OFFICE OF NAVAL RESEARCH

PHYSICAL OCEANOGRAPHIC DATA

Polymode Survey (CNO Project No. R/S-12)

28 October, 1975 to 9 November, 1975

USS ANCHORAGE USS BARBOUR COUNTY

USS MAUNA KEA USS BADGER

USS TUSCALOOSA USS DULUTH USS MOBILE

Data Report Prepared by

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The objective of the Polymode survey was to collect surface layer salinity and upper thermal structure data in a broad swath between Japan and Hawaii. Seven U.S. Naval vessels from the Pacific Amphibious Fleet (PHIBRON5) rendezvoused at sea and proceeded to the study area where they lined up abreast and traversed from 160°E to 179°E longitude with the southernmost ship maintaining approximately 30°N latitude. A spacing of 25 nautical miles was maintained between ships.

During the passage through the study area hourly XBT launchings were made. At two-hour intervals seawater samples were collected for salinity determinations, and bucket thermometer temperatures were taken. Continuous salinity and temperature measurements were made by thermosalinographs installed by GEOSECS personnel. During the entire transit a magnetometer and continuously recording thermistors were towed by the USS Mobile and the USS Mauna Kea, respectively. Fathometers were in continuous operation on all ships.

In this report the surface temperature and salinity data are presented both graphically and in tabular form.

SUMMARY OF OBSERVATIONS AND SAMPLES COLLECTED

1. 532 XBT launchings alternating between 750 meter probes and 500 meter probes. The XBT recorders were calibrated daily.
2. 400 bucket thermometer measurements of surface layer temperature.
3. 325 seawater samples for the determination of surface layer salinity.
4. 2 continuous records of surface layer temperature and salinity by thermosalinograph.
5. Continuous recording magnetometer.
6. Continuous recording towed thermistors.
7. Bathymetric data from the seven participating ships.

CONTINUOUS UNDERWAY THERMOSALINOGRAPH DATA

Two continuous records of temperature and salinity at 3m depth were made with Plessey Model 6600T thermosalinographs on the USS Barbour County and the USS Tuscaloosa.

Seawater was supplied to the thermosalinographs from the inlet side of the main engine and auxiliary generator cooling water lines on the USS Barbour County and USS Tuscaloosa, respectively.

In this report, the temperature and salinity data are presented graphically together with sigma T, latitude, and longitude, vs. time.

Temperature and salinity recorder chart readings were logged at 15-minute intervals and were corrected by applying the mean difference between thermosalinograph data and independent measurements of temperature and salinity. Bucket thermometer readings were used to calibrate temperature; salinity corrections were based on inductive salinometer measurements of water samples drawn from the thermosalinograph supply lines.

The corrected temperature data differ from the bucket temperatures by an overall mean value of 0.005°C. The standard deviation of the differences is 0.08°C.

Variations in salinity offset were small, and changed gradually with time. The corrected salinity data differ from the calibration samples by a mean value of 0.005°/$_{oo}$. The standard deviation of the salinity differences is 0.04°/$_{oo}$.

Footnotes found in the tabulated data signify the following:

I = Interpolated position assuming ship's speed constant.

G = Temperature or salinity value considered correct.
(Unfootnoted data are also considered correct.)

C = Measured value correct, but changing rapidly.

N = Instrumental noise; data useable, but of lower quality.

P = Data quality poor.

U = Data uncertain or unuseable.

SURFACE LAYER BUCKET TEMPERATURE AND SALINITY DATA

On ships where thermosalinographs were not installed, the necessary plumbing was connected to the ship's seawater injection scoop in the aft engine room to provide an uncontaminated water source for the collection of surface layer salinity samples. This same water source was used to measure the surface layer temperature by directing the water flow into the reservoir of a bucket thermo-

ONR R/S-12 USS ANCHORAGE — USS ANCHORAGE — 3 NOV75 (JULIAN 307)

TIME		LAT	LONG	T	S	XBT NO		TIME		LAT	LONG	T	S	XBT NO
401		31.52N	160.02E			1	*	1400		31.58N	162.72E			12
433	I	31.53N	160.15E	24.40	34.60		*	1433	I	31.58N	162.84E	24.00	34.30	
459	I	31.55N	160.26E			2	*	1500		31.58N	162.95E			13
600		31.58N	160.52E			3	*	1600		31.63N	163.23E			14
628	I	31.58N	160.64E	24.60	34.52		*	1630	I	31.65N	163.36E	24.20	34.33	
700		31.58N	160.78E			4	*	1700		31.67N	163.50E			15
800		31.65N	161.02E			5	*	1800		31.70N	163.80E			16
836	I	31.62N	161.18E	24.70	34.46		*	1832	I	31.71N	163.93E	23.95	34.36	
900		31.60N	161.28E			6	*	1900		31.73N	164.04E			17
1000		31.68N	161.56E			7	*	2000		31.75N	164.32E			18
1032	I	31.67N	161.70E	24.50	34.49		*	2031	I	31.75N	164.44E	25.10	34.62	
1100		31.66N	161.83E			8	*	2100		31.74N	164.55E			19
1200		31.66N	162.10E			9	*	2200		31.70N	164.87E			20
1202	I	31.66N	162.11E			10	*	2233	I	31.69N	165.00E	25.10	34.72	
1233	I	31.63N	162.27E	23.90	34.45		*	2300		31.68N	165.10E			21
1300		31.61N	162.42E				*	2301	I	31.67N	165.10E			22
1301	I	31.60N	162.42E			11	*	2359	I	31.66N	165.26E			23

