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TEMPERATURE, SALINITY, AND CURRENT MEASUREMENTS FOR
COOS BAY, OREGON, DURING 1960-1963

by

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and

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Chairman

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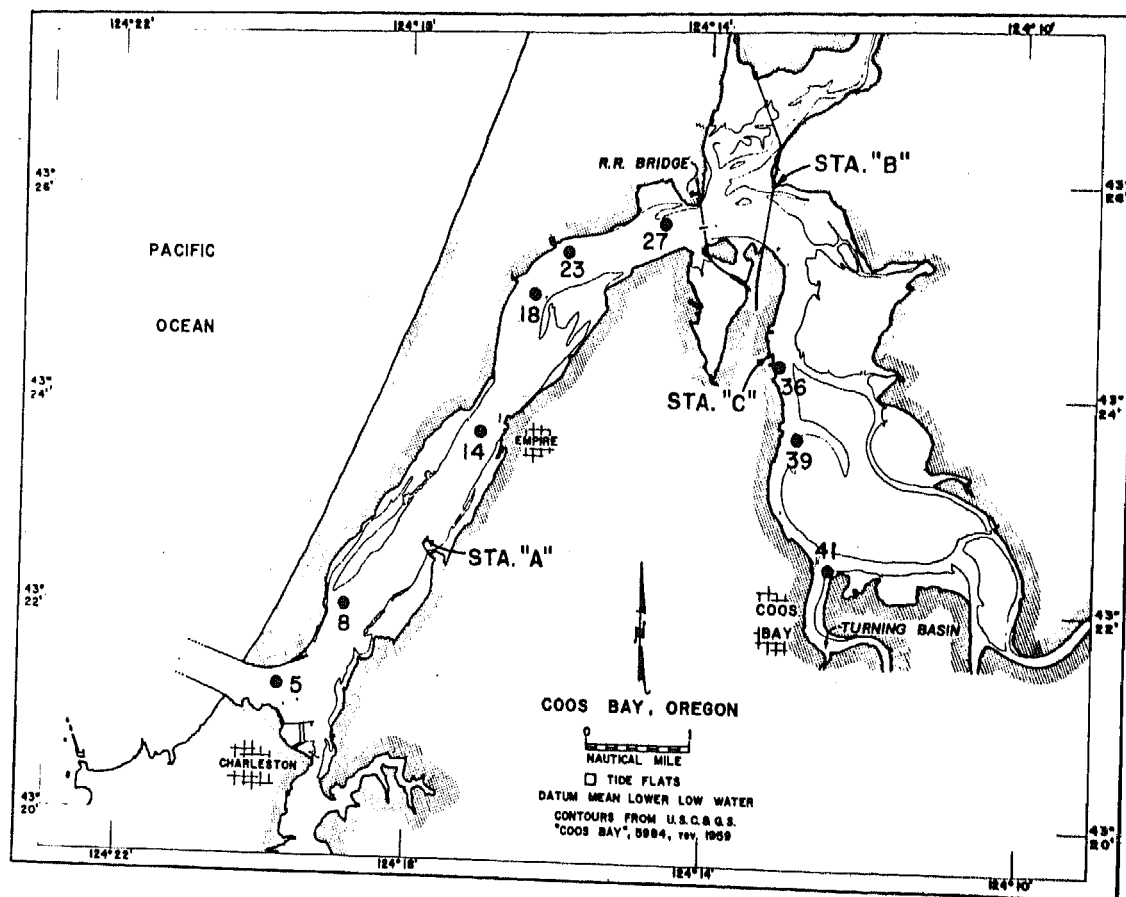


Figure 1. Map of Coos Bay.

TEMPERATURE, SALINITY AND CURRENT MEASUREMENTS FOR
COOS BAY, OREGON, DURING 1960-1963

INTRODUCTION

Temperature, salinity, and current measurements extending over one or more tidal cycles were made at various times during the three-year period 1960-1962 in Coos Bay, on the central Oregon coast ($43^{\circ}20'N$, $124^{\circ}13'W$). Dissolved oxygen was measured occasionally. The three regular sampling stations are shown in Figure 1. Station A is located at the Coos Bay Pulp and Paper dock south of Empire, Station B at the U. S. 101 Highway bridge, and Station C at the municipal docks at North Bend. On two occasions, midchannel stations along the entire fifteen-mile length of the estuary were sampled. A special current study was conducted in March 1963. Measurements in Coos Bay before 1960 have been reported by Queen and Burt (1955), Burt (1956), and Burt and McAlister (1958).

METHODS AND PROCEDURES

The present program began in June 1960 with observations of temperature, salinity, and currents at the three regular sampling stations. Measurements were made at hourly or half-hourly intervals. Observations were continued throughout at least one tidal cycle, although some of the records are incomplete for one or more stations because of equipment failure. Station B was sampled each time, and one or both of the other stations were usually sampled during the same period.

Water samples were obtained with a Frautschy bottle. Temperatures were read to $0.1^{\circ}C$ with a standardized bucket thermometer; salinities were determined to 0.1% by titration. Some measurements were made with a standardized conductivity-temperature indicator (CTI). These data are indicated in the tables by asterisks. The Winkler method was used to determine dissolved oxygen. Current velocities were measured with a current drag similar to that described by Pritchard and Burt (1951). Occasional measurements were made using Price and Ekman meters. Flood currents were recorded as positive numbers; ebb currents as negative numbers.

From June 1960 until summer 1961, measurements were taken only for surface and bottom. Temperature, salinity, and current velocities observed during this period at the three stations are listed in Table I.

Beginning in May 1961, measurements were taken at five-foot depth intervals, as well as at the surface and the bottom. Data for Station B for the period May through August 1961 are listed in Table II-i. Station C was sampled during July (Table II-ii), and Station A during August (Table II-iii).

Field measurements were normally made using a 16- or 25-foot boat. In August 1961 and March 1962, the small boat survey was supplemented by the research vessel ACONA. On these occasions, the ACONA occupied Station B and the small boats maintained a continuous survey at 5-foot depth intervals at various midchannel locations along the estuary. Current, temperature, and salinity were measured. These data are listed chronologically in Table III.

On several occasions during the sampling periods, dissolved oxygen measurements were taken. From July 1960 to May 1961, observations were made at the surface and the bottom at Station B. In March 1962, the measurements were taken at depths of 0, 10, 20, and 30 feet in midchannel. These observations are shown in Table IV.

In March 1963, short-period current measurements were also made at Station B in connection with a turbulence study. Mean current velocities from a depth of five feet were observed for one-minute intervals over a tidal cycle. A Price Meter was used. These observations are summarized in Table V.

RESULTS

Temperature and salinity data at the three principal stations indicate that Coos Bay ranges from a well-mixed estuary during periods of low runoff to a partially mixed estuary during periods of maximum runoff. This agrees with earlier studies.

The seasonal effects of runoff on the temperature and salinity structure of the estuary are graphically shown in Figure 2. Data at Station B are used for illustration. On 20 September 1960, a period of low runoff, the estuary was well mixed. By 20 December 1960, runoff had increased considerably, and the estuary had become partially mixed.

The one-minute current data were used in connection with a study to measure the natural turbulence. The intensity and scale of turbulence varied with the stage of the tide. Eddy diameters ranged from as small as could be observed to 500 meters (Blanton, 1963).

ACKNOWLEDGMENTS

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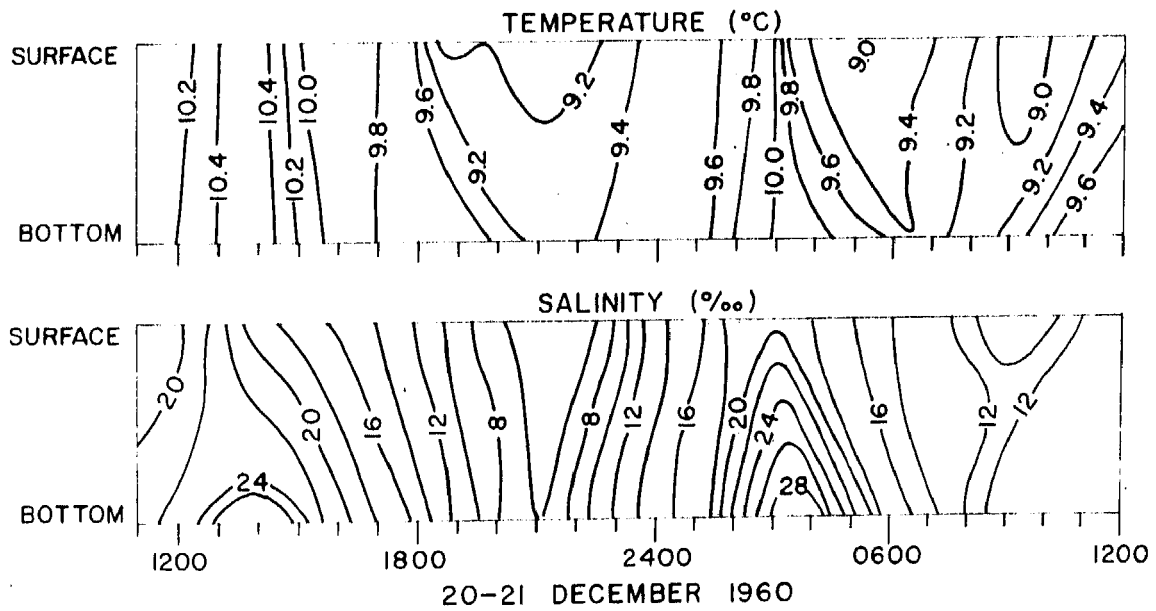
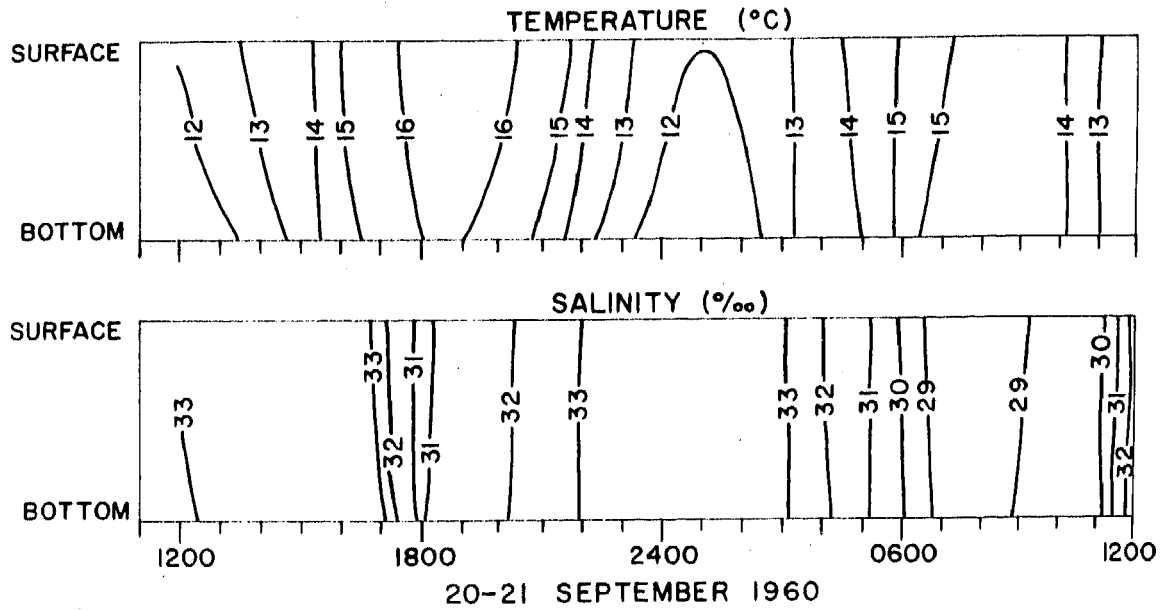


