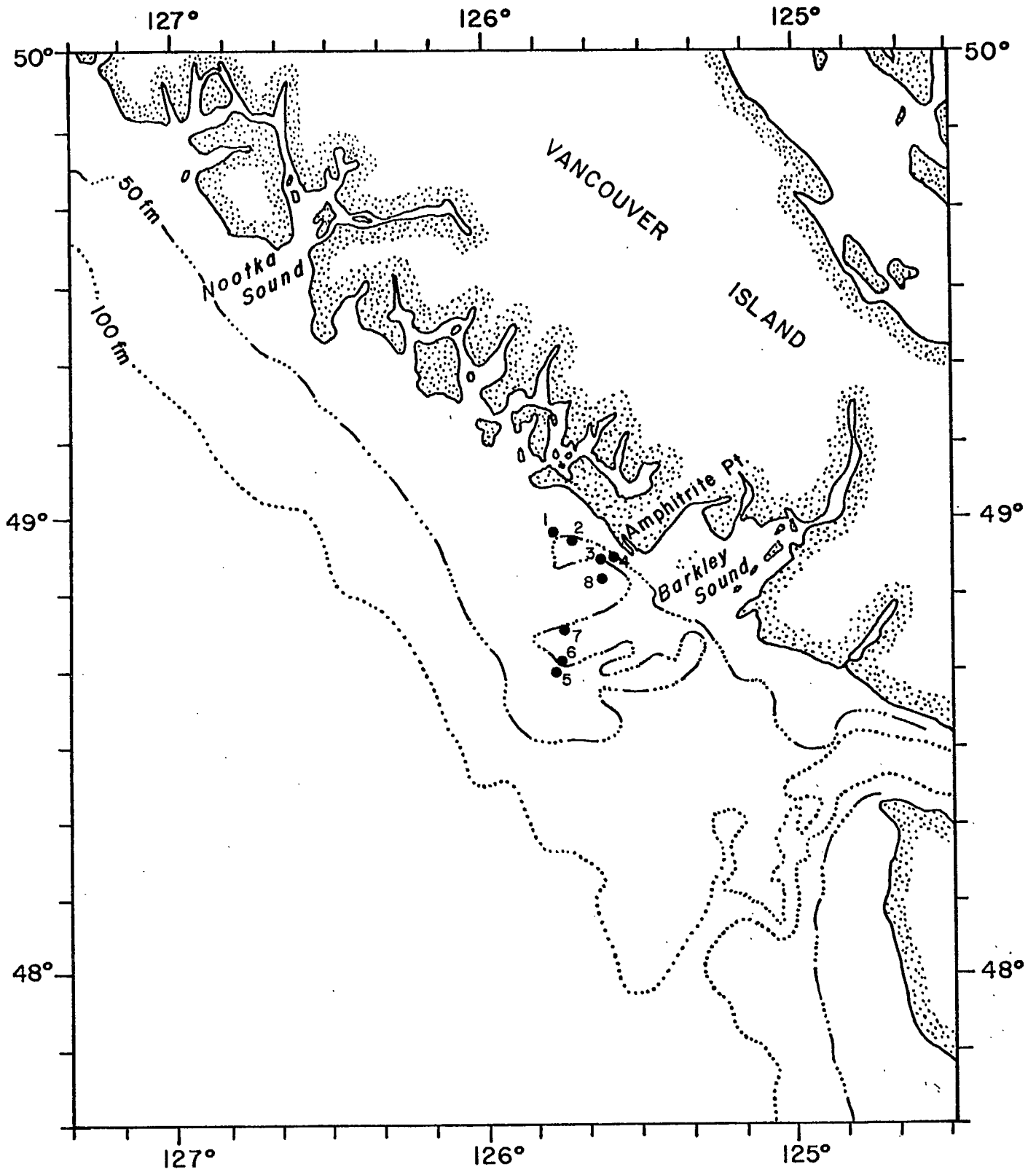
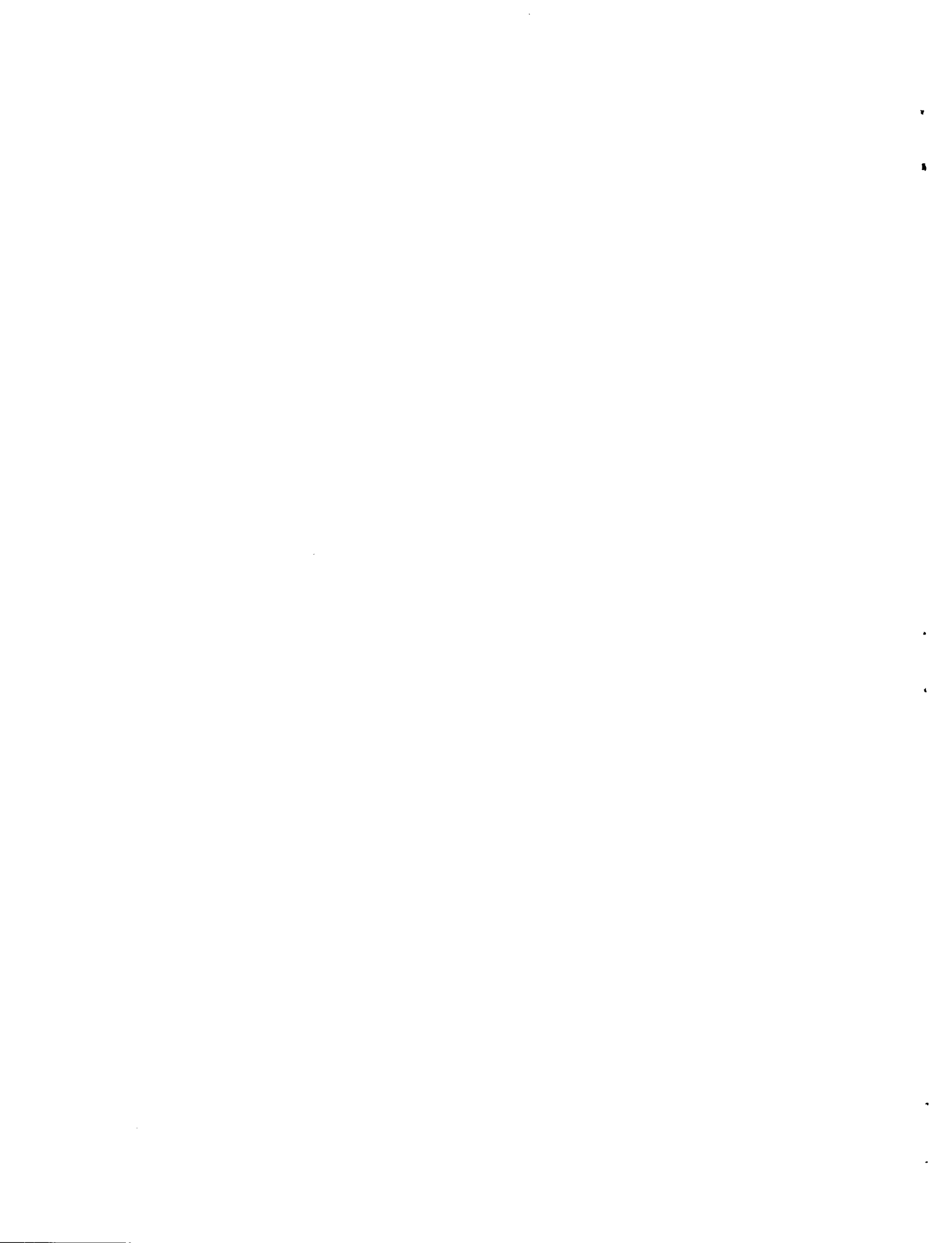


Figure 2. Station positions, February 19-21, 1979.





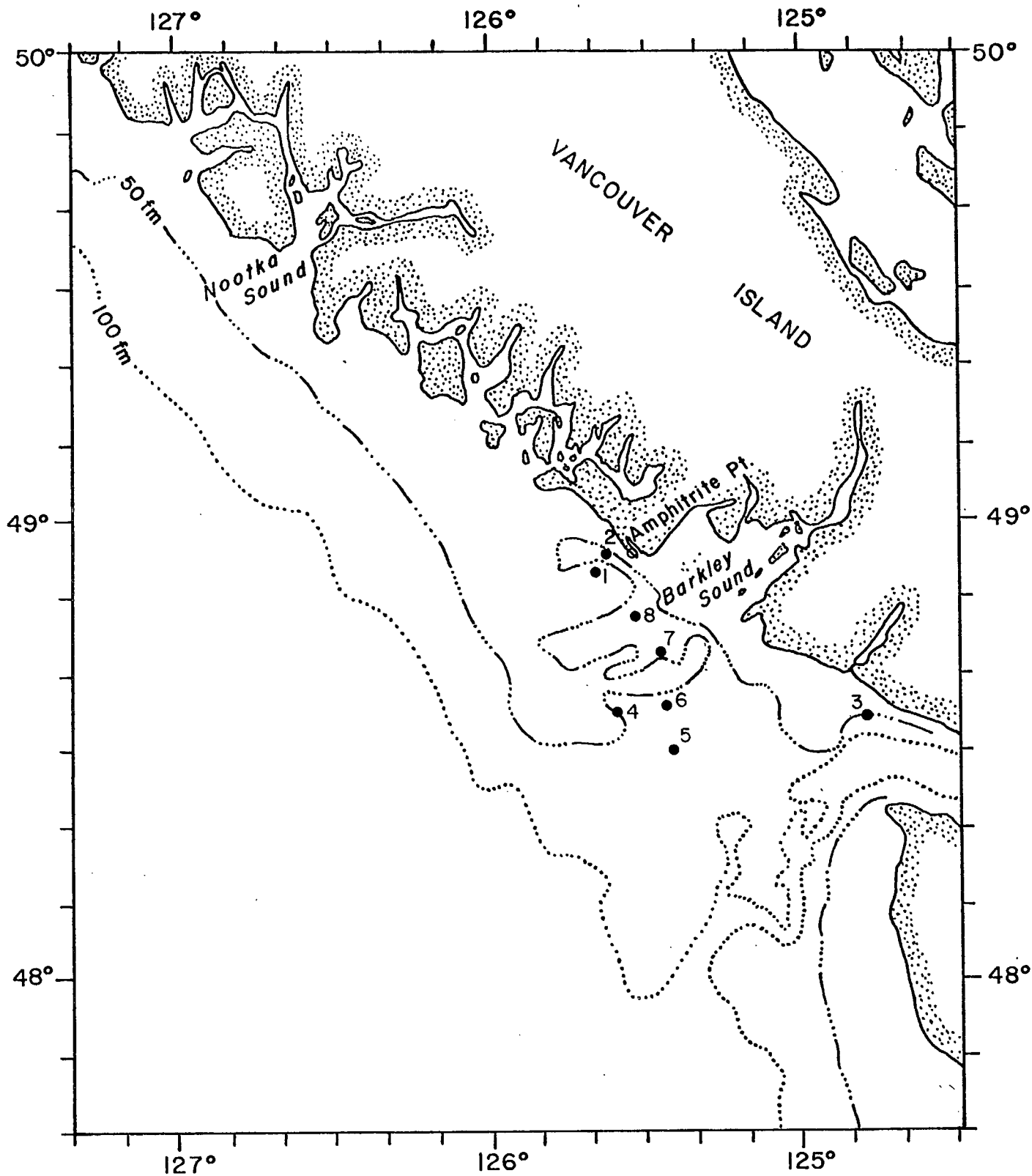


Figure 3. Station positions, March 9-12, 1979.

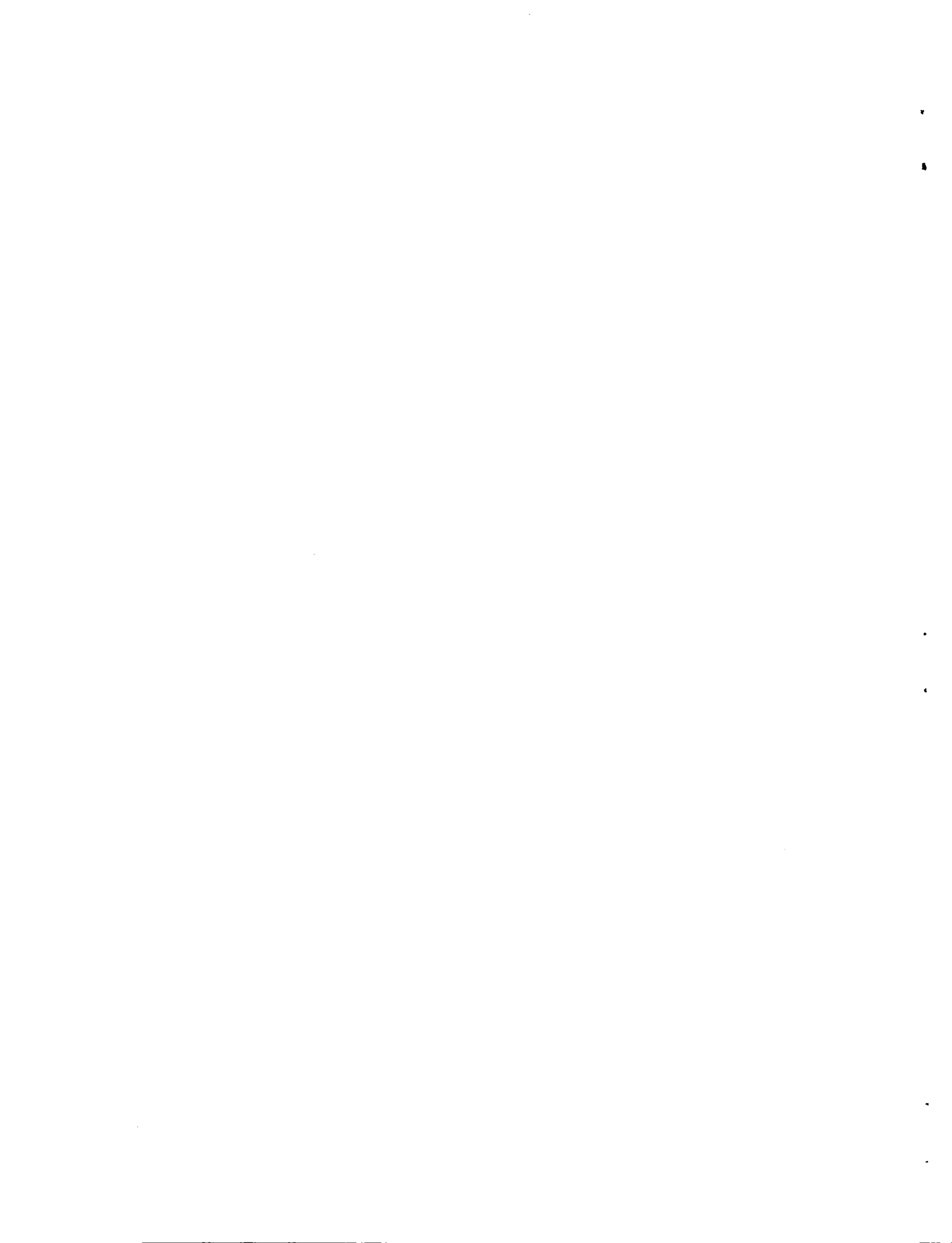
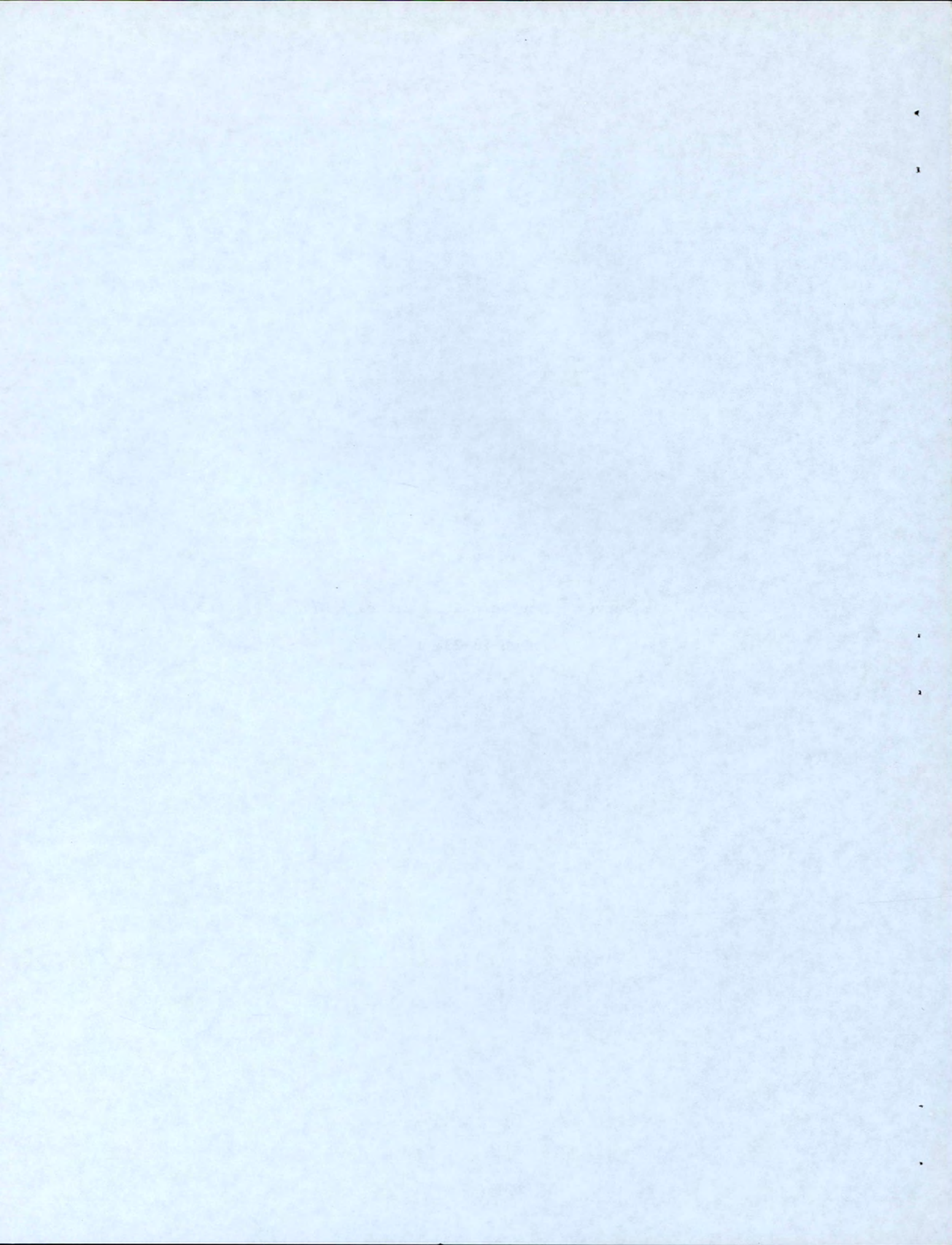




Figure 4. Daily sea surface temperatures at Amphitrite Point, 1979.



