TEMPERATURE DATA SETS FOR NEARSHORE AND OFFSHORE WATERS OF AMERICAN SAMOA

Peter Craig
Dept. Marine & Wildlife Resources, American Samoa
DMWR Biological Report Series No. 77
1995

The purpose of this brief report is to identify sources of information that present water temperature data in American Samoa.

NEARSHORE COASTAL WATERS

1. Afao Bay. Craig (1995) gathered nearshore water temperature data from 1990-95. Measurements were made at varying times of day using a mercury thermometer with a presumed accuracy of ± 0.5^0 C. The sample site was located approximately 100 m west of the main ava and temperature was measured at a depth of 0.3 m. This site was beyond the ava's outflow of warm water from the reeftop. Figure 1 shows the seasonal pattern of temperatures at this site. Monthly means (^{0}C), for all years combined, were:

1990-95	mean	SE	range	n
Jan	29.3	0.10	28.0-31.0	37
Feb	29.6	0.09	28.0-30.3	29
Mar	29.5	0.08	28.6-30.1	24
Apr	29.6	0.09	28.6-30.7	29
May	29.3	0.11	28.0-30.5	28
Jun	28.1	0.10	27.5-28.9	15
Jul	27.9	0.12	27.0-28.6	11
Aug	27.1	0.14	26.2-28.6	20
Sep	27.6	0.12	26.4-28.5	30
Oct	28.0	0.07	27.5-28.6	21
Nov	28.5	0.11	27.8-29.4	27
Dec	29.0	0.10	28.0-30.0	24

2. Vaitogi. Sesepasara (1975) presented monthly surface samples collected at Vaitogi in 1973-75 (Fig. 2). Water samples were collected by bucket from the cliff and temperatures were measured with a mercury thermometer.

3. Fagatele National Marine Sanctuary. In 1992, FNMS deployed constant recording thermographs in Fagatele Bay at two depths (4 and 12 m). Figures 3 and 4 show examples of these data sets (N. Daschbach, pers. comm.).

4. Taima Bank. FNMS also put a constant recording thermograph on Taima Bank (15 m depth), approximately 100 m east of the bank's navigation bouy, beginning in 1992. Figure 5 shows an example of this data set (N. Daschbach, pers. comm.).

5. Pago Pago Harbor. NOAA has monitored surface water temperatures in the harbor at the main dock since at least 1980 (Fig. 6). Salinities were also recorded (Fig. 7). In 1993, sampling was automated and relocated to DMWR's dock, primarily to monitor changes in water height. DMWR has access to these data.

In addition, the American Samoa Environmental Protection Agency has a monthly monitoring program (primarily for nutrient levels) in the harbor.

While harbor data sets are extensive, it should be noted that water temperatures in the harbor are probably not representative of nearshore water temperatures elsewhere around the island. Harbor conditions probably cause increased water temperatures due to limited circulation (water residency time of about 15-30 days) and heat absorbance due heavy sedimentation (after rainfalls) and phytoplankton blooms (from eutrophic conditions).

OFFSHORE WATERS

1. Near Tutuila Island. NOAA National Ocean Service measured XBT temperature profiles on two dates. On March 20, 1993, profiles were measured at 2 sites 1-5 miles south of Tutuila (Figs. 8 and 9). On November 16, 1993, profiles were taken at varying distances from Tutuila Island: 1, 5, 10, 20, 50, 100, and 200 nautical miles (Figs. 10-16).

2. Away from Tutuila Island. Fisheries Forum Agency (?) has a data set that includes some temperature profiles for this general region.

STREAMS

Stream temperature data were not located, but USGS has extensive data on stream flows at several locations on Tutuila Island.

References:

Craig, P. 1995. Life history and harvest of the surgeonfish *Acanthurus lineatus* in American Samoa.

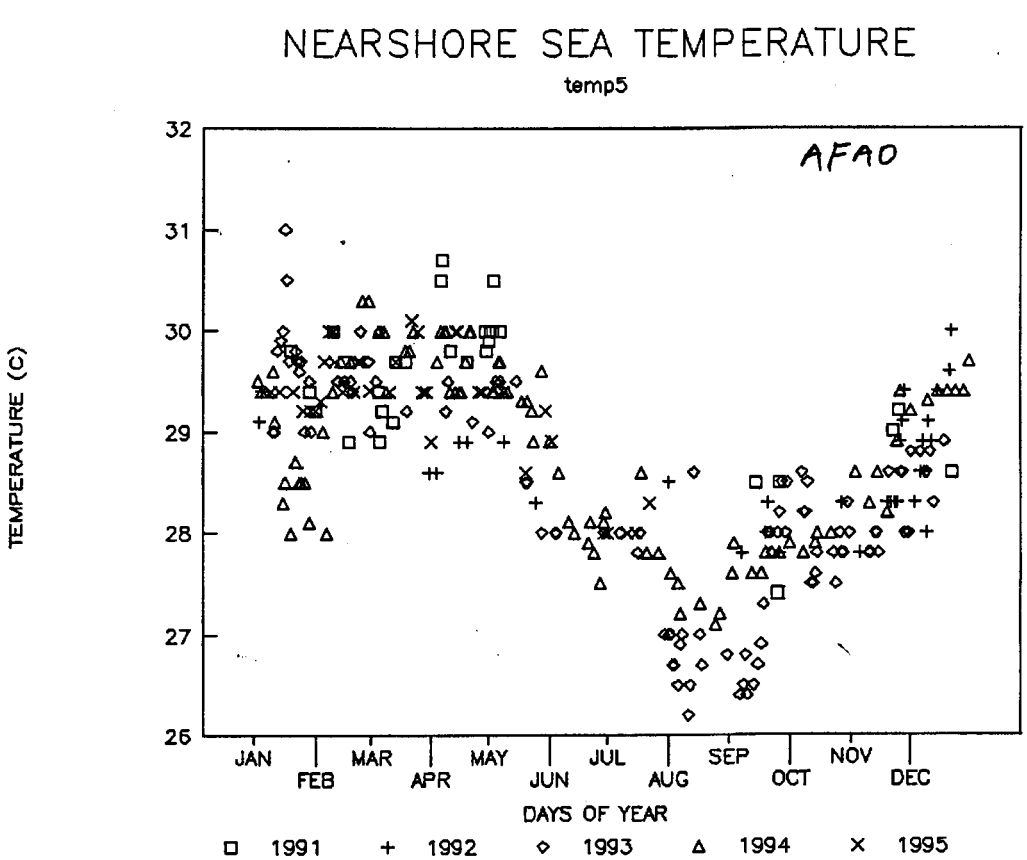

NEARSHORE SEA TEMPERATURE
temp5
AFAO
TEMPERATURE (C)
32
31
30
29
28
27
26
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
DAYS OF YEAR
1991
1992
1993
1994
1995

Figure 1.

