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SEA FLOOR GEOTHERMAL MEASUREMENTS FROM CONRAD CRUISE 13

by

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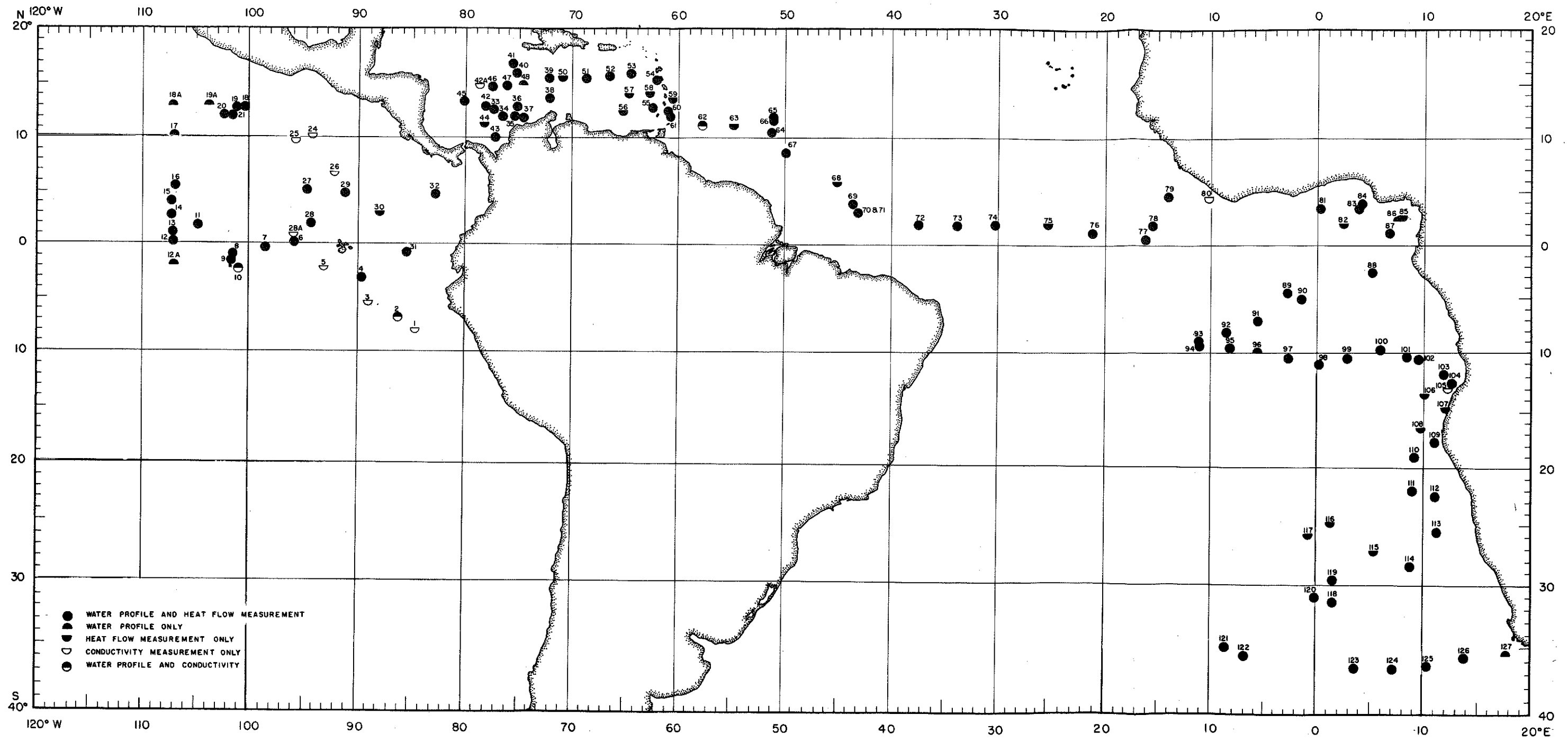
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GEO THERMAL MEASUREMENTS, CONRAD CRUISE 13

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INTRODUCTION

This report gives results of temperature measurements in the deep-ocean water and sea-floor sediment, and results of conductivity measurements on sediment cores taken with the temperature measurements. These measurements were made on R/V CONRAD Cruise 13 beginning at Callao, Peru in April 1970, and ending in Capetown, South Africa in December 1970.

The principal objective of the measurements reported here is to determine the geothermal heat flux through the sea floor (see for example, Bullard, 1954). These measurements are also pertinent to studies of deep and near bottom water temperature in the ocean, as well as steady-state and transient thermal processes at the sediment-water interface. We have attempted, in this report, to present the data in a form that is useful to scientists interested in the thermal regime of the deep ocean.

INSTRUMENT TECHNIQUES

For a complete description of the instruments and techniques used to measure temperature and conductivity in the deep sea, see Gerard et al. (1960) and Langseth (1965). A summary of the measurement techniques is given below so that the reader can better assess the data.

The Ewing Thermograd: All of the temperature data reported was measured with the Ewing thermograd. This instrument uses an array of 3 to 5 thermistor probes mounted along a coring tube to measure sediment temperatures, a thermistor probe to measure water temperature, and a pressure

gauge to indicate the depth of the instrument in the water. The temperature and pressure are recorded on 70 mm film as analog traces. The recorder is placed inside of a pressure case that is secured inside the weight at the top of the piston corer.

Water Temperature Measurements: Water temperatures are measured during lowering and hoisting of the thermograd with a bead-type thermistor that is mounted in a watertight stainless steel probe. The diameter of the probe is about 1.25 mm and its length is 2.5 cm. The probe has a time constant of about 0.5 sec in flowing water. This probe is mounted on the pressure vessel. During lowering, the water probe points downward so that relatively undisturbed water is continually flowing past it. (Lowering rates vary from 100 to 200 meters/minute). Upon hoisting, the probe is in the wake of the core weight. (Hoisting rates are usually 50 to 100 meters/minute.)

The water temperature trace on the 70 mm film record has a displacement of about 2.5 cm per degree centigrade, and the film record is read with a precision of about 0.1 mm. The water probe is calibrated prior to use at sea in a constant-temperature bath at 5 or 6 points with an absolute accuracy of $\pm 0.05^\circ$ C. The relative accuracy of calibration between temperature points is about $\pm 0.005^\circ$ C.

Instrument Depth Measurements: The depth of the instrument below the sea surface is measured by a pressure gauge. This gauge consists of a cavity exposed to the ambient sea pressure and surrounded by strain-sensitive wires. The linearity of the gauge is about 0.35%. The pressure detected

by the gauge is recorded as a separate trace on the 70 mm film record, which has a sensitivity of 1500 m per centimeter displacement. Thus the resolution of the record is about 15 m. Depths during lowering are found by a linear interpolation between the surface and bottom readings which results in an accuracy of depth measurement of about ± 25 m.

Sediment Temperatures: Temperatures at up to five points below the sediment-water interface are measured by means of thermistor probes mounted along the core tube. The thermistor is in the end of a stainless steel probe 0.317 cm in diameter. This probe is pressure proof and mounted on a steel fin so that it is held about 5 cm from the core tube. The probe itself is secured in a plastic (PVC) collar that provides thermal insulation from the fin. The tip of the probe projects about one inch beyond this collar.

To measure sediment temperatures the corer is lowered to within about a hundred meters of the bottom and held for a few minutes to allow the probes to equilibrate in the nearly isothermal near bottom water. The corer is then lowered until bottom contact is made. Upon contact, the corer free-falls about 10 ft., penetrating the sediment to depths up to 25 meters. The corer is left undisturbed in the sediment for about 5 minutes, while temperatures are recorded as the probes equilibrate with the sediment. The corer is then extracted from the sediment and hoisted back up to the ship.

The sediment probes are calibrated in the same way as the water probe described earlier. Temperature gradients in the sediment, which are of

prime interest, are determined by taking the difference between measurements in the water near the bottom and in the sediment after equilibration. Thus in determining gradients we depend only on the relative calibration accuracy which is $\pm 0.005^\circ \text{ C}$.

Conductivity Measurements: Measurements of thermal conductivity are made on the sediment core samples aboard the research ship about one hour after the core has been extruded from the core tube. A thin probe is imbedded in the sediment and the temperature measured while the probe is heated at a constant rate. We use a probe about 6 cm in length and 0.8 mm in diameter that contains a 50 Ω heater wire and a thermistor. The probe is inserted into the 2 1/2" sediment sample at an angle of about 45° to the long axis of the core. Six volts is applied to the heater and the temperature rise is recorded on a Varian strip-chart recorder for about two minutes.

Reduction of thermograd and conductivity data: The trace displacements on the 70 mm thermograd film record are measured on a projected image of the film on the surface of a digitizing table. The magnification is about 4 times. The minimum digitizing increment of this table is 0.01". The digitized trace displacements corresponding to water and mud temperatures and instrument depth are entered on computer punch cards, which are converted into temperature versus depth information with an IBM 1130 computer.

The conductivity measurements are reduced by manually reading displacements from the strip chart records. Displacement versus resistance

calibration, made on board ship, and temperature versus resistance calibration of the thermistor are used to convert displacements into temperature. Readings are taken approximately every 10 seconds after the probe heater is turned on. These temperatures are then plotted versus the logarithm of time. The slope of these semi-log plots can be interpreted in terms of conductivity by means of the following relation.

$$K = \frac{Q \cdot \ln(t_2/t_1)}{4\pi (T_2 - T_1)}$$

where:

Q = the heater power per unit length in cal/cm sec

t₂ and t₁ are times after heater turn-on usually 10 and 100 seconds

T₂ and T₁ are temperatures at t₁ and t₂.

PRESENTATION OF THE DATA:

Summary Table: The thermal data relevant to the geothermal heat flux is given for each station in Table 1.

The depths are given in corrected meters, determined by taking the depth indicated by the Precision Depth Recorder at the time of the core contact and correcting for the velocity of sound in water using Matthews (1939) tables.

The gradient refers to the vertical gradient in the sediment determined from temperature measurements in the sediment. Units are °C/10 m.

The listed conductivity value is the harmonic mean, $N/\sum_{i=1}^N (1/K_i)$

where N is the total number of measurements and X_i 's are conductivity values, of all measurements within the interval of gradient measurement, Units are $\text{mcal}/^\circ\text{C sec cm}$.

Each conductivity measurement is followed by an "M" or "A" which indicates whether the value is based on measurements (M) or is assumed from nearby stations (A).

Heat flow is the product of the gradient and the conductivity. The units are $\mu\text{cal}/\text{cm}^2\text{sec}$.

The evaluation is a subjective index applied by the authors to indicate our appraisal of the reliability of the temperature and conductivity measurements. The numbers are interpreted in Table 2.

TABLE 1: CONRAD 13 GEOTHERMAL DATA

| Latitude | Longitude | Depth Meters | Gradient | Conduct | Heat Flow | Eval | T' grad Number | Core Number | Year |
|---------------------------|-----------|-----------------|------------|---------|--------------|------|-------------------|----------------|------|
| <u>EQUATORIAL PACIFIC</u> | | | | | | | | | |
| 7° 54'S | 84° 20'W | 4238 | - | 1.60 | - | - | 1 | 104 | 1970 |
| 6° 58'S | 86° 01'W | 4172 | - | 1.67 | - | - | 2 | 105 | 1970 |
| 5° 24'S | 88° 48'W | 4024 | - | 1.59 | - | - | 3 | 106 | 1970 |
| 3° 07'S | 89° 25'W | 2213 | 0.90 | 1.83 | 1.66 | 8 | 4 | 108 | 1970 |
| 2° 21'S | 92° 56'W | 3084 | - | 1.98 | - | - | 5 | 109 | 1970 |
| 0° 08'N | 95° 39'W | 3250 | 1.60 | 2.03 | 3.25 | 8 | 6 | 110 | 1970 |
| 0° 32'S | 98° 41'W | 3254 | 3.5-4.46* | 1.99 | 6.9-8.9* | 5 | 7 | 111 | 1970 |
| 1° 12'S | 101° 22'W | 3301 | 0.96 | 1.93 | 1.85 | 10 | 8 | 112 | 1970 |
| 1° 39'S | 103° 38'W | 3320 | 1.25 | 2.14 | 2.68 | 10 | 9 | 113 | 1970 |
| 1° 39'S | 103° 38'W | 3433 | - | 1.96 | - | - | 10 | 114 | 1970 |
| 1° 38'N | 104° 50'W | 3508 | 0.88 | 1.97 | 1.73 | 7 | 11 | 115 | 1970 |
| 2° 04'S | 106° 55'W | 3781 | - | - | - | - | 12A | 116 | 1970 |
| 0° 18'S | 106° 54'W | 3735 | NL | 2.15 | - | 10 | 12 | 117 | 1970 |
| 0° 57'N | 106° 53'W | 3687 | 0.54 | 2.14 | 1.16 | 10 | 13 | 118 | 1970 |
| 2° 32'N | 107° 13'W | 3797 | NL | 2.16 | - | 10 | 14 | 119 | 1970 |
| 3° 50'N | 106° 54'W | 3749 | 0.62 | 2.44 | 1.51 | 8 | 15 | 120 | 1970 |
| 5° 24'N | 106° 54'W | 3824 | 1.23 | 2.07 | 2.55 | 10 | 16 | 121 | 1970 |
| 10° 03'N | 107° 00'W | 3257 | - | - | - | - | 17 | 122A | 1970 |
| 12° 50'N | 107° 10'W | 3517 | - | - | - | - | 18A | 122 | 1970 |
| <u>NORTH PACIFIC</u> | | | | | | | | | |
| 12° 50'N | 100° 32'W | 3457 | 2.56 | 1.71 | 5.30 | 9 | 18 | 124 | 1970 |
| 12° 47'N | 103° 54'W | 2828 | - | - | - | - | 19A | 125A | 1970 |
| 12° 45'N | 101° 11'W | 3380 | 0.31 | 1.66 | 0.51 | 6 | 19 | 125 | 1970 |
| 12° 09'N | 102° 17'W | 3150 | 3.74-5.55* | 1.68 | 6.3-9.3* | 5 | 20 | 126 | 1970 |
| 12° 08'N | 101° 30'W | 3287 | 1.21 | 1.68 | 2.05 | 10 | 21 | 127 | 1970 |

*Minimum and maximum gradient.

TABLE 1: CONRAD 13 GEOTHERMAL DATA

| Latitude | Longitude | Depth Meters | Gradient | Conduct | Heat Flow | Eval | T'grad Number | Core Number | Year |
|-----------------------------|-----------|-----------------|----------|---------|--------------|------|------------------|----------------|------|
| <u>GUATEMALA BASIN</u> | | | | | | | | | |
| 10° 01'N | 94° 02'W | 3797 | - | 1.49 | - | - | 24 | 133 | 1970 |
| 9° 39'N | 95° 23'W | 4099 | - | 1.54 | - | - | 25 | 134 | 1970 |
| 6° 37'N | 91° 52'W | 3581 | - | 1.44 | - | - | 26 | 135 | 1970 |
| 4° 59'N | 94° 28'W | 3488 | 0.15 | 1.69 | 0.25 | 6 | 27 | 136 | 1970 |
| <u>GALAPAGOS RIFT ZONE</u> | | | | | | | | | |
| 0° 51'N | 96° 02'W | 3437 | - | 1.78 | - | - | 28A | 137 | 1970 |
| 1° 49'N | 94° 08'W | 2659 | 0.19 | 1.88 | 0.36 | 5 | 28 | 138 | 1970 |
| 4° 45'N | 90° 56'W | 3034 | 0.29 | 2.12 | 0.61 | 8 | 29 | 139 | 1970 |
| <u>SE OF COCOS RIDGE</u> | | | | | | | | | |
| 2° 52'N | 87° 45'W | 2239 | 1.46 | 1.99 | 2.89 | 5 | 30 | 140 | 1970 |
| <u>CARNEGIE RIDGE</u> | | | | | | | | | |
| 1° 00'S | 85° 09'W | 2407 | 0.29 | 2.00 | 0.58 | 5 | 31 | 141 | 1970 |
| <u>PANAMA FRACTURE ZONE</u> | | | | | | | | | |
| 4° 28'N | 82° 26'W | 3550 | 0.22 | 1.82 | 0.41 | 8 | 32 | 142 | 1970 |
| <u>CARIBBEAN</u> | | | | | | | | | |
| 12° 30'N | 76° 58'W | 3815 | 0.56 | 3.32 | 1.86 | 8 | 33 | 144 | 1970 |
| 11° 53'N | 76° 09'W | 3290 | 0.25 | 2.21 | 0.56 | 6 | 34 | 145 | 1970 |
| 11° 55'N | 75° 02'W | 3389 | 0.50 | 2.43 | 1.22 | 8 | 35 | 146 | 1970 |
| 12° 53'N | 74° 51'W | 3943 | 0.49 | 2.48 | 1.22 | 8 | 36 | 147 | 1970 |
| 11° 45'N | 74° 17'W | 1258 | 0.20 | 2.19 | 0.44 | 7 | 37 | 148 | 1970 |
| 13° 41'N | 71° 40'W | 4280 | 0.61 | 2.25 | 1.33 | 9 | 38 | 149 | 1970 |
| 15° 37'N | 71° 40'W | 3790 | - | 2.29 | - | 0 | 39 | 150 | 1970 |
| 15° 51'N | 74° 47'W | 2795 | 0.21 | 2.40(A) | 0.50 | 5 | 40 | 151 | 1970 |

TABLE 1: (Continued) CONRAD 13 GEOTHERMAL DATA

| Latitude | Longitude | Depth Meters | Gradient | Conduct | Heat Flow | Eval | T'grad Number | Core Number | Year |
|-------------------|-----------|-----------------|------------|---------|--------------|------|------------------|----------------|------|
| CARIBBEAN (Cont.) | | | | | | | | | |
| 15° 04'N | 75° 52'W | 3334 | 0.61 | 2.31 | 1.45 | 4 | 41 | 153 | 1970 |
| 14° 53'N | 78° 45'W | 2296 | - | 2.21 | - | 1 | 42A | 154 | 1970 |
| 12° 52'N | 77° 45'W | 3932 | 0.59 | 2.21(A) | 1.30 | 4 | 42 | 155 | 1970 |
| 10° 02'N | 76° 57'W | 3104 | 0.52 | 2.85 | 1.48 | 6 | 43 | 156 | 1970 |
| 11° 15'N | 78° 09'W | 3590 | 0.66 | 2.16 | 1.43 | 4 | 44 | 157 | 1970 |
| 13° 11'N | 79° 50'W | 3016 | 0.69 | 2.64(A) | 1.82 | 7 | 45 | 158 | 1970 |
| 14° 42'N | 77° 10'W | 4027 | 0.56 | 2.64(A) | 1.34 | 7 | 46 | 159 | 1970 |
| 14° 54'N | 75° 48'W | 4132 | 0.85 | 2.64(A) | 2.24 | 6 | 47 | 160 | 1970 |
| 15° 41'N | 70° 43'W | 4220 | 0.54 | 2.23(A) | 1.20 | 8 | 50 | 163 | 1970 |
| 15° 28'N | 68° 24'W | 4393 | 0.57 | 1.85 | 1.05 | 8 | 51 | 164 | 1970 |
| 15° 43'N | 66° 12'W | 4688 | 0.70 | 1.83 | 1.28 | 8 | 52 | 165 | 1970 |
| 15° 58'N | 64° 12'W | 3579 | 0.75 | 1.91 | 1.43 | 9 | 53 | 166 | 1970 |
| 15° 15'N | 61° 46'W | 2517 | - | 2.54 | - | 0 | 54 | 167 | 1970 |
| 12° 49'N | 62° 06'W | 2974 | 0.70 | 2.39 | 1.67 | 7 | 55 | 168 | 1970 |
| 12° 31'N | 65° 07'W | 4649 | 0.53 | 1.94 | 1.03 | 8 | 56 | 169 | 1970 |
| 14° 02'N | 64° 35'W | 3550 | 0.61 | 2.08 | 1.27 | 10 | 57 | 170 | 1970 |
| 14° 03'N | 62° 21'W | 2729 | 1.14 | 1.86 | 2.12 | 6 | 58 | 171 | 1970 |
| 13° 31'N | 60° 21'W | 1972 | 0.34-1.43* | 2.32 | 0.79-3.39* | 6 | 59 | 172 | 1970 |
| 12° 21'N | 60° 41'W | 2336 | 0.27 | 1.95 | 0.52 | 7 | 60 | 173 | 1970 |
| 12° 01'N | 60° 32'W | 2262 | 0.36 | 1.99 | 0.72 | 7 | 61 | 174 | 1970 |

*Minimum and maximum gradient.

TABLE 1: (Continued) CONRAD 13 GEOTHERMAL DATA

| Latitude | Longitude | Depth Meters | Gradient | Conduct | Heat Flow | Eval | T'grad Number | Core Number | Year |
|-------------------------------|-----------|-----------------|------------|---------|--------------|------|------------------|----------------|------|
| <u>GUYANA BASIN</u> | | | | | | | | | |
| 11° 03'N | 57° 27'W | 4007 | - | 2.23 | - | - | 62 | 175 | 1970 |
| 10° 59'N | 54° 29'W | 4615 | 0.58 | 2.03 | 1.18 | 7 | 63 | 176 | 1970 |
| <u>DEMERARA ABYSSAL PLAIN</u> | | | | | | | | | |
| 10° 48'N | 50° 56'W | 4969 | 0.64 | 1.92 | 1.24 | 6 | 64 | 177 | 1970 |
| 11° 23'N | 50° 49'W | 4980 | 0.34 | 2.10 | 0.71 | 7 | 65 | 178 | 1970 |
| 11° 39'N | 50° 48'W | 5004 | 0.17-0.69* | 1.98 | 0.34-1.38* | 10 | 66 | 179 | 1970 |
| 8° 24'N | 49° 32'W | 4483 | 0.63 | 1.75 | 1.10 | 8 | 67 | 182 | 1970 |
| <u>CEARA RISE</u> | | | | | | | | | |
| 5° 52'N | 44° 50'W | 3771 | 0.64 | 1.91(A) | 1.22 | 8 | 68 | 183 | 1970 |
| 3° 52'N | 43° 18'W | 3446 | 0.50-0.62* | 2.03 | 1.11-1.24* | 10 | 69 | 184 | 1970 |
| 3° 06'N | 42° 53'W | 4302 | 0.74 | 2.05 | 1.52 | 5 | 70 | 185 | 1970 |
| 3° 08'N | 42° 55'W | 4298 | 0.82 | 2.28 | 1.87 | 7 | 71 | 186 | 1970 |
| <u>GUYANA BASIN</u> | | | | | | | | | |
| 1° 52'N | 37° 12'W | 4448 | 0.41-0.54* | 1.90 | 0.78-1.17* | 10 | 72 | 187 | 1970 |
| <u>MID-ATLANTIC RIDGE</u> | | | | | | | | | |
| 1° 49'N | 33° 41'W | 3453 | 0.44-0.59* | 2.31 | 1.10-1.36* | 8 | 73 | 188 | 1970 |
| 1° 52'N | 30° 00'W | 3234 | 0.36 | 2.10 | 0.76 | 6 | 74 | 189 | 1970 |
| 1° 47'N | 25° 26'W | 3797 | 0.16-0.40* | 1.98 | 0.32-0.79* | 8 | 75 | 190 | 1970 |
| <u>FRACTURE ZONE</u> | | | | | | | | | |
| 1° 11'N | 20° 56'W | 4960 | 0.86 | 1.72 | 1.48 | 8 | 76 | 191 | 1970 |
| 0° 31'N | 15° 51'W | 4840 | 1.09 | 1.61 | 1.75 | 6 | 77 | 192 | 1970 |

TABLE 1: (Continued) CONRAD 13 GEOTHERMAL DATA

| Latitude | Longitude | Depth Meters | Gradient | Conduct | Heat Flow | Eval | T'grad Number | Core Number | Year |
|---------------------------|-----------|-----------------|------------|---------|--------------|------|------------------|----------------|------|
| <u>GUINEA BASIN</u> | | | | | | | | | |
| 1° 47'N | 15° 15'W | 5322 | 0.91 | 1.64 | 1.55 | 10 | 78 | 193 | 1970 |
| 4° 31'N | 13° 41'W | 4770 | 0.62 | 1.57 | 0.99 | 8 | 79 | 194 | 1970 |
| 4° 35'N | 10° 03'W | 2539 | - | 1.87 | - | - | 80 | 195 | 1970 |
| 3° 15'N | 0° 32'E | 4649 | 0.64 | 2.08 | 1.34 | 8 | 81 | 198 | 1970 |
| 2° 01'N | 2° 39'E | 4395 | 0.56 | 1.96A | 1.09 | 8 | 82 | 199 | 1970 |
| <u>GULF OF GUINEA</u> | | | | | | | | | |
| 3° 25'N | 4° 03'E | 3691 | 0.75 | 1.84 | 1.38 | 10 | 83 | 200 | 1970 |
| 3° 55'N | 4° 31'E | 1858 | 0.60 | 1.99 | 1.19 | 8 | 84 | 201 | 1970 |
| 2° 50'N | 8° 05'E | 1000 | 1.01 | 1.97 | 1.99 | 10 | 85 | 202 | 1970 |
| 2° 24'N | 7° 32'E | 2548 | - | - | - | 0 | 86 | 203 | 1970 |
| <u>GUINEA BASIN</u> | | | | | | | | | |
| 1° 22'S | 6° 53'E | 3100 | 0.38-0.87* | 1.92 | 0.74-1.68* | 9 | 87 | 204 | 1970 |
| 2° 17'S | 5° 11'E | 3733 | 0.72-1.14* | 1.74 | 1.39-2.21* | 9 | 88 | 205 | 1970 |
| 4° 28'S | 2° 54'E | 5204 | 0.84-1.23* | 1.43 | 1.20-1.75* | 10 | 89 | 206 | 1970 |
| 5° 02'S | 1° 23'E | 3605 | 0.73-1.27* | 1.56 | 1.14-1.98* | 9 | 90 | 207 | 1970 |
| <u>MID-ATLANTIC RIDGE</u> | | | | | | | | | |
| 6° 59'S | 5° 10'W | 4624 | 0.98 | 1.96 | 1.92 | 10 | 91 | 208 | 1970 |
| 8° 12'S | 8° 13'W | 4298 | 1.12 | 1.64 | 1.84 | 10 | 92 | 209 | 1970 |
| 9° 09'S | 10° 37'W | 3658 | 1.05 | 2.16 | 2.27 | 10 | 93 | 210 | 1970 |
| 9° 16'S | 10° 33'W | 3706 | 0.21 | 2.21 | 0.46 | 6 | 94 | 211 | 1970 |
| 9° 30'S | 7° 54'W | 3952 | 0.51 | 2.18 | 1.12 | 7 | 95 | 212 | 1970 |
| <u>ANGOLA BASIN</u> | | | | | | | | | |
| 9° 56'S | 5° 20'W | 1963 | - | - | - | - | 96 | 213A | 1970 |

*Minimum and maximum gradient.

TABLE 1: (Continued) CONRAD 13 GEOTHERMAL DATA

| Latitude | Longitude | Depth Meters | Gradient | Conduct | Heat Flow | Eval. | T'grad Number | Core Number | Year |
|------------------------------------|-----------|-----------------|----------|---------|--------------|-------|------------------|----------------|------|
| <u>ANGOLA BASIN (Cont.)</u> | | | | | | | | | |
| 10° 29'S | 2° 24'W | 5158 | 0.62 | 1.83 | 1.13 | 10 | 97 | 213 | 1970 |
| 11° 07'S | 0° 30'E | 5610 | 0.62 | 1.70 | 1.05 | 10 | 98 | 214 | 1970 |
| 10° 27'S | 3° 06'E | 5577 | 0.68 | 1.66 | 1.13 | 10 | 99 | 215 | 1970 |
| 10° 24'S | 6° 02'E | 5286 | 0.73 | 1.70 | 1.24 | 10 | 100 | 216 | 1970 |
| 10° 24'S | 8° 28'E | 4761 | 0.67 | 1.50 | 1.01 | 10 | 101 | 217 | 1970 |
| 10° 38'S | 9° 33'E | 4146 | 0.56 | 1.63 | 0.91 | 8 | 102 | 218 | 1970 |
| <u>CONTINENTAL RISE OFF ANGOLA</u> | | | | | | | | | |
| 11° 14'S | 11° 53'E | 2775 | 0.68 | 1.74 | 1.18 | 10 | 103 | 219 | 1970 |
| 12° 12'S | 12° 36'E | 1761 | - | 2.50 | - | 0 | 104 | 220 | 1970 |
| 12° 49'S | 12° 22'E | 1995 | - | 2.66 | - | 0 | 105 | 221 | 1970 |
| 13° 34'S | 9° 59'E | 3987 | 0.74 | 1.77 | 1.31 | 8 | 106 | 222 | 1970 |
| 14° 25'S | 12° 08'E | 1518 | 0.30 | 2.03 | 0.61 | 5 | 107 | 223 | 1970 |
| 16° 22'S | 9° 32'E | 4223 | 0.48 | 2.30 | 1.11 | 6 | 108 | 224 | 1970 |
| 17° 36'S | 11° 02'E | 2072 | 0.61 | 1.79 | 1.09 | 9 | 109 | 225 | 1970 |
| 18° 59'S | 8° 59'E | 4772 | 0.61 | 1.77 | 1.08 | 8 | 110 | 226 | 1970 |
| <u>CAPE BASIN</u> | | | | | | | | | |
| 21° 53'S | 8° 52'E | 4303 | 0.44 | 2.20 | 0.97 | 6 | 111 | 227 | 1970 |
| 22° 20'S | 11° 12'E | 3206 | 0.43 | 1.97 | 0.85 | 9 | 112 | 228 | 1970 |
| 25° 30'S | 11° 18'E | 4195 | 0.42 | 1.84 | 0.77 | 9 | 113 | 229 | 1970 |
| 28° 08'S | 8° 45'E | 5042 | - | 1.83 | - | 0 | 114 | 230 | 1970 |
| 27° 04'S | 5° 19'E | 4292 | 0.81 | 2.38 | 1.93 | 6 | 115 | 231 | 1970 |
| <u>ANGOLA BASIN</u> | | | | | | | | | |
| 24° 50'S | 1° 03'E | 5329 | 0.64 | 2.45(A) | 1.57 | 6 | 116 | 232 | 1970 |

TABLE 1: (Continued) CONRAD 13 GEOTHERMAL DATA

| Latitude | Longitude | Depth Meters | Gradient | Conduct | Heat Flow | Eval | T'grad Number | Core Number | Year |
|------------------------------|-----------|-----------------|----------|---------|--------------|------|------------------|----------------|------|
| <u>ANGOLA BASIN (Cont.)</u> | | | | | | | | | |
| 25° 44'S | 1° 55'W | 4779 | 0.49 | 2.46 | 1.21 | 5 | 117 | 234 | 1970 |
| <u>WALVIS RIDGE</u> | | | | | | | | | |
| 31° 18'S | 1° 27'E | 4479 | 0.53 | 2.27 | 1.21 | 8 | 118 | 235 | 1970 |
| 29° 38'S | 1° 37'E | 3675 | 0.52 | 2.10 | 1.09 | 7 | 119 | 236 | 1970 |
| <u>ANGOLA BASIN</u> | | | | | | | | | |
| 30° 53'S | 1° 08'W | 4361 | <0.88 | 2.34 | <2.1 | 5 | 120 | 237 | 1970 |
| 34° 54'S | 8° 34'W | 4057 | 0.70 | 2.15 | 1.51 | 8 | 121 | 240 | 1970 |
| <u>WALVIS RIDGE</u> | | | | | | | | | |
| 35° 39'S | 6° 50'W | 4107 | - | 2.26 | - | 0 | 122 | 241 | 1970 |
| <u>CAPE BASIN</u> | | | | | | | | | |
| 36° 31'S | 3° 33'E | 5220 | 0.80 | 1.67 | 1.34 | 10 | 123 | 244 | 1970 |
| 36° 28'S | 7° 05'E | 5028 | 0.87 | 1.67 | 1.45 | 4 | 124 | 245 | 1970 |
| 36° 17'S | 10° 17'E | 5075 | 0.47 | 1.78 | 0.84 | 10 | 125 | 246 | 1970 |
| 35° 46'S | 13° 52'E | 4834 | 0.60 | 2.45(A) | 1.47 | 6 | 126 | 247 | 1970 |
| 35° 49'S | 17° 37'E | 3612 | - | - | - | 0 | 127 | 248 | 1970 |
| 46° 36'S | 7° 38'E | 2494 | - | 1.88 | - | - | - | 253 | 1970 |
| <u>OFF CAPE OF GOOD HOPE</u> | | | | | | | | | |
| 53° 11'S | 0° 21'W | 2525 | - | 1.42 | - | - | - | 256 | 1970 |

TABLE 2: DEFINITION OF EVALUATION INDEX

| Index | Estimated Error Range | Reliability | Remarks (Typical Diagnostics) |
|-------|-----------------------|--------------|---|
| 9-10 | 5-10% | High | Three or more sediment temperatures. |
| 7-8 | 10-15% | Good | Only two probes in sediment. Conductivity may be assumed. |
| 5-6 | 15-50% | Fair | Corer moved in sediment. Apparent shunting of thermistors. |
| 4 | >30% | Poor | Only one probe in sediment. |
| <3 | - | Unacceptable | |

Listings of the Data: Individual listings of the temperature and depth data are given for each station. Depths and corresponding in situ and potential temperatures (computed from Wüst, 1961) are given. The depths in these lists occasionally differ from the accurate figures in Table 1 because of variations in quality of the digitized films. At some stations malfunction of either the water probe or pressure gauge obviated any measurement, in such cases the listing of water temperatures is omitted.

Sediment conductivity values are listed with the depth of measurement in the sediment.

Plots of Geothermal Data: The listed data for each station is presented graphically on the page adjacent to the listing. A note about the conductivity presentation: each value is printed out at a depth corresponding to the distance from the top of the core to the point of measurement. This usually represents the true depth in the sediment within ± 10 cm.

General Description of CONRAD 13 Geothermal Measurements: The first measurements of heat flow on CONRAD 13 were made when the ship left Callao, Peru for Acapulco. From Acapulco the ship went to Balboa, Panama Canal Zone, then to the Caribbean making port in Cartagena and Trinidad. From Trinidad the CONRAD sailed to Abidjan then to Mocamedes and finally to Cape Town.

The legs of the cruise from Callao to Balboa resulted in 29 new heat flow stations in the vicinity of the East Pacific Rise near the Equator. Some very high values of heat flow were observed; t'grads #6, 7, 18 and 20. About an equal number showed below normal heat flow; t'grads #19, 27, 28, 29, 31 and 32.

Several of the stations show temperature gradients that change greatly with depth, C13-10, 12 and 14 are the best examples. Other stations, 13, 15 and possibly 16 show some change of gradient with depth. Most of these stations are within an area bounded by 2° S to 5° N and 100° W to 110° W. A number of VEMA 24 stations obtained nonlinear gradients in the same region. Generally the gradient decreases with depth. The gradient in the upper part of the sediment is usually closer to the average oceanic value whereas the lower gradient may have half this magnitude.

The cause of these changes in gradient with depth are not known. However the uniformity of bottom water temperature and the general uniformity of sediment cover appears to rule out such causes as; change in bottom water temperatures, rapid sedimentation, or refraction of subsurface topography.

Twenty-six new heat flow stations were obtained in the Caribbean area. Most of the values from those stations were near the world average and in general agreed with the earlier results reported by Epp et al., 1970. Two values somewhat above average, C13-46 and 47, were observed in the northern Colombian Basin at the foot of Nicaragua Rise. Another above average value was observed in the western edge of the Grenada Trough, C13-58. Two stations, C13-60 and C13-61, east of the Windward Islands, show below average heat flow near the Tobago Trough.

From Trinidad to Abidjan the ship made a Trans-Atlantic profile at about 1° N. A series of stations were made in the Guyana Abyssal Plain. Most of these stations were in water deep enough to clearly show the Antarctic bottom water (AABW) as a colder near-bottom layer. The results in the Guyana Abyssal Plain are puzzling. Stations 64 and 66 show large changes in gradient with depth in the sediment and the sediment temperature profile with depth for the three stations, C13-64 to 66 and a V26 station, V26-51, are very different in absolute value and gradient. Most of this basin is covered with thick, stratified sediment, 1 to 1.5 sec thick, with isolated basement peaks or ridges protruding through. Three of the above stations were taken within a few miles of such peaks; this may in part explain the variability of results which is unexpected in such a smooth area. Stations 68 and 69 are on the Ceara Ridge and indicate average heat flow. The remaining stations form a widely spaced profile across the Equatorial Atlantic. Four of these also show gradients that change with depth in the sediment (72 through 75). C13-73 and 74 straddle the ridge crest north of Saint Paul's rocks. Station C13-77 is

southeast of the Romanche Trench. The heat flow values at these stations do not vary significantly from the world average.

Measurements from Abidjan to Mocamedes are in the Guinea and Angola basins. Four stations, C13-87, 88, 89 and 90, on the south flank of the Guinea Ridge all show a large increase in gradient in the sediment below 9 meters. The measurements at these stations are of good quality. Two stations, C13-93 and 94, on the eastern flank of the MAR at about 10° S are very close together and near an earlier station reported by Vacquier and Von Herzen (1964), LSDA-102. The heat flow values at 93 and 94 are very different; 2.27 and 0.46 HFU respectively. The value at LSDA-102 is 0.4 HFU. All of these stations are in a region of rough topographic basement and small sediment pockets. This variation is probably real and probably due to refractive effects.

Stations C13-97 through 101 form an east-west profile at about 10° 30' S across the Angola Basin. These stations are all of high quality and show no systematic variation of heat flow. The values are virtually uniform within the uncertainty of the measurements.

On the last leg to Cape Town from Mocamedes, measurements were made along the continental rise west of Angola and southwest Africa over the Walvis Ridge and into the Cape Basin. The measurements along the continental rise, C13-108 to 113, all have uniformly below average heat flow, 0.77 to 1.11. These values may be affected by rapid sedimentation. Stations C13-115 to 121 are made in the vicinity of the Walvis Ridge. In general these measurements have lower than normal reliability. Two stations,

C13-115 and 120 give above average values. The other observed values are near normal. Stations C13-123 to 126 form a west to east line in the Cape Basin. These stations are of variable reliability. The low value at station C13-125 is in an area of thick sediment possibly controlled by current deposition.

Acknowledgements: This work was supported by the Office of Naval Research under Contract N00014-67-A-0108-0004 and by National Science Foundation Grants GA 18765 and GA 27281.

Chief scientists during the CONRAD 13 Cruise were Peter Buhl, Bill Ludwig, Rudi Markl, Robert Embley, Robert Leyden and George Bryan. Measurements were made by George Carpenter from Callao to Acapulco and by Charles Bookman for the rest of the Cruise. Captain Allen L. Jorgensen also made an important contribution to the success of the scientific program of the cruise.

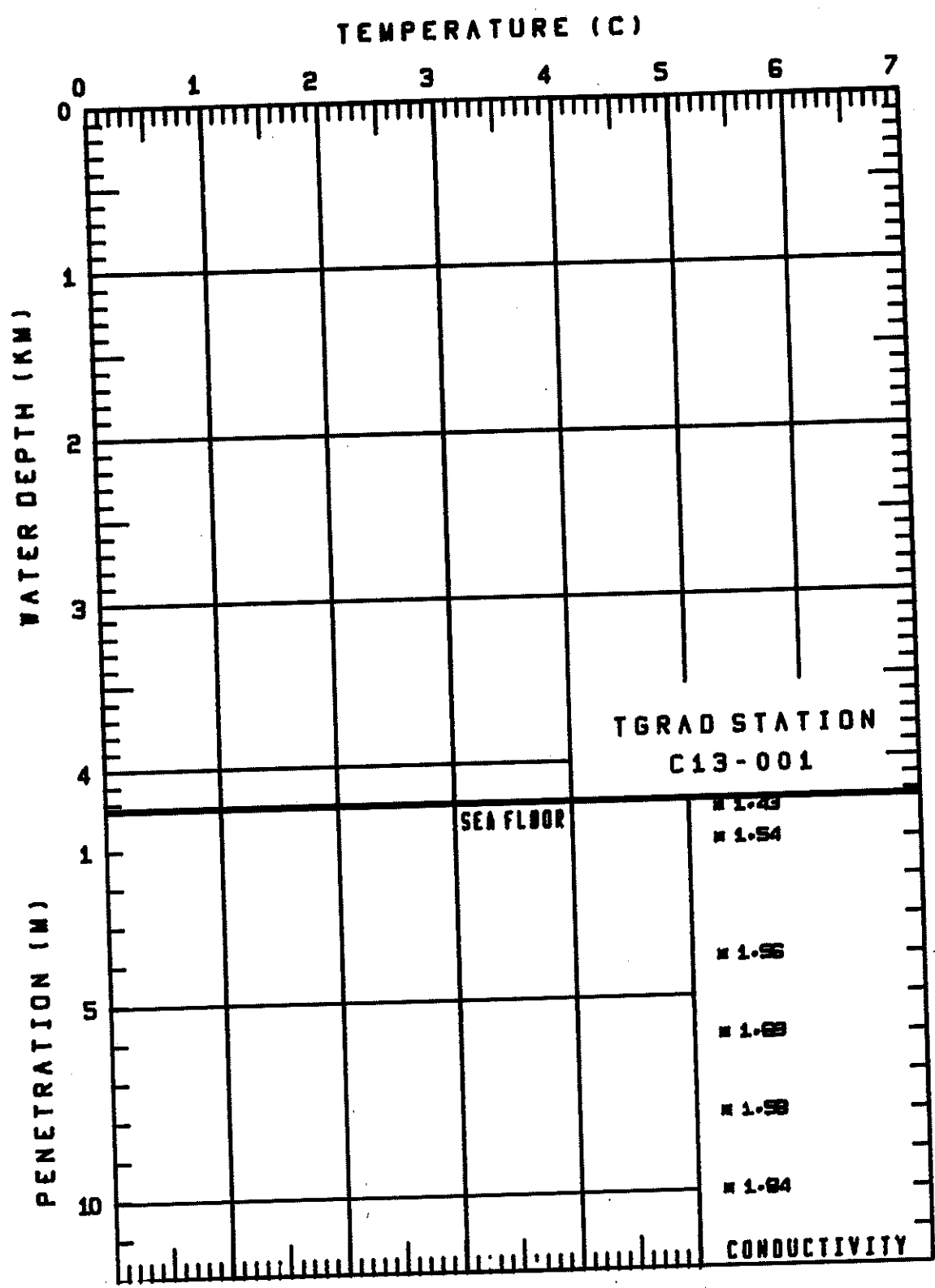
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TGRAD STATION C13-001
007 54 S 084 20 W
CRUISE STATION 118

SEDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| <u>0.20</u> | <u>1.43</u> |
| <u>1.00</u> | <u>1.54</u> |
| <u>4.00</u> | <u>1.56</u> |
| <u>6.00</u> | <u>1.69</u> |
| <u>8.00</u> | <u>1.58</u> |
| <u>10.00</u> | <u>1.84</u> |



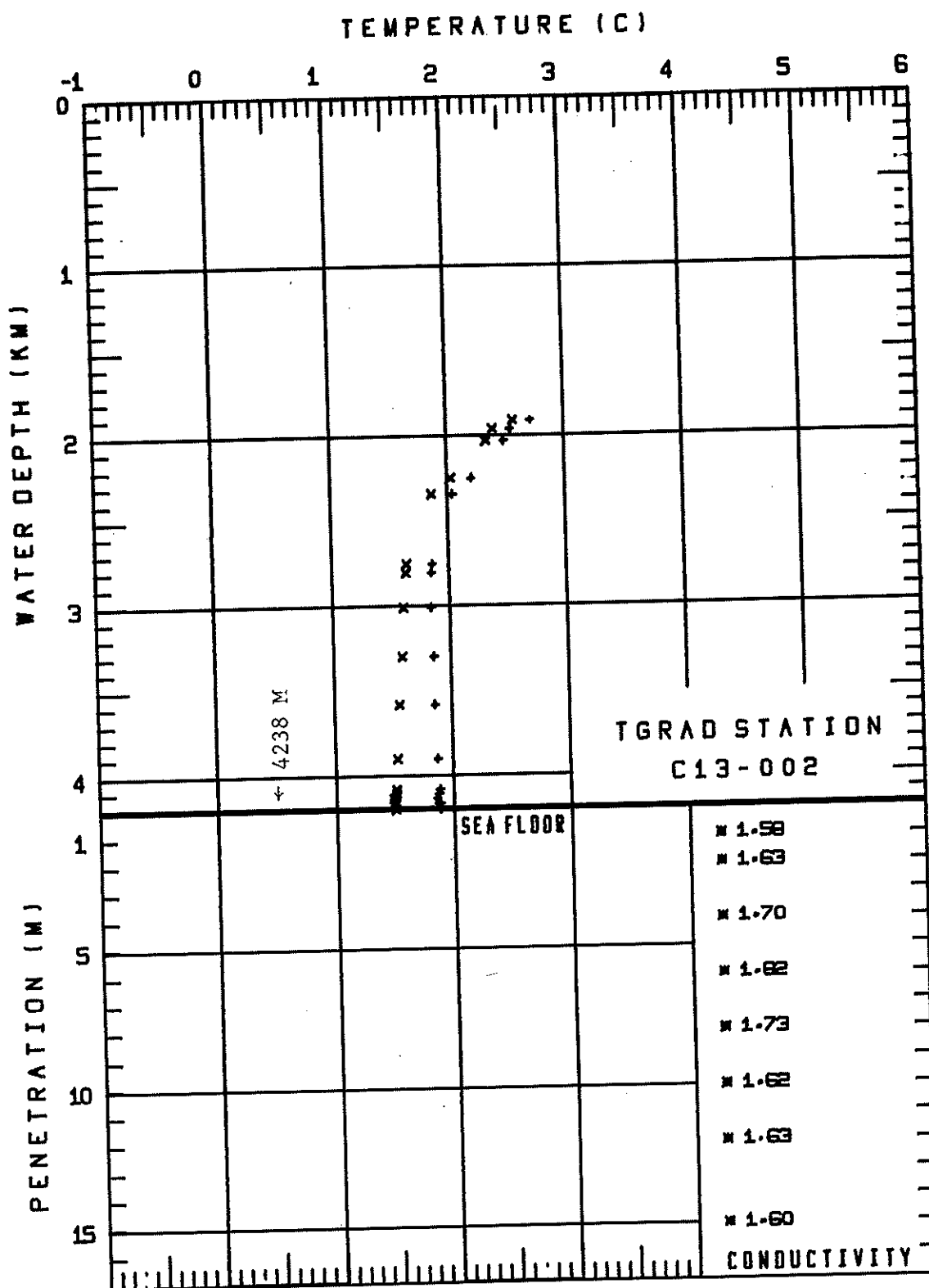
TGRAD STATION C13-002
 006 58.1 S 086 01.3 W
 CRUISE STATION 119

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1906 | 2.726 | 2.578 |
| 1957 | 2.554 | 2.403 |
| 2027 | 2.497 | 2.342 |
| 2247 | 2.209 | 2.036 |
| 2343 | 2.048 | 1.869 |
| 2754 | 1.861 | 1.647 |
| 2805 | 1.861 | 1.641 |
| 3007 | 1.855 | 1.612 |
| 3297 | 1.865 | 1.591 |
| 3583 | 1.868 | 1.559 |
| 3901 | 1.878 | 1.530 |
| 4134 | 1.867 | 1.492 |
| 4105 | 1.888 | 1.516 |
| 4081 | 1.890 | 1.519 |
| 4161 | 1.881 | 1.500 |
| 4166 | 1.894 | 1.513 |
| 4198 | 1.897 | 1.512 |

SEDIMENT CONDUCTIVITIES

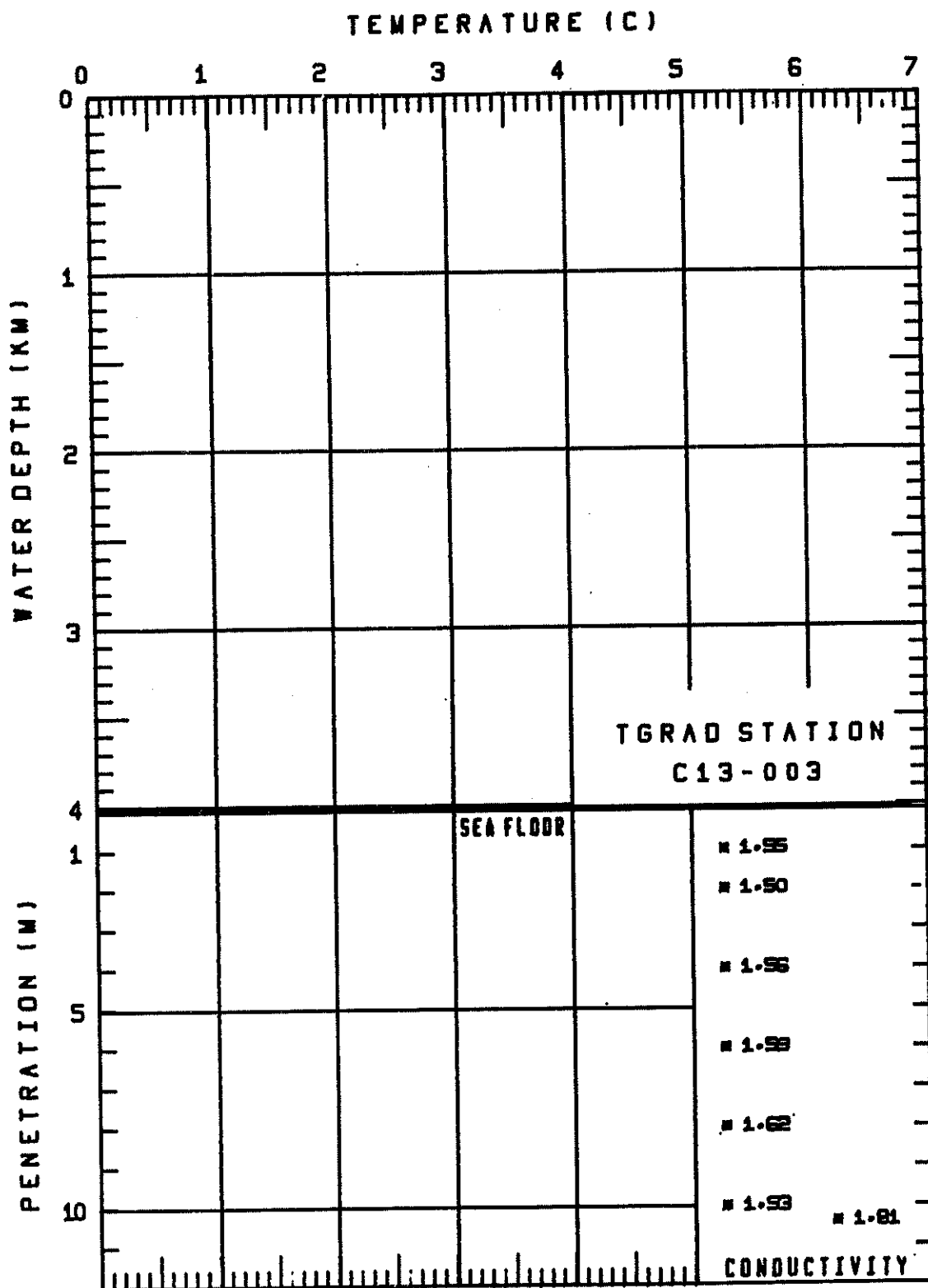
| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.58 |
| 2.00 | 1.63 |
| 4.00 | 1.70 |
| 6.00 | 1.82 |
| 8.00 | 1.73 |
| 10.00 | 1.62 |
| 12.00 | 1.63 |
| 15.00 | 1.60 |



TGRAD STATION C13-003
005 24.9 S 088 48.5 W
CRUISE STATION 120

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.55 |
| 2.00 | 1.50 |
| 4.00 | 1.56 |
| 6.00 | 1.59 |
| 8.00 | 1.62 |
| 10.00 | 1.53 |
| 10.38 | 1.81 |



TGRAD STATION C13-004
 003 07.2 S 089 25.1 W
 CRUISE STATION 121

WATER TEMPERATURES

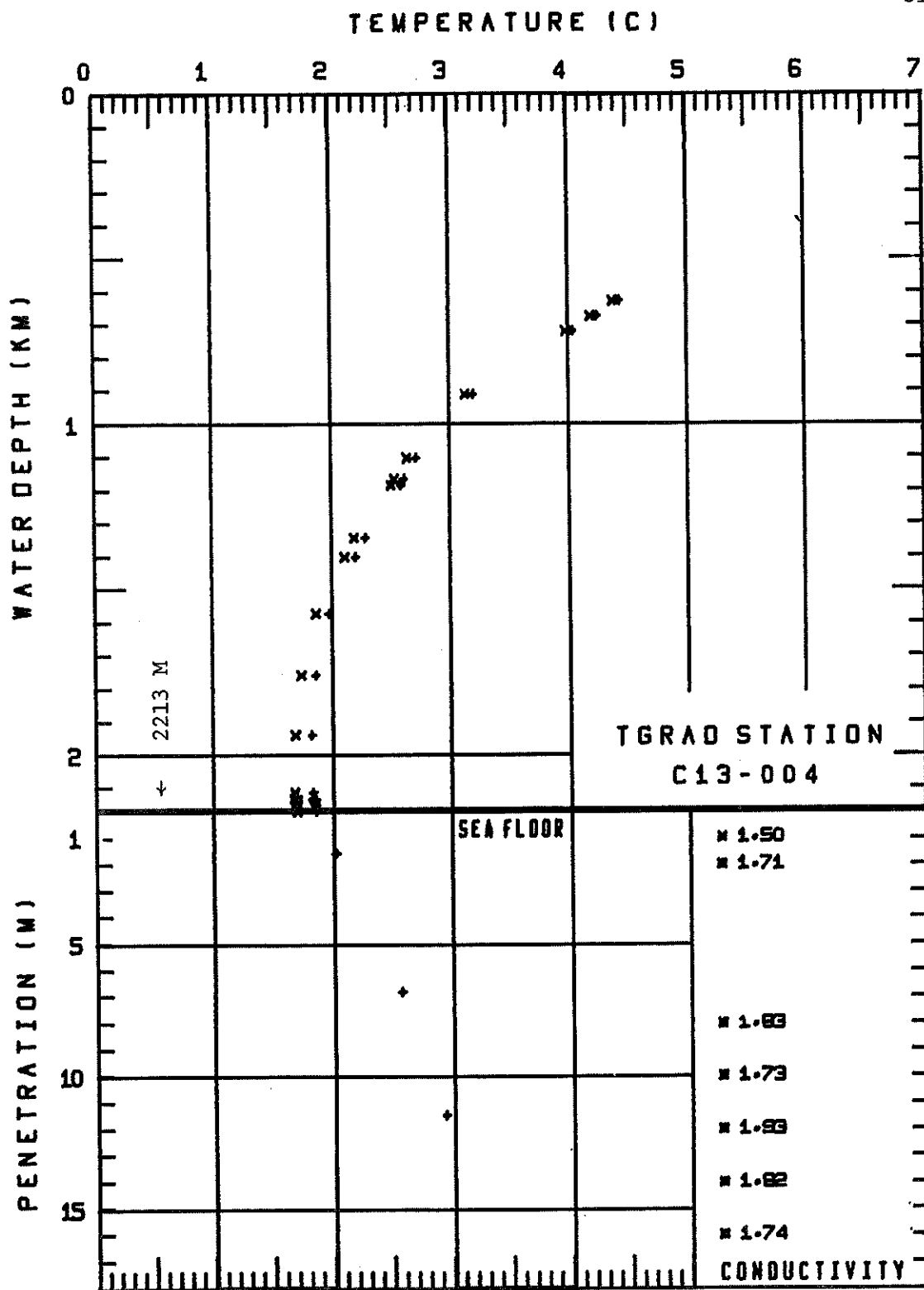
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 627 | 4.429 | 4.380 |
| 673 | 4.243 | 4.191 |
| 719 | 4.038 | 3.983 |
| 908 | 3.204 | 3.139 |
| 1101 | 2.720 | 2.644 |
| 1164 | 2.619 | 2.539 |
| 1184 | 2.596 | 2.514 |
| 1342 | 2.290 | 2.198 |
| 1401 | 2.212 | 2.117 |
| 1571 | 1.983 | 1.877 |
| 1757 | 1.869 | 1.749 |
| 1939 | 1.835 | 1.698 |
| 2113 | 1.846 | 1.694 |
| 2131 | 1.838 | 1.684 |
| 2141 | 1.858 | 1.703 |
| 2132 | 1.864 | 1.709 |
| 2146 | 1.855 | 1.700 |
| 2150 | 1.867 | 1.710 |
| 2169 | 1.871 | 1.713 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.60 | 2.034 |
| 6.80 | 2.580 |
| 11.45 | 2.947 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.50 |
| 2.00 | 1.71 |
| 8.00 | 1.83 |
| 10.00 | 1.73 |
| 12.00 | 1.93 |
| 14.00 | 1.82 |
| 16.00 | 1.74 |



TGRAD STATION C13-005
002 21.2 S 092 56.1 W
CRUISE STATION 122

~~33~~

SEDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| Top | 1.64 |
| <u>1.50</u> | <u>2.19</u> |
| 3.00 | 2.23 |

TGRAD STATION C13-006
 000 08.8 N 95 39.2 W
 CRUISE STATION 123

WATER TEMPERATURES

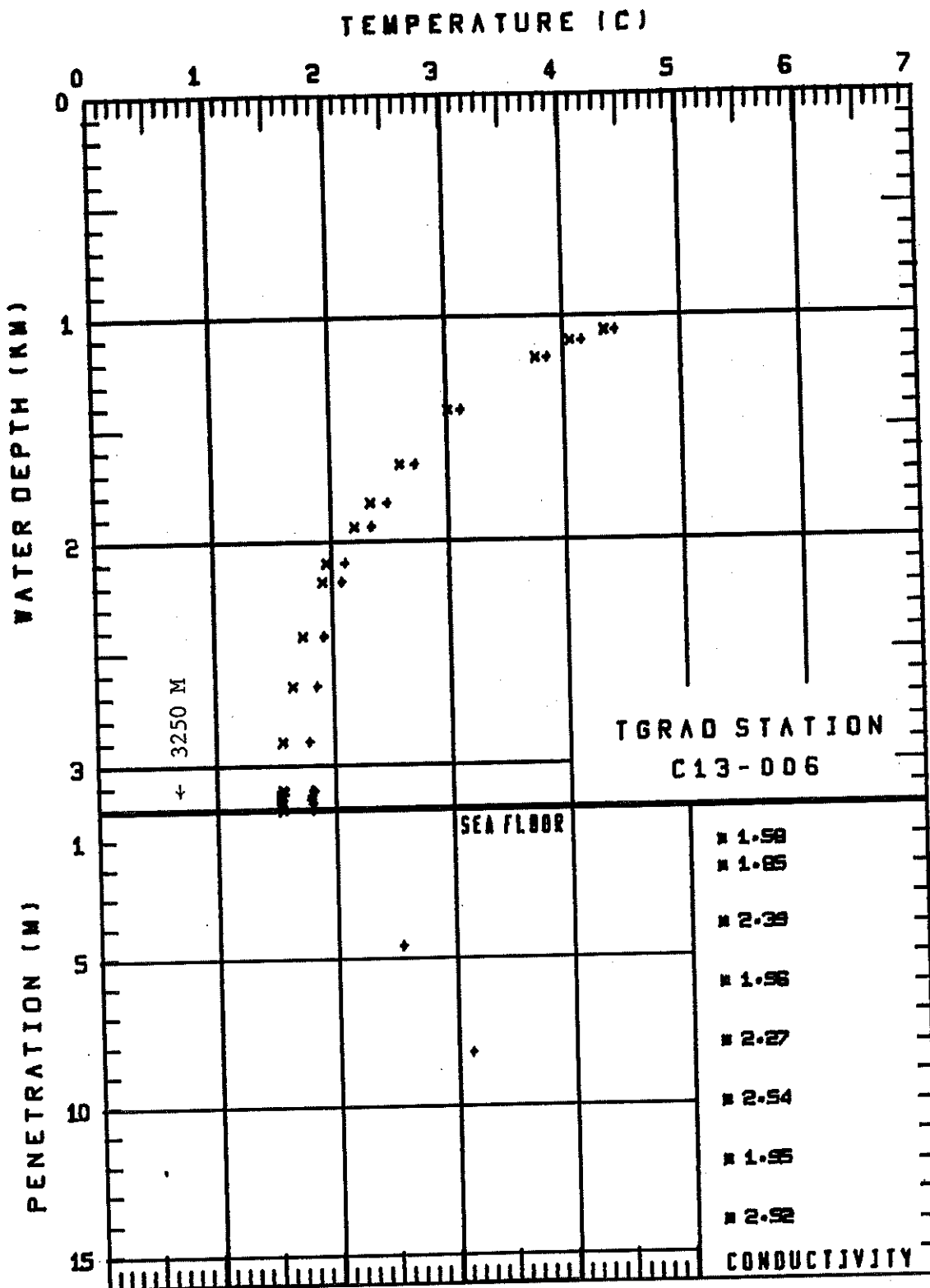
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1063 | 4.453 | 4.362 |
| 1109 | 4.163 | 4.072 |
| 1183 | 3.874 | 3.778 |
| 1417 | 3.133 | 3.025 |
| 1656 | 2.733 | 2.607 |
| 1826 | 2.488 | 2.351 |
| 1933 | 2.359 | 2.214 |
| 2095 | 2.126 | 1.970 |
| 2180 | 2.095 | 1.933 |
| 2421 | 1.938 | 1.755 |
| 2645 | 1.869 | 1.664 |
| 2894 | 1.800 | 1.572 |
| 3112 | 1.819 | 1.566 |
| 3115 | 1.831 | 1.578 |
| 3133 | 1.809 | 1.553 |
| 3150 | 1.805 | 1.549 |
| 3168 | 1.819 | 1.559 |
| 3200 | 1.825 | 1.562 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 4.60 | 2.556 |
| 8.20 | 3.134 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.20 | 1.58 |
| 2.10 | 1.85 |
| 4.00 | 2.39 |
| 6.00 | 1.96 |
| 8.00 | 2.27 |
| 10.00 | 2.54 |
| 12.00 | 1.95 |
| 14.00 | 2.52 |



TGRAD STATION C13-007
 000 32.2 S 098 41.2 W
 CRUISE STATION 124

WATER TEMPERATURES

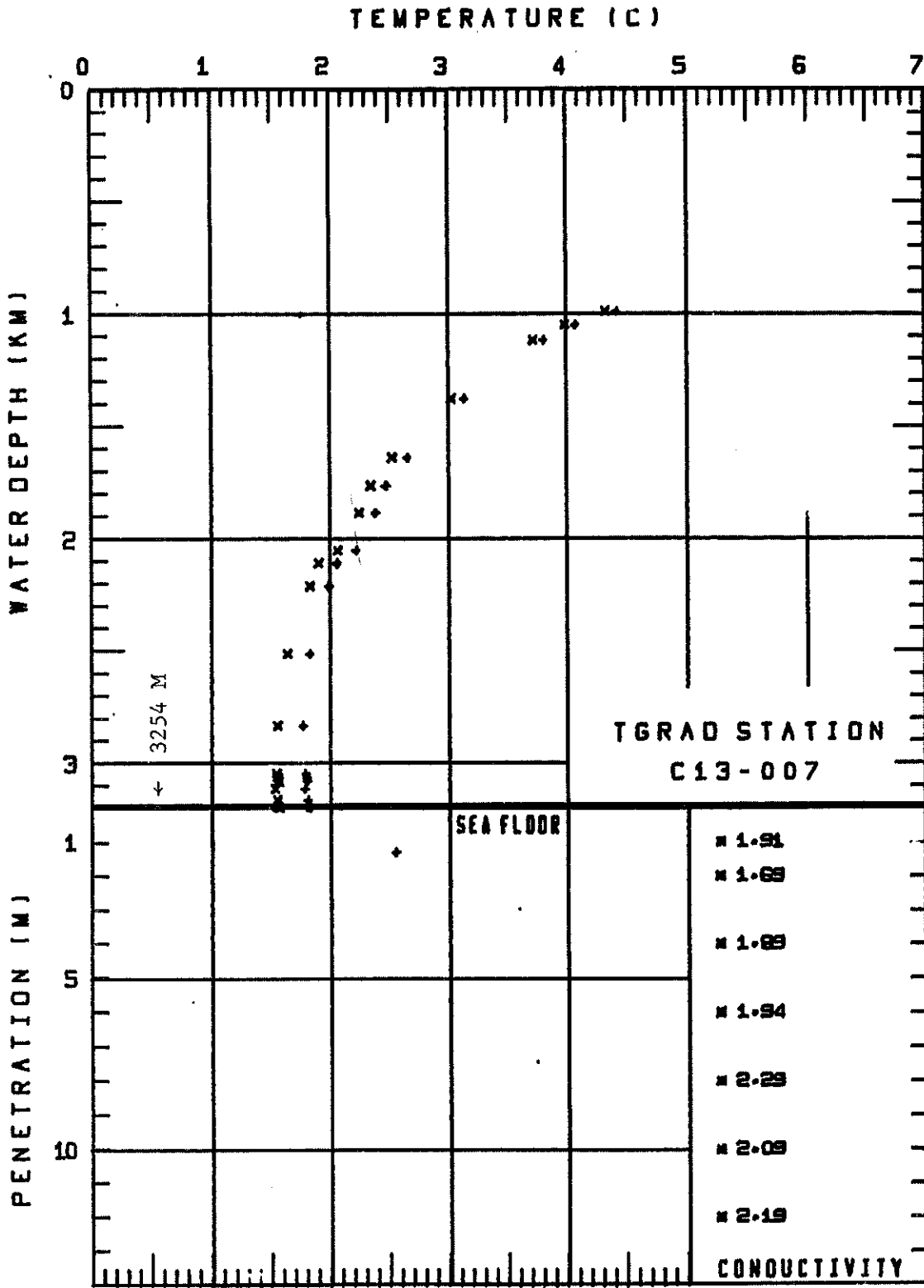
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 986 | 4.415 | 4.335 |
| 1047 | 4.078 | 3.993 |
| 1113 | 3.810 | 3.723 |
| 1373 | 3.138 | 3.032 |
| 1638 | 2.657 | 2.534 |
| 1758 | 2.479 | 2.348 |
| 1761 | 2.480 | 2.349 |
| 1881 | 2.391 | 2.250 |
| 2047 | 2.223 | 2.069 |
| 2105 | 2.063 | 1.908 |
| 2208 | 2.000 | 1.836 |
| 2510 | 1.832 | 1.641 |
| 2828 | 1.779 | 1.558 |
| 3041 | 1.798 | 1.553 |
| 3059 | 1.802 | 1.556 |
| 3078 | 1.811 | 1.562 |
| 3108 | 1.789 | 1.539 |
| 3158 | 1.819 | 1.561 |
| 3191 | 1.812 | 1.552 |
| 3194 | 1.835 | 1.573 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.30 | 2.553 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.91 |
| 2.00 | 1.69 |
| 4.00 | 1.89 |
| 6.00 | 1.94 |
| 8.00 | 2.29 |
| 10.00 | 2.09 |
| 12.00 | 2.19 |



TGRAD STATION C13-008
 001 12.0 S 101 22.0 W
 CRUISE STATION 125

WATER TEMPERATURES

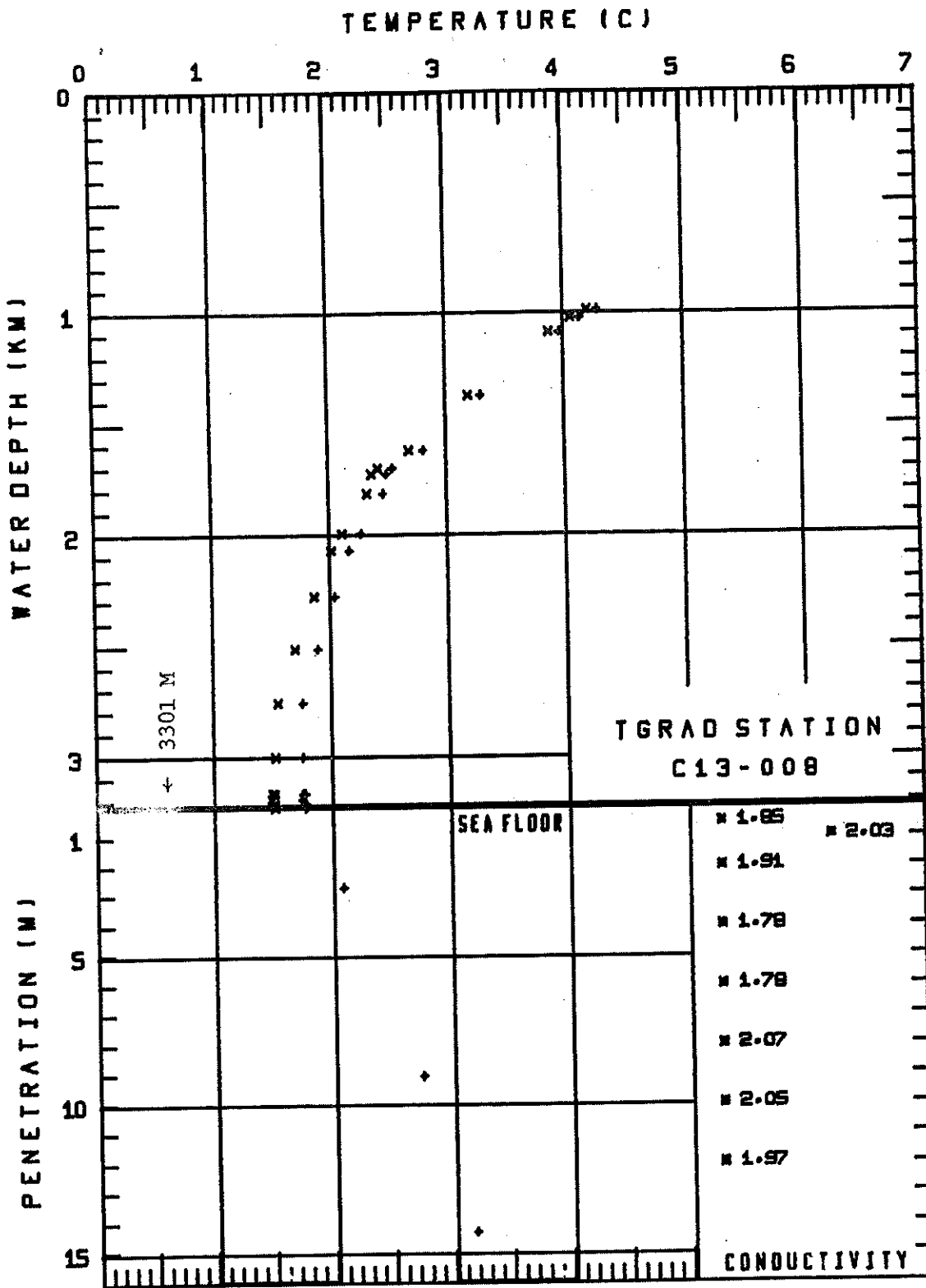
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 986 | 4.286 | 4.205 |
| 1023 | 4.145 | 4.062 |
| 1086 | 3.968 | 3.881 |
| 1370 | 3.306 | 3.200 |
| 1615 | 2.811 | 2.690 |
| 1809 | 2.467 | 2.330 |
| 1695 | 2.552 | 2.424 |
| 1721 | 2.496 | 2.369 |
| 1988 | 2.269 | 2.120 |
| 2065 | 2.180 | 2.026 |
| 2272 | 2.050 | 1.878 |
| 2509 | 1.901 | 1.710 |
| 2751 | 1.773 | 1.561 |
| 2996 | 1.772 | 1.532 |
| 3160 | 1.763 | 1.507 |
| 3160 | 1.782 | 1.526 |
| 3159 | 1.776 | 1.519 |
| 3188 | 1.757 | 1.499 |
| 3206 | 1.789 | 1.526 |
| 3225 | 1.792 | 1.527 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.70 | 2.092 |
| 9.05 | 2.743 |
| 14.30 | 3.186 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY .CGS |
|-----------------|----------------------|
| 0.50 | 1.85 |
| 1.00 | 2.03 |
| 2.00 | 1.91 |
| 4.00 | 1.78 |
| 6.00 | 1.78 |
| 8.00 | 2.07 |
| 10.00 | 2.05 |
| 12.00 | 1.97 |



TGRAD STATION C13-009
 001 39.1 S 103 38.0 W
 CRUISE STATION 126

WATER TEMPERATURES

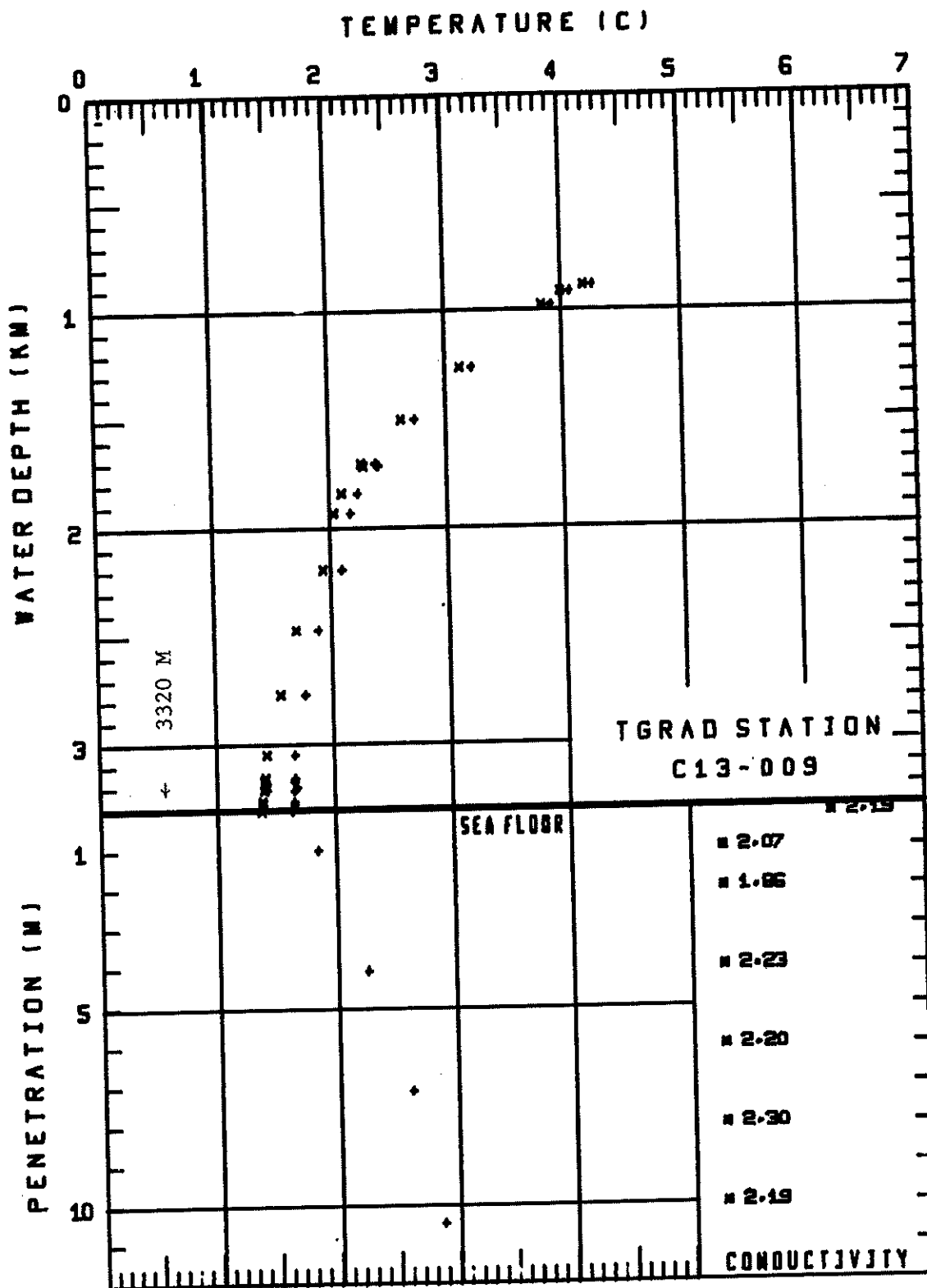
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 883 | 4.259 | 4.189 |
| 912 | 4.072 | 4.001 |
| 974 | 3.914 | 3.836 |
| 1259 | 3.229 | 3.133 |
| 1499 | 2.736 | 2.625 |
| 1700 | 2.400 | 2.276 |
| 1709 | 2.421 | 2.296 |
| 1837 | 2.243 | 2.108 |
| 1928 | 2.184 | 2.042 |
| 2186 | 2.106 | 1.943 |
| 2467 | 1.891 | 1.703 |
| 2763 | 1.776 | 1.562 |
| 3044 | 1.680 | 1.437 |
| 3148 | 1.677 | 1.425 |
| 3165 | 1.671 | 1.417 |
| 3195 | 1.690 | 1.431 |
| 3207 | 1.668 | 1.411 |
| 3260 | 1.664 | 1.400 |
| 3271 | 1.664 | 1.398 |
| 3304 | 1.651 | 1.382 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.00 | 1.858 |
| 4.05 | 2.262 |
| 7.10 | 2.625 |
| 10.45 | 2.875 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.15 | 2.19 |
| 1.00 | 2.07 |
| 2.00 | 1.86 |
| 4.00 | 2.23 |
| 6.00 | 2.20 |
| 8.00 | 2.30 |
| 10.00 | 2.19 |