3. Pollock Survey - Northern B.C. waters - M/V SCOTIA BAY,  
March 13-29, 1979



3. Pollock Survey - Northern B.C. waters - M/V SCOTIA BAY, March 13-29, 1979.

Station positions at which XBT observations were made are shown in Fig. 5 and a summary of the data is provided in Table 7.

The data are too few and too widely spaced to permit an assessment of conditions in these areas.



Table 7. Summary of temperature data.

AREA: Northern B. C. Waters

DATE: March 12-30, 1979

VESSEL: SCOTIA BAY

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)														Depth (m) Salinity (‰)	
			Lat. N	Long. W		0	10	20	30	50	75	100									
1	13/3	1045	54°10'	130°30'	100	0	10	20	30	50	75	100									
						6.3	6.3	6.2	6.2	6.2	6.2	6.2									
2	14/3	1300	52°52'	131°50'	111	0	10	20	30	50	75	100	111								
						6.7	6.6	6.5	6.5	6.4	6.4	6.3	6.3								
3	14/3	1750	52°48'	131°48'	-	0	10	20	30	50											
						6.9	6.6	6.5	6.4	6.3											
4	19/3	1055	54°17'	131°02'	114	0	10	20	30	50	75	100	114								
						6.7	6.2	6.2	6.2	6.2	6.2	6.2	6.2								
5	21/3	1035	54°01'	131°03'	96	0	10	20	30	50	75	96									
						-	6.0	6.1	6.1	6.1	6.1	6.1									
6	23/3	0829	54°40'	130°48'	360	0	10	20	30	50	75	100	300	310	340	360					
						-	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.9	6.0	6.1				
7	23/3	1430	54°49'	130°12'	355	0	10	20	30	50	75	100	125	150	200	210	250	355			
						-	5.5	5.4	5.3	5.3	5.2	5.2	5.5	5.5	5.7	5.8	5.9	5.9			
8	24/3	2057	54°52'	132°36'	-	0	10	20	30	50	75	100									
						-	5.5	5.3	5.2	5.2	5.2	5.2									
9	25/3	0828	54°50'	132°35'	409	0	10	20	30	50	200	210	250	300	330	350	409				
						-	5.8	5.7	5.5	5.5	5.5	5.5	5.6	5.7	5.8	6.0	6.1	6.1			
10	26/3	1310	55°06'	131°53'	-	0	10	20	30	50	80	90	100	150	160	200					
						6.6	5.5	5.3	5.2	5.0	5.0	5.2	5.2	5.4	5.5	5.7					
11	27/3	1040	55°16'	131°17'	-	0	8	10	20	30	50	60	100	125	150	275					
						6.7	6.0	6.2	6.0	5.8	5.8	5.7	5.7	5.8	5.8	5.8					
12	28/3	1635	55°25'	129°43'	167	0	10	20	30	50	75	100	150	167							
						-	5.7	5.6	5.5	5.4	5.4	5.4	5.5	5.5							
13	29/3	0910	53°48'	130°55'	70	0	10	20	30	50	60	70									
						6.9	6.0	6.0	6.0	5.8	5.9	5.9									

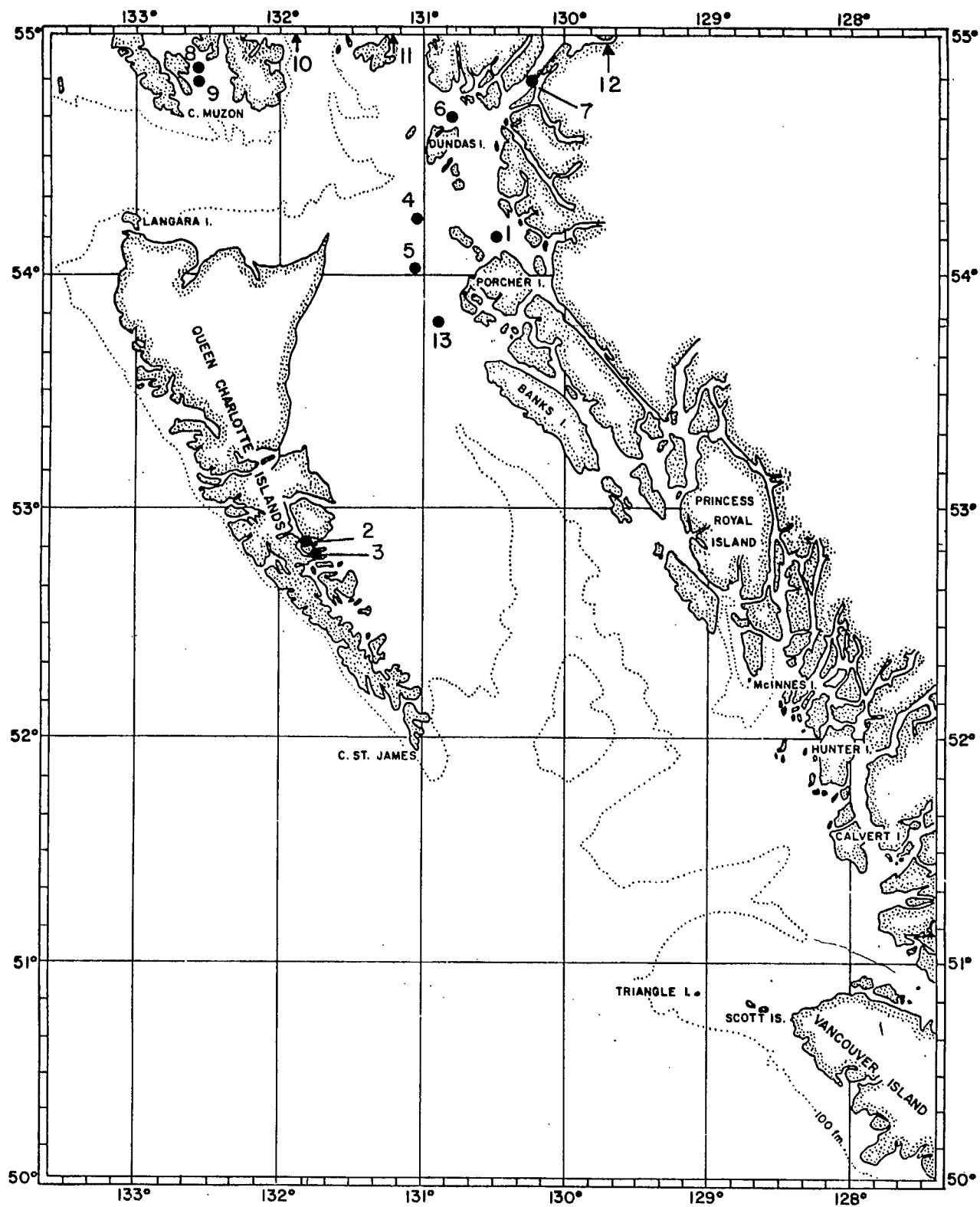
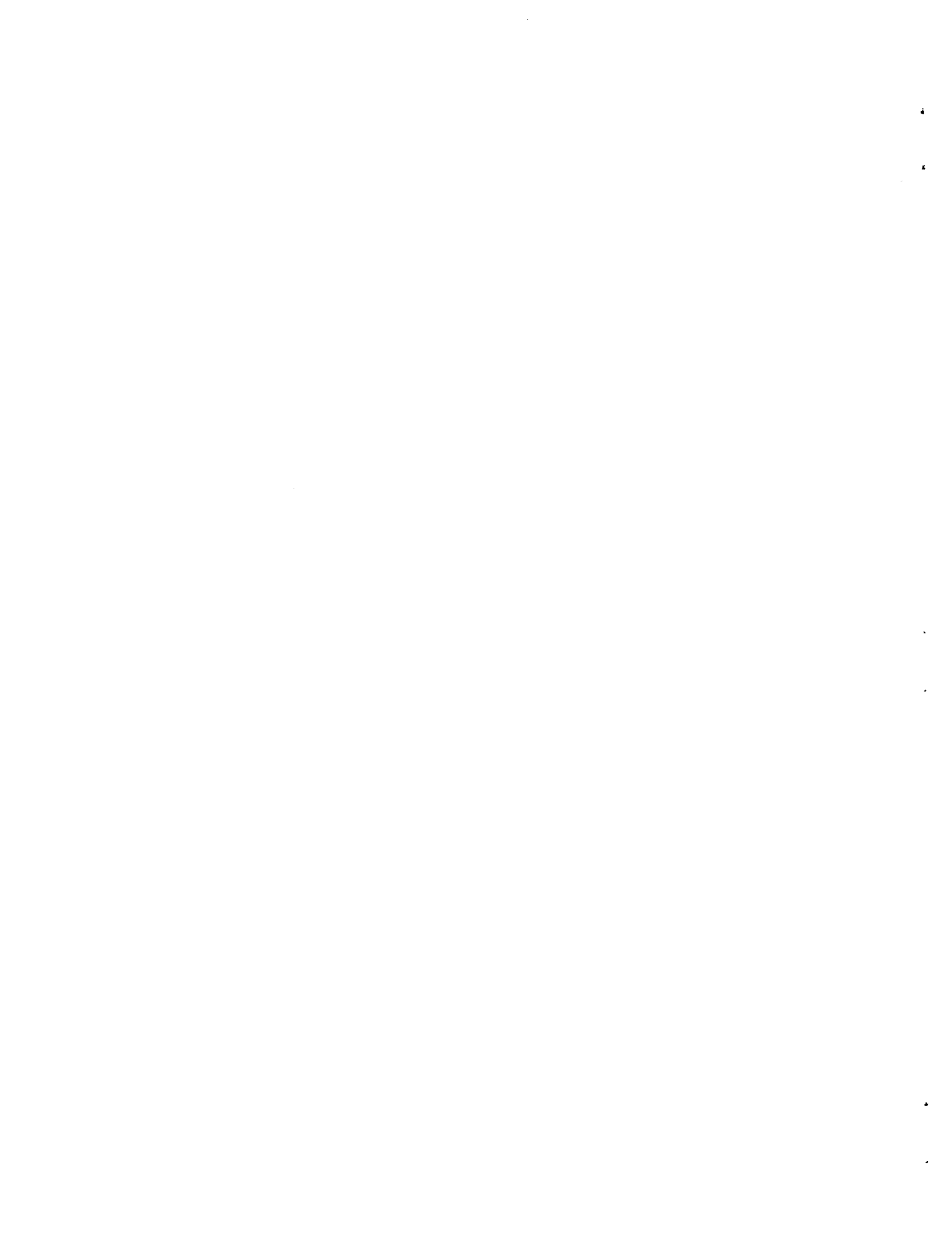
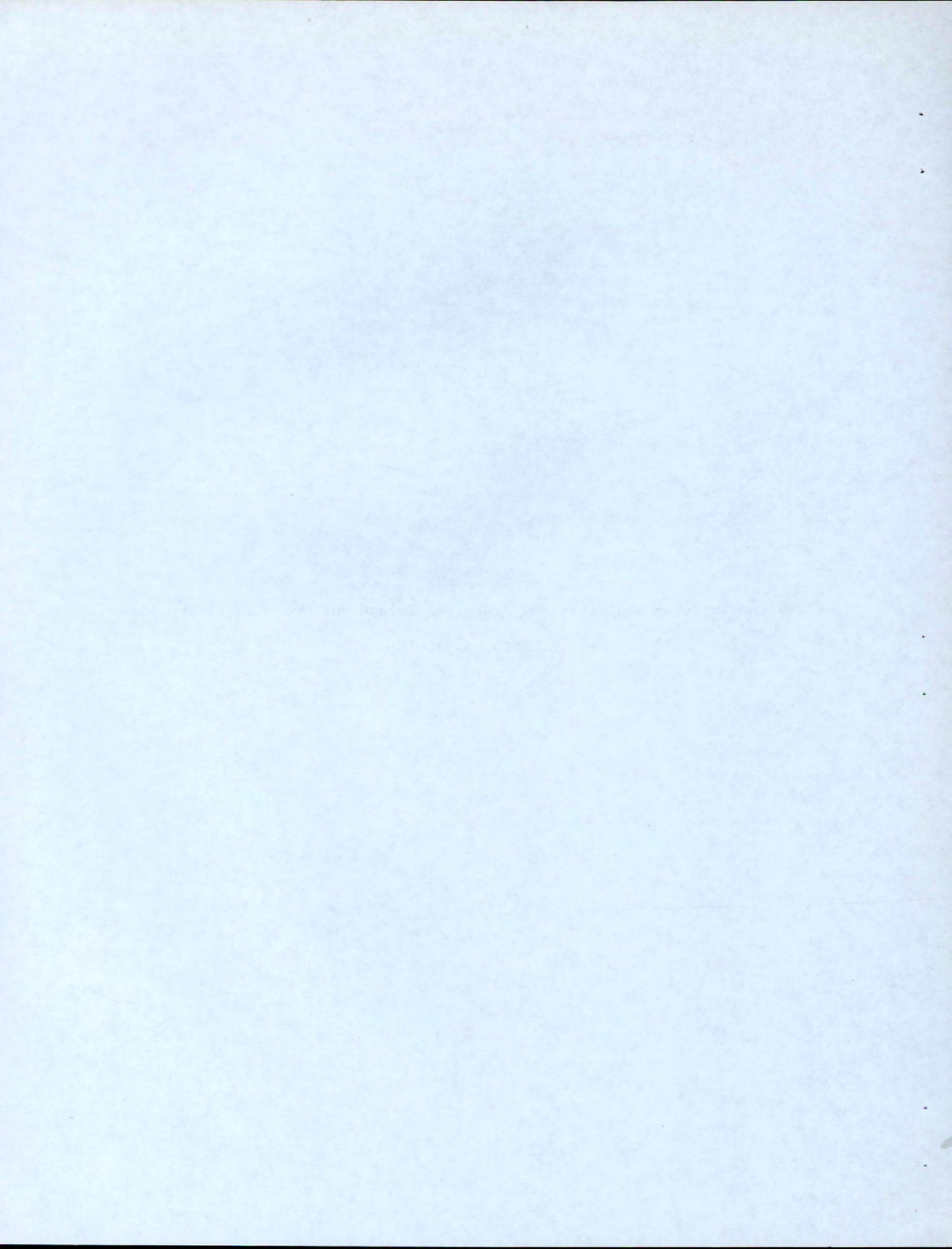


Figure 5. Station positions, March 13-29, 1979.



4. Shrimp Survey - West coast of Vancouver Island and Queen Charlotte Sound

- G.B. REED, May 2-16, 1979



4. Shrimp Survey - West coast of Vancouver Island and Queen Charlotte Sound  
- G.B. REED, May 2-15, 1979.

Locations at which XBT observations were made are shown in Fig. 6 and 7, and a summary of the data is provided in Table 8. These data, including a general assessment of conditions, are also presented by Boutillier et al. (1979).

Off the west coast of Vancouver Island, surface temperatures ranged from about 10 to 11°C during the first two weeks of May; generally average to slightly above average conditions prevailed, as indicated by the daily sea surface temperatures at Amphitrite Point (Fig. 4).

Mean bottom water temperatures decreased with increasing depths, from 8.1°C at 72 to 90 m to 7.0°C at 164 to 181 m depth (Table 9). Mean bottom temperatures were 0.2-0.3°C and 0.4-0.6°C higher than those observed in May 1978 and 1977, respectively.