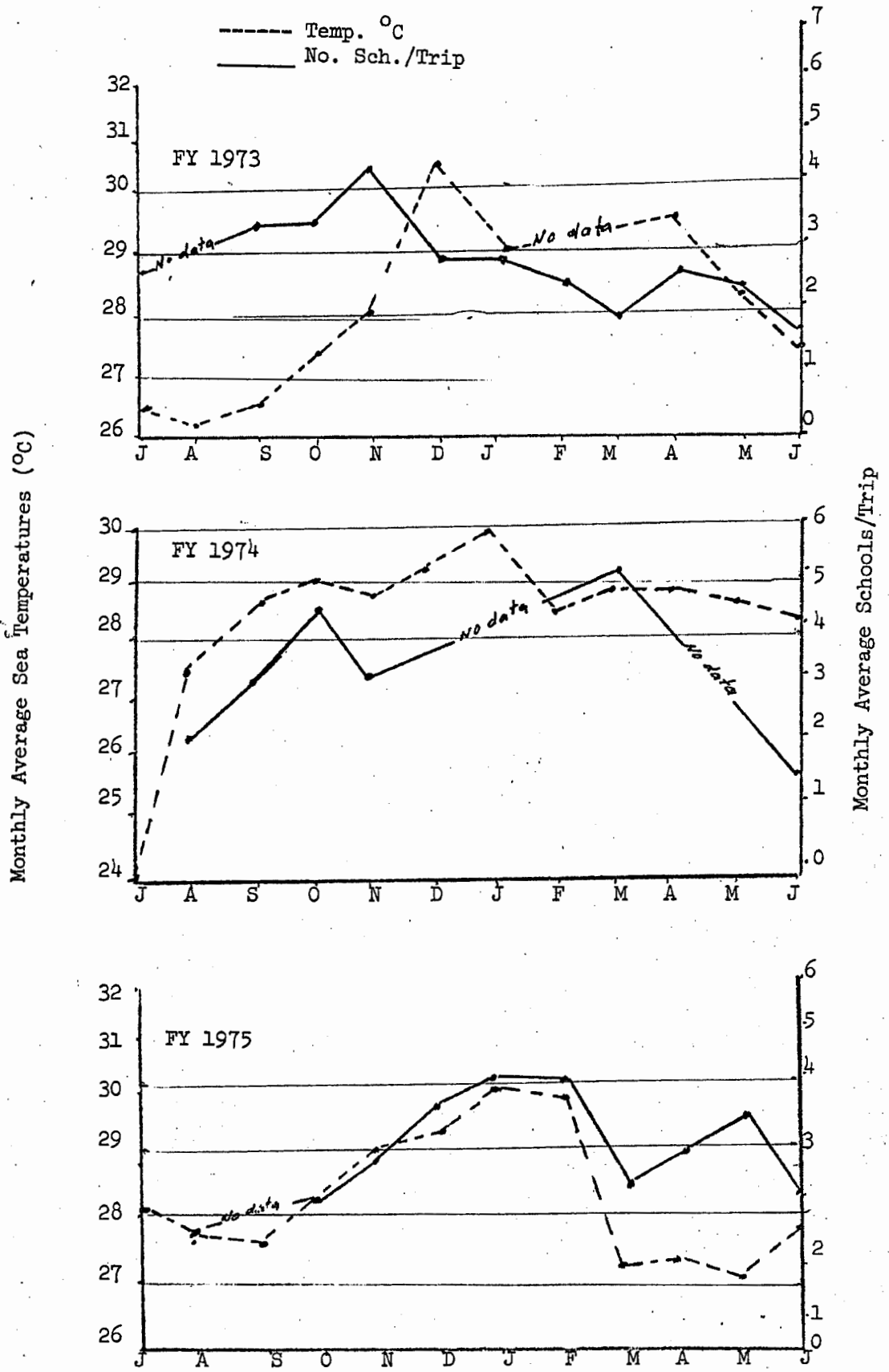


Figure 2
(Vantoqi shoreline)

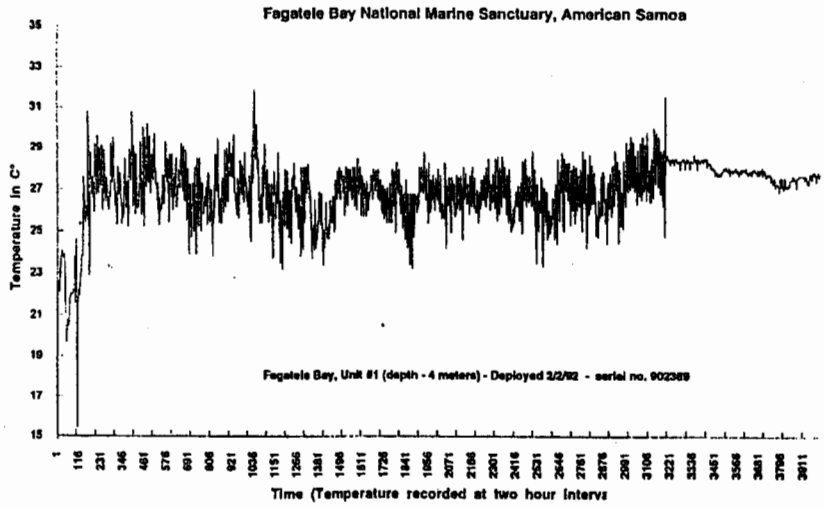


Fig. 3

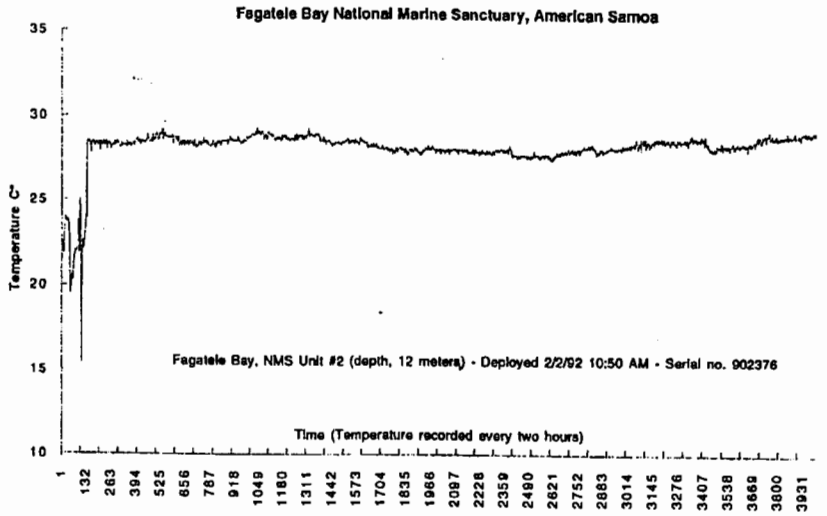


Fig. 4

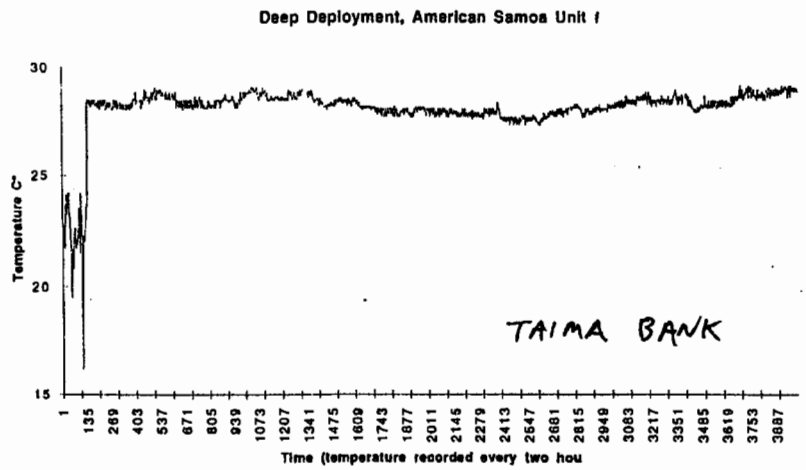


Fig. 5.