Figure 2. Temperature and Salinity Structure of Coos Bay during Periods of Low and High Runoff.

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2130	12.0	31.5	+ 37	12.0	31.8	+ 59	17.5	27.27*	- 40	15.3	27.52*	- 21	17.0	26.9	- 45	16.3	26.4	- 26	2130	
2200																				2200
2230																				2230
2300																				2300
2330																				2330
2400																				2400
0030																				0030
0100																				0100
0130																				0130
0200																				0200
0230																				0230
0300																				0300
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1000																				1000
1030																				1030
1100																				1100
1200																				1200
1230																				1230
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1400																				1400
1430																				1430
1500																				1500
1530																				1530
1600																				1600
1630																				1630
1700																				1700

16-17 August 1960

1400	13.2	33.2	- 26	13.0	33.5	+ 0	17.4	30.52*	+ 30	16.9	30.86*	- 73	18.5	27.5	+ 26	17.6	28.5	+ 0	1400	
1500																				1500
1600																				1600
1700																				1700
1800																				1800
1830																				1830
1900																				1900
2000																				2000
2030																				2030
2100																				2100
2130																				2130
2200																				2200
2230																				2230
2300																				2300
2330																				2330
2400																				2400
0030																				0030
0100																				0100

0200	11.0	33.7	- 32	11.0	34.0	- 17	12.7	33.3	- 30	11.7	33.3	- 30	13.5	33.1	+ 0	13.0	33.5	- 28	0200
0230																			0230
0300	10.0	34.2	- 21	9.8	34.0	- 32	12.8	33.2	- 41	12.8	33.1	- 41							0300
0330																			0330
0400							13.6	32.0	- 50	13.5	32.3	- 50	15.0	31.6	- 28	15.0	31.8	- 52	0400
0430																			0430
0500	11.0	33.7	- 32	11.0	34.0	- 17	14.4	31.2	- 71	14.0	31.2	- 59	14.6	30.4	- 21	13.9	30.6	- 15	0500
0600							15.0	-101	-41	15.2	-66	-41							0600
0630																			0630
0700	13.0	32.7	- 5	12.0	33.1	- 5	15.0	28.4	- 26	14.7	28.8	- 41							0700
0730																			0730
0800							15.3	28.5	+ 40	14.8	28.4	+ 65	15.5	30.2	+ 13	15.0	30.4	- 29	0800
0830																			0830
0900	11.5	33.5	+ 21	11.5	33.7	+ 59	14.5	28.8	+ 74	14.8	29.1	+ 80							0900
0930																			0930
1000							14.1	29.5	+115	14.3	29.5	+105	15.5	31.0	+ 0	15.0	31.1	+ 12	1000
1030																			1030
1100	10.0	34.2	+ 53	9.5	34.9	+ 77	13.1	29.9	+130	13.0	29.8	+132							1100
1130																			1130
1200							12.5	32.75*	+120	12.3	32.83*	+110	13.5	32.5	+ 0	14.5	30.2	+ 0	1200

22-23 October 1960

1100	12.8	33.5	+ 33			+ 52	11.9	32.52	+124	12.8	32.54	+101				12.7	32.3		1100
1200																			1200
1220																			1220
1230									+103			+ 89							1230
1250	11.6	33.2	+ 23	11.3	33.1	+ 28	11.9	32.3	+ 88	11.7	32.7	+ 76							1250
1300																			1300
1330																			1330
1400							11.7	32.7	+ 32	11.7	32.7	+ 46	12.6	32.8		12.2	32.7		1400
1430																			1430
1440	11.8	33.7	+ 0	11.6	34.2	- 28	11.7	32.5	- 59	12.0	32.8	- 71							1440
1500																			1500
1530																			1530
1540																			1540
1600							12.2	32.1	- 62	12.4	32.8	- 80	13.0	32.4		12.8	32.4		1600
1630																			1630
1640																			1640
1700	11.8	33.5	- 32	11.9	33.6	- 41	12.6	32.1	- 83	12.8	31.9	- 71							1700
1730																			1730
1735																			1735
1800							13.4	31.17*	- 58	13.5	31.18*	- 73	13.3	31.5		13.0	31.8		1800
1830																			1830
1850																			1850
1900																			1900
1915	12.1	33.5	- 40	12.0	33.5	- 35	13.8		- 65	13.9	30.7	- 73	13.9	30.6		13.9	30.6		1915
1930																			1930
2000							14.1	30.6	- 40	14.3	30.6	- 18							2000
2030																			2030
2050																			2050
2100																			2100
2130	12.9	32.3	+ 11	12.9	32.3	+ 21	14.1	30.1	+ 0	14.3	30.6	+ 20	14.2	29.1		14.7	29.5		2130
2200																			2200
2230							14.1	30.6	+ 53	14.1		+ 83							2230
2250																			2250
2300																			2300
2330							13.6	30.8	+ 88	13.8	31.2	+ 80	13.9	30.1		13.8	30.2		2330
2335	11.8	33.7	+ 28	11.9	33.6	+ 44													2335
2400							13.2	31.47*	+125		31.51*	+108							2400

Station A

22-23 October 1960

Time PST	Surface			Bottom		
	Temp. °C	Sal. %	Current cm/sec	Temp. °C	Sal. %	Current cm/sec
0030						
0100			+115			+96
0130	12.6	31.9	+113	12.8	32.0	+105
0145			+96			+113
0200						
0230	12.4	31.9	+58	12.4	32.1	+96
0235			+80			+50
0300	11.8	33.8	+15	11.4	33.5	+21
0330						
0400	11.5	33.5	- 8			- 22
0430						
0500						
0530						
0600						
0700						
0715	12.0	33.6	+ 0	11.9	33.5	- 21
0730						
0750			- 40			- 53
0800						
0830			- 34	13.5		+ 32
0850			+ 0			+ 32
0900	12.4	32.9	+ 15	12.3	33.3	+ 15
0930						
1000						
1030	12.1	33.6	+ 40	12.2	33.6	+ 44
1100						
1130	14.4	7.5	River			
1200						
1230				12.0	33.5	Ocean

Station B

Time PST	Surface			Bottom		
	Temp. °C	Sal. %	Current cm/sec	Temp. °C	Sal. %	Current cm/sec
1100	10.1		+145	9.9		+130
1110			+150			+132
1140	10.1	19.7	+140	10.2	23.5	+116
1200	10.4	23.7	+105	10.4	26.5	+89
1300			+61			+65
1400	10.5	18.8	+ 0	10.6	27.3	+ 31
1500	10.0	16.9	- 73	10.2	26.1	- 58
1530			- 96			- 115
1600	9.9	15.8	- 96			- 120
1630			- 96			- 117
1700	11.0	27.7	- 38	9.9	20.8	- 101
1800			- 132			- 107
1830	9.8		- 105	9.8		- 120
1900	9.6		- 113	10.2	15.8	- 73
			- 120			- 65
	9.1	9.0	- 89	9.8	11.0	- 66

20-21 December 1960

Time PST	Surface			Bottom		
	Temp. °C	Sal. %	Current cm/sec	Temp. °C	Sal. %	Current cm/sec
1100	10.5	16.3	+ 0	10.0	19.2	+ 28
1110						
1140						
1200						
1300	11.0	21.7	+ 0	11.0	23.9	+ 0
1330						
1400						
1430						
1500						
1530						
1600						
1630	11.0	16.5	+ 0	10.3	21.6	- 40
1700						
1800	9.5	11.8	- 28	10.0	12.8	- 16
1830						
1900						

Station C

Time PST	Surface			Bottom		
	Temp. °C	Sal. %	Current cm/sec	Temp. °C	Sal. %	Current cm/sec
0030						
0100						
0130	13.5	31.9		13.2	32.0	
0145						
0200						
0230						
0235						
0300						
0330	13.0	32.4				
0400						
0430						
0500						
0530	13.5	31.1				
0600						
0700						
0715						
0730	14.0	30.6		14.0	30.8	
0750						
0800						
0830						
0850						
0900						
0930						
0940	13.9	32.0		13.9	30.6	
1000						
1030						
1100						
1130						
1145						
1200						
1230						