Table 8 (cont'd)

Southwest Coast Vancouver Island -  
 AREA: Queen Charlotte Sound

DATE: May 2-16, 1979

VESSEL: G.B. REED

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)																Depth (m) Salinity (‰)	
			Lat. N	Long. W		0	02	20	30	34	50	68	73	95	100	120	128	150					
29	10/5	0705	49°20'	126°58'	150	9.8	9.9	9.9	8.9	8.5	8.3	8.3	8.0	8.0	7.8	7.5	7.3	7.3					
30	"	1135	49°19'	126°56'	148	9.9	9.8	9.7	8.8	8.3	8.4	8.2	8.0	8.0	7.8	7.6	7.4	7.3					
31	11/5	0705	49°16'	127°01'	163	9.9	9.9	9.8	8.5	8.4	8.2	8.2	8.1	7.9	7.8	7.7	7.5	7.3	7.1	7.1			
32	"	1230	49°24'	126°52'	116	10.6	10.1	9.8	9.8	8.7	8.2	8.2	8.1	7.9	7.8	7.5							
33	"	1930	49°16'	127°01'	168	10.3	10.0	10.0	9.8	9.0	8.5	8.3	8.0	8.0	7.8	7.7	7.5	7.2	7.1	7.0			
34	"	2005	49°21'	126°54'	136	10.8	10.1	9.5	8.5	8.3	8.2	8.0	7.9	7.7	7.5	7.4							
35	"	2040	49°26'	126°49'	88	10.3	10.1	10.1	10.0	9.7	8.7	8.5	8.4	8.3	8.2								
36	12/5	0705	49°29'	126°56'	106	10.6	10.5	10.0	10.0	9.7	8.3	8.3	8.1	7.9	7.7	7.6	7.5						
37	"	1430	49°32'	127°09'	140	10.6	10.5	10.0	9.7	8.8	8.3	8.3	8.1	8.0	8.0	7.7	7.5	7.4	7.4				
38	14/5	0700	51°24'	128°35'	211	10.0	10.0	9.0	8.6	8.4	7.6	7.7	7.5	7.0	7.0	7.0	6.8	6.5	6.4	6.4			
39	15/5	0700	51°27'	128°22'	168	10.3	10.3	10.0	9.2	9.2	8.4	7.3	7.3	7.0	6.9	6.9	6.6	6.5	6.5				
40	"	1430	51°37'	128°23'	157	10.0	9.7	9.0	9.0	8.0	7.7	7.4	7.0	7.0	6.8	6.9	6.9	6.7	6.6	6.6			
41	16/5	0700	52°04'	128°53'	173	10.0	10.0	9.0	9.0	8.0	7.0	7.0	6.9	6.9	7.0	6.9	6.7	6.6					
42	"	1105	51°59'	128°47'	173	10.2	10.0	9.2	9.1	8.5	7.5	7.1	7.0	6.9	6.8	6.8	6.6	6.6	6.5				

Table 9. Summary of bottom water temperatures (°C) by depth interval off the west coast of Vancouver Island, May 1977-79.

Depth interval		Range	Mean		
(m)	(fm)	1979	1979	1978	1977
54-71	30-39	-	8.1(1)	-	-
72-90	40-49	8.0-8.2	8.1(3)	-	-
91-108	50-59	7.5-8.1	7.9(7)	7.7(6)	7.3(8)
109-126	60-69	7.5-8.1	7.7(7)	7.5(14)	7.1(10)
127-145	70-79	7.1-7.7	7.4(9)	7.1(20)	7.0(7)
146-163	80-89	7.0-7.3	7.2(4)	6.9(7)	6.7(4)
164-181	90-99	-	7.0(2)	-	-

Numbers in bracket indicate number of observations.  
Data for May 1977 and 1978 are from Dodimead 1979a,b.



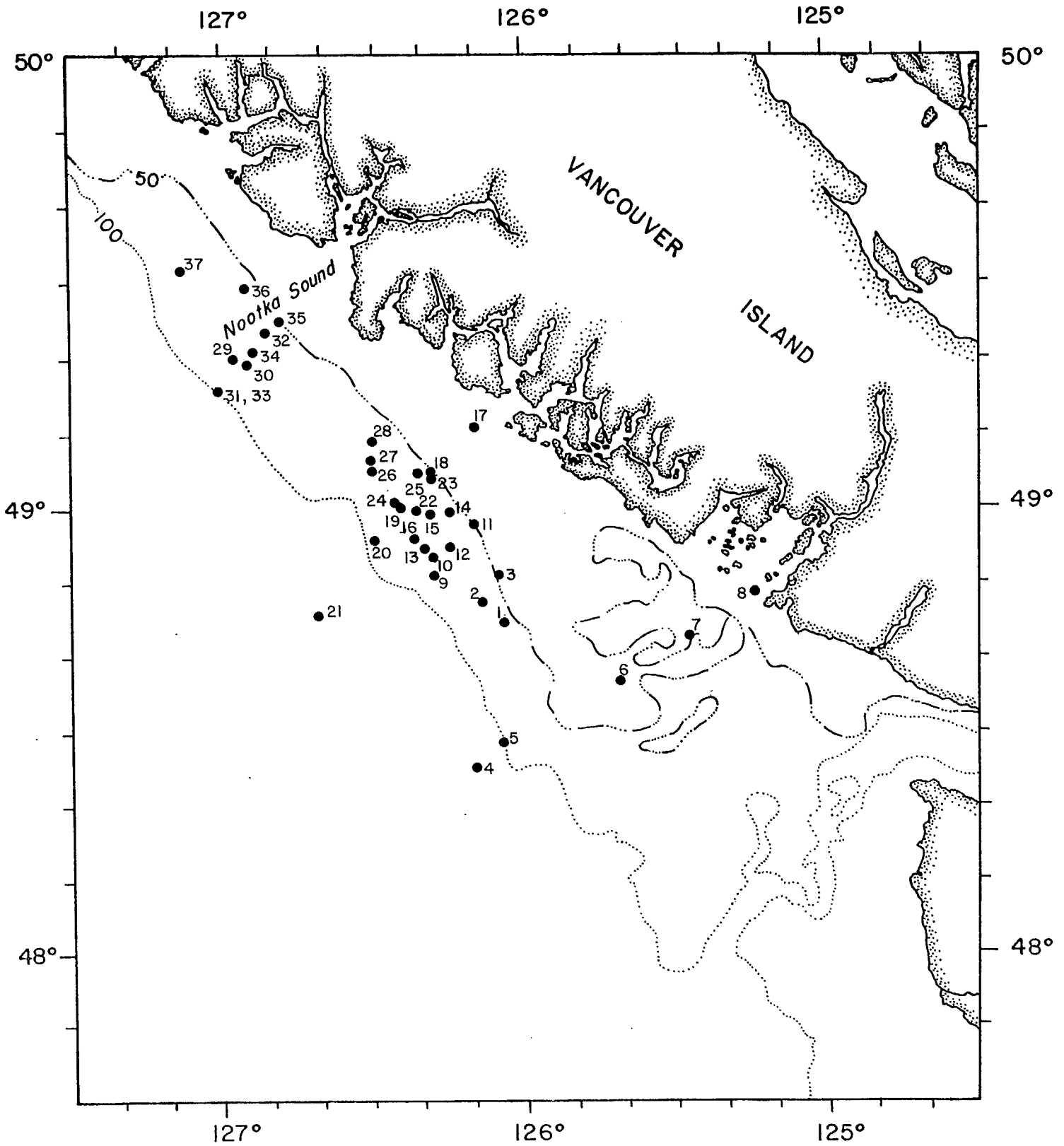


Figure 6. Station positions, May 2-12, 1979.



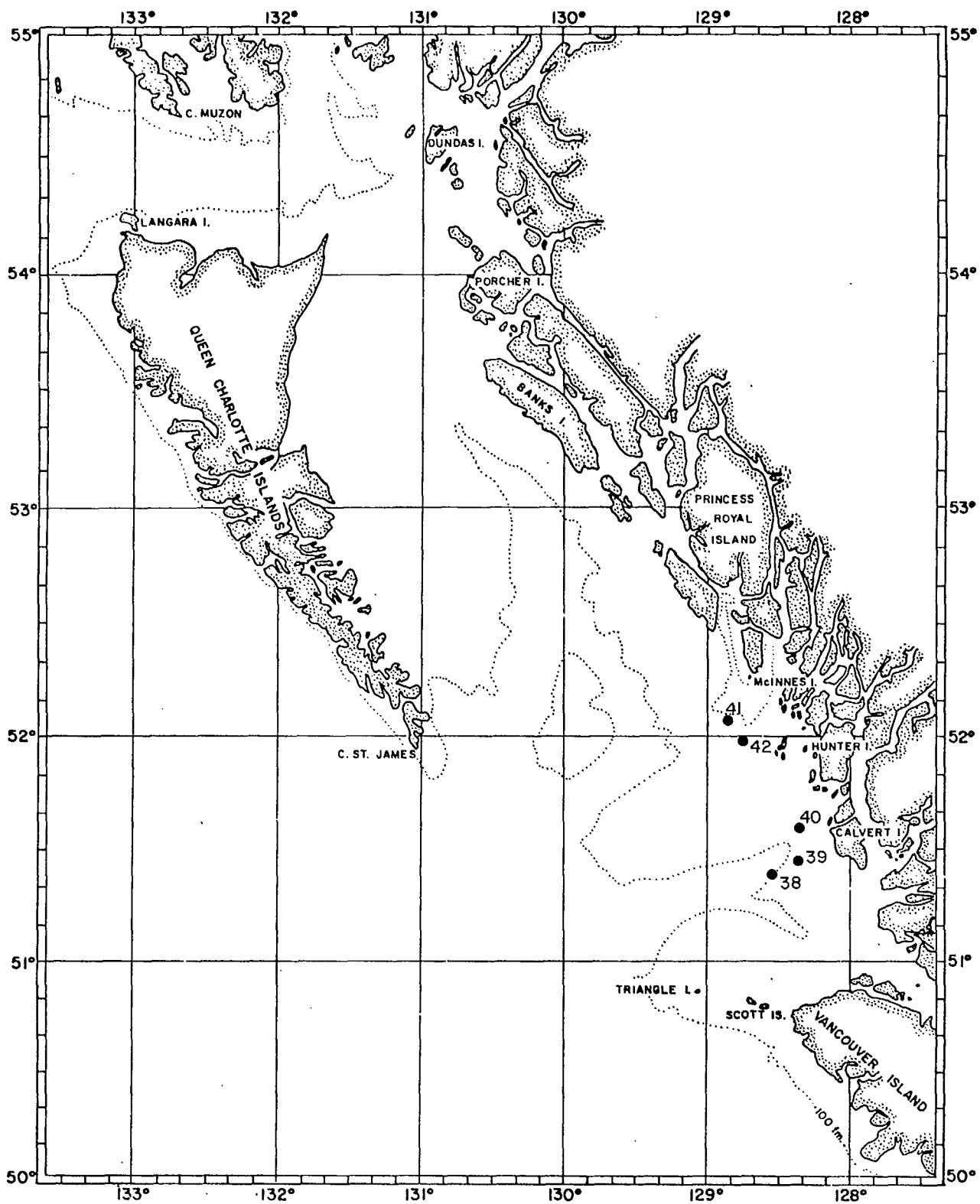


Figure 7. Station positions, May 14-16, 1979.



5. Groundfish Survey - Queen Charlotte Sound to Dixon Entrance - G.B. REED,  
June 22-July 12, 1979





5. Groundfish Survey - Queen Charlotte Sound to Dixon Entrance - G.B. REED, June 22-July 12, 1979.

Hydrographic, MBT and XBT casts were made on this survey (Fig. 8). The bathythermograph data are summarized in Table 10 and the hydrographic data are presented in Table 11.

In Goose Island Gully, Queen Charlotte Sound, bottom temperatures ranged from 6.6 to 5.4°C at depths between 100 and 300 m (Fig. 9). Between 175 and 300 m depth, the range was relatively small, 5.7 to 5.4°C. Bottom temperatures were similar to those reported for late July 1978 in this area (Dodimead et al. 1979b).

Surface temperatures decreased from south to north along a transect extending from southern Hecate Strait to Dixon Entrance (Fig. 10), typical of the temperature distribution for this area. The vertical gradient of temperature associated with the summer thermocline was most marked in southern Hecate Strait. Bottom temperatures ranged from about 5°C at 350 m to about 6.7°C at 100 m depth. In southern and central Hecate Strait, at depths between 350 and 150 m, bottom temperatures appear to be slightly higher than those observed in late July 1978, but generally similar to those observed in September 1978 (Dodimead et al. 1979b). However, in northern Hecate Strait, at bottom depths less than 150 m, temperatures in early July 1979 were lower than those observed in late July 1978 and in September 1979, by about 0.5°C and 0.5-3°C, respectively.

Vertical distributions of temperature and salinity across northern Hecate Strait show features considered typical for this area - surface salinities increasing westward and the absence of any appreciable vertical gradients in the shallow areas on the western side of the Strait (Fig. 11 and 12).

Table 10. Summary of temperature data.

AREA: Queen Charlotte Sound - Hecate Strait-  
Dixon Entrance

DATE: June 27-July 12, 1979

VESSEL: G.B. REED

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)															Depth (m) Salinity (‰)	
			Lat. N	Long. W		0	6	10	18	20	30	33	50	75	100	125	150	175	188			
1	27/06	1000	51°07'	128°20'	188	0	6	10	18	20	30	33	50	75	100	125	150	175	188			
						12.6	12.5	11.0	10.6	10.0	8.5	8.1	7.8	7.2	6.5	6.4	6.1	6.0	6.0			
2	27/06	1115	51°15'	128°40'	196	0	2	10	20	30	36	50	75	100	110	125	150	175	196			
						12.5	12.5	12.2	11.6	9.8	8.8	8.7	8.0	7.5	7.0	6.9	6.3	6.1	6.1			
3	27/06	1330	51°33'	128°13'	95	0	10	20	30	50	75	95										
						13.2	12.4	11.0	8.8	7.7	7.0	6.6										
4	27/06	1420	51°26'	128°25'	192	0	10	20	30	50	75	100	115	125	150	175	192					
						13.6	12.5	11.5	10.5	8.7	7.4	7.0	7.0	6.7	6.2	5.7	5.7					
5*	27/06	1530	51°26'	128°29'	202	0	4	10	20	30	50	75	80	100	104	125	150	175	200	202		
						13.2	12.8	12.6	11.2	10.4	8.7	7.4	7.0	6.8	6.6	6.3	5.9	5.8	5.8	5.8		
6	27/06	1615	51°24'	128°43'	220	0	10	20	30	50	66	75	100	125	127	150	175	190	200	220		
						13.3	12.6	12.0	9.9	8.8	8.2	7.7	7.4	7.1	6.9	6.3	6.2	6.0	5.8	5.7		
7	27/06	1720	51°18.5'	129°00'	244	0	2	10	20	30	39	50	75	100	110	120	150	182	200	244		
						13.0	13.0	12.9	12.5	11.5	9.7	9.0	7.4	7.1	7.2	7.0	6.2	5.7	5.7	5.5		
8	27/06	1830	51°13'	129°17'	282	0	10	20	25	30	45	72	78	100	125	138	200	215	250	282		
						12.9	12.9	11.7	10.9	11.2	8.5	7.3	7.4	7.3	7.0	6.4	5.5	5.4	5.4	5.4		
9*	27/06	2020	51°07'	129°37'	439	0	20	40	49	75	86	100	150	156	175	200	250	300	380	439		
						13.0	9.1	8.1	7.6	7.3	6.7	6.7	6.7	6.4	6.0	5.9	5.6	5.4	5.0	4.6		
10	27/06	2200	51°21'	129°49'	289	0	10	20	30	50	66	75	100	109	125	150	167	175	200	289		
						13.0	12.9	11.5	10.0	8.5	7.3	7.3	6.7	6.4	6.3	6.1	5.7	5.7	5.6	5.6		
11	28/06	2335	51°36.5'	130°02'	318	0	14	20	30	50	59	70	89	100	107	140	150	200	250	318		
						12.5	12.4	10.3	9.6	8.4	8.0	7.5	7.1	7.1	6.9	6.6	6.3	5.9	5.9	5.3		
12	28/06	0050	51°48'	130°16'	209	0	15	20	30	33	50	52	72	100	108	126	150	175	200	209		
						12.6	12.5	11.6	9.6	8.9	8.5	8.0	7.3	6.9	6.7	6.5	6.1	5.7	5.7	5.7		
13	28/06	0211	52°00'	130°30'	364	0	10	20	30	43	50	75	100	126	155	175	200	222	275	364		
						12.9	12.9	11.4	9.4	8.3	8.5	7.4	7.2	6.6	6.2	6.1	5.8	5.5	5.1	4.9		
14	28/06	0307	52°10'	130°22'	370	0	10	20	30	41	57	100	109	150	164	200	230	270	370			
						12.9	12.9	12.3	11.4	8.9	7.8	7.3	7.0	6.9	6.7	5.6	5.4	5.0	5.0			
15	28/06	0403	52°20'	130°15'	362	0	10	20	30	50	75	100	125	146	175	200	246	300	362			
						13.3	13.0	11.7	10.6	8.5	7.5	7.2	6.9	6.7	6.4	6.0	5.2	5.0	5.0			

Table 10 (cont'd)

Queen Charlotte Sound - Hecate Strait -  
AREA: Dixon Entrance

DATE: June 27-July 12, 1979

VESSEL: G.B. REED

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)															Depth (m) Salinity (‰)	
			Lat. N	Long. W		0	10	20	30	50	75	100	125	150	175	200	225	250	275	284		
16	28/06	0505	52°30'	130°15'	284	0	10	20	30	50	75	100	125	150	175	200	225	250	275	284		
						13.5	11.8	9.5	9.1	7.8	7.3	7.0	6.7	6.4	5.9	5.5	5.2	5.1	5.1	5.1		
17	28/06	0600	52°40'	130°09'	242	0	10	20	30	50	56	75	87	100	125	150	175	200	225	242		
						13.2	12.8	12.0	11.8	8.6	7.7	7.4	7.2	7.1	6.5	5.9	5.7	5.4	5.3	5.3		
18	28/06	0657	52°50'	130°11'	226	0	5	10	15	20	30	36	50	75	100	125	150	175	200	225		
						10.9	9.4	9.7	10.3	9.9	8.0	7.7	8.2	7.5	6.6	6.3	6.0	5.4	5.3	5.3		
19*	28/06	0828	53°00'	130°12'	218	0	10	20	30	45	50	75										
						12.5	12.2	11.0	9.3	8.2	8.3	7.6										
20	28/06	0945	53°09'	130°28'	205	0	2	10	20	30	35	50	75	100	125	150	175	200	205			
						12.2	12.2	12.2	11.6	9.7	9.0	8.4	7.4	6.9	6.5	5.9	5.7	5.6	5.6			
21	28/06	1100	53°17'	130°42'	195	0	10	20	30	50	75	100	125	150	175	195						
						12.5	12.0	10.3	10.0	10.4	9.3	8.2	7.3	6.7	6.4	6.4						
H-1*	28/06	2000	53°21'	131°32'	32	0	8	10	20	30	32											
						12.2	12.2	12.0	11.8	11.8	11.8											
H-2*	28/06	2100	53°25.5'	131°15'	30	0	10	20	30													
						11.9	11.9	11.7	11.7													
H-3*	28/06	2216	53°30'	130°58'	85	0	10	15	20	25	30	50	75	85								
						12.2	12.2	12.1	12.0	11.1	10.3	9.4	8.7	8.0								
H-4*	29/06	2330	53°34'	130°44'	140	0	10	20	30	50	75	100	125	140								
						11.8	11.6	11.2	10.6	9.0	7.3	6.9	6.6	6.5								
H-4	29/06	2350	53°34'	130°44'	160	0	10	20	30	50	74	100	120	150	160							
						11.8	11.2	10.9	10.3	8.9	7.2	6.9	6.7	6.5	6.5							
H-5*	29/06	1800	54°10'	131°29'	26	0	10	15	20	26												
						10.1	9.9	9.8	9.7	9.7												
H-6*	29/06	1900	54°10'	131°13'	26	0	10	15	20	26												
						11.2	11.2	11.0	11.0	11.0												
H-7*	29/06	2010	54°10'	131°03'	100	0	10	20	25	30	50	68	75	100								
						10.7	10.7	10.7	10.7	9.7	8.7	8.5	7.3	6.4								
H-7	29/06	2010	54°10'	131°03'	106	0	10	20	25	30	40	50	67	75	100	106						
						10.9	10.8	10.7	10.5	9.8	9.4	8.8	8.5	7.2	6.3	6.2						





Table 11. Temperature and salinity data.