I DENOTES INTERPOLATED POSITIONS

ONR R/S-12 USS ANCHORAGE USS ANCHORAGE 4 NOV75 (JULIAN 308)

TIME		LAT	LONG	T	S	XBT NO		TIME		LAT	LONG	T	S	XBT NO
30		31.65N	165.35E	24.79	34.78		*	1100		31.70N	168.52E			34
100		31.68N	165.57E				*	1200		31.69N	168.77E			35
101	I	31.68N	165.57E			24	*	1232	I	31.70N	168.93E	24.85	34.61	
200		31.70N	165.82E				*	1300		31.70N	169.07E			36
202	I	31.70N	165.83E			25	*	1400		31.71N	169.37E			37
250	I	31.70N	165.97E	24.57	34.84		*	1434	I	31.70N	169.55E	24.50	34.97	
259	I	31.70N	166.13E			26	*	1500		31.70N	169.68E			38
300		31.70N	166.13E				*	1600		31.69N	169.93E			39
400		31.70N	166.37E			27	*	1633	I	31.68N	170.08E	24.30	34.68	
430	I	31.69N	166.54E	24.62	34.59		*	1700		31.67N	170.20E			40
500		31.68N	166.72E			28	*	1800		31.66N	170.50E			41
600	I	31.68N	167.02E			29	*	1831	I	31.65N	170.65E	23.91	34.55	
632	I	31.68N	167.18E	24.20	34.36		*	1900		31.65N	170.78E			42
700		31.68N	167.32E			30	*	2000		31.65N	171.08E			43
800		31.70N	167.62E			31	*	2030	I	31.65N	171.22E	24.40	34.56	
831	I	31.70N	167.78E	23.91	34.49		*	2100		31.65N	171.37E			44
900		31.71N	167.93E			32	*	2200		31.68N	171.63E			45
1000		31.70N	168.22E			33	*	2230	I	31.67N	171.77E	24.52	34.54	
1029	I	31.70N	168.36E	23.80	34.54		*	2300		31.67N	171.92E			46

I DENOTES INTERPOLATED POSITIONS

ONR R/S-12 USS ANCHORAGE USS ANCHORAGE 5 NOV75 (JULIAN 309)

TIME		LAT	LONG	T	S	XBT NO		TIME		LAT	LONG	T	S	XBT NO
1		31.70N	172.22E			47	*	1102	I	31.68N	175.41E			58
37	I	31.69N	172.39E	24.92	34.67		*	1200		31.69N	175.62E			59
100		31.68N	172.50E			48	*	1232	I	31.66N	175.82E	22.72	34.39	
200		31.75N	172.78E			49	*	1300		31.63N	176.00E			60
230	I	31.74N	172.92E	25.20	34.80		*	1400		31.68N	176.28E			61
300		31.73N	173.07E			50	*	1431	I	31.71N	176.43E	22.85	34.36	
400		31.75N	173.35E			51	*	1500		31.73N	176.57E			62
430	I	31.75N	173.50E	24.48	34.58		*	1600		31.74N	176.87E			63
459	I	31.75N	173.65E			52	*	1630	I	31.75N	177.01E	23.12	34.50	
500		31.75N	173.66E				*	1700		31.75N	177.15E			64
600		31.71N	173.95E			53	*	1800		31.75N	177.50E			65
632	I	31.70N	174.13E	22.81	34.42		*	1840	I	31.75N	177.70E	24.21	34.66	
700		31.70N	174.28E			54	*	1900		31.75N	177.80E			66
800		31.68N	174.53E			55	*	2000		31.75N	178.12E			67
832	I	31.67N	174.68E	22.48	34.48		*	2030	I	31.75N	178.26E	24.09	34.66	
900		31.67N	174.80E				*	2100		31.75N	178.40E			68
901	I	31.67N	174.80E			56	*	2200		31.73N	178.70E			69
959	I	31.66N	175.10E			57	*	2231	I	31.72N	178.85E	24.39	34.66	
1000		31.66N	175.10E				*	2300		31.72N	178.98E			70
1030	I	31.67N	175.25E	22.30	34.39		*	2359	I	31.70N	179.28E			71
1100		31.68N	175.40E				*							