1930	1930	-130	9.2	6.6	9.2	8.1	9.6	8.1	9.6	8.1	9.6	8.1	-73	1930
2000		-73				-73							-73	2000
2030		-50				-50							-40	2030
2100	10.0	15.6	0	10.0	17.0	0	9.1	4.7	9.3	5.8	9.0	5.4	0	2100
2130														2130
2200	10.0	20.3	+ 35	10.0	20.8	+ 45	9.1	4.5	9.4	8.4	9.0	3.3	+ 0	2200
2230														2230
2300	10.0	20.3	+ 35	10.0	20.8	+ 45	9.1	4.5	9.4	8.4	9.0	3.3	+ 0	2300
2400														2400
0030	10.8	30.2	+ 34	11.0	31.6	+ 45	9.3	6.1	9.4	8.3	9.5	20.6	+ 0	0030
0100														0100
0130	10.8	30.2	+ 34	11.0	31.6	+ 45	9.5	13.1	9.5	15.8	10.0	23.1	+ 18	0130
0200														0200
0230	10.8	30.8	+ 34	11.5	31.6	+ 48	9.6	15.8	9.5	16.6	9.5	14.6	+ 16	0230
0300														0300
0330														0330
0400	11.2	30.3	- 27	11.8	31.5	+ 34	9.4		10.0	28.6	9.5	15.0	+ 8	0400
0430														0430
0500														0500
0540														0540
0600	10.0	27.5	- 54	10.0	27.8	- 55	8.6	14.2	9.7	16.9	9.1	12.4	+ 0	0600
0630														0630
0700														0700
0715														0715
0730														0730
0800	9.5	20.9	+ 0	10.0	24.8	+ 0	9.2	10.6	9.2	11.9	9.0	6.8	- 34	0800
0900														0900
0930														0930
1000	10.1	22.2	+ 18	10.5	25.4	+ 0	8.9	8.6	9.2	12.5	9.0	8.1	- 34	1000
1030	9.0	0.0	River	11.5	32.0	Ocean	9.0	9.9	9.6	15.6	9.0	8.8	+ 0	1030
1100														1100

28-29 January 1961

0930	11.1	31.4	- 21	10.9	32.4	- 32	10.0	26.6	11.1	29.2	9.8	23.7	+ 0	0930
1000														1000
1030														1030
1100														1100
1130														1130
1200														1200
1230														1230
1300	11.1	31.0	- 47	10.9	31.0	- 40	9.7	21.6	10.6	27.1	10.1	22.9	- 38	1300
1330														1330
1400														1400
1430														1430
1445	11.1	28.2	- 77	10.9	28.2	- 59	9.7	21.3	10.3	23.8	10.6	20.8	- 59	1445
1500														1500
1530														1530
1545														1545
1600														1600
1700														1700
1720														1720
1745	10.2	23.3	- 21	10.1	23.8	+ 0	9.4	18.4	9.9	19.1	9.3	13.1	- 40	1745
1800														1800
1830														1830
1900														1900
1915														1915
1930	10.9	27.3	+ 21	10.5	27.3	+ 52	9.5	17.5	10.0	19.4	9.6	14.5	+ 10	1930
1950														1950
2000														2000

1500				10.6	3.9	+ 0		10.9	9.6	+ 34		10.3	2.2	+ 0	11.0	14.8	+ 30	1500
1530						+ 47				+ 50								1530
1550			18.2	10.6	4.5	+ 74	18.2	10.8	13.3	+ 80								1550
1600					+ 56													1600
1630	11.0	10.8		10.6				10.8										1630
1650				11.0	6.38*	+ 86		11.0	13.30*	+ 65		10.2	3.3	+ 20	11.0	18.3	+ 30	1650
1700					+115													1700
1730	11.0	16.2	+ 58	10.9	8.5	+108		10.9	13.7	+ 37								1730
1750					+108													1750
1800				11.0	10.6	+ 80		10.6	15.0	+ 37								1800
1830				11.0	10.6	+ 65		10.6	15.0	+ 37		11.2	7.7	+ 40	10.5	18.8	+ 32	1830
1900				11.0	12.0	+ 52		10.8	15.6	+ 37								1900
1930	11.2	28.5	+ 46	10.9	12.4	+ 31		10.8	18.7	+ 26								1930
2000						- 16		10.8	17.8	- 37		10.5	19.6	+ 20	10.0	22.9	+ 40	2000
2030					9.8	- 65		10.8	17.8	- 37								2030
2100				10.7		- 65		10.9	16.42*	- 87								2100
2130				10.5	6.94*	-108		11.0	12.9	- 52								2130
2200	11.0	30.7	- 25	10.3	5.6	- 58												2200
2230																		2230
2300	10.8	15.7		10.3								11.0	19.3	- 32	10.5	8.5	- 40	2300
2400																		2400
0200	10.5	13.5	- 53	10.5				10.9	16.42*	- 87		10.0	6.9	- 46	11.2	17.4	- 32	0200
0300	10.4	13.2	+ 32	10.2				11.0	12.9	- 52								0300
0400				10.3								9.9	5.5	- 21	10.7	16.0	+ 0	0400
0445												10.0	13.9	+ 11	10.9	18.0	+ 32	0445
0600	10.4	20.0	+ 21	10.3	9.7	+ 45												0600
0630				10.3	9.7	+ 94		10.7	19.3	+ 37								0630
0700				10.3	11.0	+ 80		10.7	18.6	+ 0		11.4	20.9	+ 15	10.0	7.6	+ 40	0700
0730						+ 45												0730
0800	11.0	29.7	- 21	10.2	10.7	+ 26		10.7	18.0	- 26								0800
0830				10.3	11.6	+ 0												0830
0900								10.5	14.9	- 26		10.5	9.6	+ 0	11.5	22.9	+ 0	0900
0930						- 80												0930
1000	11.0	29.0		10.1	6.6							9.4	0.0	River				1000
1040																		1040
20-21 May 1961																		
1300				14.4	12.3	+ 46												1300
1330				14.4	15.4	+ 58												1330
1430				14.3	19.0	+ 61						14.2	16.8		14.1	18.9		1430
1500				13.6	20.0	+ 66												1500
1530				13.8	20.6	+ 69												1530
1600				13.5	21.1	+ 66												1600
1610	11.6	30.8																1610
1630				13.4	21.5	+ 68												1630
1700				13.8	21.1	+ 40												1700
1710																		1710
1730				13.6	20.7	+ 15												1730
1830				13.4	21.9	+ 40												1830
1900				13.6	20.2	+ 46												1900
1930				13.7	18.3	+ 43												1930
1940	10.2	28.2																1940
2000				13.6	19.3	+ 53												2000
2010				14.0	18.2	+ 51												2010
2030																		2030
2110	12.6	25.2		11.8	31.0							14.1	16.9		13.8	21.1		2110

2125										21.25
2130										21.30
2200										22.00
2230										22.30
2235										22.35
2300										23.00
2330										23.30
2400										24.00
0030										00.30
0100										01.00
0105										01.05
0130										01.30
0135										01.35
0200										02.00
0230										02.30
0300										03.00
0330										03.30
0400										04.00
0430										04.30
0500										05.00
0520										05.20
0530										05.30
0600										06.00
0630										06.30
0700										07.00
0730										07.30
0750										07.50
0800										08.00
0815										08.15
0830										08.30
0900										09.00
0910										09.10
0930										09.30
1000										10.00
1030										10.30
1100										11.00
1130										11.30
1200										12.00
1300										13.00
1100										11.00
1130										11.30
1200										12.00
1300										13.00
1100										11.00
1130										11.30
1200										12.00
1300										13.00

2125	17.1	26.7	16.9	27.2						21.25
2130										21.30
2200										22.00
2230										22.30
2235										22.35
2300										23.00
2330										23.30
2400										24.00
0030										00.30
0100										01.00
0105										01.05
0130										01.30
0135										01.35
0200										02.00
0230										02.30
0300										03.00
0330										03.30
0400										04.00
0430										04.30
0500										05.00
0520										05.20
0530										05.30
0600										06.00
0630										06.30
0700										07.00
0730										07.30
0750										07.50
0800										08.00
0815										08.15
0830										08.30
0900										09.00
0910										09.10
0930										09.30
1000										10.00
1030										10.30
1100										11.00
1130										11.30
1200										12.00
1300										13.00
1100										11.00
1130										11.30
1200										12.00
1300										13.00

20-21 July 1961

Table II (i). Data at Various Depths at Station B

20-21 May 1961

Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec
1300	0	14.4	12.3	+ 46	2000	15	13.7	21.0	
	5	14.4	16.2	+ 51		20	13.5	22.0	+ 32
	10	14.1	17.2	+ 55	2030	0	14.0	18.2	+ 51
1330	0	14.4	15.4	+ 58		5	13.9	19.8	+ 30
	5	14.2	16.8	+ 67		10	13.8	20.3	
	10	14.1	18.6	+ 30		15	13.6	21.0	+ 26.
1430	0	14.3	19.0	+ 61	0100	0	14.1	15.7	0
	5	14.0	19.1	+ 87		5	14.0	19.5	+ 44
	10	13.8	19.8	+ 86		10	13.8	20.9	
	15	13.7	20.0	+ 95		15	13.4	22.9	
	20	13.7	20.3	+ 79		20	13.4	23.3	+ 49
1500	0	13.6	20.0	+ 66	0200	0	13.7	18.4	+ 61
	5	13.7	20.4	+ 59		5	13.8	20.8	+ 71
	10	13.7	20.8	+ 69		10	13.3	23.4	+ 71
	15	13.7	20.9	+ 73		15	13.1	24.3	+ 71
	20	13.7	20.9	+ 68		20	12.8	25.5	+ 49
1530	0	13.8	20.6	+ 69	0300	0	13.7	19.3	+ 64
	5	13.6	21.4	+ 77		5	13.4	22.5	+ 73
	10	13.6	21.5	+ 85		10	13.1	24.3	+ 68
	15	13.6	21.5	+ 66		15	12.8	25.3	+ 56
	20	13.6	21.6	+ 65		20	12.8	25.6	+ 45
1600	0	13.5	21.1	+ 66	0415	0	13.3	21.6	+ 11
	5	13.6	21.3	+ 77		5	13.2	22.9	+ 21
	10	13.6	21.8	+ 60		10	12.8	25.0	+ 48
	15	13.5	22.0	+ 55		15	12.6	26.0	+ 21
	20	13.5	22.0	+ 45		20	12.6	26.2	+ 11
1630	0	13.4	21.5	+ 68		22	12.6	26.4	
	5	13.5	22.5	+ 61	0530	0	13.3	21.7	- 35
	10	13.4	22.9	+ 70		5	13.3	22.9	- 26
	15	13.4	22.9	+ 66		10	12.9	24.5	- 21
	20	13.4	23.0	+ 50		15	12.8	25.6	- 11
	22	13.4	23.0			20	12.6	26.3	+ 11
1700	0	13.8	21.1	+ 40		22	12.5	26.7	
	5	13.4	22.9	+ 51	0630	0	13.8	17.9	- 65
	10	13.3	23.0	+ 49		5	13.8	19.3	- 46
	15	13.3	23.3	+ 44		10	13.4	21.2	
	20	13.3	23.5	+ 35		15	12.8	25.1	
	23	13.2	23.5			20	12.6	26.2	
1730	0	13.6	20.7	+ 15		23	12.6	26.3	- 41
	5	13.3	23.0	+ 15	0730	0	13.9	19.3	
	10	13.2	23.7	+ 18		5	13.9	18.9	- 49
	15	13.2	23.9	+ 24		10	13.7	20.2	
	20	13.1	24.0	+ 28		15	13.3	22.7	
	23	13.1	24.0			20	12.9	24.0	- 41
1830	0	13.4	21.9	+ 40		22	12.8	25.0	
	5	13.5	22.7	+ 32	0800	0	13.6	18.1	- 50
	10	13.3	23.4	+ 32		5	13.9	18.9	- 44
	13	13.3	23.6			10	13.6	20.5	- 44
1900	0	13.6	20.2	+ 46		15	13.3	22.4	- 44
	5	13.5	22.1	+ 40		20	13.0	23.8	- 35
	10	13.4	22.8			21	13.0	24.1	
	15	13.2	23.7		0830	0	14.1	16.3	- 66
	20	13.2	23.8	+ 40		5	14.0	17.9	- 56
1930	0	13.7	18.3	+ 43		10	13.9	18.3	- 56
	5	13.7	21.2	+ 40		15	13.8	19.4	- 56
	10	13.5	22.4			20	13.6	20.6	- 40
	15	13.4	22.7			0	14.1	16.5	- 75
	20	13.4	22.9	+ 40	0900	0	14.1	16.5	- 75
2000	0	13.6	19.3	+ 53		5	14.0	17.3	- 69
	5	13.8	19.9	+ 56		10	14.0	17.6	- 69
	10	13.8	20.3			15	13.8	19.2	- 69
						19	13.4	21.2	- 32
					0930	0	14.2	16.3	- 77
						5	14.1	16.6	- 44
						10	14.1	16.9	