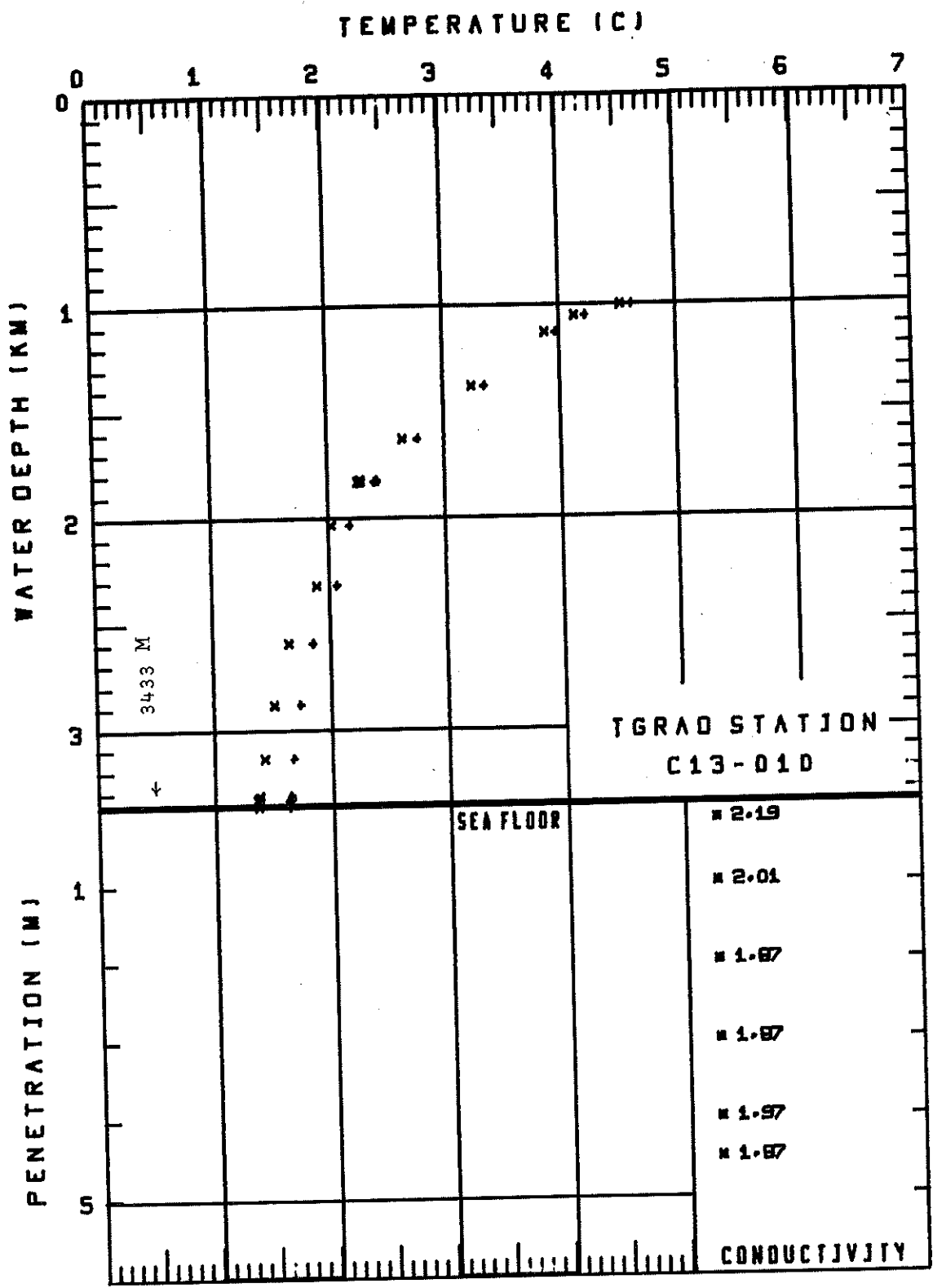
TGRAD STATION C13-010
 001 39.1 S 103 38.0 W
CRUISE STATION 126

WATER TEMPERATURES

| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| 997 | 4.621 | 4.538 |
| 1050 | 4.230 | 4.144 |
| 1128 | 3.980 | 3.889 |
| 1379 | 3.363 | 3.256 |
| 1623 | 2.783 | 2.660 |
| 1830 | 2.428 | 2.291 |
| 1818 | 2.429 | 2.295 |
| 1827 | 2.409 | 2.273 |
| 2032 | 2.188 | 2.038 |
| 2313 | 2.079 | 1.902 |
| 2586 | 1.859 | 1.661 |
| 2877 | 1.753 | 1.527 |
| 3131 | 1.687 | 1.436 |
| 3308 | 1.661 | 1.391 |
| 3327 | 1.644 | 1.374 |
| 3319 | 1.655 | 1.384 |
| 3330 | 1.640 | 1.368 |
| 3328 | 1.655 | 1.384 |
| 3360 | 1.654 | 1.380 |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH METERS</u> | <u>CONDUCTIVITY CGS</u> |
|-------------------------|-----------------------------|
| 0.20 | 2.19 |
| 1.00 | 2.01 |
| 2.00 | 1.87 |
| 3.00 | 1.87 |
| 4.00 | 1.97 |
| 4.50 | 1.87 |



TGRAD STATION C13-011
 001 38.1 N 104 50.2 W
 CRUISE STATION 127

WATER TEMPERATURES

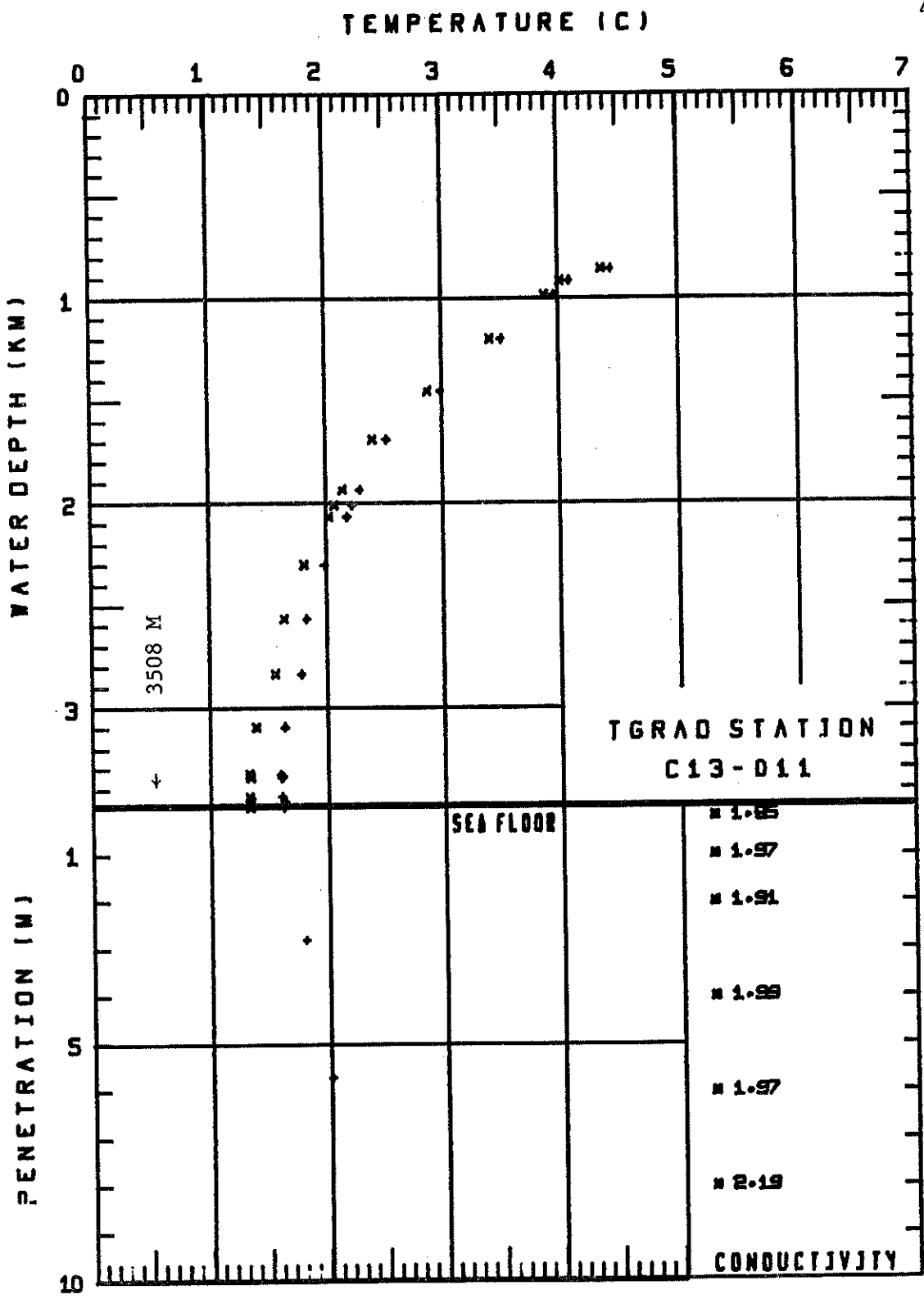
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 853 | 4.435 | 4.365 |
| 913 | 4.089 | 4.016 |
| 984 | 3.959 | 3.881 |
| 1193 | 3.509 | 3.417 |
| 1450 | 2.989 | 2.881 |
| 1685 | 2.526 | 2.401 |
| 1931 | 2.289 | 2.145 |
| 2008 | 2.229 | 2.079 |
| 2063 | 2.186 | 2.032 |
| 2298 | 1.992 | 1.819 |
| 2560 | 1.836 | 1.641 |
| 2831 | 1.789 | 1.568 |
| 3090 | 1.644 | 1.398 |
| 3316 | 1.605 | 1.338 |
| 3329 | 1.621 | 1.352 |
| 3334 | 1.615 | 1.345 |
| 3334 | 1.621 | 1.349 |
| 3431 | 1.618 | 1.336 |
| 3451 | 1.638 | 1.354 |
| 3480 | 1.634 | 1.345 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 2.80 | 1.815 |
| 5.70 | 2.019 |

SEDIMENT CONDUCTIVITIES

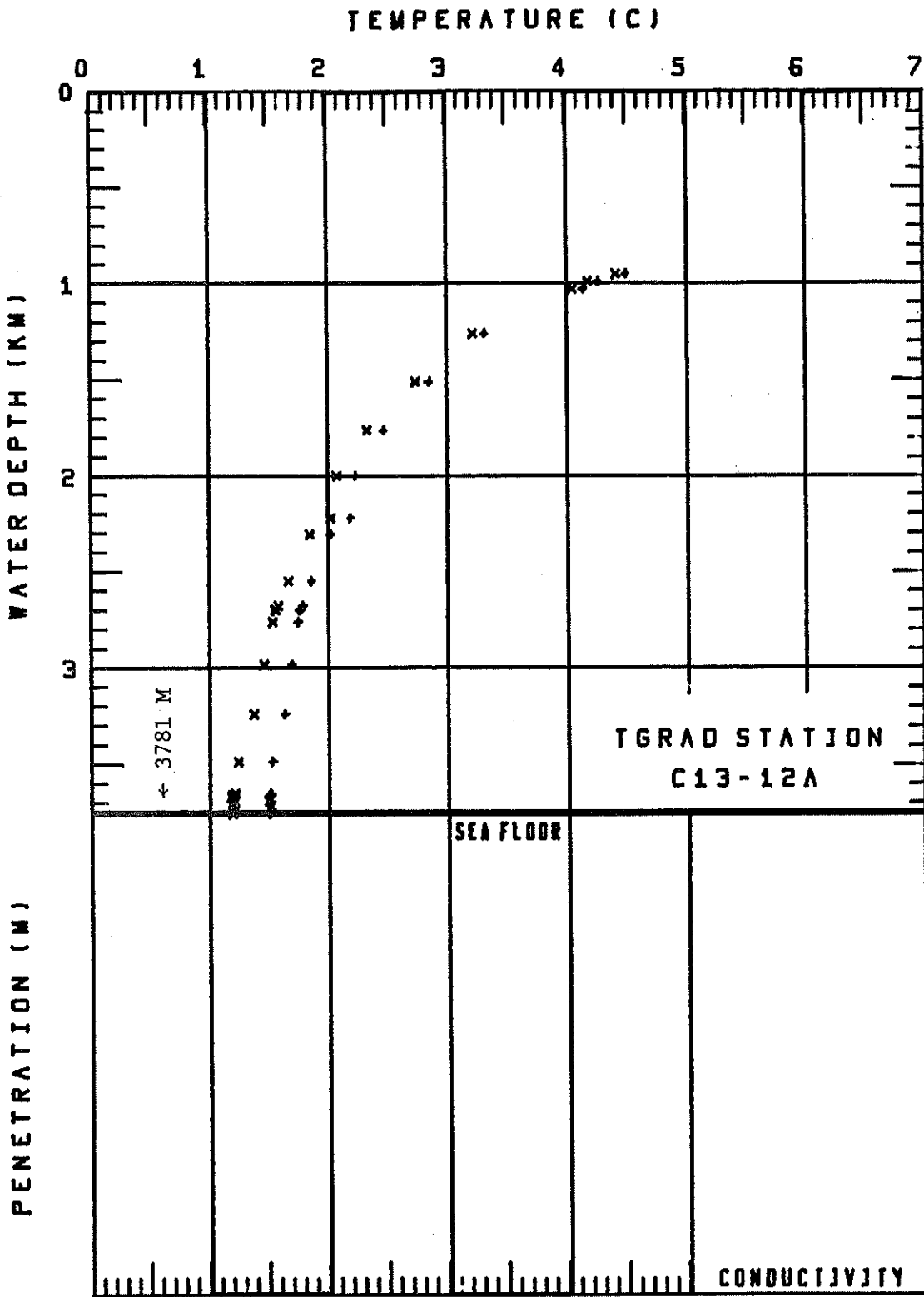
| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.20 | 1.85 |
| 1.00 | 1.97 |
| 2.00 | 1.91 |
| 4.00 | 1.99 |
| 6.00 | 1.97 |
| 8.00 | 2.19 |



TGRAD STATION C13-12A
002 04.0 S 106 55.0 W
CRUISE STATION 128

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 952 | 4.496 | 4.417 |
| 988 | 4.263 | 4.184 |
| 1027 | 4.141 | 4.059 |
| 1260 | 3.324 | 3.229 |
| 1511 | 2.857 | 2.743 |
| 1759 | 2.471 | 2.341 |
| 1998 | 2.233 | 2.085 |
| 2218 | 2.200 | 2.030 |
| 2301 | 2.029 | 1.855 |
| 2543 | 1.871 | 1.677 |
| 2695 | 1.779 | 1.572 |
| 2674 | 1.799 | 1.592 |
| 2696 | 1.775 | 1.566 |
| 2756 | 1.755 | 1.542 |
| 2977 | 1.707 | 1.471 |
| 3235 | 1.642 | 1.381 |
| 3484 | 1.536 | 1.250 |
| 3659 | 1.517 | 1.213 |
| 3654 | 1.526 | 1.221 |
| 3667 | 1.503 | 1.197 |
| 3649 | 1.527 | 1.224 |
| 3660 | 1.510 | 1.207 |
| 3693 | 1.527 | 1.219 |
| 3705 | 1.515 | 1.206 |
| 3732 | 1.529 | 1.216 |
| 3754 | 1.520 | 1.204 |



TGRAD STATION C13-012
 000 18.9 S 106 54.0 W
 CRUISE STATION 129

WATER TEMPERATURES

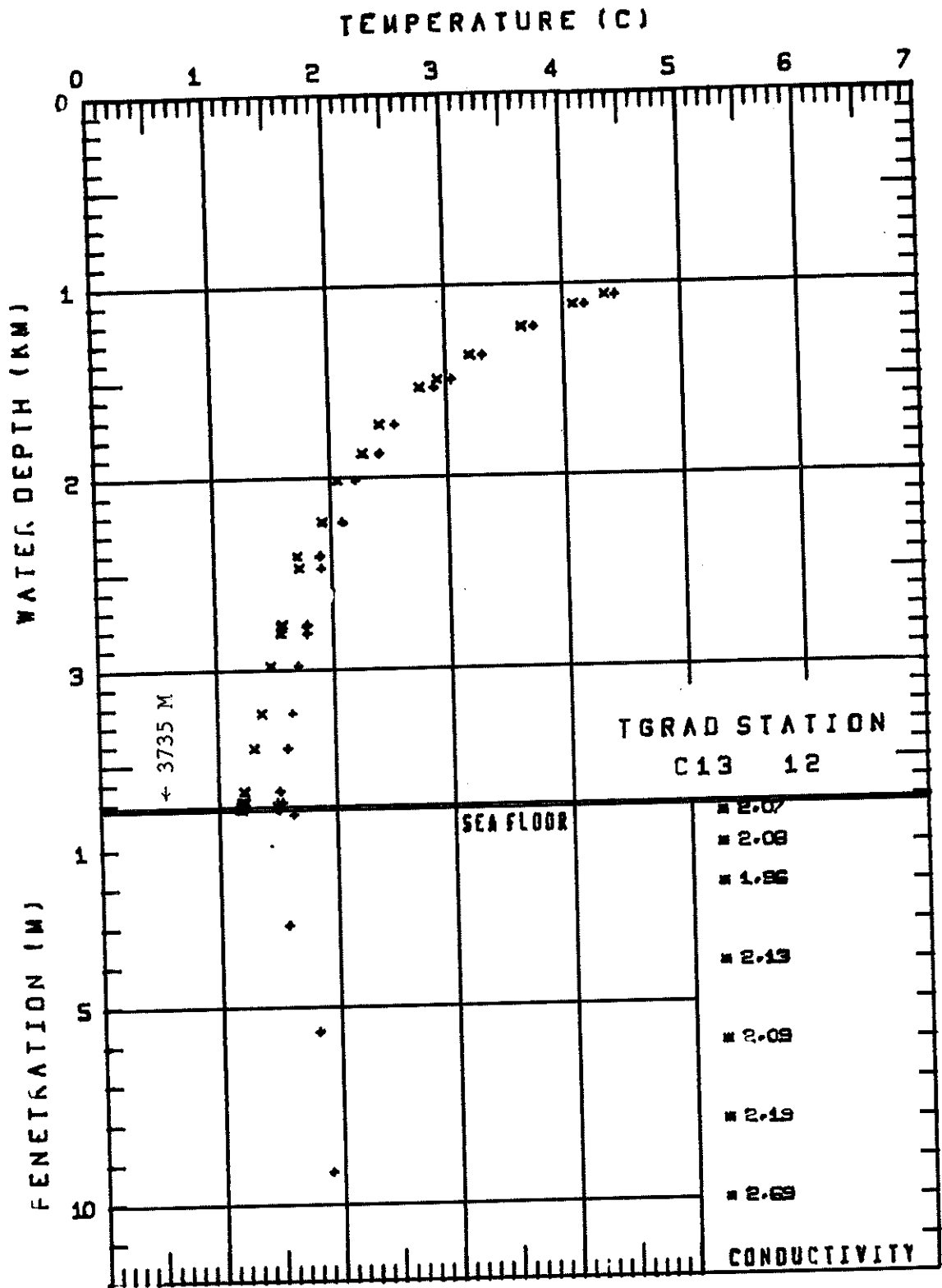
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1056 | 4.444 | 4.356 |
| 1104 | 4.185 | 4.094 |
| 1216 | 3.749 | 3.651 |
| 1364 | 3.317 | 3.211 |
| 1487 | 3.053 | 2.940 |
| 1527 | 2.902 | 2.786 |
| 1718 | 2.565 | 2.436 |
| 1868 | 2.434 | 2.293 |
| 2010 | 2.221 | 2.072 |
| 2224 | 2.107 | 1.940 |
| 2401 | 1.901 | 1.720 |
| 2466 | 1.921 | 1.733 |
| 2584 | 2.005 | 1.802 |
| 2767 | 1.777 | 1.563 |
| 2759 | 1.792 | 1.578 |
| 2805 | 1.782 | 1.565 |
| 2974 | 1.704 | 1.470 |
| 3221 | 1.647 | 1.388 |
| 3405 | 1.599 | 1.321 |
| 3547 | 1.489 | 1.198 |
| 3628 | 1.523 | 1.223 |
| 3700 | 1.506 | 1.197 |
| 3684 | 1.507 | 1.201 |
| 3723 | 1.496 | 1.184 |
| 3684 | 1.542 | 1.233 |
| 3727 | 1.517 | 1.206 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.12 | 1.635 |
| <u>2.92</u> | <u>1.578</u> |
| 5.62 | 1.818 |
| 9.17 | 1.907 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 2.07 |
| <u>1.00</u> | <u>2.08</u> |
| 2.00 | 1.96 |
| <u>4.00</u> | <u>2.13</u> |
| 6.00 | 2.09 |
| <u>8.00</u> | <u>2.19</u> |
| <u>10.00</u> | <u>2.69</u> |



TGRAD STATION C13-013
 000 57.5 N 106 53.1 W
 CRUISE STATION 130

WATER TEMPERATURES

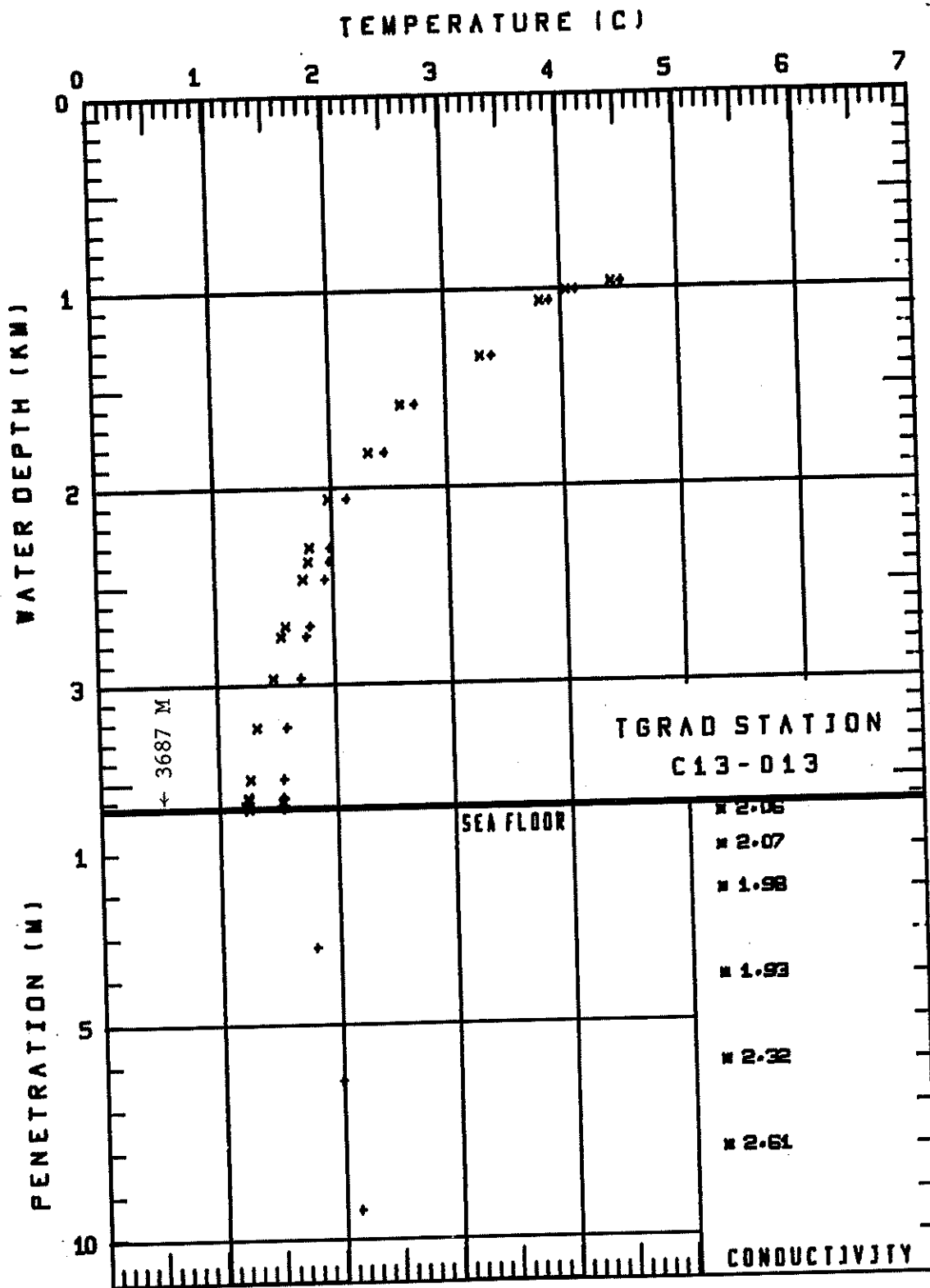
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 965 | 4.527 | 4.446 |
| 1003 | 4.137 | 4.056 |
| 1058 | 3.913 | 3.829 |
| 1336 | 3.414 | 3.310 |
| 1577 | 2.738 | 2.620 |
| 1819 | 2.473 | 2.336 |
| 2055 | 2.138 | 1.986 |
| 2300 | 1.993 | 1.819 |
| 2373 | 1.982 | 1.802 |
| 2462 | 1.944 | 1.756 |
| 2698 | 1.812 | 1.605 |
| 2752 | 1.779 | 1.565 |
| 2965 | 1.723 | 1.490 |
| 3216 | 1.599 | 1.342 |
| 3479 | 1.565 | 1.279 |
| 3571 | 1.556 | 1.260 |
| 3580 | 1.552 | 1.256 |
| 3579 | 1.562 | 1.265 |
| 3617 | 1.529 | 1.229 |
| 3615 | 1.566 | 1.266 |
| 3631 | 1.565 | 1.263 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.23 | 1.813 |
| 6.33 | 2.006 |
| 9.33 | 2.135 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 2.06 |
| 1.00 | 2.07 |
| 2.00 | 1.98 |
| 4.00 | 1.93 |
| 6.00 | 2.32 |
| 8.00 | 2.61 |



TGRAD STATION C13-014
 002 32.0 N 107 13.1 W
 CRUISE STATION 131

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 903 | 4.538 | 4.463 |
| 950 | 4.365 | 4.288 |
| 1009 | 4.123 | 4.041 |
| 1289 | 3.370 | 3.271 |
| 1539 | 2.795 | 2.679 |
| 1797 | 2.417 | 2.284 |
| 2050 | 2.126 | 1.974 |
| 2298 | 1.944 | 1.772 |
| 2352 | 1.913 | 1.736 |
| 2437 | 1.868 | 1.684 |
| 2676 | 1.821 | 1.614 |
| 2682 | 1.818 | 1.611 |
| 2918 | 1.700 | 1.471 |
| 3204 | 1.582 | 1.326 |
| 3456 | 1.565 | 1.282 |
| 3637 | 1.546 | 1.243 |
| 3641 | 1.572 | 1.269 |
| 3648 | 1.569 | 1.263 |
| 3641 | 1.558 | 1.253 |
| 3718 | 1.569 | 1.256 |
| 3739 | 1.568 | 1.252 |
| 3758 | 1.582 | 1.263 |

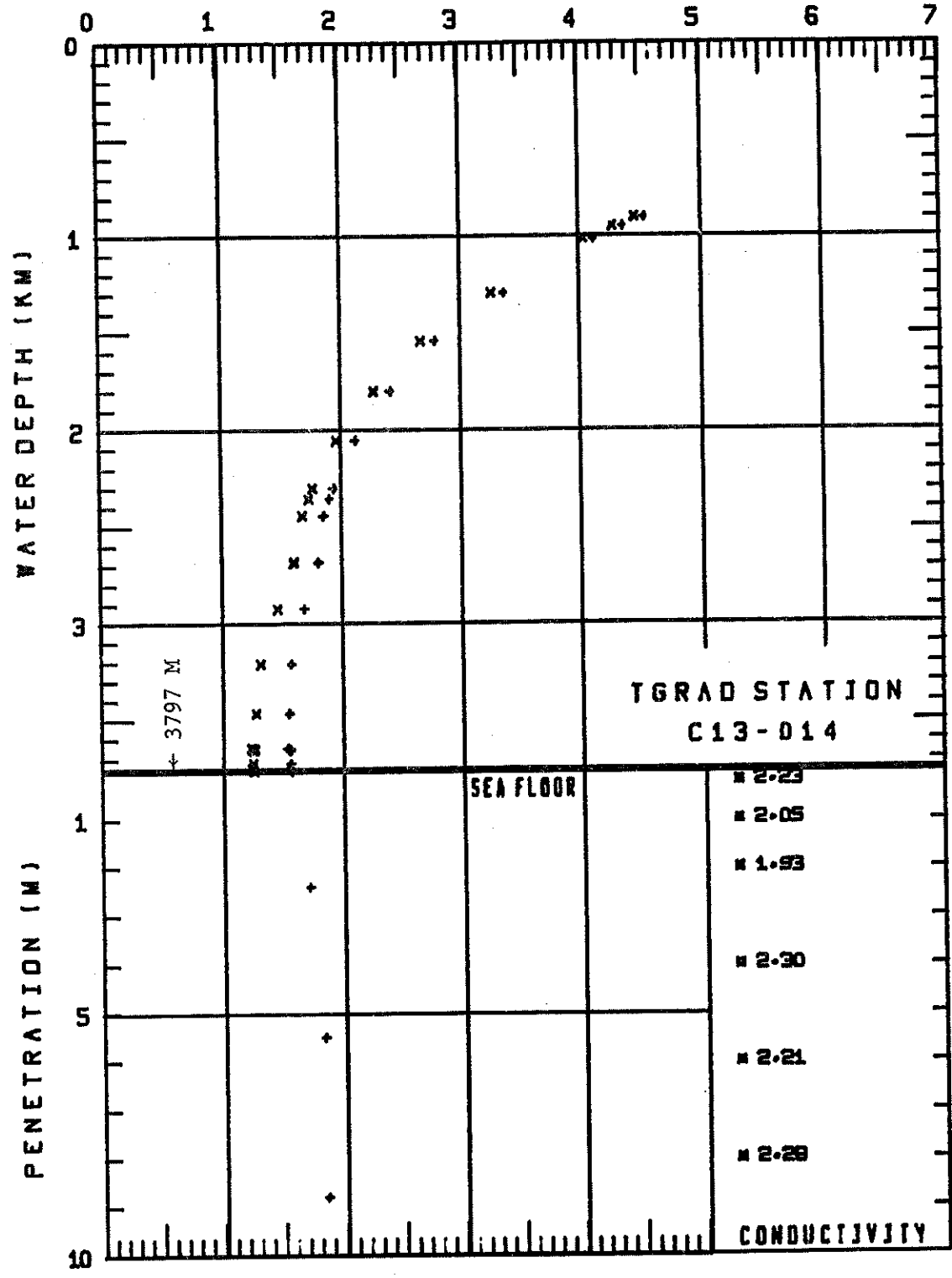
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.38 | 1.721 |
| 5.48 | 1.839 |
| 8.78 | 1.855 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 2.23 |
| 1.00 | 2.05 |
| 2.00 | 1.93 |
| 4.00 | 2.30 |
| 6.00 | 2.21 |
| 8.00 | 2.28 |

TEMPERATURE (C)



TGRAD STATION C13-015
 003 50.8 N 106 54.2 W
 CRUISE STATION 132..

WATER TEMPERATURES

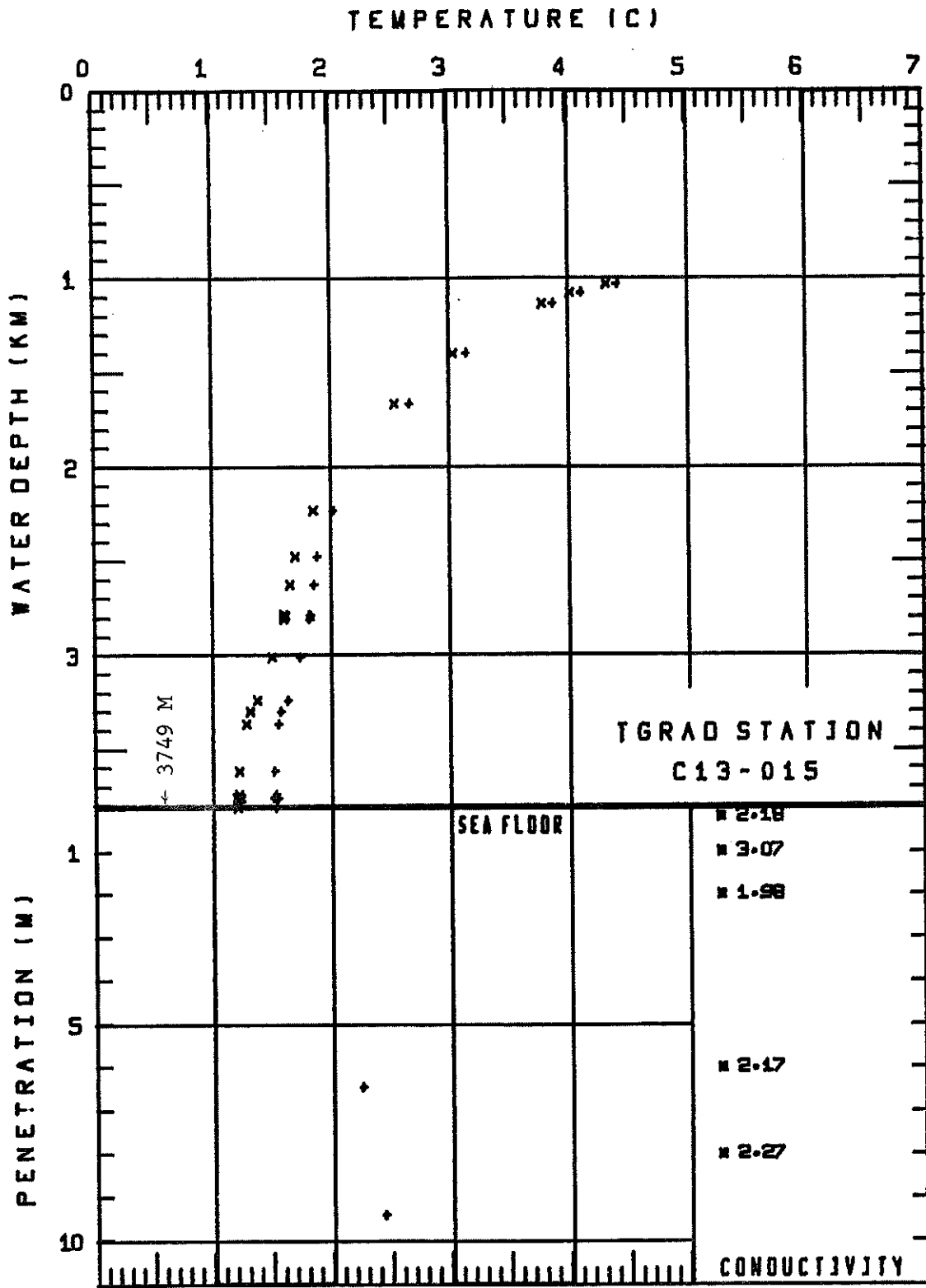
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1027 | 4.418 | 4.333 |
| 1073 | 4.115 | 4.028 |
| 1134 | 3.887 | 3.796 |
| 1395 | 3.160 | 3.053 |
| 1664 | 2.675 | 2.550 |
| 2227 | 2.032 | 1.865 |
| 2474 | 1.900 | 1.711 |
| 2622 | 1.868 | 1.667 |
| 2784 | 1.832 | 1.615 |
| 2789 | 1.839 | 1.621 |
| 2804 | 1.829 | 1.609 |
| 3007 | 1.753 | 1.515 |
| 3236 | 1.647 | 1.385 |
| 3296 | 1.588 | 1.322 |
| 3361 | 1.565 | 1.292 |
| 3614 | 1.532 | 1.232 |
| 3735 | 1.542 | 1.229 |
| 3751 | 1.527 | 1.211 |
| 3757 | 1.561 | 1.243 |
| 3807 | 1.542 | 1.220 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 6.45 | 2.257 |
| 9.40 | 2.441 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 2.18 |
| 1.00 | 3.07 |
| 2.00 | 1.98 |
| 6.00 | 2.17 |
| 8.00 | 2.27 |



TGRAD STATION C13-016
 005 24.5 N 106 54.2 W
 CRUISE STATION 133

WATER TEMPERATURES

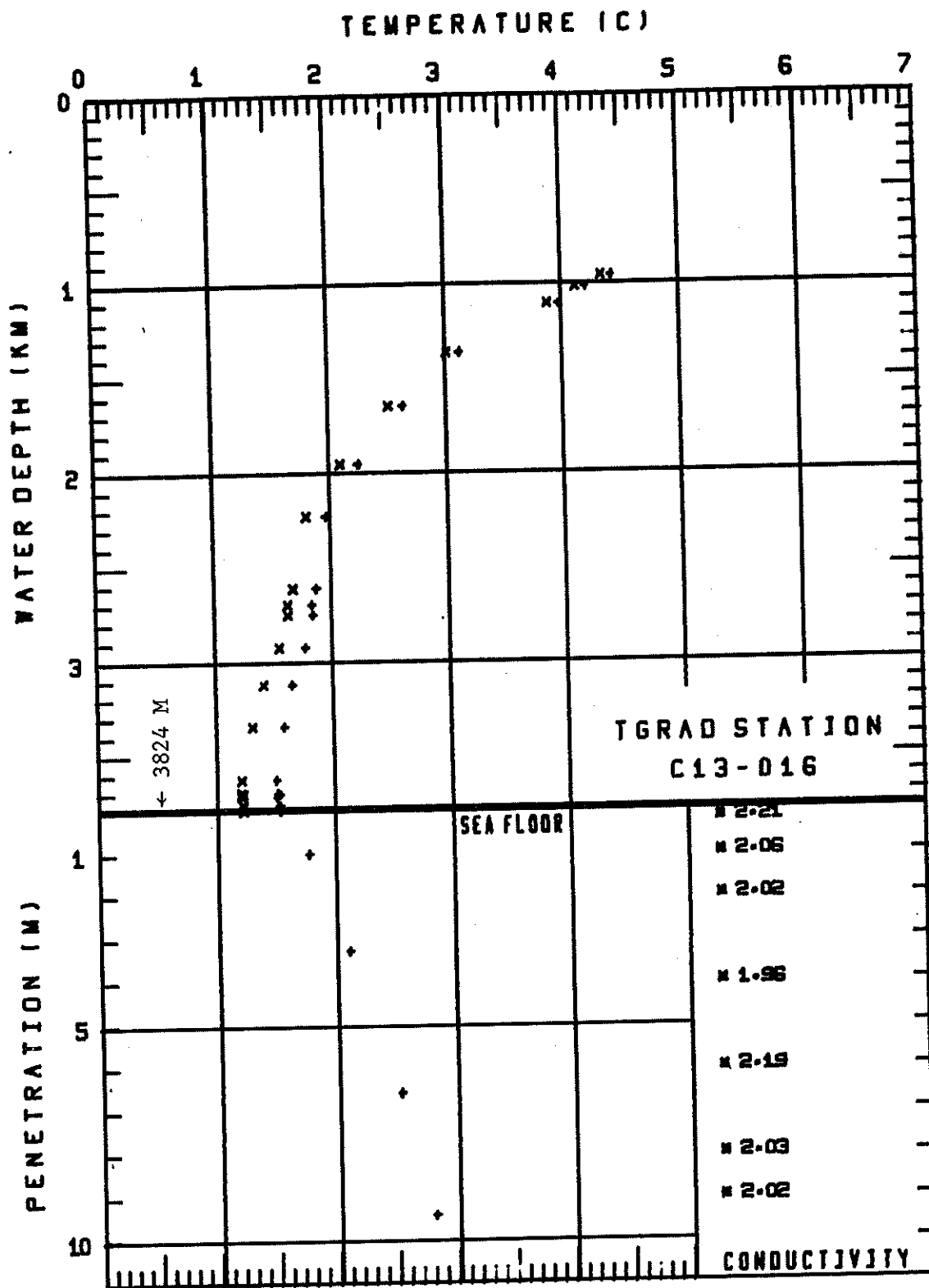
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 956 | 4.421 | 4.342 |
| 1017 | 4.204 | 4.121 |
| 1106 | 3.975 | 3.885 |
| 1360 | 3.121 | 3.019 |
| 1644 | 2.639 | 2.517 |
| 1949 | 2.250 | 2.105 |
| 2224 | 1.969 | 1.803 |
| 2607 | 1.887 | 1.686 |
| 2689 | 1.848 | 1.640 |
| 2743 | 1.852 | 1.638 |
| 2915 | 1.788 | 1.558 |
| 3115 | 1.664 | 1.417 |
| 3336 | 1.589 | 1.319 |
| 3619 | 1.519 | 1.220 |
| 3693 | 1.542 | 1.233 |
| 3696 | 1.529 | 1.220 |
| 3691 | 1.523 | 1.216 |
| 3706 | 1.526 | 1.216 |
| 3753 | 1.546 | 1.230 |
| 3783 | 1.550 | 1.230 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.01 | 1.785 |
| 3.26 | 2.118 |
| 6.56 | 2.530 |
| 9.41 | 2.812 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 2.21 |
| 1.00 | 2.06 |
| 2.00 | 2.02 |
| 4.00 | 1.96 |
| 6.00 | 2.19 |
| 8.00 | 2.03 |
| 9.00 | 2.02 |



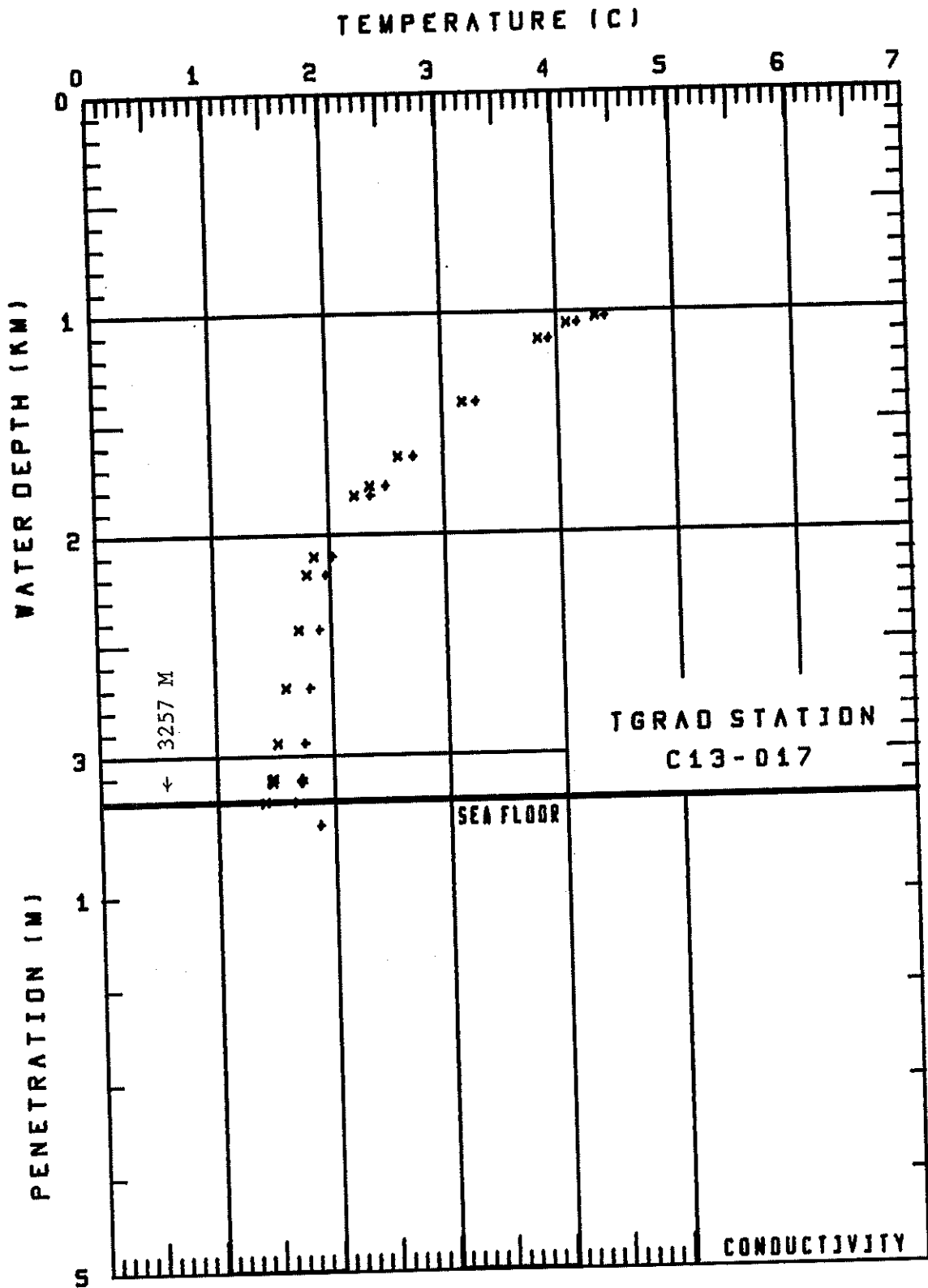
TGRAD STATION C13-017
 010 02.5 N 107 00.0 W
 CRUISE STATIO 134

WATER TEMPERATURES

| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| <u>1022</u> | <u>4.427</u> | <u>4.342</u> |
| <u>1051</u> | <u>4.181</u> | <u>4.095</u> |
| <u>1122</u> | <u>3.940</u> | <u>3.850</u> |
| <u>1404</u> | <u>3.297</u> | <u>3.187</u> |
| <u>1645</u> | <u>2.744</u> | <u>2.620</u> |
| <u>1777</u> | <u>2.505</u> | <u>2.371</u> |
| <u>1821</u> | <u>2.375</u> | <u>2.240</u> |
| <u>2096</u> | <u>2.034</u> | <u>1.881</u> |
| <u>2177</u> | <u>1.976</u> | <u>1.815</u> |
| <u>2426</u> | <u>1.914</u> | <u>1.732</u> |
| <u>2691</u> | <u>1.816</u> | <u>1.609</u> |
| <u>2940</u> | <u>1.763</u> | <u>1.530</u> |
| <u>3103</u> | <u>1.739</u> | <u>1.490</u> |
| <u>3103</u> | <u>1.729</u> | <u>1.480</u> |
| <u>3113</u> | <u>1.727</u> | <u>1.477</u> |
| <u>3118</u> | <u>1.737</u> | <u>1.486</u> |
| <u>3208</u> | <u>1.674</u> | <u>1.415</u> |

SEDIMENT TEMPERATURES

| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
|-------------------------|-----------------------------------|
| <u>0.25</u> | <u>1.884</u> |

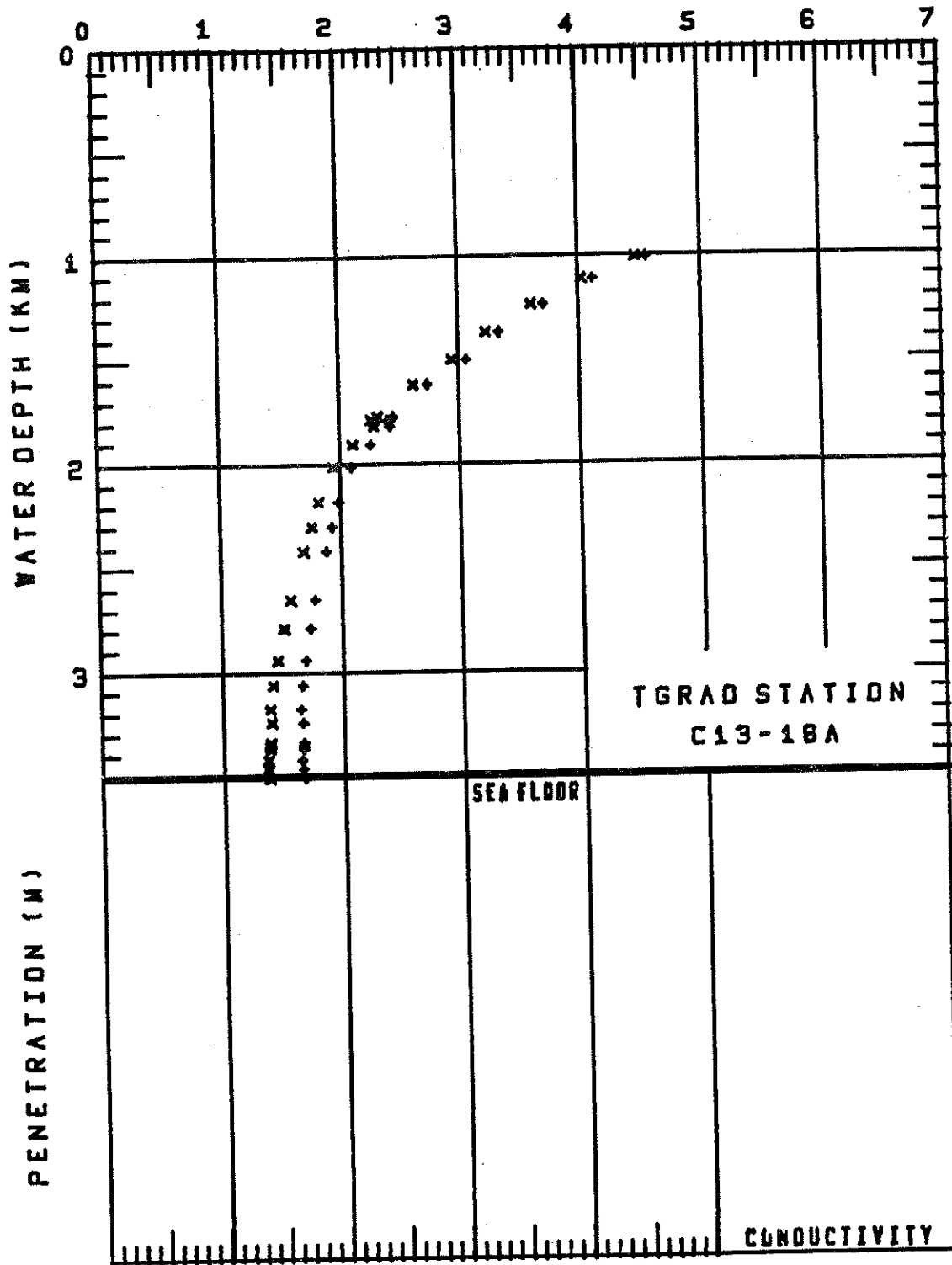


TGRAD STATION C13-18A
012 50.0 N 107 09.9 W
CRUISE STATION 135

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1006 | 4.556 | 4.471 |
| 1110 | 4.125 | 4.034 |
| 1233 | 3.718 | 3.620 |
| 1363 | 3.345 | 3.239 |
| 1496 | 3.069 | 2.954 |
| 1615 | 2.746 | 2.625 |
| 1767 | 2.454 | 2.322 |
| 1788 | 2.420 | 2.288 |
| 1811 | 2.425 | 2.290 |
| 1783 | 2.396 | 2.265 |
| 1904 | 2.256 | 2.114 |
| 2009 | 2.098 | 1.951 |
| 2177 | 1.987 | 1.826 |
| 2297 | 1.934 | 1.763 |
| 2411 | 1.875 | 1.694 |
| 2648 | 1.780 | 1.578 |
| 2783 | 1.736 | 1.519 |
| 2939 | 1.697 | 1.467 |
| 3062 | 1.665 | 1.423 |
| 3175 | 1.650 | 1.395 |
| 3241 | 1.664 | 1.401 |
| 3336 | 1.671 | 1.398 |
| 3367 | 1.668 | 1.392 |
| 3357 | 1.667 | 1.391 |
| 3353 | 1.663 | 1.388 |
| 3417 | 1.654 | 1.372 |
| 3463 | 1.655 | 1.368 |
| 3507 | 1.680 | 1.388 |
| 3509 | 1.680 | 1.387 |

TEMPERATURE (C)



TGRAD STATION C13-018
 012 50.0 N 100 32.0 W
 CRUISE STATION 137

WATER TEMPERATURES

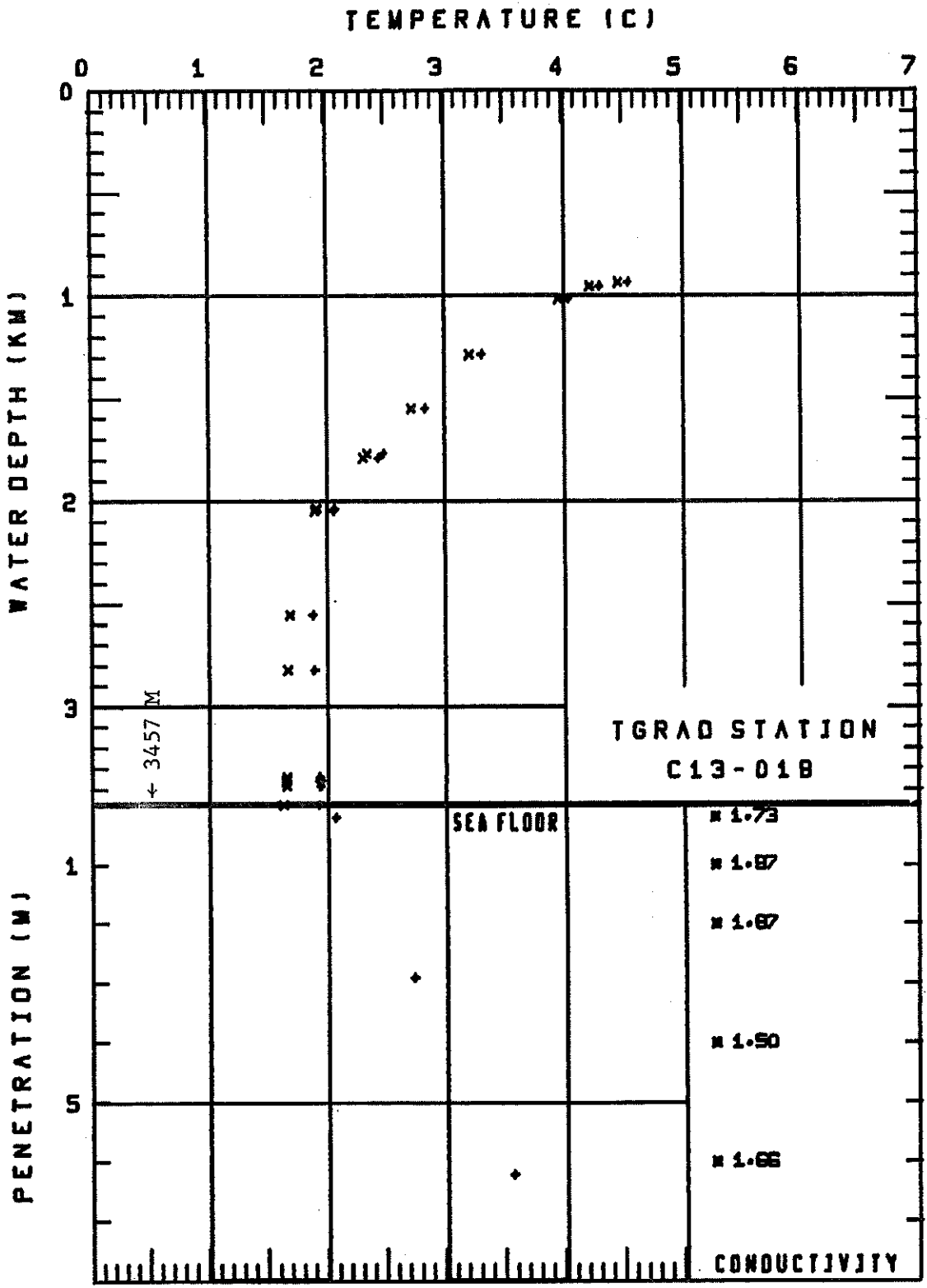
| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| 935 | 4.545 | 4.467 |
| 955 | 4.305 | 4.227 |
| 1015 | 4.046 | 3.966 |
| 1287 | 3.322 | 3.223 |
| 1549 | 2.848 | 2.730 |
| 1768 | 2.484 | 2.352 |
| 1787 | 2.451 | 2.318 |
| 2048 | 2.065 | 1.914 |
| 2036 | 2.075 | 1.927 |
| 2552 | 1.891 | 1.696 |
| 2818 | 1.901 | 1.678 |
| 3340 | 1.944 | 1.661 |
| 3358 | 1.944 | 1.660 |
| 3355 | 1.951 | 1.667 |
| 3381 | 1.954 | 1.667 |
| 3475 | 1.936 | 1.638 |

SEDIMENT TEMPERATURES

| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
|-------------------------|-----------------------------------|
| 0.21 | 2.079 |
| 2.91 | 2.739 |
| 6.21 | 3.565 |

SEDIMENT CONDUCTIVITIES

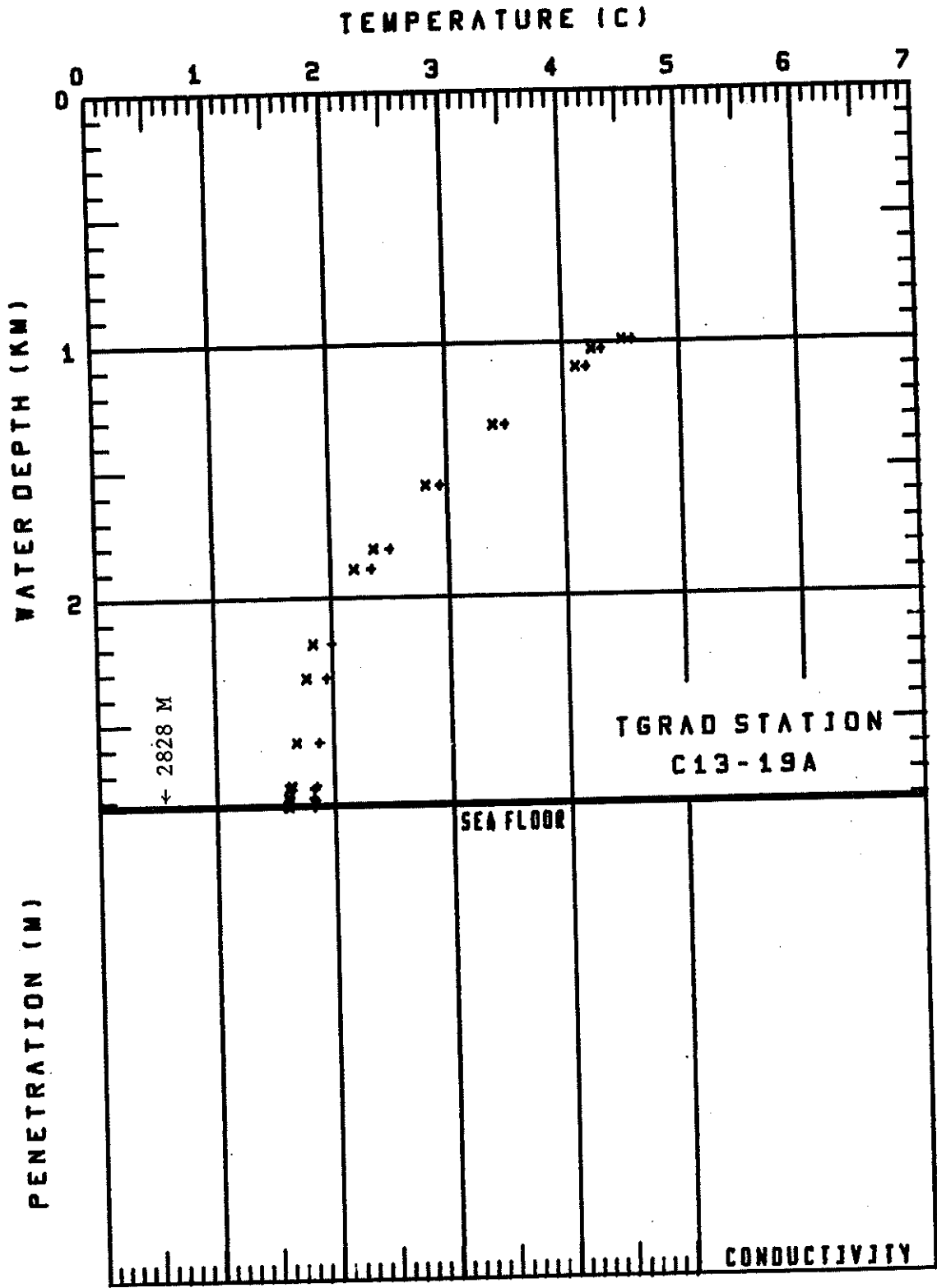
| <u>DEPTH METERS</u> | <u>CONDUCTIVITY CGS</u> |
|-------------------------|-----------------------------|
| 0.20 | 1.73 |
| 1.00 | 1.87 |
| 2.00 | 1.87 |
| 4.00 | 1.50 |
| 6.00 | 1.66 |



TGRAD STATION C13-19A
012 46.7 N 103 53.5 W
CRUISE STATION 138

WATER TEMPERATURES

| <u>DEPTH</u> <u>METERS</u> | <u>IN SITU</u> <u>TEMPERATURE</u> | <u>POTENTIAL</u> <u>TEMPERATURE</u> |
|-------------------------------|--------------------------------------|--|
| <u>988</u> | <u>4.594</u> | <u>4.512</u> |
| <u>1026</u> | <u>4.333</u> | <u>4.248</u> |
| <u>1094</u> | <u>4.200</u> | <u>4.111</u> |
| <u>1322</u> | <u>3.500</u> | <u>3.395</u> |
| <u>1556</u> | <u>2.947</u> | <u>2.828</u> |
| <u>1806</u> | <u>2.507</u> | <u>2.371</u> |
| <u>1884</u> | <u>2.342</u> | <u>2.201</u> |
| <u>2179</u> | <u>2.006</u> | <u>1.844</u> |
| <u>2314</u> | <u>1.960</u> | <u>1.786</u> |
| <u>2569</u> | <u>1.885</u> | <u>1.688</u> |
| <u>2742</u> | <u>1.857</u> | <u>1.642</u> |
| <u>2750</u> | <u>1.838</u> | <u>1.624</u> |
| <u>2789</u> | <u>1.832</u> | <u>1.612</u> |
| <u>2798</u> | <u>1.842</u> | <u>1.622</u> |
| <u>2822</u> | <u>1.839</u> | <u>1.617</u> |



TGRAD STATION C13-019
 012 45.0 N 101 11.5 W
 CRUISE STATION 139

WATER TEMPERATURES

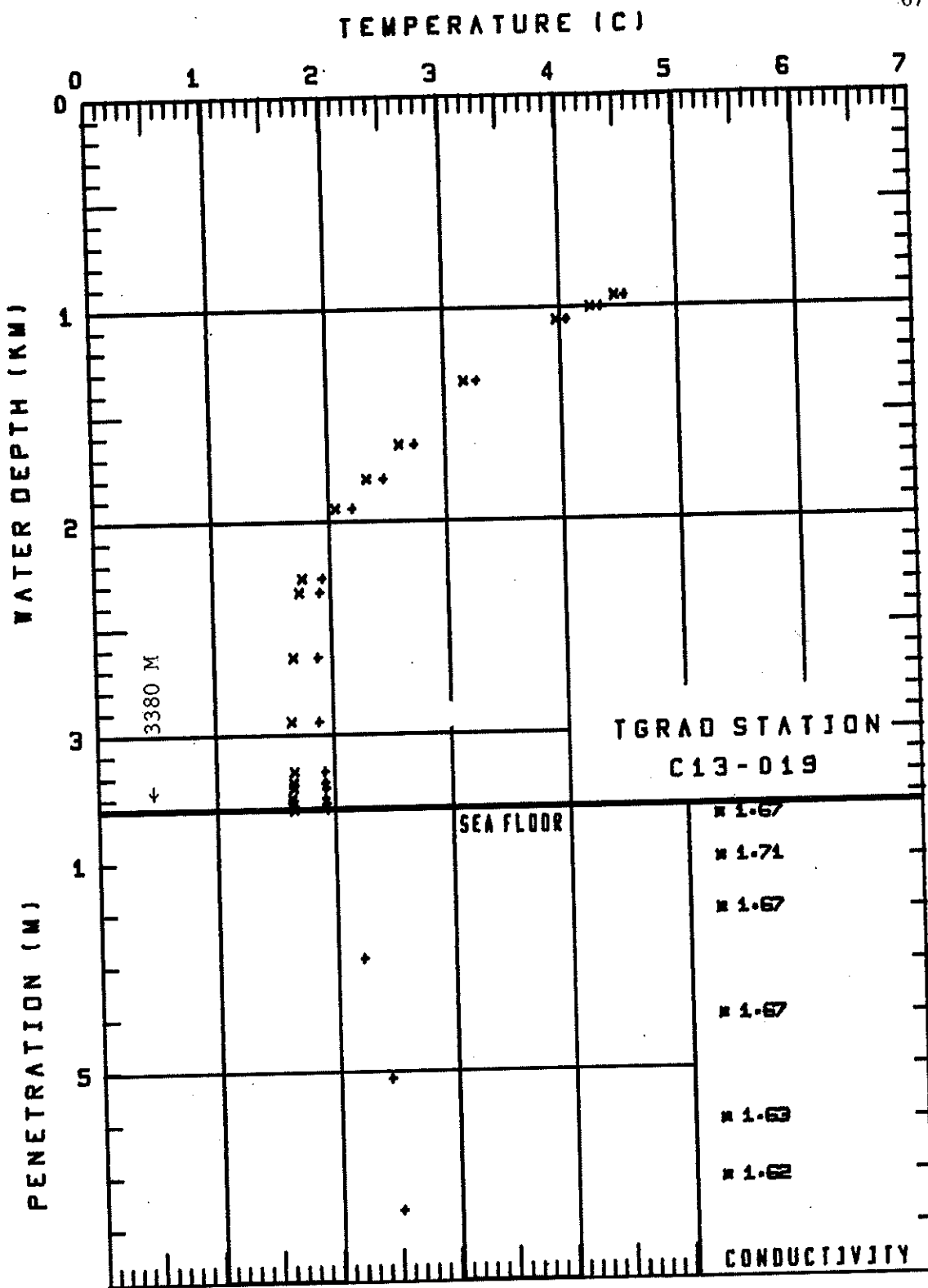
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 948 | 4.556 | 4.476 |
| 1003 | 4.355 | 4.272 |
| 1062 | 4.065 | 3.980 |
| 1343 | 3.284 | 3.180 |
| 1639 | 2.736 | 2.613 |
| 1798 | 2.469 | 2.335 |
| 1937 | 2.205 | 2.063 |
| 2265 | 1.940 | 1.773 |
| 2329 | 1.920 | 1.746 |
| 2637 | 1.891 | 1.687 |
| 2938 | 1.894 | 1.658 |
| 3170 | 1.930 | 1.668 |
| 3222 | 1.933 | 1.664 |
| 3248 | 1.938 | 1.667 |
| 3298 | 1.930 | 1.654 |
| 3323 | 1.938 | 1.658 |
| 3350 | 1.950 | 1.667 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.85 | 2.231 |
| 5.15 | 2.444 |
| 7.65 | 2.516 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 1.67 |
| 1.00 | 1.71 |
| 2.00 | 1.67 |
| 4.00 | 1.67 |
| 6.00 | 1.63 |
| 7.10 | 1.62 |



TGRAD STATION C13-020
 012 09.0 N 102 17.0 W
 CRUISE STATION 140

WATER TEMPERATURES

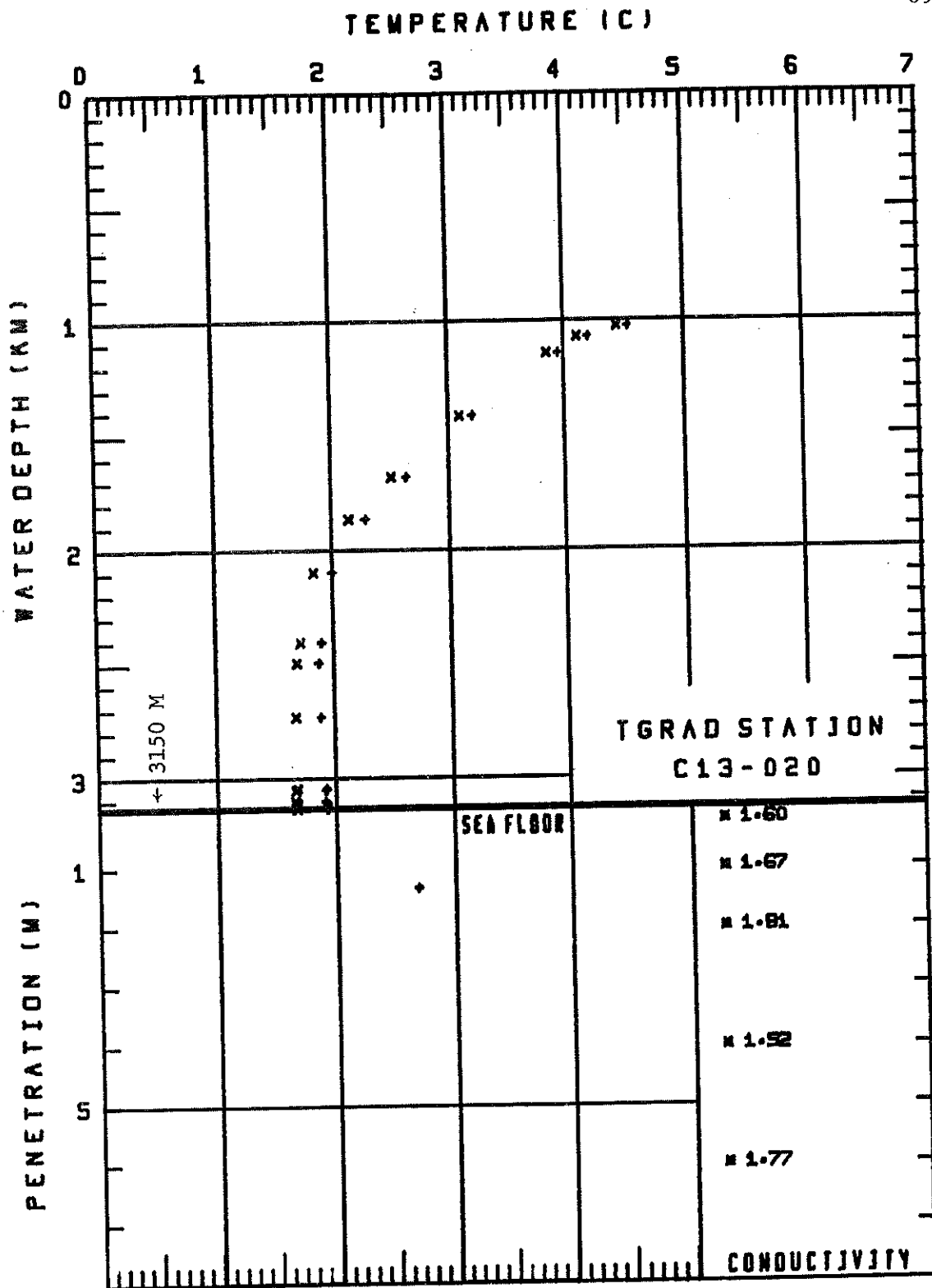
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1024 | 4.530 | 4.444 |
| 1067 | 4.199 | 4.112 |
| 1137 | 3.946 | 3.854 |
| 1412 | 3.207 | 3.098 |
| 1678 | 2.638 | 2.512 |
| 1859 | 2.282 | 2.145 |
| 2096 | 1.996 | 1.842 |
| 2399 | 1.907 | 1.727 |
| 2492 | 1.878 | 1.690 |
| 2727 | 1.894 | 1.680 |
| 3040 | 1.934 | 1.686 |
| 3046 | 1.923 | 1.674 |
| 3095 | 1.921 | 1.667 |
| 3107 | 1.940 | 1.686 |
| 3131 | 1.936 | 1.677 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.33 | 2.690 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 1.60 |
| 1.00 | 1.67 |
| 2.00 | 1.81 |
| 4.00 | 1.52 |
| 6.00 | 1.77 |



TGRAD STATION C13-021
 012 07.8 N 101 30.0 W
 CRUISE STATION 141

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 939 | 4.449 | 4.371 |
| 967 | 4.250 | 4.170 |
| 1036 | 4.029 | 3.947 |
| 1260 | 3.359 | 3.263 |
| 1489 | 2.907 | 2.793 |
| 1726 | 2.500 | 2.372 |
| 1779 | 2.454 | 2.322 |
| 1975 | 2.111 | 1.966 |
| 2066 | 2.054 | 1.902 |
| 2532 | 1.888 | 1.696 |
| 2770 | 1.901 | 1.684 |
| 3016 | 1.930 | 1.684 |
| 3199 | 1.936 | 1.670 |
| 3214 | 1.925 | 1.658 |
| 3226 | 1.923 | 1.654 |
| 3243 | 1.938 | 1.667 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.15 | 2.150 |
| 3.73 | 2.555 |
| 7.11 | 2.875 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 1.66 |
| 1.00 | 1.75 |
| 2.00 | 1.68 |
| 4.00 | 1.63 |
| 6.00 | 1.62 |
| 8.00 | 1.65 |
| 9.00 | 1.75 |