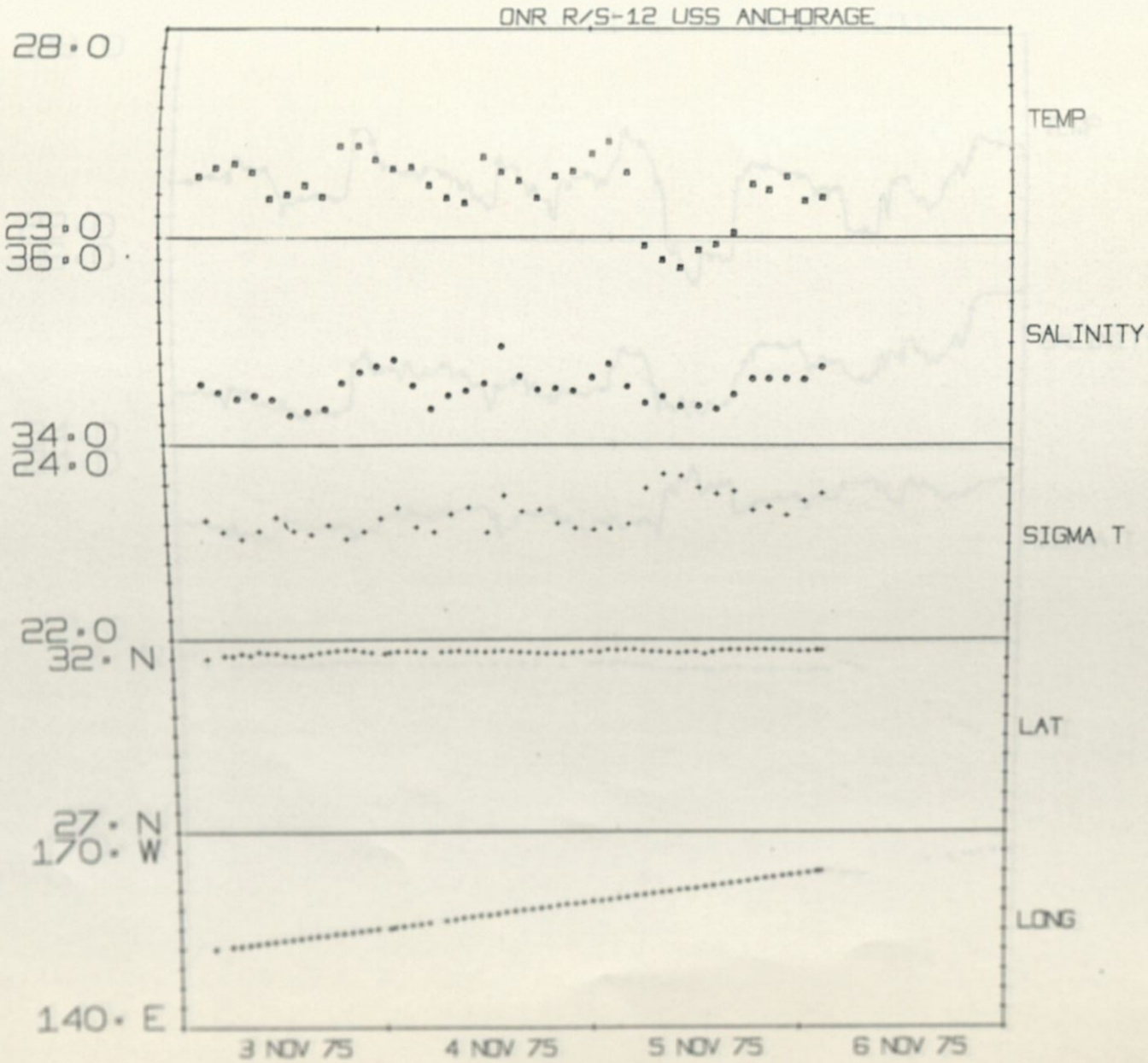
I DENOTES INTERPOLATED POSITIONS

ONR R/S-12 USS ANCHORAGE USS ANCHORAGE 6 NOV75 (JULIAN 310)

TIME		LAT	LONG	T	S	XBT NO		TIME	LAT	LONG	T	S	XBT NO
0		31.70N	179.28E				*	200	31.73N	179.88E			74
10	I	31.70N	179.36E			72	*	204	31.73N	179.88E			75
33	I	31.71N	179.44E	23.85	34.65		*	231	31.73N	179.97W	23.91	34.77	
100		31.72N	179.57E			73	*						

I DENOTES INTERPOLATED POSITIONS

DATA PLOTS


ONR R/S-12 USS ANCHORAGE
28·0
23·0
36·0
34·0
24·0
22·0
32· N
27· N
170· W
140· E
TEMP
SALINITY
SIGMA T
LAT
LONG
3 NOV 75
4 NOV 75
5 NOV 75
6 NOV 75