20-21 May 1961

Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec
0930	15	14.1	17.2	- 32	1500	10	14.5	28.7	
	18	13.9	18.3			15	13.7	29.2	
1000	0	14.2	15.7	- 38	1530	20	13.7	29.2	
	5	14.1	16.2	- 28		23	13.7	29.2	- 58
	10	14.1	16.5	- 28		0	16.1	27.6	- 81
	15	13.9	17.9	- 13		5	15.5	28.0	- 73
	18	13.9	18.4	- 13		10	15.1	28.2	
1030	0	14.3		- 51	1600	15	15.0	28.4	
	5	14.3	15.2	- 30		20	14.9	28.5	
	10	14.2	15.5	- 30		22	14.9	28.5	- 63
	15	14.1	16.2	- 10		0	16.5	27.0	- 86
	17	14.0	17.1			5	16.2	27.1	- 73
1100	0	14.6		- 30	1630	10	15.7	27.6	
	5	14.3	14.7	0		15	15.6	27.6	
	10	14.3	15.3	0		20	15.5	27.7	- 60
	15	14.1	16.0	- 10		0	16.5	26.9	- 92
	18	14.0	17.4	- 10		5	16.2	27.3	- 78
1130	0	14.6		- 8	1700	10	16.3	27.3	
	5	14.3	14.6	0		15	16.3	27.3	
	10	14.3	15.0	0		20	16.2	27.4	- 66
	15	14.2	15.5	0		0	17.2	26.4	- 50
	17	14.1	17.2			5	17.1	26.4	- 58
1200	0	14.5	13.6	+ 13	1730	10	17.0	26.7	
	5	14.4	14.5	+ 13		15	16.9	26.8	
	10	14.2	15.7	+ 13		19	16.6	27.0	- 59
	15	13.9	18.4	+ 13		0	17.6	26.5	- 52
	19	13.6	20.5	+ 32		5	17.6	25.9	- 50
1230	0	14.6	14.0	+ 19	1800	10	17.6	25.9	
	5	14.4	14.9	+ 21		15	17.6	26.0	
	10	14.2	16.0	+ 21		18	17.6	26.0	- 45
	15	13.7	19.7	+ 21		0	17.9	25.4	- 50
	18	13.5	21.1	+ 35		5	17.9	25.5	- 45
					10	17.9	25.6		
					15	17.9	25.6		
					18	17.9	25.7	- 63	
					1830	0	18.1	25.0	- 30
1230	0	14.3	27.7	+ 52	1830	5	18.1	25.1	- 30
	5	13.9	28.1	+ 47		10	18.1	25.2	0
	bottom			+ 45		15	18.1	25.6	0
1300	0	14.9	27.4	+ 37		20	18.0	25.8	0
	5	13.3	28.2	+ 35		21.5	17.9	25.9	+ 0
	10	13.2	28.8		1900	0	18.2	25.1	0
	15	13.0	29.0			5	18.2	25.2	0
	20	12.7	29.3			10	18.1	25.5	0
	23	12.7	29.3	+ 35		15	17.7	25.8	
1330	0	14.2	28.7	+ 10		20	17.2	26.1	+ 15
	5	13.5	29.1	+ 23	25	16.8	26.4	+ 13	
	10	12.7	29.7		1930	0	17.9	25.3	+ 35
	15	11.9	30.2			5	18.2	25.6	+ 46
	20	11.4	30.6			10	17.5	26.0	+ 53
	24	11.4	30.5	+ 39		15	17.4	26.3	+ 53
1400	0	15.0	28.2	+ 0		20	17.1	26.5	+ 46
	5	14.9	28.3		22	17.1	26.5	+ 42	
	10	12.5	29.9		2000	0	17.7	25.7	+ 45
	15	11.9	30.3			5	17.6	26.2	+ 58
	20	11.1	31.0			10	17.1	26.5	+ 50
	23	11.1	31.0	- 32		15	17.0	26.6	+ 41
1430	0	15.6	28.0	- 56		20	17.0	26.6	+ 37
	5	14.6	28.6	- 53	24	17.0	26.7	+ 37	
	10	13.4	29.4		2030	0	17.1	26.7	+ 58
	15	13.4	29.6			5	16.8	27.0	+ 55
	20	12.3	30.2			10	16.7	27.0	+ 50
	22	12.0	30.3	- 46		15	16.7	27.1	
1500	0	15.9	27.9	- 81		20	16.6	27.2	
	5	15.7	27.9	- 73					

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Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec
2030	22	16.6	27.3		0200	10	11.8	31.1	- 46
2100	0	16.1	27.6	+ 96		15	11.6	31.1	- 60
	5	16.1	27.7	+ 80		20	11.4	31.2	- 59
	10	16.1	27.7	+ 89		25	11.4	31.2	- 60
	15	16.1	27.8	+ 89	0230	0	13.7	28.6	- 37
	20	16.1	27.8	+ 96		5	13.5	29.0	- 43
	25	16.1	27.8	+ 73		10	12.8	29.6	- 62
2130	0	14.9	28.7	+ 96		15	12.5	29.9	- 68
	5	14.9	28.8	+ 96		20	12.6	29.9	- 77
	10	14.8	28.9	+ 91		25	12.5	30.2	- 77
	15	14.8	29.1	+ 84	0300	0	13.6	29.7	- 41
	20	14.8	29.1	+ 84		5	13.3	30.0	- 30
	25	14.8	29.1	+ 80		10	13.3	30.2	- 39
2200	0	14.3	29.2	+ 73		15	13.4	30.2	- 50
	5	14.0	29.5	+ 89		20	12.9	30.4	- 41
	10	13.8	29.6	+ 96		25	12.8	30.6	
	15	13.8	29.6	+105	0330	0	14.6	29.0	- 19
	20	13.8	29.6	+113		5	14.4	29.0	- 30
	25	13.8	29.6	+ 80		10	14.1	29.2	- 46
2230	0	13.0	30.0	+ 96		15	13.9	29.5	- 50
	5	12.9	30.2	+ 89		20	13.8	29.7	- 41
	10	12.8	30.4	+ 96		24	13.8	29.7	
	15	12.8	30.4	+ 96	0400	0	15.1	28.3	- 30
	20	12.8	30.5	+ 89		5	15.0	28.5	- 66
	25	12.8	30.5	+ 89		10	14.9	28.5	- 53
2300	0	12.4	30.7	+ 73		15	15.1	28.3	- 46
	5	12.3	30.9	+ 89		20	15.1	28.6	- 50
	10	12.2	31.0	+ 73	0430	0	15.8	27.3	- 50
	15	12.3	31.0	+ 65		5	15.8	27.6	- 37
	20	12.2	31.0	+ 65		10	15.7	27.9	- 41
	25	12.2	31.0	+ 58		15	15.8	27.9	- 43
2330	0	11.9	31.0	+ 65		20	15.6	28.0	- 41
	5	11.5	31.3	+ 65	0500	0	16.1	27.4	- 78
	10	11.5	31.4	+ 58		5	16.1	27.4	- 46
	15	11.4	31.6	+ 65		10	16.2	27.4	- 58
	20	11.4	31.6	+ 65		15	16.2	27.5	- 58
	25	11.4	31.6	+ 50		20	16.2	27.5	- 54
2400	0	11.3	31.4	+ 58	0530	0	16.6	26.7	- 77
	5	11.1	31.6	+ 58		5	16.6	26.7	- 63
	10	11.0	31.9	+ 45		10	16.6	26.8	- 67
	15	11.0	31.9	+ 45		15	16.5	26.8	- 75
	20	11.0	31.9	+ 41		18	16.5	26.9	- 79
0030	25	11.0	31.9	+ 41	0600	0	17.0	25.9	- 56
	0	10.8	32.1			5	17.0	26.1	- 47
	5	10.8	32.2			10	17.0	26.1	- 40
	10	10.8	32.2			15	16.9	26.3	- 40
	15	10.8	32.2			16	16.8	26.5	
	20	10.8	32.2		0630	0	17.2	26.0	- 35
	24	10.8	32.2			5	17.2	26.0	- 25
0100	0	10.9	31.4	0		10	17.2	26.0	
	5	10.8	31.5	0		15	17.1	26.0	
	10	10.7		0		17	17.1	26.0	- 35
	15	10.6		0	0700	0	17.5	25.6	- 38
	20	10.5		0		5	17.5	25.6	- 35
	24	10.5		0		10	17.5	25.5	
0130	0	11.4		- 28		15	17.5	25.5	- 28
	5	11.2		- 28	0730	0	17.4	25.5	- 30
	10	10.8		- 22		5	17.4	25.5	- 32
	15	10.7				10	17.4	25.5	
	20	10.6				15	17.4	25.5	- 40
	25	10.4		- 26	0800	0	17.7	25.2	0
	26	10.4				5	17.6	25.3	0
0200	0	13.6	29.5	- 41		10	17.4	25.4	0
	5	12.4	30.4	- 33		15	17.1	25.7	0