Daily sea surface temperature readings
taken at the Pago tide station

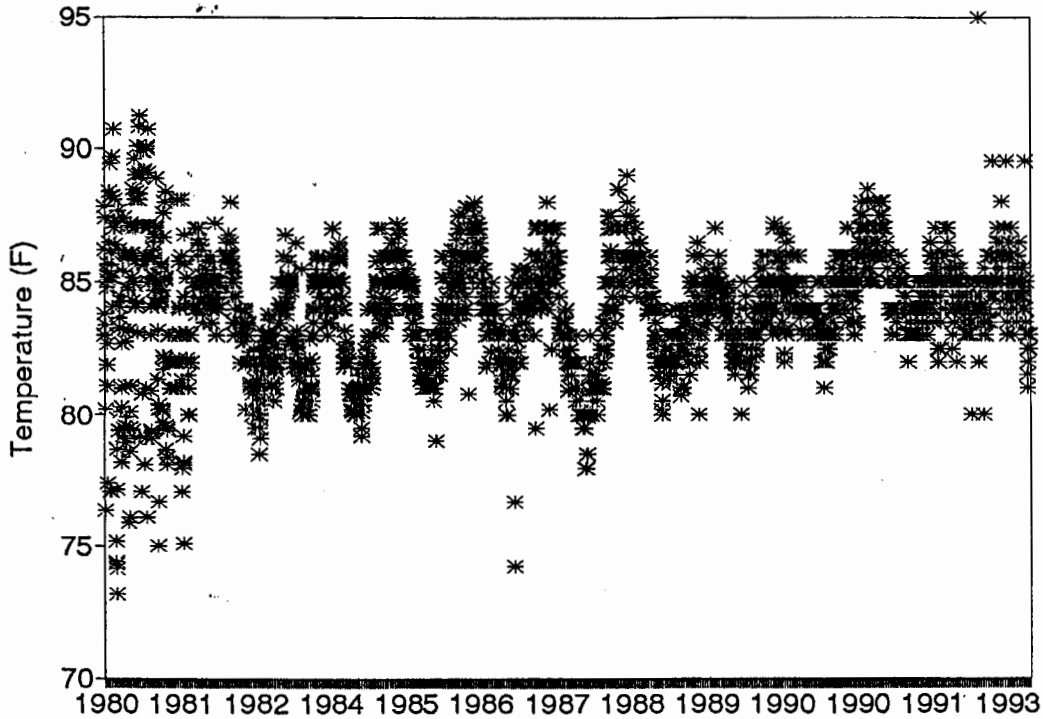


Figure 6

Daily sea surface salinity readings
taken at the Pago tide station

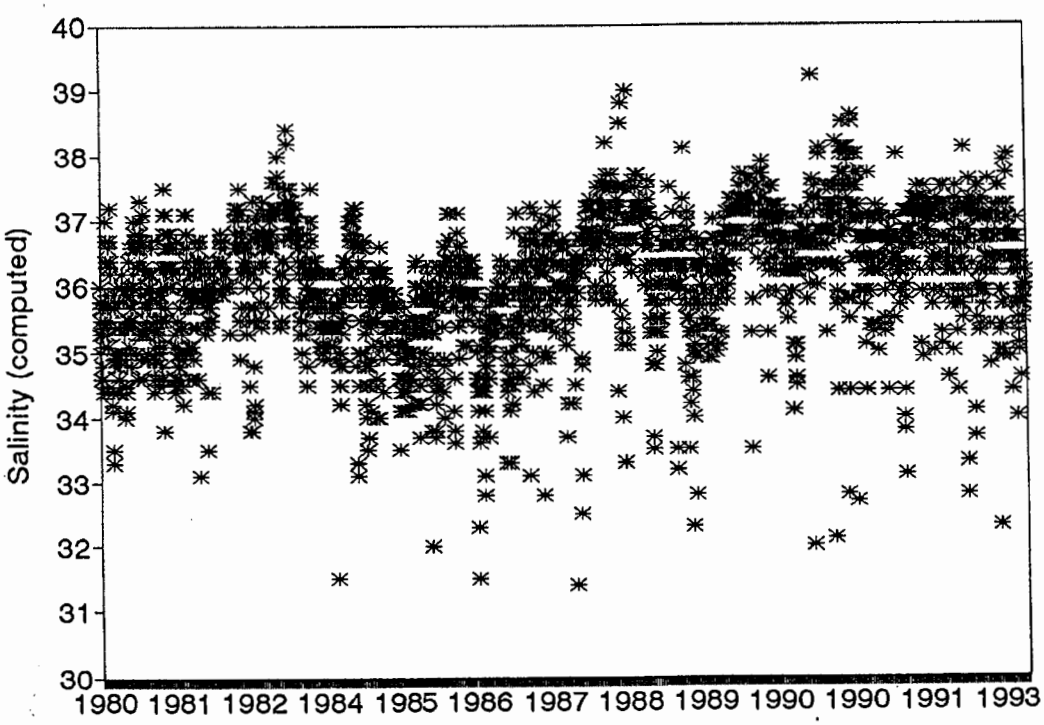


Figure 7

NOAA
National
Ocean
Service

Drop 002
Latitude : 14 20.5 S
Longitude: 170 40.8 W
Probe T-04
Date 93/03/20
Time 19:12 GMT
Bottom depth: 800 m
Cruise: TOGA/TAO 1993
Bucket Temp: 99.9 C