Station 5

Time: 1513 Date: 27-VI-79 Lat: 51°26' Long: 128°29' Sounding: 202 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	13.2	31.846
10	12.90	31.823
20	11.51	31.889
30	10.95	31.928
50	8.98	32.490
75	7.12	32.833
100	6.70	33.316
125	6.19	33.730
150	5.77	33.925
190	5.75	33.945

Station 9

Time: 2010 Date: 27-VI-79 Lat: 51°07' Long: 129°37' Sounding: 439 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	13.0	32.067
10	12.57	32.052
20	10.50	32.001
30	8.64	32.125
50	7.63	32.591
75	7.21	32.907
100	6.61	33.398
125	6.62	33.659
150	6.67	33.769
200	5.81	33.929
300	5.41	33.976
400	4.99	34.027

Table 11 (cont'd)

Station 19

Time: 0821 Date: 28-VI-79 Lat: 53°00' Long: 130°12' Sounding: 218 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	12.5	30.976
10	11.95	31.088
20	10.86	31.606
30	9.32	-
50	8.32	31.997
75	7.51	32.525
100	6.77	33.097
125	6.56	33.531
150	6.15	33.765
200	5.38	33.964

Station H-1

Time: 1950 Date: 28-VI-79 Lat: 53°21' Long: 131°32' Sounding: 32 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	12.2	32.149
5	12.00	32.122
10	11.90	32.129
20	11.73	32.129
27	11.75	32.129

Station H-2

Time: 2106 Date: 28-VI-79 Lat: 53°26' Long: 131°15' Sounding: 30 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	11.9	31.963
5	11.51	31.963
10	11.44	31.974
20	11.32	31.928



Table 11 (cont'd)

Station H-3

Time: 2220 Date: 28-VI-79 Lat: 53°30' Long: 130°58' Sounding: 85 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	12.2	31.390
5	12.11	31.380
10	12.04	31.490
20	11.08	31.602
30	9.89	31.726
50	9.22	32.025
70	8.89	32.118

Station H-4

Time: 2340 Date: 29-VI-79 Lat: 53°34' Long: 130°44' Sounding: 160 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	11.8	30.019
10	11.31	31.173
20	10.89	31.722
30	10.46	31.792
50	8.89	32.021
75	7.21	32.759
100	6.87	33.086
125	6.55	33.339
150	6.47	33.433

Station H-5

Time: 1755 Date: 29-VI-79 Lat: 54°10' Long: 131°29' Sounding: 17 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	10.1	31.332
5	9.95	31.792
10	9.84	31.804
15	9.78	31.835

Table 11 (cont'd)

Station H-6

Time: 1913 Date: 29-VI-79 Lat: 54°10' Long: 131°13' Sounding: 26 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	11.2	31.959
5	11.18	31.951
10	11.08	31.961
15	11.00	31.963
20	11.04	31.963

Station H-7

Time: 1955 Date: 29-VI-79 Lat: 54°10' Long: 131°03' Sounding: 104 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	10.9	31.351
10	10.81	31.347
20	10.56	31.498
30	9.68	31.808
50	8.89	32.071
75	6.93	32.611
100	6.22	33.000

Station H-8

Time: 2045 Date: 29-VI-79 Lat: 54°10' Long: 130°54' Sounding: 104 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	12.0	30.741
10	11.45	31.278
20	9.81	31.664
30	8.58	31.788
50	8.14	31.955
75	7.61	32.184
100	7.40	32.459

Table 11 (cont'd)

Station 32

Time: 2017 Date: 3-VII-79 Lat: 54°05' Long: 131°00' Sounding: 108 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	11.0	30.988
10	10.90	30.972
20	10.57	31.154
30	9.77	31.765
50	8.36	31.854
75	7.20	32.510
97	6.46	32.868

Station 33

Time: 2236 Date: 3-VII-79 Lat: 53°50' Long: 130°50' Sounding: 100 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	11.6	31.312
10	11.48	31.301
20	10.87	31.440
30	9.89	31.908
50	8.99	32.090
75	7.30	32.591
95	6.74	33.074

Station 48

Time: 1424 Date: 11-VII-79 Lat: 52°35' Long: 131°00' Sounding: 116 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	11.6	31.001
10	11.46	31.982
20	10.81	31.990
30	9.69	32.118
50	9.33	32.164
75	7.76	32.514
100	6.76	33.172

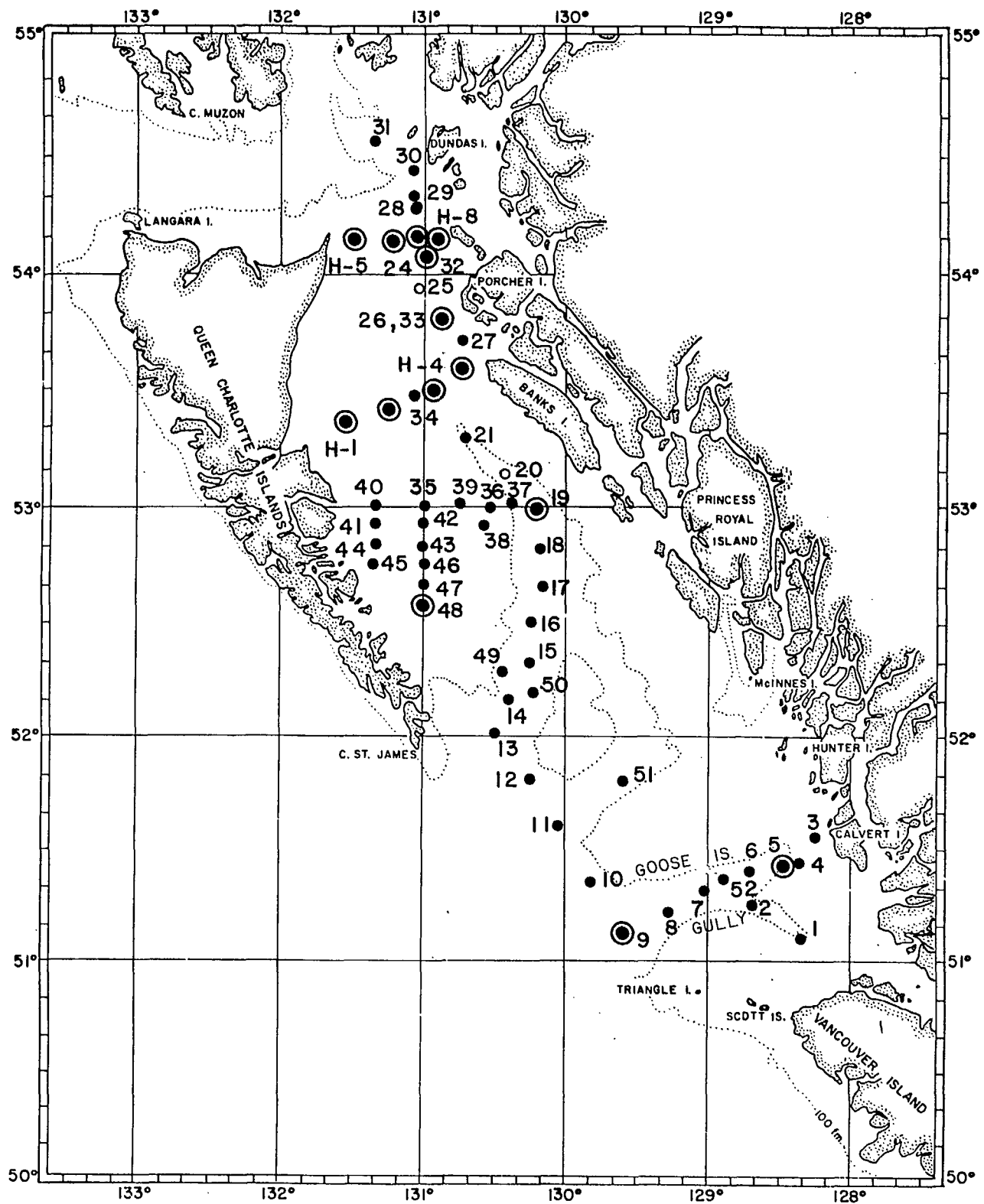
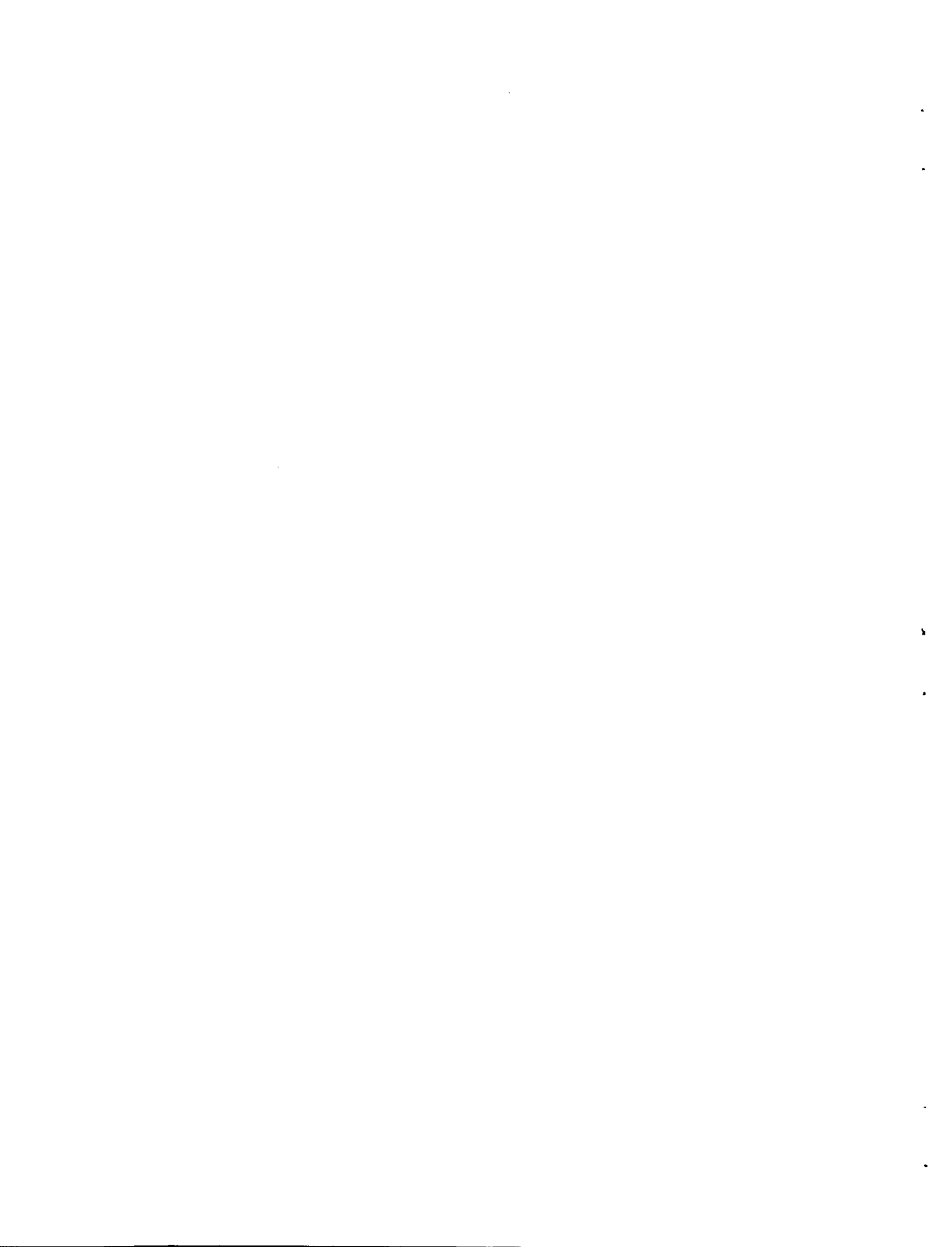


Figure 8. Station positions, June 22-July 12, 1979.

● BT or XBT, ● Nansen Bottle Cast.



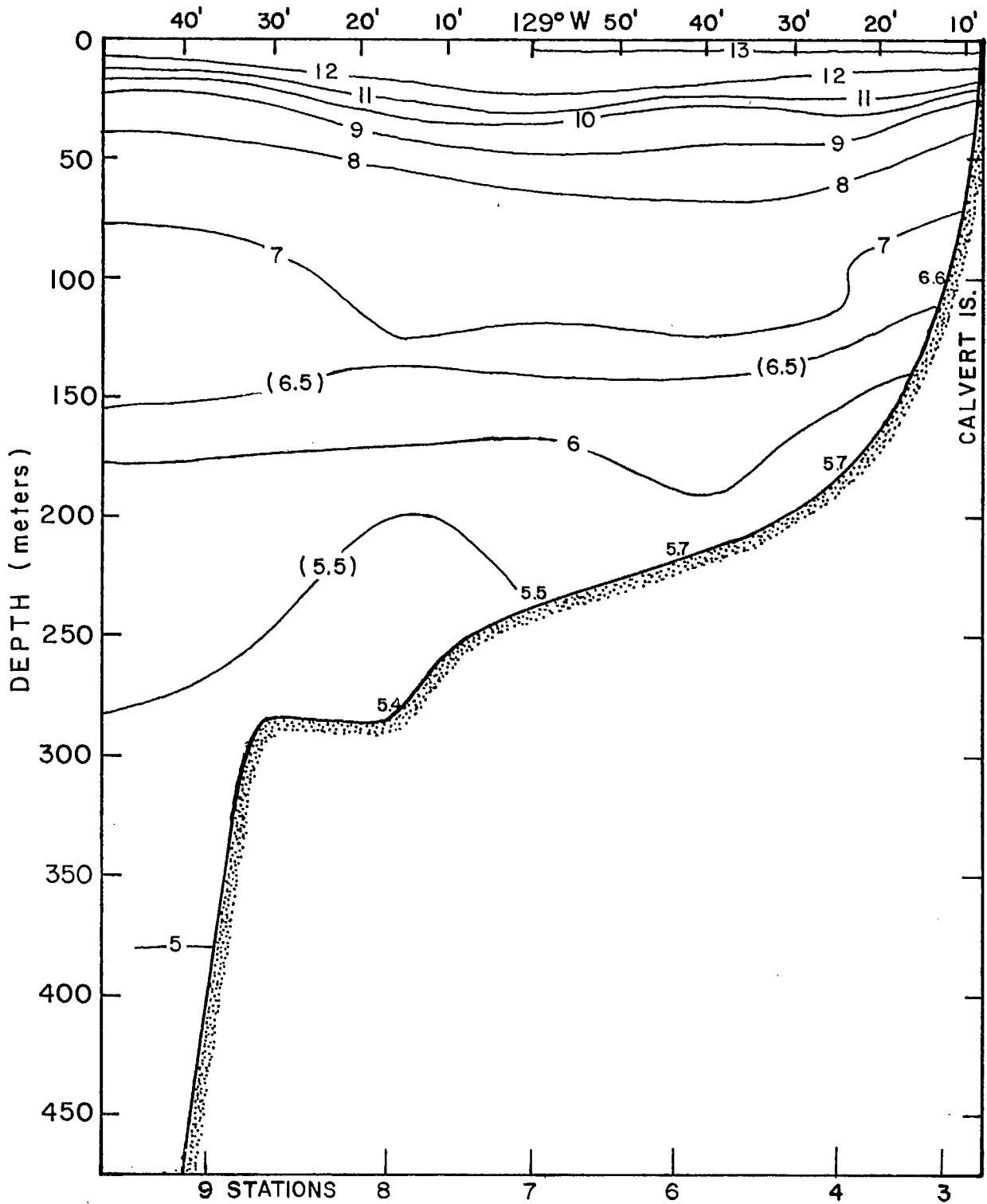
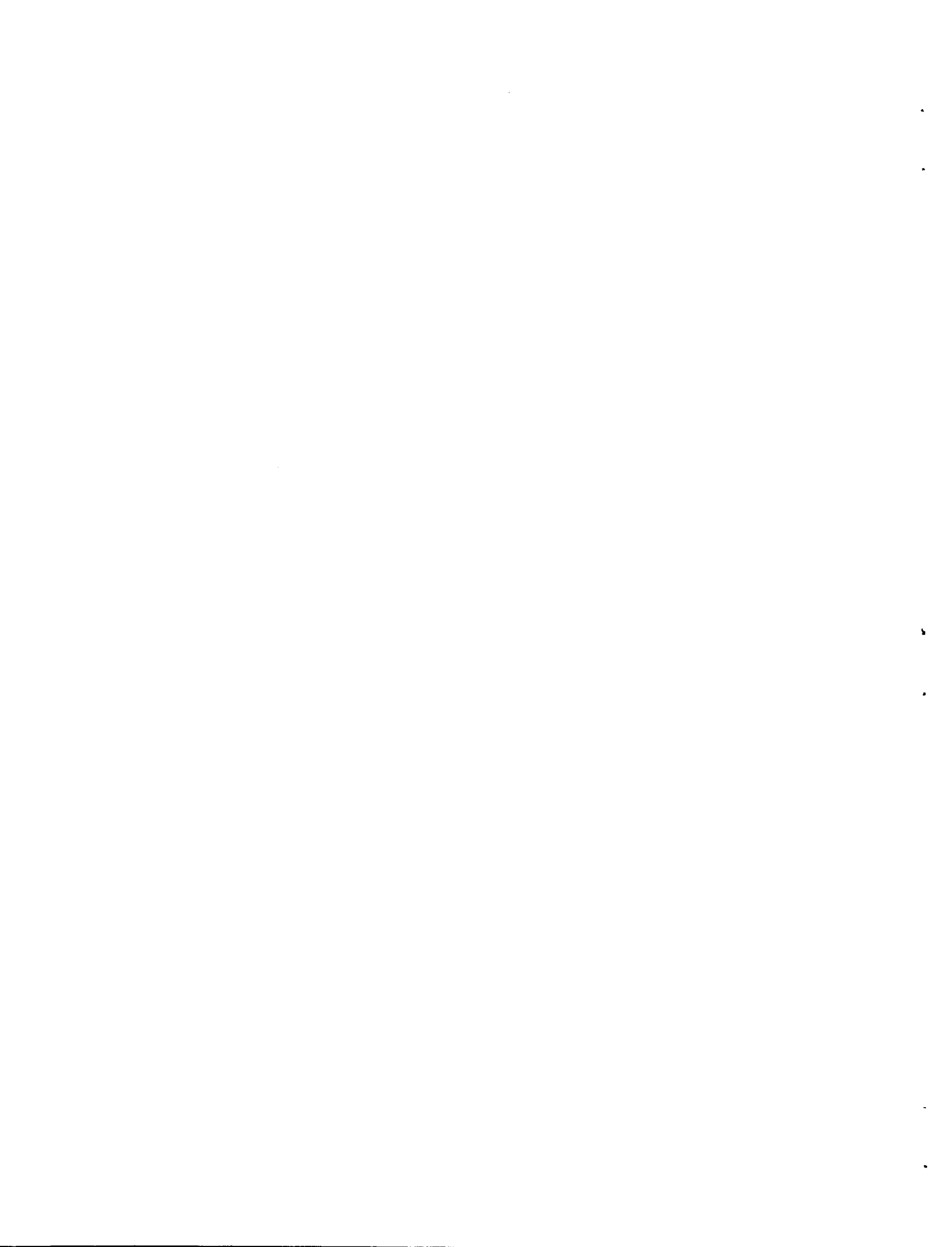