TGRAD STATION C13-024
010 01. N 094 02. W
CRUISE STATION 148

73

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 1.47 |
| 2.50 | 1.55 |
| 4.50 | 1.45 |
| 6.50 | 1.44 |
| 8.50 | 1.53 |

TGRAD STATION C13-025
009 39. N 095 23. W
CRUISE STATION 149

75

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 1.60 |
| 2.50 | 1.61 |
| 4.50 | 1.49 |
| 6.50 | 1.51 |
| 8.10 | 1.43 |

TGRAD STATION C13-026
006 37. N 091 52. W
CRUISE STATION 150

77

SEDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| <u>0.50</u> | <u>1.43</u> |
| <u>2.50</u> | <u>1.61</u> |
| <u>4.50</u> | <u>1.61</u> |
| <u>6.50</u> | <u>1.32</u> |
| <u>8.50</u> | <u>1.38</u> |
| <u>10.50</u> | <u>1.28</u> |
| <u>12.50</u> | <u>1.55</u> |

TGRAD STATION C13-027
 004 59.0 N 094 28.0 W
 CRUISE STATION 151

WATER TEMPERATURES

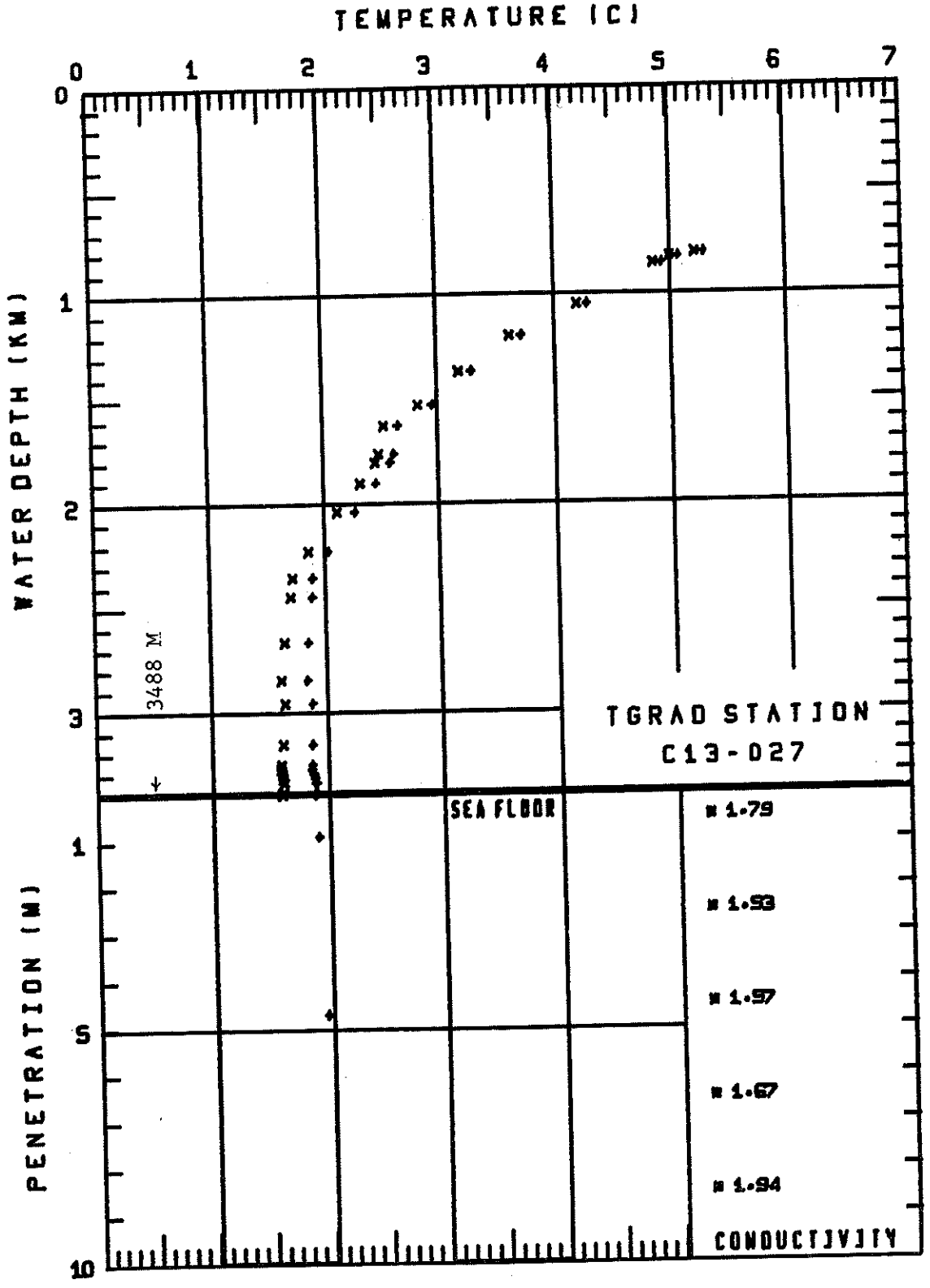
| <u>DEPTH</u> <u>METERS</u> | <u>IN SITU</u> <u>TEMPERATURE</u> | <u>POTENTIAL</u> <u>TEMPERATURE</u> |
|-------------------------------|--------------------------------------|--|
| 803 | 5.297 | 5.226 |
| 821 | 5.079 | 5.008 |
| 851 | 4.937 | 4.864 |
| 1045 | 4.289 | 4.203 |
| 1198 | 3.729 | 3.633 |
| 1369 | 3.306 | 3.200 |
| 1527 | 2.963 | 2.848 |
| 1625 | 2.663 | 2.541 |
| 1761 | 2.630 | 2.495 |
| 1801 | 2.598 | 2.461 |
| 1899 | 2.473 | 2.329 |
| 2034 | 2.276 | 2.122 |
| 2222 | 2.035 | 1.869 |
| 2350 | 1.907 | 1.732 |
| 2441 | 1.897 | 1.711 |
| 2660 | 1.858 | 1.652 |
| 2840 | 1.842 | 1.618 |
| 2955 | 1.881 | 1.644 |
| 3147 | 1.880 | 1.621 |
| 3247 | 1.874 | 1.605 |
| 3270 | 1.867 | 1.595 |
| 3292 | 1.884 | 1.608 |
| 3312 | 1.894 | 1.617 |
| 3333 | 1.904 | 1.624 |
| 3387 | 1.891 | 1.607 |
| 3390 | 1.898 | 1.611 |
| 3377 | 1.902 | 1.618 |

SEDIMENT TEMPERATURES

| <u>DEPTH</u> <u>METERS</u> | <u>TEMPERATURE</u> <u>CENTIGRADE</u> |
|-------------------------------|---|
| 0.90 | 1.915 |
| 4.70 | 1.971 |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| 0.50 | 1.79 |
| 2.50 | 1.53 |
| 4.50 | 1.57 |
| 6.50 | 1.67 |
| 8.50 | 1.94 |



TGRAD STATION C13-28A
000 51 N 096 02 W
CRUISE STATION 152

81

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 1.67 |
| 2.50 | 1.83 |
| 4.50 | 1.77 |
| 6.50 | 1.84 |
| 8.50 | 1.79 |

TGRAD STATION C13-028
 001 49.0 N 094 08.0 W
 CRUISE STATION 153

WATER TEMPERATURES

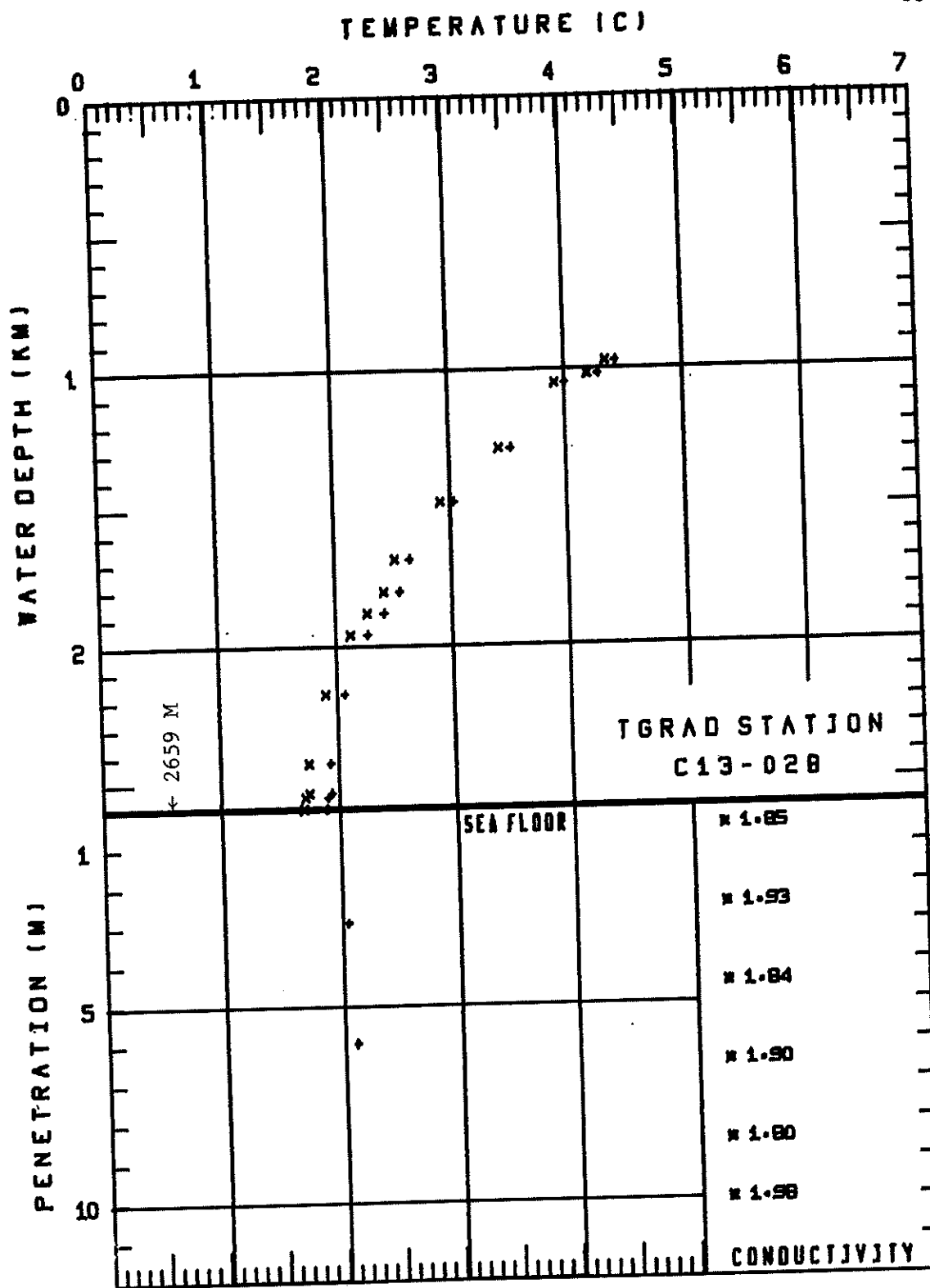
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 971 | 4.444 | 4.363 |
| 1016 | 4.297 | 4.213 |
| 1047 | 4.019 | 3.934 |
| 1284 | 3.539 | 3.438 |
| 1478 | 3.042 | 2.929 |
| 1683 | 2.655 | 2.528 |
| 1802 | 2.568 | 2.433 |
| 1880 | 2.428 | 2.286 |
| 1959 | 2.286 | 2.139 |
| 2174 | 2.072 | 1.910 |
| 2424 | 1.944 | 1.759 |
| 2532 | 1.951 | 1.756 |
| 2548 | 1.920 | 1.723 |
| 2591 | 1.907 | 1.707 |
| 2591 | 1.911 | 1.711 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.90 | 2.062 |
| 5.95 | 2.119 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 1.85 |
| 2.50 | 1.93 |
| 4.50 | 1.84 |
| 6.50 | 1.90 |
| 8.50 | 1.80 |
| 10.00 | 1.98 |



TGRAD STATION C13-029
 004 45.0 N 090 56.0 W
 CRUISE STATION 154

WATER TEMPERATURES

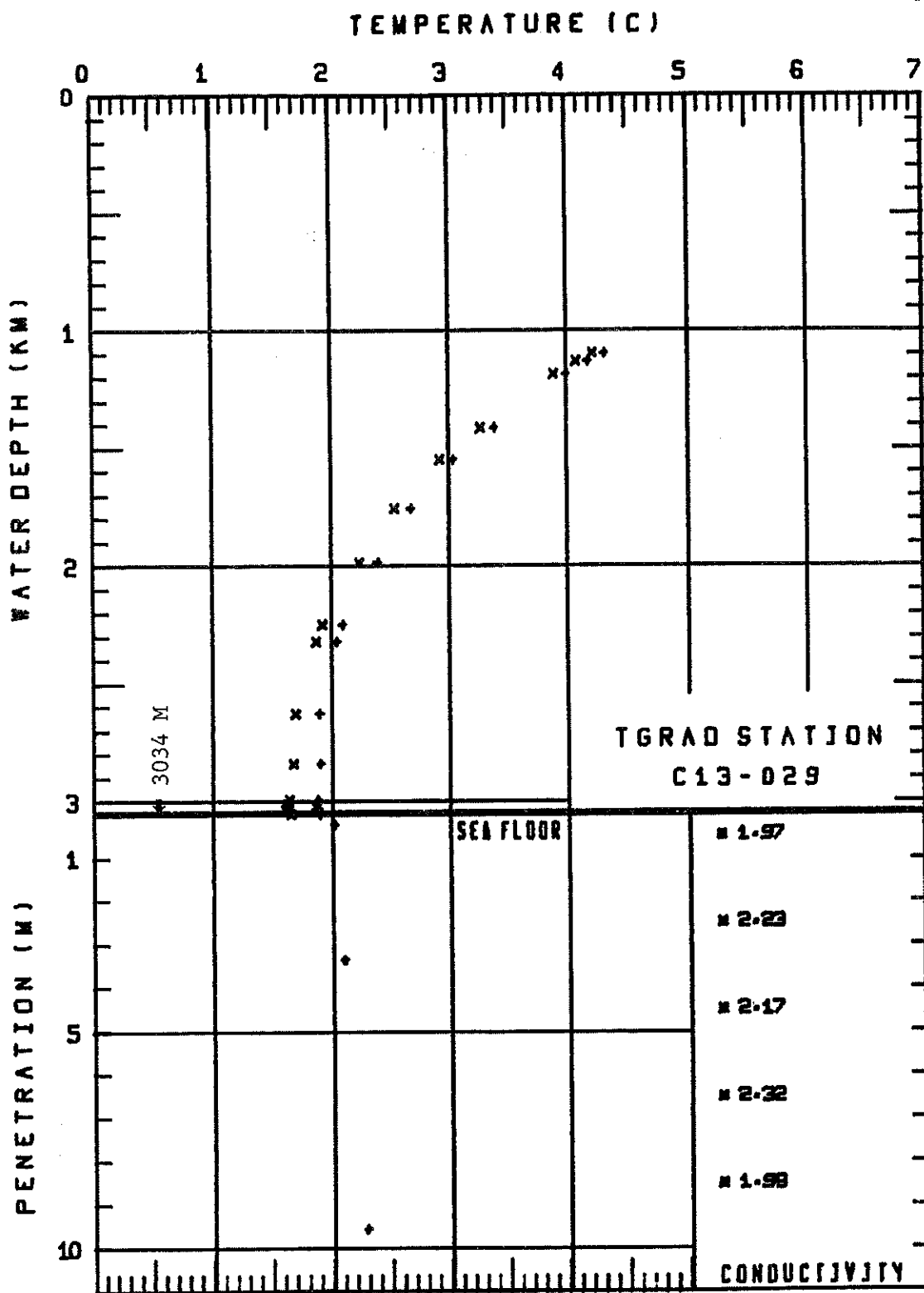
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1096 | 4.311 | 4.220 |
| 1128 | 4.177 | 4.083 |
| 1182 | 3.997 | 3.901 |
| 1410 | 3.390 | 3.278 |
| 1546 | 3.047 | 2.928 |
| 1753 | 2.677 | 2.542 |
| 1982 | 2.396 | 2.245 |
| 2249 | 2.098 | 1.928 |
| 2319 | 2.053 | 1.878 |
| 2623 | 1.907 | 1.703 |
| 2837 | 1.908 | 1.684 |
| 2989 | 1.894 | 1.652 |
| 3035 | 1.865 | 1.621 |
| 3009 | 1.880 | 1.637 |
| 3031 | 1.892 | 1.647 |
| 3051 | 1.914 | 1.665 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.25 | 2.026 |
| 3.35 | 2.101 |
| 9.55 | 2.291 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 1.97 |
| 2.50 | 2.23 |
| 4.50 | 2.17 |
| 6.50 | 2.32 |
| 8.50 | 1.98 |



TGRAD STATION C13-030
002 52.0 N 087 45.0 W
CRUISE STATION 157

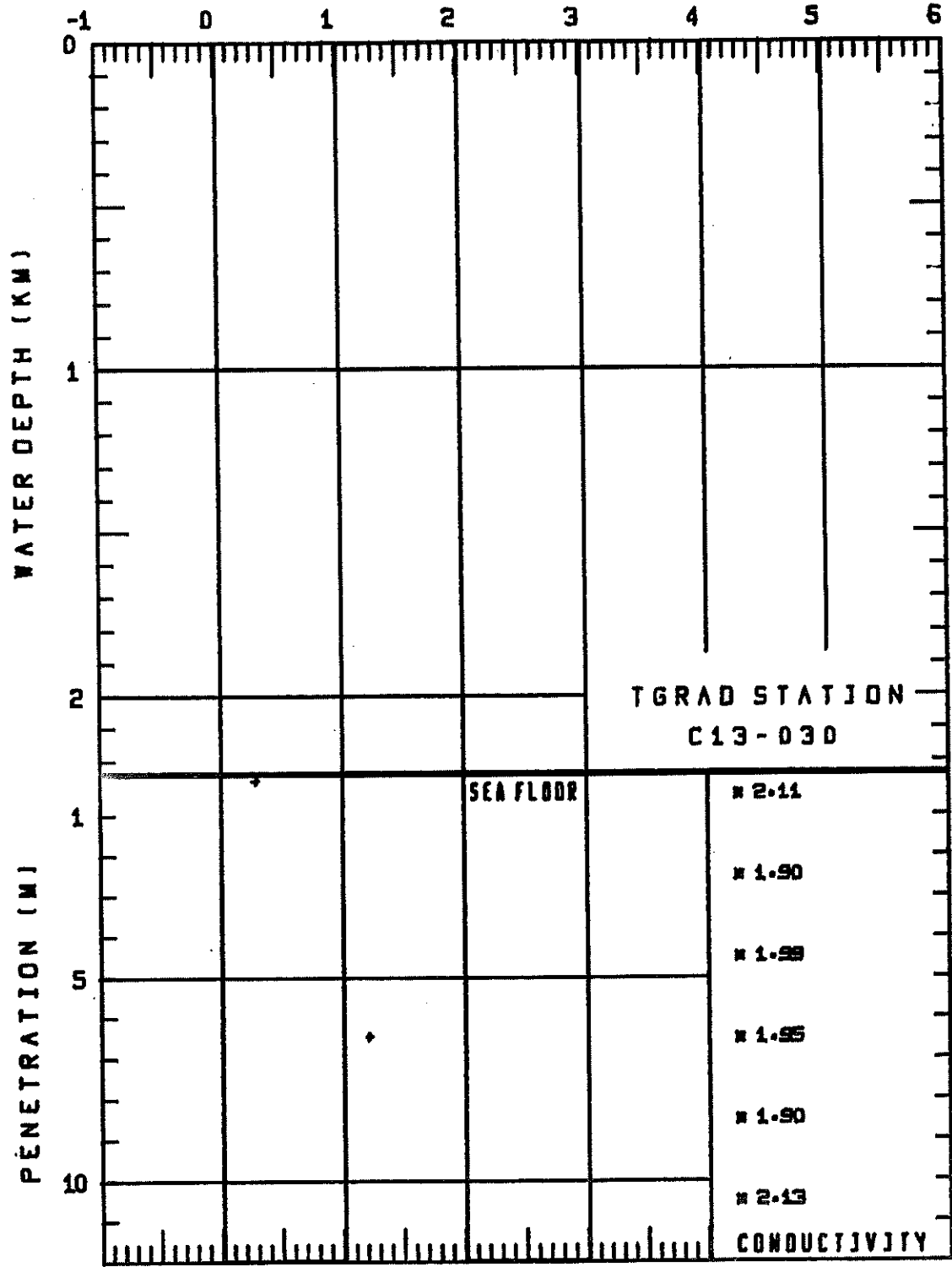
SEDIMENT TEMPERATURES

| <u>DEPTH</u> <u>METERS</u> | <u>TEMPERATURE</u> <u>CENTIGRADE</u> |
|-------------------------------|---|
| 0.15 | 0.300 |
| 6.45 | 1.224 |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| 0.50 | 2.11 |
| 2.50 | 1.90 |
| 4.50 | 1.99 |
| 6.50 | 1.95 |
| 8.50 | 1.90 |
| 10.50 | 2.13 |

TEMPERATURE (C)



TGRAD STATION C13-031
 000 59.8 S 085 08.6 W
 CRUISE STATION 158

WATER TEMPERATURES

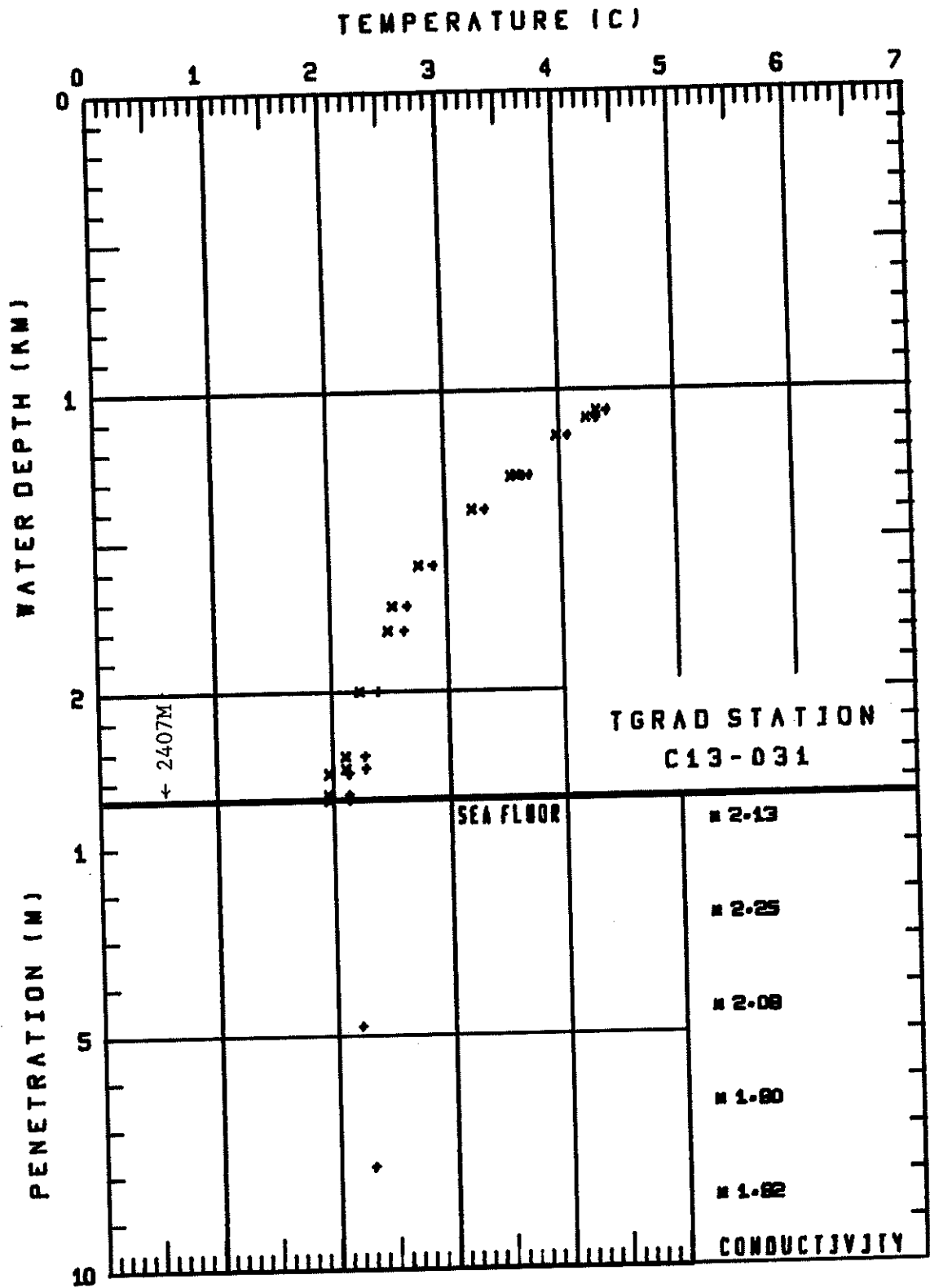
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1070 | 4.413 | 4.324 |
| 1093 | 4.328 | 4.236 |
| 1151 | 4.073 | 3.980 |
| 1282 | 3.730 | 3.626 |
| 1283 | 3.684 | 3.580 |
| 1393 | 3.344 | 3.236 |
| 1579 | 2.894 | 2.772 |
| 1714 | 2.667 | 2.538 |
| 1794 | 2.635 | 2.500 |
| 1997 | 2.400 | 2.247 |
| 2213 | 2.288 | 2.117 |
| 2253 | 2.290 | 2.117 |
| 2268 | 2.145 | 1.973 |
| 2340 | 2.142 | 1.963 |
| 2358 | 2.154 | 1.973 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE | |
|--------------|------------------------|---------|
| 4.80 | 2.218 | COOLING |
| 7.80 | 2.305 | COOLING |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.50 | 2.13 |
| 2.50 | 2.25 |
| 4.50 | 2.08 |
| 6.50 | 1.80 |
| 8.50 | 1.82 |



TGRAD STATION C13-032
 004 27.8 N 082 26.3 W
 CRUISE STATION 159

WATER TEMPERATURES

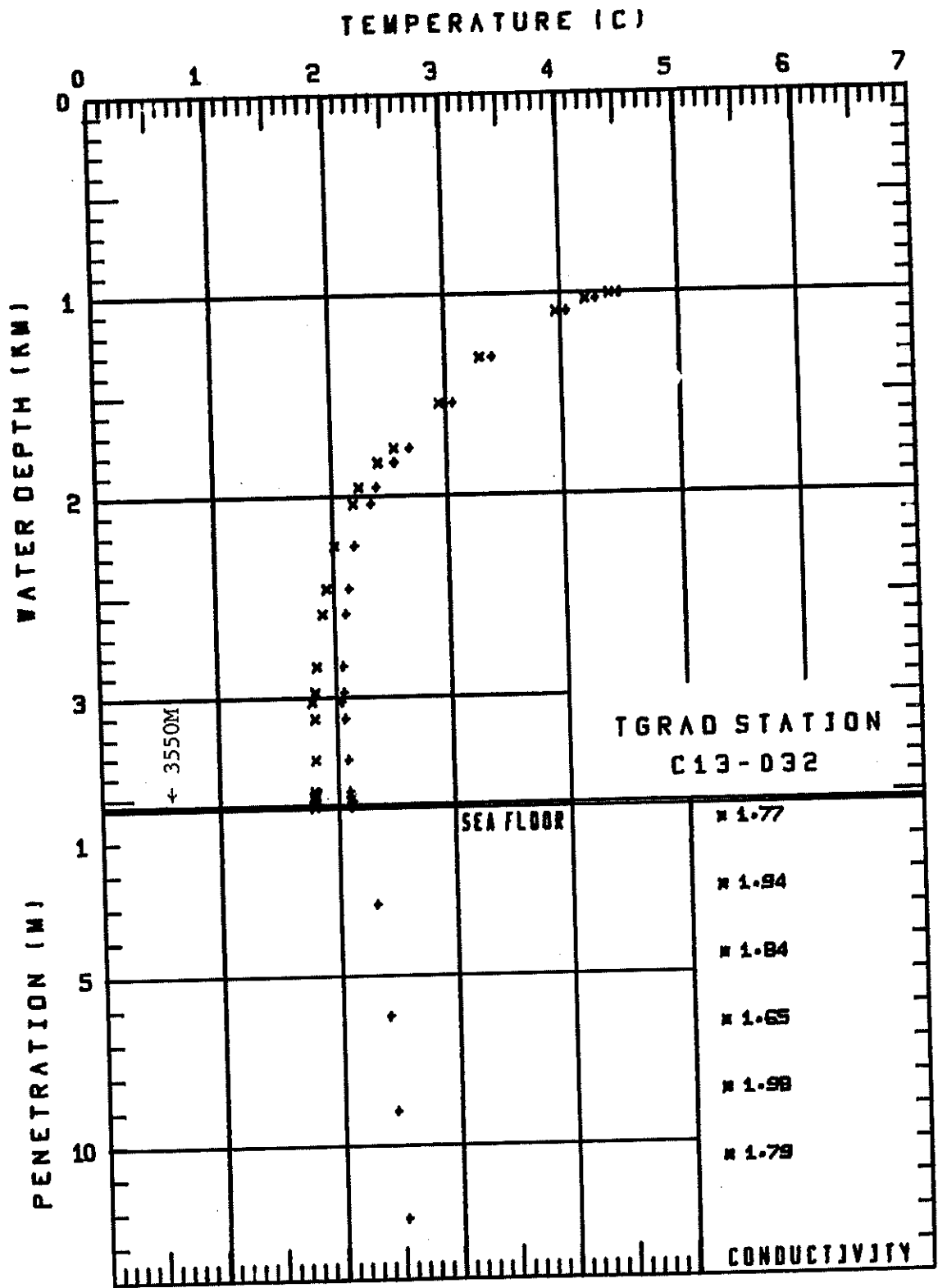
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1005 | 4.514 | 4.429 |
| 1032 | 4.309 | 4.223 |
| 1091 | 4.056 | 3.968 |
| 1315 | 3.410 | 3.309 |
| 1541 | 3.067 | 2.948 |
| 1761 | 2.686 | 2.552 |
| 1830 | 2.552 | 2.414 |
| 1953 | 2.389 | 2.243 |
| 2035 | 2.345 | 2.191 |
| 2244 | 2.198 | 2.027 |
| 2458 | 2.141 | 1.950 |
| 2582 | 2.112 | 1.908 |
| 2845 | 2.079 | 1.848 |
| 2975 | 2.076 | 1.832 |
| 3021 | 2.058 | 1.808 |
| 3103 | 2.087 | 1.828 |
| 3309 | 2.105 | 1.822 |
| 3467 | 2.113 | 1.812 |
| 3492 | 2.108 | 1.803 |
| 3518 | 2.131 | 1.822 |
| 3544 | 2.124 | 1.812 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 2.90 | 2.322 |
| 6.20 | 2.414 |
| 9.00 | 2.456 |
| 12.20 | 2.532 |

SEDIMENT CONDUCTIVITIES

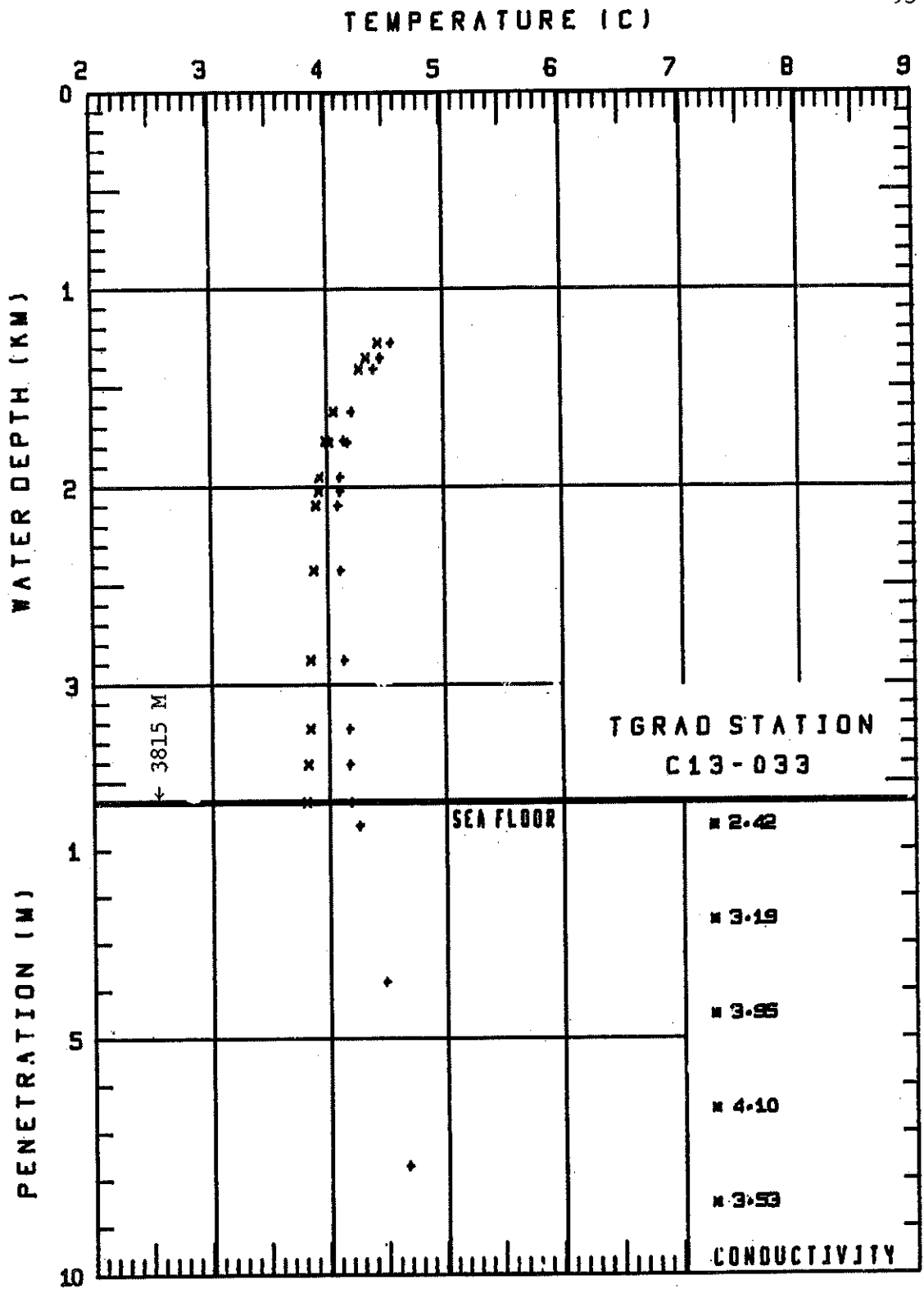
| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.50 | 1.77 |
| 2.50 | 1.94 |
| 4.50 | 1.84 |
| 6.50 | 1.65 |
| 8.50 | 1.98 |
| 10.50 | 1.79 |



TGRAD STATION C13-033
 012 30. N 076 58. W
 CRUISE STATION 162

| WATER TEMPERATURES | | | SEDIMENT TEMPERATURES | |
|--------------------|---------------------|-----------------------|-----------------------|------------------------|
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE | DEPTH METERS | TEMPERATURE CENTIGRADE |
| | | | 0.50 | 4.269 COOLING |
| 1272 | 4.560 | 4.449 | 3.80 | 4.493 COOLING |
| 1348 | 4.471 | 4.354 | 7.70 | 4.677 COOLING |
| 1403 | 4.417 | 4.295 | | |
| 1617 | 4.217 | 4.073 | | |
| 1773 | 4.190 | 4.031 | | |
| 1767 | 4.155 | 3.997 | | |
| 1950 | 4.122 | 3.946 | | |
| 2021 | 4.121 | 3.936 | | |
| 2094 | 4.107 | 3.914 | | |
| 2420 | 4.126 | 3.894 | | |
| 2876 | 4.148 | 3.858 | | |
| 3224 | 4.189 | 3.852 | | |
| 3405 | 4.192 | 3.830 | | |
| 3596 | 4.204 | 3.815 | | |

| SEDIMENT CONDUCTIVITIES | |
|-------------------------|------------------|
| DEPTH METERS | CONDUCTIVITY CGS |
| 0.50 | 2.42 |
| 2.50 | 3.19 |
| 4.50 | 3.95 |
| 6.50 | 4.10 |
| 8.50 | 3.53 |



TGRAD STATION C13-034
 011 53 N 076 09 W
 CRUISE STATION 163

WATER TEMPERATURES

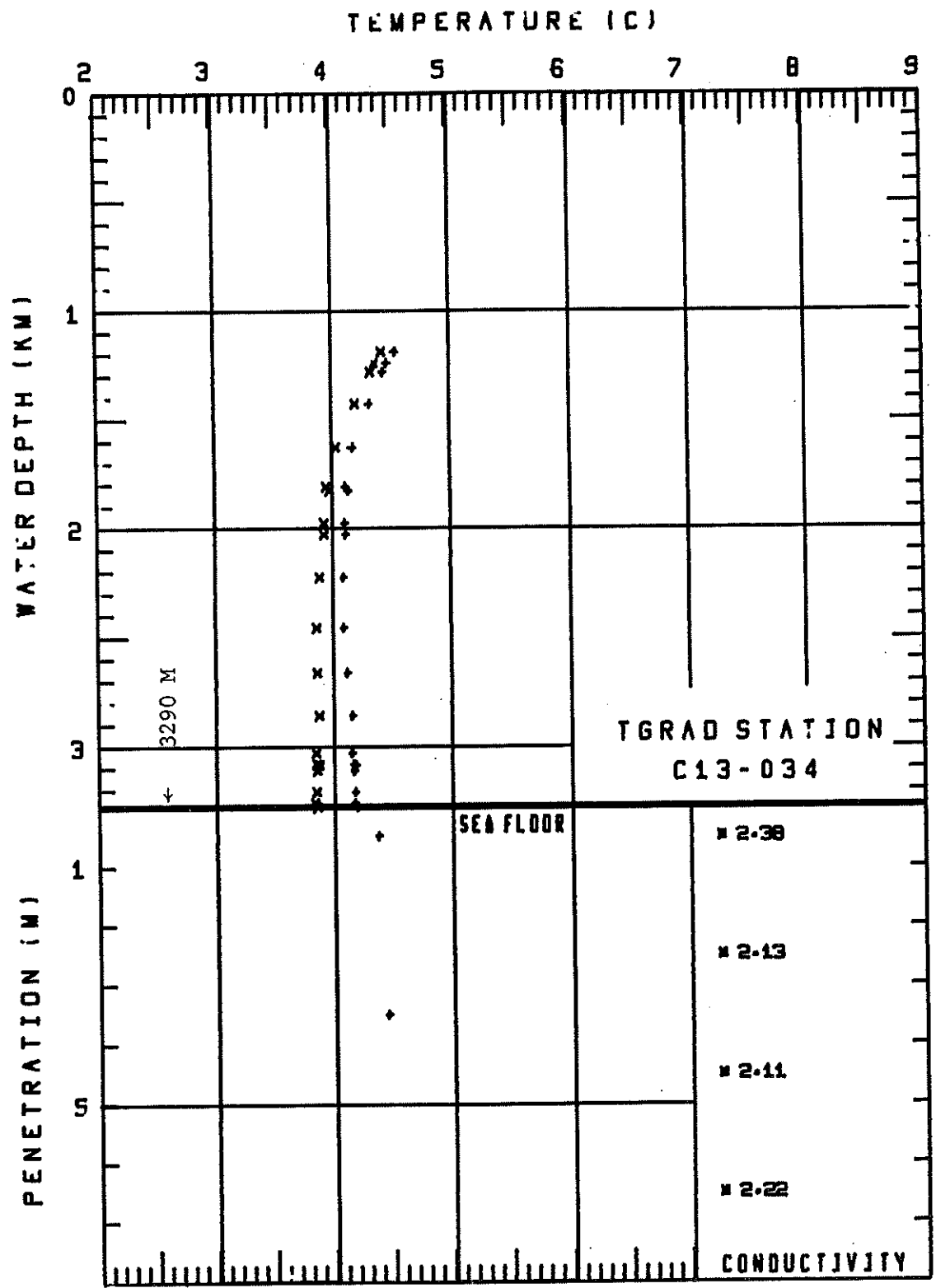
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1188 | 4.541 | 4.439 |
| 1236 | 4.484 | 4.377 |
| 1278 | 4.453 | 4.342 |
| 1423 | 4.332 | 4.208 |
| 1625 | 4.186 | 4.042 |
| 1807 | 4.121 | 3.960 |
| 1823 | 4.149 | 3.986 |
| 1971 | 4.118 | 3.937 |
| 2023 | 4.125 | 3.940 |
| 2221 | 4.104 | 3.896 |
| 2452 | 4.105 | 3.870 |
| 2660 | 4.134 | 3.872 |
| 2858 | 4.170 | 3.881 |
| 3029 | 4.165 | 3.855 |
| 3081 | 4.180 | 3.863 |
| 3084 | 4.200 | 3.882 |
| 3107 | 4.185 | 3.864 |
| 3209 | 4.191 | 3.856 |
| 3259 | 4.186 | 3.845 |
| 3276 | 4.211 | 3.867 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 0.50 | 4.384 |
| 3.50 | 4.460 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.50 | 2.38 |
| 2.50 | 2.13 |
| 4.50 | 2.11 |
| 6.50 | 2.22 |



TGRAD STATION C13-035
 011 55 N 075 02 W
 CRUISE STATION 164

WATER TEMPERATURES

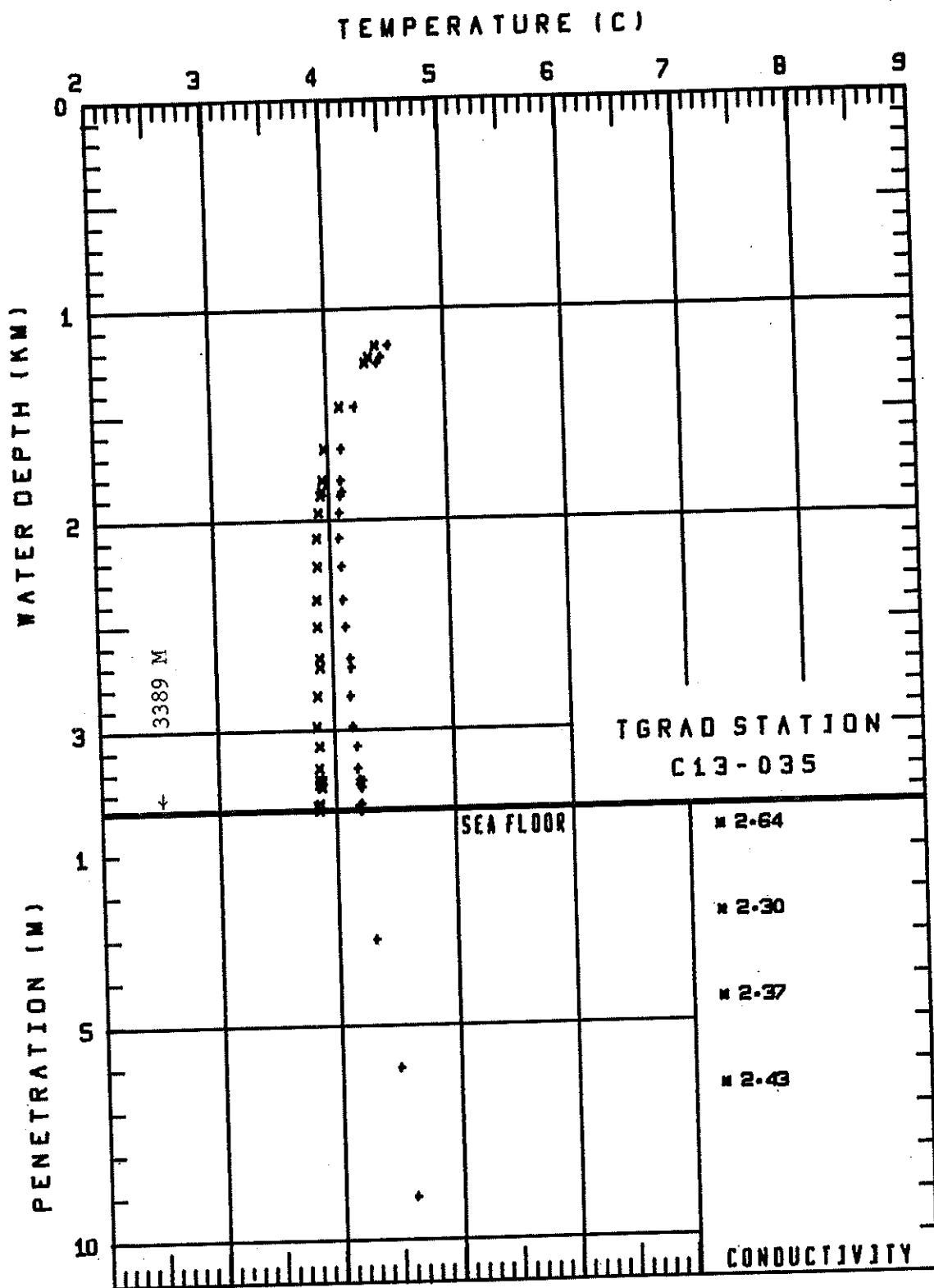
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1170 | 4.541 | 4.440 |
| 1226 | 4.484 | 4.378 |
| 1254 | 4.449 | 4.342 |
| 1459 | 4.246 | 4.120 |
| 1658 | 4.122 | 3.976 |
| 1809 | 4.120 | 3.959 |
| 1863 | 4.122 | 3.954 |
| 1882 | 4.109 | 3.940 |
| 1964 | 4.097 | 3.918 |
| 2081 | 4.092 | 3.900 |
| 2217 | 4.106 | 3.900 |
| 2376 | 4.113 | 3.887 |
| 2503 | 4.123 | 3.881 |
| 2652 | 4.159 | 3.898 |
| 2699 | 4.166 | 3.898 |
| 2832 | 4.153 | 3.869 |
| 2978 | 4.161 | 3.858 |
| 3072 | 4.196 | 3.880 |
| 3178 | 4.200 | 3.869 |
| 3234 | 4.236 | 3.897 |
| 3255 | 4.212 | 3.871 |
| 3232 | 4.210 | 3.871 |
| 3270 | 4.233 | 3.888 |
| 3355 | 4.206 | 3.851 |
| 3348 | 4.225 | 3.870 |
| 3378 | 4.222 | 3.863 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.00 | 4.324 |
| 6.00 | 4.505 |
| 9.00 | 4.620 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 2.64 |
| 2.50 | 2.30 |
| 4.50 | 2.37 |
| 6.50 | 2.43 |



TGRAD STATION C13-036
 012 53 N 074 51 W
 CRUISE STATION 165

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1181 | 4.533 | 4.430 |
| 1182 | 4.516 | 4.414 |
| 1216 | 4.523 | 4.417 |
| 1317 | 4.408 | 4.295 |
| 1415 | 4.344 | 4.220 |
| 1512 | 4.304 | 4.171 |
| 1601 | 4.224 | 4.083 |
| 1688 | 4.193 | 4.043 |
| 1732 | 4.167 | 4.013 |
| 1889 | 4.149 | 3.979 |
| 2184 | 4.131 | 3.927 |
| 2759 | 4.168 | 3.894 |
| 3338 | 4.270 | 3.915 |
| 3563 | 4.277 | 3.890 |

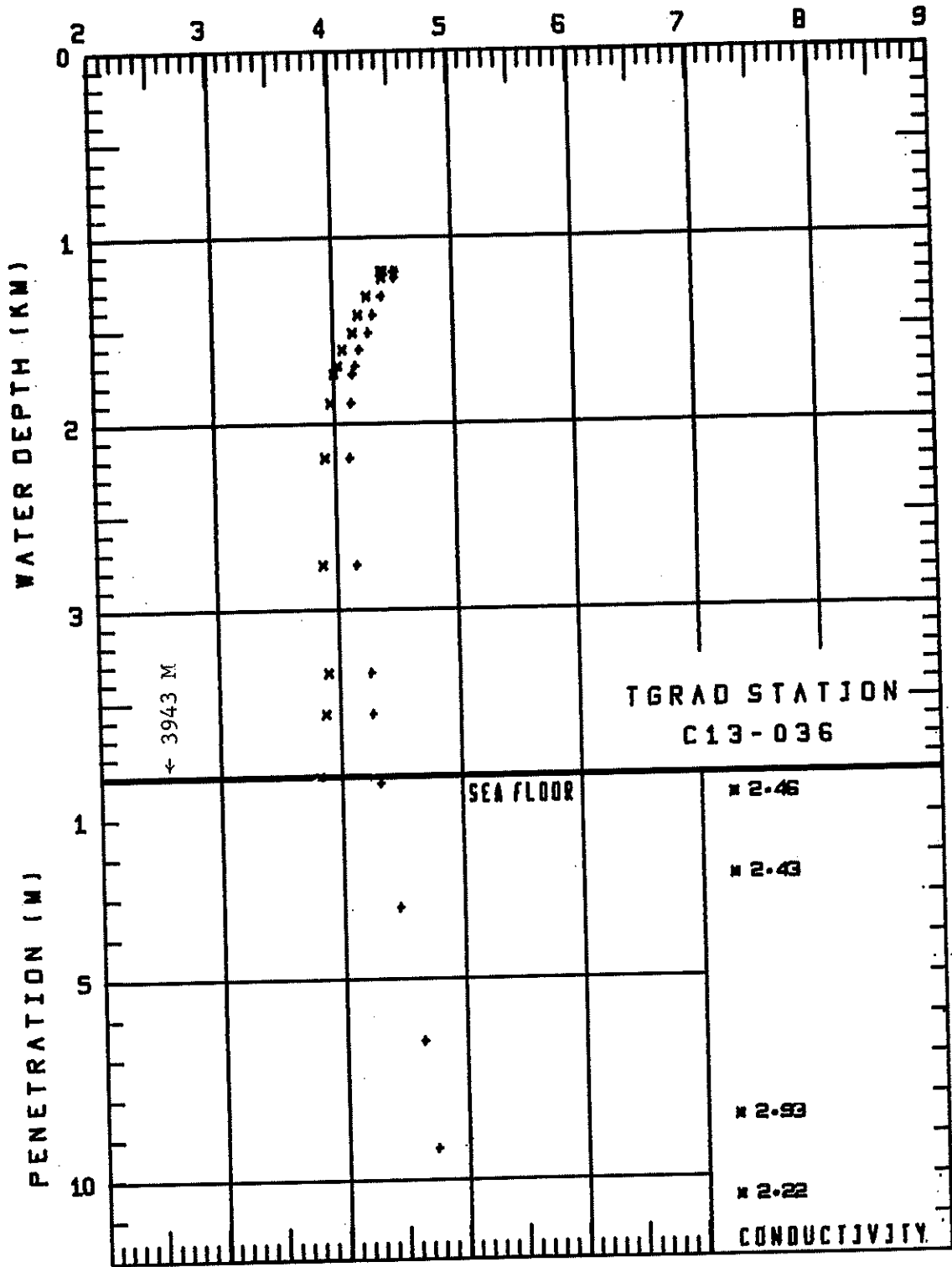
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 0.15 | 4.332 |
| 3.25 | 4.469 |
| 6.55 | 4.654 |
| 9.25 | 4.750 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.50 | 2.46 |
| 2.50 | 2.43 |
| 8.50 | 2.93 |
| 10.50 | 2.22 |

TEMPERATURE (C)



TGRAD STATION C13-037
011 45 N 074 17 W
CRUISE STATION 166

WATER TEMPERATURES

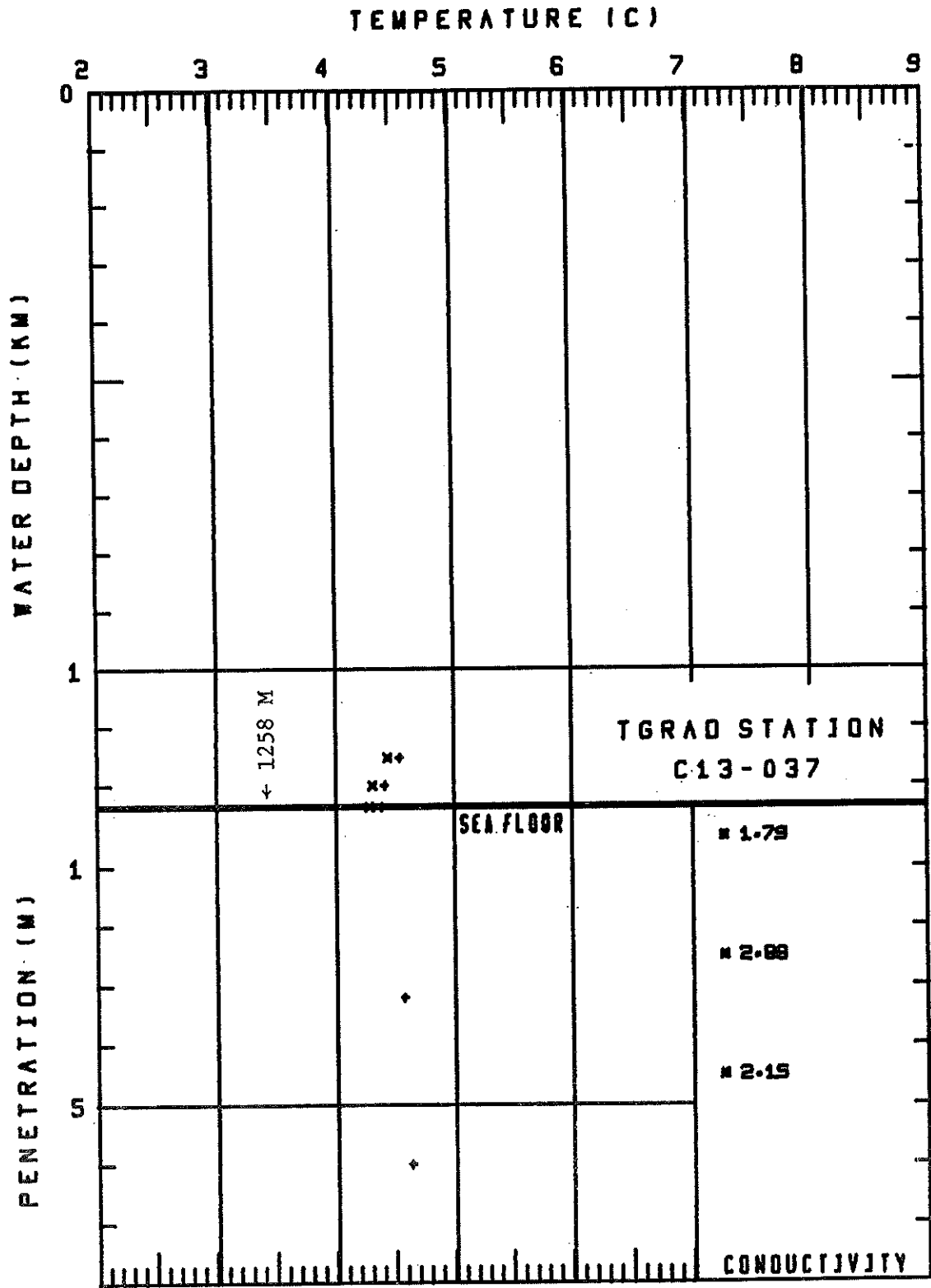
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1153 | 4.541 | 4.442 |
| 1200 | 4.417 | 4.315 |
| 1238 | 4.395 | 4.289 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.20 | 4.581 |
| 6.00 | 4.639 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 1.79 |
| 2.50 | 2.88 |
| 4.50 | 2.15 |



TGRAD STATION C13-038
 013 41 N 071 40 W
 CRUISE STATION 167

WATER TEMPERATURES

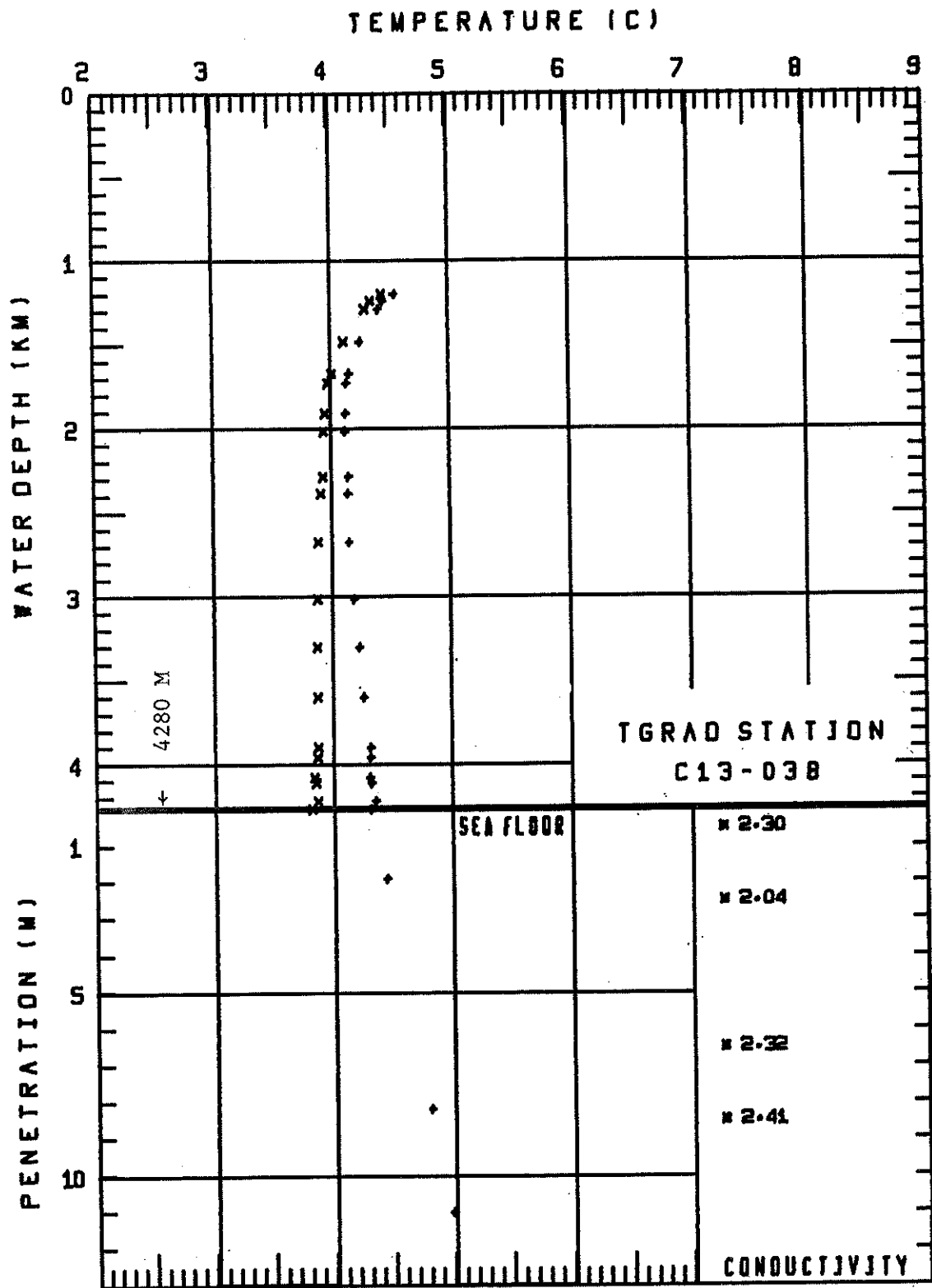
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1194 | 4.541 | 4.438 |
| 1238 | 4.450 | 4.344 |
| 1284 | 4.411 | 4.300 |
| 1478 | 4.248 | 4.119 |
| 1668 | 4.163 | 4.015 |
| 1724 | 4.137 | 3.984 |
| 1905 | 4.128 | 3.955 |
| 2011 | 4.127 | 3.943 |
| 2282 | 4.154 | 3.938 |
| 2382 | 4.145 | 3.917 |
| 2674 | 4.151 | 3.888 |
| 3013 | 4.194 | 3.885 |
| 3300 | 4.229 | 3.880 |
| 3595 | 4.267 | 3.876 |
| 3895 | 4.317 | 3.881 |
| 3957 | 4.321 | 3.875 |
| 4077 | 4.311 | 3.848 |
| 4106 | 4.326 | 3.856 |
| 4217 | 4.358 | 3.870 |
| 4264 | 4.316 | 3.822 |

SBDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.90 | 4.442 |
| 8.20 | 4.814 |
| 11.00 | 4.988 |

SBDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 2.30 |
| 2.50 | 2.04 |
| 6.50 | 2.32 |
| 8.50 | 2.41 |



TGRAD STATION C13-039
 015 37 N 071 40 W
 CRUISE STATION 168

WATER TEMPERATURES

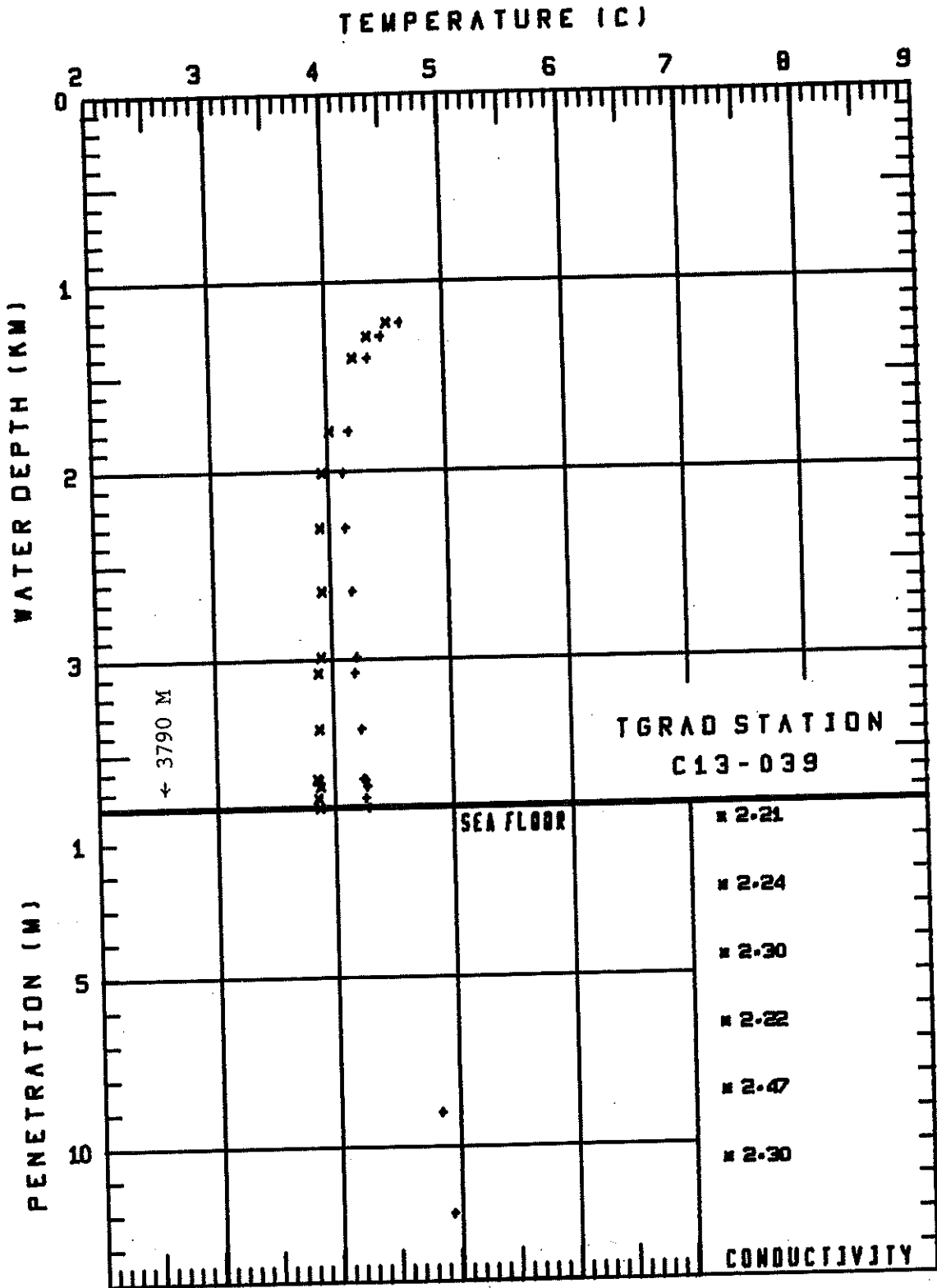
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1212 | 4.630 | 4.523 |
| 1285 | 4.470 | 4.358 |
| 1399 | 4.356 | 4.234 |
| 1787 | 4.182 | 4.021 |
| 2005 | 4.137 | 3.953 |
| 2297 | 4.144 | 3.927 |
| 2635 | 4.192 | 3.933 |
| 2983 | 4.215 | 3.910 |
| 3067 | 4.197 | 3.881 |
| 3364 | 4.241 | 3.883 |
| 3630 | 4.253 | 3.857 |
| 3631 | 4.269 | 3.872 |
| 3666 | 4.283 | 3.881 |
| 3730 | 4.272 | 3.861 |
| 3780 | 4.297 | 3.877 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 9.00 | 4.861 |
| 12.00 | 4.944 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 2.21 |
| 2.50 | 2.24 |
| 4.50 | 2.30 |
| 6.50 | 2.22 |
| 8.50 | 2.47 |
| 10.50 | 2.30 |



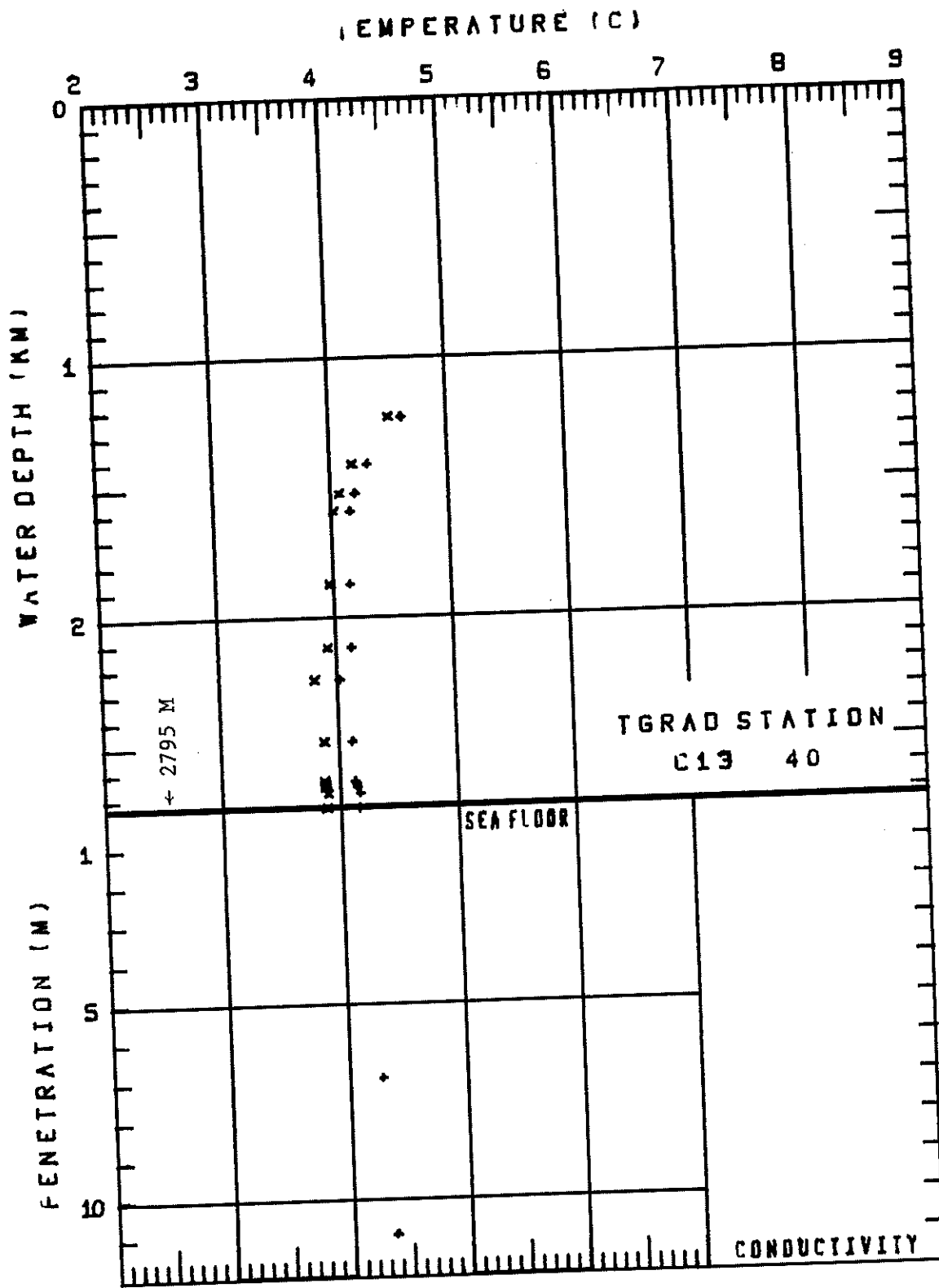
TGRAD STATION C13-040
015 51 N 074 47 W
CRUISE STATION 169

WATER TEMPERATURES

| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| 1226 | 4.618 | 4.512 |
| 1408 | 4.316 | 4.194 |
| 1520 | 4.211 | 4.079 |
| 1592 | 4.165 | 4.026 |
| 1869 | 4.146 | 3.977 |
| 2114 | 4.135 | 3.940 |
| 2230 | 4.029 | 3.821 |
| 2478 | 4.120 | 3.881 |
| 2642 | 4.144 | 3.883 |
| 2629 | 4.133 | 3.875 |
| 2655 | 4.148 | 3.888 |
| 2679 | 4.172 | 3.907 |
| 2733 | 4.166 | 3.894 |

SEDIMENT TEMPERATURES

| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
|-------------------------|-----------------------------------|
| 6.90 | 4.281 |
| 10.90 | 4.363 |



TGRAD STATION C13-041
 015 04 N 075 52 W
 CRUISE STATION 171

WATER TEMPERATURES

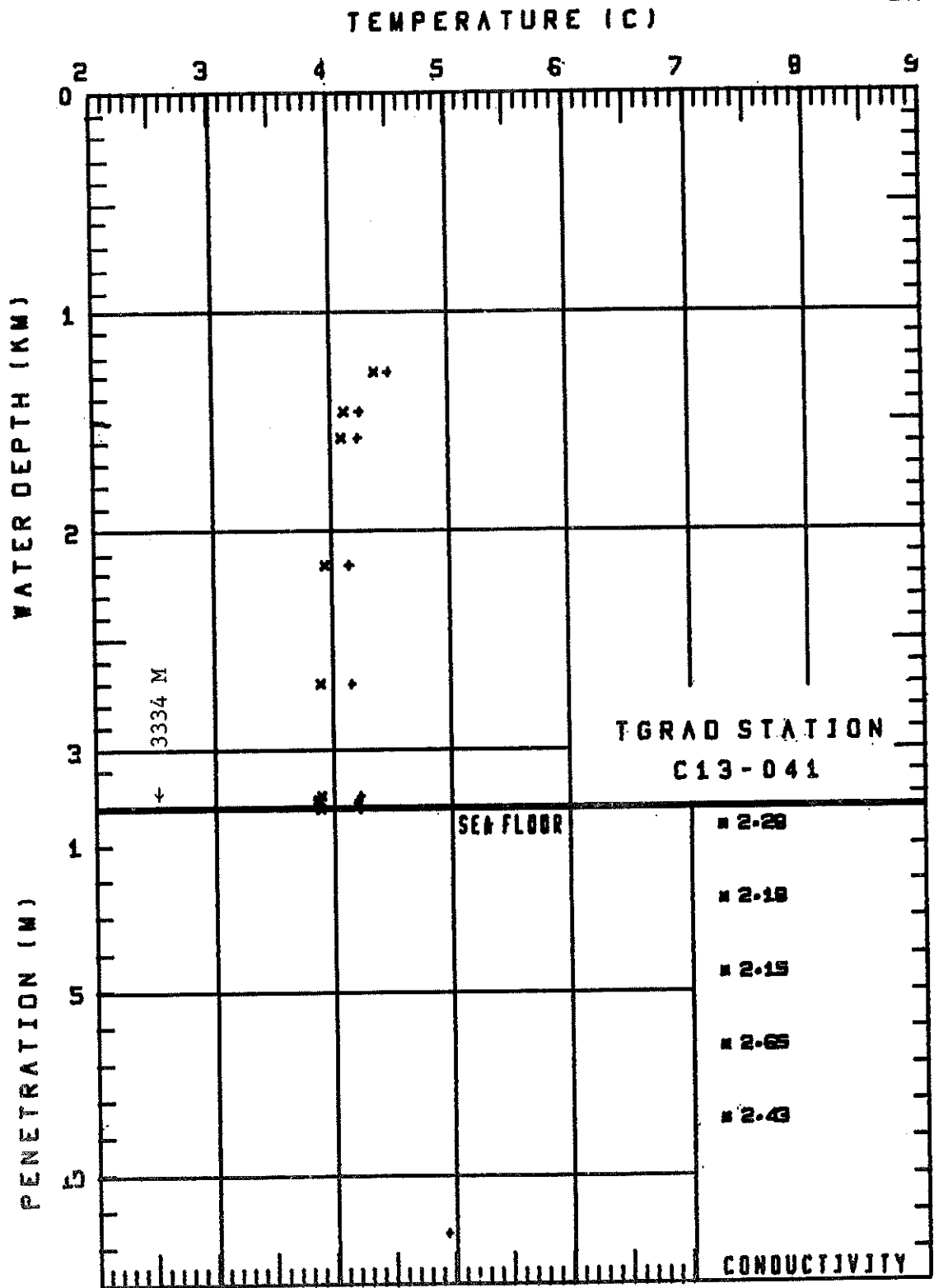
| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| <u>1274</u> | <u>4.496</u> | <u>4.385</u> |
| <u>1456</u> | <u>4.248</u> | <u>4.121</u> |
| <u>1576</u> | <u>4.239</u> | <u>4.100</u> |
| <u>2155</u> | <u>4.155</u> | <u>3.954</u> |
| <u>2695</u> | <u>4.172</u> | <u>3.904</u> |
| <u>3206</u> | <u>4.237</u> | <u>3.901</u> |
| <u>3224</u> | <u>4.218</u> | <u>3.881</u> |
| <u>3235</u> | <u>4.208</u> | <u>3.869</u> |
| <u>3266</u> | <u>4.239</u> | <u>3.895</u> |

SEDIMENT TEMPERATURES

| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
|-------------------------|-----------------------------------|
| <u>11.60</u> | <u>4.949</u> |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH METERS</u> | <u>CONDUCTIVITY CGS</u> |
|-------------------------|-----------------------------|
| <u>0.50</u> | <u>2.28</u> |
| <u>2.50</u> | <u>2.18</u> |
| <u>4.50</u> | <u>2.15</u> |
| <u>6.50</u> | <u>2.65</u> |
| <u>8.50</u> | <u>2.43</u> |