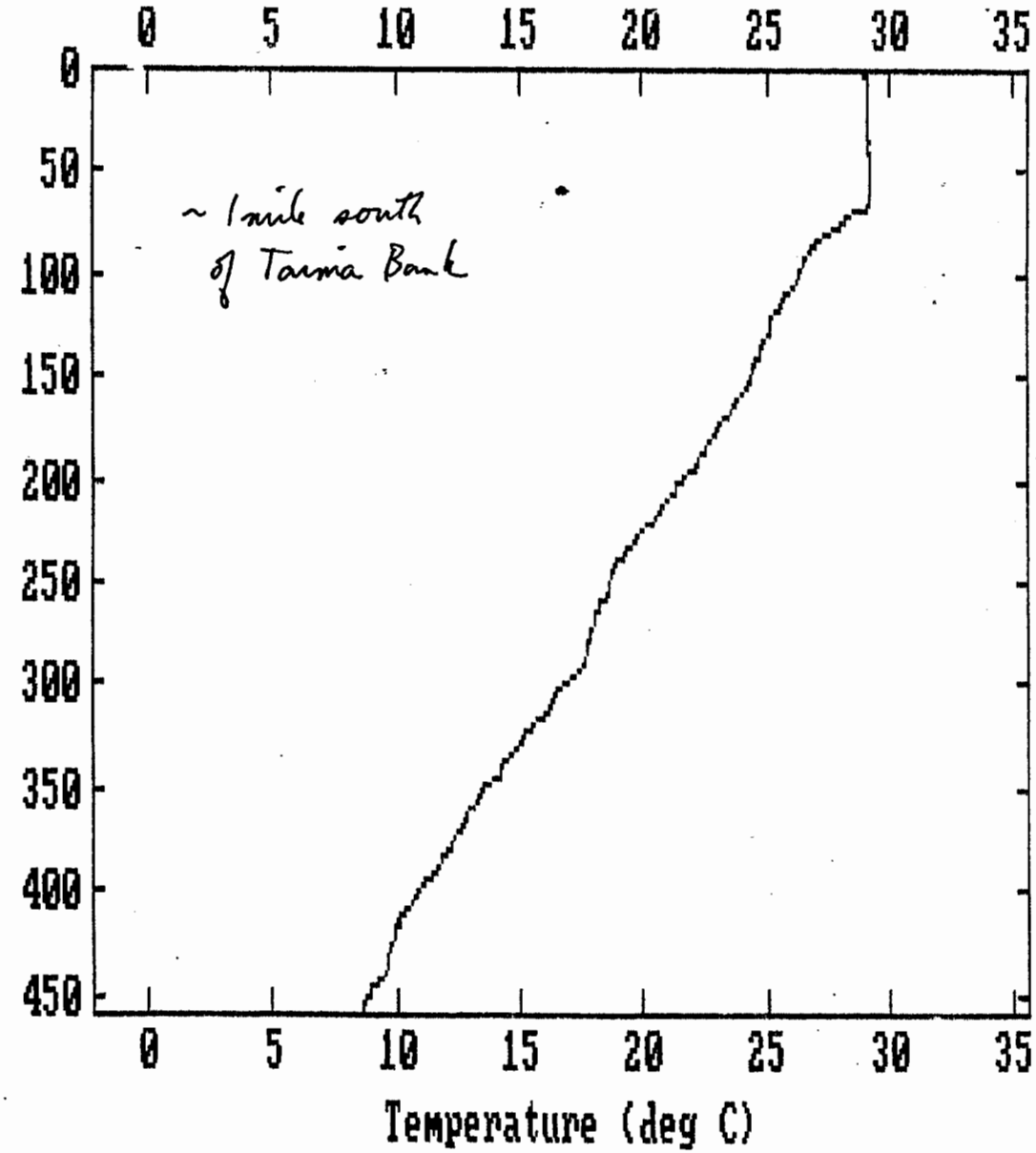
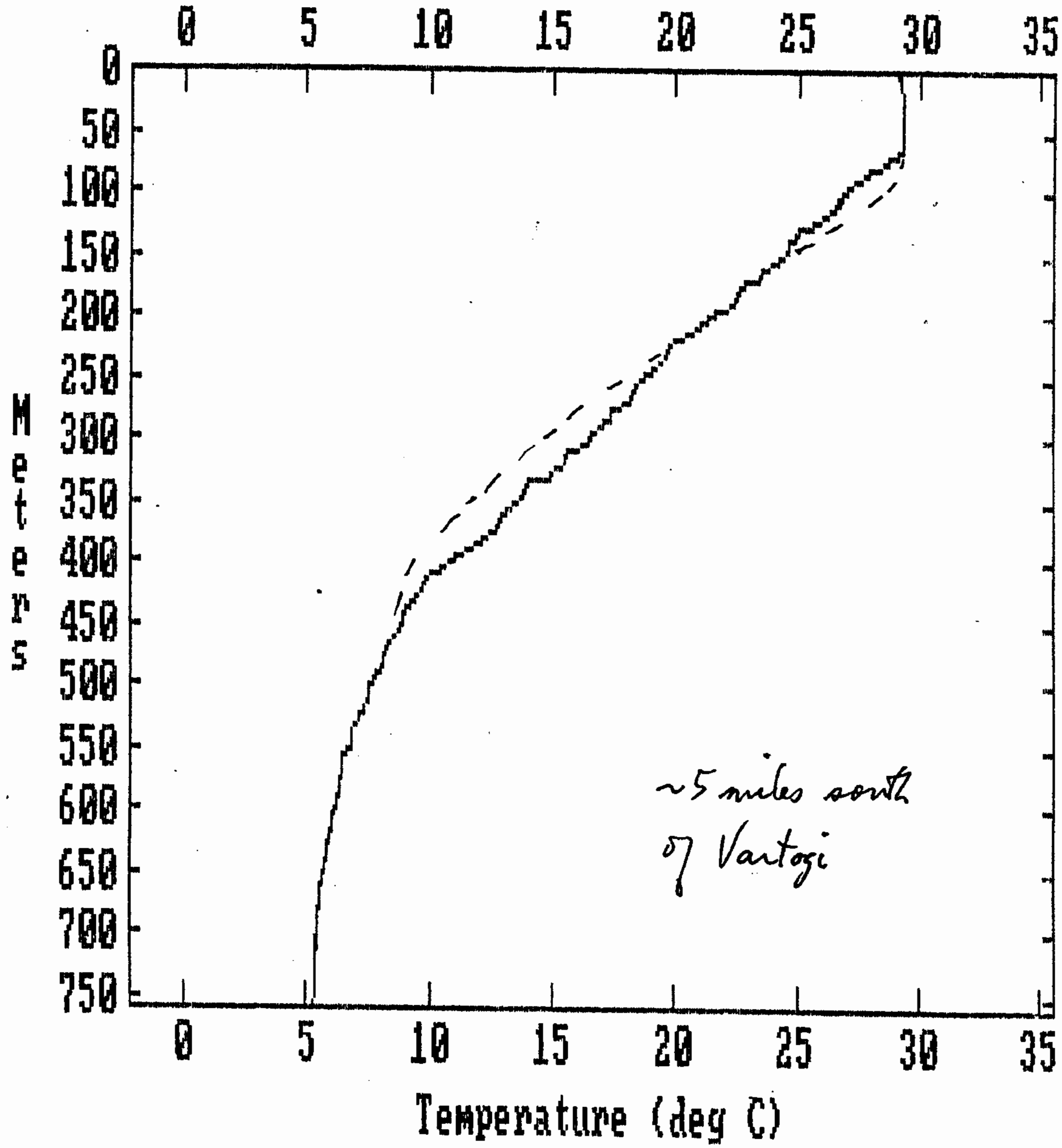


Figure 8

Figure 9

NOAA
National
Ocean
Service

Drop 003
Latitude : 14 27.4 S
Longitude: 170 45.6 W
Probe T-07
Date 93/03/20
Time 19:37 GMT
Bottom depth: 1000 m
Cruise: TOGA/TAO 1993
Bucket Temp: 99.9 C



NOAA
National
Ocean
Service

Drop 013
Latitude : 14 14.2 S
Longitude: 170 29.3 W
Probe T-07
Date 93/11/16
Time 02:00 GMT
Bottom depth: 1200 m
Cruise: 810
Bucket Temp: 99.9 C