Figure 9. Vertical section of temperature (°C) in Goose Island Gully, Queen Charlotte Sound, June 29, 1979.



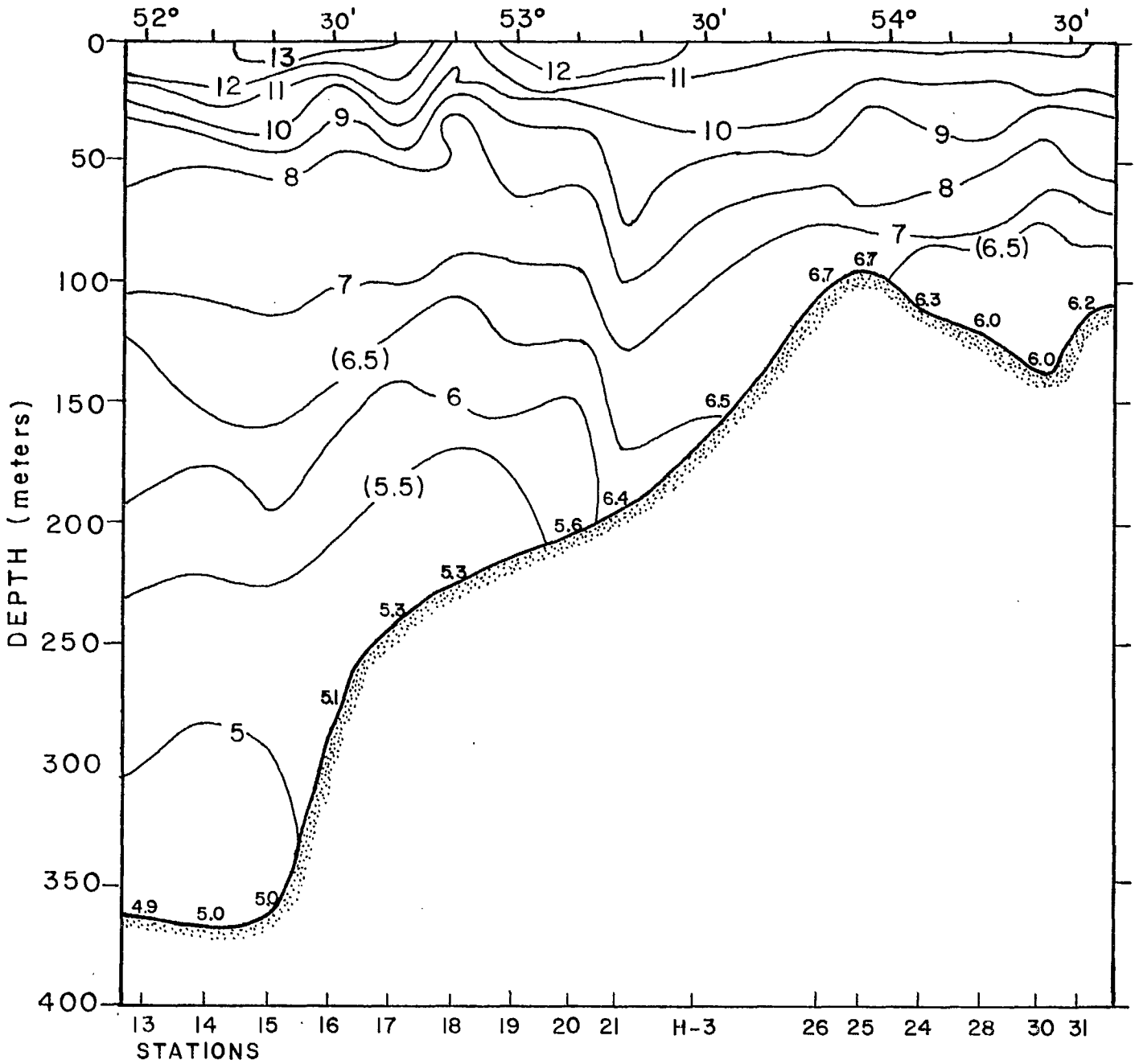
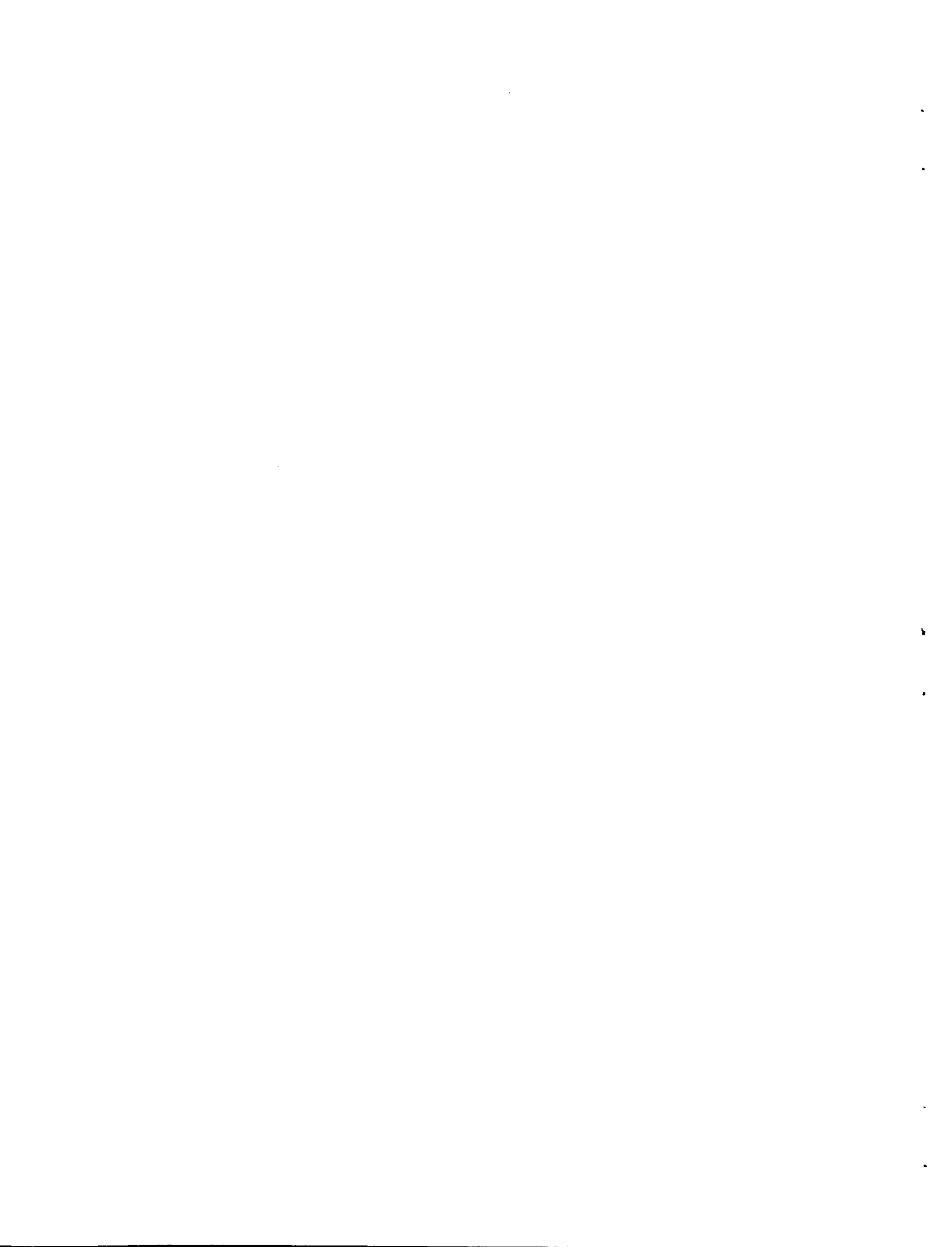


Figure 10. Vertical section of temperature ( $^{\circ}\text{C}$ ) along a north-south transect in mid-Hecate Strait, June 27-July 12, 1979.





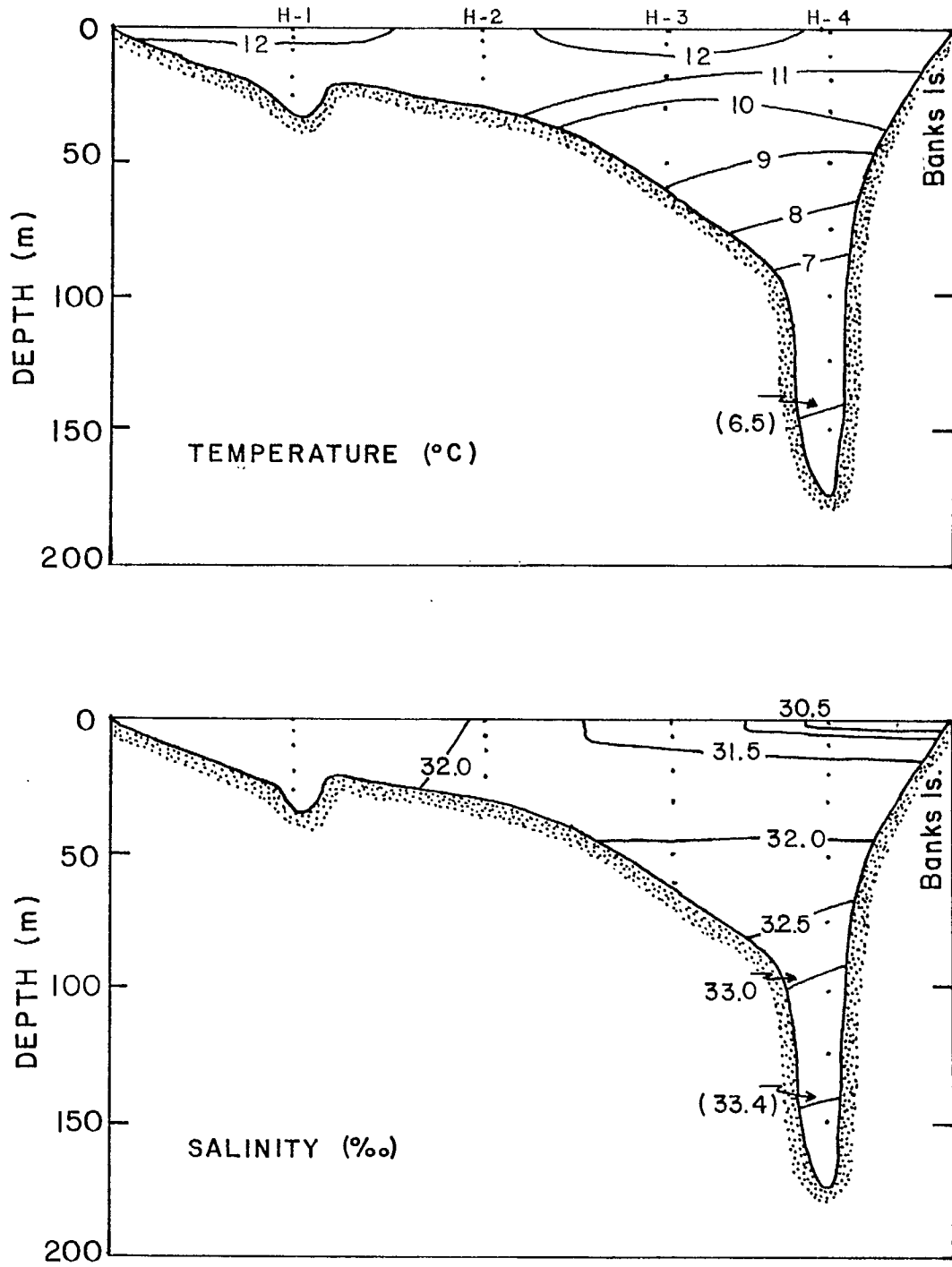
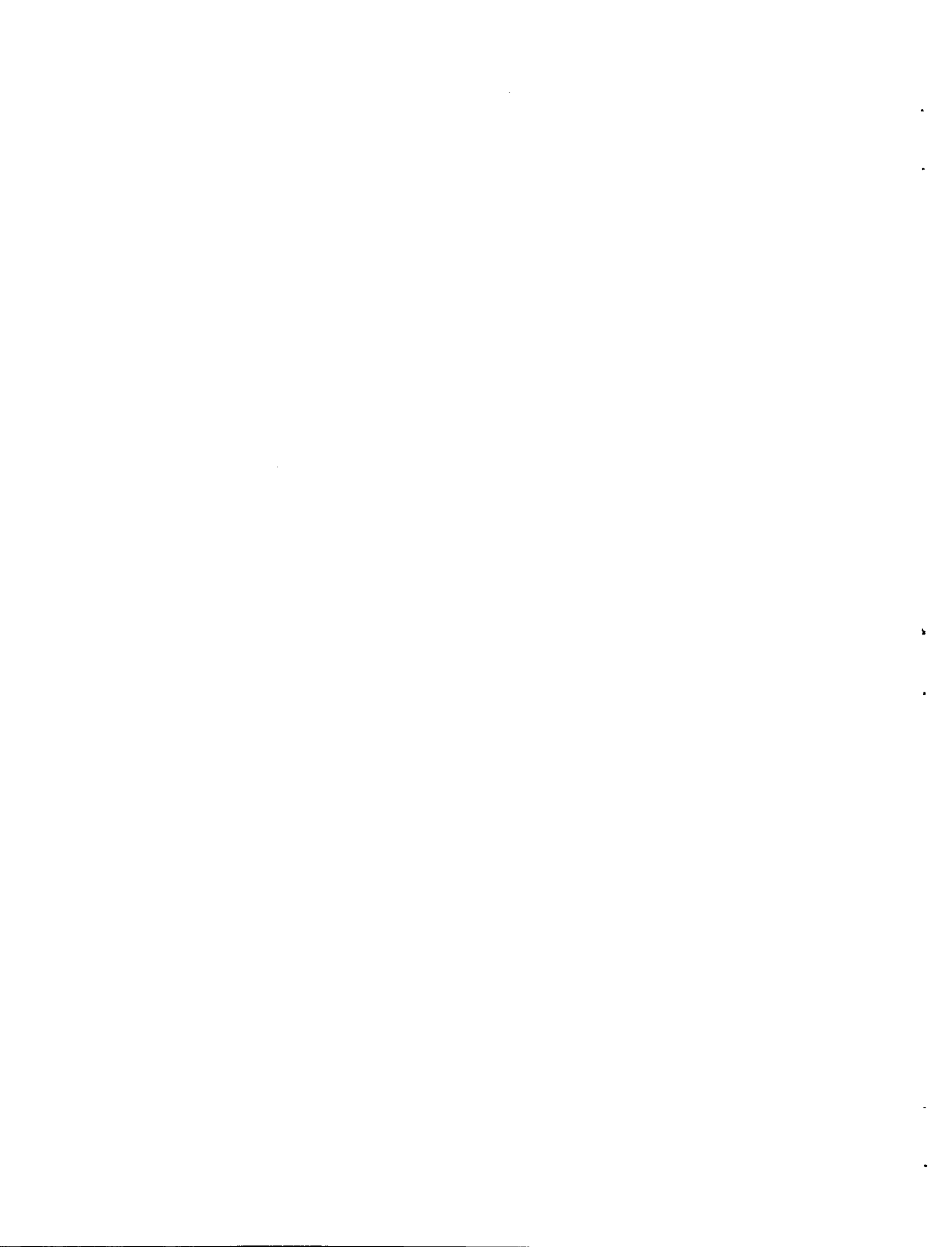


Figure 11. Vertical sections of temperature and salinity between Queen Charlotte Islands and Banks Island, June 28, 1979.