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Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec
0830	0	17.7	25.3	+ 26	0030	0	19.26*	28.3	- 11
	5	17.3	25.8	+ 34		5	19.26*	28.5	- 12
	10	17.2	25.8	+ 33		10	19.27*	28.6	- 6
	15	17.4	25.9	+ 22		15	19.27*	28.7	- 5
0900	0	17.6	25.2	+ 34	0100	18B	19.30*	28.8	- 12
	5	17.4	25.7	+ 43		0	19.36*	28.4	- 10
	10	17.2	25.8	+ 46		5	19.33*	28.5	- 12
	15	17.1	26.2	+ 35		10	19.29*	28.6	- 12
0930	0	17.4	26.0	+ 51	0130	15	19.31*	28.7	- 12
	5	17.1	26.1	+ 60		17B	19.36*	28.7	- 12
	10	17.0	26.3	+ 62		0	19.26*	28.3	+ 11
	15	17.0	26.3			5	19.28*	28.6	+ 20
1000	17	17.9	26.3	+ 56	0200	10	19.12*	28.7	+ 22
	0	17.0	26.5	+ 49		15	18.90*	28.8	+ 21
	5	16.8	26.7	+ 51		18B	18.89*	28.9	+ 18
	10	16.7	26.8	+ 51		0	19.14*	28.7	+ 25
1030	15	16.6	26.9		0230	5	19.15*	28.8	+ 24
	20	16.7	26.9	+ 54		10	19.16*	28.9	+ 30
	0	16.7	27.1	+ 50		15	19.02*	28.9	+ 30
	5	16.6	27.1	+ 59		18B	19.02*	29.0	+ 25
1100	10	16.5	27.2		0300	0	18.92*	28.7	+ 34
	15	16.5	27.2			5	18.84*	29.0	+ 38
	20	16.5	27.2	+ 69		10	18.94*	28.9	+ 35
	0	16.3	27.6			15	18.94*	29.1	+ 30
1130	5	16.1	27.9	+ 89	0330	19B	18.96*	29.2	+ 24
	10	16.0	28.0	+ 80		0	18.60*	28.7	+ 43
	15	16.0	28.0	+ 65		5	18.52*	29.2	+ 45
	20	16.0	28.0			10	18.49*	29.3	+ 44
1200	22	16.0	28.0		0400	15	18.48*	29.3	+ 37
	0	15.9	28.1			19B	18.46*	29.4	+ 33
	5	15.6	28.3	+ 89		0	18.39*	29.2	+ 45
	10	15.5	28.5	+ 73		5	18.32*	29.3	+ 41
1230	15	15.5	28.5	+ 65	0430	10	18.30*	29.4	+ 43
	20	15.5	28.5			15	18.29*	29.1	+ 36
	24	15.5	28.5			19B	18.28*	29.1	+ 32
	0	15.6	28.1	+ 76		0	18.07*	28.8	+ 50
1300	5	15.4	28.5	+ 80	0500	5	18.00*	29.3	+ 45
	10	15.1	28.6			10	18.00*	29.3	+ 41
	15	15.1	28.8			15	18.00*	29.4	+ 37
	20	15.1	28.8	+ 80		20B	18.00*	29.4	+ 28
20-21 July 1961	25	15.1	28.8		0530	0	17.96*	29.4	+ 38
	0	14.7	29.1			5	17.80*	29.7	+ 41
	5	14.4	29.5			10	17.80*	29.7	+ 38
	10	14.3	29.8			15	17.80*	29.7	+ 35
2300	15	14.3	29.7		0600	20	17.80*	29.8	+ 25
	20	14.3	29.7			0	17.48*	30.0	+ 39
	23	14.3	29.7			5	17.48*	30.0	+ 35
						10	17.48*	30.0	+ 36
2330	15	17.46*	30.0	+ 33	0530	15	17.46*	30.0	+ 33
	Bottom	18.88*	28.8	- 4		20B	17.46*	30.0	+ 25
	0	19.02*	28.5	- 34		0	17.28*	30.3	+ 36
	5	19.00*	28.6	- 34		5	17.23*	30.3	+ 28
2400	10	19.00*	28.7	- 10	0600	10	17.00*	30.6	+ 27
	15	19.02*	28.7	- 6		15	16.89*	30.6	+ 28
	B	19.02*	28.7	- 6		20B	16.89*	30.7	+ 21
	0	19.24*	28.4	- 15		0	17.22*	30.3	+ 21
2430	5	19.26*	28.3	- 14	0600	5	16.88*	30.6	+ 23
	10	19.26*	28.3	- 10		10	16.80*	30.6	+ 27
	15-B	19.27*	28.3	- 10		15	16.70*	30.8	+ 22
						21B	16.67*	30.8	+ 24

20-21 July 1961

Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec
0630	0	17.80*	29.8	- 21	1200	0	17.2	30.4	+ 92
	5	17.02*	30.5	- 14		5	17.51*	30.5	+117
	10	16.68*	30.8	- 20		10	17.48*	30.5	+121
	15	16.58*	31.0	- 13		15	16.6	30.9	+103
	22B	16.52*	31.0	- 13		20	16.95*	31.0	+ 78
0700	0	17.40*	30.3	- 16	1300	0	16.6	30.9	+131
	5	17.02*	30.4	- 7		5	16.94*	31.6	+139
	10	16.48*	31.0	- 6		10	15.7	31.7	+148
	15	16.40*	31.0	- 8		15	15.48*	31.9	+128
	22B	16.38*	31.0	- 7		20	15.42*	31.9	+117
0730	0	17.51*	30.2	- 20	1400	0	15.7	31.7	+143
	5	17.20*	30.4	- 25		5	15.48*	31.9	+162
	10	16.81*	30.8	- 22		10	14.4	32.5	+142
	15	16.55*	31.0	- 13		15	14.11*	32.5	+131
	22B	16.40*	31.0	- 11		20	14.04*	32.6	+136
0800	0	17.56*	29.9	- 30	1500	0	14.4	32.5	+152
	5	17.46*	30.1	- 30		5	14.3	32.6	+178
	10	17.30*	30.2	- 16		10	13.67*	32.7	+148
	15	17.04*	30.8	- 18		15	13.60*	32.8	+162
	21B	16.80*	30.9	- 17		20	13.5	32.8	+178
0830	0	17.65*	30.1	- 34	1600	0	14.3	32.6	+139
	5	17.60*	30.1	- 32		5	13.67*	32.7	+159
	10	17.54*	30.2	- 21		10	13.60*	32.8	+136
	15	17.50*	30.2	- 21		15	13.5	32.8	+119
	20	17.18*		- 23		20	13.21*	32.8	+122
0900	0	18.06*	29.7	- 29	1700	0	13.5	32.8	+106
	5	18.02*	29.7	- 24		5	13.21*	32.8	+ 97
	10	18.00*	29.7	- 24		10	12.47*	33.1	+ 84
	15	17.94*	29.8	- 17		15	12.47*	33.1	+ 77
	20	17.90*	29.8	- 13		20	12.4	32.5	+ 76
0930	0	18.52*	29.4	- 24	1800	0	14.4	32.5	- 34
	5	18.38*	29.4	- 26		5	13.57*	32.8	- 21
	10	18.38*	29.4	- 25		10	13.57*	32.8	- 15
	15	18.34*	29.4	- 20		15	12.53*	33.0	- 38
	19B	18.28*	29.5	- 18		18	12.53*	33.0	- 68
1000	0	18.61*	29.2	- 16	1830	0	15.2	32.1	- 95
	5	18.61*	29.2	- 22		5	13.49*	32.8	- 82
	10	18.68*	29.2	- 18		10	13.49*	32.8	- 83
	15	18.58*	29.2	- 16		15	13.02*	32.9	- 84
	19B	18.48*	29.3	- 16		18	13.02*	32.9	- 57
1030	0	18.80*	29.1	- 16	1900	0	15.8		-199
	5	18.81*	29.1	- 28		5	14.36*	32.4	- 79
	10	18.80*	29.1	- 15		10	14.36*	32.4	-145
	15	18.78*	29.1	- 17		15	15.4	32.6	-124
	18B	18.74*	29.1	- 26		18	15.4	32.6	-104
2-3-August 1961					2000	5			-170
1000	0	17.5	30.0	- 13		10	15.46*	32.1	-194
	5			- 79		15	14.99*	32.2	-111
	10	17.87*	30.0	-111		18	15.7	31.4	-123
	15			- 82		0	16.10*	31.7	-178
	18	17.85*	30.0	- 97	5	16.10*	31.7	-182	
1030	0	17.8	29.8	- 57	2100	10	15.71*	31.9	-153
	5			- 41		15	16.3	31.6	-126
	10	18.11*	29.8	- 48		18	16.3	31.6	-117
	15			- 23		0	16.51*	31.6	-180
	18	18.07*	29.8	- 26		5	16.40*	31.6	-161
1100	0	17.6	27.6	+ 28	2200	10	16.40*	31.6	-156
	5			+ 31		15	17.3	31.0	-121
	10	18.05*	29.8	+ 26		18	17.3	31.0	-101
	15			+ 18		0	17.3	31.0	-155
	18	17.92*	29.9	+ 22		5			-167
					10			-131	
					15	17.56*	31.1	-110	