TGRAD STATION C13-42A
014 52.7 N 078 44.6 W
CRUISE STATION 172

111

SBDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| 0.50 | 2.11 |
| 2.50 | 2.27 |
| 4.50 | 1.96 |
| 6.50 | 2.27 |
| 8.50 | 2.43 |
| 10.50 | 2.29 |

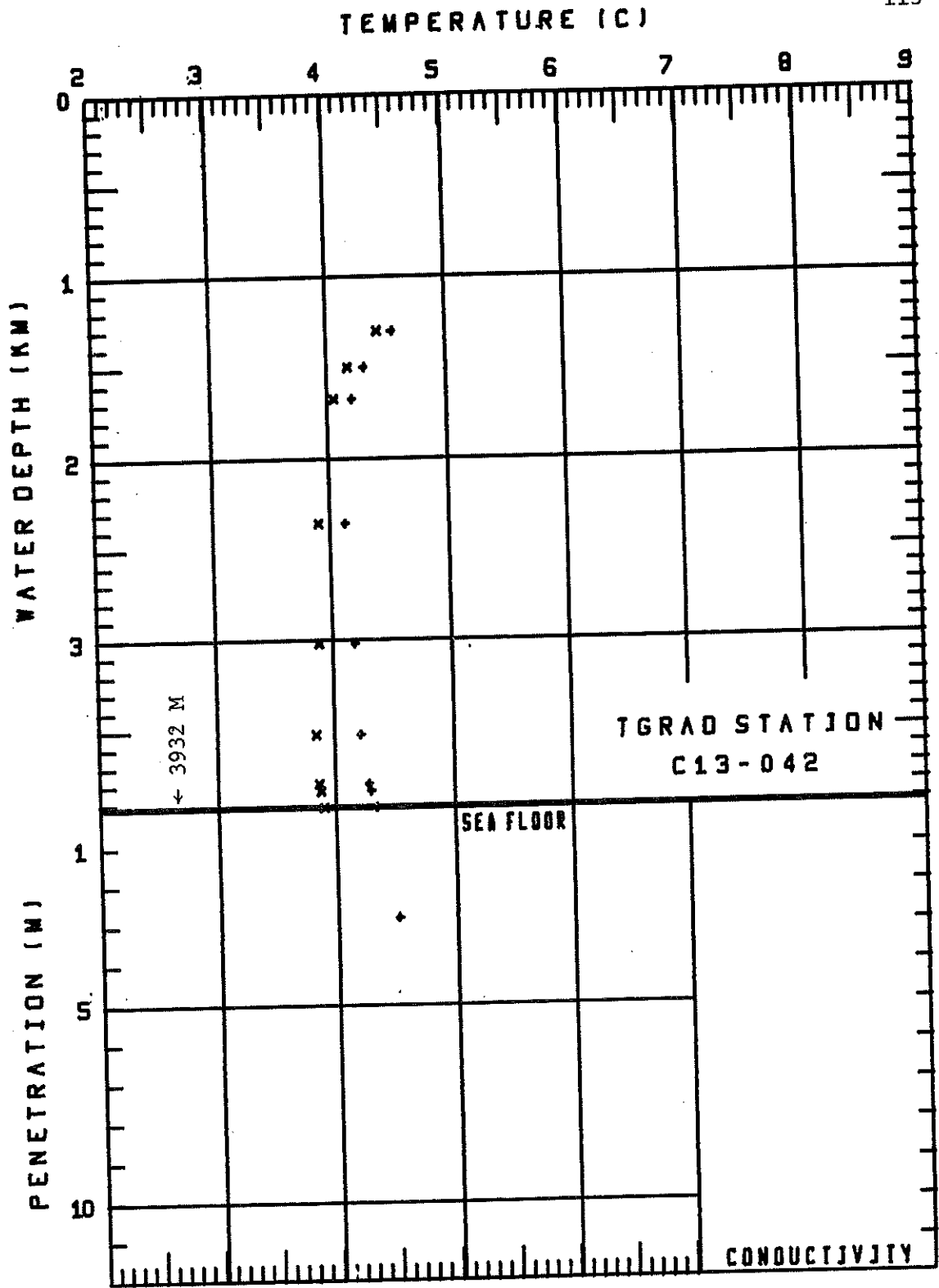
TGRAD STATION C13-042
 012 52 N 077 45 W
 CRUISE STATION 173

WATER TEMPERATURES

| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| <u>1302</u> | <u>4.555</u> | <u>4.440</u> |
| <u>1495</u> | <u>4.317</u> | <u>4.186</u> |
| <u>1672</u> | <u>4.215</u> | <u>4.066</u> |
| <u>2354</u> | <u>4.137</u> | <u>3.914</u> |
| <u>3017</u> | <u>4.197</u> | <u>3.888</u> |
| <u>3516</u> | <u>4.231</u> | <u>3.854</u> |
| <u>3788</u> | <u>4.292</u> | <u>3.872</u> |
| <u>3823</u> | <u>4.313</u> | <u>3.888</u> |
| <u>3916</u> | <u>4.355</u> | <u>3.914</u> |

SEDIMENT TEMPERATURES

| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
|-------------------------|-----------------------------------|
| <u>2.80</u> | <u>4.526</u> |



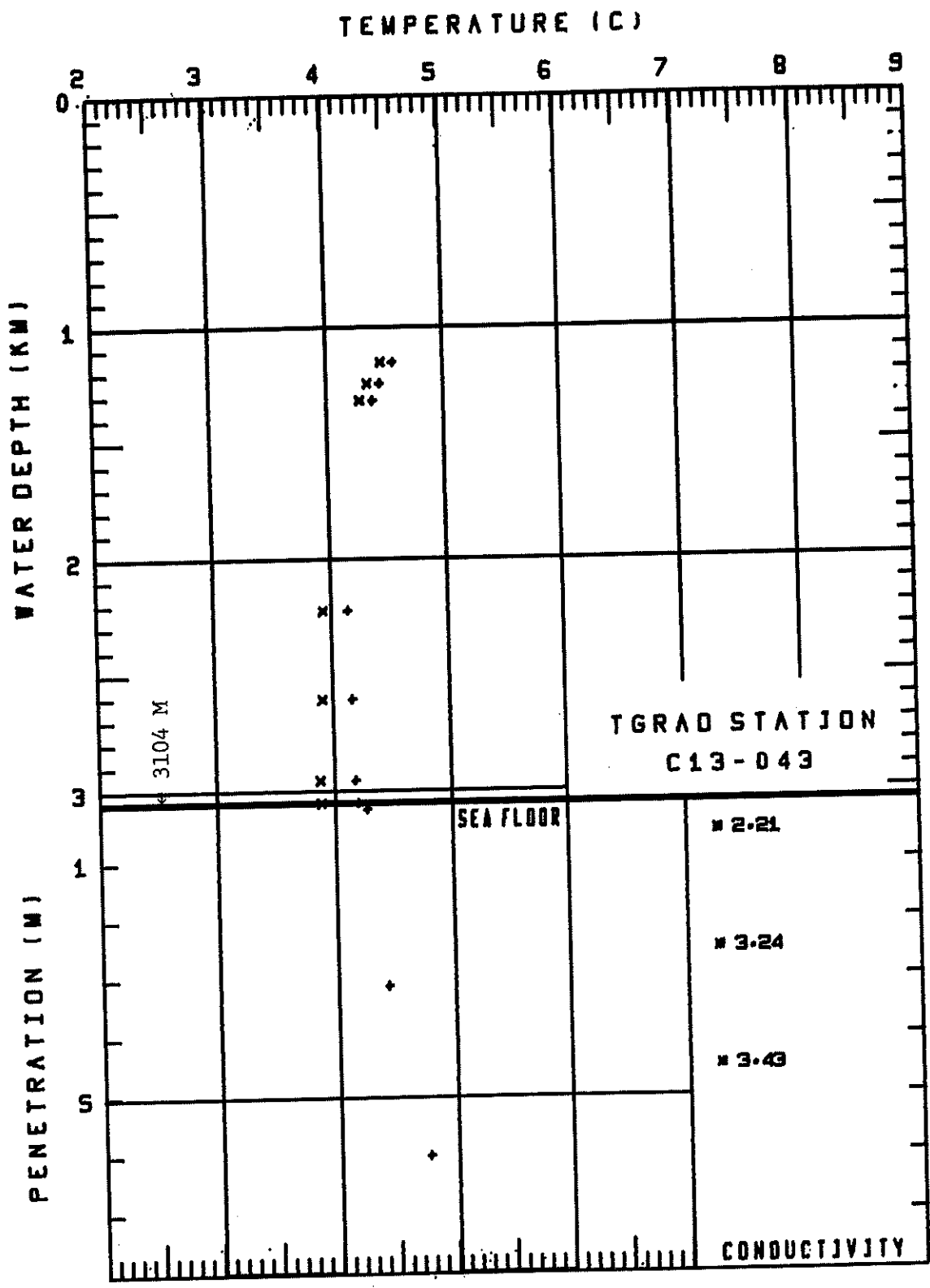
TGRAD STATION C13-043
 010 02 N 076 57 W
 CRUISE STATION 174

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE | SEDIMENT TEMPERATURES | |
|-----------------|------------------------|--------------------------|-----------------------|---------------------------|
| | | | DEPTH METERS | TEMPERATURE CENTIGRADE |
| 1149 | 4.568 | 4.469 | | |
| 1242 | 4.460 | 4.354 | | |
| 1316 | 4.398 | 4.284 | | |
| 2219 | 4.144 | 3.936 | 0.10 | 4.280 |
| 2603 | 4.172 | 3.917 | 3.10 | 4.439 |
| 2954 | 4.184 | 3.882 | 6.00 | 4.772 |
| 3051 | 4.203 | 3.889 | | |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 2.21 |
| 2.50 | 3.24 |
| 4.50 | 3.43 |



TGRAD STATION C13-044
011 15 N 078 09 W
CRUISE STATION 175

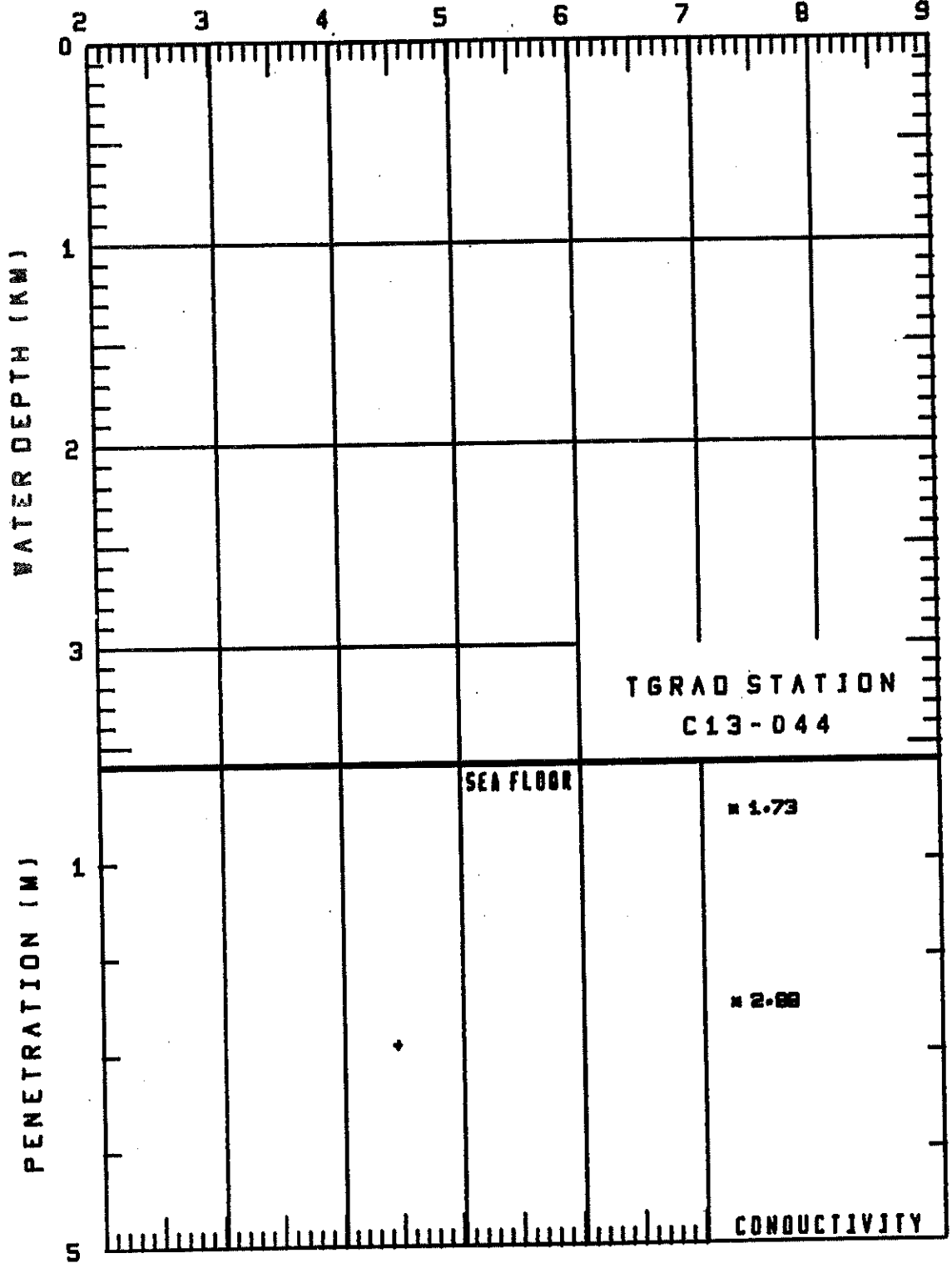
SEDIMENT TEMPERATURES

| <u>DEPTH</u> <u>METERS</u> | <u>TEMPERATURE</u> <u>CENTIGRADE</u> |
|-------------------------------|---|
| <u>2.90</u> | <u>4.450</u> |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| <u>0.50</u> | <u>1.73</u> |
| <u>2.50</u> | <u>2.88</u> |

TEMPERATURE (C)



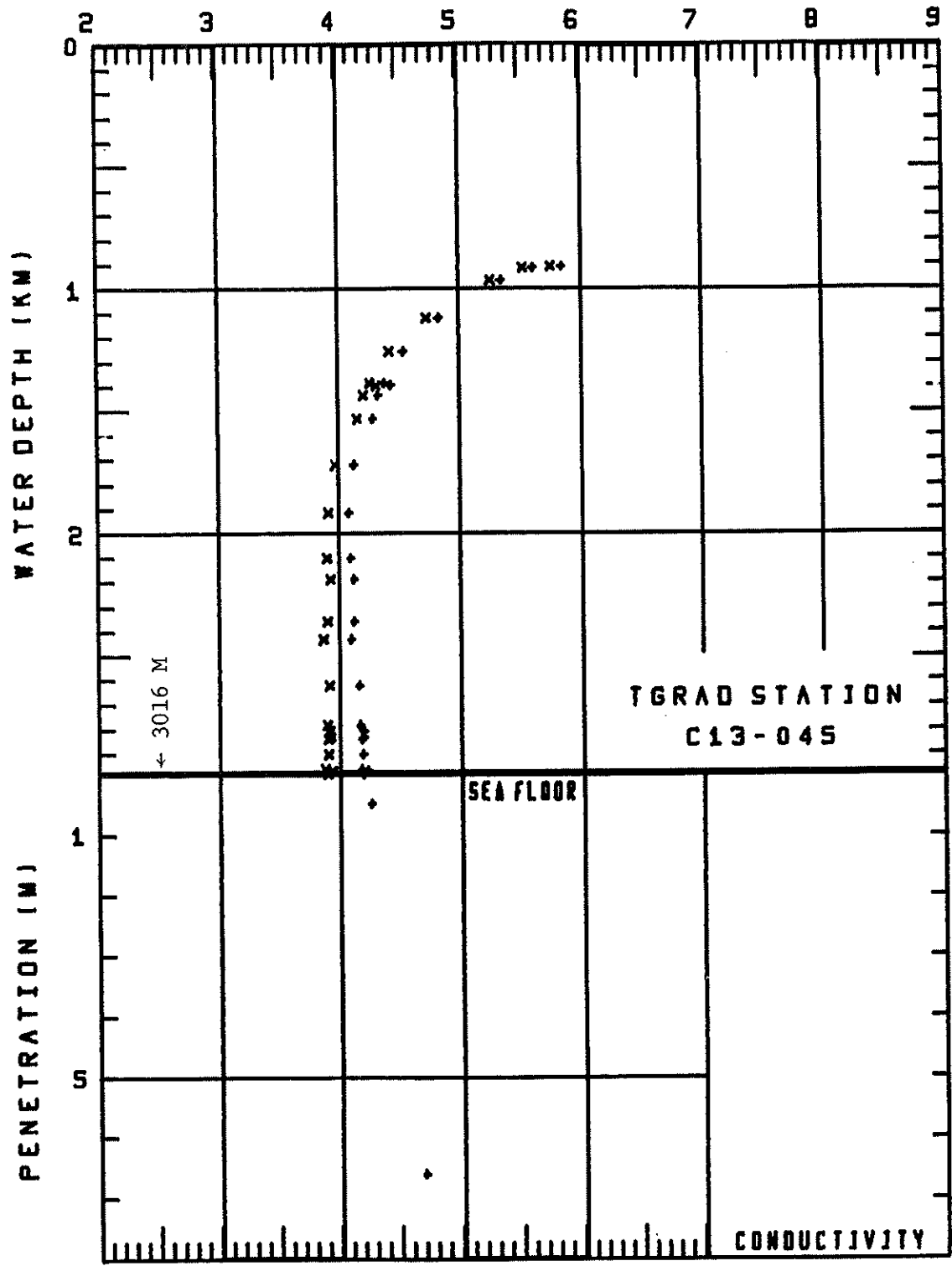
TGRAD STATION C13-045
 013 11 N 079 50 W
 CRUISE STATION 176

WATER TEMPERATURES

| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| 907 | 5.842 | 5.756 |
| 915 | 5.614 | 5.529 |
| 965 | 5.354 | 5.266 |
| 1121 | 4.845 | 4.746 |
| 1255 | 4.548 | 4.438 |
| 1393 | 4.453 | 4.330 |
| 1384 | 4.396 | 4.276 |
| 1434 | 4.352 | 4.226 |
| 1531 | 4.307 | 4.172 |
| 1720 | 4.137 | 3.986 |
| 1914 | 4.100 | 3.927 |
| 2100 | 4.108 | 3.914 |
| 2185 | 4.140 | 3.935 |
| 2356 | 4.135 | 3.910 |
| 2431 | 4.113 | 3.880 |
| 2619 | 4.179 | 3.921 |
| 2781 | 4.181 | 3.903 |
| 2831 | 4.213 | 3.928 |
| 2805 | 4.210 | 3.927 |
| 2837 | 4.198 | 3.913 |
| 2900 | 4.203 | 3.908 |
| 2961 | 4.188 | 3.887 |
| 2980 | 4.208 | 3.903 |
| 2967 | 4.247 | 3.942 |

| <u>SEDIMENT TEMPERATURES</u> | |
|------------------------------|-----------------------------------|
| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
| 0.50 | 4.270 |
| 6.60 | 4.698 |

TEMPERATURE (C)



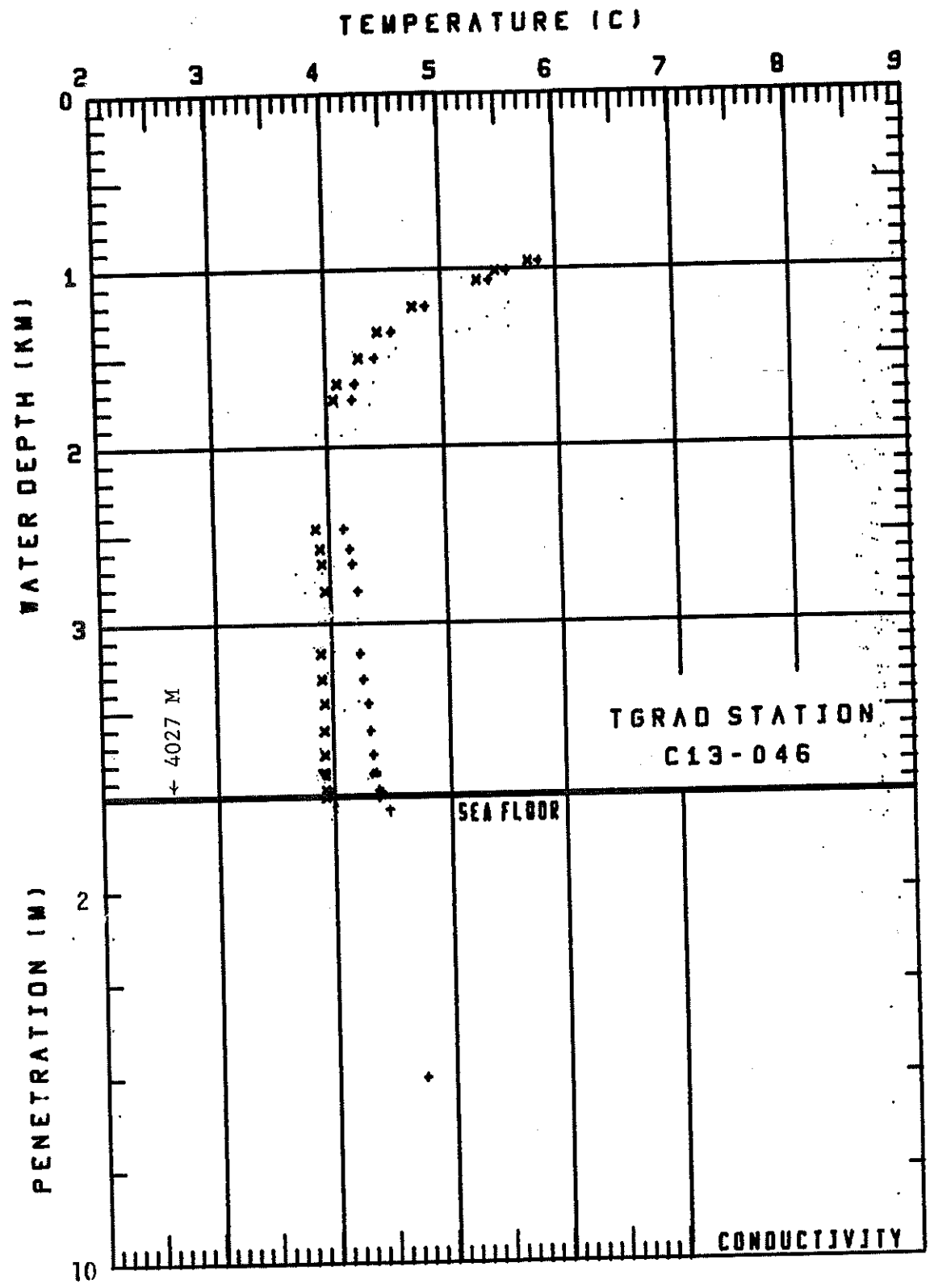
TGRAD STATION C13-046
 014 42 N 077 10 W
 CRUISE STATION 177

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 955 | 5.852 | 5.762 |
| 1009 | 5.569 | 5.475 |
| 1061 | 5.416 | 5.318 |
| 1208 | 4.865 | 4.757 |
| 1351 | 4.573 | 4.453 |
| 1498 | 4.420 | 4.288 |
| 1641 | 4.245 | 4.099 |
| 1730 | 4.222 | 4.067 |
| 2459 | 4.131 | 3.894 |
| 2576 | 4.177 | 3.923 |
| 2658 | 4.198 | 3.935 |
| 2813 | 4.240 | 3.956 |
| 2951 | 4.226 | 3.925 |
| 3102 | 4.205 | 3.884 |
| 3167 | 4.243 | 3.914 |
| 3313 | 4.271 | 3.920 |
| 3452 | 4.310 | 3.938 |
| 3607 | 4.328 | 3.933 |
| 3744 | 4.346 | 3.931 |
| 3847 | 4.361 | 3.930 |
| 3860 | 4.363 | 3.929 |
| 3850 | 4.340 | 3.908 |
| 3881 | 4.322 | 3.888 |
| 3941 | 4.385 | 3.938 |
| 3957 | 4.409 | 3.960 |
| 3973 | 4.398 | 3.947 |
| 3982 | 4.394 | 3.940 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.10 | 4.420 |
| 6.00 | 4.755 |



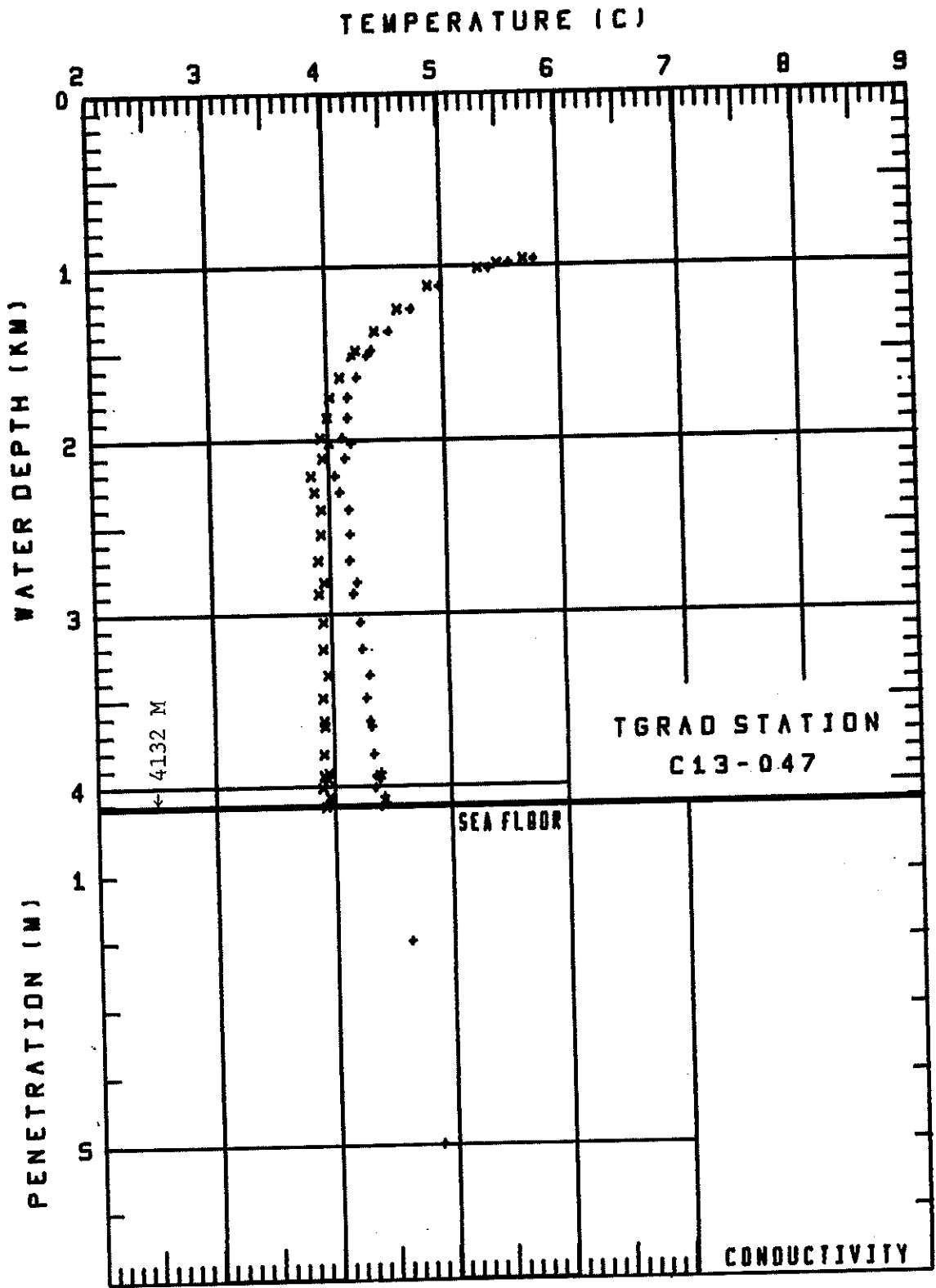
TGRAD STATION C13-047
 014 54 N 075 48 W
 CRUISE STATION 178

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 958 | 5.800 | 5.710 |
| 981 | 5.582 | 5.491 |
| 1010 | 5.420 | 5.328 |
| 1112 | 4.989 | 4.890 |
| 1242 | 4.736 | 4.625 |
| 1371 | 4.547 | 4.425 |
| 1482 | 4.388 | 4.257 |
| 1507 | 4.356 | 4.223 |
| 1634 | 4.263 | 4.118 |
| 1749 | 4.187 | 4.030 |
| 1869 | 4.177 | 4.006 |
| 1985 | 4.128 | 3.947 |
| 2017 | 4.205 | 4.019 |
| 2101 | 4.153 | 3.957 |
| 2204 | 4.063 | 3.857 |
| 2298 | 4.099 | 3.882 |
| 2401 | 4.170 | 3.940 |
| 2539 | 4.180 | 3.933 |
| 2693 | 4.174 | 3.907 |
| 2818 | 4.234 | 3.950 |
| 2882 | 4.199 | 3.907 |
| 3049 | 4.250 | 3.935 |
| 3202 | 4.267 | 3.931 |
| 3353 | 4.326 | 3.967 |
| 3486 | 4.291 | 3.915 |
| 3617 | 4.321 | 3.924 |
| 3652 | 4.330 | 3.928 |
| 3813 | 4.345 | 3.921 |
| 3940 | 4.368 | 3.922 |
| 3934 | 4.364 | 3.920 |
| 3918 | 4.404 | 3.960 |
| 3953 | 4.401 | 3.951 |
| 4001 | 4.359 | 3.904 |
| 4058 | 4.432 | 3.967 |
| 4112 | 4.405 | 3.931 |
| 4096 | 4.449 | 3.977 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.00 | 4.647 |
| 5.00 | 4.882 |

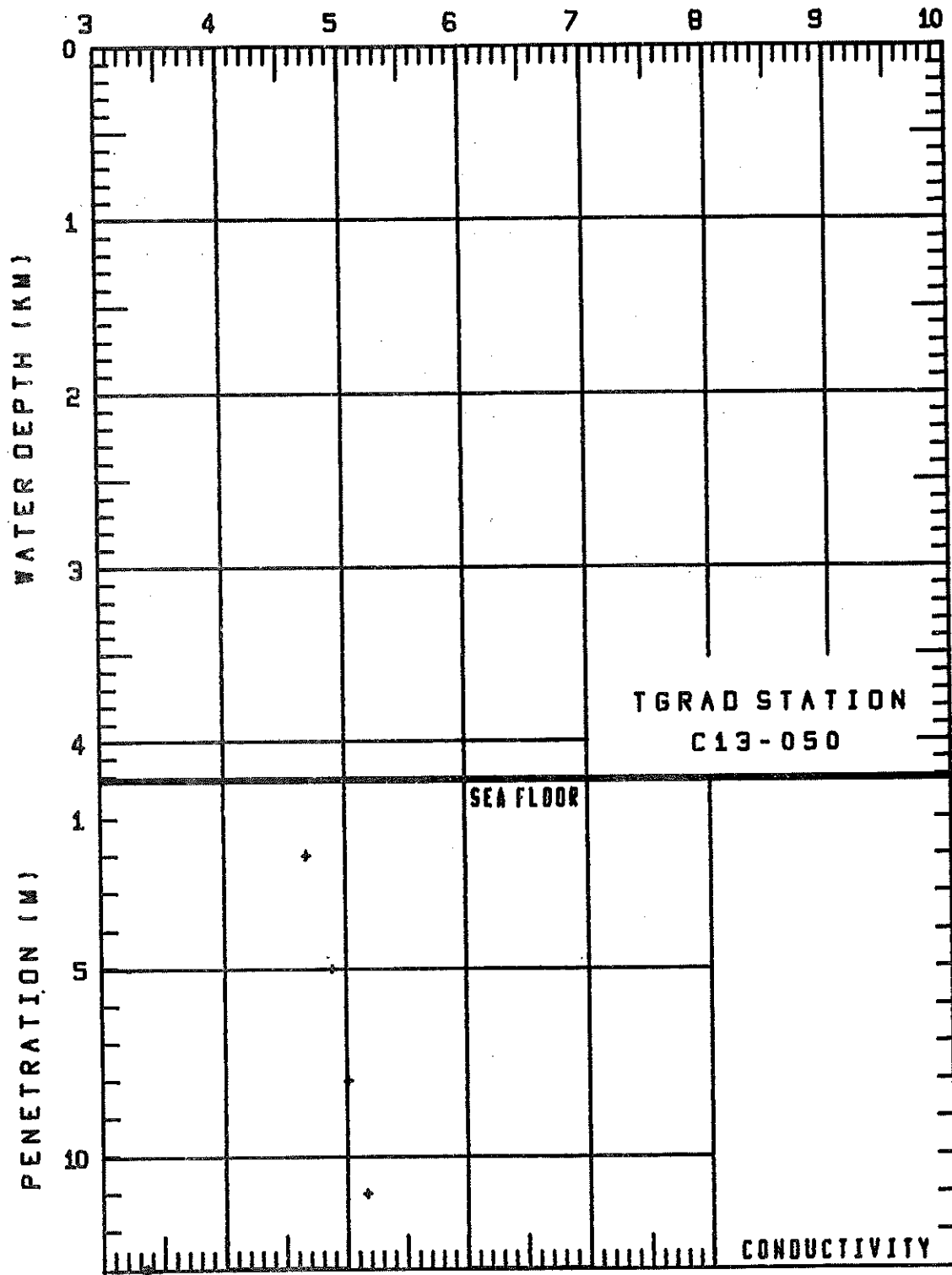


TGRAD STATION C13-050
015 41 N 070 43 W
CRUISE STATION 181

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.00 | 4.682 |
| 5.00 | 4.892 |
| 8.00 | 5.015 |
| 11.00 | 5.170 |

TEMPERATURE (C)



TGRAD STATION C13-051
 015 28 N 068 24 W
 CRUISE STATION 182

WATER TEMPERATURES

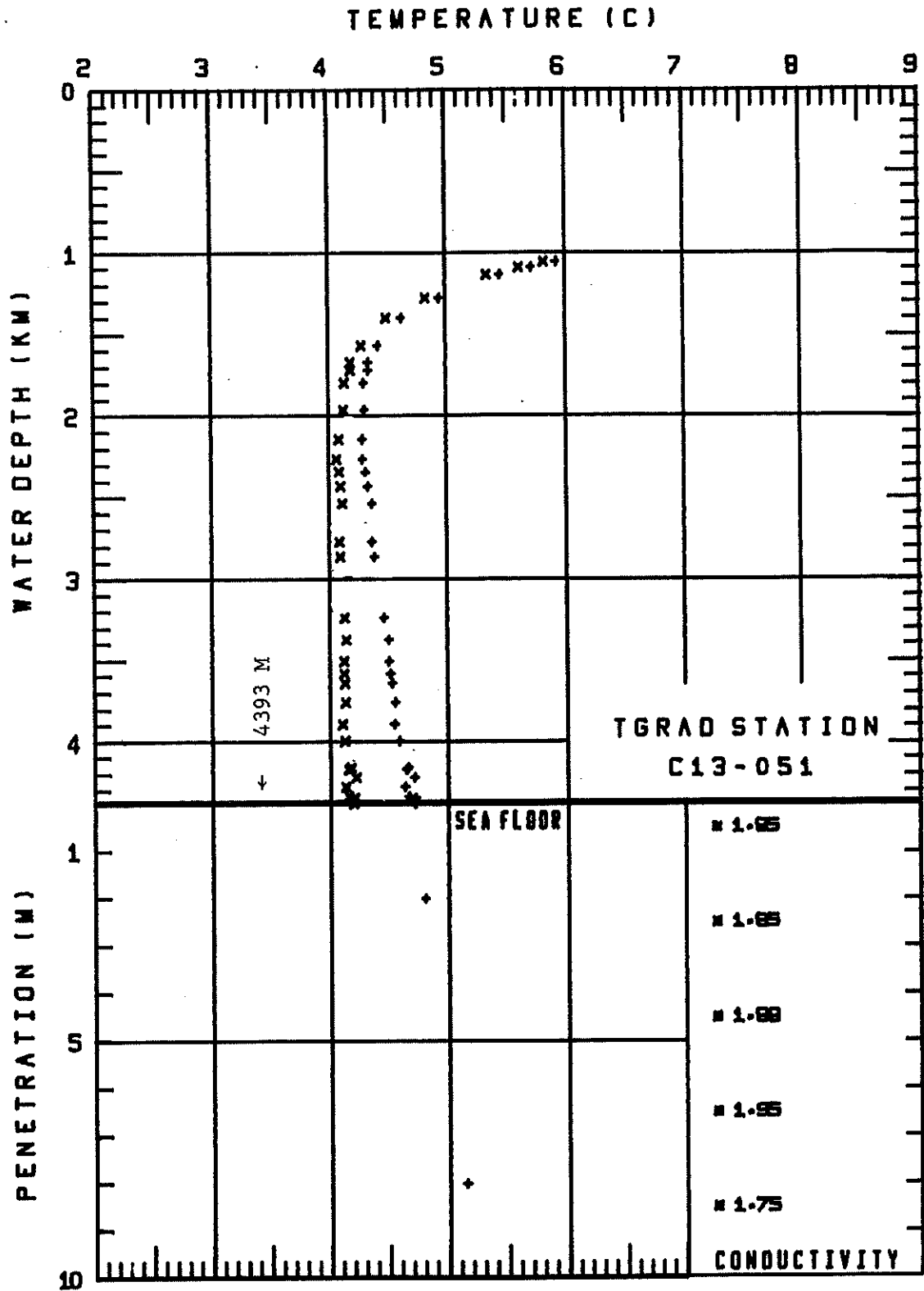
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1053 | 5.917 | 5.815 |
| 1090 | 5.713 | 5.611 |
| 1131 | 5.448 | 5.342 |
| 1275 | 4.946 | 4.829 |
| 1397 | 4.625 | 4.500 |
| 1565 | 4.422 | 4.283 |
| 1667 | 4.342 | 4.192 |
| 1714 | 4.345 | 4.190 |
| 1794 | 4.304 | 4.140 |
| 1961 | 4.311 | 4.130 |
| 2042 | 4.366 | 4.174 |
| 2141 | 4.295 | 4.092 |
| 2259 | 4.289 | 4.073 |
| 2338 | 4.318 | 4.092 |
| 2425 | 4.339 | 4.102 |
| 2531 | 4.369 | 4.118 |
| 2680 | 4.316 | 4.047 |
| 2766 | 4.373 | 4.092 |
| 2857 | 4.390 | 4.097 |
| 2969 | 4.372 | 4.064 |
| 2971 | 4.475 | 4.164 |
| 3162 | 4.399 | 4.064 |
| 3232 | 4.474 | 4.128 |
| 3369 | 4.509 | 4.142 |
| 3500 | 4.510 | 4.125 |
| 3577 | 4.524 | 4.127 |
| 3636 | 4.536 | 4.130 |
| 3754 | 4.564 | 4.140 |
| 3888 | 4.559 | 4.114 |
| 3990 | 4.595 | 4.133 |
| 4080 | 4.712 | 4.231 |
| 4155 | 4.674 | 4.184 |
| 4167 | 4.655 | 4.164 |
| 4215 | 4.725 | 4.223 |
| 4275 | 4.644 | 4.135 |
| 4331 | 4.680 | 4.161 |
| 4343 | 4.730 | 4.208 |
| 4376 | 4.730 | 4.203 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 2.00 | 4.810 |
| 8.00 | 5.153 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.50 | 1.85 |
| 2.50 | 1.85 |
| 4.50 | 1.88 |
| 6.50 | 1.95 |
| 8.50 | 1.75 |



TGRAD STATION C13-052
 015 43 N 066 12 W
 CRUISE STATION 183

WATER TEMPERATURES

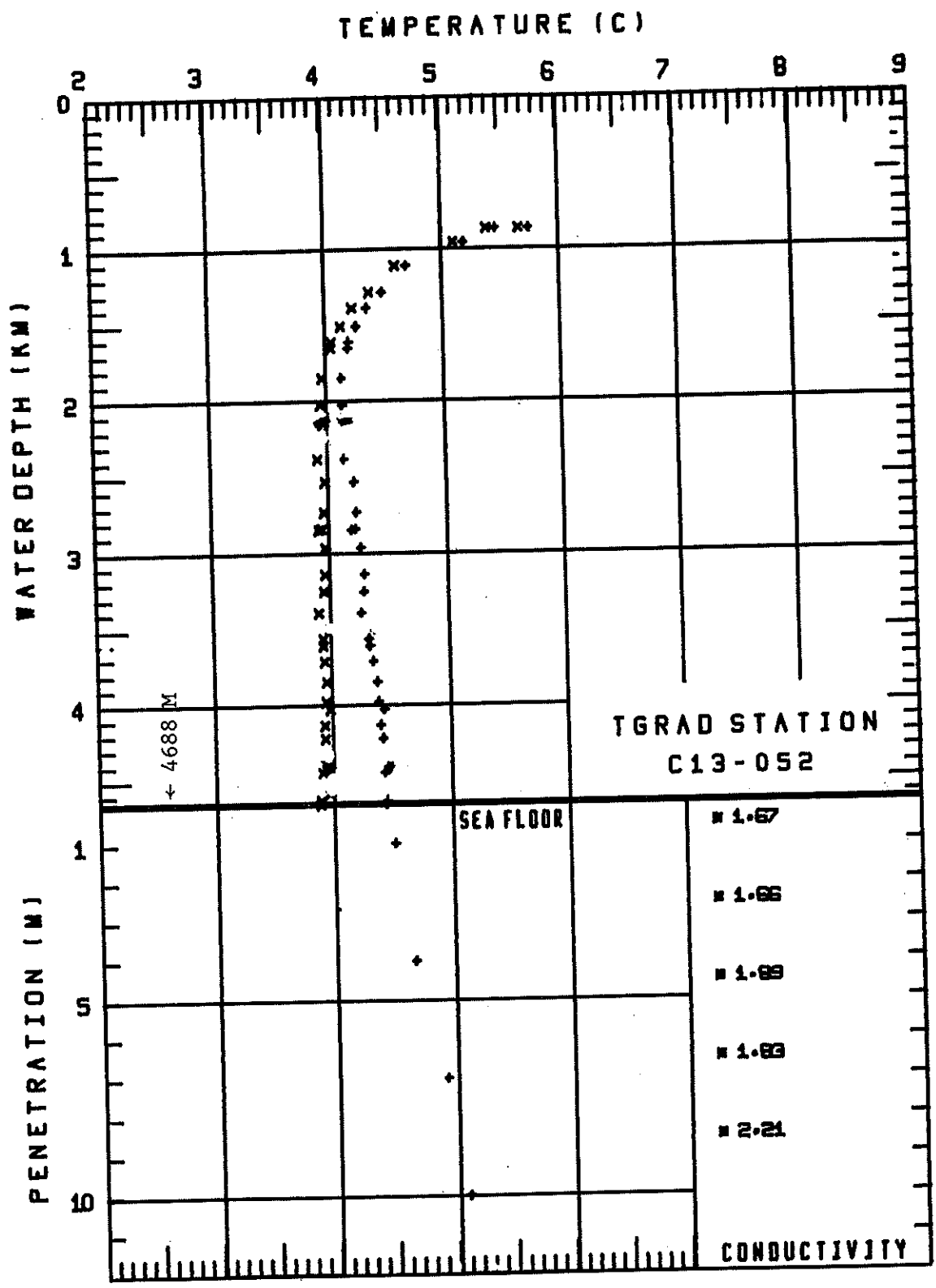
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 865 | 5.741 | 5.661 |
| 869 | 5.467 | 5.389 |
| 955 | 5.197 | 5.112 |
| 1112 | 4.714 | 4.618 |
| 1281 | 4.500 | 4.388 |
| 1386 | 4.365 | 4.245 |
| 1501 | 4.278 | 4.146 |
| 1605 | 4.210 | 4.067 |
| 1646 | 4.205 | 4.059 |
| 1842 | 4.142 | 3.976 |
| 2020 | 4.145 | 3.960 |
| 2109 | 4.139 | 3.943 |
| 2126 | 4.153 | 3.955 |
| 2203 | 4.181 | 3.973 |
| 2374 | 4.151 | 3.924 |
| 2525 | 4.230 | 3.983 |
| 2729 | 4.245 | 3.971 |
| 2838 | 4.238 | 3.951 |
| 2958 | 4.280 | 3.976 |
| 3138 | 4.302 | 3.973 |
| 3251 | 4.300 | 3.956 |
| 3388 | 4.273 | 3.911 |
| 3558 | 4.333 | 3.946 |
| 3604 | 4.339 | 3.944 |
| 3707 | 4.365 | 3.954 |
| 3846 | 4.401 | 3.967 |
| 3974 | 4.408 | 3.955 |
| 4024 | 4.451 | 3.990 |
| 4130 | 4.420 | 3.943 |
| 4214 | 4.437 | 3.947 |
| 4328 | 4.454 | 3.946 |
| 4404 | 4.506 | 3.983 |
| 4422 | 4.479 | 3.954 |
| 4400 | 4.480 | 3.959 |
| 4446 | 4.547 | 4.015 |
| 4517 | 4.565 | 4.021 |
| 4576 | 4.526 | 3.973 |
| 4623 | 4.463 | 3.907 |
| 4649 | 4.457 | 3.896 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 1.00 | 4.524 |
| 4.00 | 4.675 |
| 7.00 | 4.922 |
| 10.00 | 5.095 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.50 | 1.67 |
| 2.50 | 1.66 |
| 4.50 | 1.89 |
| 6.50 | 1.83 |
| 8.50 | 2.21 |



TGRAD STATION C13-053
 015 58 N 064 12 W
 CRUISE STATION 184

WATER TEMPERATURES

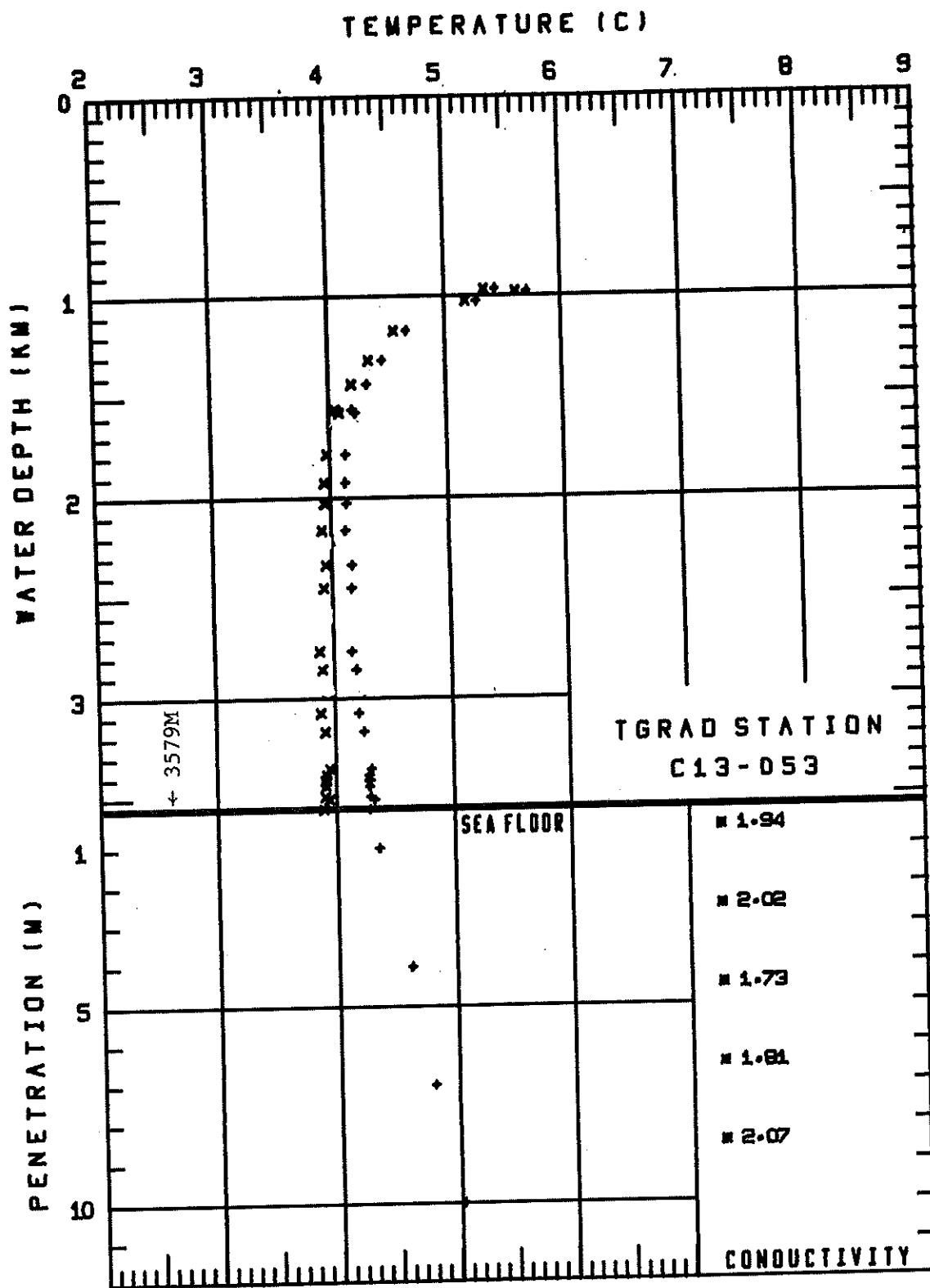
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 973 | 5.710 | 5.618 |
| 962 | 5.435 | 5.347 |
| 1022 | 5.277 | 5.185 |
| 1169 | 4.668 | 4.566 |
| 1315 | 4.456 | 4.342 |
| 1432 | 4.325 | 4.200 |
| 1560 | 4.196 | 4.060 |
| 1576 | 4.227 | 4.089 |
| 1780 | 4.137 | 3.979 |
| 1923 | 4.128 | 3.954 |
| 2024 | 4.135 | 3.949 |
| 2159 | 4.122 | 3.921 |
| 2333 | 4.174 | 3.953 |
| 2447 | 4.166 | 3.930 |
| 2761 | 4.159 | 3.884 |
| 2852 | 4.189 | 3.901 |
| 3068 | 4.201 | 3.885 |
| 3163 | 4.247 | 3.917 |
| 3351 | 4.306 | 3.948 |
| 3380 | 4.288 | 3.927 |
| 3410 | 4.280 | 3.915 |
| 3407 | 4.291 | 3.927 |
| 3436 | 4.284 | 3.915 |
| 3486 | 4.288 | 3.913 |
| 3505 | 4.324 | 3.944 |
| 3551 | 4.284 | 3.900 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENIGRADE |
|-----------------|--------------------------|
| 1.00 | 4.357 |
| 4.00 | 4.626 |
| 7.00 | 4.802 |
| 10.00 | 5.035 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 1.94 |
| 2.50 | 2.02 |
| 4.50 | 1.73 |
| 6.50 | 1.81 |
| 8.50 | 2.07 |



TGRAD. STATION C13-054
 015 15 N 061 46 W
 CRUISE STATION 185

WATER TEMPERATURES

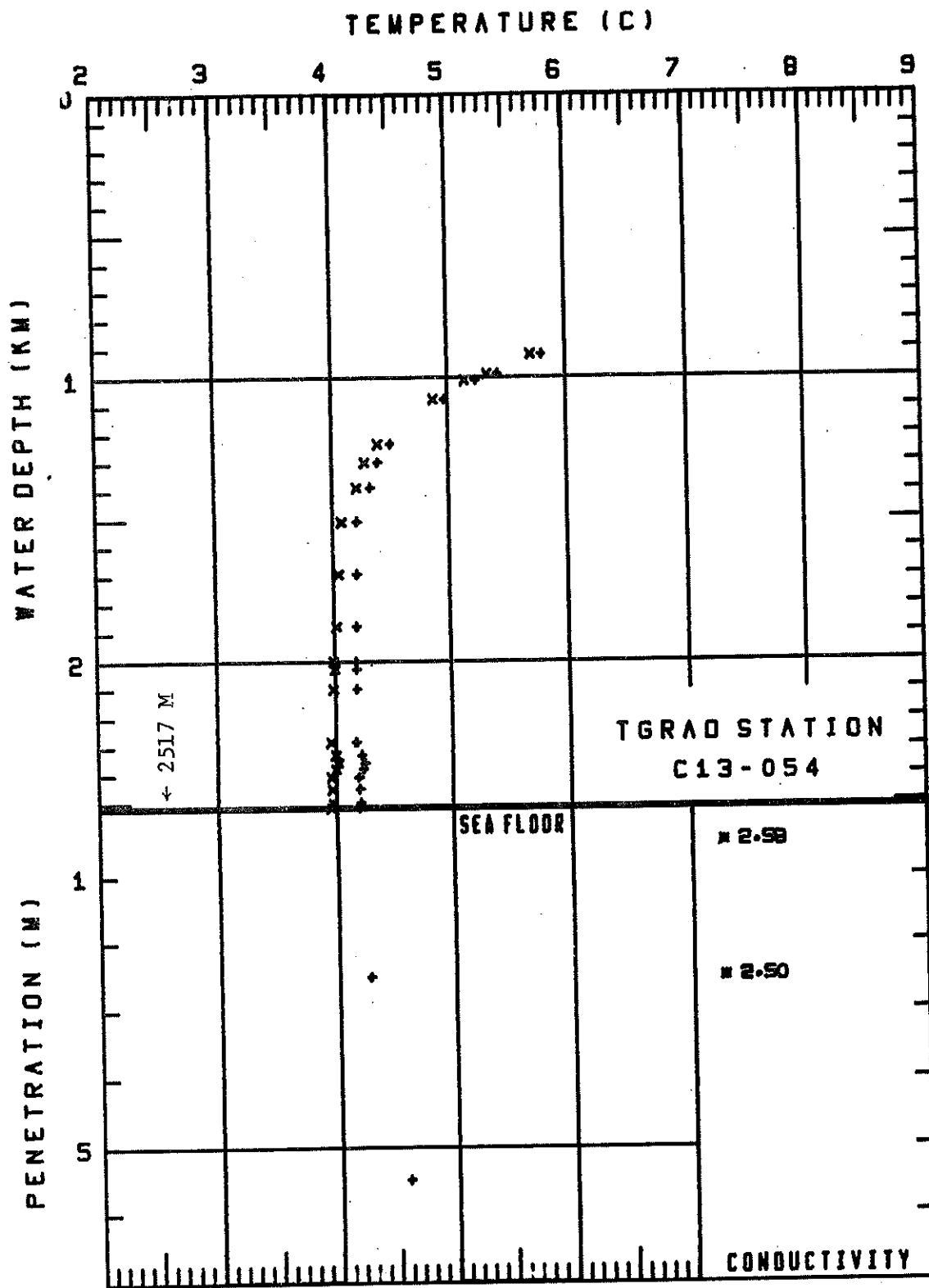
| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| 919 | 5.803 | 5.717 |
| 985 | 5.439 | 5.349 |
| 1010 | 5.250 | 5.159 |
| 1076 | 4.980 | 4.884 |
| 1233 | 4.505 | 4.398 |
| 1296 | 4.398 | 4.286 |
| 1386 | 4.331 | 4.211 |
| 1505 | 4.210 | 4.079 |
| 1691 | 4.203 | 4.052 |
| 1875 | 4.197 | 4.026 |
| 2025 | 4.194 | 4.007 |
| 1998 | 4.184 | 4.000 |
| 2095 | 4.189 | 3.994 |
| 2284 | 4.180 | 3.963 |
| 2377 | 4.236 | 4.005 |
| 2356 | 4.253 | 4.026 |
| 2327 | 4.225 | 4.003 |
| 2407 | 4.196 | 3.963 |
| 2448 | 4.206 | 3.969 |
| 2515 | 4.204 | 3.959 |
| 2497 | 4.213 | 3.970 |

SEDIMENT TEMPERATURES

| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
|-------------------------|-----------------------------------|
| 2.50 | 4.278 |
| 5.50 | 4.588 cooling |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH METERS</u> | <u>CONDUCTIVITY CGS</u> |
|-------------------------|-----------------------------|
| 0.50 | 2.58 |
| 2.50 | 2.50 |



TGRAD STATION C13-055
 012 49 N . 062 06 W
 CRUISE STATION 186

WATER TEMPERATURES

| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|---------------------|----------------------------|------------------------------|
| 897 | 5.607 | 5.526 |
| 943 | 5.297 | 5.212 |
| 962 | 5.133 | 5.048 |
| 1092 | 4.701 | 4.606 |
| 1254 | 4.486 | 4.378 |
| 1377 | 4.356 | 4.236 |
| 1442 | 4.345 | 4.219 |
| 1503 | 4.303 | 4.171 |
| 1672 | 4.179 | 4.031 |
| 1837 | 4.224 | 4.059 |
| 1939 | 4.204 | 4.027 |
| 2114 | 4.221 | 4.023 |
| 2240 | 4.251 | 4.038 |
| 2355 | 4.178 | 3.953 |
| 2487 | 4.233 | 3.990 |
| 2606 | 4.292 | 4.033 |
| 2756 | 4.250 | 3.973 |
| 2879 | 4.280 | 3.986 |
| 2852 | 4.289 | 4.000 |
| 2892 | 4.264 | 3.970 |
| 2904 | 4.305 | 4.008 |
| 2982 | 4.293 | 3.986 |
| 2929 | 4.343 | 4.041 |
| 2936 | 4.328 | 4.026 |

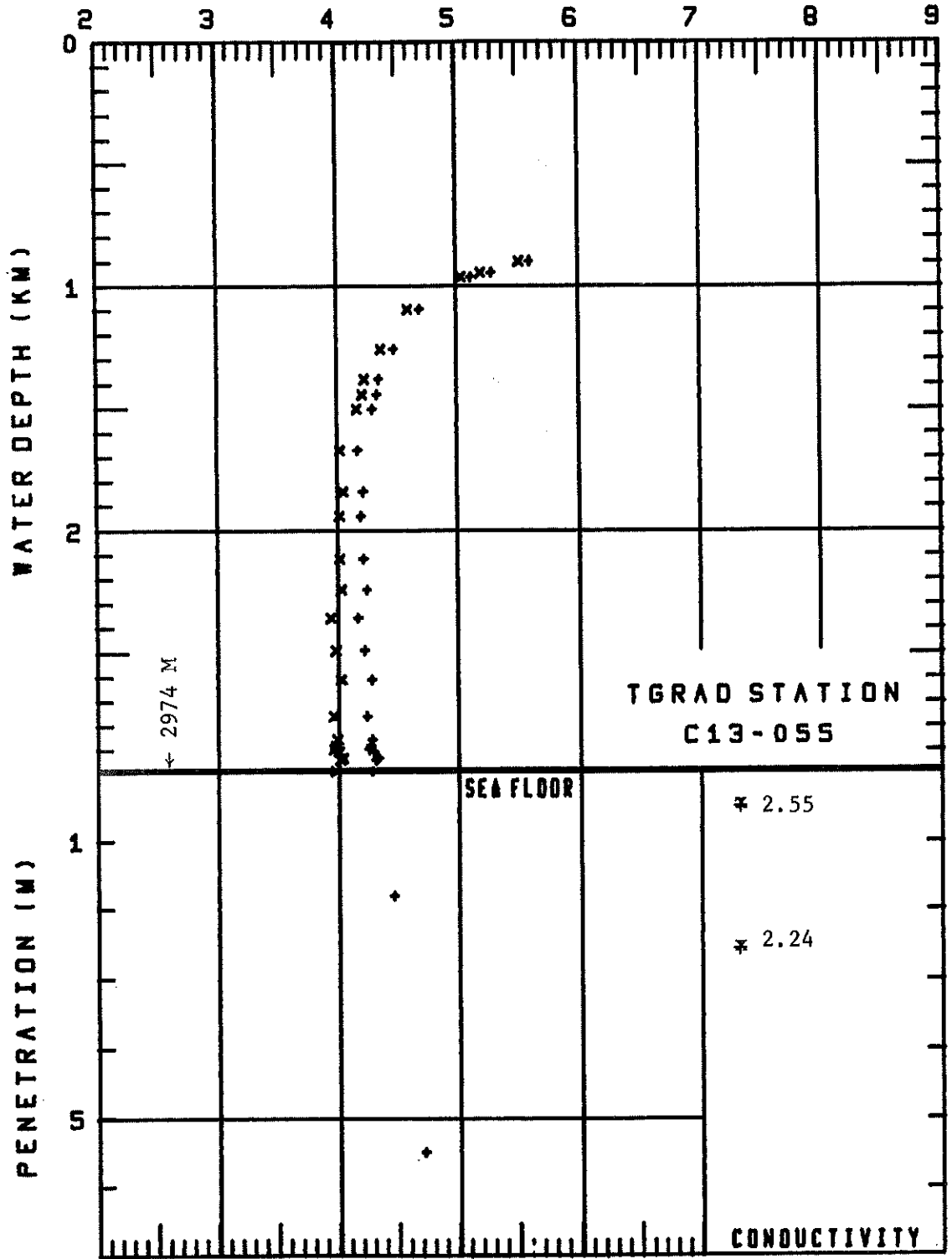
SEDIMENT TEMPERATURES

| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
|---------------------|-------------------------------|
| 1.80 | 4.473 |
| 5.50 | 4.725 |

SEDIMENT CONDUCTIVITIES

| <u>Depth Meters</u> | <u>Conductivity CGS</u> |
|---------------------|-------------------------|
| 0.50 | 2.55 |
| 2.50 | 2.24 |

TEMPERATURE (C)



TGRAD STATION C13-056
012 31 N 065 07 W
CRUISE STATION 187

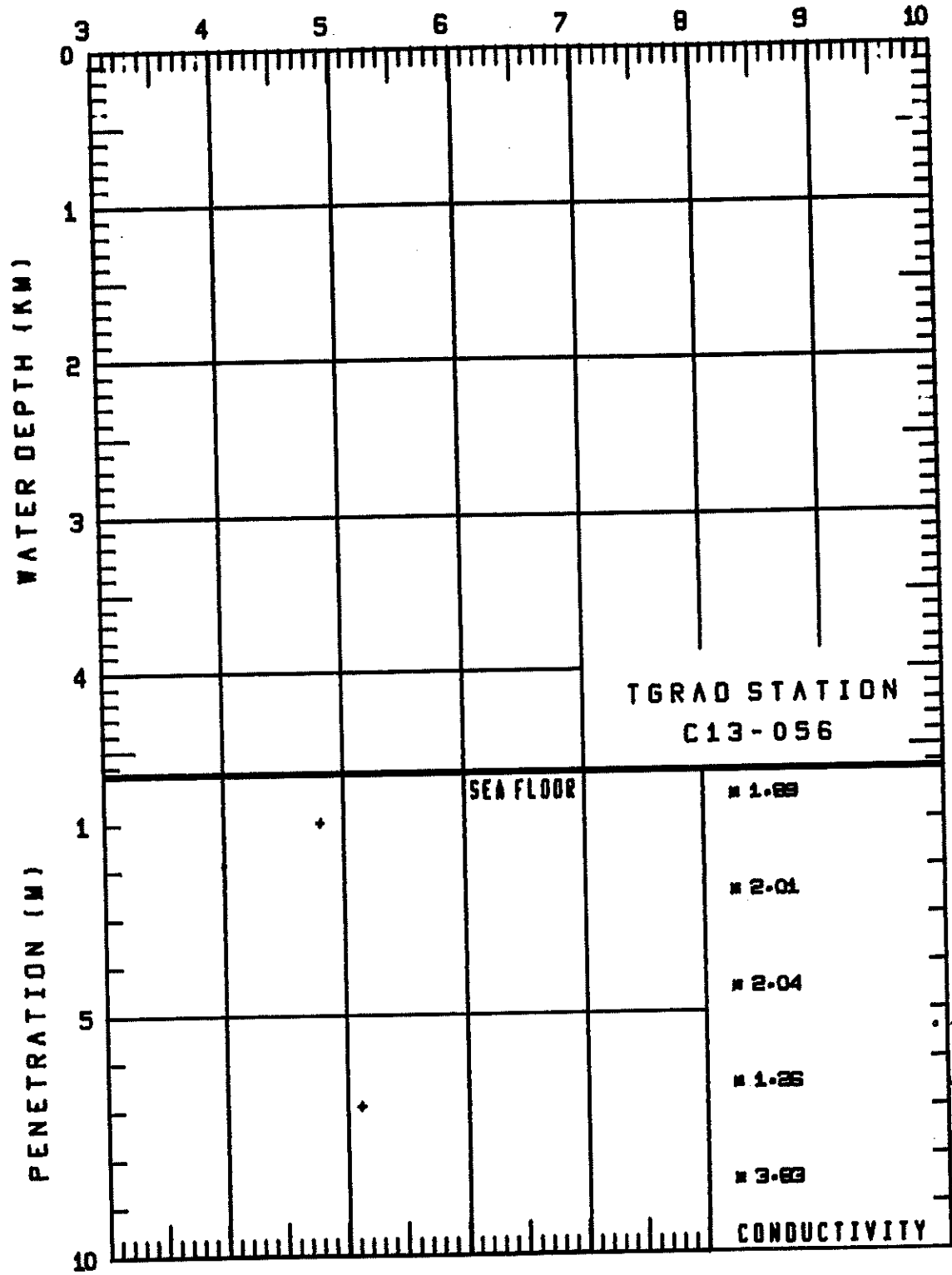
SEDIMENT TEMPERATURES

| <u>DEPTH</u> <u>METERS</u> | <u>TEMPERATURE</u> <u>CENTIGRADE</u> |
|-------------------------------|---|
| <u>1.00</u> | <u>4.814</u> |
| <u>6.90</u> | <u>5.125</u> |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| <u>0.50</u> | <u>1.89</u> |
| <u>2.50</u> | <u>2.01</u> |
| <u>4.50</u> | <u>2.04</u> |
| <u>6.50</u> | <u>1.26</u> |
| <u>8.50</u> | <u>3.83</u> |

TEMPERATURE (C)



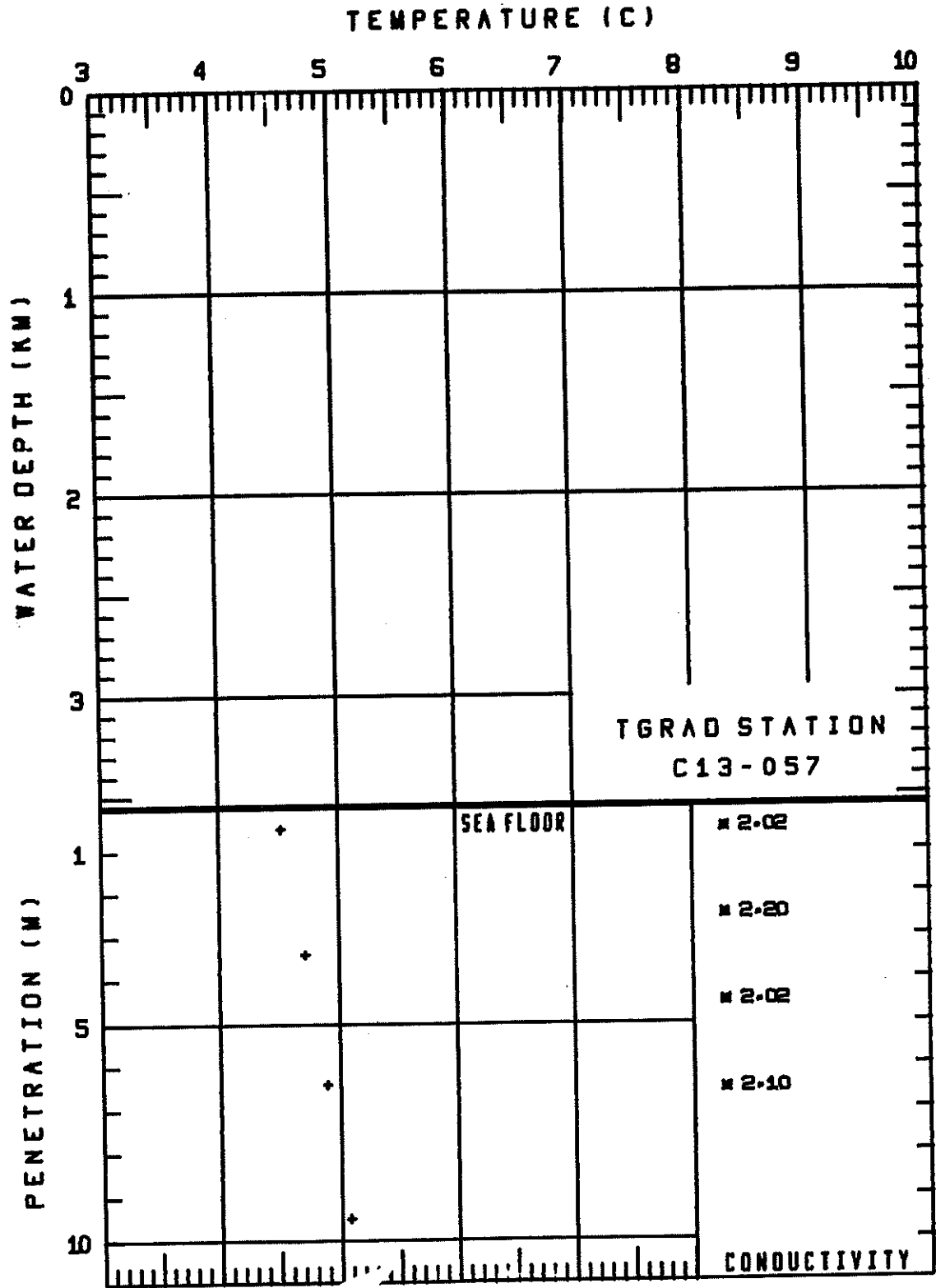
TGRAD STATION C13-057
014 02 N 064 35 W
CRUISE STATION 188

SBDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.50 | 4.534 |
| 3.40 | 4.724 |
| 6.40 | 4.895 |
| 9.50 | 5.083 |

SBDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 2.02 |
| 2.50 | 2.20 |
| 4.50 | 2.02 |
| 6.50 | 2.10 |



TGRAD STATION C13-058
014 03 N 062 21 W
CRUISE STATION 189

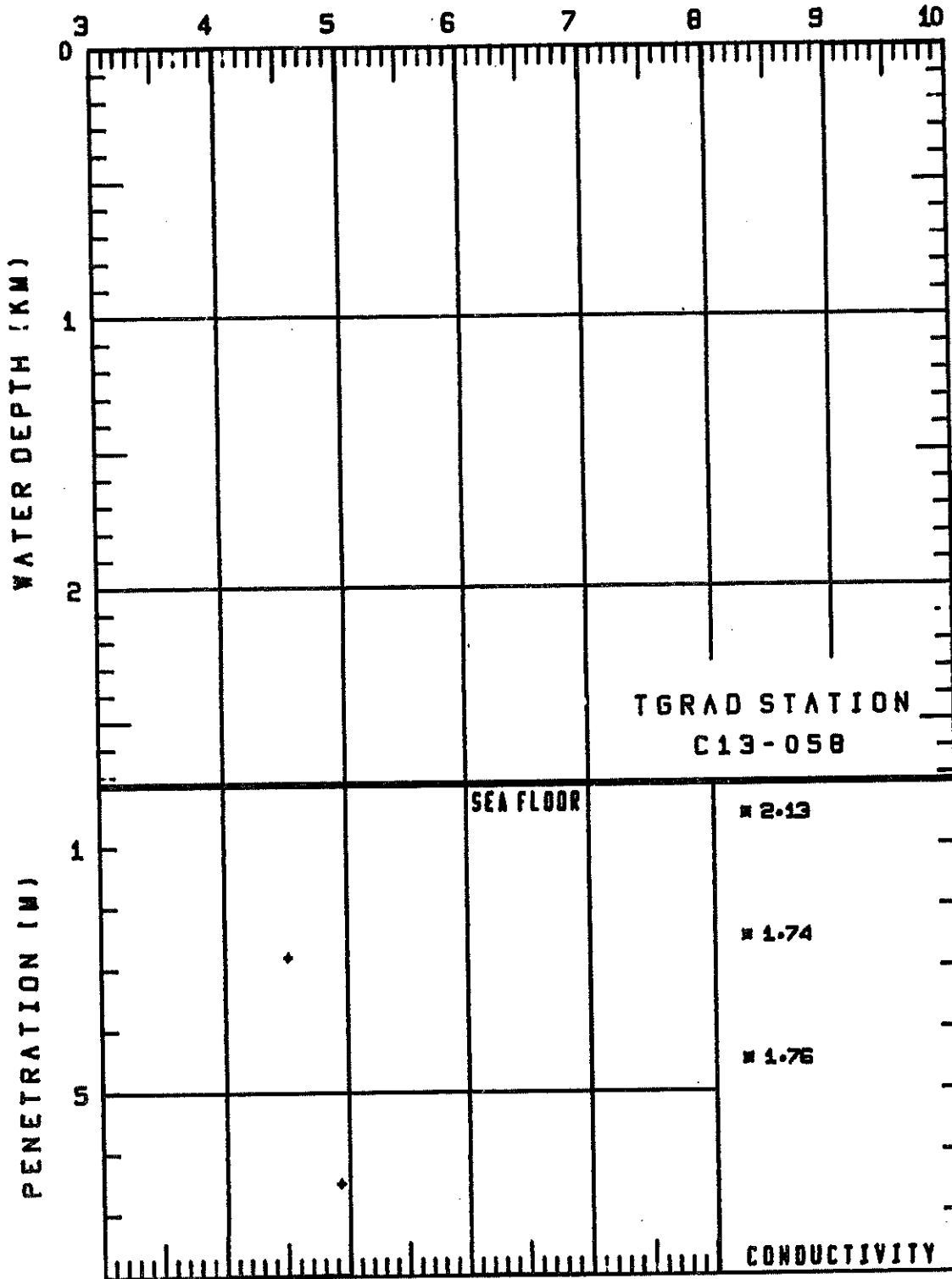
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE | |
|-----------------|---------------------------|---------|
| 2.80 | 4.526 | COOLING |
| 6.50 | 4.940 | COOLING |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS | |
|-----------------|---------------------|--|
| 0.50 | 2.13 | |
| 2.50 | 1.74 | |
| 4.50 | 1.76 | |

TEMPERATURE (C)