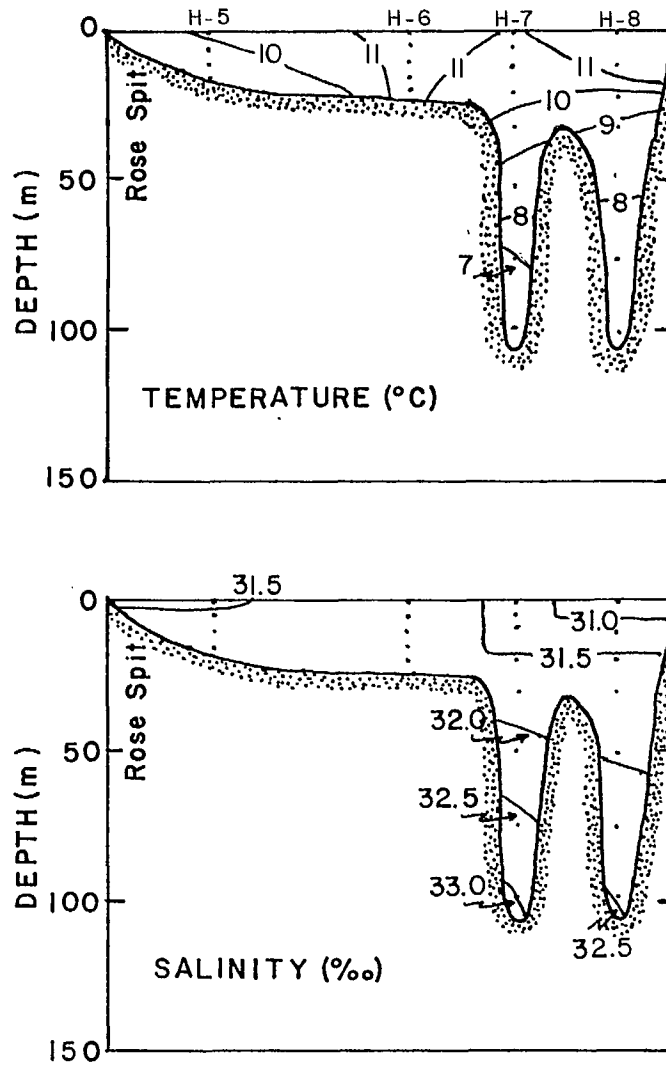
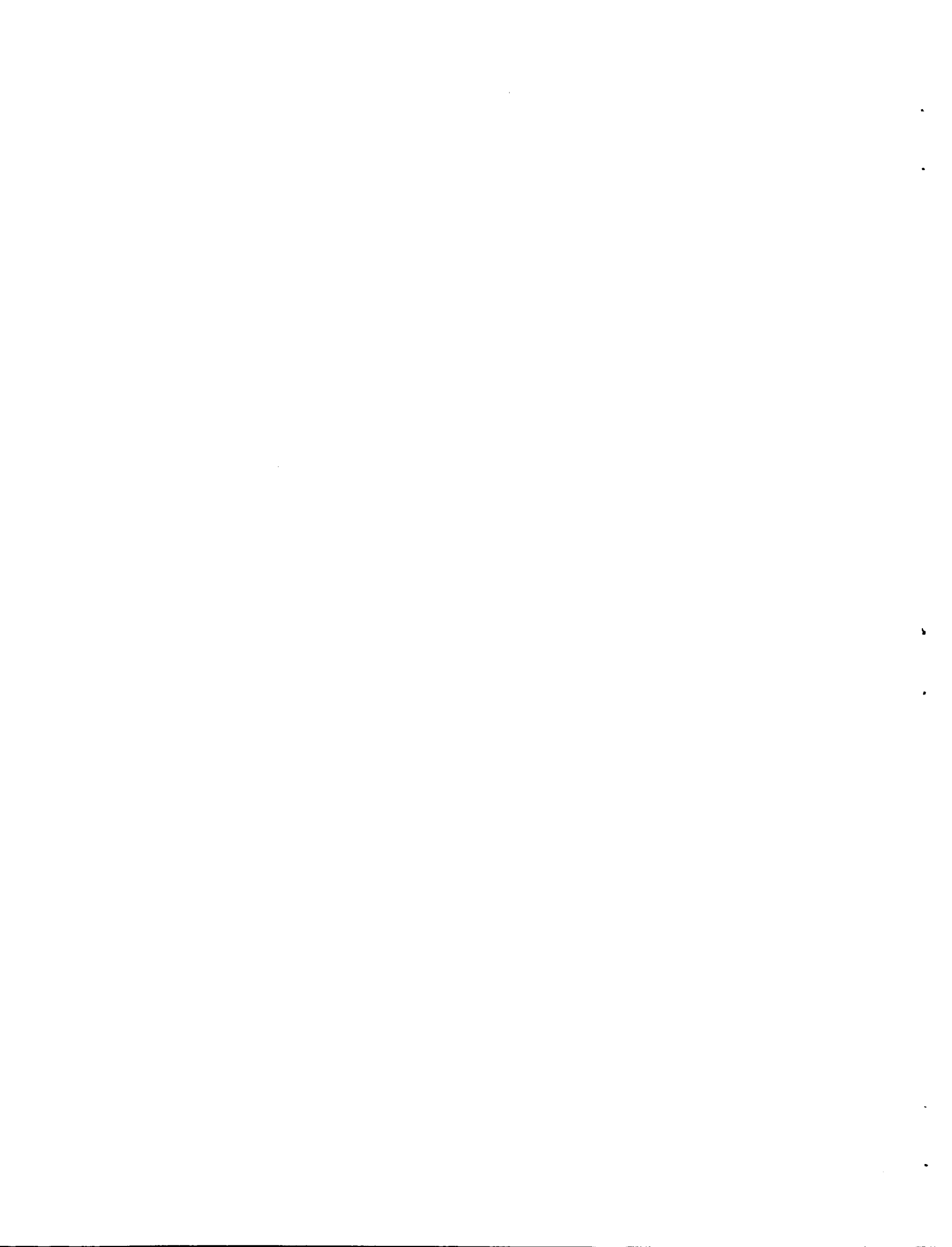


Figure 12. Vertical section of temperature and salinity across northern Hecate Strait, June 29, 1979.



6. Squid Survey - West coast of Vancouver Island - G.B. REED,  
August 16-123, 1979



6. Squid Survey - West coast of Vancouver Island - G.B. REED, August 16-23, 1979.

Stations at which XBT observations were made are shown in Fig. 13 and a listing of the data is provided in Table 12.

Surface temperatures ranged from about 15 to 17.5°C, with the coldest waters generally occurring between the coast and the 100 fm isobath. Daily sea surface temperatures at Amphitrite Point (Fig. 4) indicate that surface temperatures were relatively high for this time of year.

The range of bottom water temperatures at depths between 109 and 181 m was relatively small over the area, 6.3 to 6.8°C, (Table 13). Mean bottom temperatures at depths of 72 to 181 m were generally lower (by about 0.5 to 0.9°C) than those observed in May 1979.



Table 12. Summary of temperature data.

AREA: West Coast of Vancouver Island

DATE: August 16-23, 1979

VESSEL: G.B. REED

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)																Depth (m) Salinity (‰)	
			Lat. N	Long. W		0	05	25	50	70	75	100	150	165	188	200	273	305					
1	16/8	2030	48°39'	126°13'	305	0	05	25	50	70	75	100	150	165	188	200	273	305					
						16.6	16.6	10.2	8.2	8.0	7.6	7.5	7.1	6.8	6.6	6.5	6.1	5.8					
2	17/8	0737	48°44'	126°24'	485	0	03	10	15	25	35	55	75	100	150	200	265	315	485				
						16.6	15.2	15.0	11.0	9.0	8.0	8.0	7.8	7.5	7.2	6.5	6.0	5.5	5.2				
3	17/8	1015	48°43'	126°25'	355	0	10	12	20	40	50	100	150	165	175	185	200	260	300	355			
						16.6	14.0	10.2	8.0	7.5	7.3	7.0	6.5	6.2	6.3	6.1	5.8	5.5	5.4	5.3			
4	17/8	1845	48°40'	126°46'	1495	0	10	15	30	50	80	90	100	200	250	400	550	720	1330	1495			
						17.4	17.4	16.5	10.0	8.0	7.6	7.8	7.7	6.7	6.2	5.3	4.5	4.0	3.0	2.3			
5	18/8	0735	48°39'	126°45'	287	0	10	20	25	50	85	90	100	135	140	175	200	225	250	287			
						16.8	16.8	15.7	12.5	8.0	7.7	7.5	7.5	7.5	7.0	6.7	6.5	6.2	6.0	6.0			
6	18/8	0955	48°56'	126°22'	148	0	02	10	25	50	75	100	125	148									
						14.7	14.7	14.7	9.0	7.5	7.3	7.0	6.6	6.5									
7	18/8	1240	49°05'	126°25'	129	0	02	12	25	30	49	50	75	100	110	129							
						15.2	15.0	15.0	10.0	9.6	7.9	8.0	7.3	6.9	6.6	6.6							
8	19/8	1338	49°18'	126°37'	99	0	02	10	18	22	30	40	50	70	83	99							
						15.8	15.5	15.3	12.5	10.4	9.0	8.5	8.3	7.8	7.7	7.6							
9	20/8	0920	49°26'	126°57'	122	0	03	08	15	22	28	45	50	80	90	100	105	106	122				
						15.7	15.3	15.2	13.6	10.8	10.6	8.6	8.4	7.6	7.2	7.2	7.2	6.9	6.8				
10	20/8	2015	49°38'	127°03'	100	0	05	13	25	32	43	45	50	70	80	88	100						
						16.2	15.0	11.6	9.4	9.0	9.0	8.8	8.8	8.5	8.2	7.5	7.3						
11	21/8	0807	49°42'	127°05'	84	0	05	10	11	20	30	45	50	55	70	75	84						
						16.5	15.7	14.5	13.0	10.0	8.7	8.1	8.0	7.8	7.7	7.4	7.4						
12	21/8	1710	49°18'	127°07'	183	0	10	20	25	40	50	83	90	100	110	125	150	183					
						17.3	13.5	9.0	8.3	7.8	7.5	7.5	7.3	7.4	7.3	6.8	6.5	6.5					
13	21/8	1910	49°10'	126°51'	155	0	10	20	40	50	55	90	100	125	126	140	150	155					
						16.0	13.2	9.2	8.3	7.7	7.4	7.3	7.1	7.0	6.8	6.5	6.5	6.5					
14	21/8	2110	49°00'	126°34'	168	0	05	10	15	30	50	65	75	90	105	125	135	150	168				
						17.2	17.2	15.8	12.5	9.0	8.2	7.7	7.8	7.5	7.5	7.0	6.8	6.8	6.8				
15	22/8	0310	48°49'	126°19'	178	0	03	10	25	40	50	55	60	100	110	145	150	165	178				
						17.2	16.8	16.5	11.5	9.5	8.5	8.3	7.8	7.6	7.3	7.3	7.1	6.8	6.8				



Table 13. Summary of bottom water temperatures ( $^{\circ}\text{C}$ ) off the west coast of Vancouver Island, August 16-23, 1979.

Depth interval		Range	Mean
(m)	(fm)		
72-108	40-59	7.3-7.6	7.4(3)
109-145	60-79	6.3-6.8	6.6(3)
146-181	80-99	6.5-6.8	6.6(4)

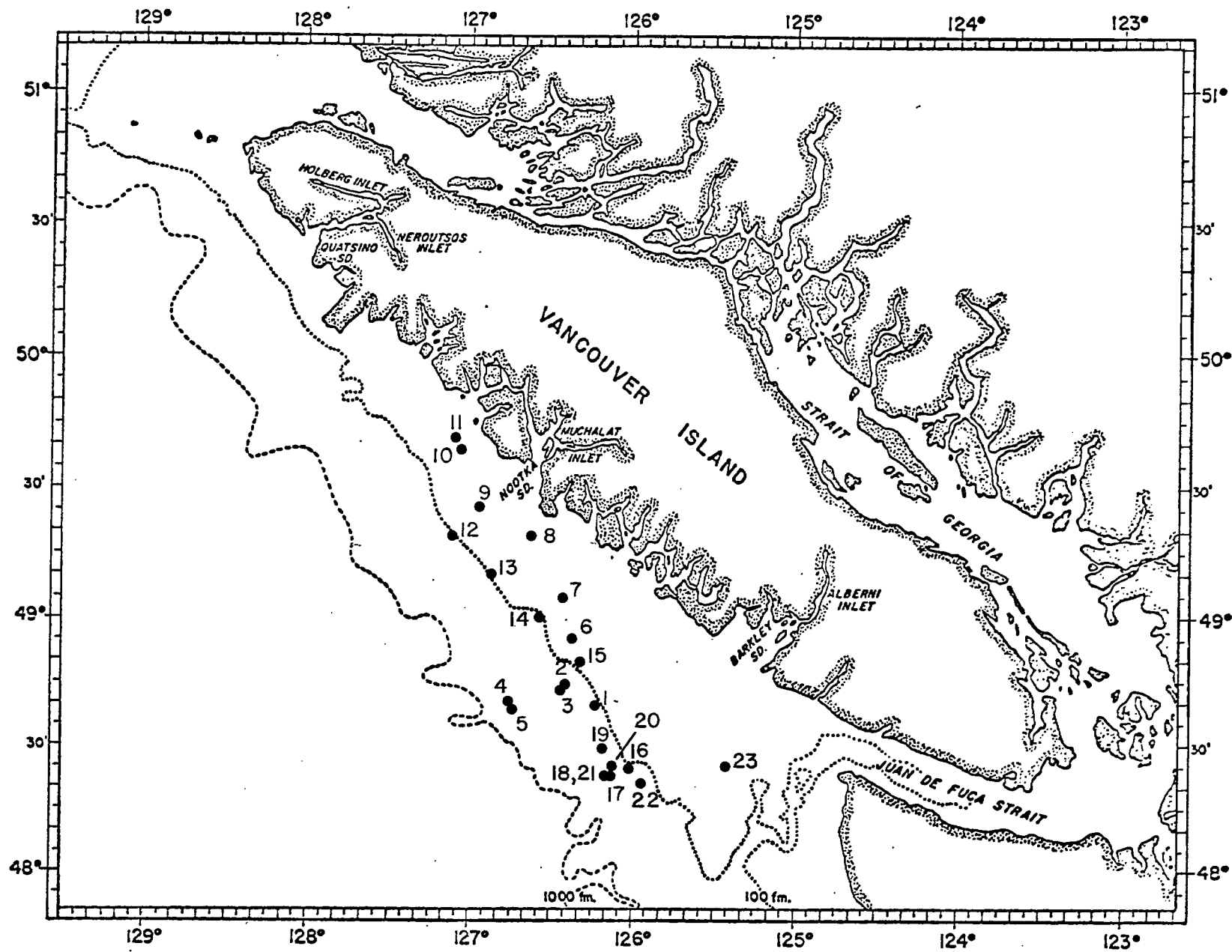
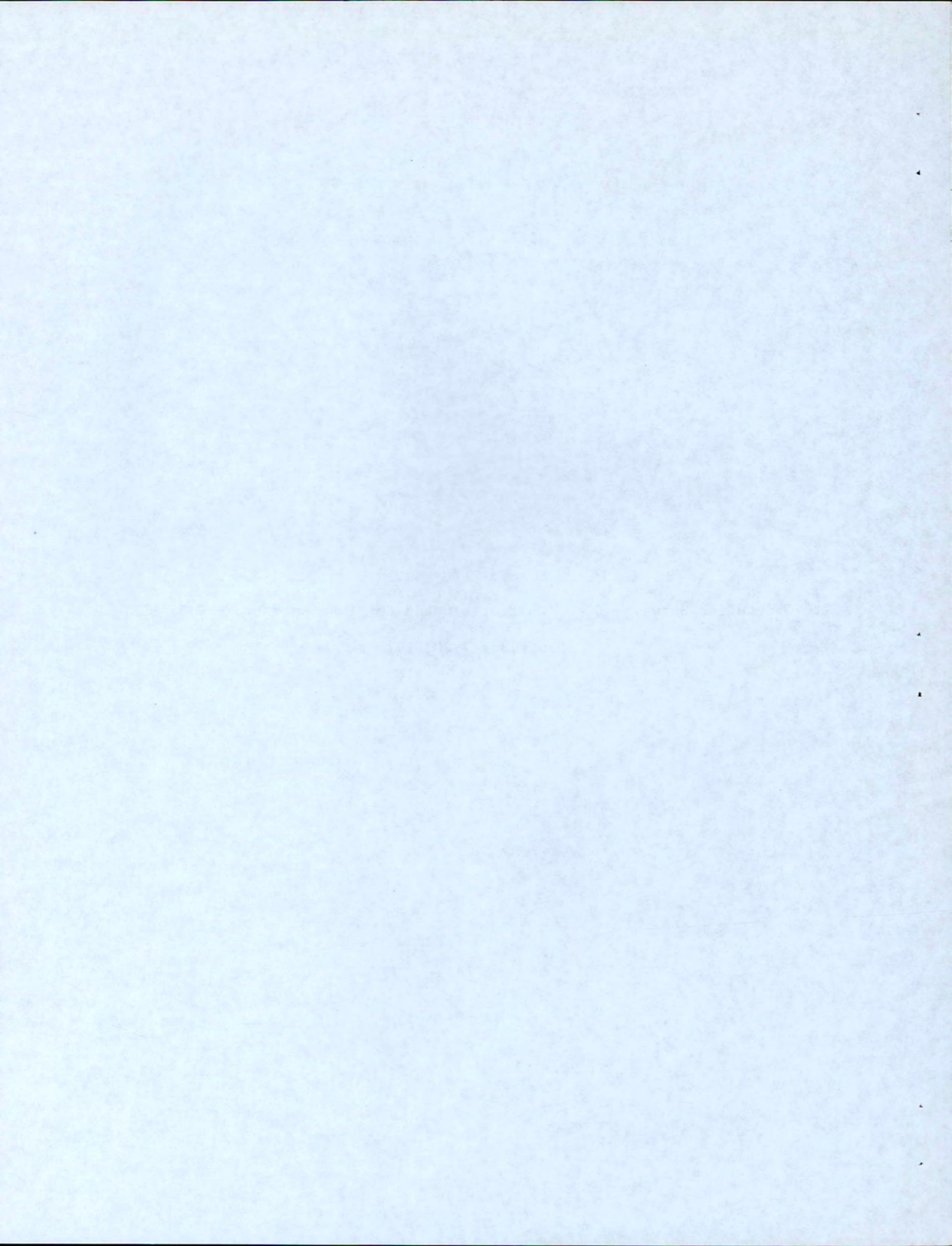


Figure 13. Station positions, August 16-23, 1979.