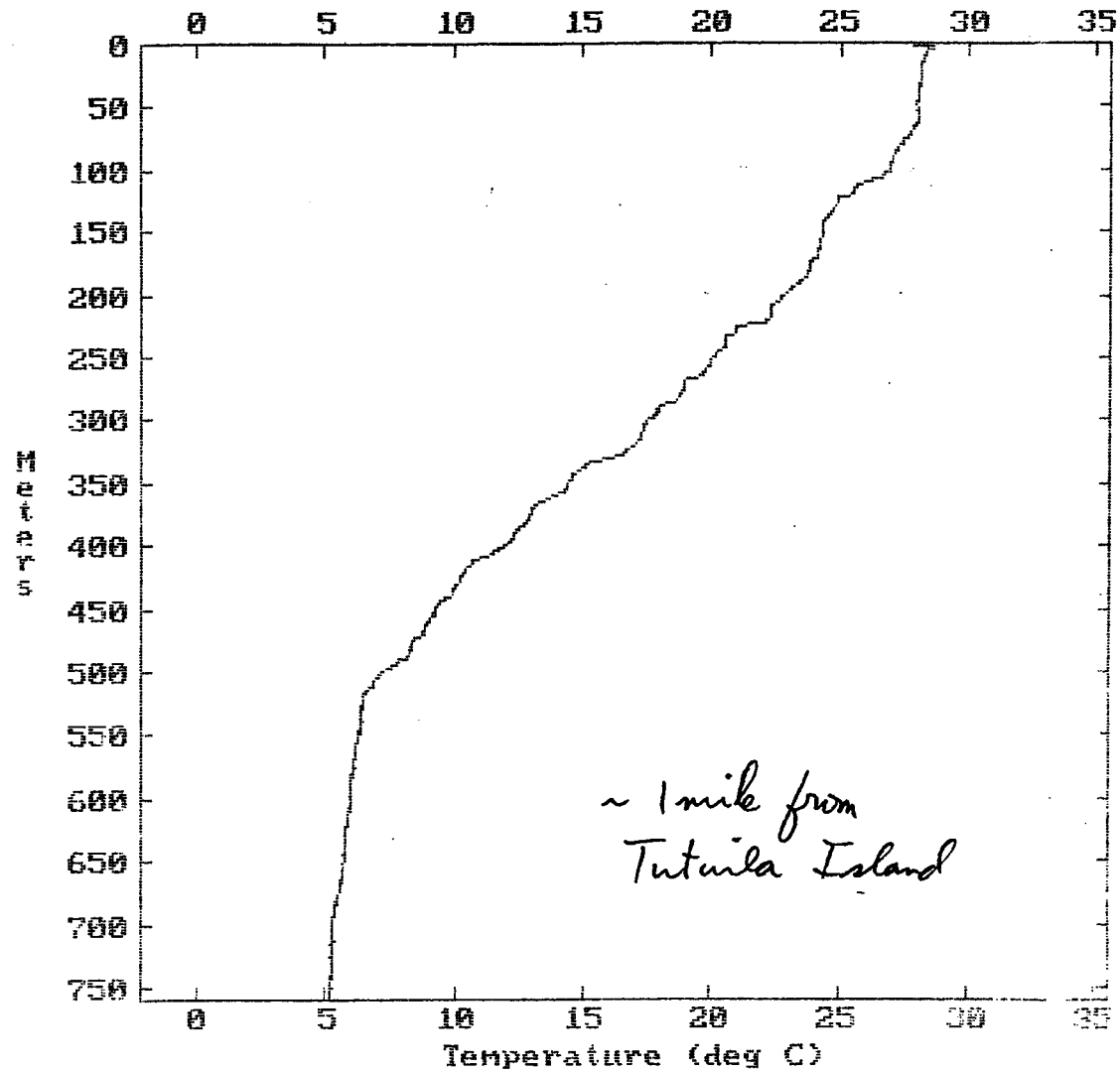


Figure 10

NOAA
National
Ocean
Service

Drop 010
Latitude : 14 09.1 S
Longitude: 170 29.4 W
Probe T-07
Date 93/11/16
Time 01:26 GMT
Bottom depth: 1993 m
Cruise: 810
Bucket Temp: 30.4 C

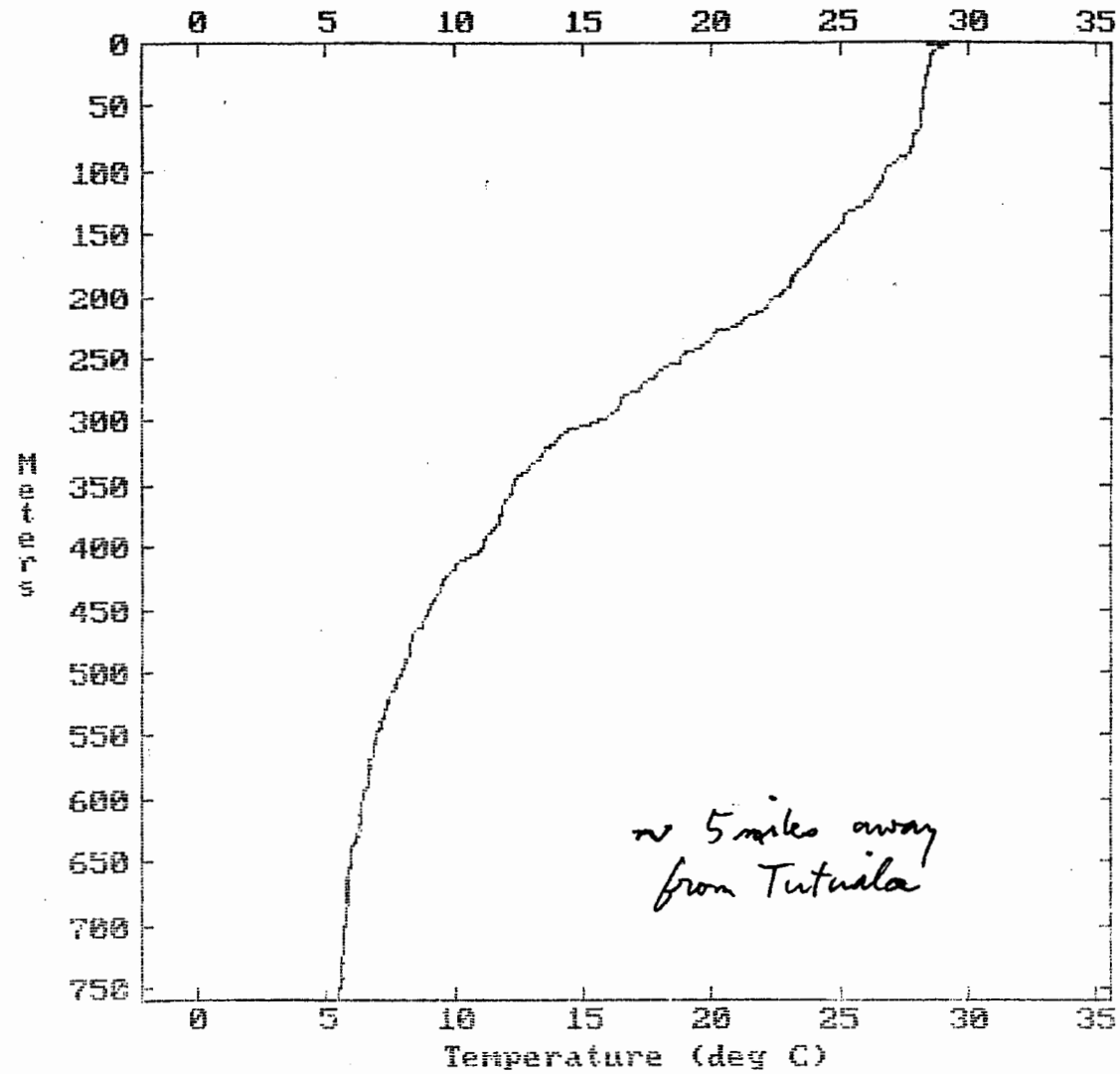


Figure 11

LAUNCH THE PROBE!