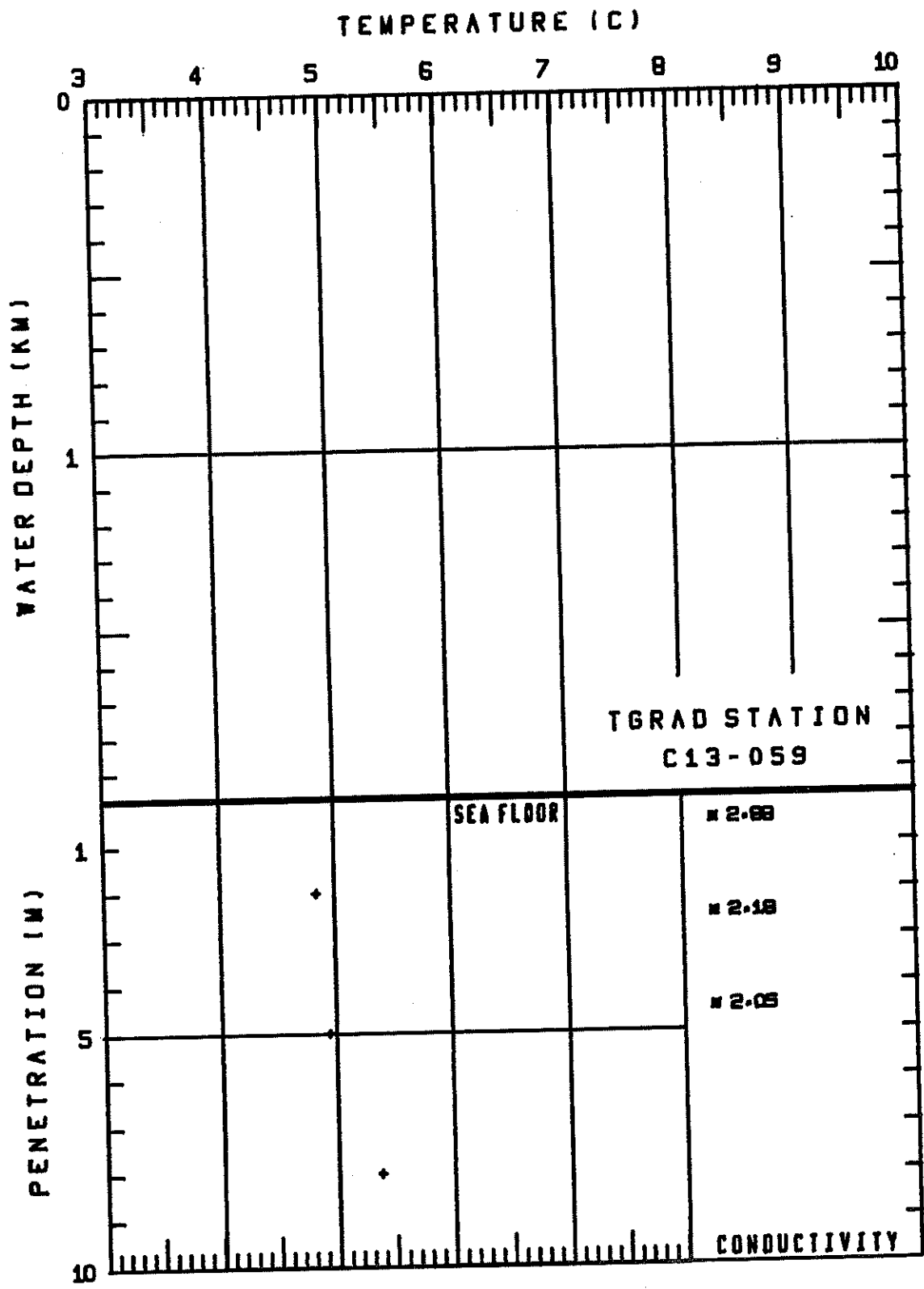
TGRAD STATION C13-059
013 31 N 060 21 W
CRUISE STATION 190

SEDIMENT TEMPERATURES

| <u>DEPTH</u> <u>METERS</u> | <u>TEMPERATURE</u> <u>CENTIGRADE</u> | |
|-------------------------------|---|----------------|
| <u>2.00</u> | <u>4.854</u> | <u>COOLING</u> |
| <u>5.00</u> | <u>4.954</u> | <u>COOLING</u> |
| <u>8.00</u> | <u>5.383</u> | <u>COOLING</u> |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH</u> <u>METERS</u> | <u>CONDUCTIVITY</u> <u>CGS</u> |
|-------------------------------|-----------------------------------|
| <u>0.50</u> | <u>2.88</u> |
| <u>2.50</u> | <u>2.18</u> |
| <u>4.50</u> | <u>2.05</u> |



TGRAD STATION
C13-059

SEA FLOOR

2.88
2.18
2.05

CONDUCTIVITY

TGRAD STATION C13-061
 012 01 N 060 32 W
 CRUISE STATION 192

WATER TEMPERATURES

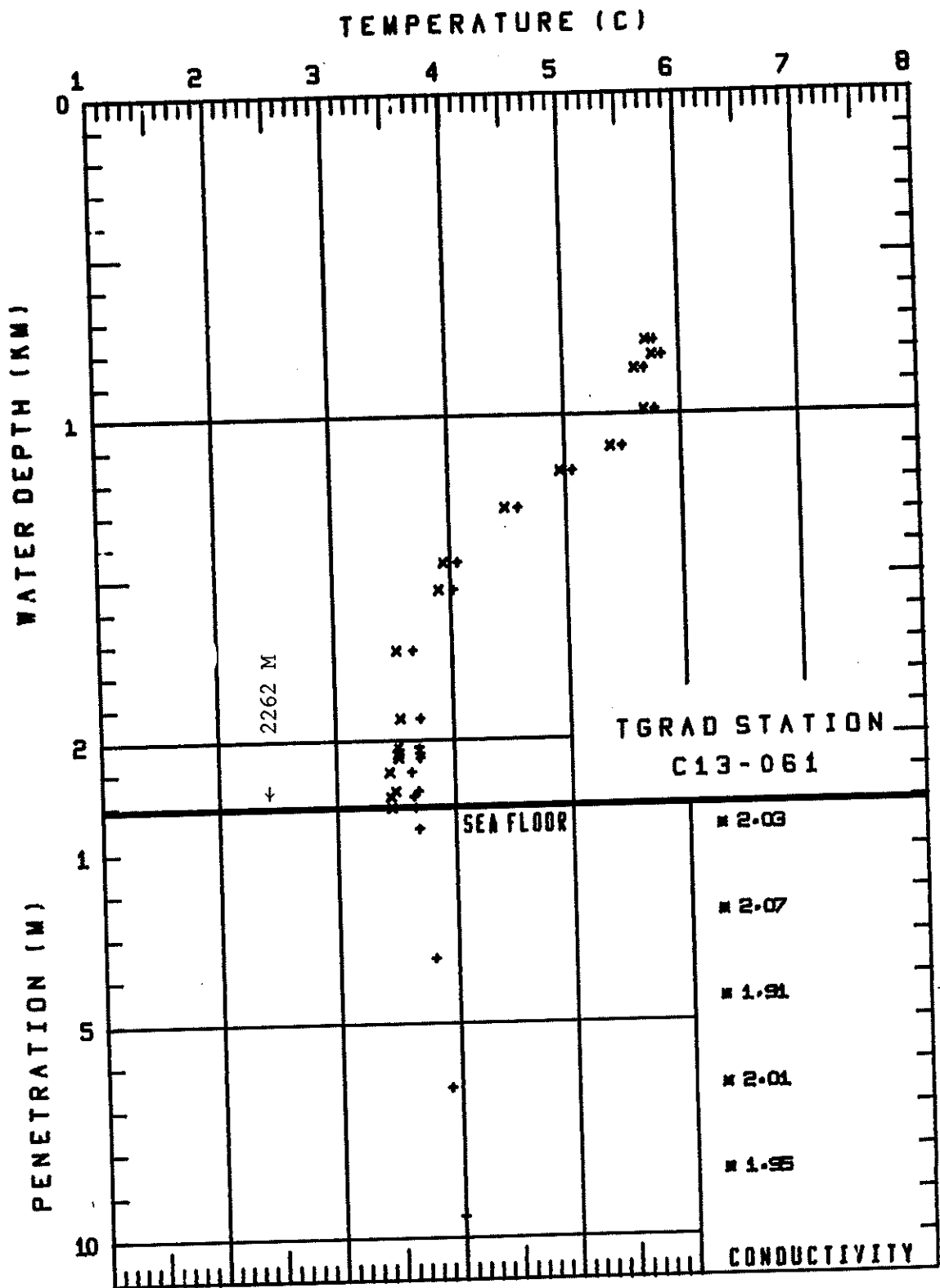
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 769 | 5.786 | 5.717 |
| 815 | 5.850 | 5.774 |
| 858 | 5.696 | 5.618 |
| 984 | 5.784 | 5.691 |
| 1097 | 5.497 | 5.395 |
| 1171 | 5.062 | 4.956 |
| 1284 | 4.588 | 4.475 |
| 1450 | 4.065 | 3.941 |
| 1535 | 4.026 | 3.895 |
| 1933 | 3.719 | 3.550 |
| 2055 | 3.710 | 3.529 |
| 2041 | 3.713 | 3.533 |
| 2020 | 3.704 | 3.526 |
| 1721 | 3.674 | 3.528 |
| 2100 | 3.637 | 3.451 |
| 2175 | 3.653 | 3.460 |
| 2159 | 3.692 | 3.500 |
| 2209 | 3.664 | 3.467 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 0.50 | 3.693 |
| 3.50 | 3.802 |
| 6.50 | 3.921 |
| 9.50 | 4.001 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.50 | 2.03 |
| 2.50 | 2.07 |
| 4.50 | 1.91 |
| 6.50 | 2.01 |
| 8.50 | 1.95 |



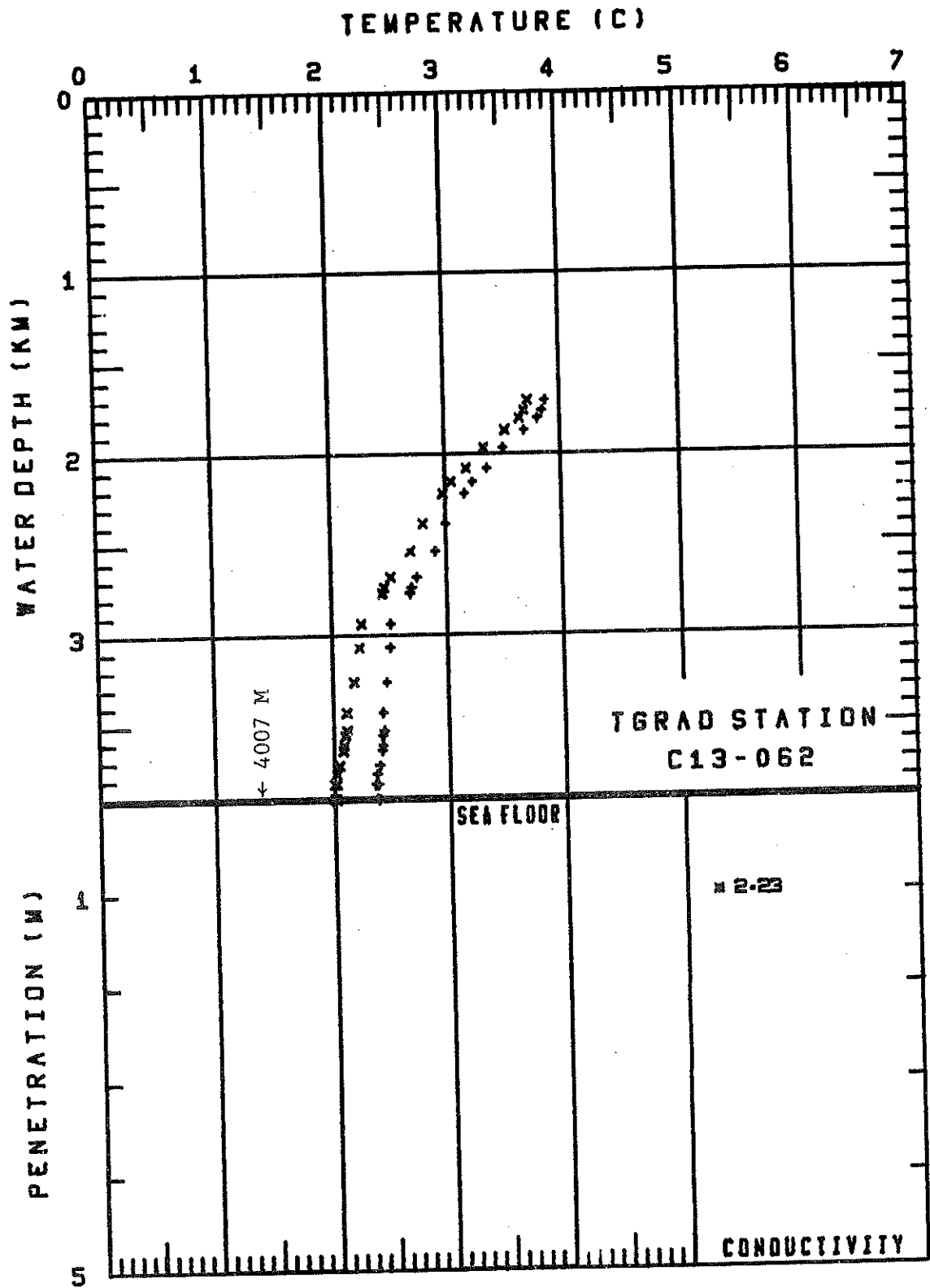
TGRAD STATION C13-062
 011 03 N 057 27 W
 CRUISE STATION 193

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1708 | 3.877 | 3.730 |
| 1763 | 3.851 | 3.698 |
| 1805 | 3.812 | 3.655 |
| 1873 | 3.696 | 3.533 |
| 1967 | 3.513 | 3.344 |
| 2081 | 3.369 | 3.191 |
| 2155 | 3.242 | 3.059 |
| 2217 | 3.172 | 2.983 |
| 2385 | 3.006 | 2.802 |
| 2534 | 2.909 | 2.691 |
| 2677 | 2.745 | 2.516 |
| 2735 | 2.696 | 2.460 |
| 2766 | 2.685 | 2.447 |
| 2934 | 2.513 | 2.260 |
| 3066 | 2.503 | 2.236 |
| 3256 | 2.473 | 2.184 |
| 3427 | 2.428 | 2.119 |
| 3525 | 2.436 | 2.117 |
| 3552 | 2.427 | 2.102 |
| 3607 | 2.423 | 2.093 |
| 3633 | 2.416 | 2.084 |
| 3716 | 2.395 | 2.052 |
| 3764 | 2.374 | 2.026 |
| 3819 | 2.361 | 2.006 |
| 3821 | 2.377 | 2.022 |
| 3899 | 2.370 | 2.006 |
| 3900 | 2.375 | 2.009 |
| 3899 | 2.392 | 2.026 |
| 3908 | 2.384 | 2.019 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.23 |



TGRAD STATION C13-063
010 59 N 054 29 W
CRUISE STATION 194

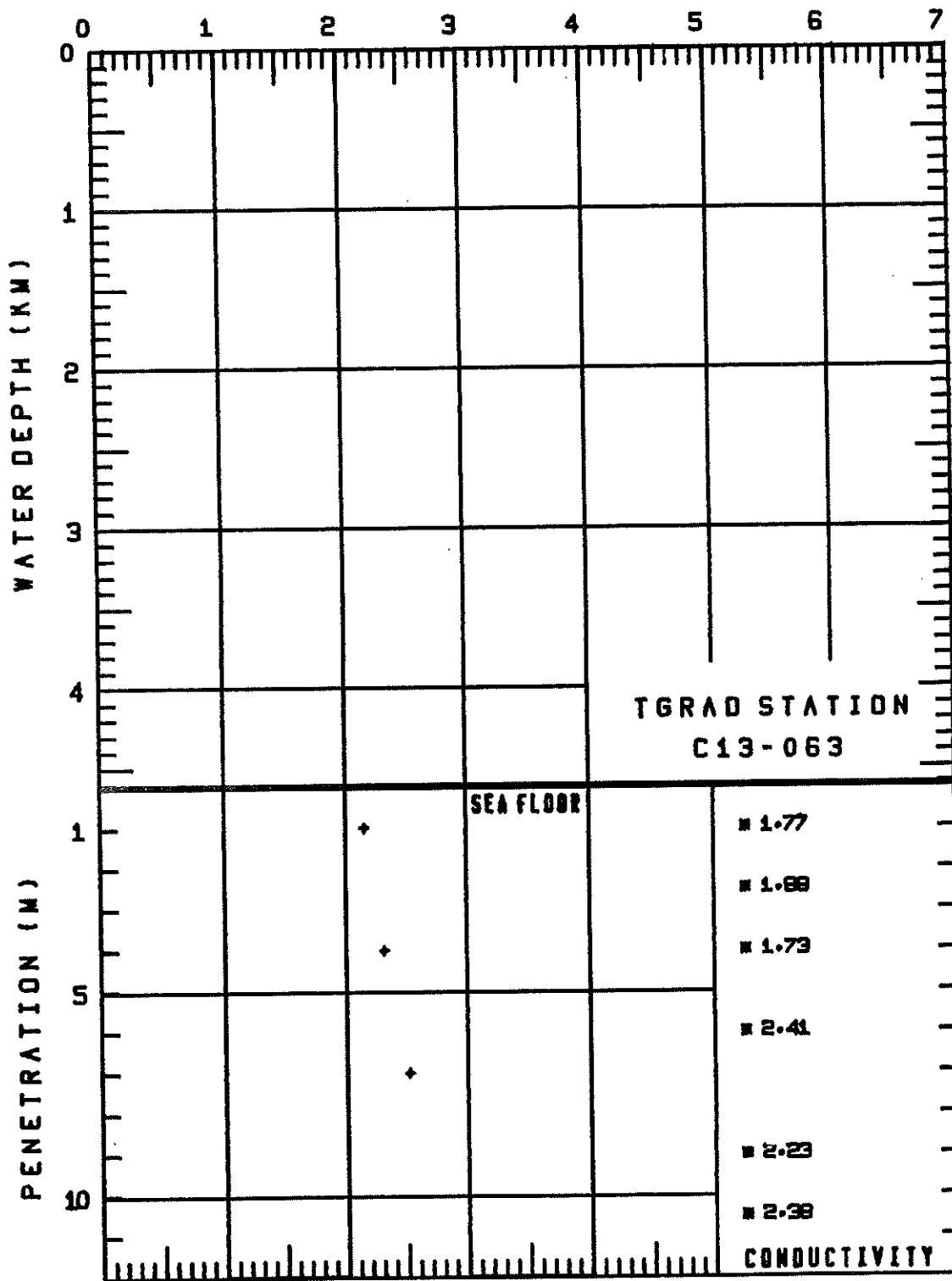
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.00 | 2.165 |
| 4.00 | 2.322 |
| 7.00 | 2.523 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.77 |
| 2.50 | 1.88 |
| 4.00 | 1.73 |
| 6.00 | 2.41 |
| 9.00 | 2.23 |
| 10.50 | 2.38 |

TEMPERATURE (C)



TGRAD STATION C13-064
 010 48 N 050 56 W
 CRUISE STATION 195

WATER TEMPERATURES

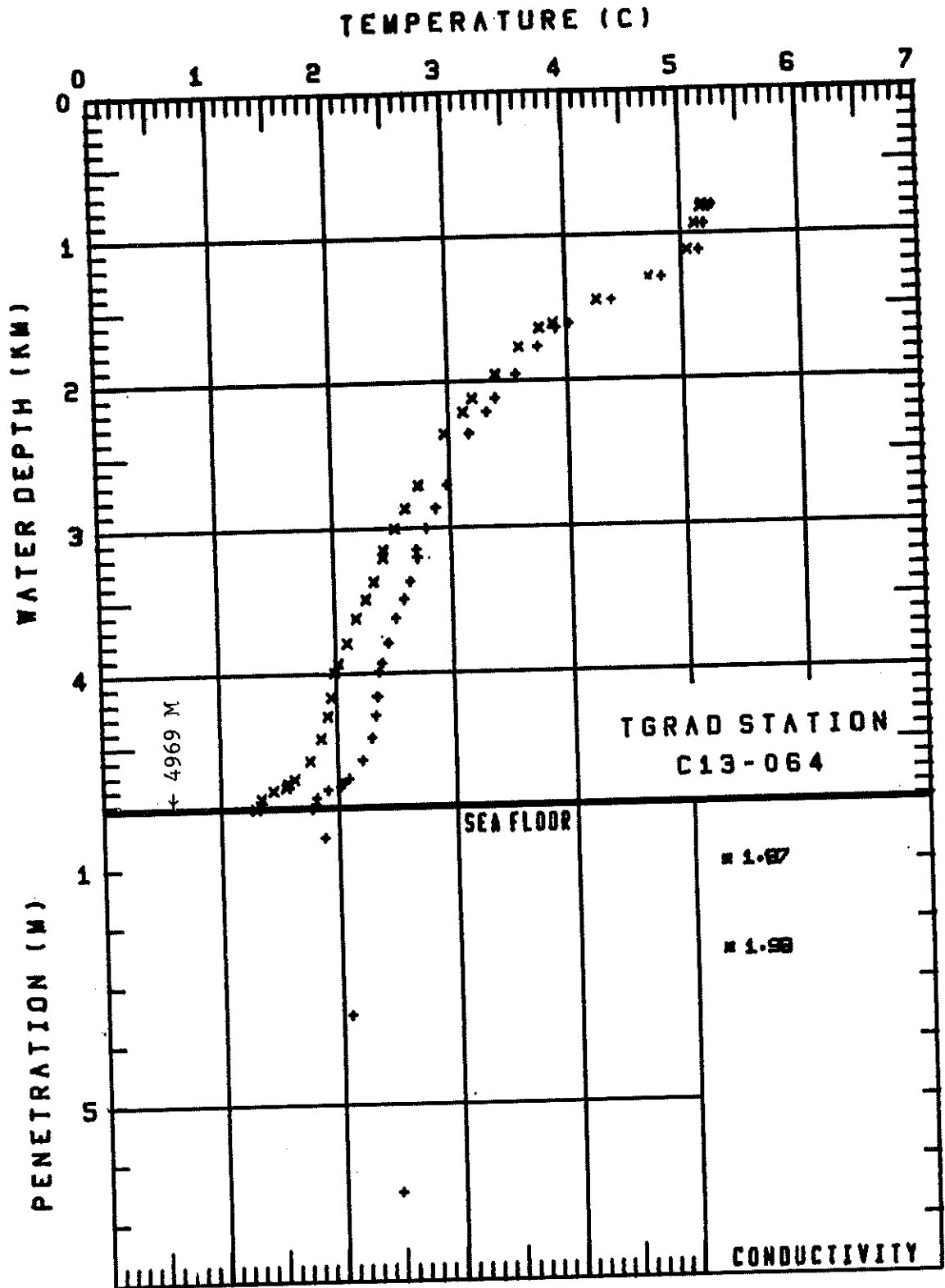
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 799 | 5.270 | 5.200 |
| 815 | 5.250 | 5.179 |
| 928 | 5.203 | 5.121 |
| 1109 | 5.159 | 5.059 |
| 1293 | 4.833 | 4.717 |
| 1446 | 4.399 | 4.272 |
| 1601 | 4.029 | 3.891 |
| 1633 | 3.915 | 3.776 |
| 1765 | 3.755 | 3.602 |
| 1946 | 3.571 | 3.403 |
| 2113 | 3.396 | 3.214 |
| 2207 | 3.324 | 3.133 |
| 2351 | 3.177 | 2.973 |
| 2704 | 2.982 | 2.744 |
| 2860 | 2.887 | 2.632 |
| 2996 | 2.808 | 2.539 |
| 3145 | 2.720 | 2.437 |
| 3201 | 2.723 | 2.433 |
| 3366 | 2.659 | 2.351 |
| 3485 | 2.601 | 2.280 |
| 3616 | 2.528 | 2.193 |
| 3786 | 2.463 | 2.109 |
| 3930 | 2.402 | 2.032 |
| 3989 | 2.376 | 2.000 |
| 4161 | 2.365 | 1.966 |
| 4293 | 2.348 | 1.930 |
| 4442 | 2.308 | 1.872 |
| 4596 | 2.226 | 1.773 |
| 4724 | 2.101 | 1.637 |
| 4756 | 2.056 | 1.589 |
| 4757 | 2.046 | 1.579 |
| 4779 | 2.033 | 1.565 |
| 4798 | 1.924 | 1.459 |
| 4856 | 1.826 | 1.358 |
| 4898 | 1.825 | 1.349 |
| 4919 | 1.782 | 1.306 |
| 4925 | 1.792 | 1.313 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.50 | 1.894 |
| 3.50 | 2.085 |
| 6.50 | 2.475 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.87 |
| 2.50 | 1.98 |



TGRAD STATION C13-065
 011 23 N 050 49 W
 CRUISE STATION 196

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 832 | 5.293 | 5.220 |
| 823 | 5.198 | 5.126 |
| 898 | 5.163 | 5.083 |
| 1075 | 5.056 | 4.960 |
| 1188 | 5.078 | 4.970 |
| 1298 | 4.755 | 4.638 |
| 1451 | 4.361 | 4.234 |
| 1542 | 4.079 | 3.947 |
| 1642 | 3.815 | 3.677 |
| 1727 | 3.731 | 3.585 |
| 1937 | 3.505 | 3.338 |
| 1968 | 3.463 | 3.296 |
| 2120 | 3.322 | 3.139 |
| 2308 | 3.199 | 3.000 |
| 2459 | 3.072 | 2.859 |
| 2461 | 3.055 | 2.842 |
| 2491 | 3.023 | 2.809 |
| 2624 | 2.957 | 2.729 |
| 2787 | 2.885 | 2.639 |
| 2976 | 2.755 | 2.490 |
| 3098 | 2.688 | 2.411 |
| 3215 | 2.638 | 2.349 |
| 3264 | 2.618 | 2.323 |
| 3447 | 2.541 | 2.227 |
| 3622 | 2.467 | 2.133 |
| 3796 | 2.423 | 2.069 |
| 3931 | 2.398 | 2.028 |
| 4012 | 2.368 | 1.987 |
| 4060 | 2.367 | 1.980 |
| 4226 | 2.334 | 1.927 |
| 4384 | 2.284 | 1.858 |
| 4540 | 2.179 | 1.736 |
| 4661 | 2.000 | 1.549 |
| 4670 | 2.023 | 1.571 |
| 4692 | 1.987 | 1.532 |
| 4686 | 2.016 | 1.562 |
| 4744 | 1.957 | 1.496 |
| 4775 | 1.898 | 1.436 |
| 4823 | 1.809 | 1.345 |
| 4848 | 1.802 | 1.335 |
| 4881 | 1.763 | 1.293 |

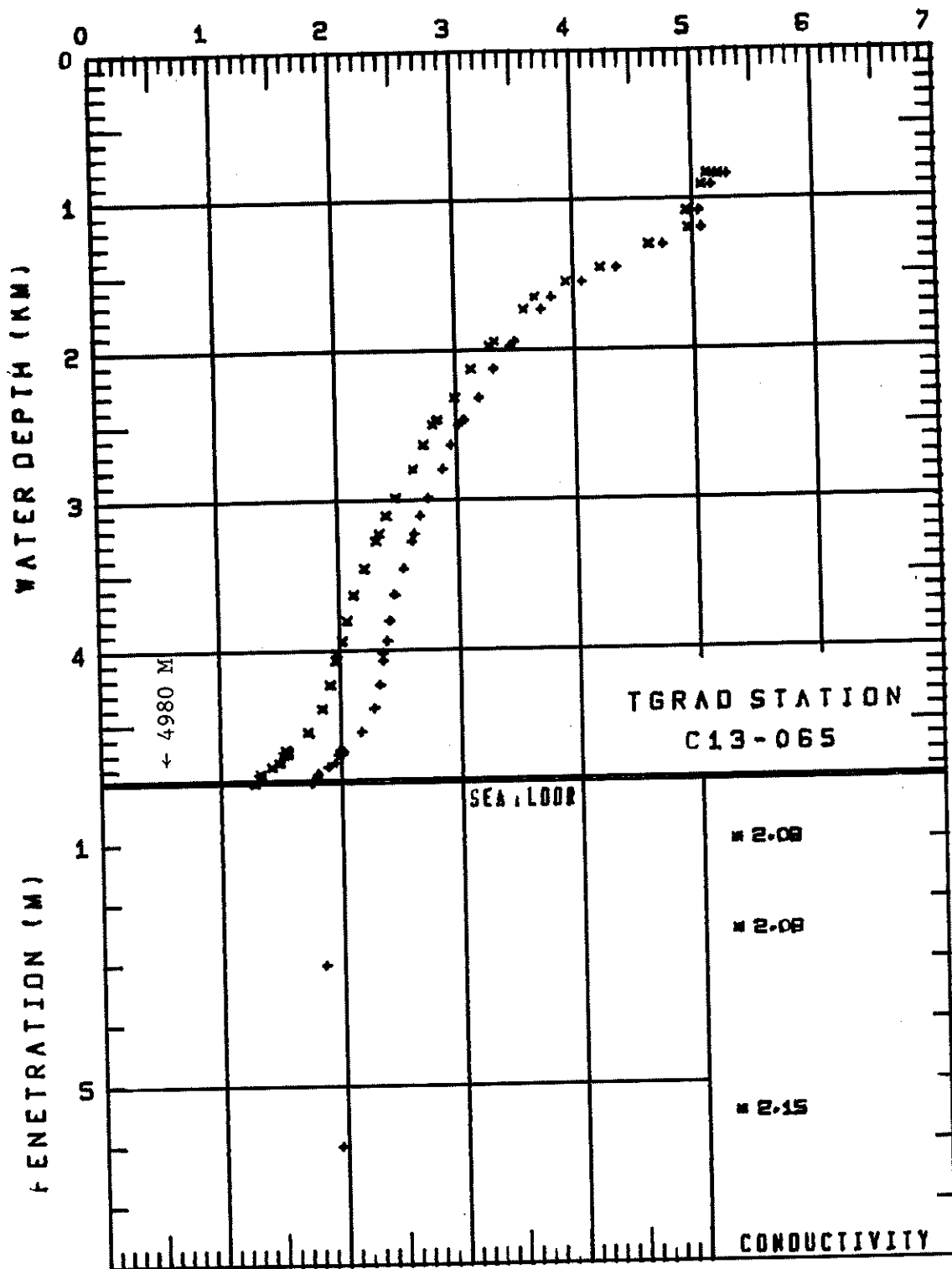
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.00 | 1.848 |
| 6.00 | 1.957 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.08 |
| 2.50 | 2.08 |
| 5.50 | 2.15 |

TEMPERATURE (C)



TGRAD STATION C13-066
 011 39 N 050 48 W
 CRUISE STATION 197

WATER TEMPERATURES

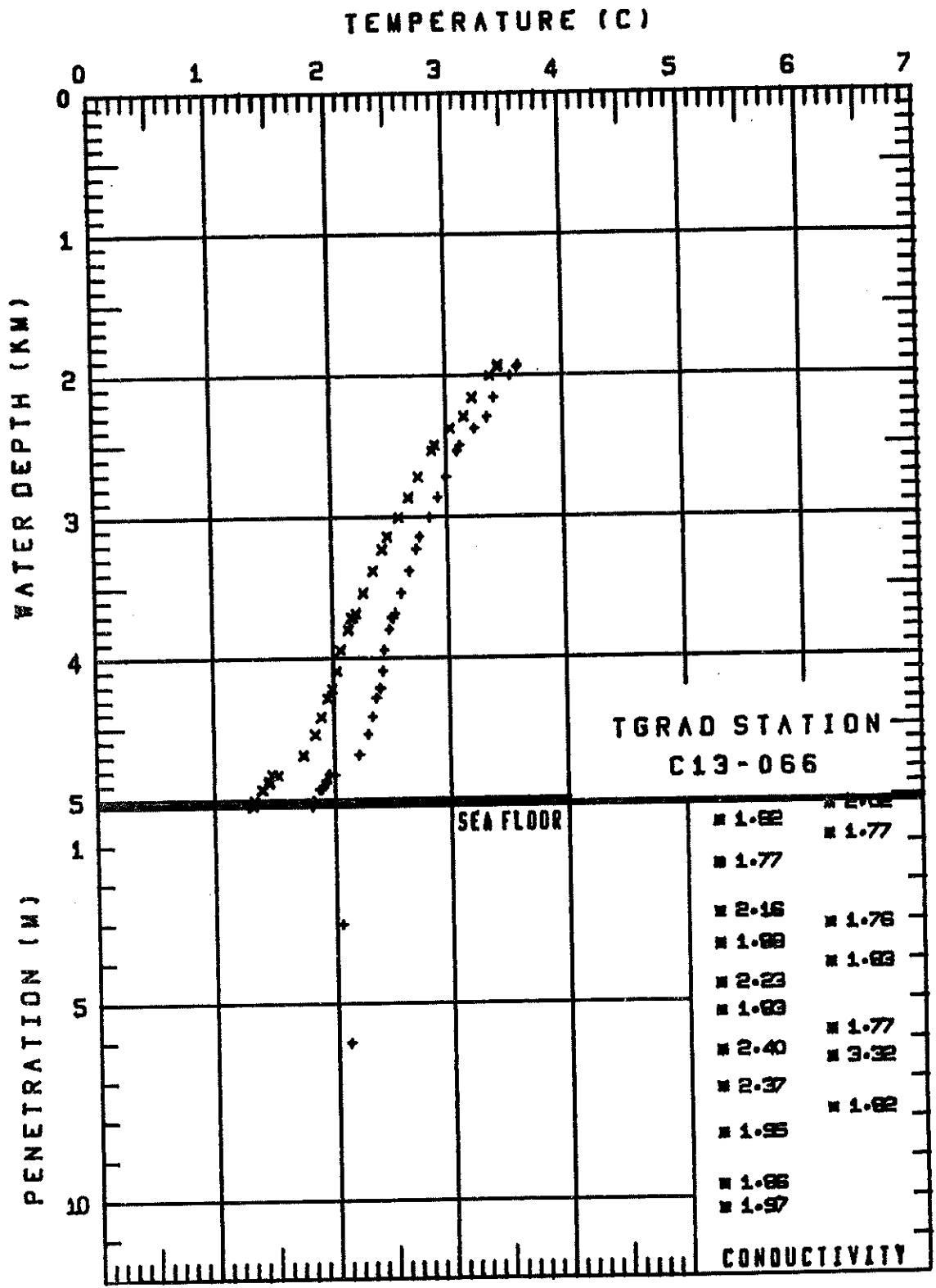
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1929 | 3.631 | 3.463 |
| 1937 | 3.625 | 3.456 |
| 2002 | 3.565 | 3.391 |
| 2159 | 3.425 | 3.238 |
| 2291 | 3.368 | 3.166 |
| 2375 | 3.251 | 3.043 |
| 2490 | 3.122 | 2.904 |
| 2534 | 3.100 | 2.878 |
| 2717 | 2.995 | 2.756 |
| 2861 | 2.925 | 2.671 |
| 3000 | 2.852 | 2.582 |
| 3134 | 2.767 | 2.483 |
| 3226 | 2.733 | 2.440 |
| 3380 | 2.668 | 2.357 |
| 3537 | 2.598 | 2.271 |
| 3680 | 2.546 | 2.204 |
| 3706 | 2.522 | 2.177 |
| 3708 | 2.513 | 2.166 |
| 3790 | 2.494 | 2.139 |
| 3939 | 2.447 | 2.073 |
| 4091 | 2.429 | 2.036 |
| 4215 | 2.403 | 1.996 |
| 4280 | 2.375 | 1.959 |
| 4416 | 2.335 | 1.904 |
| 4537 | 2.297 | 1.851 |
| 4681 | 2.216 | 1.753 |
| 4825 | 2.010 | 1.536 |
| 4817 | 1.963 | 1.493 |
| 4864 | 1.937 | 1.460 |
| 4872 | 1.940 | 1.463 |
| 4877 | 1.937 | 1.460 |
| 4925 | 1.897 | 1.414 |
| 4926 | 1.880 | 1.398 |
| 5011 | 1.835 | 1.345 |
| 5042 | 1.819 | 1.323 |
| 5000 | 1.825 | 1.335 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 3.00 | 2.060 |
| 6.00 | 2.113 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 0.10 | 2.02 |
| 0.50 | 1.82 |
| 0.85 | 1.77 |
| 1.55 | 1.77 |
| 2.80 | 2.16 |
| 3.10 | 1.76 |
| 3.60 | 1.88 |
| 4.10 | 1.83 |
| 4.60 | 2.23 |
| 5.30 | 1.83 |
| 5.80 | 1.77 |
| 6.30 | 2.40 |
| 6.50 | 3.32 |
| 7.25 | 2.37 |
| 7.80 | 1.82 |
| 8.40 | 1.95 |
| 9.70 | 1.86 |
| 10.30 | 1.07 |



TGRAD STATION C13-067
 008 24 N 049 32 W
 CRUISE STATION 201

WATER TEMPERATURES

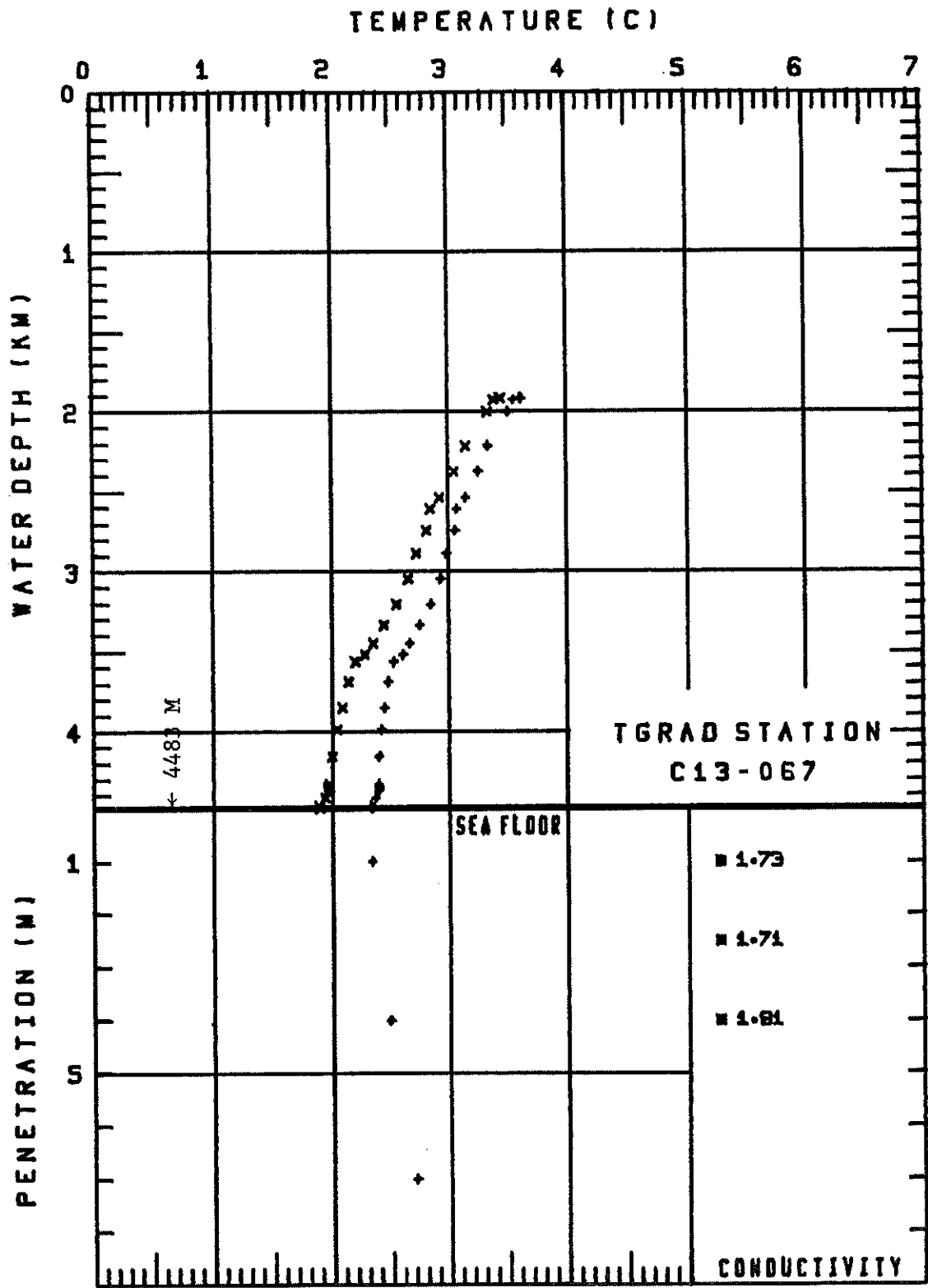
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1913 | 3.622 | 3.457 |
| 1924 | 3.565 | 3.401 |
| 2000 | 3.519 | 3.348 |
| 2214 | 3.350 | 3.157 |
| 2371 | 3.263 | 3.055 |
| 2537 | 3.157 | 2.934 |
| 2740 | 3.065 | 2.821 |
| 2609 | 3.079 | 2.849 |
| 2885 | 2.989 | 2.730 |
| 3045 | 2.937 | 2.659 |
| 3204 | 2.851 | 2.558 |
| 3333 | 2.756 | 2.449 |
| 3446 | 2.674 | 2.356 |
| 3516 | 2.611 | 2.285 |
| 3561 | 2.529 | 2.201 |
| 3685 | 2.486 | 2.144 |
| 3852 | 2.450 | 2.088 |
| 3987 | 2.424 | 2.046 |
| 4154 | 2.402 | 2.003 |
| 4329 | 2.401 | 1.977 |
| 4248 | 2.404 | 1.979 |
| 4370 | 2.398 | 1.970 |
| 4411 | 2.375 | 1.941 |
| 4478 | 2.342 | 1.901 |
| 4471 | 2.337 | 1.898 |
| 4460 | 2.329 | 1.891 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.00 | 2.335 |
| 4.00 | 2.488 |
| 7.00 | 2.712 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.73 |
| 2.50 | 1.71 |
| 4.00 | 1.81 |

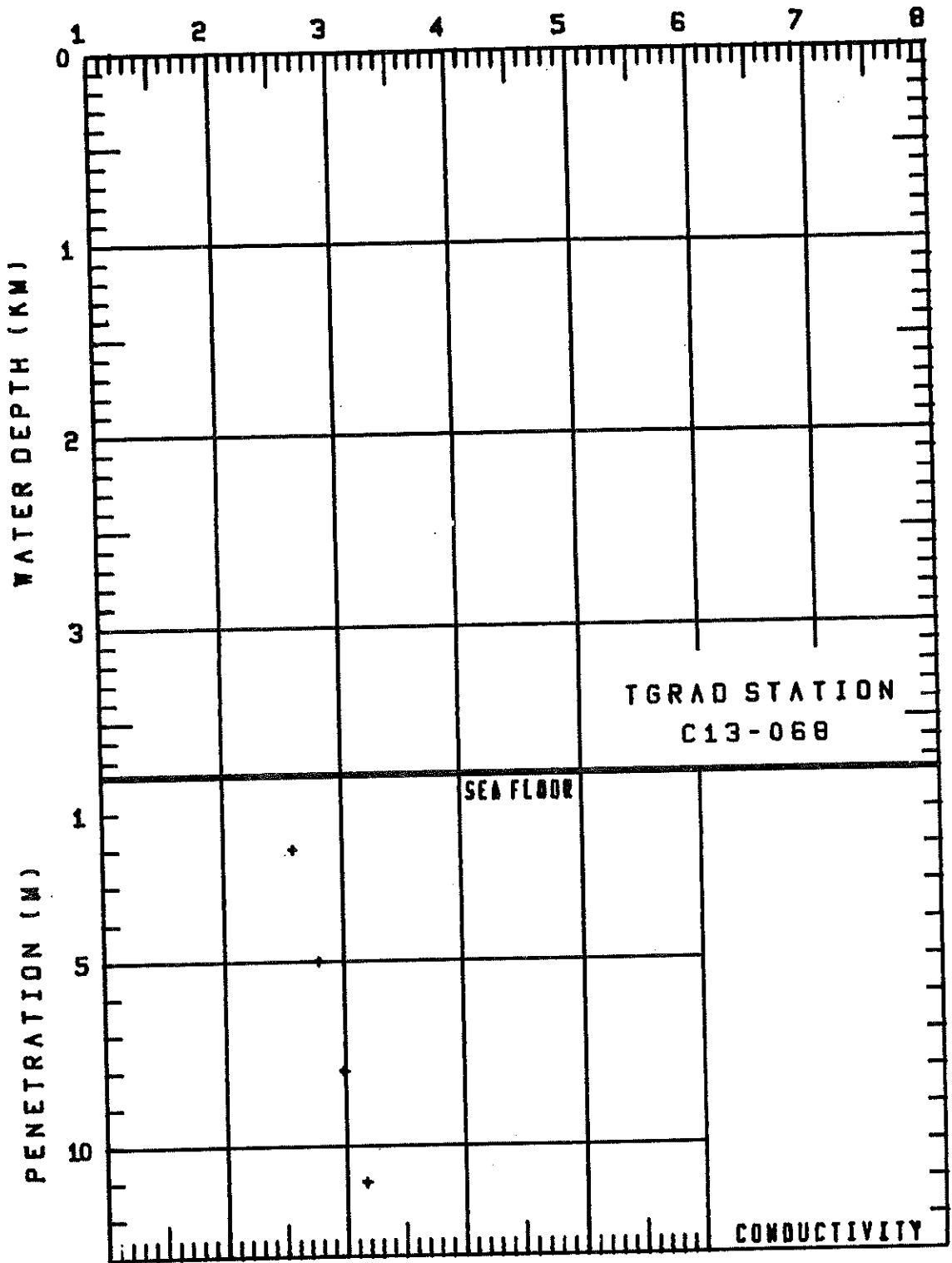


TGRAD STATION C13-068
005 52 N 044 50 W
CRUISE STATION 202

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.00 | 2.591 |
| 5.00 | 2.796 |
| 8.00 | 2.995 |
| 11.00 | 3.173 |

TEMPERATURE (C)



TGRAD STATION C13-069
 003 52 N 043 18 W
 CRUISE STATION 203

WATER TEMPERATURES

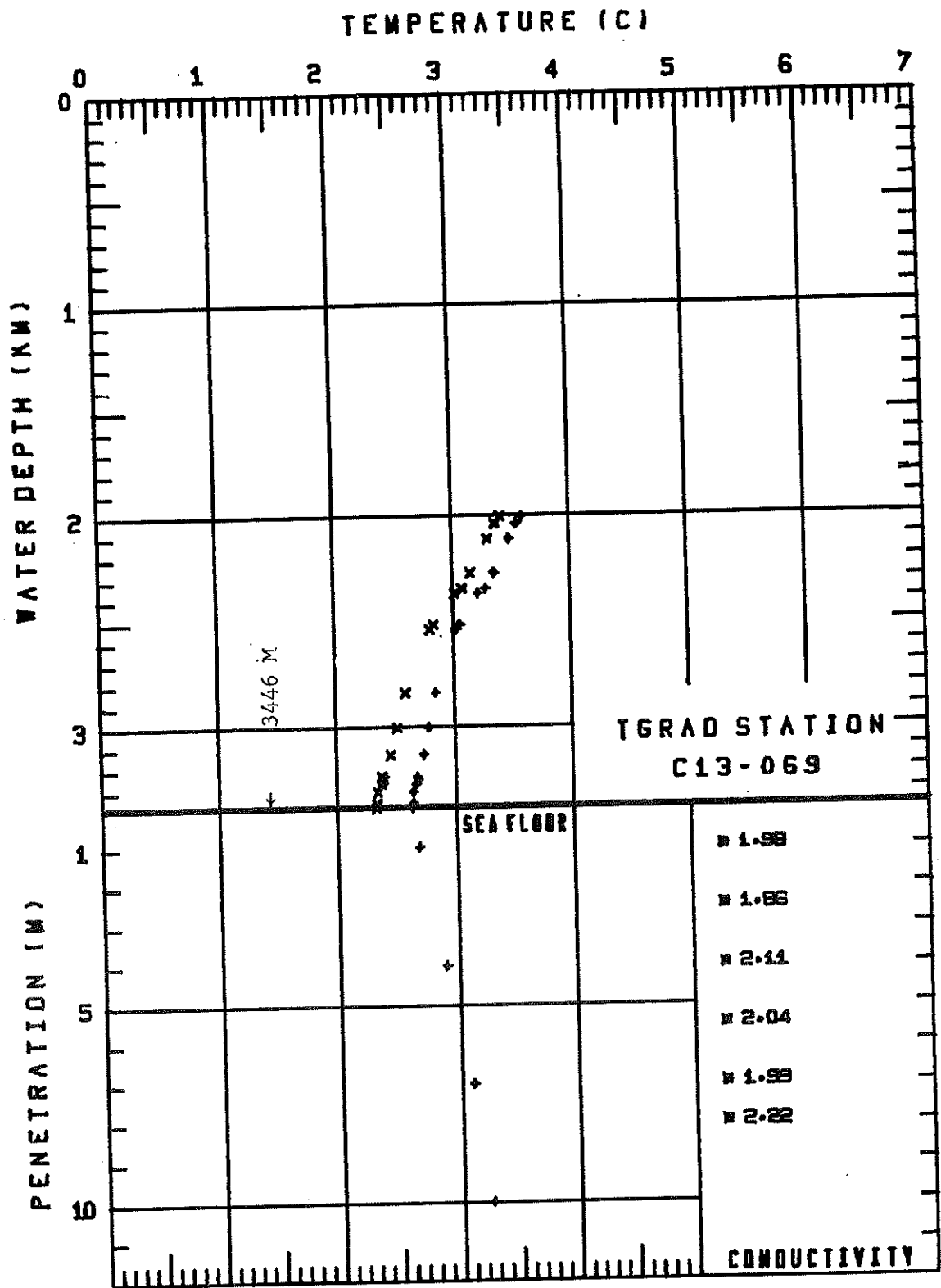
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 2006 | 3.599 | 3.425 |
| 2040 | 3.555 | 3.378 |
| 2109 | 3.499 | 3.315 |
| 2270 | 3.362 | 3.164 |
| 2344 | 3.293 | 3.088 |
| 2369 | 3.227 | 3.021 |
| 2516 | 3.062 | 2.843 |
| 2538 | 3.032 | 2.810 |
| 2835 | 2.850 | 2.600 |
| 2998 | 2.792 | 2.525 |
| 3126 | 2.743 | 2.461 |
| 3247 | 2.693 | 2.398 |
| 3232 | 2.681 | 2.389 |
| 3265 | 2.678 | 2.382 |
| 3305 | 2.653 | 2.354 |
| 3355 | 2.651 | 2.344 |
| 3363 | 2.650 | 2.342 |
| 3378 | 2.645 | 2.335 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.00 | 2.692 |
| 4.00 | 2.901 |
| 7.00 | 3.111 |
| 10.00 | 3.260 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.98 |
| 2.50 | 1.86 |
| 4.00 | 2.11 |
| 5.50 | 2.04 |
| 7.00 | 1.99 |
| 8.00 | 2.22 |



TGRAD STATION C13-070
 003.06 N 042 53 W
 CRUISE STATION 204

WATER TEMPERATURES

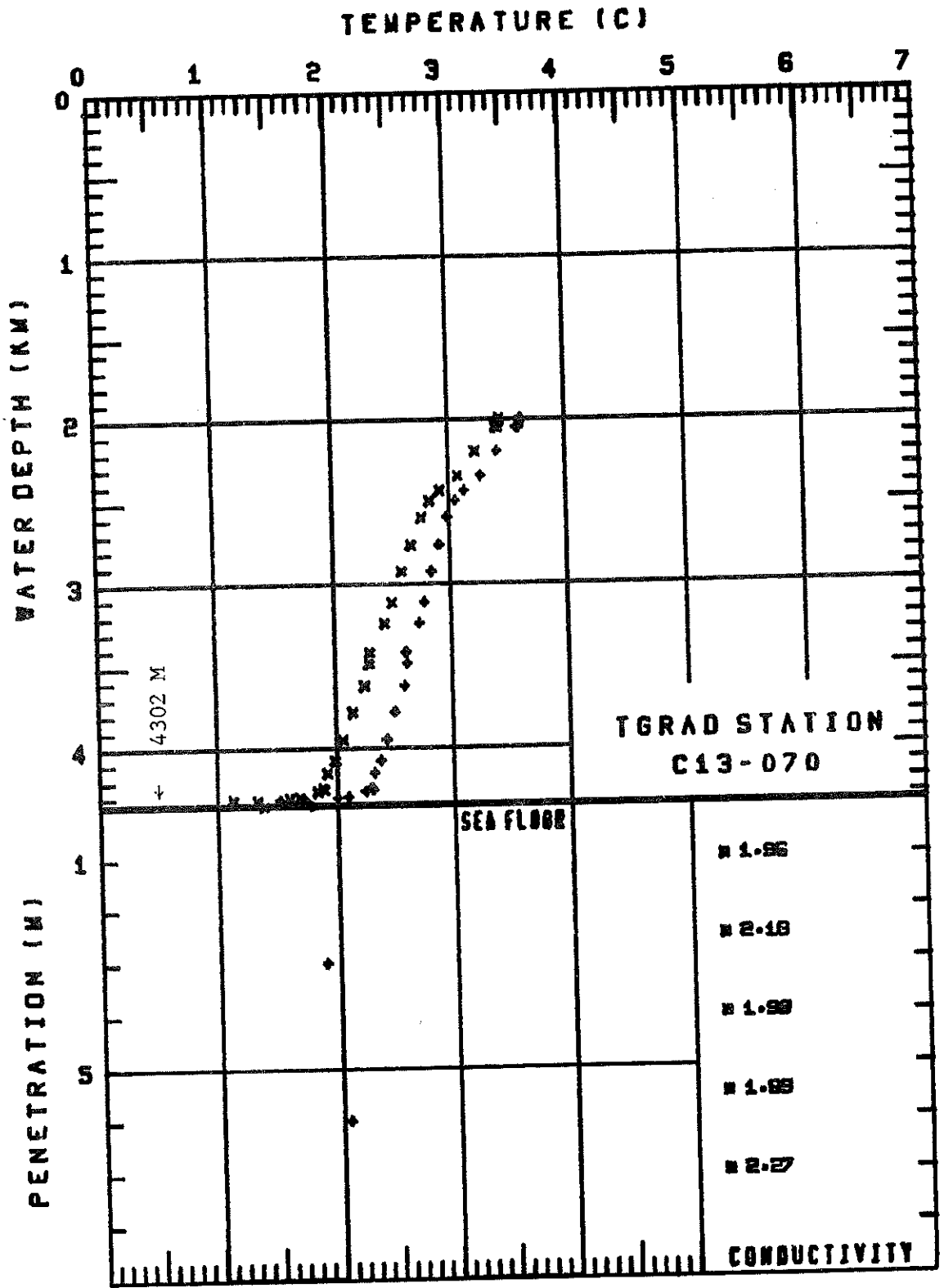
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1991 | 3.631 | 3.457 |
| 2014 | 3.631 | 3.454 |
| 2047 | 3.618 | 3.438 |
| 2046 | 3.601 | 3.422 |
| 2194 | 3.433 | 3.242 |
| 2343 | 3.293 | 3.088 |
| 2431 | 3.142 | 2.931 |
| 2490 | 3.063 | 2.848 |
| 2593 | 3.000 | 2.773 |
| 2763 | 2.923 | 2.679 |
| 2923 | 2.850 | 2.591 |
| 3111 | 2.784 | 2.503 |
| 3237 | 2.736 | 2.440 |
| 3415 | 2.618 | 2.305 |
| 3480 | 2.621 | 2.300 |
| 3617 | 2.598 | 2.260 |
| 3778 | 2.509 | 2.154 |
| 3947 | 2.436 | 2.062 |
| 4071 | 2.387 | 1.999 |
| 4150 | 2.325 | 1.930 |
| 4239 | 2.297 | 1.891 |
| 4250 | 2.313 | 1.904 |
| 4261 | 2.252 | 1.845 |
| 4293 | 2.104 | 1.697 |
| 4300 | 2.012 | 1.608 |
| 4347 | 1.800 | 1.401 |
| 4312 | 1.740 | 1.346 |
| 4310 | 1.529 | 1.145 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.99 | 1.895 |
| 5.99 | 2.067 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS. |
|-----------------|----------------------|
| 1.00 | 1.96 |
| 2.50 | 2.18 |
| 4.00 | 1.99 |
| 5.50 | 1.89 |
| 7.00 | 2.27 |



TGRAD STATION C13-071
 003 08 N 042 55 W
 CRUISE STATION 204

WATER TEMPERATURES

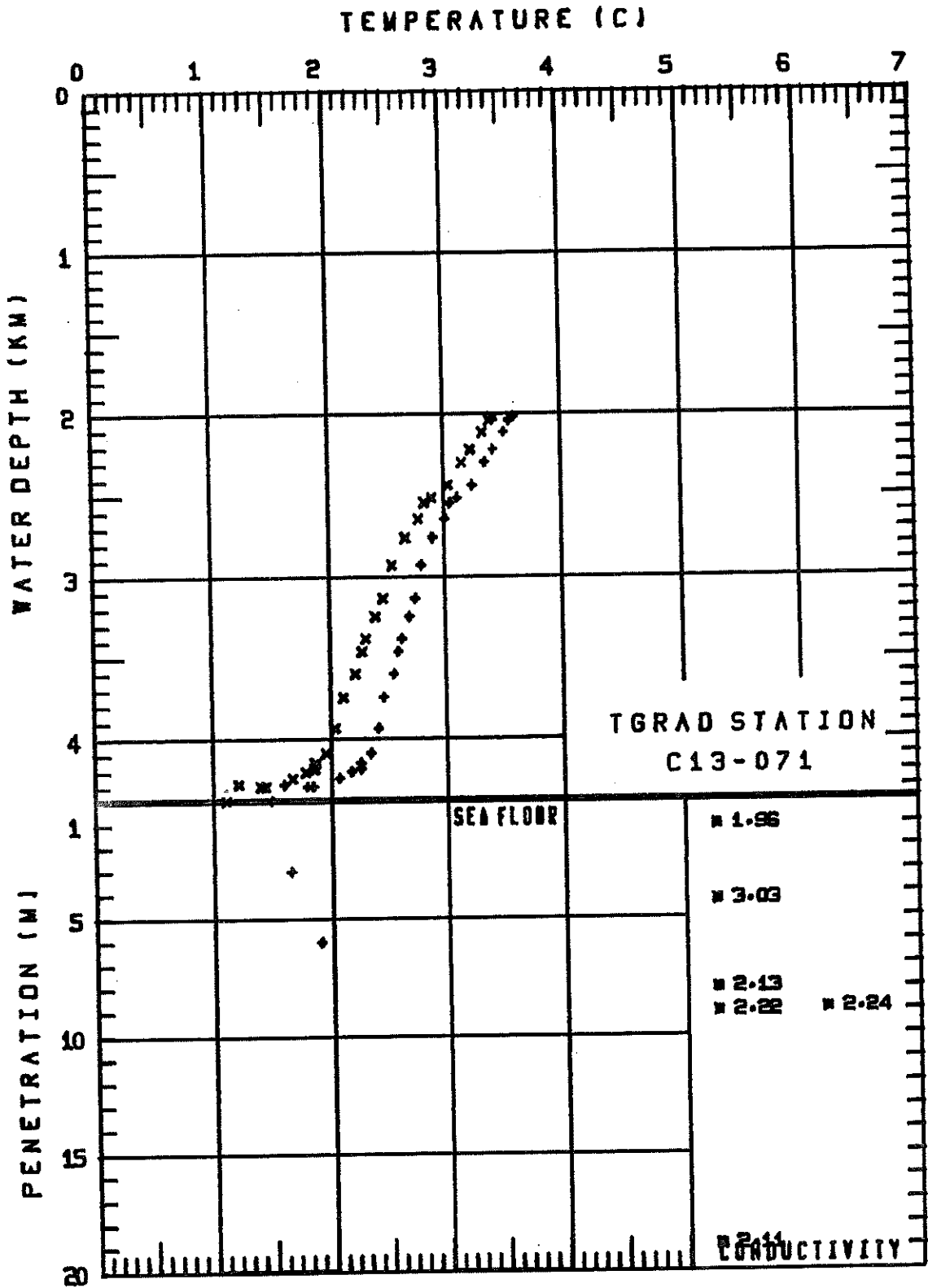
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 2019 | 3.613 | 3.436 |
| 2039 | 3.579 | 3.401 |
| 2112 | 3.532 | 3.346 |
| 2220 | 3.437 | 3.243 |
| 2296 | 3.363 | 3.163 |
| 2437 | 3.260 | 3.046 |
| 2514 | 3.121 | 2.901 |
| 2541 | 3.060 | 2.838 |
| 2641 | 3.019 | 2.786 |
| 2760 | 2.913 | 2.668 |
| 2925 | 2.809 | 2.549 |
| 3130 | 2.753 | 2.470 |
| 3241 | 2.698 | 2.404 |
| 3381 | 2.628 | 2.319 |
| 3462 | 2.600 | 2.282 |
| 3599 | 2.555 | 2.223 |
| 3745 | 2.467 | 2.118 |
| 3935 | 2.416 | 2.046 |
| 4083 | 2.349 | 1.961 |
| 4150 | 2.266 | 1.872 |
| 4150 | 2.266 | 1.872 |
| 4181 | 2.263 | 1.865 |
| 4203 | 2.186 | 1.789 |
| 4239 | 2.078 | 1.680 |
| 4290 | 1.848 | 1.454 |
| 4287 | 1.805 | 1.413 |
| 4276 | 1.609 | 1.227 |
| 4377 | 1.506 | 1.115 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.00 | 1.661 |
| 6.00 | 1.907 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.05 | 1.96 |
| 4.25 | 3.03 |
| 8.00 | 2.13 |
| 8.90 | 2.24 |
| 9.00 | 2.22 |
| 18.90 | 2.11 |



TGRAD STATION C13-072
 001 52 N 037 12 W
 CRUISE STATION 205

WATER TEMPERATURES

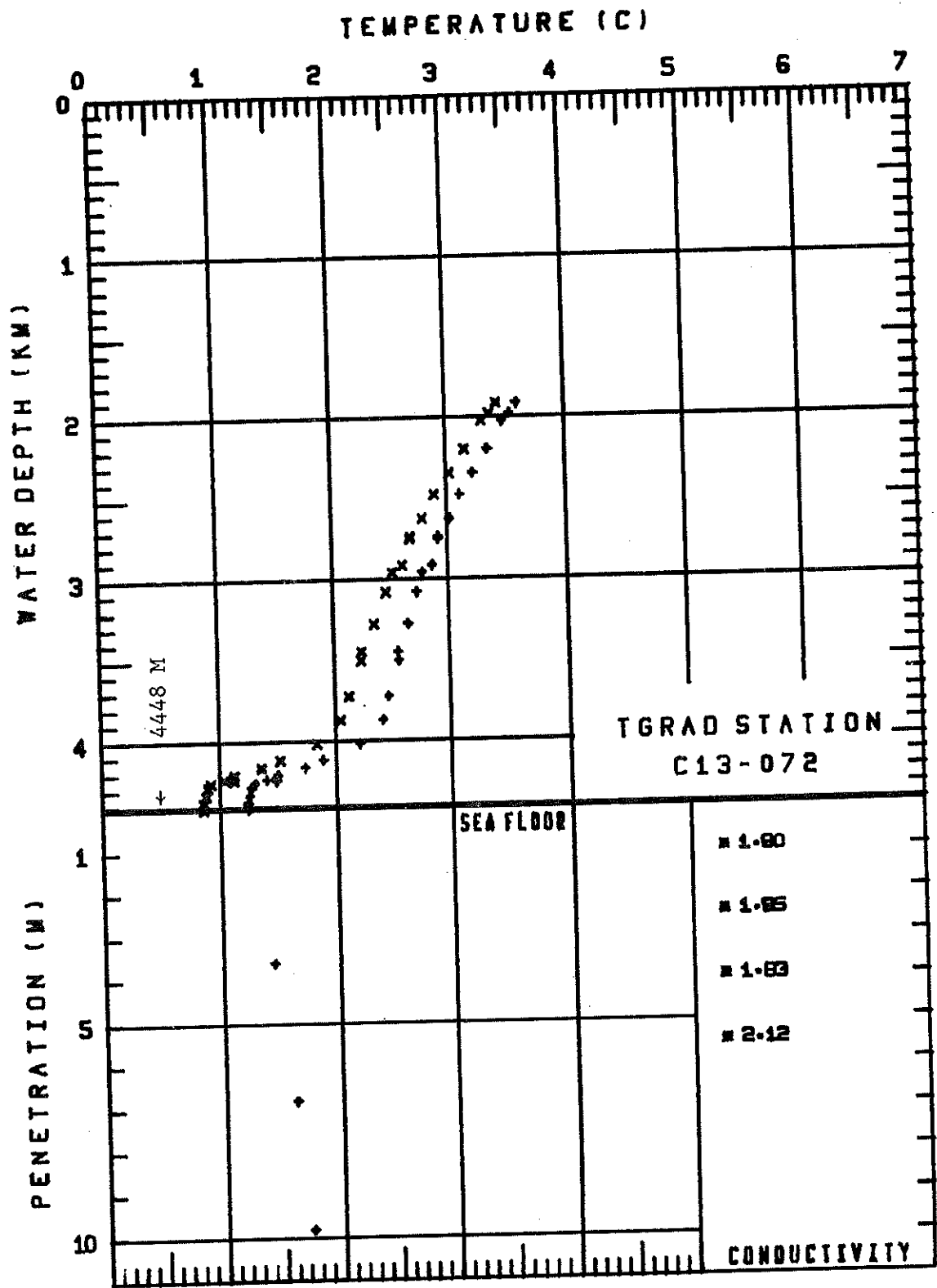
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1915 | 3.602 | 3.437 |
| 1974 | 3.547 | 3.377 |
| 2021 | 3.487 | 3.313 |
| 2196 | 3.355 | 3.165 |
| 2342 | 3.234 | 3.030 |
| 2478 | 3.117 | 2.901 |
| 2622 | 3.025 | 2.795 |
| 2750 | 2.921 | 2.679 |
| 2736 | 2.924 | 2.684 |
| 2911 | 2.875 | 2.614 |
| 2958 | 2.788 | 2.525 |
| 3080 | 2.738 | 2.462 |
| 3275 | 2.657 | 2.361 |
| 3449 | 2.556 | 2.242 |
| 3499 | 2.561 | 2.240 |
| 3724 | 2.473 | 2.126 |
| 3869 | 2.415 | 2.052 |
| 4018 | 2.220 | 1.846 |
| 4113 | 1.901 | 1.526 |
| 4158 | 1.736 | 1.362 |
| 4221 | 1.490 | 1.118 |
| 4202 | 1.503 | 1.134 |
| 4239 | 1.494 | 1.121 |
| 4234 | 1.411 | 1.042 |
| 4258 | 1.302 | 0.934 |
| 4283 | 1.276 | 0.907 |
| 4329 | 1.256 | 0.883 |
| 4414 | 1.250 | 0.867 |
| 4373 | 1.242 | 0.863 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 3.60 | 1.443 |
| 6.80 | 1.615 |
| 0.80 | 1.739 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.80 |
| 2.50 | 1.85 |
| 4.00 | 1.83 |
| 5.50 | 2.12 |



TGRAD STATION C13-073
 001 49 N 033 41 W
 CRUISE STATION 206

WATER TEMPERATURES

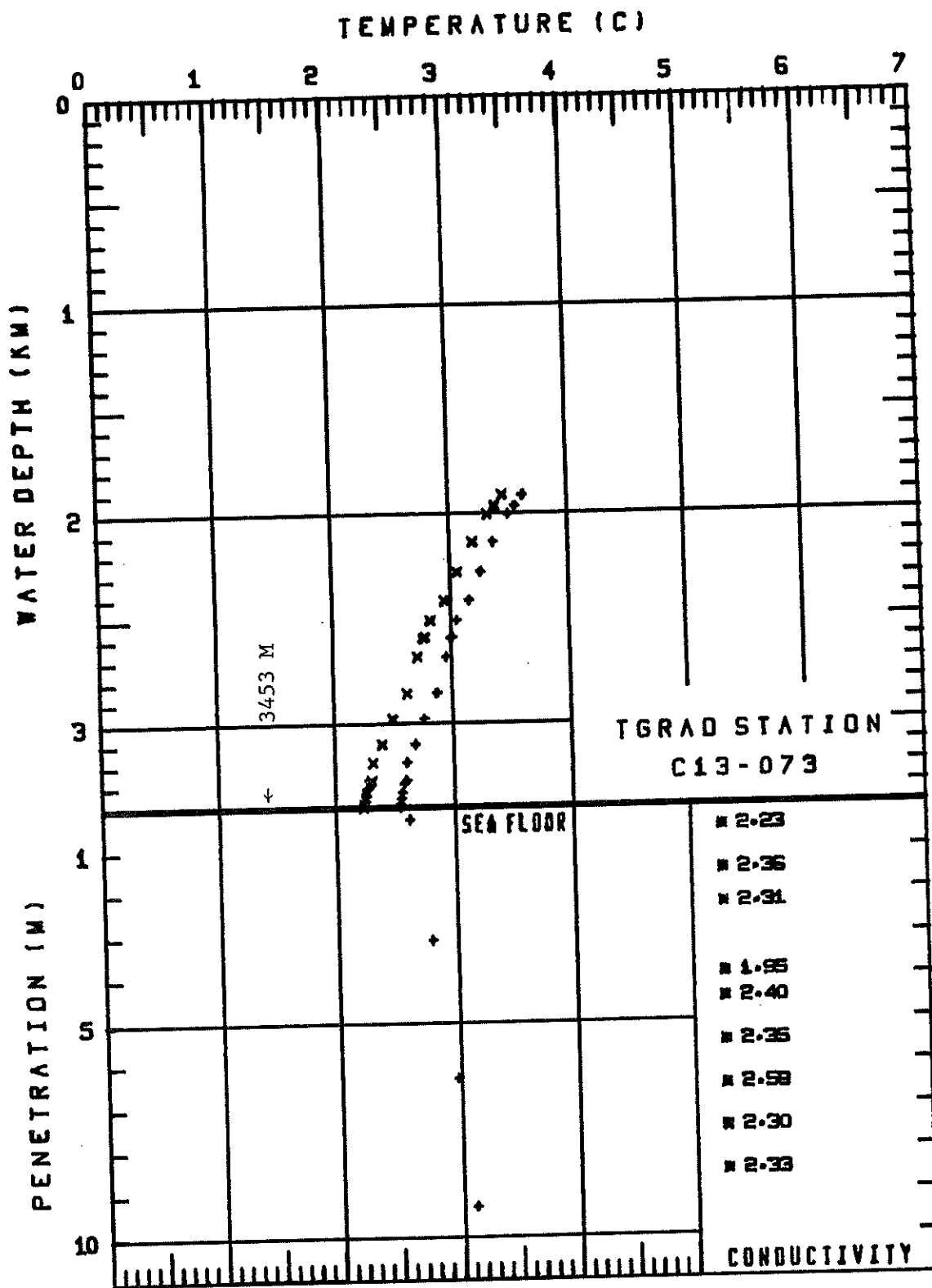
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1912 | 3.625 | 3.460 |
| 1963 | 3.563 | 3.394 |
| 2003 | 3.507 | 3.335 |
| 2136 | 3.380 | 3.196 |
| 2277 | 3.264 | 3.066 |
| 2413 | 3.166 | 2.956 |
| 2510 | 3.059 | 2.839 |
| 2592 | 3.005 | 2.777 |
| 2588 | 3.017 | 2.791 |
| 2682 | 2.963 | 2.727 |
| 2857 | 2.883 | 2.631 |
| 2976 | 2.769 | 2.506 |
| 3097 | 2.690 | 2.413 |
| 3184 | 2.618 | 2.332 |
| 3289 | 2.592 | 2.296 |
| 3272 | 2.614 | 2.319 |
| 3329 | 2.571 | 2.269 |
| 3400 | 2.555 | 2.246 |
| 3356 | 2.566 | 2.263 |
| 3384 | 2.555 | 2.249 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.30 | 2.633 |
| 3.10 | 2.798 |
| 6.30 | 2.986 |
| 9.30 | 3.120 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 2.23 |
| 1.50 | 2.36 |
| 2.30 | 2.31 |
| 3.90 | 1.95 |
| 4.50 | 2.40 |
| 5.50 | 2.35 |
| 6.50 | 2.58 |
| 7.50 | 2.30 |
| 8.50 | 2.33 |



TGRAD STATION C13-074
 001 52 N 030 00 W
 CRUISE STATION 207

WATER TEMPERATURES

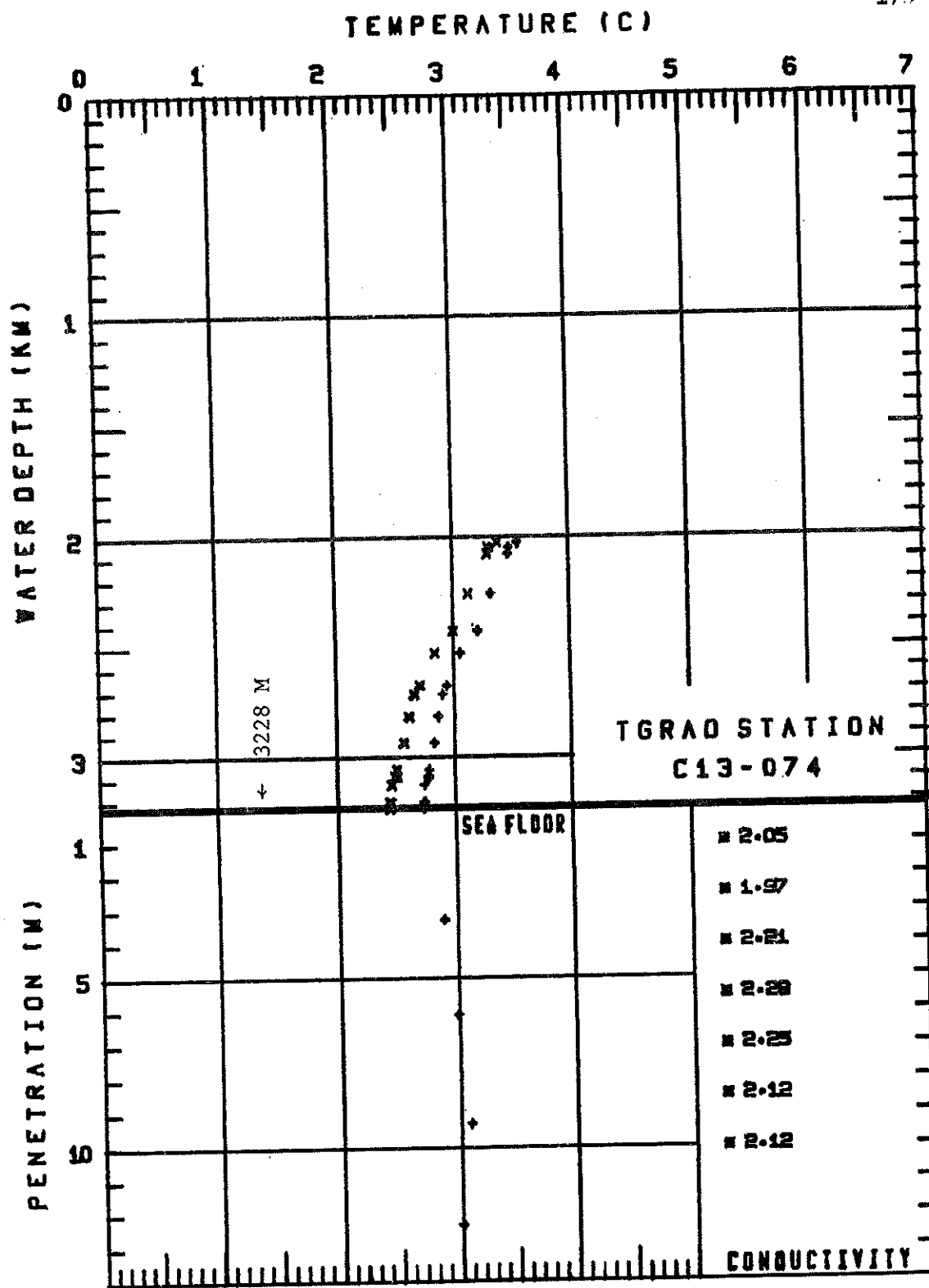
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 2027 | 3.565 | 3.388 |
| 2050 | 3.493 | 3.315 |
| 2077 | 3.483 | 3.303 |
| 2257 | 3.335 | 3.138 |
| 2426 | 3.217 | 3.003 |
| 2525 | 3.065 | 2.845 |
| 2672 | 2.947 | 2.713 |
| 2714 | 2.902 | 2.664 |
| 2812 | 2.863 | 2.615 |
| 2931 | 2.829 | 2.568 |
| 3052 | 2.782 | 2.508 |
| 3085 | 2.786 | 2.508 |
| 3084 | 2.777 | 2.500 |
| 3121 | 2.743 | 2.461 |
| 3200 | 2.747 | 2.456 |
| 3200 | 2.738 | 2.447 |
| 3228 | 2.738 | 2.444 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.30 | 2.889 |
| 6.10 | 2.999 |
| 9.30 | 3.098 |
| 12.30 | 3.013 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.05 |
| 2.50 | 1.97 |
| 4.00 | 2.21 |
| 5.50 | 2.28 |
| 7.00 | 2.25 |
| 8.50 | 2.12 |
| 10.00 | 2.12 |