7. Groundfish Survey - Queen Charlotte Sound to Dixon Entrance - G.B. REED,  
September 7-20, 1979



7. Groundfish Survey - Queen Charlotte Sound to Dixon Entrance - G.B. REED, September 7-20, 1979.

The positions at which hydrographic, MBT and XBT casts were made on this survey are shown in Fig. 14. The BT data are summarized in Table 14 and the hydrographic data are listed in Table 15.

In Goose Island Gully, Queen Charlotte Sound, bottom temperatures in early September 1979 were about 6°C at depths of 200 to 300 m (Fig. 15), about 0.5°C higher than those observed in late June 1979 (Fig. 9). An increase of this magnitude in the subsurface waters from July to late August has been observed in other data from this area (Dodimead et al. 1979b). Bottom temperatures were generally similar to those observed in August-September 1977 and 1978 (Dodimead 1979a,b).

The surface temperature distribution along a transect extending from southern Hecate Strait to Dixon Entrance was typical for this area - being featured by a general decrease from south to north (Fig. 16). At depths of 350 to 100 m, bottom temperatures ranged from about 5.0 to 7.9°C. At the shallower depths, 100-150 m, bottom temperatures in September were about 1°C higher than those in June-July. The increase is attributed to vertical transfer of heat downward from the surface layer. In southern Hecate Strait, bottom temperatures were generally similar in these two periods.



Table 14. Summary of temperature data.

Queen Charlotte Sound - Hecate Strait -  
AREA: Dixon Entrance

DATE: September 7-20, 1979

VESSEL: G.B. REED

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)															Depth (m) Salinity (‰)			
			Lat. N	Long. W		0	10	25	40	50	75	100	125	150	165	180								
1	07/09	0945	51°07'	128°20'	180	0	10	25	40	50	75	100	125	150	165	180								
						14.0	13.5	9.7	9.1	9.1	8.2	7.2	7.0	6.8	6.5	6.3								
2	07/09	1110	51°15'	128°40'	183	0																		
						13.7																		
3	07/09	1230	51°24'	128°43'	208	0	18	35	50	65	75	100	115	150	175	200	208							
						12.2	12.0	9.3	8.8	7.8	7.5	6.8	6.7	6.3	6.2	6.0	6.0							
4	07/09	1400	51°19'	129°00'	238	0	20	30	50	75	100	125	150	175	200	238								
						15.5	15.4	14.0	9.0	7.7	7.2	6.6	6.5	6.3	6.2	6.2								
5	07/09	1520	51°13'	129°17'	283	0	01	20	40	50	85	100	105	120	140	150	200	225	283					
						15.0	15.0	15.0	8.5	7.8	6.9	6.7	6.9	6.9	6.3	6.3	6.4	6.0	6.0					
6*	07/09	1715	51°07'	129°37'	332	0	01	17	25	42	50	75	100	150	200	250	300	332						
						14.2	14.2	14.2	10.5	7.7	7.7	7.1	7.1	6.9	6.5	6.4	6.0	5.8						
7	07/09	1845	51°21'	129°49'	230	0	01	17	25	30	40	50	75	100	125	150	175	200	230					
						13.6	13.6	13.5	12.8	10.0	8.5	8.2	7.3	7.0	6.9	6.8	6.2	6.2	6.1					
8*	07/09	2030	51°37'	130°02'	340	0	01	18	25	50	60	75	100	132	150	175	200	250	300	340				
						13.3	13.2	13.2	11.5	9.3	8.3	7.4	6.8	6.5	6.0	5.8	5.8	5.7	5.7	5.5				
9	07/09	2158	51°48'	130°16'	211	0	01	18	30	50	75	100	125	150	160	200	211							
						14.1	14.1	14.0	13.4	10.7	8.0	7.5	6.9	6.3	6.0	5.9	5.9							
10*	07/09	2330	52°00'	130°30'	385	0	01	12	25	33	50	75	100	150	175	220	250	300	385					
						13.3	13.3	13.2	11.2	9.7	8.9	7.7	7.3	6.7	6.0	5.5	5.2	5.1	5.1					
11	08/09	0030	52°10'	130°22'	-	0	01	13	25	50	60	75	100	120										
						13.1	13.0	13.0	12.5	9.7	9.0	8.6	7.0	6.5										
12	08/09	0140	52°20'	130°15'	358	0	01	25	40	45	50	70	92	101	150	175	200	250	300	358				
						13.7	13.7	13.7	10.4	10.5	10.2	9.2	7.2	7.0	6.5	6.2	5.7	5.1	5.0	5.0				
13	08/09	0240	52°30'	130°07'	290	0	01	25	32	50	60	100	150	172	200	225	250	290						
						14.4	14.4	14.3	11.5	9.8	8.6	7.5	6.2	5.5	5.4	5.2	5.1	5.1						
14	08/09	0328	52°40'	130°09'	236	0	01	25	40	50	75	100	125	150	200	215	236							
						14.5	14.4	14.3	12.2	11.0	8.0	7.4	6.7	6.2	5.8	5.5	5.4							
15	08/09	0425	52°50'	130°11'	235	0	25	35	40	43	50	105	115	130	150	170	200	235						
						14.1	14.0	11.0	11.1	10.0	9.8	6.8	7.0	6.4	6.6	6.4	6.7	6.1	5.9					

Table 14 (cont'd)

Queen Charlotte Sound - Hecate Strait -  
AREA: Dixon Entrance

DATE: September 7-20, 1979

VESSEL: G.B. REED

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)														Depth (m) Salinity (‰)		
			Lat. N	Long. W		0	01	17	20	25	50	75	100	125	150	170	200	225	228			
16*	08/09	0555	53°00'	130°12'	228	0	01	17	20	25	50	75	100	125	150	170	200	225	228			
						14.2	14.2	14.3	14.5	14.5	9.5	8.5	7.8	7.2	6.5	6.1	6.0	5.8	5.7			
17	08/09	0715	53°09'	130°28'	193	0	01	12	15	20	50	75	78	80	100	125	153	193				
						12.5	12.5	12.5	12.9	12.5	9.5	8.6	8.9	8.5	7.8	7.3	6.5	6.3				
18	08/09	0820	53°17'	130°42'	160	0	01	10	25	50	75	100	110	125	150	160						
						12.5	12.4	12.3	9.7	8.5	8.2	7.9	7.5	7.5	6.7	6.3						
19	08/09	0930	53°30'	130°46'	162	0	01	20	42	50	65	75	100	120	150	162						
						12.7	12.7	12.6	10.2	10.1	9.7	9.0	7.7	7.6	7.2	7.1						
20	08/09	1039	53°43'	130°43'	135	0	05	30	35	50	75	100	125	135								
						12.2	12.0	11.9	11.6	10.5	8.2	7.3	6.9	6.9								
21	08/09	1125	53°50'	130°52'	96	0	05	25	50	67	75	96										
						12.6	12.4	11.9	10.5	9.2	8.0	7.5										
22	08/09	1212	53°57'	131°01'	88	0	01	20	25	30	50	75	88									
						12.5	12.5	12.5	12.0	11.5	9.8	8.0	7.9									
23	08/09	1305	54°07'	131°02'	117	0	01	20	37	43	50	63	85	95	117							
						13.3	13.3	13.1	12.0	10.2	10.0	9.1	8.7	7.9	7.9							
24	08/09	1403	54°17'	131°02'	130	0	05	28	35	45	50	70	85	115	120	130						
						13.0	12.5	12.1	11.5	11.5	11.0	8.2	7.8	7.8	7.3	7.2						
25	08/09	1430	54°20'	131°05'	94	0	05	12	30	50	68	75	94									
						12.8	12.7	12.2	11.9	9.5	8.8	8.1	7.4									
26	08/09	1500	54°26'	131°05'	-	0	12	28	50	60	75											
						12.6	12.6	12.0	9.8	9.1	8.5											
27	08/09	1600	54°33'	131°20'	114	0	05	25	45	47	50	55	59	66	73	75	85	100	114			
						11.7	11.7	10.8	10.9	11.0	9.7	9.3	9.4	9.2	8.3	8.5	8.2	7.8	7.5			
28	08/09	1720	54°25'	131°20'	300	0	10	13	25	40	47	50	70	85	100	125	150	175	200	300		
						11.4	10.6	10.8	10.5	10.9	10.1	10.0	8.0	7.3	6.0	6.9	6.1	5.7	5.6	5.5		
29*	11/09	1540	54°25'	131°20'	238	0	25	50	63	75	100	125	150	175	238							
						11.1	10.6	9.5	8.7	8.5	7.5	6.3	6.0	5.9	5.8							
30	11/09	1650	54°24'	131°18'	185	0	15	25	35	50	75	85	92	100	125	150	175	185				
						11.0	10.5	10.3	10.0	9.7	8.5	8.2	7.5	7.2	6.5	6.2	6.1	6.0				

Table 14 (cont'd)

Queen Charlotte Sound - Hecate Strait -  
AREA: Dixon Entrance

DATE: September 7-20, 1979

VESSEL: G.B. REED

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)													Depth (m) Salinity (‰)	
			Lat. N	Long. W		0	25	32	50	58	75	80	90	100	125	160				
31	11/09	1700	54°24'	131°17'	160	0	25	32	50	58	75	80	90	100	125	160				
						11.0	10.5	10.2	9.8	9.2	8.7	8.6	7.5	7.3	6.5	6.1				
32	11/09	1715	54°23'	131°15'	121	0	10	25	50	55	75	90	100	121						
						11.2	11.1	10.2	9.8	9.5	8.5	7.7	7.3	6.8						
33	11/09	1730	54°23'	131°13'	84	0	25	40	50	60	65	75	84							
						11.5	11.0	9.8	9.3	9.0	8.3	8.2	8.1							
34	11/09	1755	54°22'	131°08'	80	0	10	25	42	45	50	75	80							
						11.2	11.0	10.7	10.1	9.4	9.2	8.8	8.7							
35	11/09	1810	54°21'	131°06'	100	0	13	15	25	50	53	75	90	100						
						11.8	11.9	11.6	11.1	10.4	10.0	9.2	8.5	7.7						
36	12/09	1945	53°38'	131°08'	78	0	25	32	35	50	75	78								
						12.4	11.8	11.5	10.0	9.6	9.4	9.4								
37	12/09	1440	53°34'	131°09'	78	0	22	25	30	50	78									
						11.7	11.5	11.1	10.5	9.6	9.4									
38	13/09	1645	52°54'	130°24'	163	0	20	25	37	50	75	100	125	150	163					
						13.9	13.7	12.8	10.0	9.0	8.0	7.5	7.1	6.8	6.7					
39	13/09	1720	52°54'	130°26'	-	0	10	25	30	40	50	75	95	100	110	135				
						14.1	14.0	13.2	12.5	10.0	9.0	8.2	7.7	7.6	7.4	7.3				
40	13/09	1745	52°54'	130°32'	112	0	10	25	40	50	70	75	85	100	112					
						13.5	13.4	12.5	10.7	9.7	8.1	7.8	7.6	7.5	7.5					
41	13/09	1810	52°54'	130°37'	101	0	15	25	30	40	50	60	65	75	101					
						13.6	13.1	12.9	12.5	10.1	9.2	8.7	8.2	8.3	8.3					
42	13/09	1820	52°54'	130°39'	75	0	10	25	35	50	60	75								
						13.6	13.5	12.9	11.5	9.3	8.1	7.8								
43	13/09	1850	52°54'	130°45'	60	0	20	25	37	50	60									
						12.9	12.7	11.0	9.1	8.7	8.7									
44	14/09	1420	52°35'	131°09'	148	0	15	25	40	50	75	85	100	125	148					
						13.2	11.8	10.7	10.0	8.7	7.8	7.8	7.5	7.2	7.1					
45	14/09	1520	52°40'	131°00'	76	0	8	12	25	35	50	62	76							
						12.7	12.6	11.5	10.7	9.6	9.1	8.5	8.3							

Table 14 (cont'd)

Queen Charlotte Sound - Hecate Strait  
 AREA: Dixon Entrance

DATE: September 7-20, 1979

VESSEL: G-B. REED

No.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)														Depth (m) Salinity (‰)
			Lat. N	Long. W		0	13	15	25	40	50	62	75	90	100	132				
46	14/09	1840	52°40'	130°44'	132	0	13	15	25	40	50	62	75	90	100	132				
						14.3	13.8	13.0	12.7	11.5	10.3	9.4	8.3	7.4	7.4	7.5				
47	15/09	1640	52°58'	131°00'	35	0	10	15	20	35										
						12.4	12.0	11.1	10.5	10.0										
48	16/09	1630	53°20'	130°54'	130	0	20	25	50	60	75	100	105	130						
						13.5	13.3	12.5	10.6	10.2	9.3	8.3	10.6	10.5						
49	16/09	1840	53°20'	131°10'	34	0	20	25	34											
						12.4	12.1	11.1	11.0											
50*	17/09	1620	54°25'	131°20'	242	0	25	40	50	75	90	100	110	125	136	150	200	242		
						12.0	12.0	12.2	11.4	10.7	10.4	10.2	8.0	7.1	6.5	6.3	5.9	5.7		
51	19/09	1415	53°10'	130°46'	149	0	20	25	42	50	75	100	125	149						
						13.7	13.7	13.4	10.8	9.8	8.5	7.9	7.6	7.3						
52	19/09	1630	52°50'	131°00'	36	0	10	25	36											
						12.6	12.5	12.0	12.0											
53	19/09	2125	52°28'	130°10'	298	0	20	30	50	75	100	125	150	200	225	250	298			
						13.9	13.9	12.0	9.4	7.8	7.2	7.0	6.7	6.1	5.8	5.7	5.6			
54	20/09	0100	52°00'	129°30'	202	0	01	10	20	25	40	70	87	100	110	150	161	202		
						15.3	15.2	15.7	10.3	8.8	10.0	8.3	8.3	7.8	8.0	7.7	7.4	7.3		
55	20/09	0530	51°24'	128°42'	211	0	15	30	50	60	65	80	100	150	180	211				
						15.4	15.4	11.1	9.0	7.9	8.0	7.4	7.3	6.8	6.3	6.3				
56	20/09	0805	51°07'	128°22'	177	0	03		15	25	30	50	65	67	82	100	125	150	177	
						13.3	13.3		13.5	13.0	13.0	11.3	9.8	9.9	8.9	8.0	6.7	6.7	6.7	

\*Bottle Cast.

Table 15. Temperature and salinity data.