2-3 August 1961

Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec		
2230	0	17.7	30.8	-146	0500	0	14.9	32.2	+ 78		
	5			-209		5			+ 69		
	10			-133		10			+ 85		
	15			- 88		15			+ 62		
2300	0	18.00*	30.9	- 88	0530	0	13.84*	32.3	+ 62		
	5	18.0	30.4	-142		5	14.6	32.3	+ 50		
	10			-117		10			+ 55		
	15			-107		15			+ 64		
18.34*	30.6			- 82	15	14.63*			32.4	+ 65	
2400	0	18.0	30.0	- 43	0610	0	14.5	31.8	- 36		
	5			- 14		5			- 27		
	10			- 39		10			15.31*	32.0	- 11
	15			- 78		15			- 5		
0100	0	18.46*	30.1	- 78	0700	0	16.15*	31.4	- 79		
	5	18.0	30.1	+ 43		5			- 62		
	10			+123		10			- 64		
	15			+ 62		15			15.41*	31.9	- 64
18.37*	30.4			+ 65	15	- 64					
0200	0	17.3	30.9	+ 95	0730	18	14.29*	32.3	- 53		
	5			+113		0			-128		
	10			+108		5			-146		
	15			+ 36		10			-113		
0300	0	17.67*	31.0	+ 36	0800	15	16.5	31.2	-153		
	5	16.1	31.5	+120		0			-133		
	10			+103		5			-188		
	15			+106		10			-111		
16.47*	31.5			+112	15	16.16*	31.5				
0400	0	15.3	31.9	+150	0800	10	16.5	31.2	-133		
	5			+111		15			-188		
	10			+ 35		15			-111		
	15			+ 85		15			16.16*	31.5	
	15	15.51*	32.0	+ 85							

Table II (ii). Data at Various Depths at Station C*

20-21 July 1961

Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec
1100	0	19.14	27.4	+ 14	1800	0	15.24	30.5	+ 25
	10	19.06	27.4	+ 13		5	15.20	30.9	+ 32
	19	18.94	27.7	+ 12		10	14.98	31.0	+ 32
1130	0	19.19	27.4	+ 18	1830	15	14.88	31.1	- 29
	5	19.12	27.4	+ 12		20	14.84	31.2	- 35
	10	19.07	27.5	+ 11		0	16.14	30.4	+ 29
	15	19.06	27.6	+ 10		5	15.34	31.0	+ 27
1200	18	19.01	27.7	+ 14	1900	10	15.02	31.1	- 21
	0	19.17	27.5	+ 21		15	14.60	31.3	- 36
	5	19.09	27.6	+ 24		20	14.58	31.3	- 22
	10	18.97	27.6	+ 23		0	15.74	30.7	+ 27
1230	15	18.92	27.6	+ 20	1930	5	15.15	31.1	+ 23
	18	18.86	27.7	+ 24		10	15.12	31.1	+ 23
	0	19.14	27.8	+ 29		15	14.68	31.3	- 18
	5	19.08	27.8	+ 32		20	14.56	31.3	- 18
1300	10	18.83	27.9	+ 35	2000	0	16.64	30.1	+ 36
	15	18.77	28.0	+ 38		5	15.84	30.8	+ 33
	19	18.75	28.1	+ 29		10	15.54	31.0	+ 20
	0	19.13	27.9	+ 33		15	15.36	31.1	+ 31
1330	5	18.92	28.0	+ 36	2105	20	15.10	31.3	+ 27
	10	18.70	28.2	+ 35		0	17.50	29.5	+ 49
	15	18.68	28.2	+ 29		5	16.28	30.5	+ 36
	18	18.68	28.2	+ 27		10	15.66	31.0	+ 34
1400	0	18.84	28.3	+ 46	2135	15	15.35	31.1	+ 34
	5	18.63	28.4	+ 47		20	15.32	31.2	+ 33
	10	18.59	28.4	+ 41		0	17.36	29.5	+ 31
	15	18.53	28.5	+ 38		5	17.50	29.6	- 26
1430	18	18.52	28.5	+ 32	2200	10	17.42	29.7	- 26
	0	18.54	28.5	+ 50		15	17.28	29.8	- 18
	5	18.51	28.5	+ 52		20	17.26	29.8	- 16
	10	18.45	28.5	+ 50		21	17.26	29.8	- 26
1500	15	18.41	28.7	+ 41	2235	0	17.88	29.3	- 26
	19	18.40	28.7	+ 38		5	17.88	29.6	- 32
	0	18.17	29.0	+ 57		10	17.84	29.7	- 31
	5	18.16	29.0	+ 59		15	17.84	29.8	- 28
1530	10	18.10	29.0	+ 56	2300	21	17.88	29.7	- 18
	15	18.09	29.0	+ 55		0	18.26	29.1	- 21
	20	18.08	29.0	+ 55		5	18.30	29.1	- 38
	0	17.75	29.2	+ 47		10	18.30	29.1	- 21
1635	5	17.66	29.3	+ 57	2330	15	18.28	29.2	- 15
	10	17.58	29.3	+ 58		20	18.22	29.2	- 10
	15	17.54	29.5	+ 50		0	18.70	28.8	- 18
	20	17.54	29.5	+ 45		5	18.77	28.4	- 21
1700	0	17.26	29.5	+ 45	2400	10	18.74	28.8	- 17
	5	17.15	29.7	+ 56		15	18.72	28.8	- 14
	10	17.08	29.8	+ 52		20	18.52	29.0	- 12
	15	17.07	29.8	+ 48		0	18.90	28.8	- 18
1735	20	17.06	29.9	+ 35	0030	5	18.90	28.7	- 21
	0	16.24	30.1	+ 48		10	18.88	28.7	- 17
	5	16.38	29.9	+ 52		15	18.88	28.7	- 11
	10	16.10	30.2	+ 55		19	18.88	28.7	- 3
1800	15	16.16	30.2	+ 48	2430	0	19.02	28.6	- 22
	20	16.16	30.2	+ 45		5	19.00	28.6	- 22
	0	16.16	30.1	+ 64		10	19.00	28.7	- 10
	5	15.82	30.4	+ 54		15	19.02	28.7	- 6
1830	10	15.70	30.7	+ 43	2400	18	19.00	28.7	- 6
	15	15.66	30.6	+ 41		0	19.24	28.4	- 15
	20	15.66	30.7	+ 41		5	19.26	28.4	- 14
	0	15.44	30.7	+ 37		10	19.26	28.4	- 10
1900	5	15.38	30.7	+ 38	2430	15	19.22	28.4	- 10
	10	15.17	30.9	+ 34		0	19.26	28.4	- 11
	15	15.10	31.0	- 34		5	19.26	28.4	- 12
	20	15.11	31.0	- 32		10	19.27	28.5	- 6

*All observations made with C.T.I.

20-21 July

Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	
0030	15	19.27	28.7	- 5	0700	15	16.40	31.1	- 8	
	18	19.30	28.8	- 12		22	16.38	31.1	- 7	
0100	0	19.36	28.4	- 10	0730	0	17.51	30.2	- 19	
	5	19.33	28.5	- 12		5	17.20	30.3	- 25	
	10	19.29	28.6	- 12		10	16.81	30.7	- 22	
	15	19.31	28.7	- 12		15	16.55	30.9	- 13	
	17	19.36	28.7	- 12		22	16.40	31.1	- 11	
0130	0	19.26	28.3	+ 11	0800	0	17.56	29.9	- 31	
	5	19.28	28.6	+ 20		5	17.46	30.0	- 31	
	10	19.12	28.7	+ 22		10	17.30	30.3	- 16	
	15	18.90	28.8	+ 21		15	17.04	30.7	- 18	
	18	18.89	28.9	+ 18		21	16.80	30.9	- 17	
0200	0	19.14	28.6	+ 25	0830	0	17.65	30.0	- 34	
	5	19.15	28.8	+ 24		5	17.60	30.2	- 32	
	10	19.16	28.8	+ 31		10	17.54	30.2	- 21	
	15	19.02	28.9	+ 31		0830	15	17.50	30.2	- 21
	18	19.02	29.0	+ 25			20	17.18	30.5	- 23
0230	0	18.92	28.7	+ 34	0900	0	18.06	29.6	- 29	
	5	18.84	29.0	+ 38		5	18.02	29.7	- 24	
	10	18.94	29.0	+ 35		10	18.00	29.7	- 24	
	15	18.94	29.2	+ 31		15	17.94	29.8	- 17	
	19	18.96	29.1	+ 24		20	17.90	29.8	- 13	
0300	0	18.60	28.8	+ 43	0930	0	18.52	29.2	- 24	
	5	18.52	29.3	+ 45		5	18.38	29.3	- 26	
	10	18.49	29.3	+ 44		10	18.38	29.3	- 25	
	15	18.48	29.4	+ 37		15	18.34	29.4	- 20	
	19	18.46	29.4	+ 33		19	18.28	29.4	- 18	
0330	0	18.39	29.2	+ 45	1000	0	18.61	29.2	- 16	
	5	18.32	29.4	+ 42		5	18.61	29.2	- 22	
	10	18.30	29.4	+ 43		10	18.60	29.2	- 18	
	15	18.29	29.0	+ 36		15	18.58	29.2	- 16	
	19	18.28	29.1	+ 32		19	18.48	29.3	- 16	
0400	0	18.07	29.6	+ 50	1030	0	18.80	29.1	- 16	
	5	18.00	29.3	+ 45		5	18.81	29.1	- 28	
	10	18.00	29.3	+ 41		10	18.80	29.0	- 15	
	15	18.00	29.3	+ 37		15	18.78	29.0	- 17	
	20	18.00	29.3	+ 28		19	18.74	29.1	- 26	
0430	0	17.96	29.4	+ 38						
	5	17.80	29.7	+ 42						
	10	17.80	29.7	+ 38						
	15	17.80	29.7	+ 35						
	20	17.80	29.7	+ 25						
0500	0	17.48	29.9	+ 39						
	5	17.47	30.0	+ 35						
	10	17.47	30.0	+ 42						
	15	17.46	30.0	+ 33						
	20	17.46	30.0	+ 25						
0530	0	17.28	30.2	+ 36						
	5	17.23	30.4	+ 28						
	10	17.00	30.6	+ 32						
	15	16.89	30.6	+ 28						
	20	16.88	30.6	+ 21						
0600	0	17.22	30.2	+ 21						
	5	16.88	30.7	+ 23						
	10	16.80	30.8	+ 27						
	15	16.70	30.9	+ 22						
	21	16.67	30.9	+ 24						
0630	0	17.80	29.8	- 21						
	5	17.02	30.6	- 14						
	10	16.68	30.8	- 19						
	15	16.58	30.9	- 13						
	22	16.52	31.0	- 13						
0700	0	17.40	30.2	- 16						
	5	17.02	30.6	- 7						
	10	16.48	31.0	- 12						