TGRAD STATION C13-075
001 47 N 025 26 W
CRUISE STATION 208

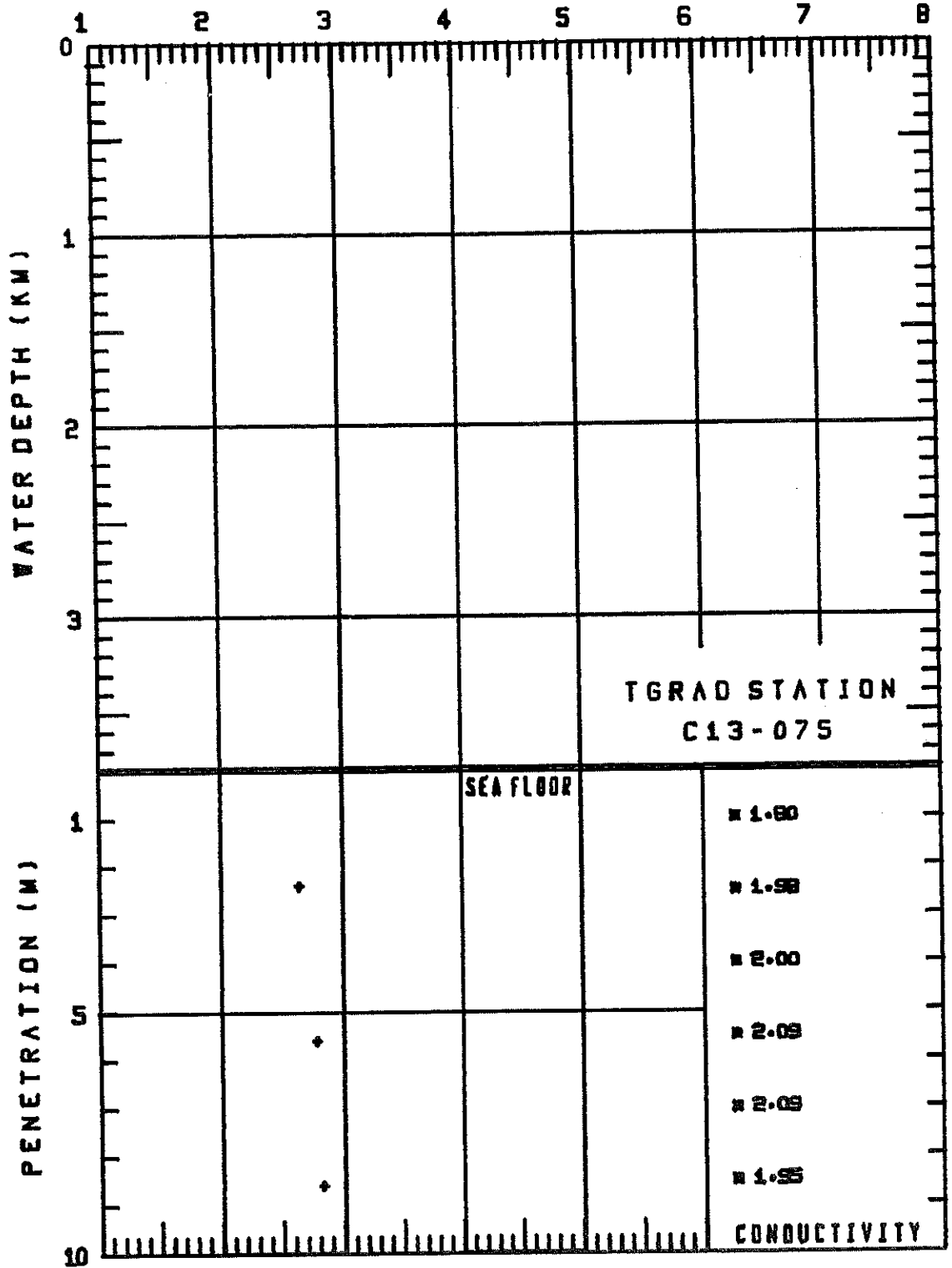
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.40 | 2.653 |
| 5.60 | 2.782 |
| 8.60 | 2.829 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.80 |
| 2.50 | 1.98 |
| 4.00 | 2.00 |
| 5.50 | 2.09 |
| 7.00 | 2.09 |
| 8.50 | 1.95 |

TEMPERATURE (C)



TGRAD STATION C13-076
 001 11 N 020 56 W
 CRUISE STATION 209

WATER TEMPERATURES

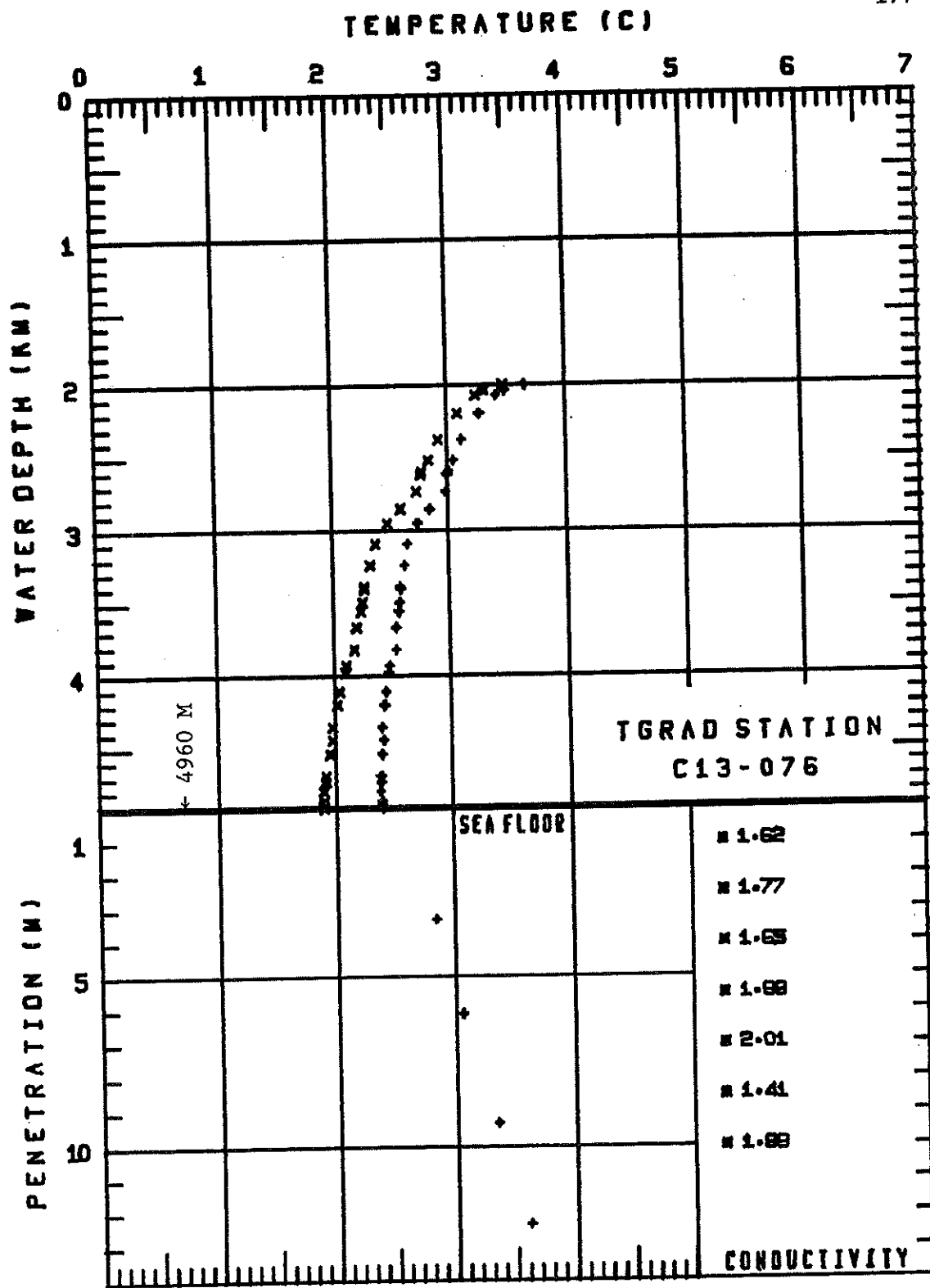
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1996 | 3.655 | 3.481 |
| 2035 | 3.500 | 3.323 |
| 2068 | 3.427 | 3.250 |
| 2192 | 3.283 | 3.095 |
| 2370 | 3.134 | 2.929 |
| 2514 | 3.060 | 2.842 |
| 2589 | 3.013 | 2.788 |
| 2611 | 3.007 | 2.779 |
| 2729 | 2.982 | 2.740 |
| 2847 | 2.851 | 2.600 |
| 2947 | 2.743 | 2.482 |
| 3088 | 2.651 | 2.377 |
| 3233 | 2.624 | 2.332 |
| 3382 | 2.587 | 2.279 |
| 3396 | 2.589 | 2.279 |
| 3489 | 2.579 | 2.257 |
| 3548 | 2.573 | 2.245 |
| 3661 | 2.546 | 2.205 |
| 3814 | 2.542 | 2.181 |
| 3919 | 2.481 | 2.109 |
| 3970 | 2.480 | 2.101 |
| 4101 | 2.448 | 2.054 |
| 4196 | 2.435 | 2.029 |
| 4348 | 2.409 | 1.983 |
| 4433 | 2.423 | 1.984 |
| 4533 | 2.409 | 1.957 |
| 4683 | 2.395 | 1.924 |
| 4726 | 2.401 | 1.923 |
| 4786 | 2.392 | 1.905 |
| 4861 | 2.403 | 1.905 |
| 4884 | 2.409 | 1.907 |
| 4893 | 2.411 | 1.907 |
| 4908 | 2.411 | 1.905 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.30 | 2.854 |
| 6.10 | 3.066 |
| 9.30 | 3.351 |
| 12.30 | 3.611 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.62 |
| 2.50 | 1.77 |
| 4.00 | 1.65 |
| 5.50 | 1.88 |
| 7.00 | 2.01 |
| 8.50 | 1.41 |
| 10.00 | 1.88 |



TGRAD STATION C13-077
 000 31 N 015 51 W
 CRUISE STATION 210

WATER TEMPERATURES

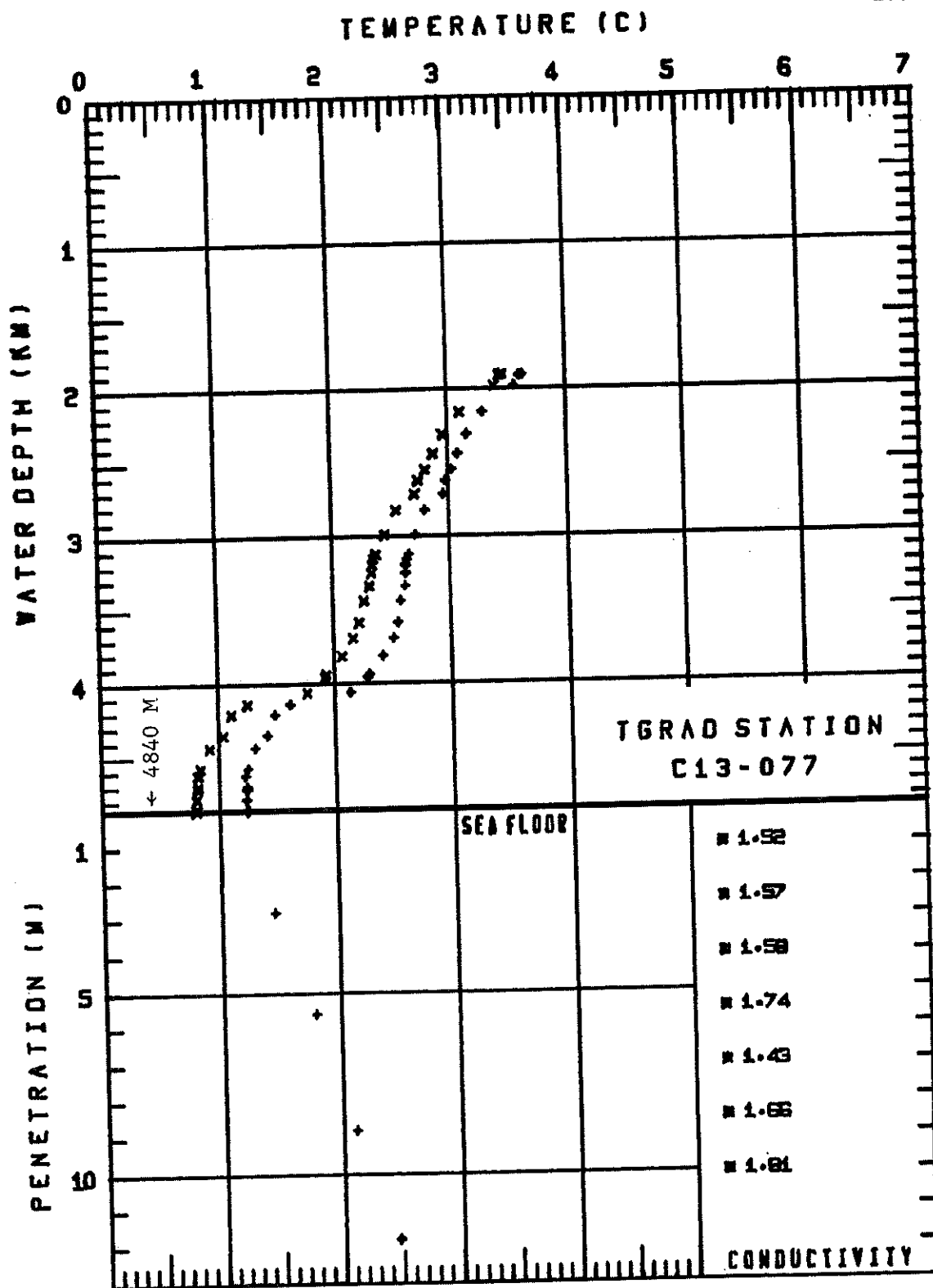
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1903 | 3.637 | 3.473 |
| 1907 | 3.615 | 3.451 |
| 1976 | 3.574 | 3.403 |
| 2158 | 3.304 | 3.119 |
| 2310 | 3.172 | 2.973 |
| 2438 | 3.092 | 2.881 |
| 2543 | 3.038 | 2.815 |
| 2620 | 2.987 | 2.758 |
| 2711 | 2.964 | 2.725 |
| 2821 | 2.815 | 2.566 |
| 2990 | 2.727 | 2.462 |
| 3124 | 2.665 | 2.387 |
| 3155 | 2.650 | 2.368 |
| 3195 | 2.637 | 2.349 |
| 3246 | 2.638 | 2.344 |
| 3335 | 2.628 | 2.325 |
| 3436 | 2.593 | 2.279 |
| 3583 | 2.565 | 2.232 |
| 3690 | 2.523 | 2.179 |
| 3810 | 2.433 | 2.076 |
| 3935 | 2.311 | 1.944 |
| 3955 | 2.297 | 1.928 |
| 4056 | 2.153 | 1.776 |
| 4133 | 1.628 | 1.263 |
| 4204 | 1.496 | 1.128 |
| 4345 | 1.431 | 1.049 |
| 4430 | 1.322 | 0.932 |
| 4573 | 1.259 | 0.854 |
| 4621 | 1.239 | 0.828 |
| 4696 | 1.253 | 0.833 |
| 4714 | 1.249 | 0.827 |
| 4784 | 1.243 | 0.813 |
| 4863 | 1.252 | 0.810 |
| 4854 | 1.257 | 0.816 |
| 4852 | 1.244 | 0.805 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE | |
|-----------------|---------------------------|---------|
| 2.80 | 1.467 | COOLING |
| 5.60 | 1.798 | COOLING |
| 8.80 | 2.126 | COOLING |
| 11.80 | 2.473 | COOLING |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.52 |
| 2.50 | 1.57 |
| 4.00 | 1.58 |
| 5.50 | 1.74 |
| 7.00 | 1.43 |
| 8.50 | 1.66 |
| 10.00 | 1.81 |



TGRAD STATION C13-078
 001 47 N 015 15 W
 CRUISE STATION 211

WATER TEMPERATURES

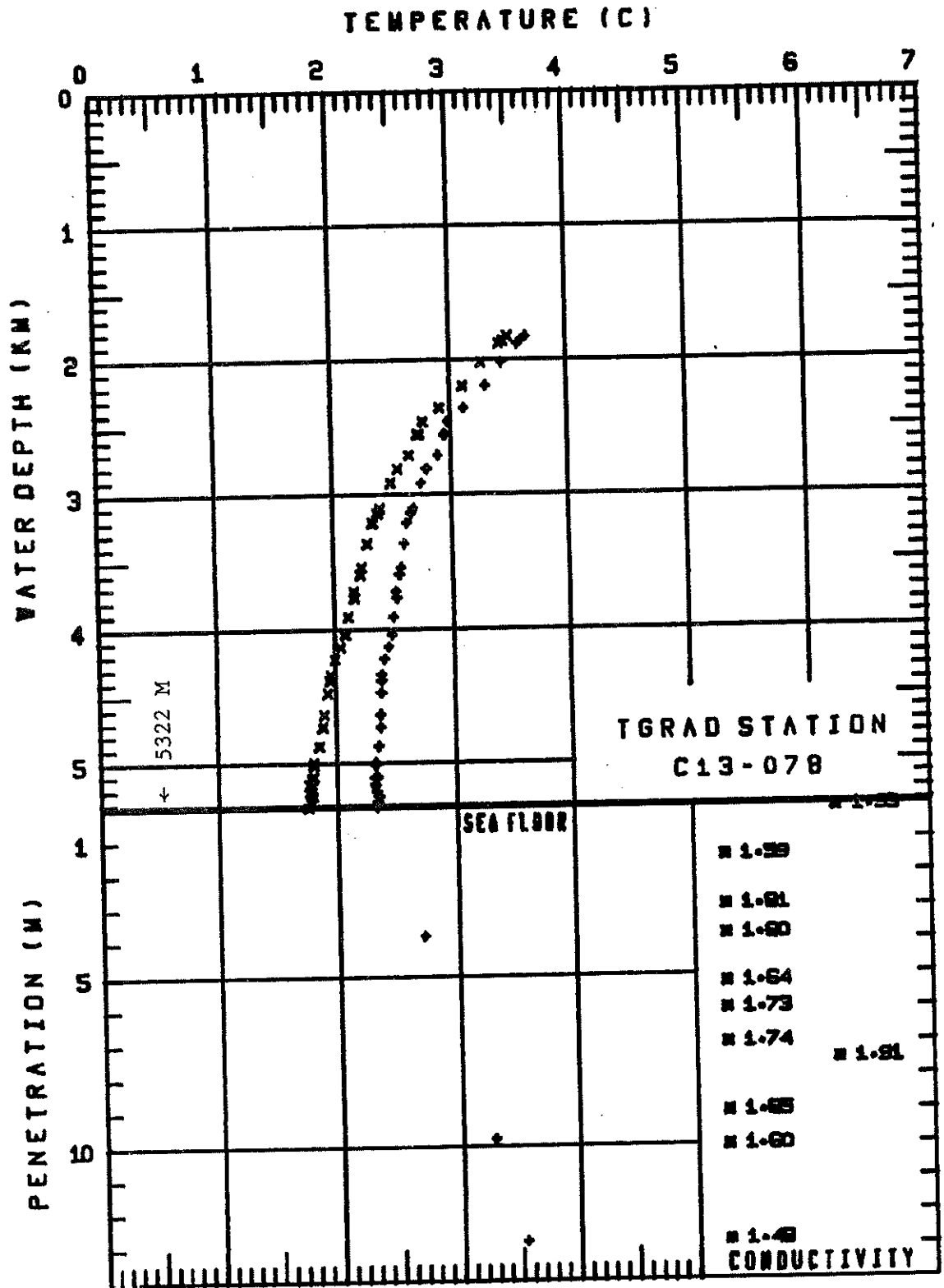
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1822 | 3.667 | 3.512 |
| 1855 | 3.625 | 3.466 |
| 1872 | 3.592 | 3.433 |
| 2018 | 3.451 | 3.278 |
| 2189 | 3.309 | 3.120 |
| 2356 | 3.122 | 2.920 |
| 2453 | 2.986 | 2.776 |
| 2552 | 2.966 | 2.743 |
| 2549 | 2.954 | 2.733 |
| 2701 | 2.895 | 2.659 |
| 2805 | 2.806 | 2.560 |
| 2911 | 2.752 | 2.495 |
| 3101 | 2.684 | 2.407 |
| 3138 | 2.663 | 2.382 |
| 3204 | 2.631 | 2.343 |
| 3360 | 2.602 | 2.297 |
| 3535 | 2.571 | 2.244 |
| 3590 | 2.560 | 2.229 |
| 3714 | 2.526 | 2.179 |
| 3761 | 2.529 | 2.175 |
| 3903 | 2.495 | 2.125 |
| 4035 | 2.483 | 2.095 |
| 4128 | 2.454 | 2.055 |
| 4220 | 2.420 | 2.009 |
| 4334 | 2.394 | 1.970 |
| 4377 | 2.392 | 1.963 |
| 4472 | 2.388 | 1.946 |
| 4630 | 2.377 | 1.914 |
| 4727 | 2.376 | 1.898 |
| 4867 | 2.359 | 1.862 |
| 4987 | 2.331 | 1.819 |
| 5012 | 2.332 | 1.815 |
| 5108 | 2.331 | 1.800 |
| 5113 | 2.339 | 1.808 |
| 5092 | 2.346 | 1.818 |
| 5156 | 2.323 | 1.786 |
| 5151 | 2.334 | 1.796 |
| 5208 | 2.335 | 1.789 |
| 5242 | 2.356 | 1.805 |
| 5324 | 2.336 | 1.773 |
| 5282 | 2.348 | 1.789 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.80 | 2.720 |
| 9.80 | 3.282 |
| 12.80 | 3.541 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.10 | 1.93 |
| 1.50 | 1.59 |
| 2.95 | 1.81 |
| 3.80 | 1.60 |
| 5.20 | 1.64 |
| 6.00 | 1.73 |
| 7.00 | 1.74 |
| 7.50 | 1.91 |
| 9.00 | 1.65 |
| 10.00 | 1.60 |
| 12.80 | 1.48 |



TGRAD STATION C13-079
 004 31 N 013 41 W
 CRUISE STATION 212

WATER TEMPERATURES

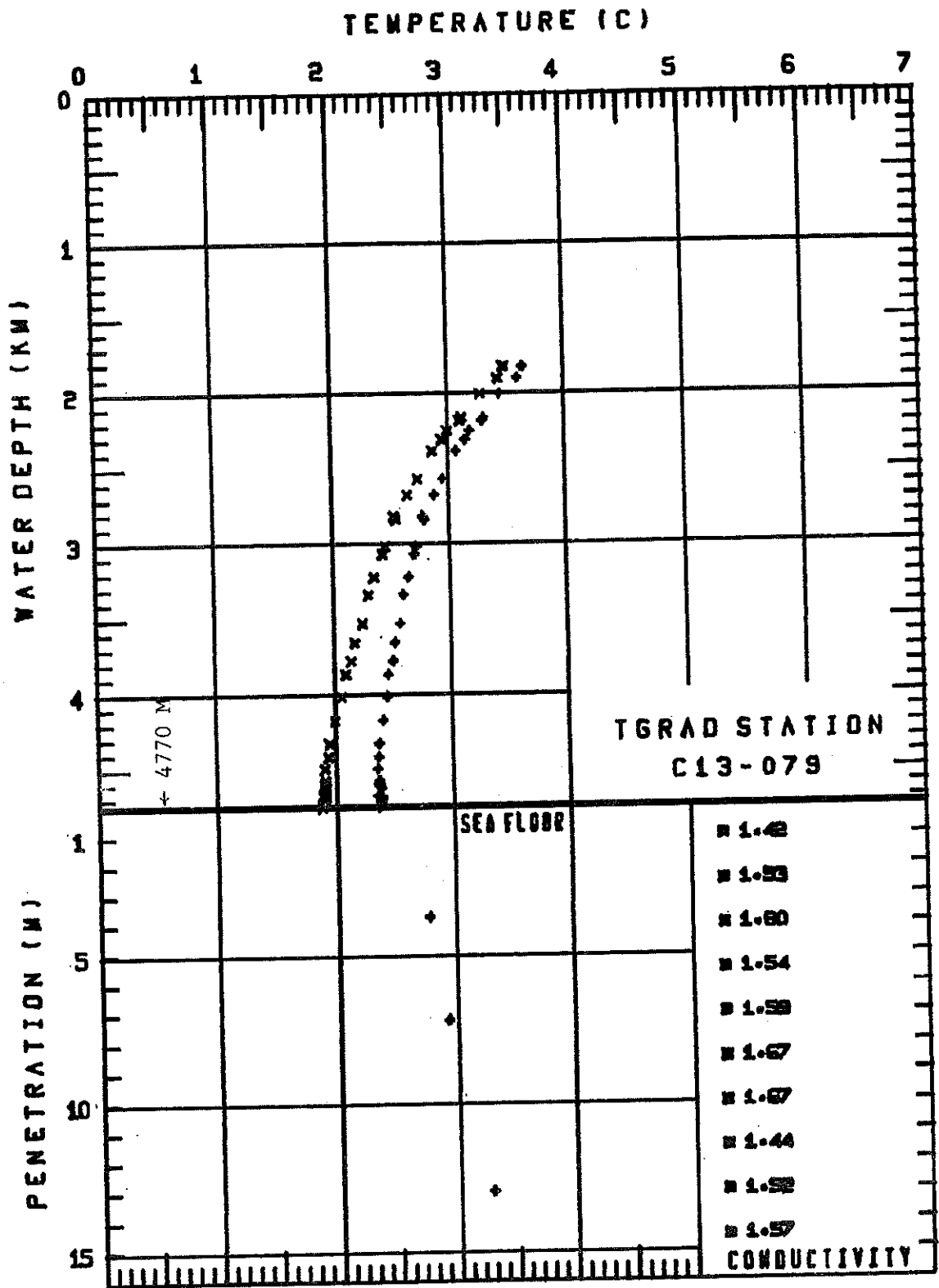
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1820 | 3.657 | 3.500 |
| 1818 | 3.650 | 3.493 |
| 1898 | 3.608 | 3.446 |
| 2000 | 3.460 | 3.289 |
| 2158 | 3.316 | 3.131 |
| 2181 | 3.302 | 3.114 |
| 2246 | 3.196 | 3.002 |
| 2309 | 3.155 | 2.957 |
| 2379 | 3.079 | 2.875 |
| 2566 | 2.963 | 2.742 |
| 2670 | 2.882 | 2.651 |
| 2832 | 2.797 | 2.548 |
| 2814 | 2.783 | 2.538 |
| 3014 | 2.727 | 2.460 |
| 3064 | 2.704 | 2.430 |
| 3219 | 2.650 | 2.359 |
| 3335 | 2.605 | 2.302 |
| 3527 | 2.574 | 2.249 |
| 3651 | 2.523 | 2.184 |
| 3776 | 2.506 | 2.151 |
| 3864 | 2.467 | 2.101 |
| 4009 | 2.448 | 2.066 |
| 4170 | 2.410 | 2.007 |
| 4321 | 2.377 | 1.957 |
| 4412 | 2.375 | 1.941 |
| 4490 | 2.358 | 1.914 |
| 4573 | 2.375 | 1.918 |
| 4599 | 2.374 | 1.914 |
| 4620 | 2.381 | 1.920 |
| 4673 | 2.359 | 1.890 |
| 4750 | 2.364 | 1.884 |
| 4682 | 2.391 | 1.920 |
| 4706 | 2.387 | 1.911 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 3.70 | 2.780 |
| 7.20 | 2.929 |
| 13.00 | 3.292 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.42 |
| 2.50 | 1.53 |
| 4.00 | 1.80 |
| 5.50 | 1.54 |
| 7.00 | 1.59 |
| 8.50 | 1.67 |
| 10.00 | 1.67 |
| 11.50 | 1.44 |
| 13.00 | 1.52 |
| 14.50 | 1.57 |



TGRAD STATION C13-080
004 35 N 010 03 W
CRUISE STATION 213

185

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.80 |
| 2.50 | 1.80 |
| 4.50 | 1.98 |
| 7.00 | 1.81 |
| 8.50 | 2.00 |
| 10.00 | 1.79 |
| 11.50 | 1.93 |

TGRAD STATION C13-081
003 15 N 000 32 E
CRUISE STATION 216

WATER TEMPERATURES

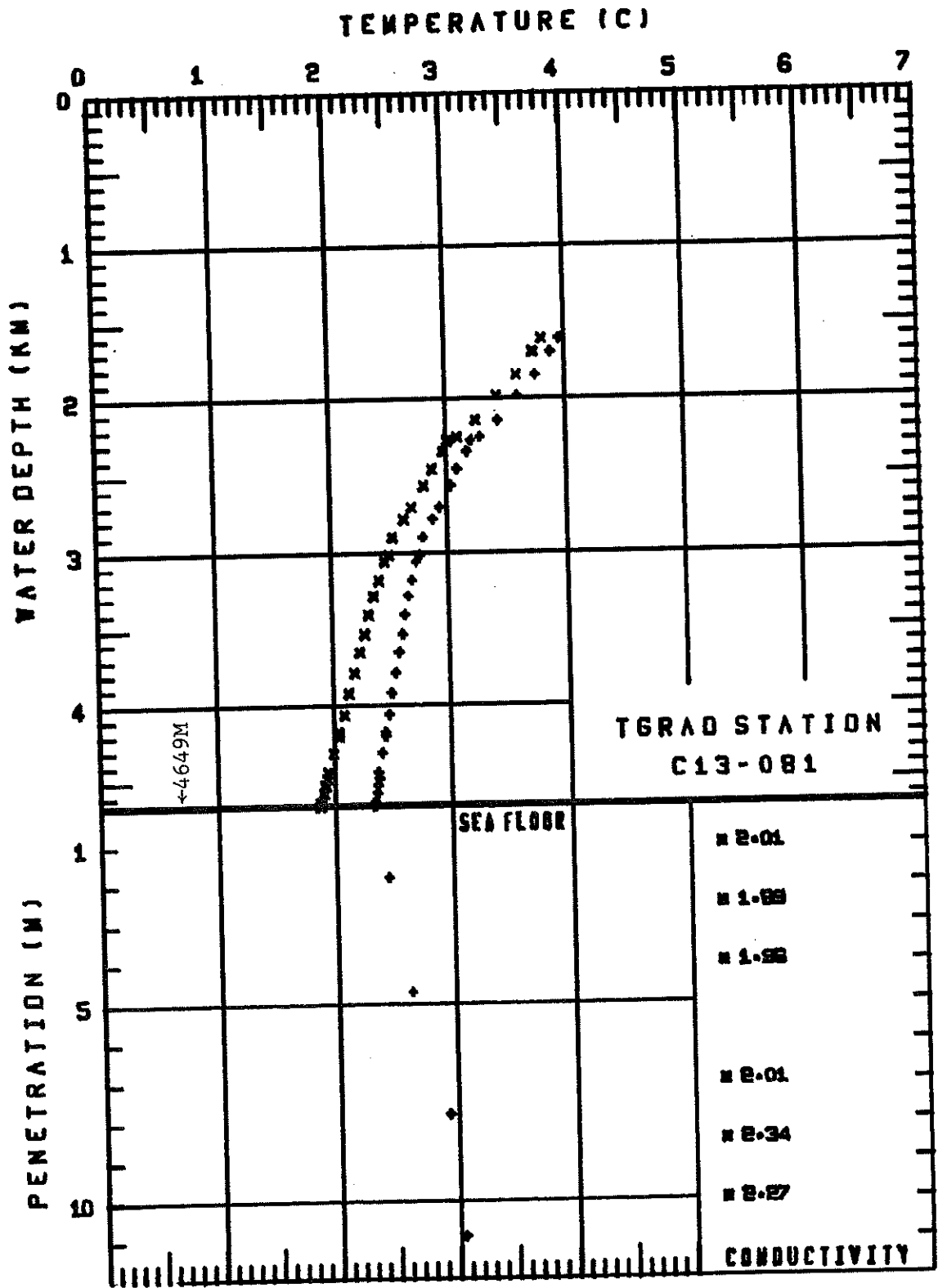
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1606 | 3.962 | 3.823 |
| 1691 | 3.905 | 3.759 |
| 1692 | 3.895 | 3.750 |
| 1842 | 3.770 | 3.611 |
| 1977 | 3.619 | 3.447 |
| 2140 | 3.450 | 3.264 |
| 2249 | 3.298 | 3.104 |
| 2271 | 3.219 | 3.023 |
| 2339 | 3.186 | 2.984 |
| 2455 | 3.107 | 2.894 |
| 2560 | 3.041 | 2.817 |
| 2702 | 2.951 | 2.714 |
| 2780 | 2.892 | 2.646 |
| 2897 | 2.802 | 2.546 |
| 3015 | 2.779 | 2.509 |
| 3012 | 2.780 | 2.512 |
| 3053 | 2.744 | 2.471 |
| 3179 | 2.704 | 2.417 |
| 3282 | 2.671 | 2.374 |
| 3399 | 2.639 | 2.328 |
| 3531 | 2.618 | 2.290 |
| 3648 | 2.582 | 2.243 |
| 3782 | 2.554 | 2.197 |
| 3917 | 2.517 | 2.144 |
| 4056 | 2.493 | 2.102 |
| 4173 | 2.460 | 2.055 |
| 4200 | 2.456 | 2.048 |
| 4307 | 2.427 | 2.006 |
| 4436 | 2.394 | 1.957 |
| 4521 | 2.387 | 1.937 |
| 4480 | 2.397 | 1.953 |
| 4522 | 2.384 | 1.934 |
| 4571 | 2.375 | 1.921 |
| 4631 | 2.364 | 1.901 |
| 4656 | 2.355 | 1.888 |
| 4635 | 2.351 | 1.888 |
| 4659 | 2.352 | 1.885 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE | |
|--------------|------------------------|---------|
| 1.80 | 2.467 | COOLING |
| 4.70 | 2.645 | COOLING |
| 7.80 | 2.947 | COOLING |
| 10.90 | 3.059 | COOLING |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 2.01 |
| 2.50 | 1.89 |
| 4.00 | 1.96 |
| 7.00 | 2.01 |
| 8.50 | 2.34 |
| 10.00 | 2.27 |

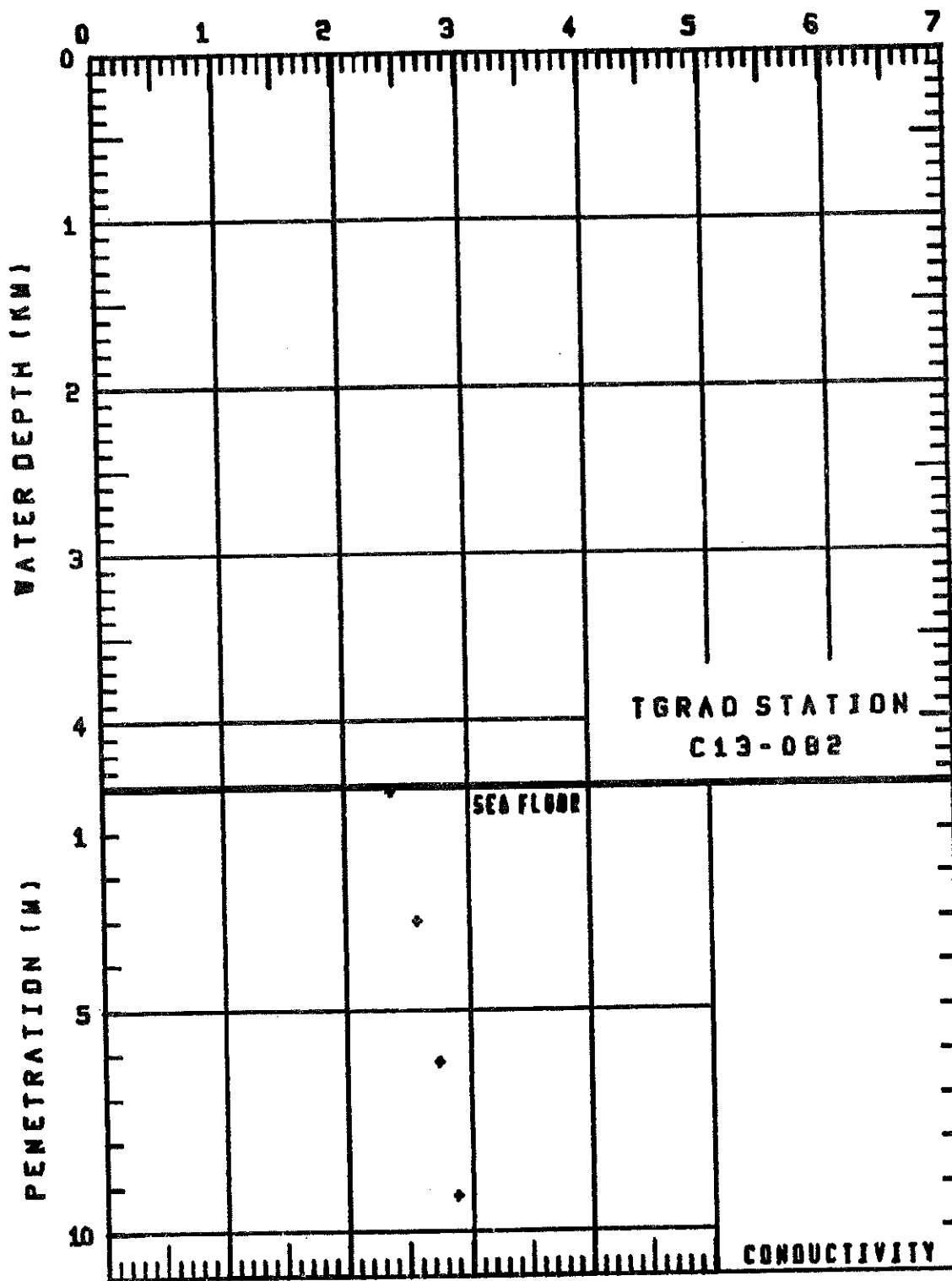


TGRAD STATION C13-082
002 01 N 002 39 E
CRUISE STATION 217

SEDIMENT TEMPERATURES

| <u>DEPTH</u> <u>METERS</u> | <u>TEMPERATURE</u> <u>CENTIGRADE</u> |
|-------------------------------|---|
| 0.10 | 2.381 |
| 3.00 | 2.592 |
| 6.20 | 2.760 |
| 9.20 | 2.890 |

TEMPERATURE (C)



TGRAD STATION C13-083
 003 25 N 004 03 E
 CRUISE STATION 218

WATER TEMPERATURES

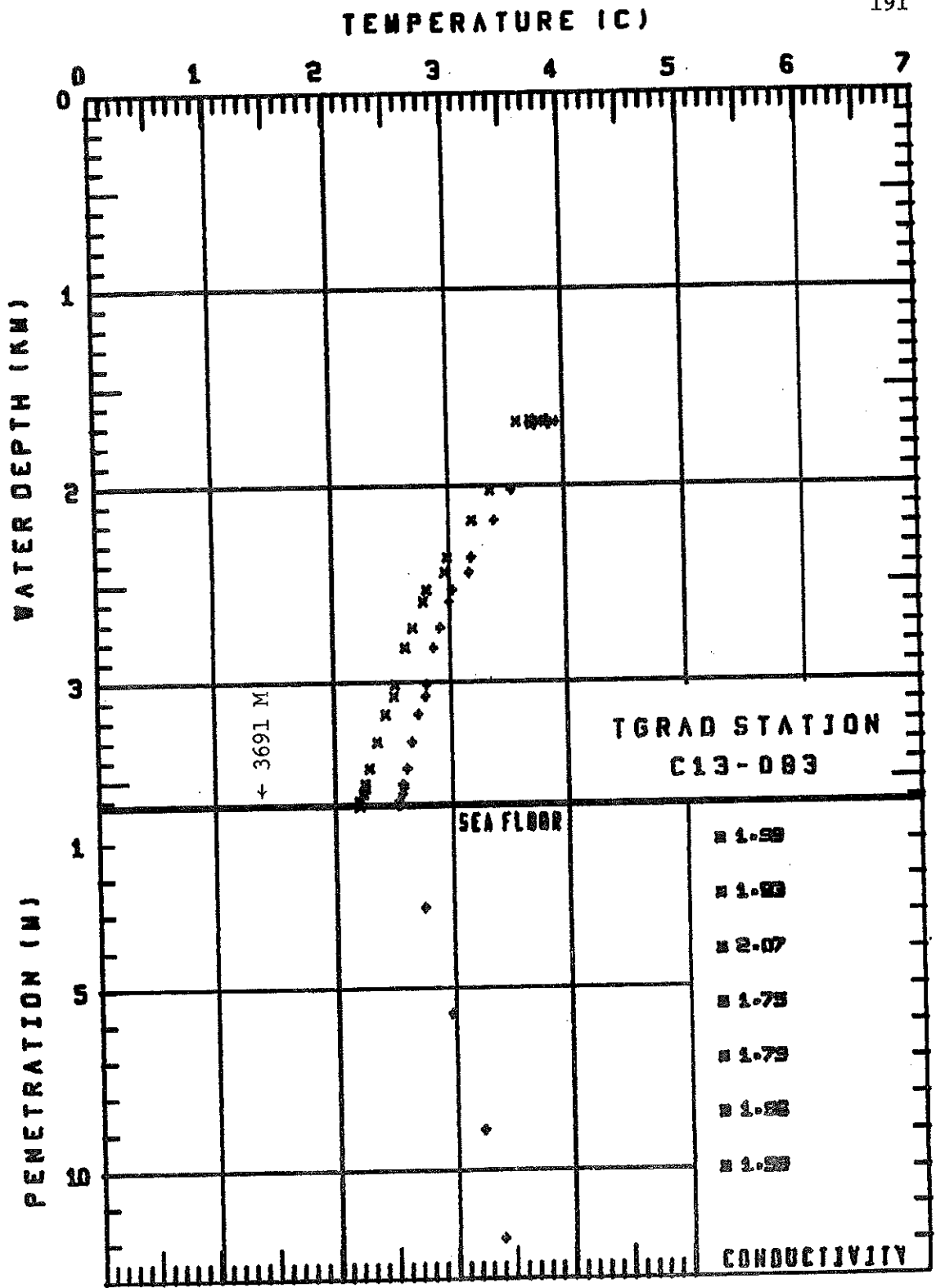
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1675 | 3.947 | 3.802 |
| 1685 | 3.885 | 3.739 |
| 1667 | 3.874 | 3.730 |
| 1674 | 3.752 | 3.611 |
| 2022 | 3.548 | 3.374 |
| 2176 | 3.403 | 3.214 |
| 2112 | 3.335 | 3.153 |
| 2362 | 3.203 | 2.996 |
| 2440 | 3.183 | 2.968 |
| 2530 | 3.040 | 2.821 |
| 2589 | 3.008 | 2.782 |
| 2721 | 2.930 | 2.691 |
| 2822 | 2.874 | 2.625 |
| 3009 | 2.802 | 2.532 |
| 3067 | 2.791 | 2.515 |
| 3163 | 2.726 | 2.441 |
| 3303 | 2.672 | 2.371 |
| 3435 | 2.624 | 2.308 |
| 3535 | 2.595 | 2.269 |
| 3514 | 2.591 | 2.266 |
| 3565 | 2.584 | 2.252 |
| 3624 | 2.556 | 2.219 |
| 3623 | 2.554 | 2.217 |
| 3600 | 2.548 | 2.216 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|------------------------|
| 2.80 | 2.765 |
| 5.70 | 2.984 |
| 8.90 | 3.243 |
| 11.90 | 3.405 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|------------------|
| 1.00 | 1.99 |
| 2.50 | 1.83 |
| 4.00 | 2.07 |
| 5.50 | 1.75 |
| 7.00 | 1.79 |
| 8.50 | 1.96 |
| 10.00 | 1.59 |



TGRAD STATION C13-084
 003 55 N 004 31 E
 CRUISE STATION 220

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1678 | 3.968 | 3.823 |
| 1687 | 3.907 | 3.762 |
| 1723 | 3.867 | 3.717 |
| 1835 | 3.849 | 3.690 |
| 1785 | 3.779 | 3.625 |
| 1810 | 3.762 | 3.605 |
| 1868 | 3.684 | 3.522 |

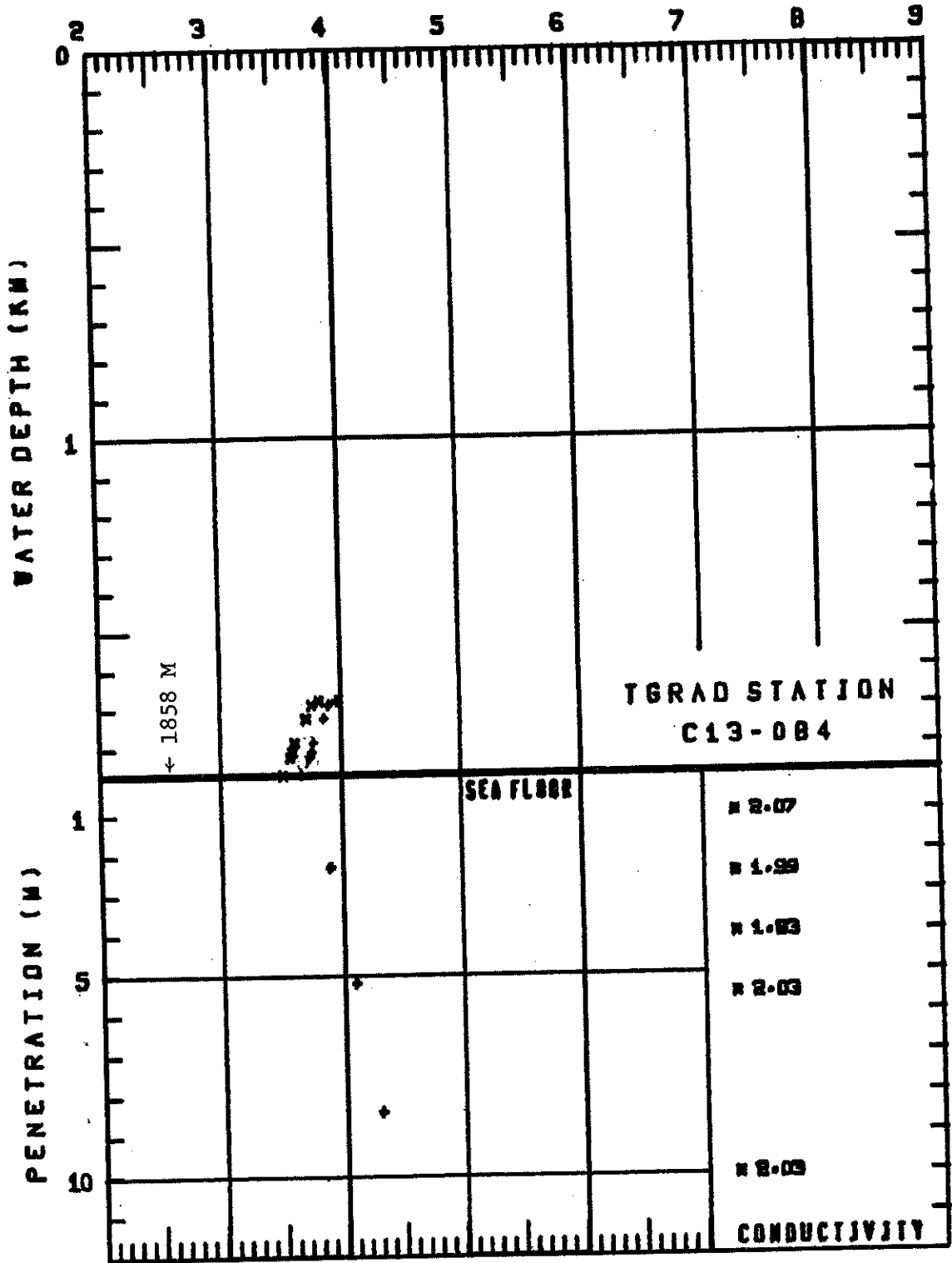
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 2.30 | 3.907 |
| 5.20 | 4.106 |
| 8.40 | 4.310 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 2.07 |
| 2.50 | 1.99 |
| 4.00 | 1.83 |
| 5.50 | 2.03 |
| 10.00 | 2.03 |

TEMPERATURE (C)



TGRAD STATION C13-085
002 50 N 008 05 E
CRUISE STATION 221

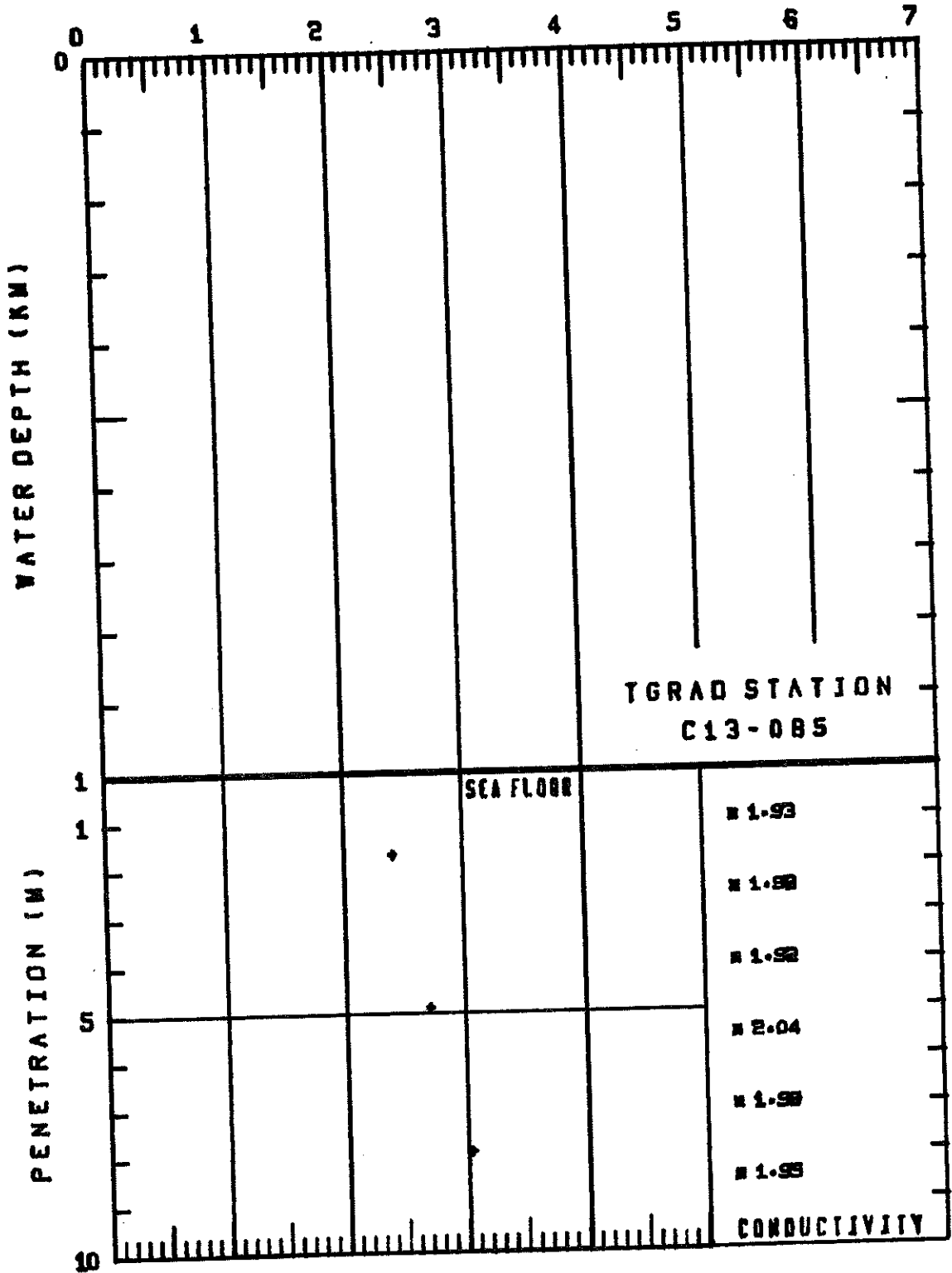
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.70 | 2.421 |
| 4.90 | 2.719 |
| 7.90 | 3.043 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.93 |
| 2.50 | 1.98 |
| 4.00 | 1.92 |
| 5.50 | 2.04 |
| 7.00 | 1.99 |
| 8.50 | 1.95 |

TEMPERATURE (C)

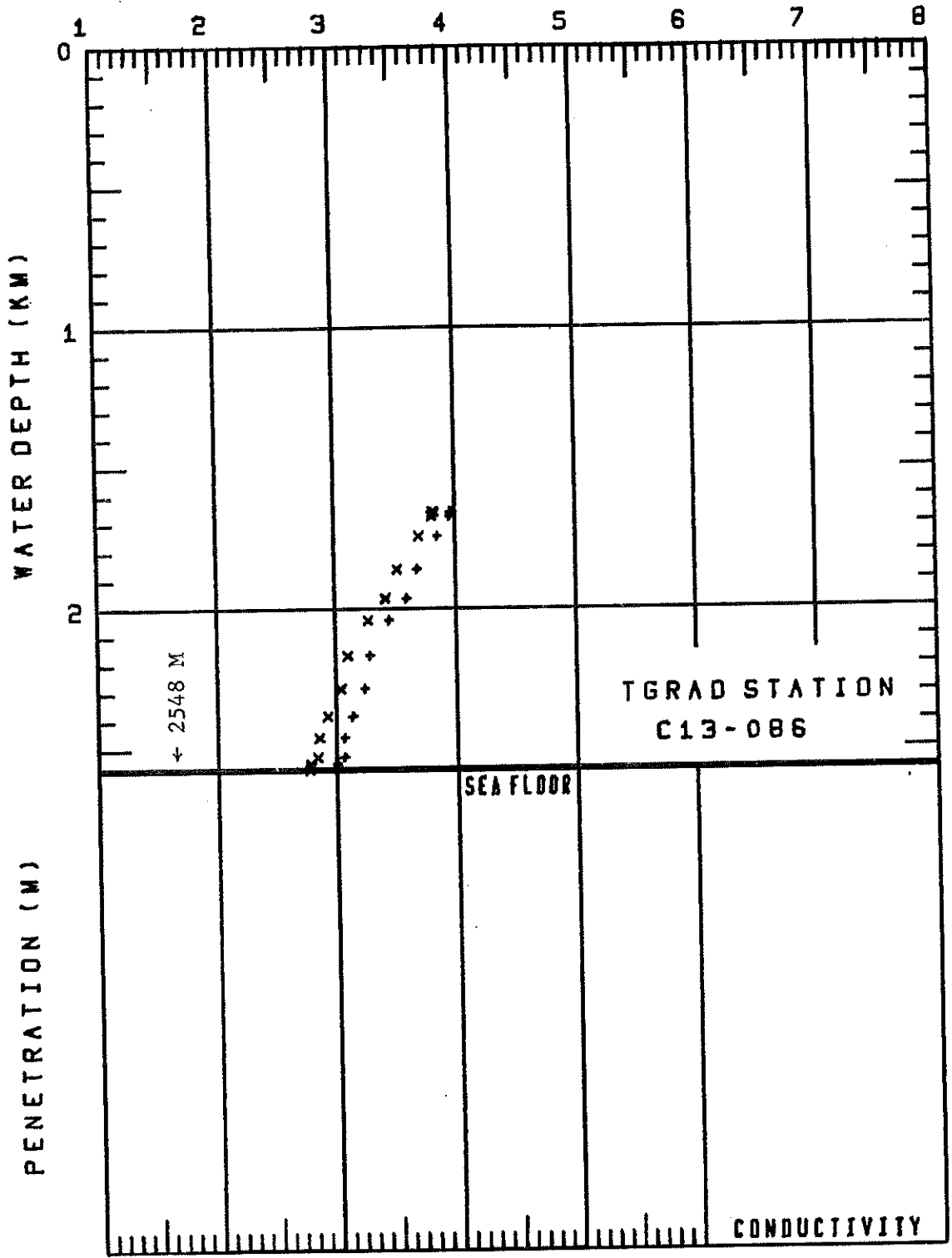


TGRAD STATION C13-086
002 24 N 007 32 E
CRUISE STATION 222

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1657 | 3.983 | 3.839 |
| 1672 | 3.961 | 3.816 |
| 1655 | 3.970 | 3.826 |
| 1741 | 3.861 | 3.710 |
| 1860 | 3.694 | 3.533 |
| 1962 | 3.602 | 3.433 |
| 2040 | 3.460 | 3.284 |
| 2165 | 3.296 | 3.109 |
| 2283 | 3.250 | 3.052 |
| 2379 | 3.141 | 2.935 |
| 2457 | 3.080 | 2.868 |
| 2524 | 3.069 | 2.849 |
| 2570 | 3.006 | 2.782 |
| 2547 | 3.013 | 2.790 |
| 2558 | 3.017 | 2.795 |

TEMPERATURE (C)



TGRAD STATION C13-087
 001 22 S 006 53 E
 CRUISE STATION 224

WATER TEMPERATURES

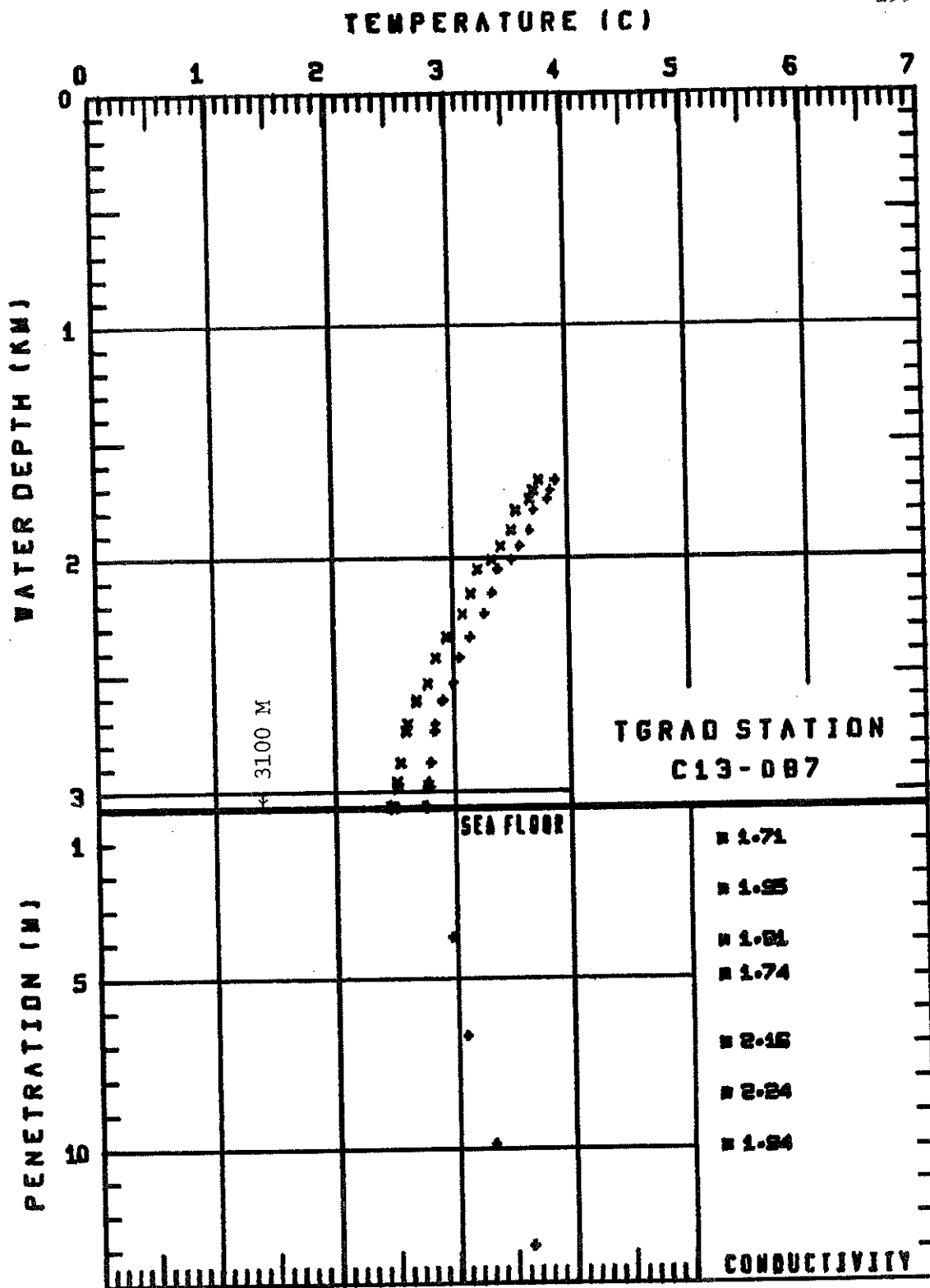
| <u>DEPTH METERS</u> | <u>IN SITU TEMPERATURE</u> | <u>POTENTIAL TEMPERATURE</u> |
|-------------------------|--------------------------------|----------------------------------|
| 1664 | 3.914 | 3.770 |
| 1710 | 3.869 | 3.721 |
| 1745 | 3.842 | 3.691 |
| 1795 | 3.725 | 3.572 |
| 1879 | 3.690 | 3.528 |
| 1946 | 3.605 | 3.436 |
| 2007 | 3.532 | 3.359 |
| 2048 | 3.409 | 3.233 |
| 2148 | 3.356 | 3.171 |
| 2238 | 3.291 | 3.098 |
| 2337 | 3.163 | 2.960 |
| 2424 | 3.072 | 2.862 |
| 2535 | 3.012 | 2.790 |
| 2611 | 2.914 | 2.688 |
| 2606 | 2.921 | 2.696 |
| 2708 | 2.852 | 2.617 |
| 2738 | 2.845 | 2.606 |
| 2876 | 2.809 | 2.555 |
| 2980 | 2.802 | 2.536 |
| 2958 | 2.783 | 2.521 |
| 2981 | 2.786 | 2.521 |
| 3059 | 2.763 | 2.488 |
| 3070 | 2.773 | 2.497 |
| 3064 | 2.763 | 2.488 |
| 3063 | 2.738 | 2.464 |

SEDIMENT TEMPERATURES

| <u>DEPTH METERS</u> | <u>TEMPERATURE CENTIGRADE</u> |
|-------------------------|-----------------------------------|
| 3.80 | 2.977 |
| 6.70 | 3.092 |
| 9.90 | 3.318 |
| 12.90 | 3.635 |

SEDIMENT CONDUCTIVITIES

| <u>DEPTH METERS</u> | <u>CONDUCTIVITY CGS</u> |
|-------------------------|-----------------------------|
| 1.00 | 1.71 |
| 2.50 | 1.95 |
| 4.00 | 1.81 |
| 5.00 | 1.74 |
| 7.00 | 2.16 |
| 8.50 | 2.24 |
| 10.00 | 1.94 |



TGRAD STATION C13-088
 002 17 S 005 11 E
 CRUISE STATION 225

WATER TEMPERATURES

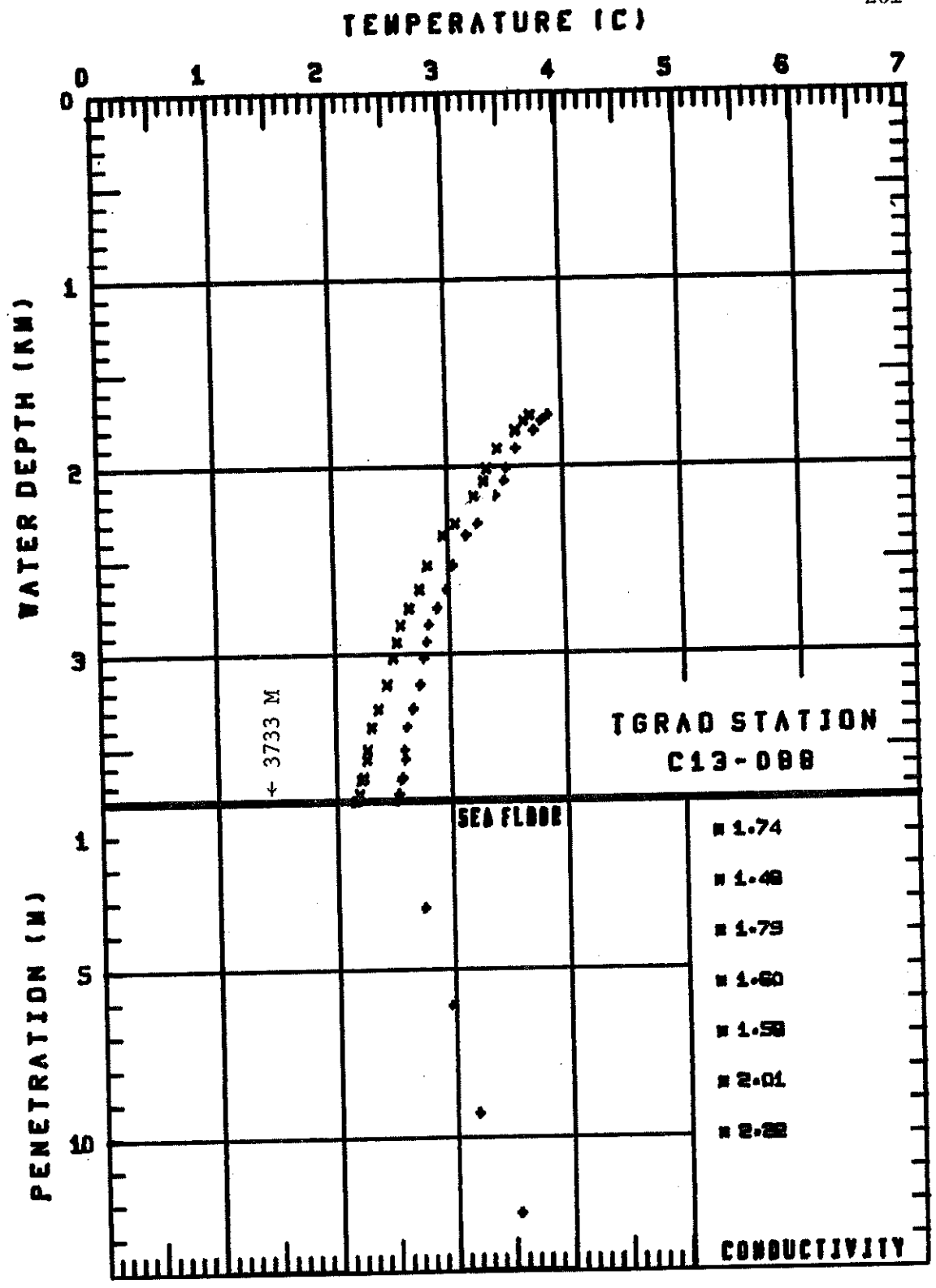
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1724 | 3.888 | 3.739 |
| 1754 | 3.836 | 3.685 |
| 1806 | 3.769 | 3.612 |
| 1903 | 3.611 | 3.448 |
| 2005 | 3.528 | 3.355 |
| 2076 | 3.513 | 3.332 |
| 2153 | 3.434 | 3.247 |
| 2165 | 3.336 | 3.151 |
| 2301 | 3.279 | 3.079 |
| 2365 | 3.177 | 2.973 |
| 2526 | 3.052 | 2.831 |
| 2650 | 2.990 | 2.757 |
| 2750 | 2.903 | 2.661 |
| 2840 | 2.835 | 2.585 |
| 2931 | 2.813 | 2.553 |
| 3017 | 2.786 | 2.516 |
| 3159 | 2.751 | 2.466 |
| 3288 | 2.681 | 2.382 |
| 3386 | 2.631 | 2.322 |
| 3507 | 2.605 | 2.282 |
| 3557 | 2.608 | 2.278 |
| 3651 | 2.587 | 2.245 |
| 3661 | 2.585 | 2.243 |
| 3666 | 2.569 | 2.227 |
| 3778 | 2.547 | 2.191 |
| 3740 | 2.552 | 2.201 |
| 3779 | 2.529 | 2.173 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.20 | 2.759 |
| 6.10 | 2.977 |
| 9.30 | 3.197 |
| 12.30 | 3.545 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.74 |
| 2.50 | 1.48 |
| 4.00 | 1.79 |
| 5.50 | 1.60 |
| 7.00 | 1.58 |
| 8.50 | 2.01 |
| 10.00 | 2.22 |



TGRAD STATION C13-089
 004 28 S 002 54 E
 CRUISE STATION 226

WATER TEMPERATURES

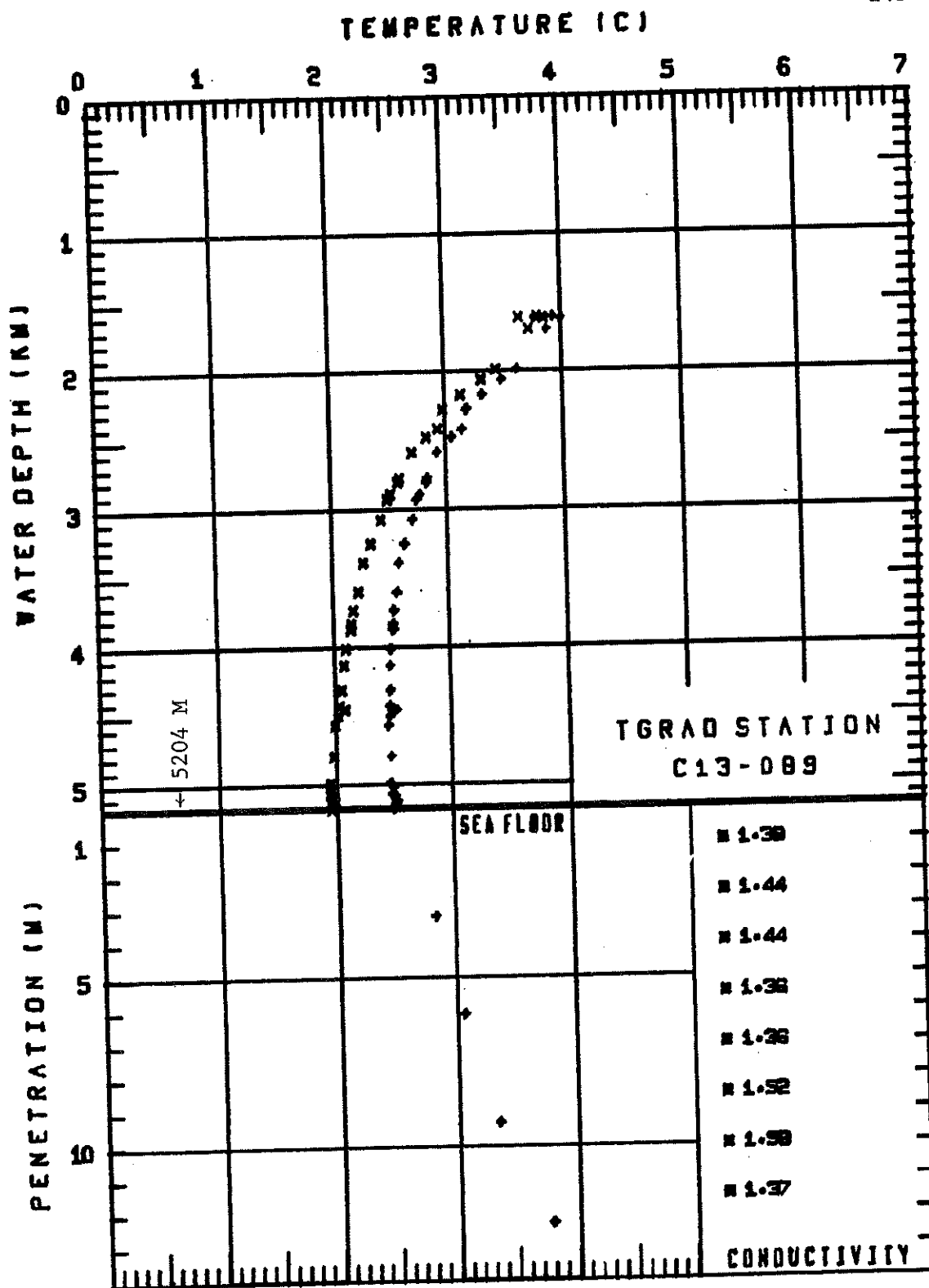
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1612 | 3.995 | 3.856 |
| 1604 | 3.940 | 3.802 |
| 1698 | 3.881 | 3.734 |
| 1609 | 3.789 | 3.653 |
| 1985 | 3.624 | 3.450 |
| 2057 | 3.500 | 3.322 |
| 2164 | 3.335 | 3.147 |
| 2273 | 3.188 | 2.993 |
| 2412 | 3.151 | 2.941 |
| 2471 | 3.055 | 2.842 |
| 2578 | 2.940 | 2.717 |
| 2770 | 2.848 | 2.605 |
| 2800 | 2.837 | 2.592 |
| 2887 | 2.776 | 2.521 |
| 2920 | 2.752 | 2.495 |
| 3066 | 2.709 | 2.435 |
| 3242 | 2.638 | 2.345 |
| 3378 | 2.586 | 2.279 |
| 3589 | 2.561 | 2.229 |
| 3722 | 2.535 | 2.187 |
| 3822 | 2.526 | 2.164 |
| 3862 | 2.525 | 2.157 |
| 4003 | 2.495 | 2.111 |
| 4129 | 2.489 | 2.089 |
| 4307 | 2.487 | 2.063 |
| 4417 | 2.480 | 2.041 |
| 4492 | 2.477 | 2.028 |
| 4564 | 2.461 | 2.003 |
| 4448 | 2.539 | 2.092 |
| 4789 | 2.484 | 1.993 |
| 4982 | 2.477 | 1.957 |
| 5012 | 2.506 | 1.980 |
| 5062 | 2.492 | 1.960 |
| 5083 | 2.510 | 1.973 |
| 5173 | 2.513 | 1.963 |
| 5134 | 2.519 | 1.974 |
| 5116 | 2.532 | 1.989 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.20 | 2.836 |
| 6.10 | 3.068 |
| 9.30 | 3.348 |
| 12.30 | 3.790 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.38 |
| 2.50 | 1.44 |
| 4.00 | 1.44 |
| 5.50 | 1.36 |
| 7.00 | 1.36 |
| 8.50 | 1.52 |
| 10.00 | 1.58 |
| 11.50 | 1.37 |