NOAA
National
Ocean
Service

Drop 009
Latitude : 14 03.7 S
Longitude: 170 29.3 W
Probe T-07
Date 93/11/16
Time 01:03 GMT
Bottom depth: 3685 m
Cruise: 810
Bucket Temp: 30.4 C

LAUNCH THE PROBE!

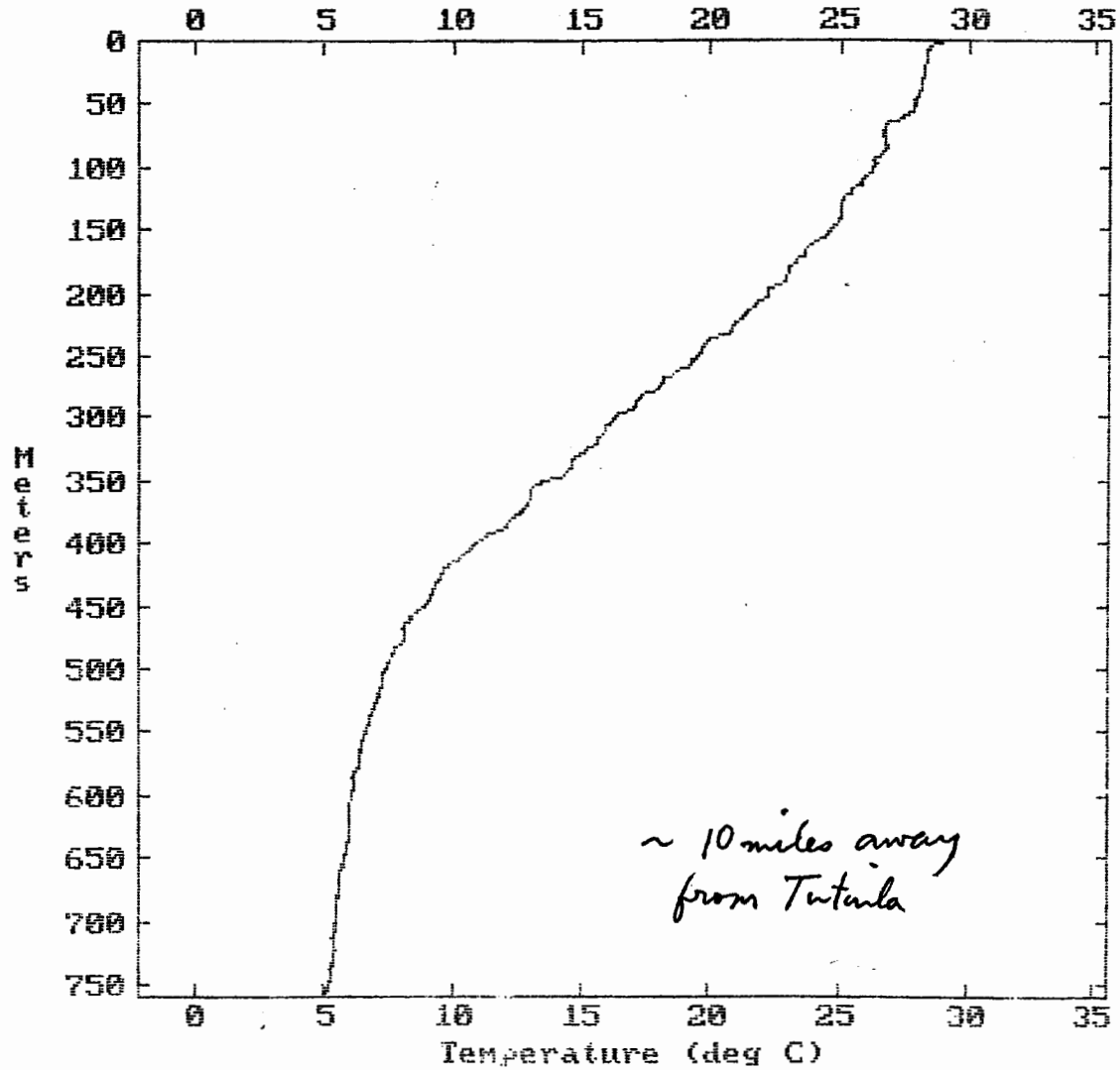


Figure 12

NOAA
National
Ocean
Service

Drop 006
Latitude : 13 53.1 S
Longitude: 170 28.5 W
Probe T-07
Date 93/11/16
Time 00:21 GMT
Bottom depth: 4104 m
Cruise: 810
Bucket Temp: 30.3 C

LAUNCH THE PROBE!