Table II (iii). Data at Various Depths at Station A

2-3 August 1961

Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec
0930	0	15.0	32.4	-141	1730	0	10.9		- 30
	10	14.3	32.3	-136		10	10.9		- 35
	20			-118		20	10.8		- 35
1000	30			-103	30				- 30
	0	14.9	32.1	-103	35				- 19
	10	14.4		- 82	1800	0	13.8		- 30
20			- 70	10		11.5		0	
30			- 50	20		10.9		0	
1030	0	15.1	31.6	- 46	30	10.8		0	
	10	15.2	31.9	- 47	1830	0	13.2		- 61
	20	14.7	32.3	- 39		10	11.1		- 46
27	14.9	32.1	- 26	20		10.5		- 43	
1100	0	15.3		- 19	30	10.5		- 41	
	10	15.1		- 10	1900	0	13.6		-134
	20	14.3		0		10	11.5		-136
24	14.3		- 19	20		11.1		-101	
1130	0	15.3		+ 27	30	10.8		- 70	
	10	14.5		+ 41	1930	0	12.5		-121
	20	14.3		+ 37		10	11.5		-139
25	14.1		+ 50	20		11.5		-151	
1200	0	14.5		+ 73	30	11.2		-153	
	10	14.4		+ 65	34			-155	
	20	14.3		+ 41	2000	0	11.9		-121
28	14.3		+ 57	10		10.9		-139	
0	14.3		+115	20		11.2		-155	
1230	10	14.2		+ 94	30	10.8		-153	
	20	14.2		+ 88	2130	0	13.3	29.7	-160
	30	14.0		+ 69		10	13.1	30.0	
0	13.3		+127	20		13.1	30.0		
1300	10	13.5		+121	30	13.3	29.7		
	20	13.3		+111	2200	0	13.4	29.6	-162
	30	13.3		+108		10	13.6	29.4	
38	13.3		+ 96	20		13.6	29.4		
1330	0	12.9		+ 73	30	13.6	29.4		
	10	12.5		+130	2230	0	14.3	28.5	-162
	20			+137		10	14.3	28.5	
30			+131	20		14.2	28.3		
1430	39			+104	30	14.2	28.3		
	0	12.5		+137	2300	0	15.0	27.7	-105
	10	11.8		+152		10	14.7	27.8	-101
20	11.5		+ 85	20		14.7	27.8	- 73	
1500	30	11.2		+ 80	28	14.7	27.8	- 73	
	0	11.8		+133	2330	0	15.3	27.3	- 55
	10	11.5		+155		10	15.0	27.5	- 61
20	11.5		+162	20		14.8	27.7	- 61	
1530	30	11.2		+101	24	14.9	27.6	- 43	
	0	11.5		+118	2400	0	15.5	27.3	- 30
	10	11.0		+145		10	15.3	27.4	- 19
20	11.1		+139	20		14.7	27.8	- 10	
1600	30	11.1		+101	22	14.1	28.2	- 10	
	0	11.3		+109	0100	0	14.4	27.4	+ 65
	10	11.0		+119		10	14.4	27.4	+ 80
20	11.0		+ 90	20		14.2	27.6	+ 73	
1630	30	10.8		+ 70	25	14.2	27.6	+ 71	
	0	11.5		+ 85	0200	0	13.7	27.9	+101
	10	11.2		+ 84		10	13.6	28.0	+ 96
20	11.0		+ 76	20		13.6	28.0	+ 89	
1700	30	11.0		+ 73	30	13.5	28.1	+ 74	
	0	11.0		+ 65	0300	0	13.5	31.6	+101
	10	11.0		+ 66		10	12.0		+ 99
20	10.9		+ 62	20		11.9		+ 93	
	30	10.8		+ 53	30	12.5		+ 95	
	38			+ 43					

2-3 August 1961

Time PST	Depth ft	Temp. °C	Sal.	Current cm/sec	Time PST	Depth ft	Temp. °C	Sal.	Current cm/sec
0330	0	12.5		+ 89	0600	0	11.1		+ 19
	10	12.0		+ 86		10	10.8		+ 30
	20	12.0		+ 89		20	10.9		+ 33
	30	12.0				30	10.4		+ 35
0400	0	11.5		+105	0630	0	11.5		- 35
	10	11.3		+ 99		10	11.1		0
	20	11.1		+ 96		20	10.2		- 10
	30	11.1		+ 89		30			- 10
0430	0	11.1		+ 91	0700	0	11.9	31.0	- 65
	10	11.0		+ 86		10	11.7	31.2	- 45
	20	11.0		+ 84		20	10.5		- 41
	30	10.9		+ 73		30	10.2		- 50
0500	0	10.9		+ 71	0730	0	12.1	30.6	-103
	10	10.8		+ 71		10	11.8	31.1	- 88
	20	10.8		+ 68		20	10.9		- 81
	30	10.8		+ 58		30	10.9		- 71
0530	0	11.0		+ 39					
	10	10.8		+ 43					
	20	10.8		+ 41					
	30	10.8		+ 39					

Location	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	Location	Time PST	Depth ft	Temp. °C	Sal. ‰	Current cm/sec	
Empire	0604	0	15.03		-24	Station A	1300	0	9.3	32.09		
		5	14.84		-21			10	9.2	32.16		
		10	14.52		-21			20	9.2	32.10		
		15	14.47		-17			30	9.2	32.14		
		20	14.46		-21							
		25	14.44		-21		Railroad Bridge	1300	0	8.9	24.78	
		30	14.42		-17				10	8.9	25.46	
		35	14.42		-21				20	8.9	25.93	
		37.5	14.42		-11				30	8.8	26.22	
		0	14.82		-14			1500	0	8.9	17.12	
	5	14.66		-21	10	8.8			16.78			
	10	14.48		-7	20	8.7			16.89			
	15	14.42		-11	30	8.6			16.53			
	20	14.37		-14								
	25	14.35		-24	Station A	1530			0	9.3	28.60	
	30	14.32		-17			10	9.3	29.05			
	35	14.30		-11			20	9.3	29.56			
	37.5	14.30		-4			30	9.3	29.69			
	0	15.38		-21		Railroad Bridge	1700	0	8.4	12.34		
	5	14.98		-17				10	8.4	11.91		
	10	14.57		-21				20	8.5	11.76		
	15	14.53		-21				30	8.6	11.60		
	20	14.50		-21								
	25	14.48		-17			Station A	1900	0	8.5	15.30	
	30	14.46		-14	10				8.6	16.00		
	35	14.44		-14	20				8.7	16.53		
	37.5	14.43		-11	30				8.8	18.03		
	0	15.50		-47	2200			0	9.1	28.37		
	5	15.24		-47		10		9.3	30.70			
	10	15.12		-40		20		9.3	30.86			
	15	14.81		-40		30		9.3	31.08			
	20	14.82		-37		0100		0	9.3	31.69		
	25	14.61		-30				10	9.3	31.69		
	30	14.64		-27			20	9.3	31.69			
	35	14.60		-24			30	9.3	31.71			
	37.5	14.60		-21			0	9.2	29.69			
	0	16.10		-67			0400	10	9.2	29.74		
5	15.25		-64	20	9.2	29.78						
10	15.17		-57	30	9.2	29.81						
15	15.18		-54	0700	10	8.5		16.37				
20	15.19		-50		20	8.6		18.71				
25	15.19		-54		30	8.7		19.92				
30	15.21		-47		0930	0	8.9	22.09				
35	15.21		-41	10		8.9	22.74					
38	15.21		-27	20		8.9	22.99					
6-7 Mar. 1962												
Railroad Bridge	0900	0	7.6	13.21								
		10	7.9	16.13								
		20	8.0	18.33								
		30	8.1	19.40								
Station A	0930	0	9.1	30.73								
		10	9.1	31.47								
		20	9.1	31.58								
		30	9.1	31.69								
	1130	0	9.2	32.07								
		10	9.2	31.94								
		20	9.2	31.92								
		30	9.2	31.98								

Table IV. Dissolved Oxygen

	Time PST	Depth ft	Dissolved Oxygen ml/l		Time PST	Depth ft	Dissolved Oxygen ml/l
Station B				Station B			
12 July 1960	1700	0	6.62	20 May 1961	1330	0	5.41
		Bottom	6.78		1430	0	4.44
	2200	0	5.20		1530	0	5.39
		Bottom	4.85		1630	0	4.96
13 July 1960	0300	0	6.28		1730	0	5.16
		Bottom	6.07		1900	0	5.50
	0800	0	4.44	21 May 1961	0100	0	5.54
		Bottom	4.16		0200	0	5.51
	1300	0	4.91		0300	0	2.91
		Bottom	4.28		0415	0	5.42
16 Aug. 1960	1400	Bottom	4.74		0530	0	5.35
	2000	Bottom	5.08		0630	0	5.33
17 Aug. 1960	0200	Bottom	4.37		0730	0	5.20
	0800	Bottom	4.83		0800	0	5.19
	1400	Bottom	4.83		0900	0	5.01
20 Sept. 1960	1220	0	5.87		1000	0	4.96
		Bottom	5.76		1100	0	5.54
	1800	0	5.62		1200	0	5.55
		Bottom	5.57				
	2400	0	5.90	Railroad Bridge			
		Bottom	5.88	6 Mar. 1962	0900	0	5.54
21 Sept. 1960	0600	0	5.04			10	6.38
		Bottom	5.06			20	6.17
	1200	0	5.11			30	6.22
		Bottom	5.83				
22 Oct. 1960	1200	0	4.99	Station A			
		Bottom	4.99	(midchannel)			
	1800	0	4.76	6 Mar. 1962	0930	0	6.32
		Bottom	4.57			10	6.63
	2400	0	4.79			20	6.27
		Bottom	4.74			30	6.52
23 Oct. 1960	0600	0	4.80		1130	0	6.54
		Bottom	4.62			10	6.35
	1200	0	5.13			20	6.15
		Bottom	5.45			30	6.29
20 Dec. 1960	1110	0	6.29		1300	0	6.09
		Bottom	6.27			10	6.40
	1700	0	6.46			20	6.39
		Bottom	6.31			30	6.43
	2300	0	6.48				
		Bottom	6.62	Railroad Bridge			
21 Dec. 1960	0500	0	6.56	6 Mar. 1962	1300	0	6.53
		Bottom	6.33			10	6.63
						20	6.66
						30	5.65
Station B						0	6.01
28 Jan. 1961	1000	0	5.98		1500	0	6.47
		Bottom	5.96			10	6.42
	1600	0	6.18			20	5.42
		Bottom	6.07			30	6.85
	2200	0	2.84				
		Bottom	2.51	Station A			
29 Jan. 1961	1000	0	2.89	(midchannel)			
		Bottom	2.91	6 Mar. 1962	1530	0	6.57
25 Mar. 1961	1100	0	7.66			10	6.35
		Bottom	3.51			20	6.51
	1700	0	6.78			30	6.40
		Bottom	6.50				
	2300	0	7.66				
		Bottom	3.51				