TGRAD STATION C13-090
 005 02 S 001 23 E
 CRUISE STATION 227

WATER TEMPERATURES

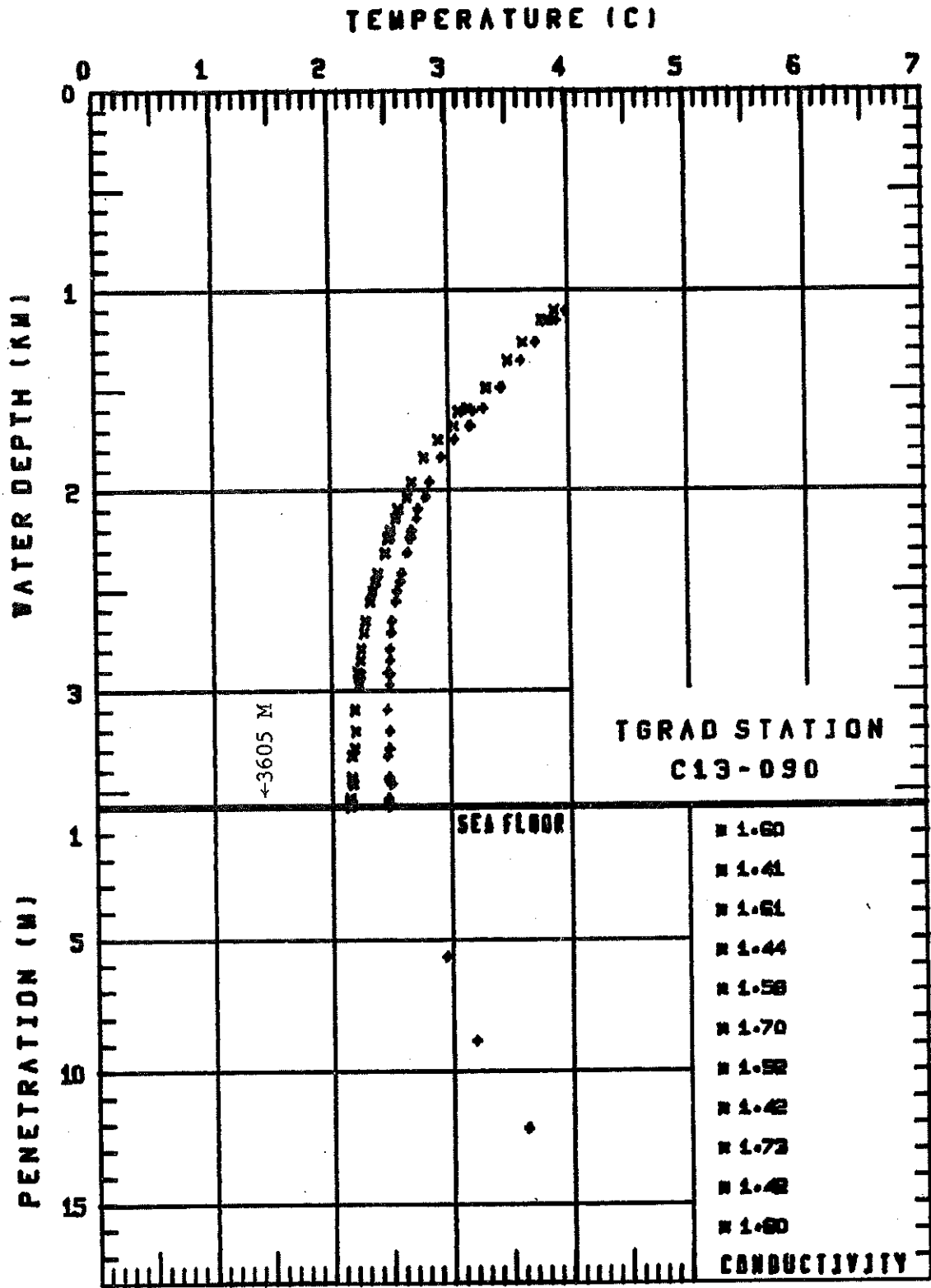
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1100 | 3.986 | 3.898 |
| 1153 | 3.916 | 3.823 |
| 1147 | 3.881 | 3.789 |
| 1260 | 3.736 | 3.634 |
| 1350 | 3.613 | 3.506 |
| 1487 | 3.443 | 3.324 |
| 1588 | 3.298 | 3.171 |
| 1606 | 3.220 | 3.093 |
| 1678 | 3.190 | 3.055 |
| 1743 | 3.059 | 2.921 |
| 1831 | 2.954 | 2.808 |
| 1954 | 2.852 | 2.697 |
| 2032 | 2.819 | 2.657 |
| 2090 | 2.750 | 2.584 |
| 2140 | 2.736 | 2.563 |
| 2200 | 2.697 | 2.519 |
| 2230 | 2.690 | 2.509 |
| 2237 | 2.681 | 2.500 |
| 2309 | 2.657 | 2.468 |
| 2414 | 2.611 | 2.413 |
| 2451 | 2.595 | 2.394 |
| 2502 | 2.569 | 2.362 |
| 2551 | 2.556 | 2.345 |
| 2653 | 2.526 | 2.305 |
| 2705 | 2.520 | 2.293 |
| 2791 | 2.502 | 2.266 |
| 2847 | 2.503 | 2.260 |
| 2908 | 2.483 | 2.234 |
| 2919 | 2.506 | 2.256 |
| 2970 | 2.499 | 2.242 |
| 3093 | 2.476 | 2.206 |
| 3199 | 2.495 | 2.212 |
| 3286 | 2.497 | 2.204 |
| 3324 | 2.477 | 2.180 |
| 3432 | 2.489 | 2.178 |
| 3446 | 2.490 | 2.178 |
| 3466 | 2.509 | 2.193 |
| 3536 | 2.487 | 2.164 |
| 3558 | 2.486 | 2.159 |
| 3577 | 2.494 | 2.165 |
| 3566 | 2.502 | 2.174 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 5.68 | 2.960 |
| 8.86 | 3.197 |
| 12.16 | 3.625 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.60 |
| 2.50 | 1.41 |
| 4.00 | 1.61 |
| 5.50 | 1.44 |
| 7.00 | 1.59 |
| 8.50 | 1.70 |
| 10.00 | 1.52 |
| 11.50 | 1.42 |
| 13.00 | 1.73 |
| 14.50 | 1.42 |
| 16.00 | 1.60 |



TGRAD STATION C13-091
 006 59 S 005 10 W
 CRUISE STATION 228

WATER TEMPERATURES

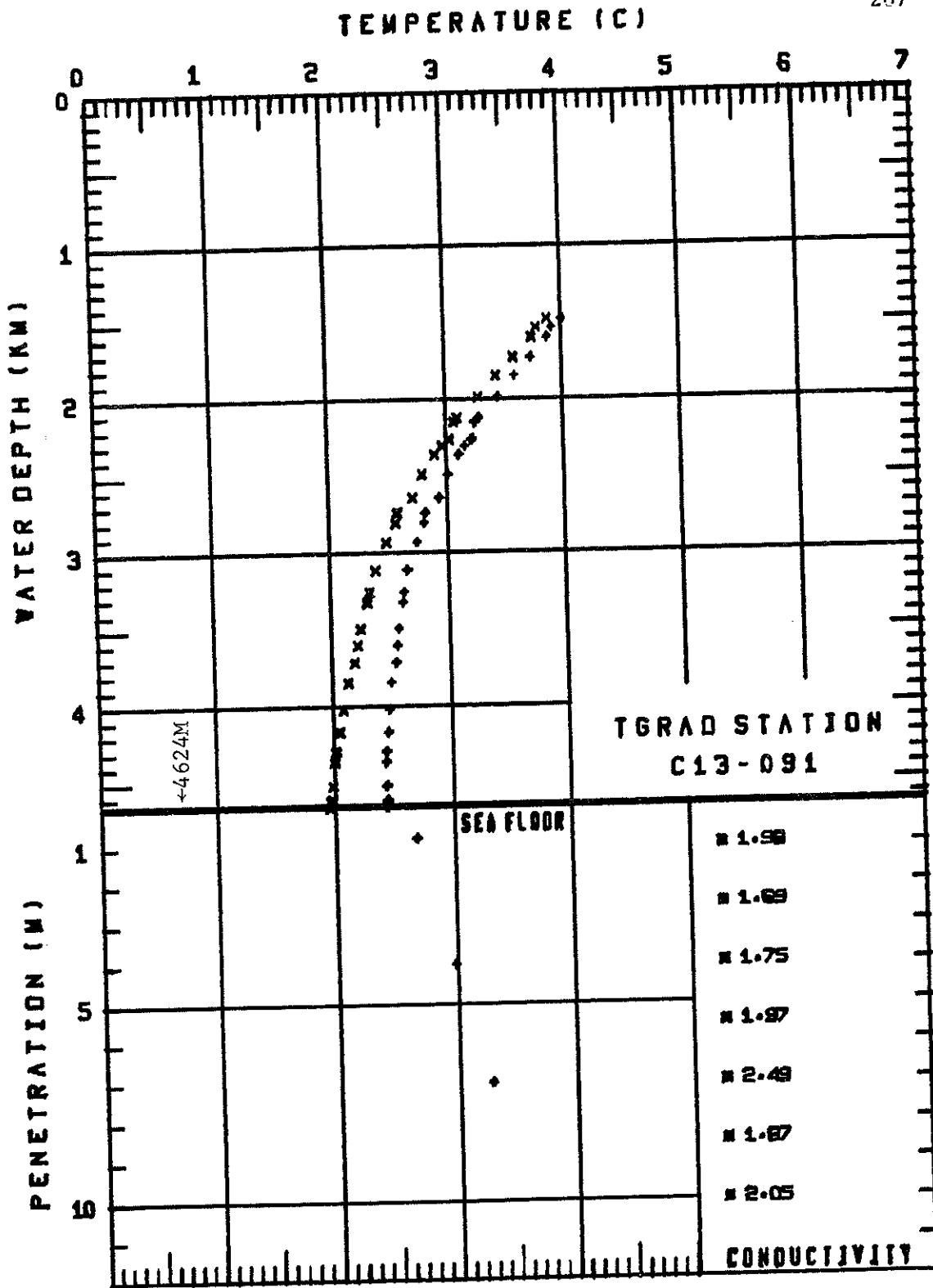
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1481 | 4.009 | 3.883 |
| 1538 | 3.925 | 3.795 |
| 1598 | 3.887 | 3.750 |
| 1727 | 3.738 | 3.592 |
| 1844 | 3.596 | 3.438 |
| 1986 | 3.453 | 3.282 |
| 2119 | 3.284 | 3.105 |
| 2147 | 3.252 | 3.069 |
| 2261 | 3.223 | 3.028 |
| 2301 | 3.167 | 2.969 |
| 2356 | 3.109 | 2.907 |
| 2485 | 3.015 | 2.800 |
| 2636 | 2.940 | 2.710 |
| 2736 | 2.818 | 2.580 |
| 2803 | 2.808 | 2.561 |
| 2928 | 2.743 | 2.484 |
| 3108 | 2.659 | 2.382 |
| 3251 | 2.627 | 2.335 |
| 3319 | 2.611 | 2.310 |
| 3490 | 2.572 | 2.251 |
| 3599 | 2.558 | 2.223 |
| 3713 | 2.546 | 2.198 |
| 3841 | 2.499 | 2.135 |
| 4014 | 2.477 | 2.093 |
| 4161 | 2.461 | 2.058 |
| 4290 | 2.442 | 2.022 |
| 4359 | 2.440 | 2.010 |
| 4514 | 2.440 | 1.990 |
| 4613 | 2.436 | 1.971 |
| 4653 | 2.436 | 1.967 |
| 4605 | 2.451 | 1.987 |
| 4624 | 2.441 | 1.976 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.80 | 2.678 |
| 4.00 | 2.983 |
| 7.00 | 3.277 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.98 |
| 2.50 | 1.69 |
| 4.00 | 1.75 |
| 5.50 | 1.97 |
| 7.00 | 2.49 |
| 8.50 | 1.87 |
| 10.00 | 2.05 |



TGRAD STATION C13-092
 008 12 S 008 13 W
 CRUISE STATION 229

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1596 | 3.967 | 3.829 |
| 1658 | 3.930 | 3.788 |
| 1690 | 3.902 | 3.756 |
| 1803 | 3.751 | 3.596 |
| 1947 | 3.541 | 3.374 |
| 2065 | 3.404 | 3.227 |
| 2234 | 3.239 | 3.047 |
| 2314 | 3.204 | 3.003 |
| 2416 | 3.093 | 2.884 |
| 2457 | 3.082 | 2.869 |
| 2588 | 2.990 | 2.764 |
| 2692 | 2.902 | 2.667 |
| 2749 | 2.868 | 2.626 |
| 2856 | 2.841 | 2.587 |
| 2965 | 2.772 | 2.508 |
| 3058 | 2.719 | 2.447 |
| 3224 | 2.666 | 2.375 |
| 3370 | 2.591 | 2.284 |
| 3469 | 2.535 | 2.218 |
| 3509 | 2.541 | 2.219 |
| 3664 | 2.507 | 2.167 |
| 3815 | 2.493 | 2.134 |
| 3965 | 2.493 | 2.114 |
| 4098 | 2.495 | 2.099 |
| 4169 | 2.495 | 2.089 |
| 4218 | 2.481 | 2.069 |
| 4128 | 2.500 | 2.100 |
| 4220 | 2.496 | 2.085 |
| 4263 | 2.500 | 2.081 |
| 4282 | 2.500 | 2.079 |
| 4251 | 2.514 | 2.096 |

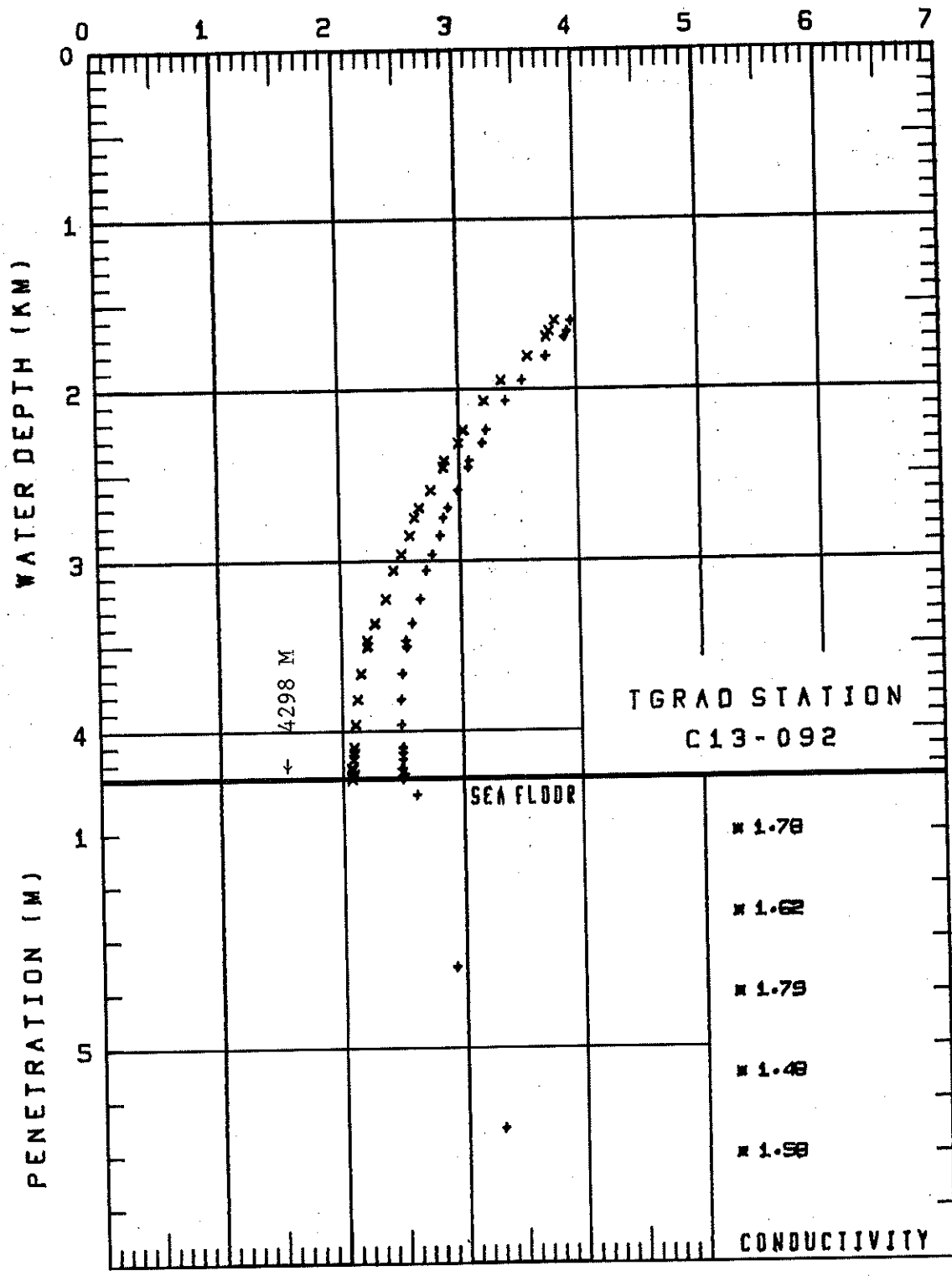
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.30 | 2.608 |
| 3.50 | 2.927 |
| 6.50 | 3.309 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.78 |
| 2.50 | 1.62 |
| 4.00 | 1.79 |
| 5.50 | 1.48 |
| 7.00 | 1.58 |

TEMPERATURE (C)



TGRAD STATION C13-093
 009 09 S 010 37 W
 CRUISE STATION 230

WATER TEMPERATURES

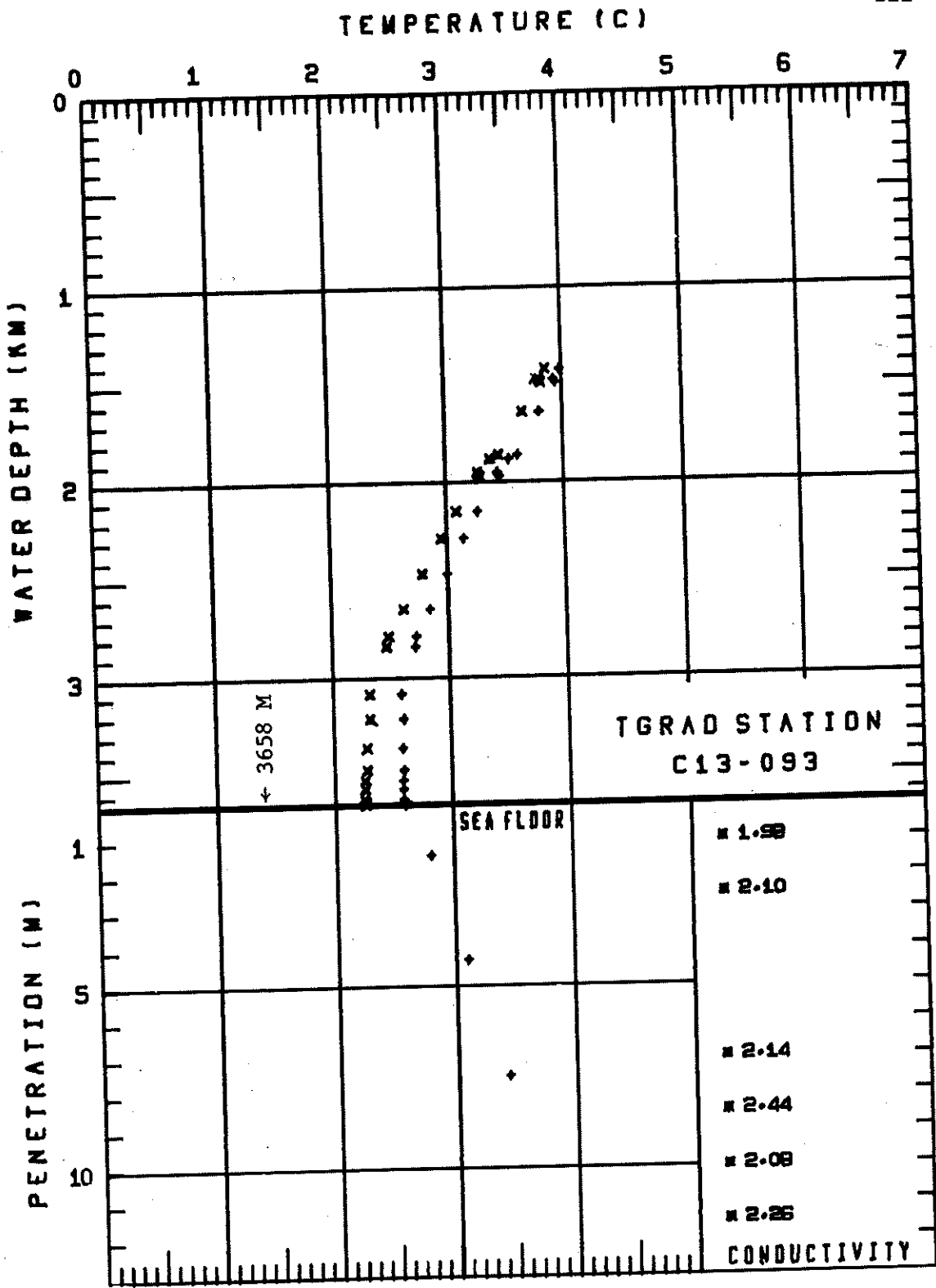
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1422 | 3.982 | 3.862 |
| 1492 | 3.951 | 3.825 |
| 1474 | 3.934 | 3.809 |
| 1641 | 3.805 | 3.665 |
| 1478 | 3.749 | 3.625 |
| 1862 | 3.617 | 3.457 |
| 1882 | 3.546 | 3.385 |
| 1970 | 3.463 | 3.296 |
| 1949 | 3.446 | 3.279 |
| 2148 | 3.275 | 3.091 |
| 2285 | 3.151 | 2.955 |
| 2469 | 3.006 | 2.792 |
| 2648 | 2.855 | 2.625 |
| 2788 | 2.732 | 2.490 |
| 2838 | 2.717 | 2.469 |
| 3052 | 2.588 | 2.316 |
| 3208 | 2.606 | 2.319 |
| 3358 | 2.591 | 2.285 |
| 3471 | 2.600 | 2.282 |
| 3212 | 2.686 | 2.395 |
| 3523 | 2.589 | 2.264 |
| 3569 | 2.592 | 2.262 |
| 3619 | 2.594 | 2.256 |
| 3637 | 2.609 | 2.269 |
| 3650 | 2.605 | 2.263 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 1.40 | 2.809 |
| 4.30 | 3.114 |
| 7.50 | 3.441 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.98 |
| 2.50 | 2.10 |
| 7.00 | 2.14 |
| 8.50 | 2.44 |
| 10.00 | 2.08 |
| 11.50 | 2.26 |



TGRAD STATION C13-094
 009 16 S 010 33 W
 CRUISE STATION 231

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1452 | 3.951 | 3.829 |
| 1432 | 3.937 | 3.817 |
| 1465 | 3.911 | 3.788 |
| 1644 | 3.800 | 3.661 |
| 1753 | 3.668 | 3.520 |
| 1902 | 3.535 | 3.374 |
| 1988 | 3.417 | 3.247 |
| 2024 | 3.409 | 3.236 |
| 1997 | 3.309 | 3.140 |
| 2091 | 3.316 | 3.138 |
| 2249 | 3.250 | 3.055 |
| 2346 | 3.164 | 2.961 |
| 2478 | 3.030 | 2.816 |
| 2710 | 2.828 | 2.592 |
| 2790 | 2.782 | 2.539 |
| 2958 | 2.640 | 2.381 |
| 3120 | 2.607 | 2.330 |
| 3345 | 2.589 | 2.285 |
| 3482 | 2.585 | 2.265 |
| 3515 | 2.601 | 2.276 |
| 3544 | 2.587 | 2.260 |
| 3594 | 2.588 | 2.255 |
| 3648 | 2.595 | 2.255 |
| 3675 | 2.605 | 2.260 |
| 3697 | 2.605 | 2.257 |

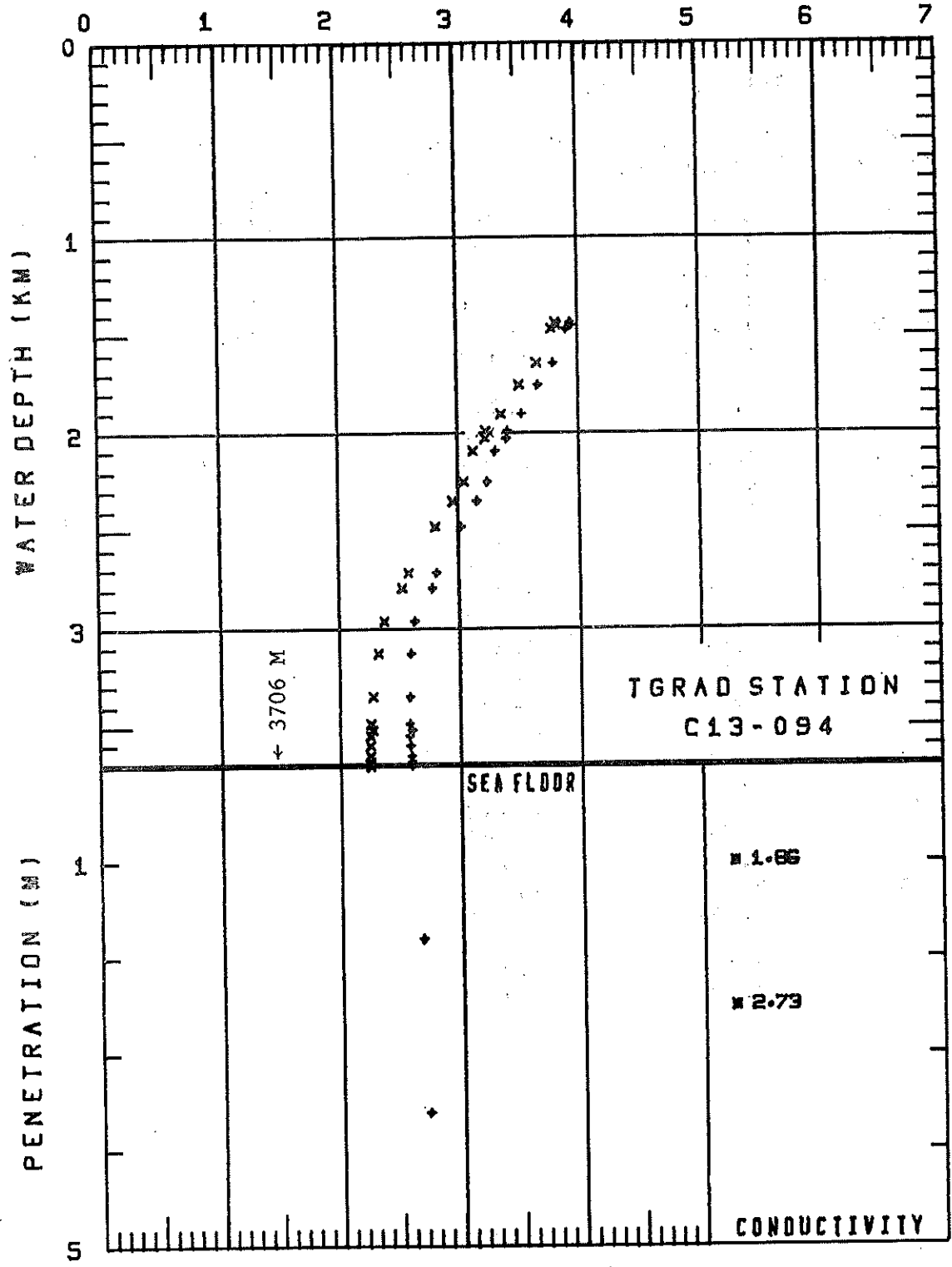
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.80 | 2.686 |
| 3.60 | 2.725 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.86 |
| 2.50 | 2.73 |

TEMPERATURE (C)



TGRAD STATION C13-095
 009 30 S 007 54 W
 CRUISE STATION 232

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1325 | 3.977 | 3.868 |
| 1322 | 3.943 | 3.834 |
| 1350 | 3.920 | 3.808 |
| 1566 | 3.821 | 3.688 |
| 1720 | 3.677 | 3.530 |
| 1873 | 3.493 | 3.332 |
| 1951 | 3.387 | 3.221 |
| 2025 | 3.269 | 3.098 |
| 2093 | 3.251 | 3.074 |
| 2125 | 3.227 | 3.047 |
| 2260 | 3.168 | 2.975 |
| 2443 | 3.039 | 2.829 |
| 2609 | 2.951 | 2.724 |
| 2700 | 2.874 | 2.638 |
| 2807 | 2.809 | 2.563 |
| 2955 | 2.692 | 2.433 |
| 3102 | 2.618 | 2.342 |
| 3262 | 2.560 | 2.269 |
| 3433 | 2.532 | 2.219 |
| 3559 | 2.515 | 2.188 |
| 3612 | 2.526 | 2.190 |
| 3576 | 2.548 | 2.217 |
| 3726 | 2.522 | 2.173 |
| 3802 | 2.522 | 2.164 |
| 3750 | 2.536 | 2.184 |
| 3832 | 2.521 | 2.159 |
| 3856 | 2.528 | 2.164 |
| 3909 | 2.528 | 2.157 |
| 3889 | 2.532 | 2.163 |
| 3899 | 2.534 | 2.164 |

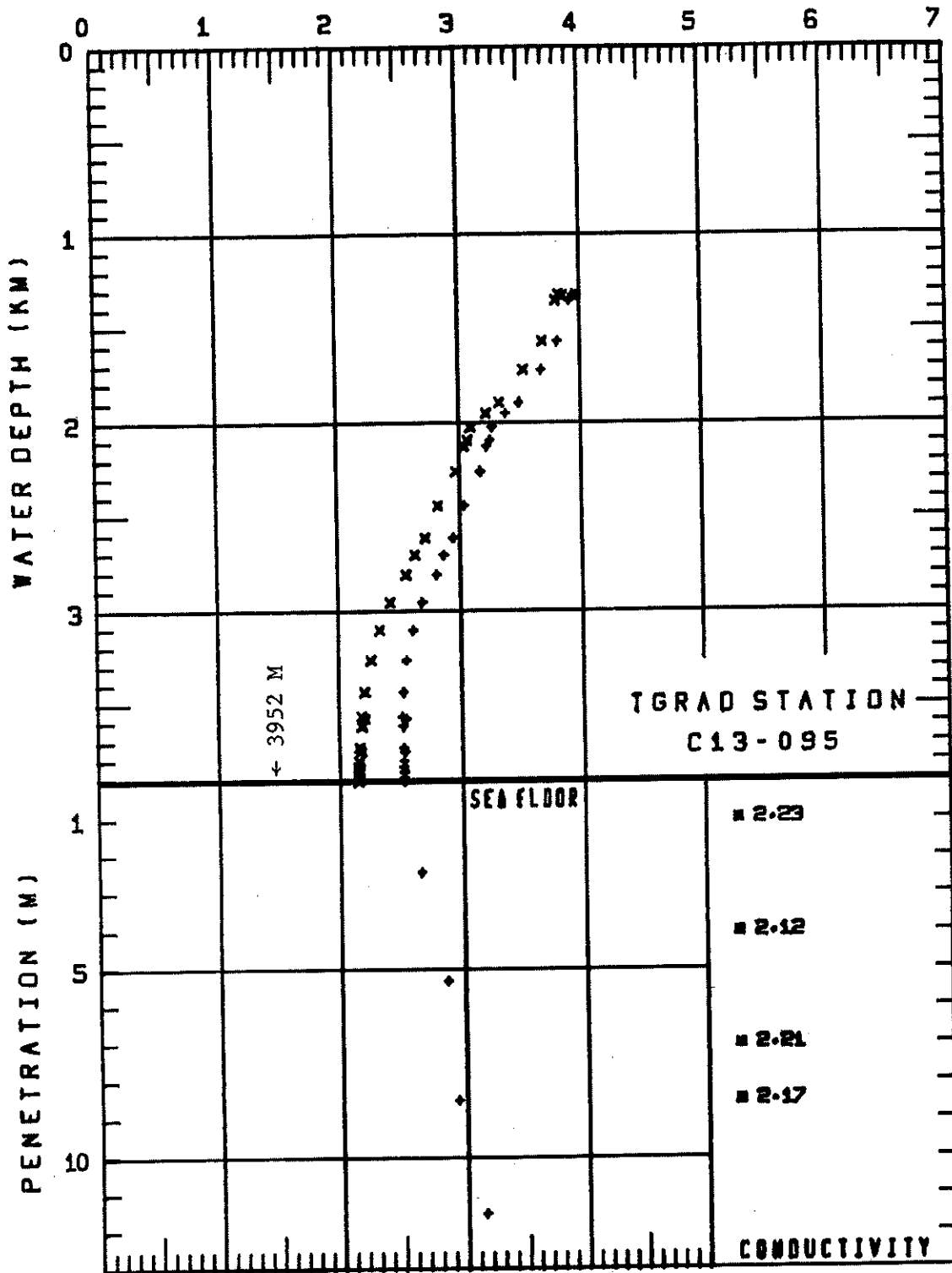
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 2.40 | 2.663 |
| 5.30 | 2.868 |
| 8.50 | 2.940 |
| 11.50 | 3.151 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 2.23 |
| 4.00 | 2.12 |
| 7.00 | 2.21 |
| 8.50 | 2.17 |

TEMPERATURE (C)

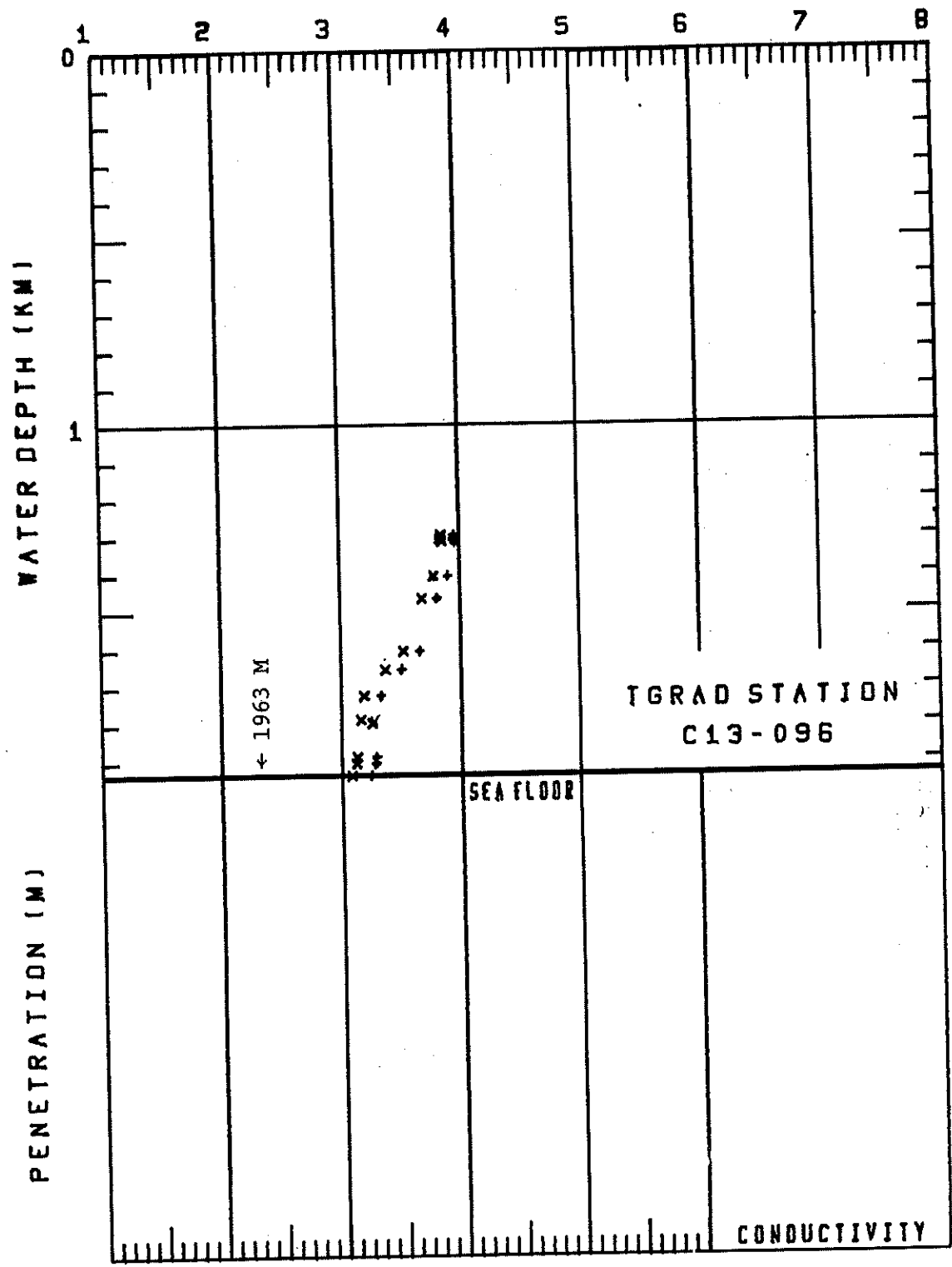


TGRAD STATION C13-096
009 56 S 005 20 W
CRUISE STATION 233

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1312 | 3.969 | 3.861 |
| 1305 | 3.950 | 3.842 |
| 1293 | 3.956 | 3.849 |
| 1405 | 3.903 | 3.786 |
| 1465 | 3.809 | 3.687 |
| 1603 | 3.658 | 3.525 |
| 1653 | 3.506 | 3.369 |
| 1723 | 3.334 | 3.192 |
| 1787 | 3.313 | 3.166 |
| 1902 | 3.285 | 3.127 |
| 1885 | 3.286 | 3.131 |
| 1935 | 3.243 | 3.082 |

TEMPERATURE (C)



TGRAD STATION C13-097
 010 29 S 002 24 W
 CRUISE STATION 234

WATER TEMPERATURES

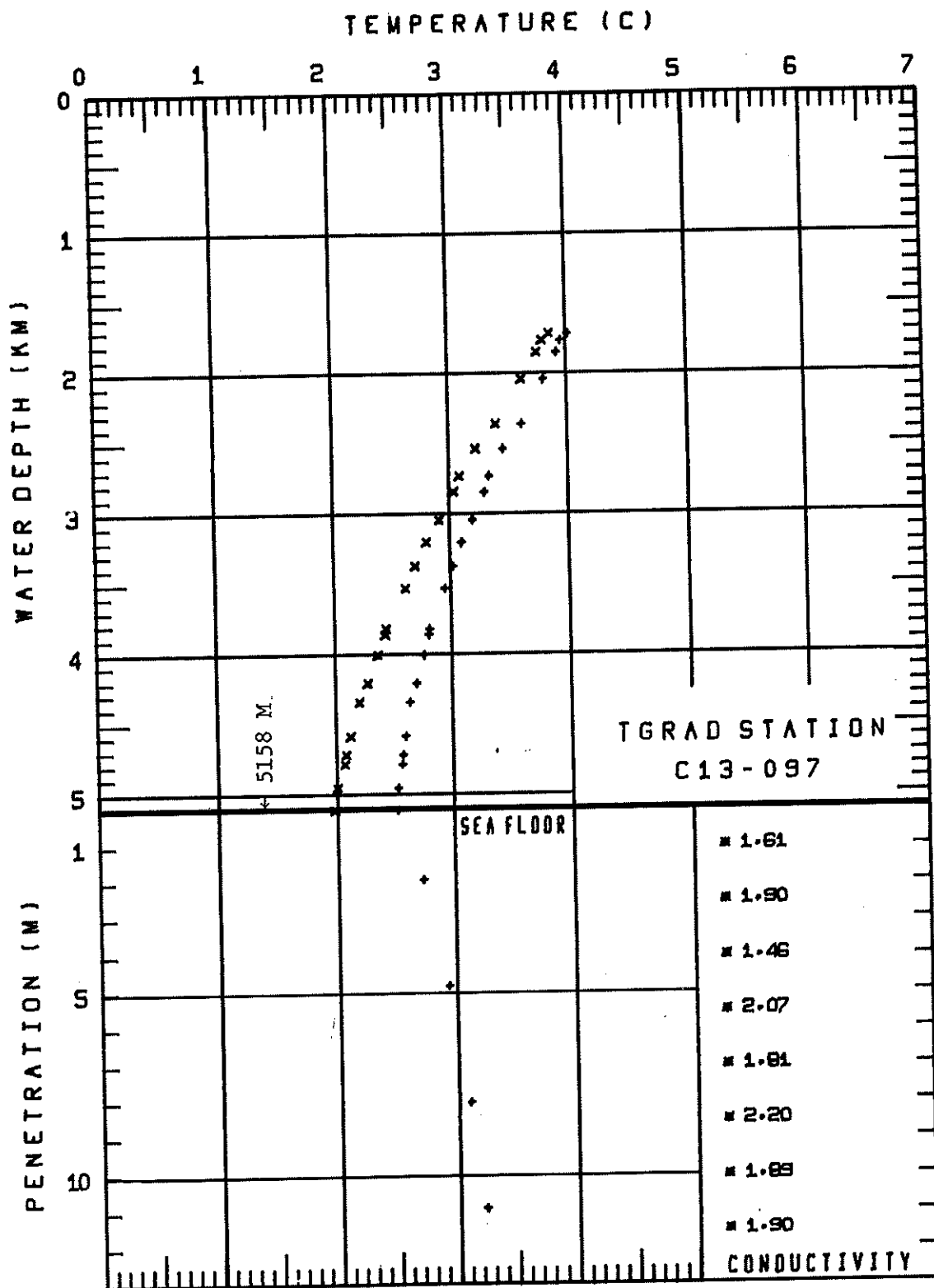
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1716 | 4.022 | 3.871 |
| 1759 | 3.962 | 3.809 |
| 1847 | 3.930 | 3.767 |
| 2036 | 3.816 | 3.634 |
| 2355 | 3.622 | 3.409 |
| 2531 | 3.468 | 3.238 |
| 2725 | 3.348 | 3.098 |
| 2836 | 3.313 | 3.050 |
| 3038 | 3.210 | 2.927 |
| 3197 | 3.113 | 2.812 |
| 3365 | 3.033 | 2.713 |
| 3527 | 2.966 | 2.627 |
| 3814 | 2.822 | 2.451 |
| 3853 | 2.819 | 2.443 |
| 4000 | 2.769 | 2.376 |
| 4201 | 2.710 | 2.290 |
| 4337 | 2.653 | 2.218 |
| 4581 | 2.608 | 2.140 |
| 4714 | 2.585 | 2.098 |
| 4781 | 2.576 | 2.081 |
| 4752 | 2.539 | 2.019 |
| 5109 | 2.532 | 1.992 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 1.90 | 2.738 |
| 4.80 | 2.944 |
| 8.00 | 3.112 |
| 10.90 | 3.239 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.61 |
| 2.50 | 1.90 |
| 4.00 | 1.46 |
| 5.50 | 2.07 |
| 7.00 | 1.81 |
| 8.50 | 2.20 |
| 10.00 | 1.89 |
| 11.50 | 1.90 |



TGRAD STATION C13-098
 011 07 S 000 30 E
 CRUISE STATION 235

WATER TEMPERATURES

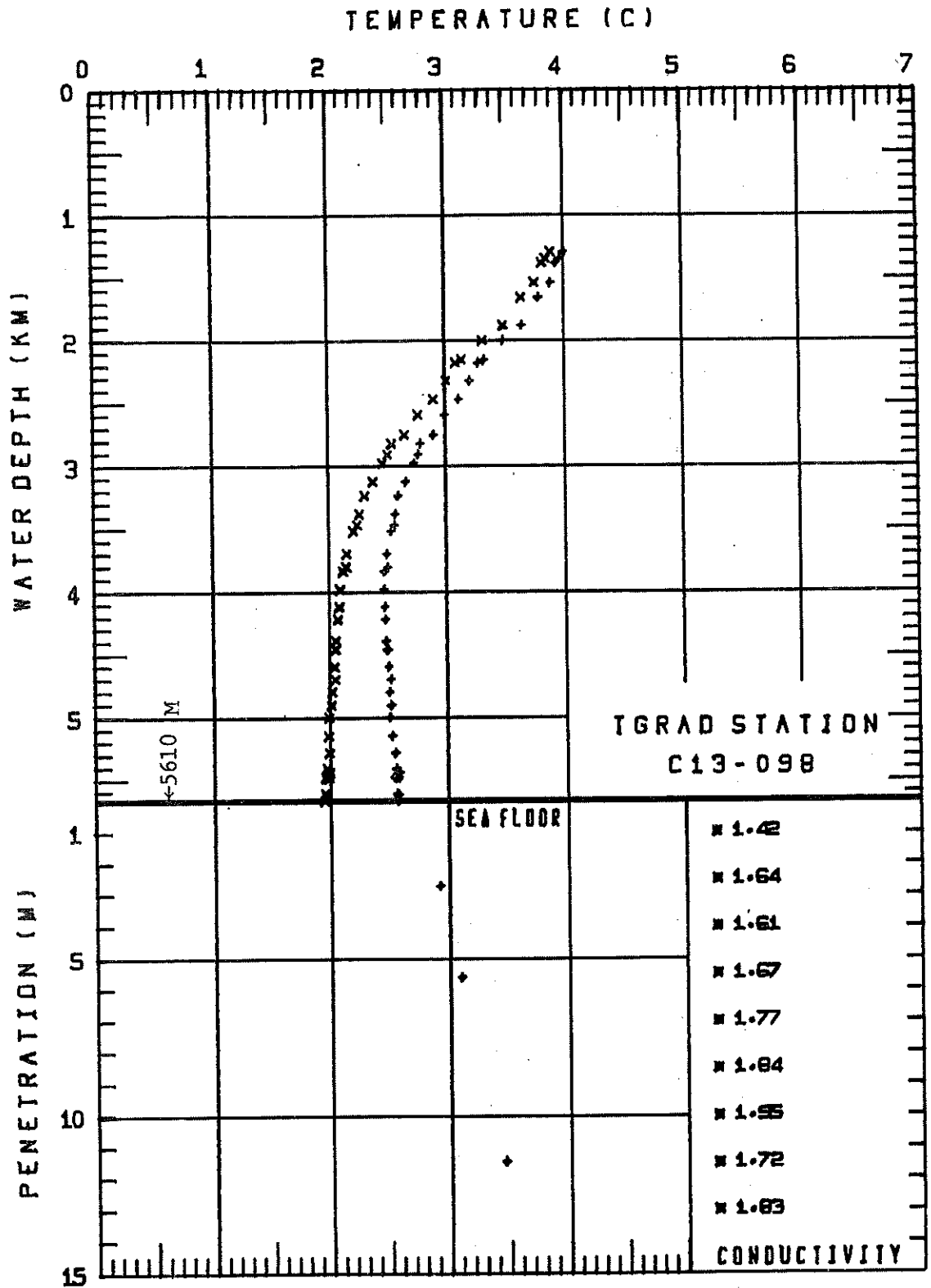
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1295 | 4.007 | 3.901 |
| 1351 | 3.971 | 3.858 |
| 1382 | 3.940 | 3.824 |
| 1539 | 3.897 | 3.766 |
| 1663 | 3.796 | 3.654 |
| 1881 | 3.658 | 3.496 |
| 2000 | 3.500 | 3.328 |
| 2174 | 3.288 | 3.100 |
| 2150 | 3.335 | 3.151 |
| 2323 | 3.220 | 3.019 |
| 2463 | 3.126 | 2.911 |
| 2590 | 3.006 | 2.780 |
| 2749 | 2.908 | 2.666 |
| 2817 | 2.796 | 2.550 |
| 2909 | 2.776 | 2.519 |
| 2973 | 2.737 | 2.474 |
| 3119 | 2.670 | 2.390 |
| 3232 | 2.607 | 2.316 |
| 3374 | 2.580 | 2.273 |
| 3513 | 2.541 | 2.219 |
| 3467 | 2.571 | 2.253 |
| 3692 | 2.503 | 2.159 |
| 3801 | 2.512 | 2.153 |
| 3830 | 2.484 | 2.125 |
| 3977 | 2.475 | 2.095 |
| 4112 | 2.486 | 2.089 |
| 4217 | 2.487 | 2.075 |
| 4383 | 2.493 | 2.058 |
| 4455 | 2.496 | 2.052 |
| 4451 | 2.505 | 2.060 |
| 4594 | 2.509 | 2.045 |
| 4693 | 2.530 | 2.050 |
| 4789 | 2.517 | 2.023 |
| 4899 | 2.529 | 2.019 |
| 4994 | 2.519 | 1.996 |
| 5142 | 2.539 | 1.992 |
| 5276 | 2.567 | 1.999 |
| 5404 | 2.568 | 1.980 |
| 5431 | 2.591 | 1.996 |
| 5475 | 2.562 | 1.963 |
| 5473 | 2.559 | 1.961 |
| 5448 | 2.578 | 1.982 |
| 5476 | 2.593 | 1.993 |
| 5603 | 2.575 | 1.956 |
| 5609 | 2.584 | 1.961 |
| 5660 | 2.584 | 1.953 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 2.70 | 2.928 |
| 5.60 | 3.105 |
| 11.45 | 3.464 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.42 |
| 2.50 | 1.64 |
| 4.00 | 1.61 |
| 5.50 | 1.67 |
| 7.00 | 1.77 |
| 8.50 | 1.84 |
| 10.00 | 1.95 |
| 11.50 | 1.72 |
| 13.00 | 1.82 |



TGRAD STATION C13-099
 010 27 S 003 06 E
 CRUISE STATION 236

WATER TEMPERATURES

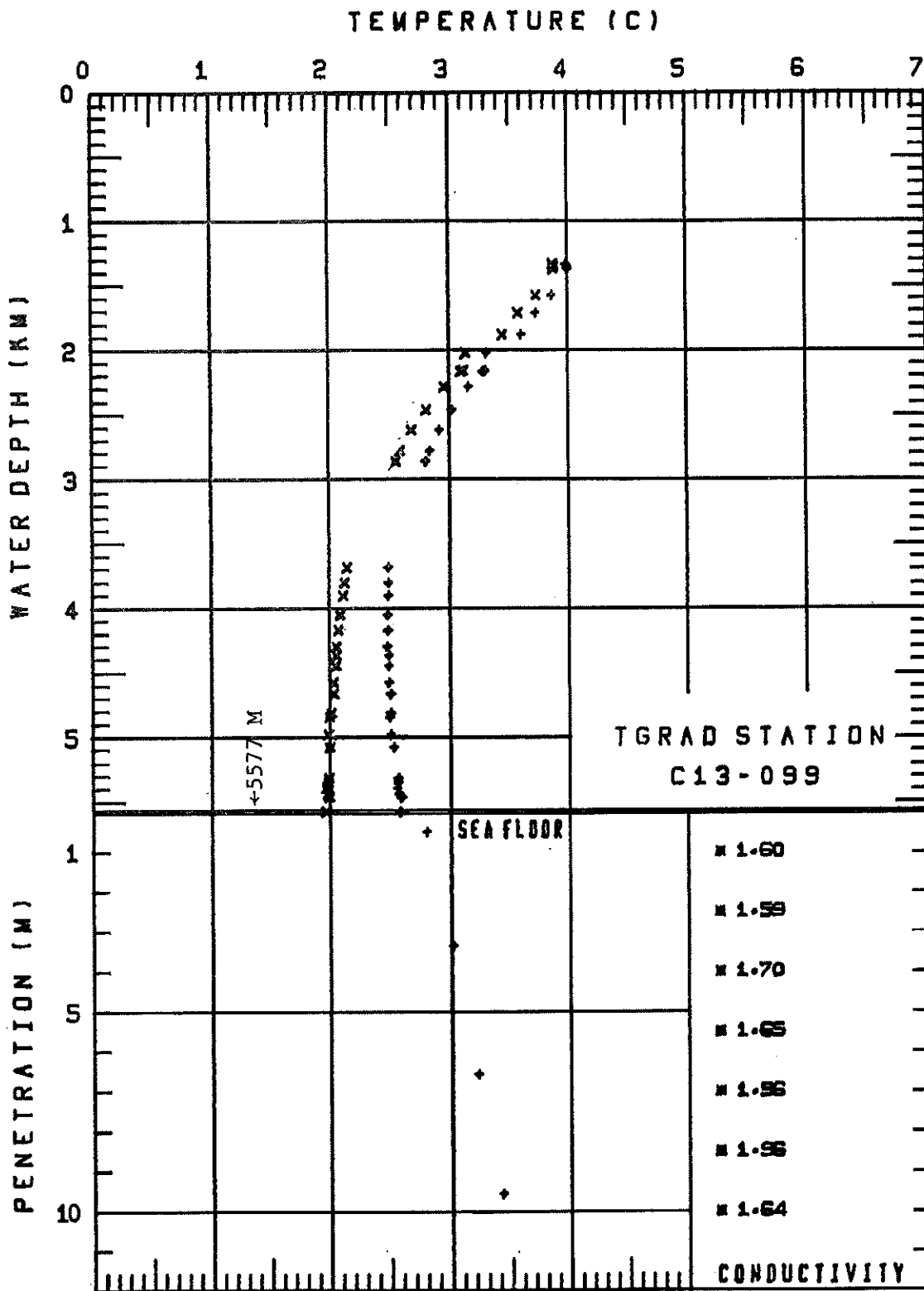
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1331 | 3.993 | 3.881 |
| 1351 | 4.003 | 3.890 |
| 1370 | 4.001 | 3.887 |
| 1571 | 3.871 | 3.738 |
| 1710 | 3.731 | 3.585 |
| 1878 | 3.609 | 3.448 |
| 2022 | 3.315 | 3.144 |
| 2157 | 3.306 | 3.121 |
| 2160 | 3.284 | 3.099 |
| 2276 | 3.164 | 2.967 |
| 2458 | 3.030 | 2.818 |
| 2613 | 2.927 | 2.700 |
| 2772 | 2.844 | 2.601 |
| 2852 | 2.813 | 2.561 |
| 3676 | 2.499 | 2.157 |
| 3794 | 2.495 | 2.138 |
| 3898 | 2.495 | 2.125 |
| 4045 | 2.489 | 2.100 |
| 4164 | 2.492 | 2.086 |
| 4289 | 2.487 | 2.065 |
| 4359 | 2.495 | 2.065 |
| 4438 | 2.500 | 2.058 |
| 4571 | 2.497 | 2.036 |
| 4658 | 2.514 | 2.040 |
| 4808 | 2.514 | 2.019 |
| 4835 | 2.503 | 2.005 |
| 4971 | 2.509 | 1.990 |
| 5072 | 2.539 | 2.003 |
| 5307 | 2.574 | 2.000 |
| 5345 | 2.568 | 1.990 |
| 5317 | 2.569 | 1.994 |
| 5391 | 2.565 | 1.979 |
| 5434 | 2.575 | 1.982 |
| 5459 | 2.595 | 1.997 |
| 5572 | 2.582 | 1.967 |
| 5567 | 2.585 | 1.970 |
| 5574 | 2.591 | 1.973 |

SEDIMENT TEMPERATURES
 DEPTH TEMPERATURE
 METERS CENTIGRADE

| | |
|------|-------|
| 0.50 | 2.802 |
| 3.35 | 3.015 |
| 6.55 | 3.223 |
| 9.55 | 3.427 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.60 |
| 2.50 | 1.59 |
| 4.00 | 1.70 |
| 5.50 | 1.65 |
| 7.00 | 1.56 |
| 8.50 | 1.96 |
| 10.00 | 1.64 |



TGRAD STATION C13-100
 010 24 S 006 02 E
 CRUISE STATION 237

WATER TEMPERATURES

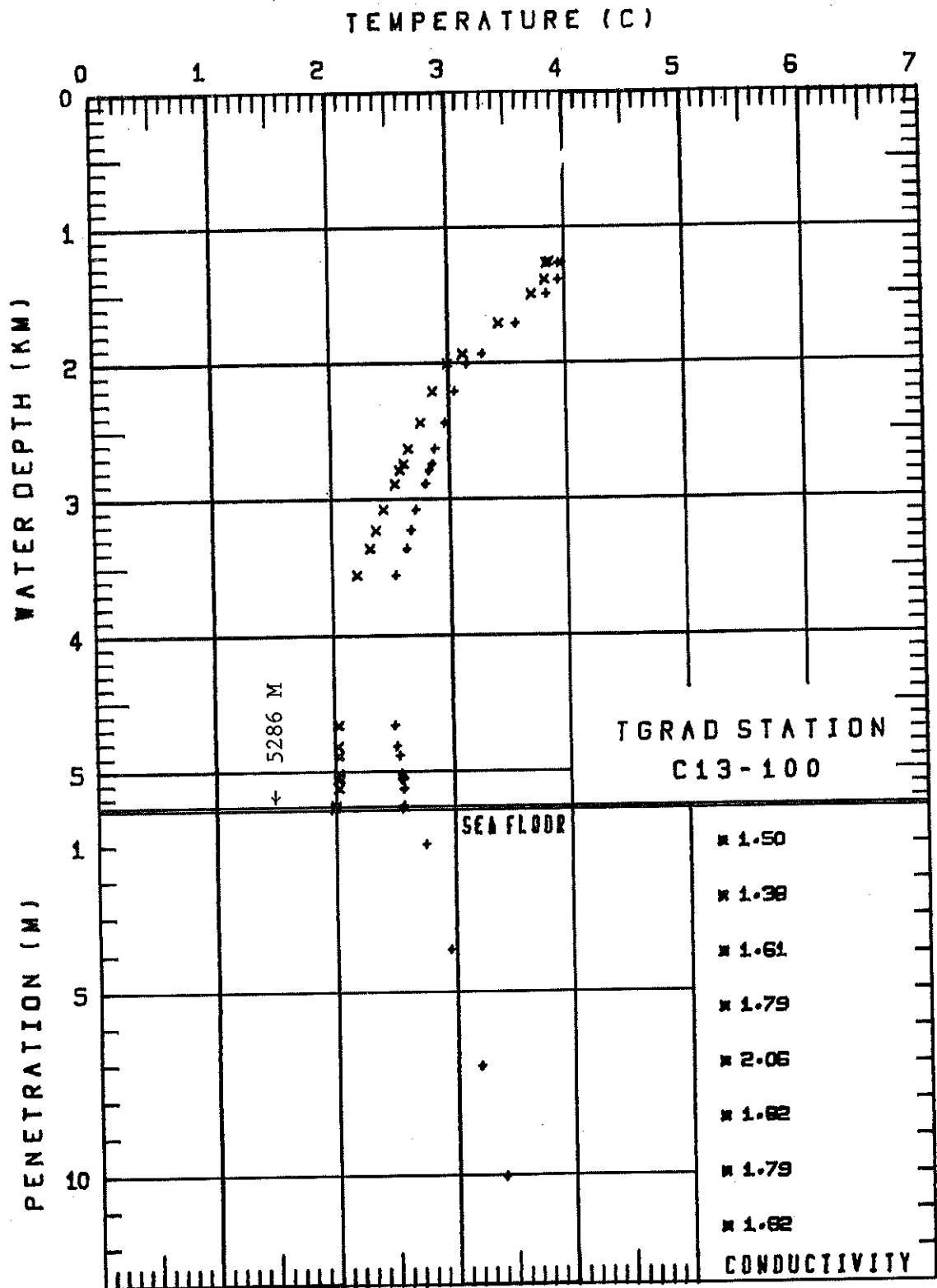
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1259 | 3.982 | 3.878 |
| 1263 | 3.954 | 3.850 |
| 1391 | 3.954 | 3.837 |
| 1494 | 3.849 | 3.724 |
| 1713 | 3.584 | 3.440 |
| 1931 | 3.289 | 3.128 |
| 2004 | 3.164 | 2.997 |
| 2206 | 3.058 | 2.871 |
| 2439 | 2.974 | 2.766 |
| 2633 | 2.884 | 2.657 |
| 2740 | 2.858 | 2.618 |
| 2791 | 2.832 | 2.587 |
| 2885 | 2.796 | 2.541 |
| 3073 | 2.717 | 2.441 |
| 3229 | 2.671 | 2.378 |
| 3364 | 2.631 | 2.323 |
| 3554 | 2.535 | 2.209 |
| 4662 | 2.509 | 2.035 |
| 4817 | 2.526 | 2.029 |
| 4886 | 2.547 | 2.039 |
| 5023 | 2.559 | 2.029 |
| 5047 | 2.573 | 2.039 |
| 5053 | 2.565 | 2.029 |
| 5063 | 2.563 | 2.026 |
| 5123 | 2.579 | 2.033 |
| 5264 | 2.565 | 1.999 |
| 5256 | 2.572 | 2.006 |
| 5272 | 2.565 | 1.996 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.00 | 2.755 |
| 3.85 | 2.960 |
| 7.05 | 3.205 |
| 10.05 | 3.401 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.50 |
| 2.50 | 1.38 |
| 4.00 | 1.61 |
| 5.50 | 1.79 |
| 7.00 | 2.06 |
| 8.50 | 1.82 |
| 10.00 | 1.79 |
| 11.50 | 1.82 |



TGRAD STATION C13-101
 010 24 S 008 28 E
 CRUISE STATION 238

WATER TEMPERATURES

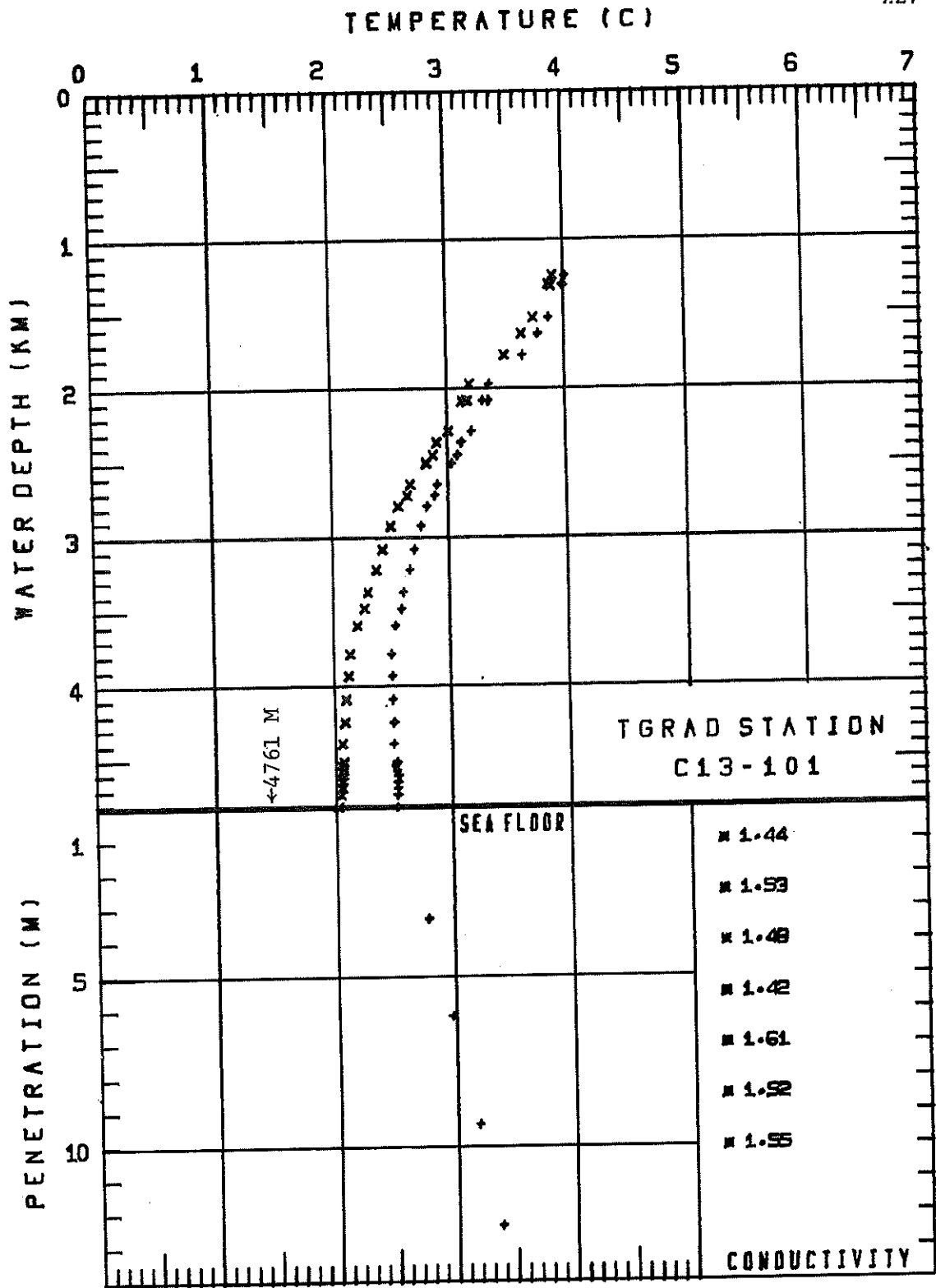
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1242 | 4.012 | 3.909 |
| 1311 | 4.005 | 3.895 |
| 1300 | 3.988 | 3.881 |
| 1527 | 3.870 | 3.743 |
| 1632 | 3.782 | 3.644 |
| 1773 | 3.648 | 3.497 |
| 1968 | 3.364 | 3.198 |
| 2078 | 3.312 | 3.135 |
| 2078 | 3.358 | 3.180 |
| 2281 | 3.212 | 3.015 |
| 2359 | 3.122 | 2.920 |
| 2442 | 3.094 | 2.882 |
| 2496 | 3.040 | 2.823 |
| 2640 | 2.916 | 2.687 |
| 2714 | 2.894 | 2.657 |
| 2787 | 2.822 | 2.578 |
| 2917 | 2.771 | 2.513 |
| 3076 | 2.712 | 2.438 |
| 3214 | 2.670 | 2.380 |
| 3366 | 2.613 | 2.308 |
| 3476 | 2.589 | 2.270 |
| 3588 | 2.539 | 2.209 |
| 3784 | 2.500 | 2.144 |
| 3927 | 2.506 | 2.131 |
| 4084 | 2.502 | 2.107 |
| 4243 | 2.509 | 2.093 |
| 4385 | 2.501 | 2.065 |
| 4529 | 2.516 | 2.059 |
| 4510 | 2.532 | 2.079 |
| 4566 | 2.532 | 2.069 |
| 4599 | 2.541 | 2.074 |
| 4642 | 2.536 | 2.063 |
| 4813 | 2.532 | 2.033 |
| 4681 | 2.540 | 2.061 |
| 4729 | 2.539 | 2.053 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 3.30 | 2.783 |
| 6.15 | 2.980 |
| 9.35 | 3.191 |
| 12.35 | 3.380 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.44 |
| 2.50 | 1.53 |
| 4.00 | 1.48 |
| 5.50 | 1.42 |
| 7.00 | 1.61 |
| 8.50 | 1.52 |
| 10.00 | 1.55 |



TGRAD STATION C13-102
 010 38 S 009 33 E
 CRUISE STATION 239

WATER TEMPERATURES

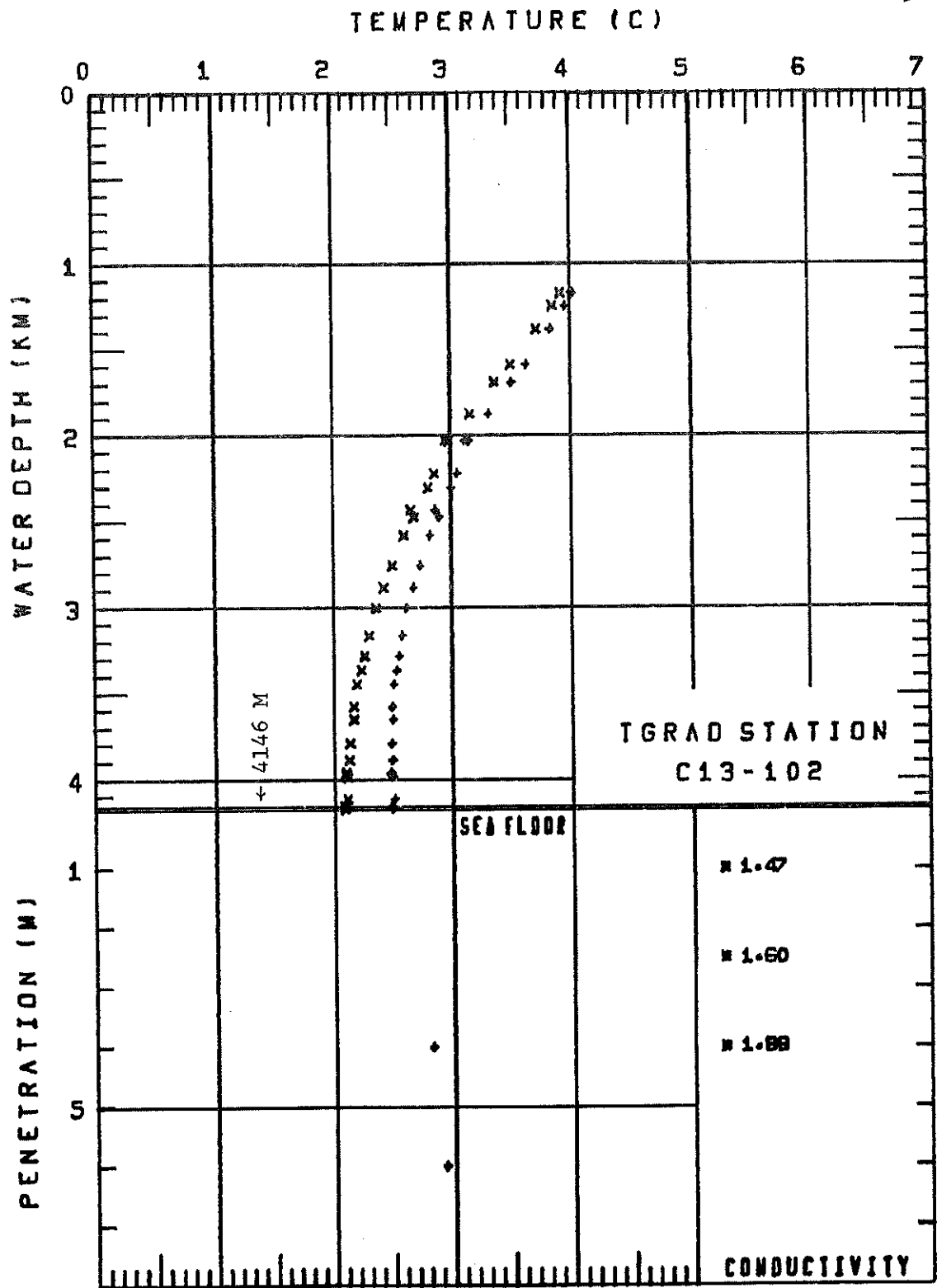
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1166 | 4.020 | 3.925 |
| 1171 | 4.022 | 3.927 |
| 1247 | 3.961 | 3.859 |
| 1380 | 3.841 | 3.726 |
| 1588 | 3.640 | 3.508 |
| 1690 | 3.516 | 3.376 |
| 1876 | 3.326 | 3.171 |
| 2029 | 3.160 | 2.992 |
| 2034 | 3.159 | 2.989 |
| 2027 | 3.131 | 2.963 |
| 2224 | 3.062 | 2.875 |
| 2304 | 3.010 | 2.815 |
| 2472 | 2.908 | 2.697 |
| 2579 | 2.835 | 2.613 |
| 2431 | 2.880 | 2.673 |
| 2754 | 2.752 | 2.514 |
| 2885 | 2.692 | 2.440 |
| 3003 | 2.633 | 2.369 |
| 3163 | 2.593 | 2.312 |
| 3279 | 2.567 | 2.273 |
| 3362 | 2.547 | 2.243 |
| 3446 | 2.519 | 2.206 |
| 3577 | 2.506 | 2.177 |
| 3651 | 2.514 | 2.175 |
| 3788 | 2.499 | 2.142 |
| 3884 | 2.506 | 2.137 |
| 3963 | 2.486 | 2.107 |
| 3958 | 2.488 | 2.111 |
| 3982 | 2.501 | 2.120 |
| 4112 | 2.516 | 2.118 |
| 4157 | 2.493 | 2.088 |
| 4169 | 2.506 | 2.100 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 4.00 | 2.829 |
| 6.00 | 2.940 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.47 |
| 2.50 | 1.60 |
| 4.00 | 1.88 |