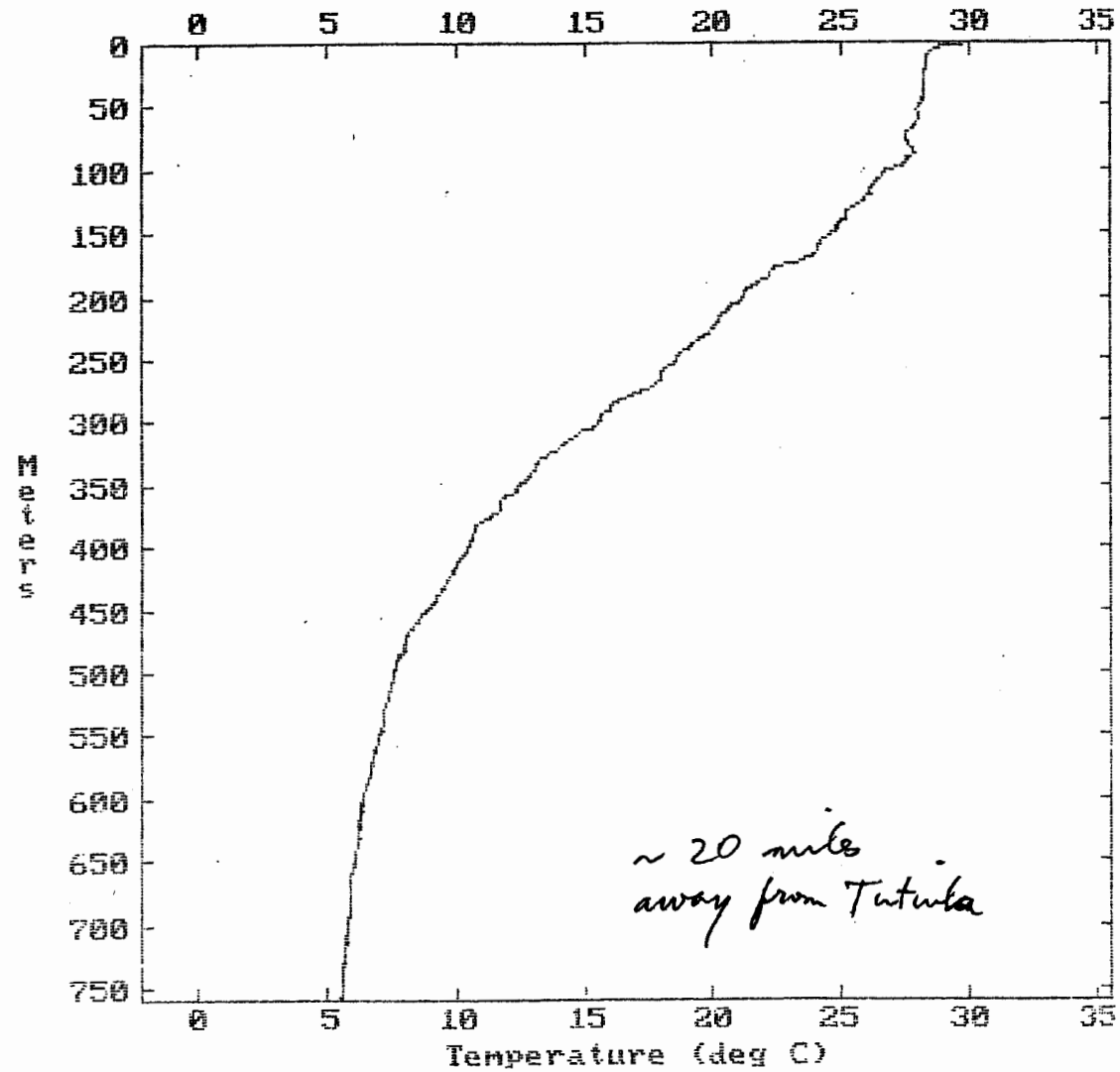


Figure 13

NOAA
National
Ocean
Service

Drop 007
Latitude : 13 23.3 S
Longitude: 170 25.8 W
Probe T-07
Date 93/11/15
Time 22:22 GMT
Bottom depth: 4849 m
Cruise: 810
Bucket Temp: 30.3 C

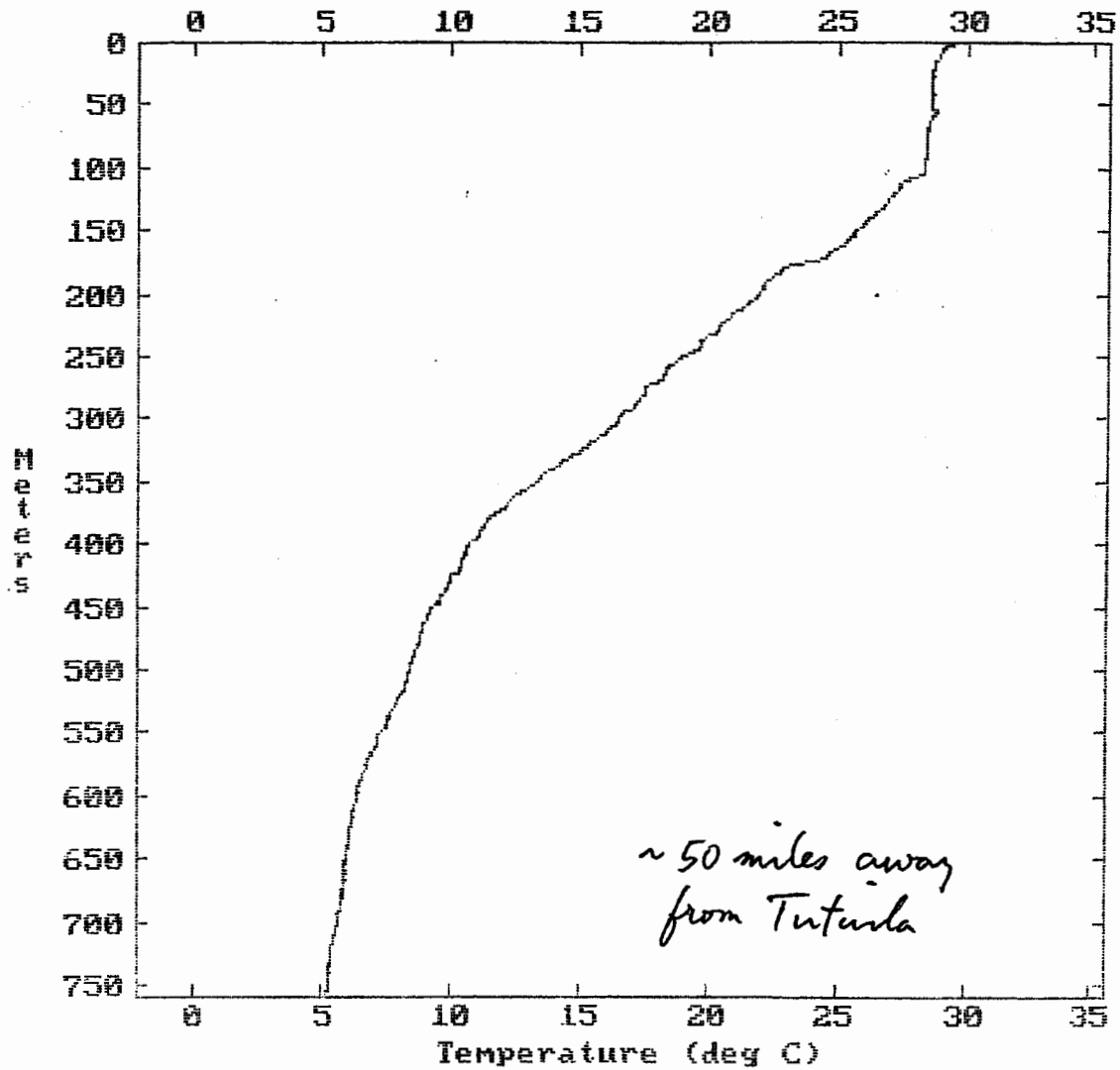


Figure 14

LAUNCH THE PROBE!

(15)

NOAA
National
Ocean
Service

Drop 006
Latitude : 12 33.6 S
Longitude: 170 22.1 W
Probe T-07
Date 93/11/15
Time 18:55 GMT
Bottom depth: 4952 m
Cruise: 810
Bucket Temp: 28.9 C