	Time PST	Depth ft	Dissolved Oxygen ml/l	
Railroad Bridge 6 Mar. 1962	1700	0	6.78	
		10	4.94	
		20	4.84	
		30	6.79	
Station A (midchannel) 6 Mar. 1962	1900	0	5.94	
		10	6.00	
		20	6.01	
		30	5.60	
	2200	0	70.51	
		10	6.37	
		20	6.22	
		30	6.72	
	7 Mar. 1962	0100	0	6.69
			10	6.39
			20	6.13
			30	6.14
0400		0	6.49	
		10	5.80	
		20	6.74	
		30	6.52	
0700		10	6.70	
		20	6.52	
		30	6.31	
0930		0	6.88	
	10	6.33		
	20	6.22		

Table V. Short-Period Current Measurements at Station B

19-20 March 1963

Time PST	Current cm/sec	Time PST	Current cm/sec	Time PST	Current cm/sec	Time PST	Current cm/sec	Time PST	Current cm/sec	Time PST	Current cm/sec	Time PST	Current cm/sec	Time PST	Current cm/sec
1944	+ 46	2116	+ 3	2210	- 26	2359	- 25	0054	- 13	0148	- 3				
45	+ 46	17		11	- 26			55	- 12	49	- 5				
46	+ 44	18		12	- 26	2400	- 27	56	- 10	50	- 3				
47	+ 41	19		13	- 26	01	- 21	57	- 5	51	- 5				
48	+ 36	20		14	- 27	02	- 24	58	- 6	52	- 4				
49	+ 40	21	+ 4	15	- 26	03	- 24	59	- 5	53	- 5				
50	+ 38	22	+ 7	16	- 27	04	- 23			54	- 5				
		23	+ 17	17	- 25	05	- 24	0100	- 11	55	- 4				
2030	+ 28	24	+ 10	18	- 30	06	- 27	01	- 11	56	- 5				
31	+ 26	19	+ 7	19	- 28	07		02	- 11	57	- 6				
32	+ 24	20	+ 8	20	- 30			03	- 8	58	- 4				
33	+ 24	21	+ 5	21	- 27	0010		04	- 8	59	- 7				
34	+ 24	22	+ 12	22	- 26	11		05	- 8						
35	+ 24	23	+ 20	23	- 25	12		06	- 10	0200	- 6				
36	+ 26	24		24	- 24	13	- 20	07	- 10	01	- 6				
37	+ 26	25	+ 6	25	- 24	14	- 16	08	- 8	02	- 8				
38	+ 27	26	+ 6	15	- 25	15	- 17	09	- 5	03	- 5				
39	+ 28	27	+ 4	16	- 26	16	- 23	10	- 4	04	- 4				
40	+ 25	28	+ 6	17	- 25	17	- 20	11	- 6	05	- 6				
41	+ 24	29	+ 3	18	- 27	18	- 22	12	- 5	06	- 5				
42	+ 24	30	+ 4	19	- 27	19	- 23	13	- 7	07	- 7				
43	+ 23	31	+ 4	20	- 25	20	- 25	14	- 6	08	- 6				
44	+ 22	32	+ 5	21	- 27	21	- 25	15	- 6	09	- 6				
45	+ 24	33	+ 5	22	- 30	22	- 25	16	- 8	10	- 8				
46	+ 25	34	+ 3	23	- 28	23	- 23	17	- 8	11	- 8				
47	+ 24	35	+ 2	24	- 36	24	- 25	18	- 8	12	- 8				
48	+ 25	36	+ 2	25	- 38	25	- 25	19	- 7	13	- 8				
49	+ 24	37	+ 4	26	- 37	26	- 23	20	- 8	14	- 8				
50	+ 22	38	- 4	27	- 35	27	- 23	21	- 8	15	- 8				
51	+ 23	39		28	- 38	28	- 24	22	- 8	16	- 8				
52	+ 21	40	- 8	29	- 36	29	- 21	23	- 8	17	- 10				
53	+ 23	41	- 10	30	- 38	30	- 21	24	- 11	18	- 11				
54	+ 21	42	- 14	31	- 40	31	- 23	25	- 10	19	- 10				
55	+ 22	43	- 15	32	- 40	32	- 22	26	- 10	20	- 10				
56	+ 22	44	- 11	33	- 41	33	- 21	27	- 8	21	- 8				
57	+ 22	45	- 5	34	- 41	34	- 21	28	- 5	22	- 5				
58	+ 21	2341	- 5	35	- 41	35	- 21	29	- 7	23	- 7				
59	+ 17	42	- 5	36	- 28	36	- 20	30	- 6	24	- 6				
		43	- 15	37	- 27	37	- 10	31	- 6	25	- 6				
2100	+ 16	44	- 12	38	- 28	38	- 10	32	- 10	26	- 4				
01	+ 16	45	- 10	39	- 27	39	- 8	33	- 8	27	- 4				
02	+ 15	46	- 13	40	- 29	40	- 24	34	- 7	28	- 8				
03	+ 14	47	- 13	41	- 28	41	- 21	35	- 10	29	- 8				
04	+ 14	48	- 10	42	- 27	42	- 14	36	- 11	30	- 5				
05	+ 12	49	- 7	43	- 27	43	- 16	37	- 11	31	- 5				
06	+ 11	2200	- 7	44	- 27	44	- 14	38	- 10						
07	+ 13	01	- 6	45	- 27	45	- 13	39	- 11	0336	+ 32				
08	+ 12	02	- 7	46	- 27	46	- 15	40	- 11	37	+ 32				
09	+ 7	03	- 8	47	- 25	47	- 16	41	- 10	38	+ 32				
10	+ 6	04	- 15	48	- 23	48	- 18	42	- 7	39	+ 30				
11	+ 5	05	- 18	49	- 24	49	- 17	43	- 6	40	+ 32				
12	+ 5	06	- 24	50	- 26	50	- 17	44	- 5	41	+ 32				
13	+ 6	07	- 25	51	- 25	51	- 13	45	- 4	42	+ 33				
14	+ 3	08	- 25	52	- 23	52	- 14	46	- 5	43	+ 30				
15	+ 5	09	- 28	53	- 24	53	- 12	47	- 4	44	+ 30				

0345	+ 34	0450	+ 62	0554	+ 60
46	+ 34	51	+ 62	55	+ 60
47	+ 34	52	+ 63	56	+ 54
48	+ 34	53	+ 55	57	+ 56
49	+ 34	54	+ 58	58	+ 56
50	+ 37	55	+ 60	59	+ 56
51	+ 34	56	+ 59		
52	+ 34	57	+ 57	0600	+ 54
53	+ 35	58	+ 59	01	+ 54
54	+ 39	59	+ 59	02	+ 54
55	+ 36			03	+ 49
56	+ 35	0500	+ 58	04	+ 49
57	+ 37	01		05	+ 48
58	+ 37	02		06	
59	+ 41	03		07	
		04		08	
0400	+ 38	05		09	
01		06	+ 58	10	
02		07	+ 54	11	+ 48
03		08	+ 49	12	+ 52
04		09	+ 48	13	+ 49
05	+ 33	10	+ 49	14	+ 50
06	+ 35	11	+ 49	15	+ 52
07	+ 33	12	+ 48	16	+ 57
08		13	+ 50	17	+ 54
09		14	+ 45	18	+ 56
10	+ 33	15	+ 48	19	+ 56
11	+ 33	16	+ 53	20	+ 50
12	+ 34	17		21	+ 49
13	+ 36	18	+ 53	22	+ 52
14	+ 38	19	+ 55	23	+ 49
15	+ 37	20	+ 54	24	+ 50
16	+ 36	21	+ 52	25	+ 52
17	+ 37	22	+ 53	26	+ 57
18		23	+ 54	27	+ 54
19	+ 49	24	+ 54	28	+ 56
20	+ 44	25	+ 53	29	+ 56
21	+ 41	26	+ 53	30	+ 50
22	+ 41	27	+ 52	31	+ 49
23	+ 43	28	+ 53	32	+ 50
24	+ 41	29	+ 54	33	+ 49
25	+ 39	30	+ 57	34	+ 48
26	+ 43	31	+ 60	35	+ 48
27	+ 41	32	+ 57	36	+ 53
28	+ 43	33	+ 56	37	+ 52
29	+ 46	34		38	
30	+ 47	35		39	+ 50
31	+ 46	36		40	+ 52
32	+ 46	37		41	+ 52
33	+ 52	38	+ 56	42	+ 53
34		39	+ 58	43	+ 48
35		40	+ 58	44	+ 47
36		41	+ 63	45	+ 45
37	+ 55	42	+ 60		
38	+ 56	43	+ 56		
39	+ 55	44			
40	+ 54	45	+ 56		
41	+ 54	46	+ 55		
42	+ 53	47	+ 60		
43	+ 52	48	+ 62		
44	+ 52	49	+ 60		
45	+ 53	50	+ 59		
46	+ 54	51	+ 52		
47	+ 60	52	+ 49		
48	+ 60	53	+ 53		
49	+ 62				