Station 6

Time: 1715 Date: 7-IX-79 Lat: 51°07' Long: 129°37' Sounding: 337 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	14.5	31.877
10	14.34	31.873
20	14.07	31.895
29	10.42	32.308
48	7.74	32.731
72	7.42	32.981
96	7.18	33.503
145	6.82	33.788
192	6.47	33.839
241	6.30	33.851
289	6.05	33.867
337	5.82	33.886

Station 8

Time: 2030 Date: 7-IX-79 Lat: 51°37' Long: 130°02' Sounding: 340 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	13.3	31.959
10	13.24	31.912
20	12.86	31.966
30	11.07	32.184
50	9.40	32.409
75	7.96	32.778
100	7.28	32.996
125	6.72	33.257
150	6.46	33.437
200	5.88	33.816
250	5.75	33.835
300	5.68	33.855

Table 15 (cont'd)

Station 10

Time: 2330 Date: 7-IX-79 Lat. 52°00' Long. 130°30' Sounding: 395 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	13.4	31.877
5	13.32	31.916
15	13.24	31.920
25	11.94	32.067
45	9.81	32.362
70	8.35	32.564
95	7.58	32.782
145	6.90	33.160
195	5.97	33.659
245	5.43	33.847
295	5.20	33.886
395	5.05	33.925

Station 16

Time: 0540 Date: 8-IX-79 Lat: 53°00' Long: 130°12' Sounding: 228 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	14.4	31.676
10	14.28	31.649
20	14.35	31.687
30	13.55	31.893
50	9.87	32.114
75	8.72	32.494
100	7.81	32.770
125	7.23	33.074
150	6.58	33.404
200	5.94	33.683

Table 15 (cont'd)

Station 28

Time: 1710 Date: 8-IX-79 Lat: 54°25' Long: 131°20' Sounding: 252 m

Depth (m)	Temp (°C)	Sal. (‰)
0	11.4	31.746
10	10.88	31.738
19	10.70	31.835
28	10.56	31.912
48	9.82	32.090
72	8.60	32.514
96	7.44	32.654
120	6.80	32.942
144	5.96	33.359
192	5.64	33.550
221	5.57	33.597

Station 29

Time: 1530 Date: 11-IX-79 Lat: 52°25' Long: 131°20' Sounding: 238 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	11.1	31.901
10	11.14	31.974
20	10.70	32.063
29	10.16	32.172
49	9.41	32.444
73	8.38	32.564
98	7.32	32.763
123	6.15	32.218
148	5.79	33.476
218	5.69	33.523

Table 15 (cont'd)

Station 50

Time: 1630 Date 17-IX-79 Lat: 54°25' Long: 131°20' Sounding: 220 m

Depth (m)	Temp. (°C)	Sal. (‰)
0	12.0	31.901
10	12.09	31.870
20	12.08	31.864
29	12.12	31.928
48	11.36	32.098
71	10.64	32.327
94	9.74	32.494
118	6.90	32.864
142	6.13	33.300
189	5.76	33.495





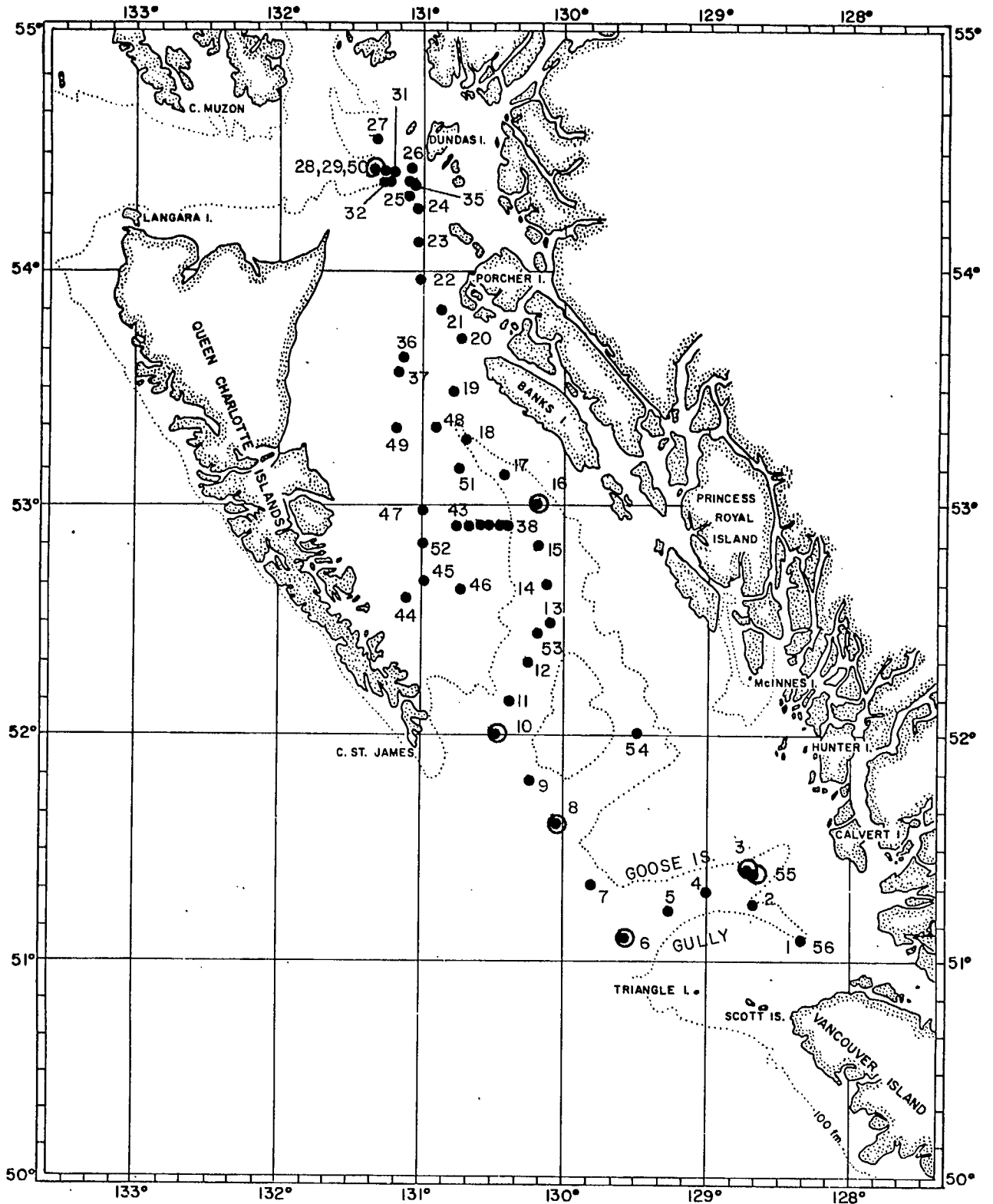
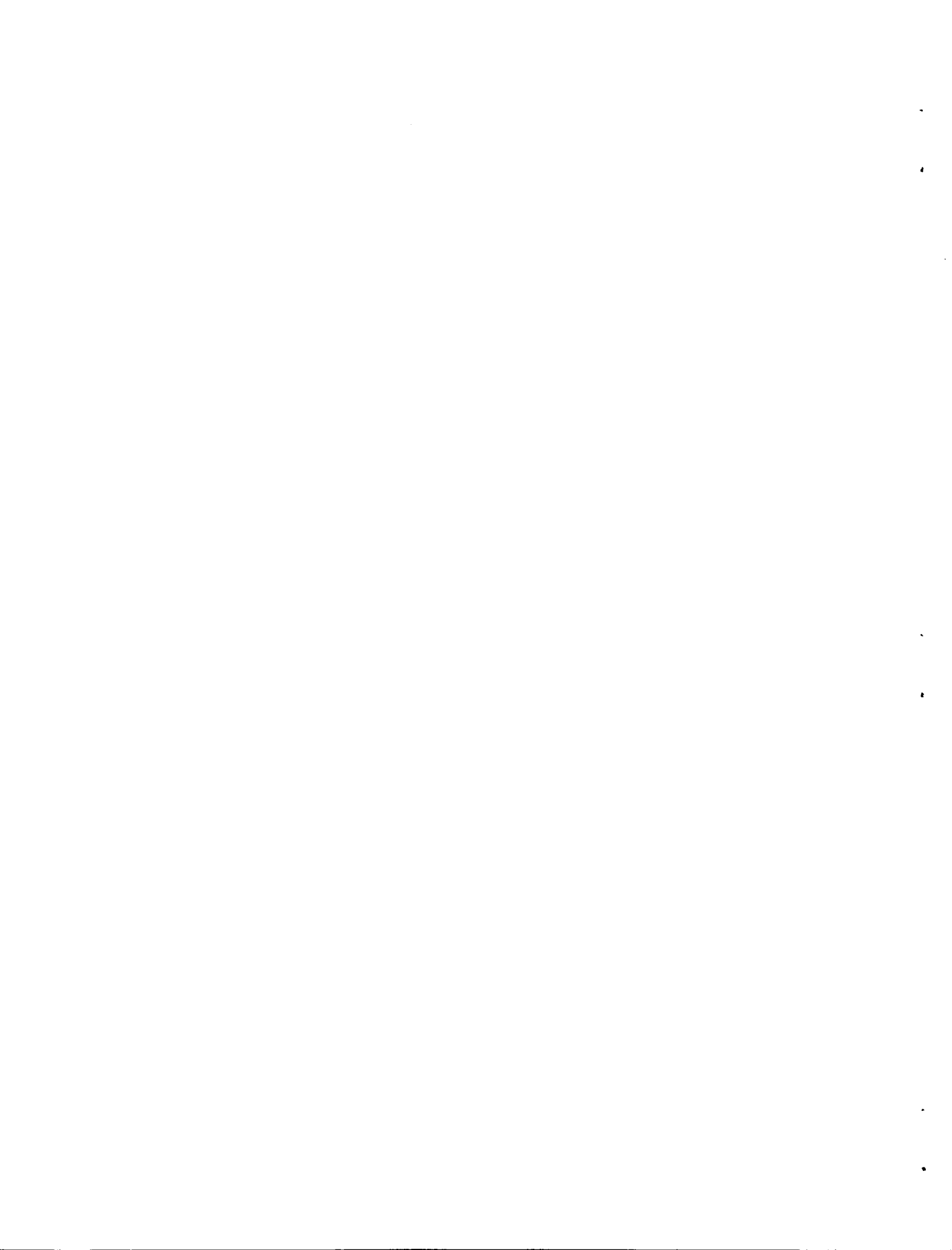


Figure 14. Station positions, September 7-20, 1979.  
(● XBT, BT; ○ Bottle Cast).



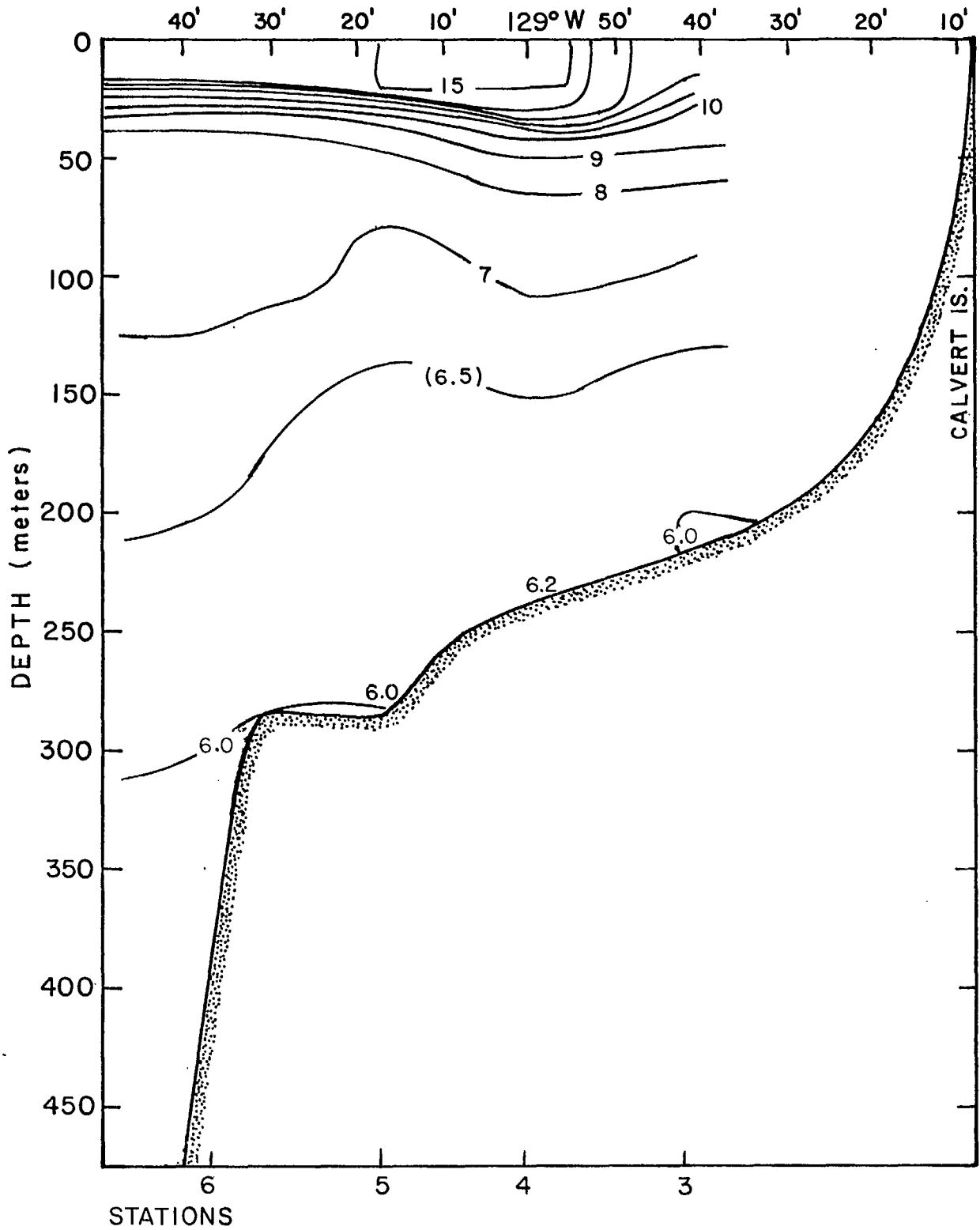


Figure 15. Vertical section of temperature ( $^{\circ}\text{C}$ ) in Goose Island Gully, Queen Charlotte Sound, September 7, 1979.



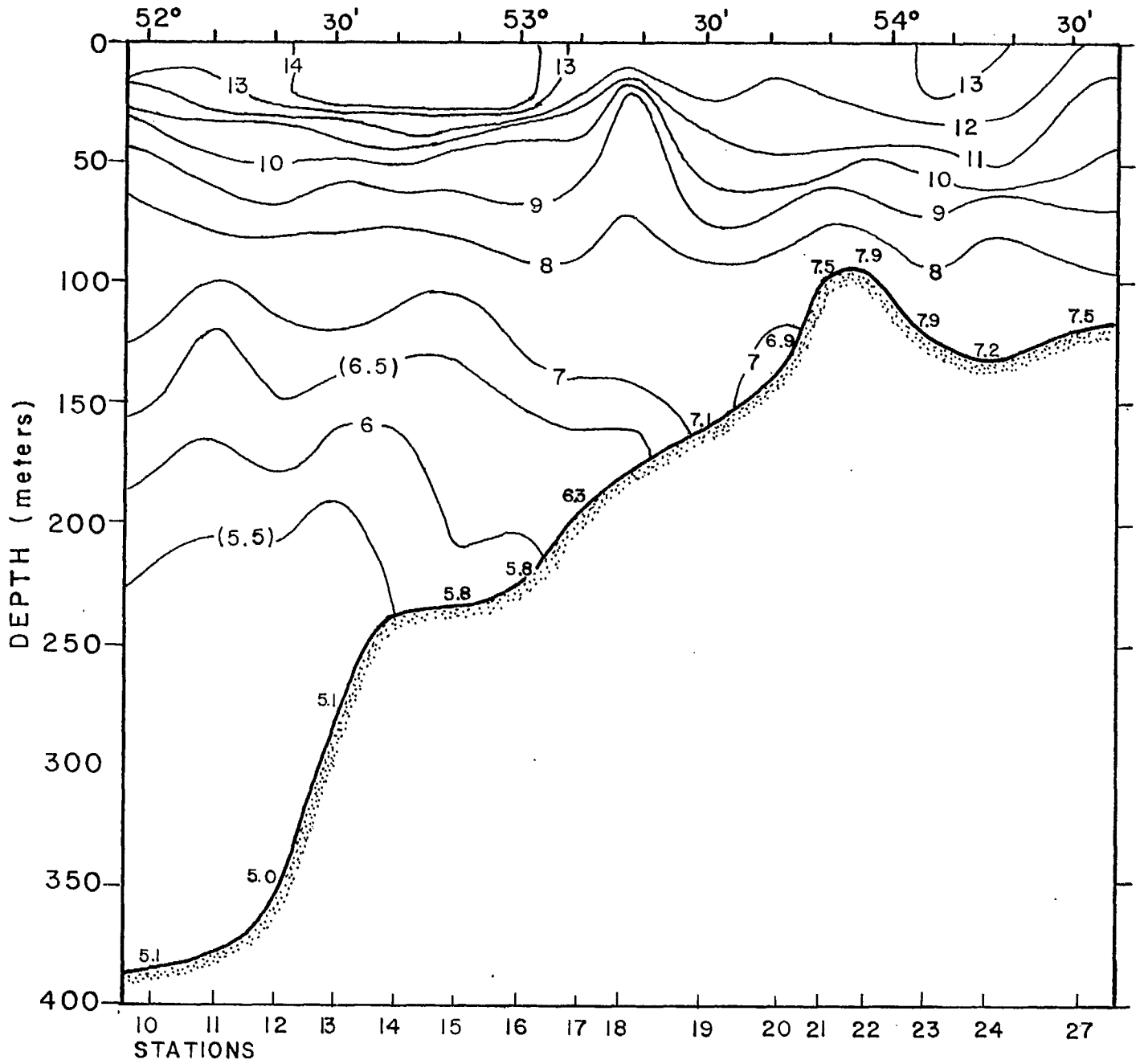


Figure 16. Vertical section of temperature ( $^{\circ}\text{C}$ ) along a north-south transect in mid-Hecate Strait, September 7-8, 1979.

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