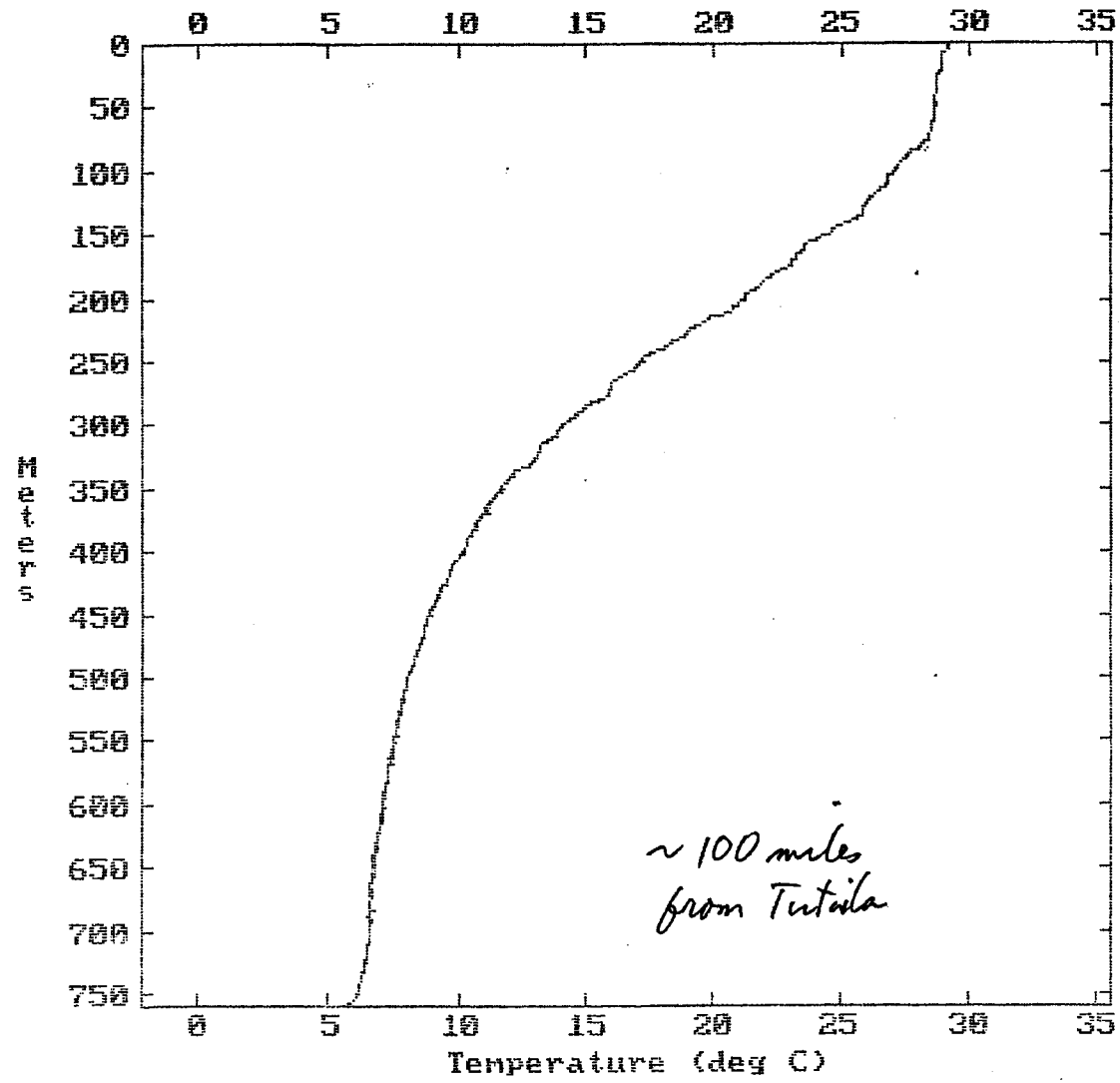


Figure 15

LAUNCH THE PROBE!

NOAA
National
Ocean
Service

Drop 005
Latitude : 11 05.0 S
Longitude: 170 18.0 W
Probe T-07
Date 93/11/15
Time 12:47 GMT
Bottom depth: 5083 m
Cruise: 810
Bucket Temp: 29.3 C

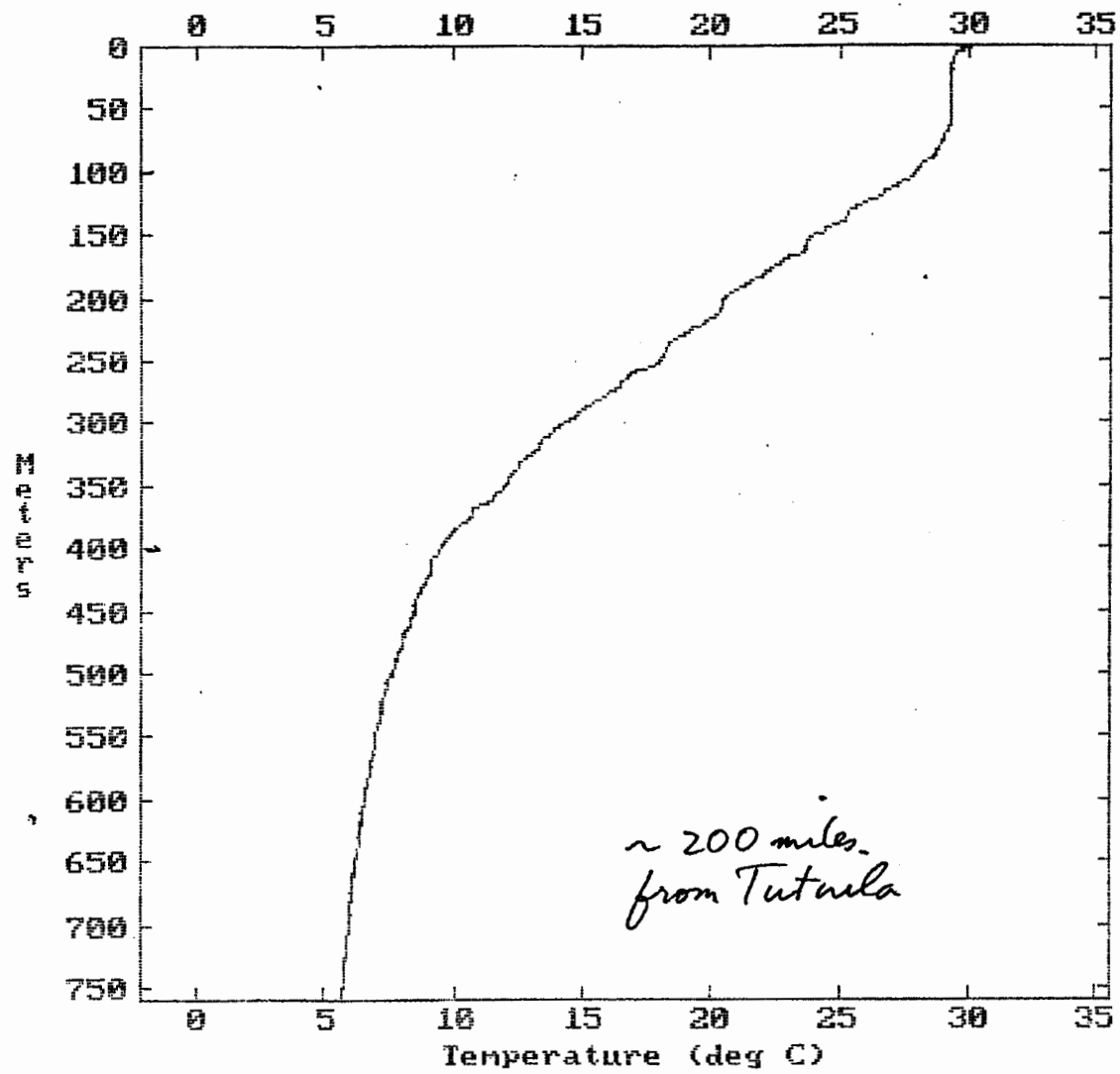


Figure #16