TGRAD STATION C13-103
 011 14 S 011 53 E
 CRUISE STATION 240

WATER TEMPERATURES

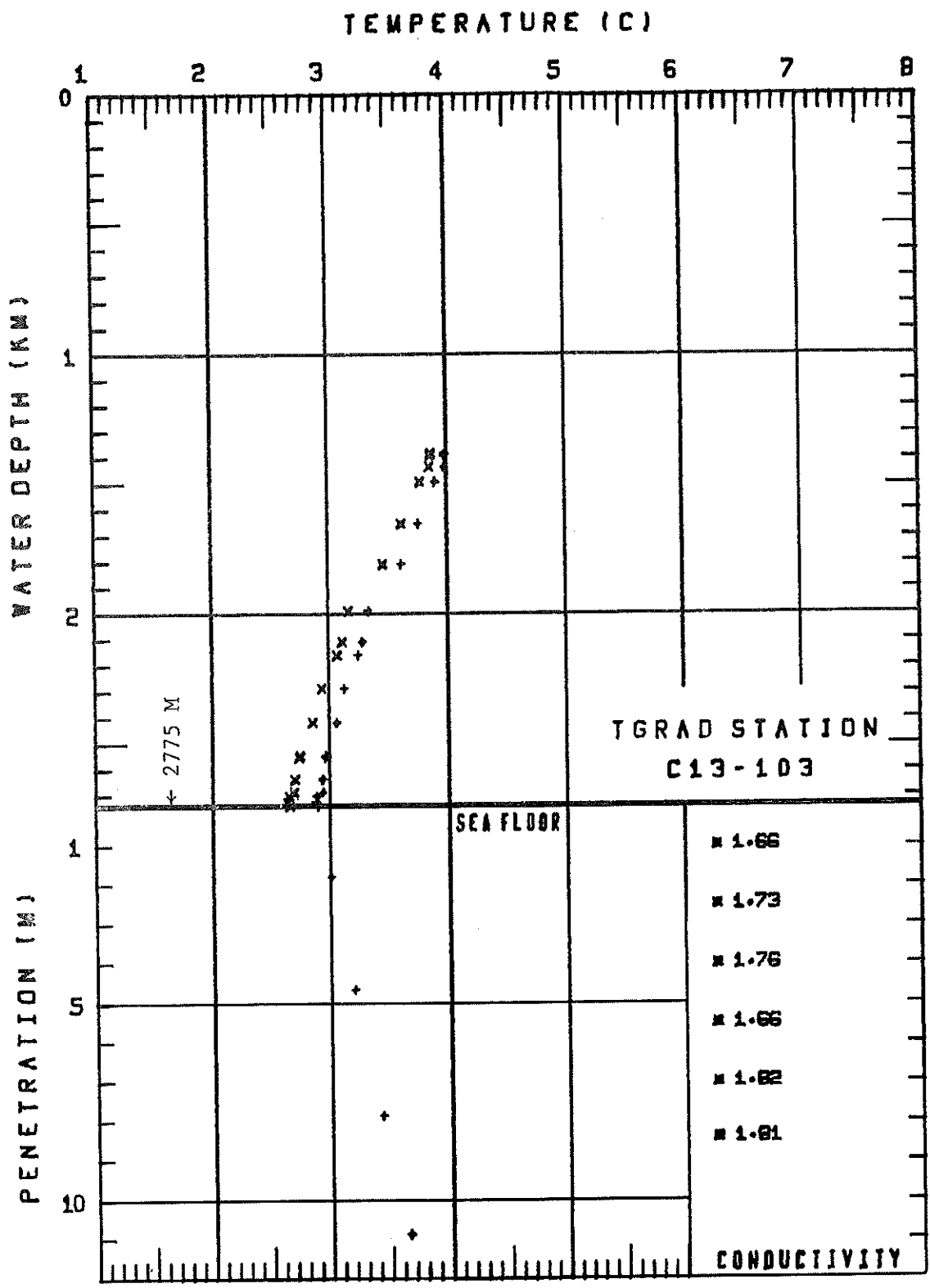
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1381 | 3.993 | 3.877 |
| 1387 | 3.989 | 3.874 |
| 1434 | 3.984 | 3.863 |
| 1490 | 3.914 | 3.788 |
| 1651 | 3.763 | 3.624 |
| 1807 | 3.624 | 3.469 |
| 1986 | 3.344 | 3.177 |
| 2105 | 3.300 | 3.121 |
| 2156 | 3.260 | 3.076 |
| 2285 | 3.138 | 2.943 |
| 2416 | 3.072 | 2.862 |
| 2550 | 2.971 | 2.750 |
| 2543 | 2.980 | 2.759 |
| 2635 | 2.943 | 2.713 |
| 2682 | 2.942 | 2.707 |
| 2738 | 2.902 | 2.663 |
| 2698 | 2.894 | 2.659 |
| 2722 | 2.883 | 2.645 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 1.80 | 3.012 |
| 4.65 | 3.203 |
| 7.85 | 3.428 |
| 10.85 | 3.654 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.66 |
| 2.50 | 1.73 |
| 4.00 | 1.76 |
| 5.50 | 1.66 |
| 7.00 | 1.82 |
| 8.40 | 1.81 |



TGRAD STATION C13-104
 012 12 S 012 36 E
 CRUISE STATION 241

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1094 | 4.000 | 3.911 |
| 1097 | 3.966 | 3.877 |
| 1137 | 3.951 | 3.859 |
| 1264 | 3.924 | 3.821 |
| 1418 | 3.811 | 3.693 |
| 1587 | 3.750 | 3.617 |
| 1568 | 3.738 | 3.607 |
| 1639 | 3.686 | 3.549 |
| 1624 | 3.688 | 3.552 |
| 1669 | 3.659 | 3.519 |
| 1658 | 3.634 | 3.496 |
| 1683 | 3.598 | 3.456 |

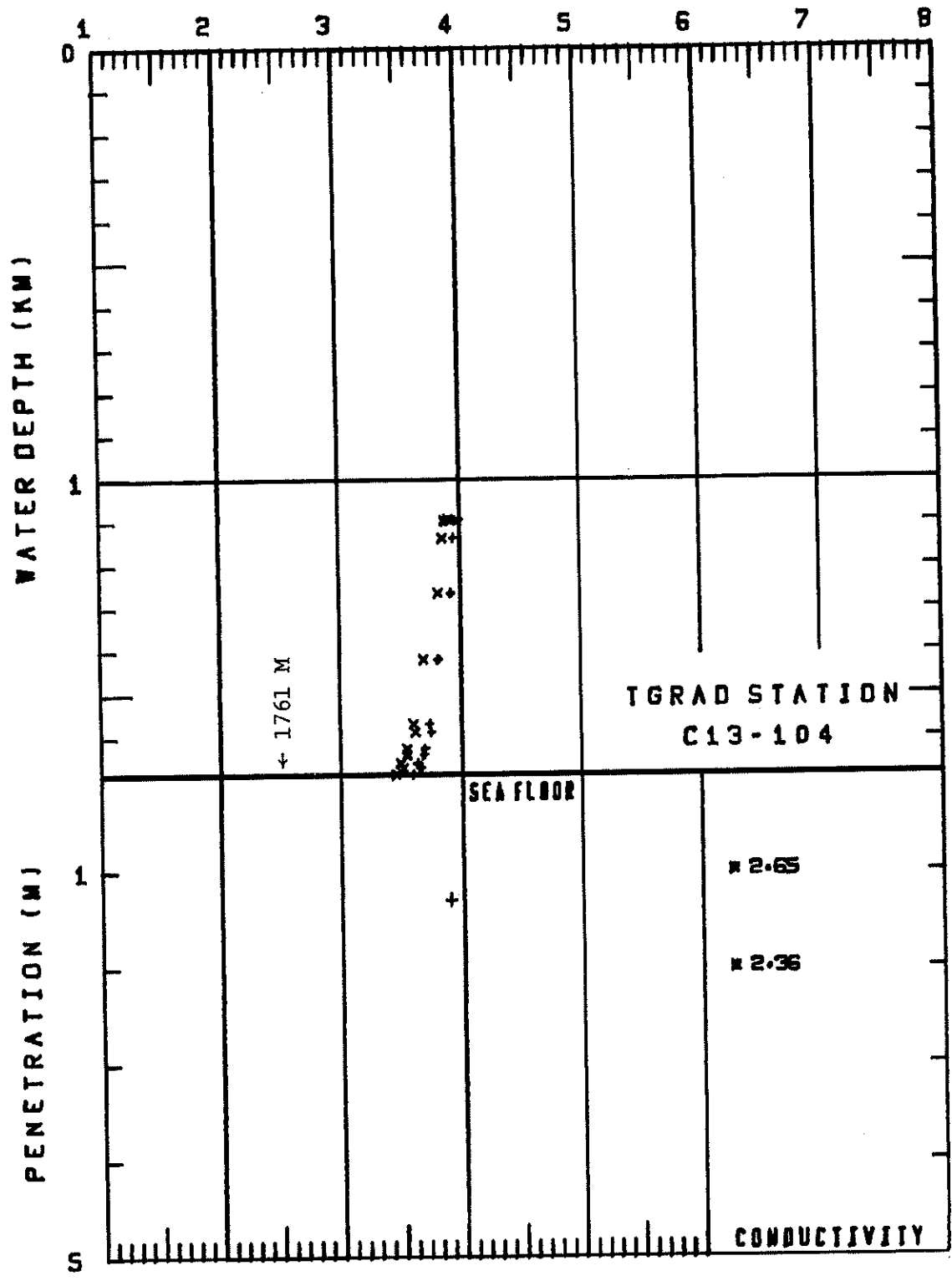
SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.65 |
| 2.00 | 2.36 |

SEDIMENT TEMPERATURE

| Depth Meters | Temperature Centigrade |
|-----------------|---------------------------|
| 1.35 | 3.896 |

TEMPERATURE (C)



TGRAD STATION C13-105
012 49 S 012 22 E
CRUISE STATION 242

235

SBDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.53 |
| 2.00 | 2.80 |

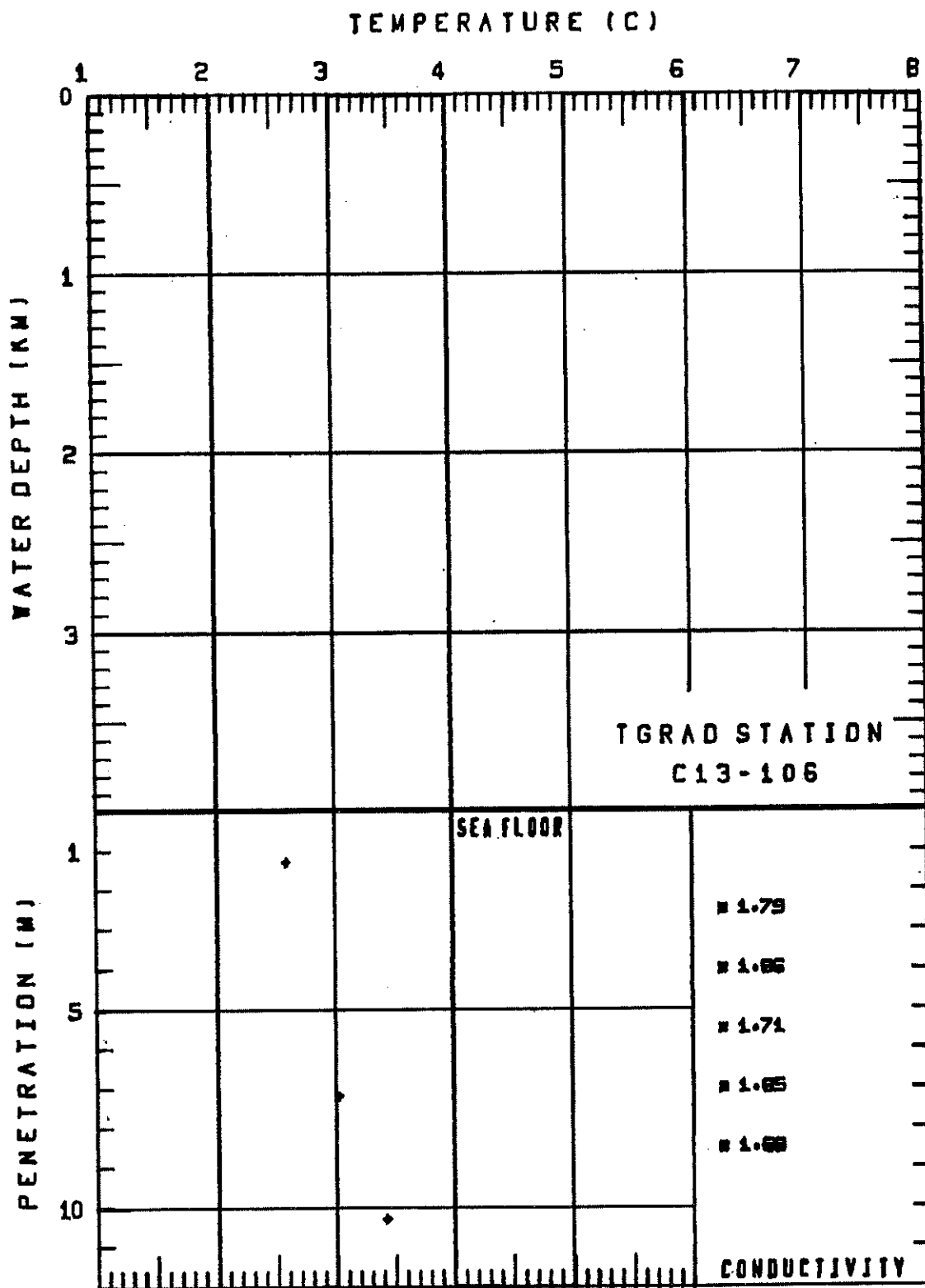
TGRAD STATION C13-106
013 34 S 009 59 E
CRUISE STATION 243

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE | |
|-----------------|---------------------------|---------|
| 1.30 | 2.594 | COOLING |
| 7.20 | 3.032 | COOLING |
| 10.30 | 3.434 | COOLING |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 2.50 | 1.79 |
| 4.00 | 1.86 |
| 5.50 | 1.71 |
| 7.00 | 1.85 |
| 8.50 | 1.68 |



TGRAD STATION C13-107
014 25 S 012 08 E
CRUISE STATION 244

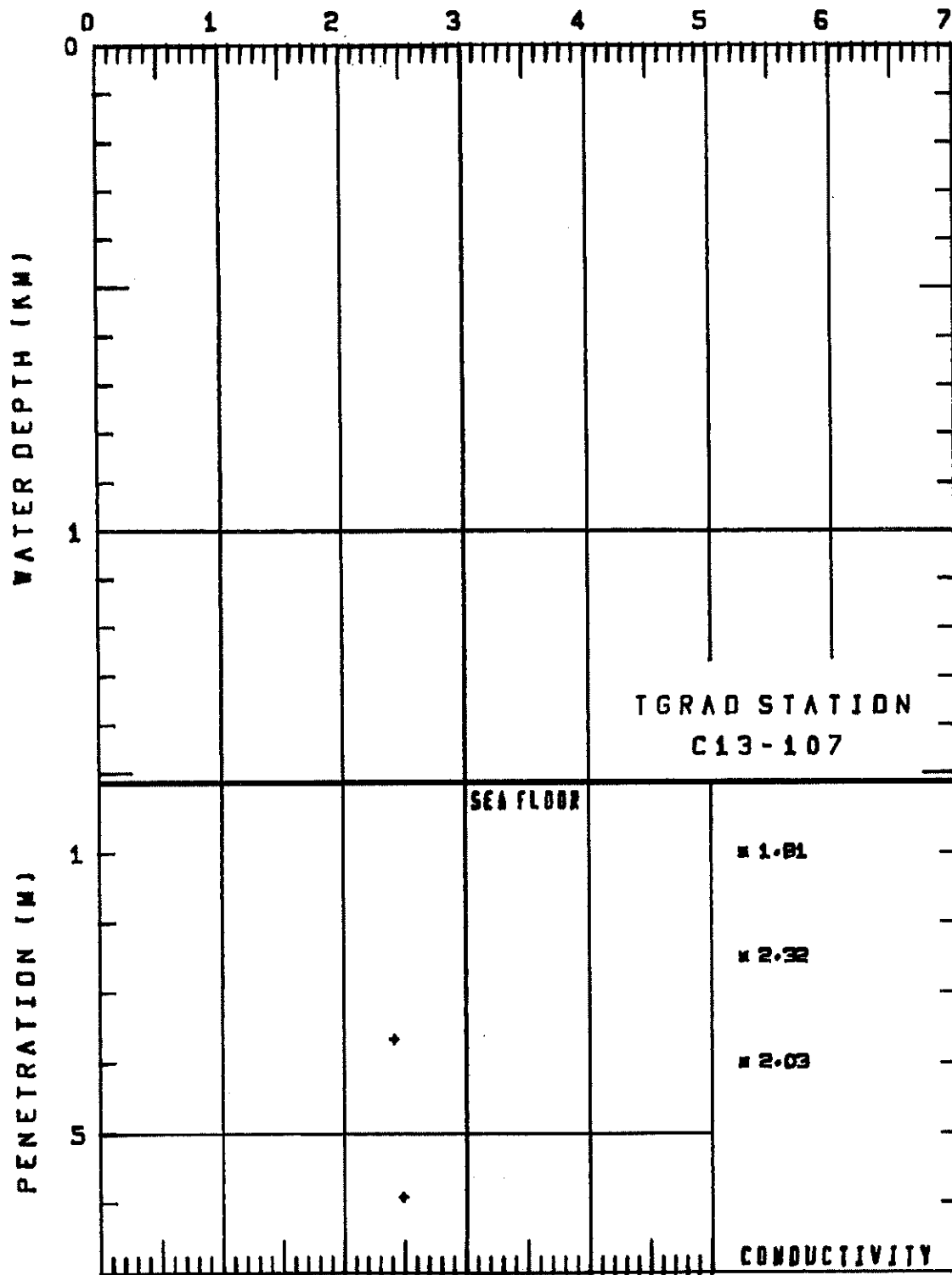
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE | |
|-----------------|---------------------------|---------|
| 3.65 | 2.421 | COOLING |
| 5.90 | 2.489 | COOLING |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.81 |
| 2.50 | 2.32 |
| 4.00 | 2.03 |

TEMPERATURE (C)



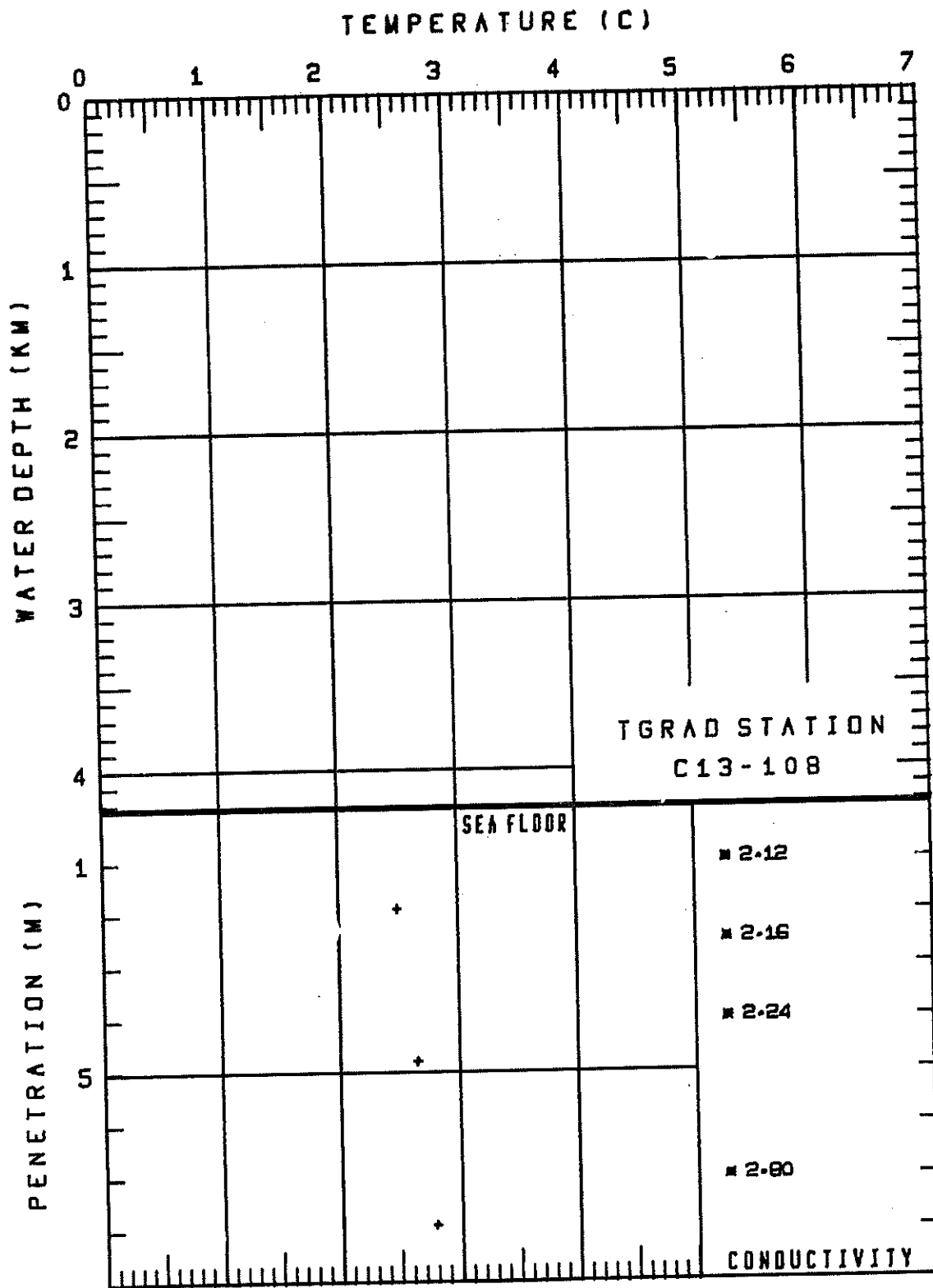
TGRAD STATION C13-108
016 22 S 009 32 E
CRUISE STATION 245

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.90 | 2.500 |
| 4.80 | 2.651 |
| 7.90 | 2.789 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.12 |
| 2.50 | 2.16 |
| 4.00 | 2.24 |
| 7.00 | 2.80 |



TGRAD STATION C13-109
 017 36 S 011 02 E
 CRUISE STATION 246

WATER TEMPERATURES

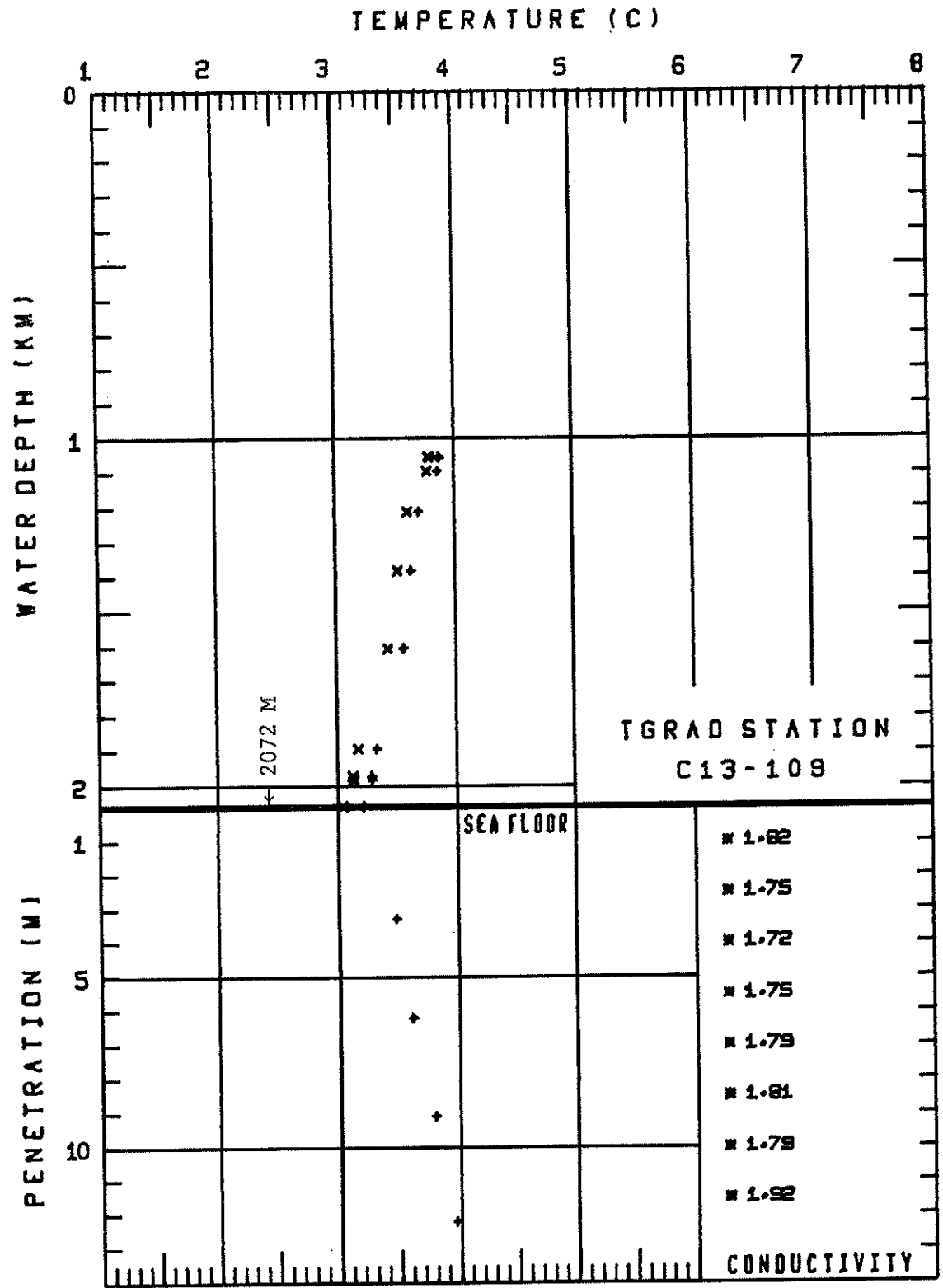
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 1095 | 3.855 | 3.769 |
| 1056 | 3.878 | 3.795 |
| 1054 | 3.868 | 3.785 |
| 1211 | 3.699 | 3.604 |
| 1382 | 3.630 | 3.517 |
| 1605 | 3.561 | 3.428 |
| 1894 | 3.332 | 3.174 |
| 1982 | 3.295 | 3.128 |
| 1971 | 3.286 | 3.121 |
| 2061 | 3.220 | 3.046 |
| 2055 | 3.209 | 3.035 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 3.30 | 3.481 |
| 6.20 | 3.611 |
| 9.10 | 3.800 |
| 12.20 | 3.973 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 1.82 |
| 2.50 | 1.75 |
| 4.00 | 1.72 |
| 5.50 | 1.75 |
| 7.00 | 1.79 |
| 8.50 | 1.81 |
| 10.00 | 1.79 |
| 11.50 | 1.92 |



TGRAD STATION C13-110
 018 59 S 008 59 E
 CRUISE STATION 247

WATER TEMPERATURES

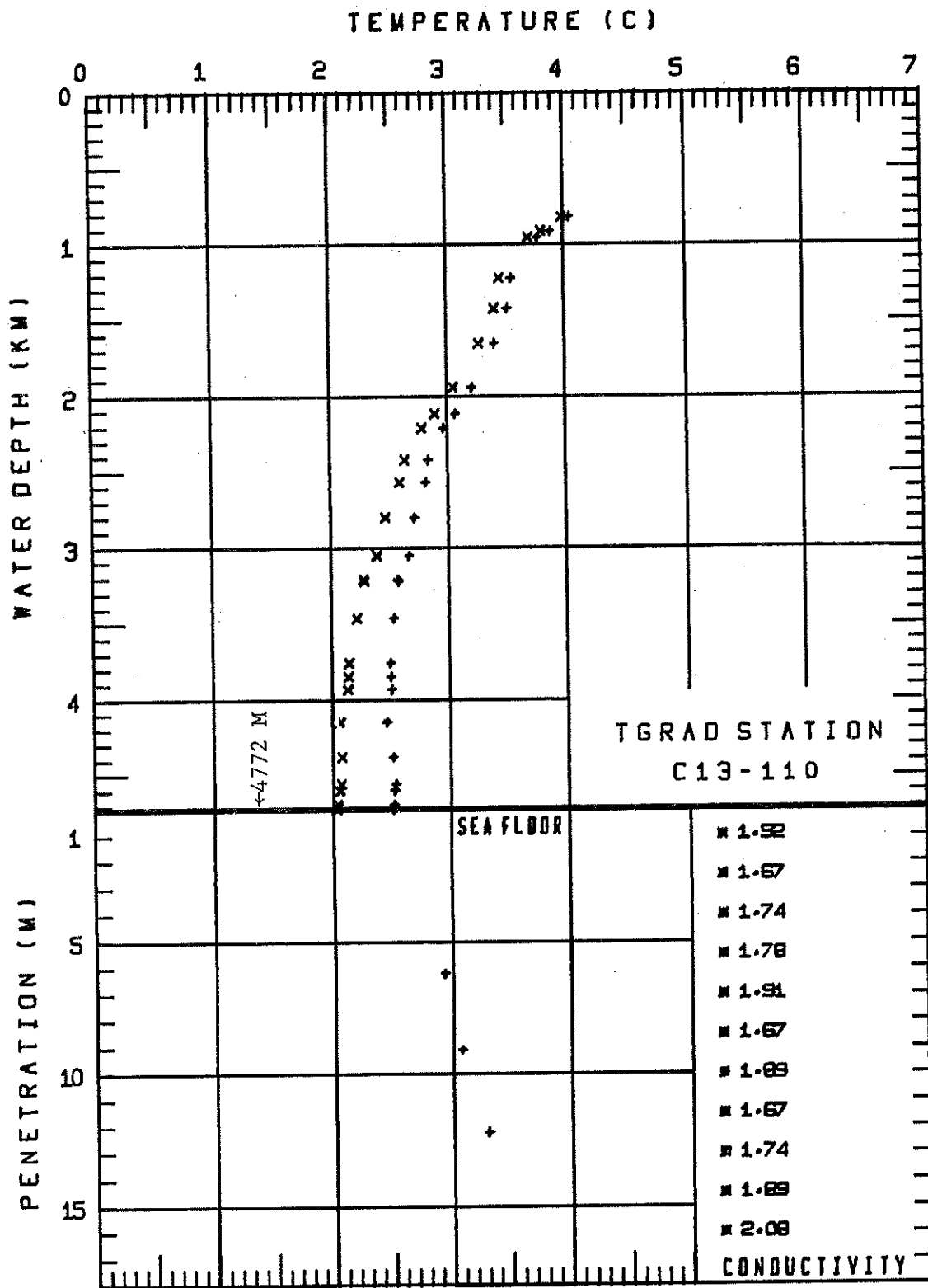
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 817 | 4.054 | 3.992 |
| 910 | 3.889 | 3.818 |
| 955 | 3.788 | 3.713 |
| 1224 | 3.562 | 3.467 |
| 1420 | 3.532 | 3.417 |
| 1649 | 3.416 | 3.282 |
| 1937 | 3.223 | 3.062 |
| 2114 | 3.079 | 2.901 |
| 2205 | 2.977 | 2.793 |
| 2417 | 2.844 | 2.641 |
| 2562 | 2.817 | 2.598 |
| 2795 | 2.717 | 2.473 |
| 3044 | 2.671 | 2.401 |
| 3202 | 2.569 | 2.284 |
| 3211 | 2.580 | 2.293 |
| 3461 | 2.539 | 2.223 |
| 3753 | 2.503 | 2.151 |
| 3843 | 2.506 | 2.144 |
| 3927 | 2.509 | 2.135 |
| 4143 | 2.467 | 2.065 |
| 4374 | 2.509 | 2.075 |
| 4550 | 2.528 | 2.068 |
| 4590 | 2.521 | 2.056 |
| 4686 | 2.515 | 2.038 |
| 4718 | 2.510 | 2.028 |
| 4702 | 2.527 | 2.046 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 6.20 | 2.931 |
| 9.10 | 3.080 |
| 12.20 | 3.299 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 1.52 |
| 2.50 | 1.67 |
| 4.00 | 1.74 |
| 5.50 | 1.78 |
| 7.00 | 1.91 |
| 8.50 | 1.67 |
| 10.00 | 1.89 |
| 11.50 | 1.67 |
| 13.00 | 1.74 |
| 14.50 | 1.89 |
| 16.00 | 2.08 |



TGRAD STATION C13-111
 021 53 S 008 52 E
 CRUISE STATION 248

WATER TEMPERATURES

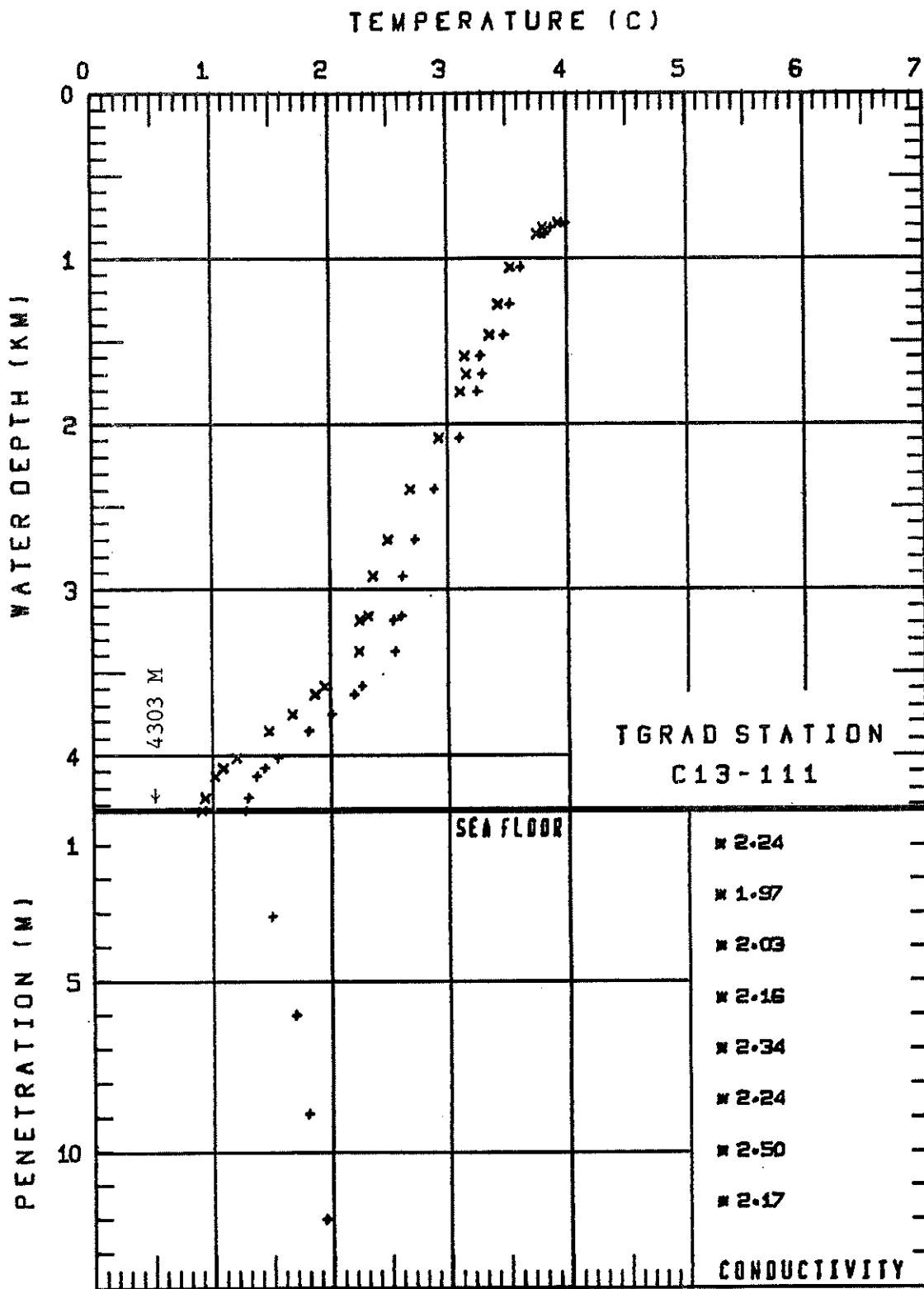
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 785 | 3.988 | 3.928 |
| 814 | 3.869 | 3.808 |
| 852 | 3.823 | 3.759 |
| 1052 | 3.615 | 3.534 |
| 1276 | 3.529 | 3.428 |
| 1463 | 3.475 | 3.357 |
| 1588 | 3.276 | 3.150 |
| 1700 | 3.298 | 3.161 |
| 1803 | 3.260 | 3.113 |
| 2082 | 3.101 | 2.928 |
| 2390 | 2.894 | 2.691 |
| 2697 | 2.730 | 2.499 |
| 2916 | 2.626 | 2.374 |
| 3156 | 2.612 | 2.331 |
| 3181 | 2.542 | 2.260 |
| 3372 | 2.559 | 2.253 |
| 3579 | 2.278 | 1.957 |
| 3631 | 2.204 | 1.880 |
| 3748 | 2.016 | 1.684 |
| 3853 | 1.825 | 1.486 |
| 4016 | 1.562 | 1.213 |
| 4075 | 1.444 | 1.092 |
| 4077 | 1.444 | 1.094 |
| 4126 | 1.375 | 1.022 |
| 4257 | 1.302 | 0.936 |
| 4332 | 1.286 | 0.911 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.10 | 1.506 |
| 6.00 | 1.700 |
| 8.90 | 1.802 |
| 12.00 | 1.941 |

SEDIMENT CONDUCTIVITIES

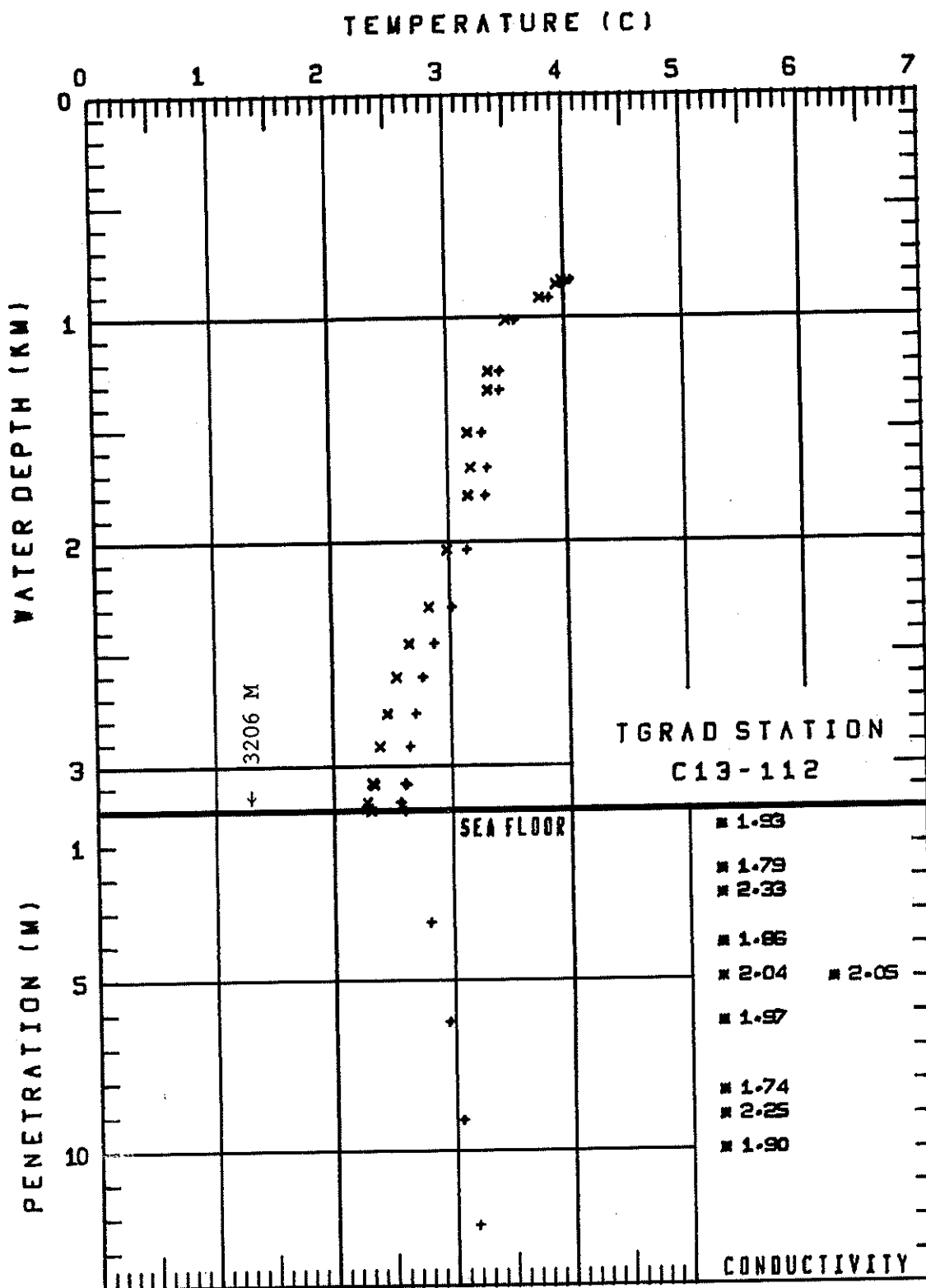
| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.24 |
| 2.50 | 1.97 |
| 4.00 | 2.03 |
| 5.50 | 2.16 |
| 7.00 | 2.34 |
| 8.50 | 2.24 |
| 10.00 | 2.50 |
| 11.50 | 2.17 |



TGRAD STATION C13-112
 022 20 S 011 12 E
 CRUISE STATION 249

| WATER TEMPERATURES | | | SEDIMENT TEMPERATURES | |
|--------------------|---------------------|-----------------------|-----------------------|------------------------|
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE | DEPTH METERS | TEMPERATURE CENTIGRADE |
| | | | 3.30 | 2.802 |
| | | | 6.20 | 2.950 |
| 832 | 4.043 | 3.980 | 9.10 | 3.050 |
| 849 | 3.995 | 3.929 | 12.20 | 3.177 |
| 910 | 3.863 | 3.792 | | |
| 1009 | 3.580 | 3.503 | | |
| 1239 | 3.446 | 3.349 | | |
| 1322 | 3.447 | 3.343 | | |
| 1511 | 3.289 | 3.170 | | |
| 1667 | 3.329 | 3.193 | | |
| 1791 | 3.309 | 3.161 | | |
| 2034 | 3.153 | 2.984 | | |
| 2291 | 3.017 | 2.823 | | |
| 2452 | 2.861 | 2.653 | | |
| 2603 | 2.767 | 2.546 | | |
| 2766 | 2.703 | 2.463 | | |
| 2911 | 2.651 | 2.396 | | |
| 3083 | 2.615 | 2.342 | | |
| 3076 | 2.606 | 2.335 | | |
| 3187 | 2.575 | 2.291 | | |
| 3161 | 2.565 | 2.285 | | |
| 3199 | 2.605 | 2.318 | | |

| SEDIMENT CONDUCTIVITIES | |
|-------------------------|------------------|
| DEPTH METERS | CONDUCTIVITY CGS |
| 0.50 | 1.93 |
| 1.80 | 1.79 |
| 2.50 | 2.33 |
| 3.95 | 1.86 |
| 4.95 | 2.04 |
| 5.00 | 2.05 |
| 6.25 | 1.97 |
| 8.30 | 1.74 |
| 9.00 | 2.25 |
| 10.00 | 1.90 |



TGRAD STATION C13-113
 025 30 S 011 18 E
 CRUISE STATION 250

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 738 | 3.961 | 3.905 |
| 829 | 3.713 | 3.651 |
| 848 | 3.503 | 3.441 |
| 902 | 3.552 | 3.484 |
| 1009 | 3.273 | 3.199 |
| 1253 | 3.243 | 3.147 |
| 1513 | 3.326 | 3.206 |
| 1763 | 3.219 | 3.076 |
| 1798 | 3.207 | 3.060 |
| 1893 | 3.186 | 3.032 |
| 2207 | 2.986 | 2.802 |
| 2594 | 2.778 | 2.558 |
| 2939 | 2.602 | 2.346 |
| 3165 | 2.532 | 2.252 |
| 3343 | 2.470 | 2.171 |
| 3687 | 2.318 | 1.983 |
| 3980 | 1.984 | 1.624 |
| 4033 | 1.880 | 1.516 |
| 4091 | 1.710 | 1.346 |
| 4090 | 1.640 | 1.279 |
| 4097 | 1.628 | 1.266 |
| 4111 | 1.523 | 1.165 |
| 4179 | 1.464 | 1.101 |
| 4221 | 1.402 | 1.036 |
| 4208 | 1.348 | 0.985 |

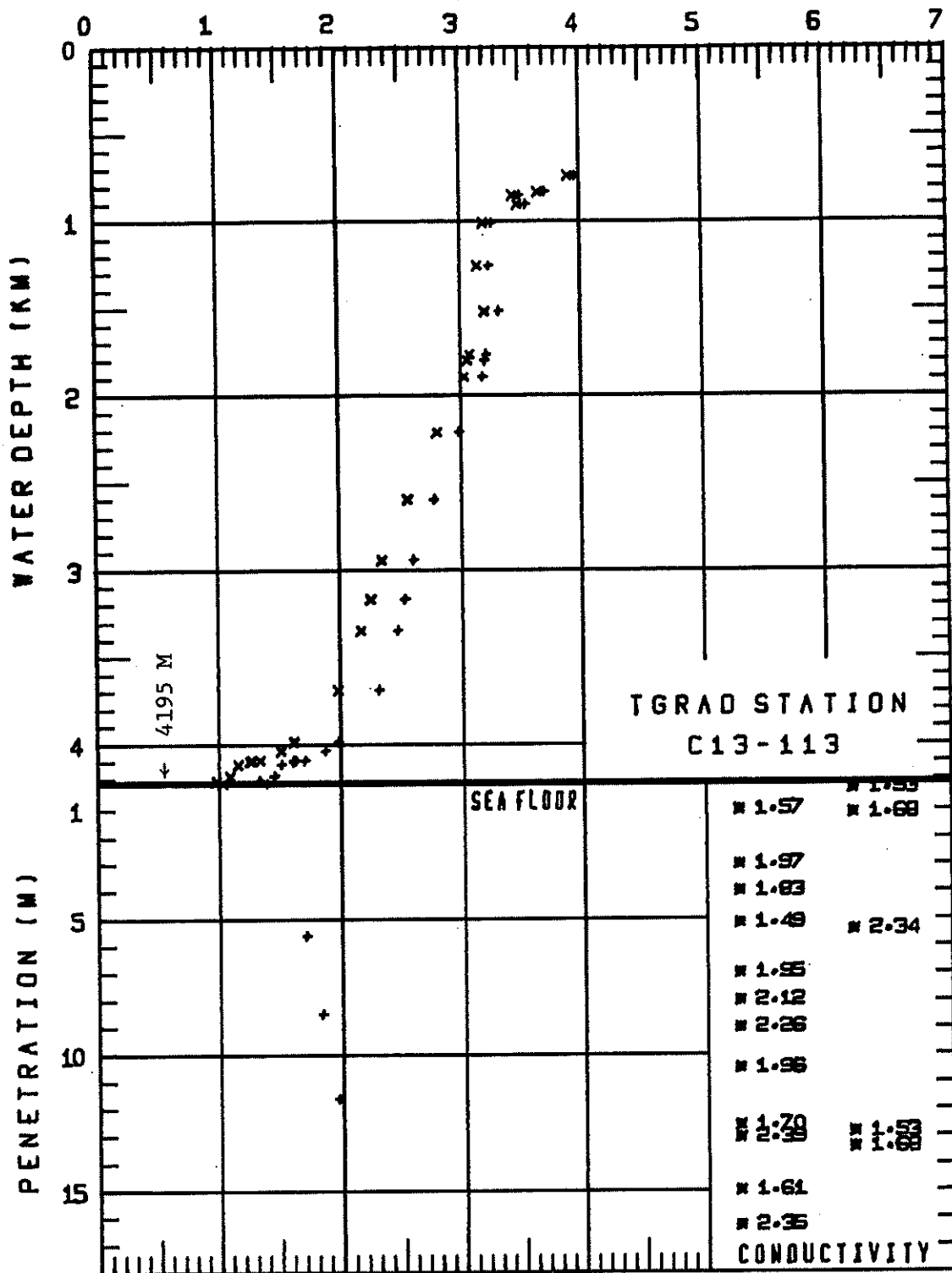
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 5.60 | 1.716 |
| 8.50 | 1.845 |
| 11.60 | 1.969 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.20 | 1.93 |
| 1.00 | 1.57 |
| 1.10 | 1.68 |
| 3.00 | 1.97 |
| 4.00 | 1.83 |
| 5.15 | 1.49 |
| 5.40 | 2.34 |
| 7.00 | 1.95 |
| 8.00 | 2.12 |
| 9.00 | 2.26 |
| 10.50 | 1.96 |
| 12.60 | 1.70 |
| 12.85 | 1.53 |
| 13.05 | 2.39 |
| 13.40 | 1.68 |
| 15.00 | 1.61 |
| 16.30 | 2.35 |

TEMPERATURE (C)



TGRAD STATION C13-114
 028 08 S 008 45 E
 CRUISE STATION 251

WATER TEMPERATURES

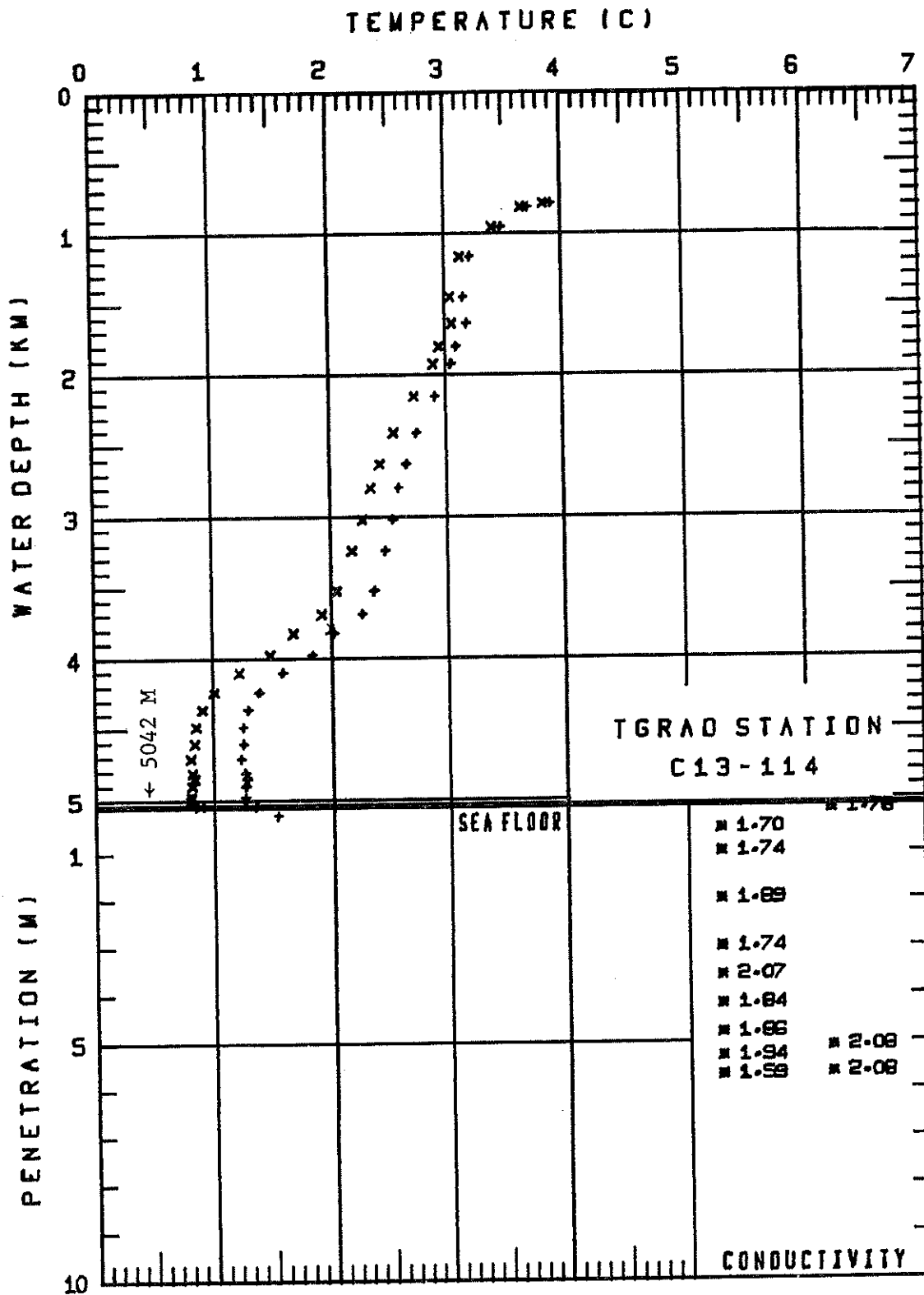
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 788 | 3.914 | 3.855 |
| 819 | 3.720 | 3.659 |
| 955 | 3.486 | 3.414 |
| 1165 | 3.217 | 3.130 |
| 1450 | 3.159 | 3.047 |
| 1634 | 3.186 | 3.058 |
| 1800 | 3.092 | 2.947 |
| 1920 | 3.045 | 2.888 |
| 2151 | 2.903 | 2.726 |
| 2409 | 2.746 | 2.546 |
| 2626 | 2.648 | 2.427 |
| 2793 | 2.582 | 2.343 |
| 3022 | 2.532 | 2.269 |
| 3239 | 2.463 | 2.177 |
| 3525 | 2.361 | 2.043 |
| 3685 | 2.255 | 1.921 |
| 3823 | 2.020 | 1.678 |
| 3974 | 1.834 | 1.480 |
| 4094 | 1.582 | 1.223 |
| 4237 | 1.381 | 1.013 |
| 4360 | 1.290 | 0.912 |
| 4481 | 1.249 | 0.856 |
| 4599 | 1.253 | 0.845 |
| 4703 | 1.233 | 0.813 |
| 4806 | 1.262 | 0.827 |
| 4844 | 1.277 | 0.837 |
| 4897 | 1.266 | 0.820 |
| 4975 | 1.267 | 0.811 |
| 5004 | 1.266 | 0.805 |
| 5042 | 1.354 | 0.883 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 0.20 | 1.529 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.10 | 1.78 |
| 0.50 | 1.70 |
| 1.00 | 1.74 |
| 2.00 | 1.89 |
| 3.00 | 1.74 |
| 3.60 | 2.07 |
| 4.20 | 1.84 |
| 4.80 | 1.86 |
| 5.10 | 2.08 |
| 5.30 | 1.94 |
| 5.65 | 2.08 |
| 5.70 | 1.59 |



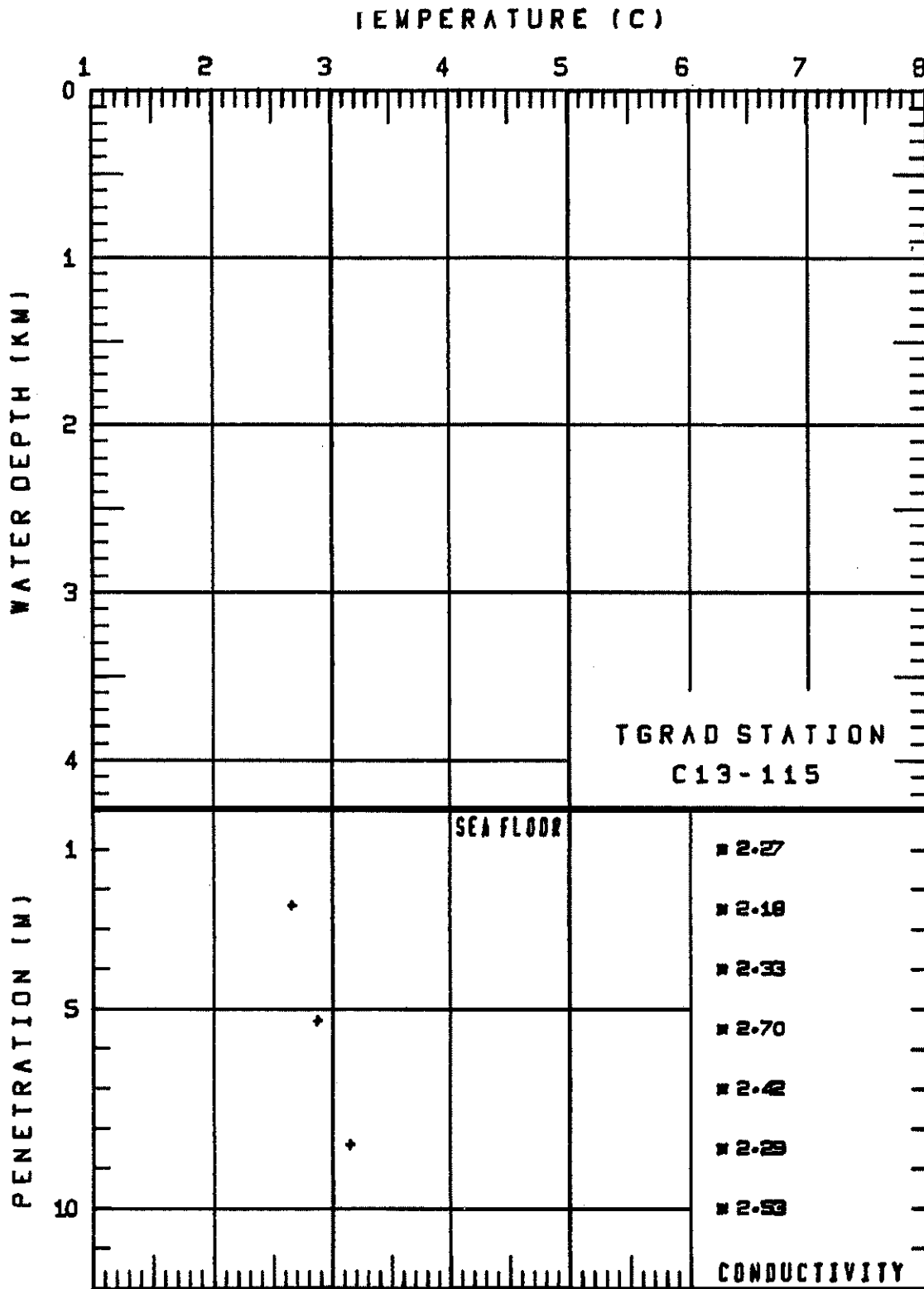
TGRAD STATION C13-115
027 04 S 005 19 E
CRUISE STATION 252

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.40 | 2.664 |
| 5.30 | 2.877 |
| 8.40 | 3.150 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.27 |
| 2.50 | 2.18 |
| 4.00 | 2.33 |
| 5.50 | 2.70 |
| 7.00 | 2.42 |
| 8.50 | 2.29 |
| 10.00 | 2.53 |

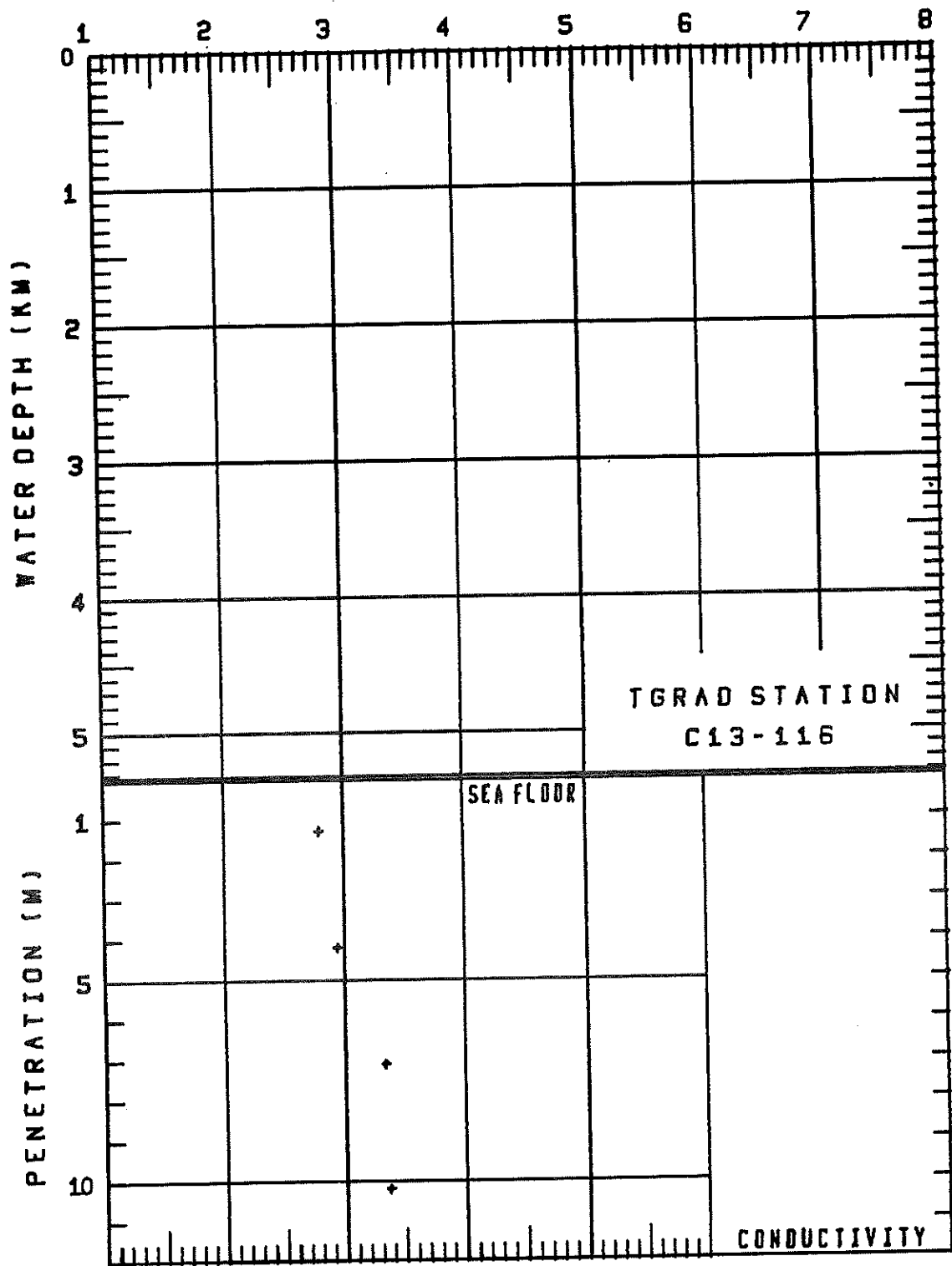


TGRAD STATION C13-116
024 50 S 001 03 E
CRUISE STATION 253

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.30 | 2.798 |
| 4.20 | 2.947 |
| 7.10 | 3.339 |
| 10.20 | 3.363 |

TEMPERATURE (C)



TGRAD STATION C13-117
025 44 S 001 55 W
CRUISE STATION 255

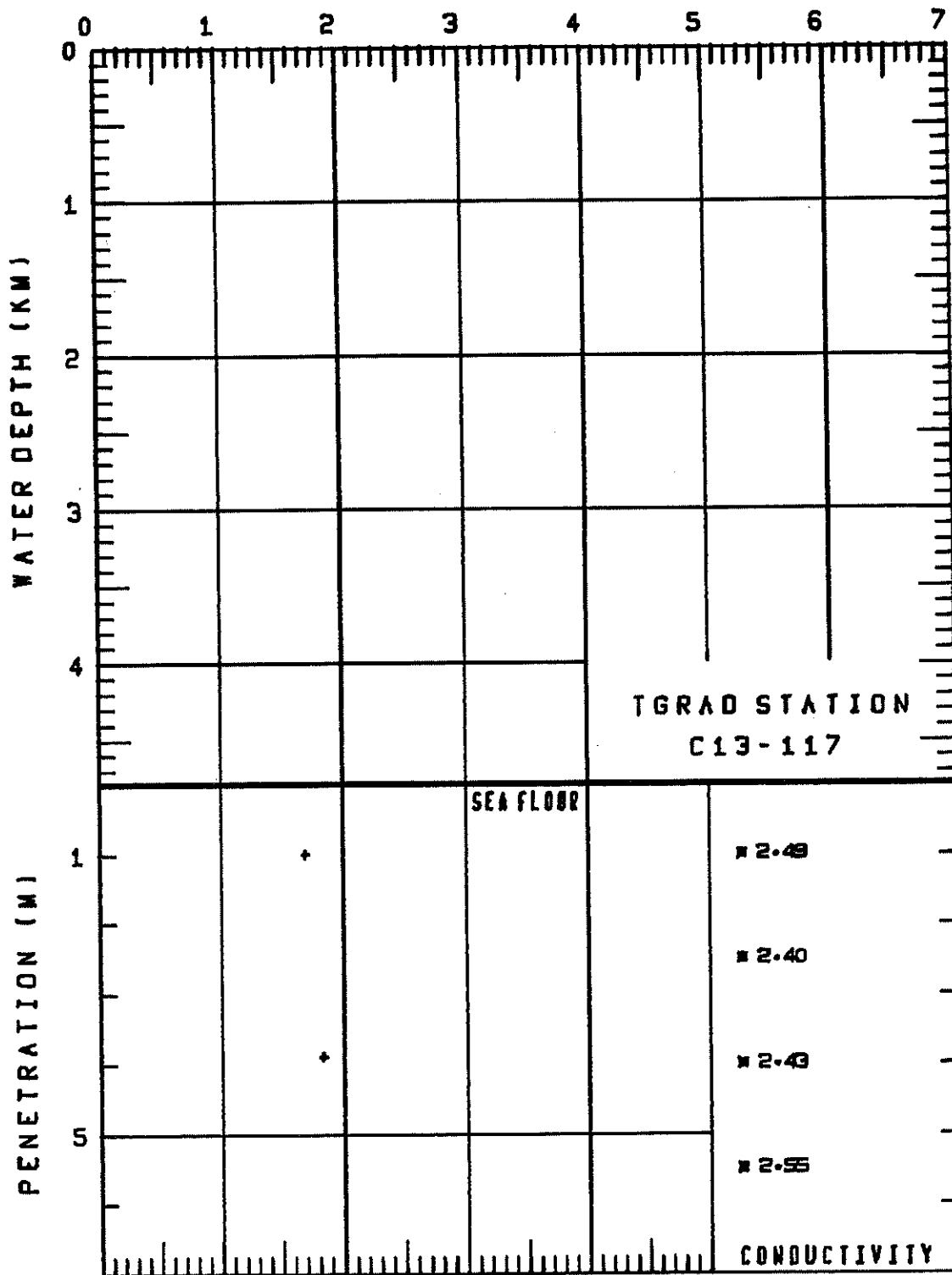
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.00 | 1.696 |
| 3.90 | 1.838 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.49 |
| 2.50 | 2.40 |
| 4.00 | 2.43 |
| 5.50 | 2.55 |

TEMPERATURE (C)



TGRAD STATION C13-118
 031 18 S 001 27 E
 CRUISE STATION 257

WATER TEMPERATURES

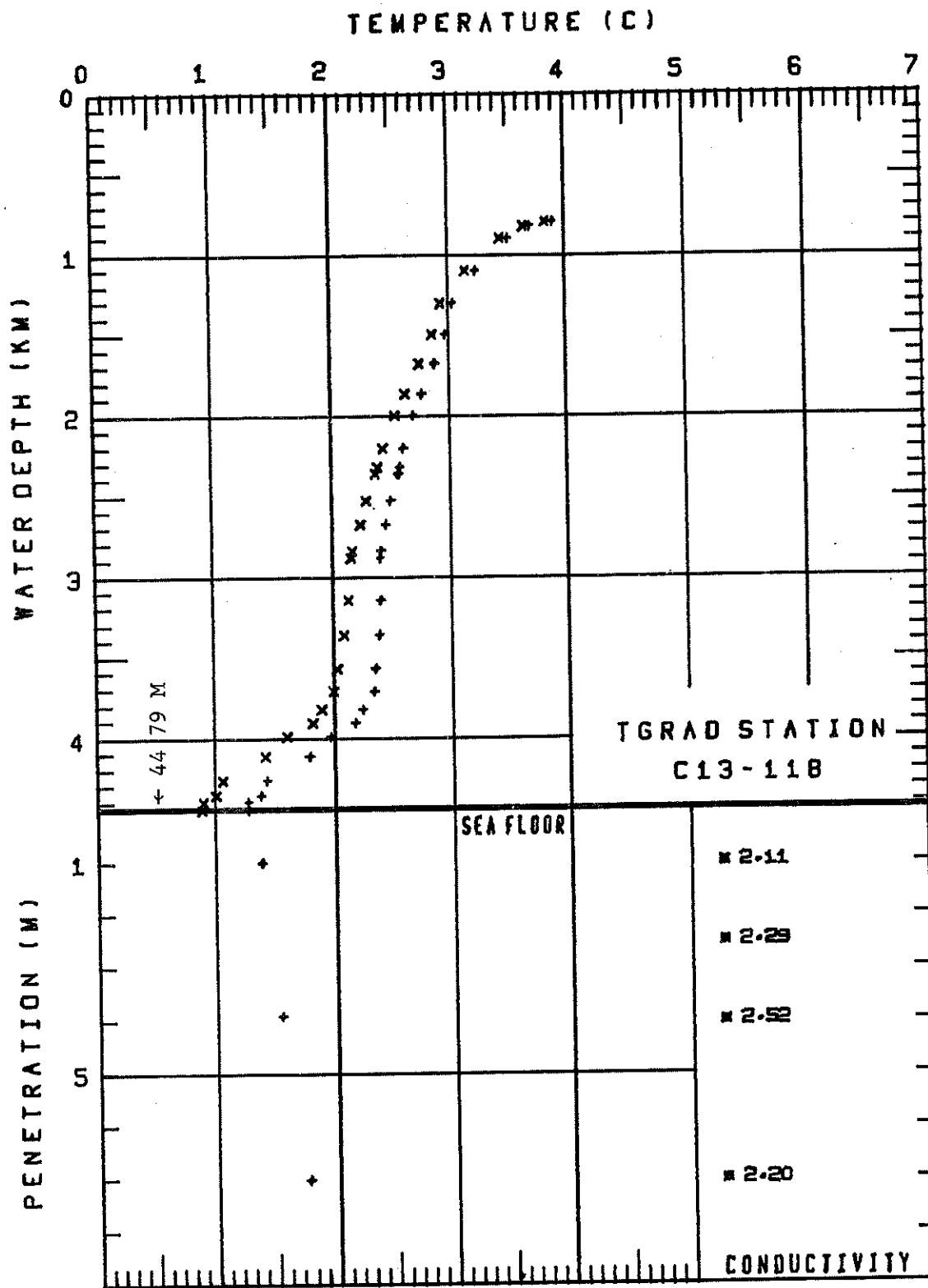
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 793 | 3.897 | 3.837 |
| 824 | 3.711 | 3.651 |
| 898 | 3.515 | 3.448 |
| 1099 | 3.236 | 3.154 |
| 1301 | 3.036 | 2.940 |
| 1494 | 2.977 | 2.863 |
| 1679 | 2.881 | 2.751 |
| 1865 | 2.775 | 2.628 |
| 1997 | 2.699 | 2.542 |
| 2201 | 2.612 | 2.436 |
| 2319 | 2.580 | 2.394 |
| 2360 | 2.561 | 2.370 |
| 2526 | 2.500 | 2.292 |
| 2676 | 2.459 | 2.236 |
| 2837 | 2.413 | 2.173 |
| 2883 | 2.404 | 2.160 |
| 3146 | 2.407 | 2.133 |
| 3359 | 2.394 | 2.094 |
| 3566 | 2.354 | 2.030 |
| 3706 | 2.337 | 1.997 |
| 3821 | 2.245 | 1.895 |
| 3903 | 2.180 | 1.822 |
| 3985 | 1.971 | 1.611 |
| 4113 | 1.800 | 1.430 |
| 4260 | 1.444 | 1.071 |
| 4351 | 1.391 | 1.009 |
| 4393 | 1.286 | 0.904 |
| 4442 | 1.282 | 0.893 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE | |
|-----------------|---------------------------|---------|
| 1.00 | 1.388 | COOLING |
| 3.90 | 1.542 | COOLING |
| 7.00 | 1.759 | COOLING |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.11 |
| 2.50 | 2.29 |
| 4.00 | 2.52 |
| 7.00 | 2.20 |



TGRAD STATION C13-119
 029 38 S 001 37 E
 CRUISE STATION 258

WATER TEMPERATURES

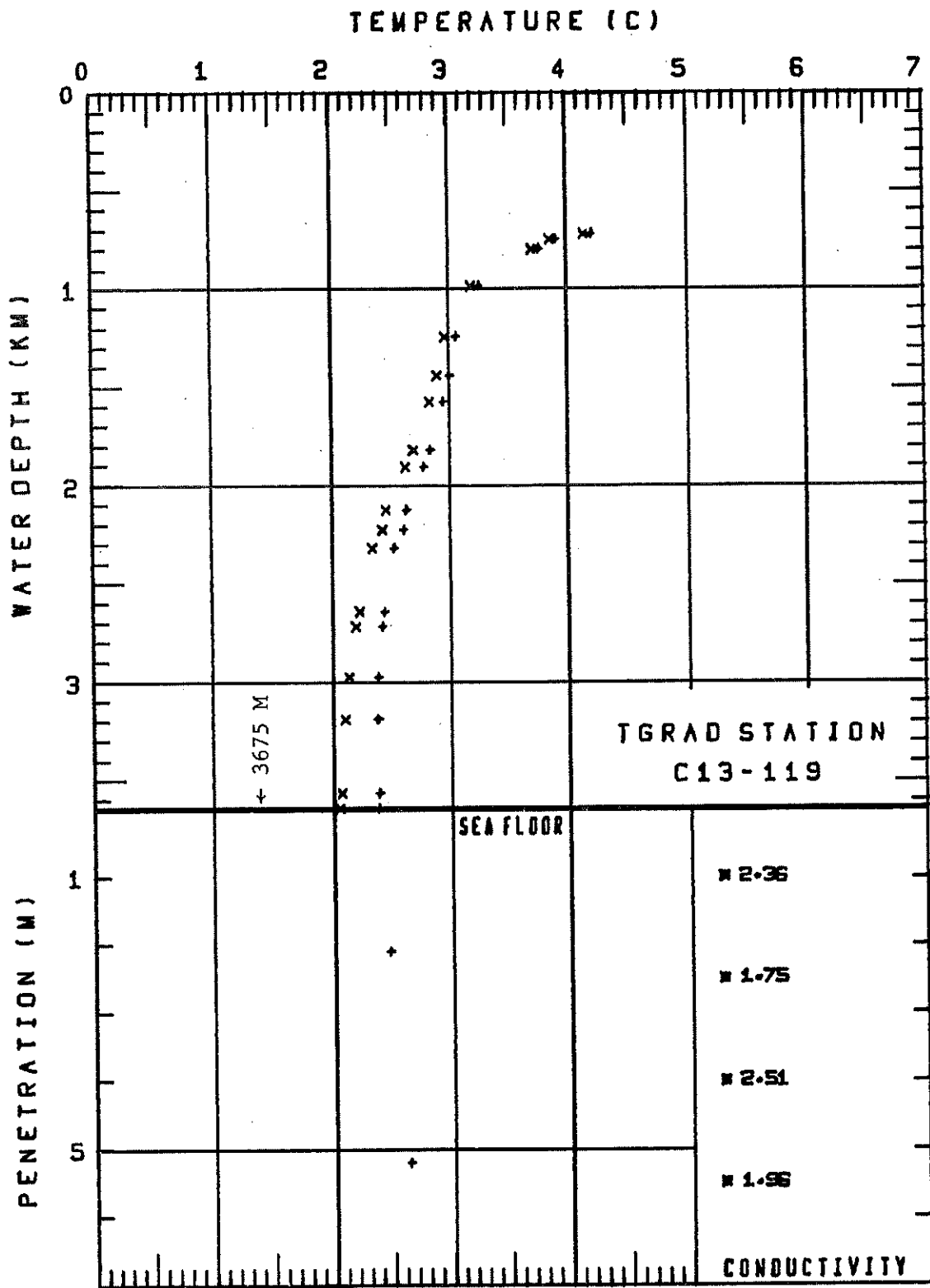
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 720 | 4.208 | 4.152 |
| 748 | 3.918 | 3.861 |
| 797 | 3.769 | 3.709 |
| 982 | 3.266 | 3.196 |
| 1242 | 3.066 | 2.974 |
| 1440 | 3.012 | 2.902 |
| 1575 | 2.957 | 2.836 |
| 1821 | 2.842 | 2.699 |
| 1906 | 2.782 | 2.633 |
| 2124 | 2.635 | 2.467 |
| 2223 | 2.608 | 2.429 |
| 2318 | 2.528 | 2.342 |
| 2641 | 2.447 | 2.229 |
| 2719 | 2.423 | 2.197 |
| 2971 | 2.390 | 2.137 |
| 3188 | 2.383 | 2.105 |
| 3562 | 2.394 | 2.071 |
| 3640 | 2.382 | 2.049 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 2.10 | 2.470 |
| 5.20 | 2.630 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 2.36 |
| 2.50 | 1.75 |
| 4.00 | 2.51 |
| 5.50 | 1.96 |



TGRAD STATION C13-120
 030 53 S 001 08 W
 CRUISE STATION 259

WATER TEMPERATURES

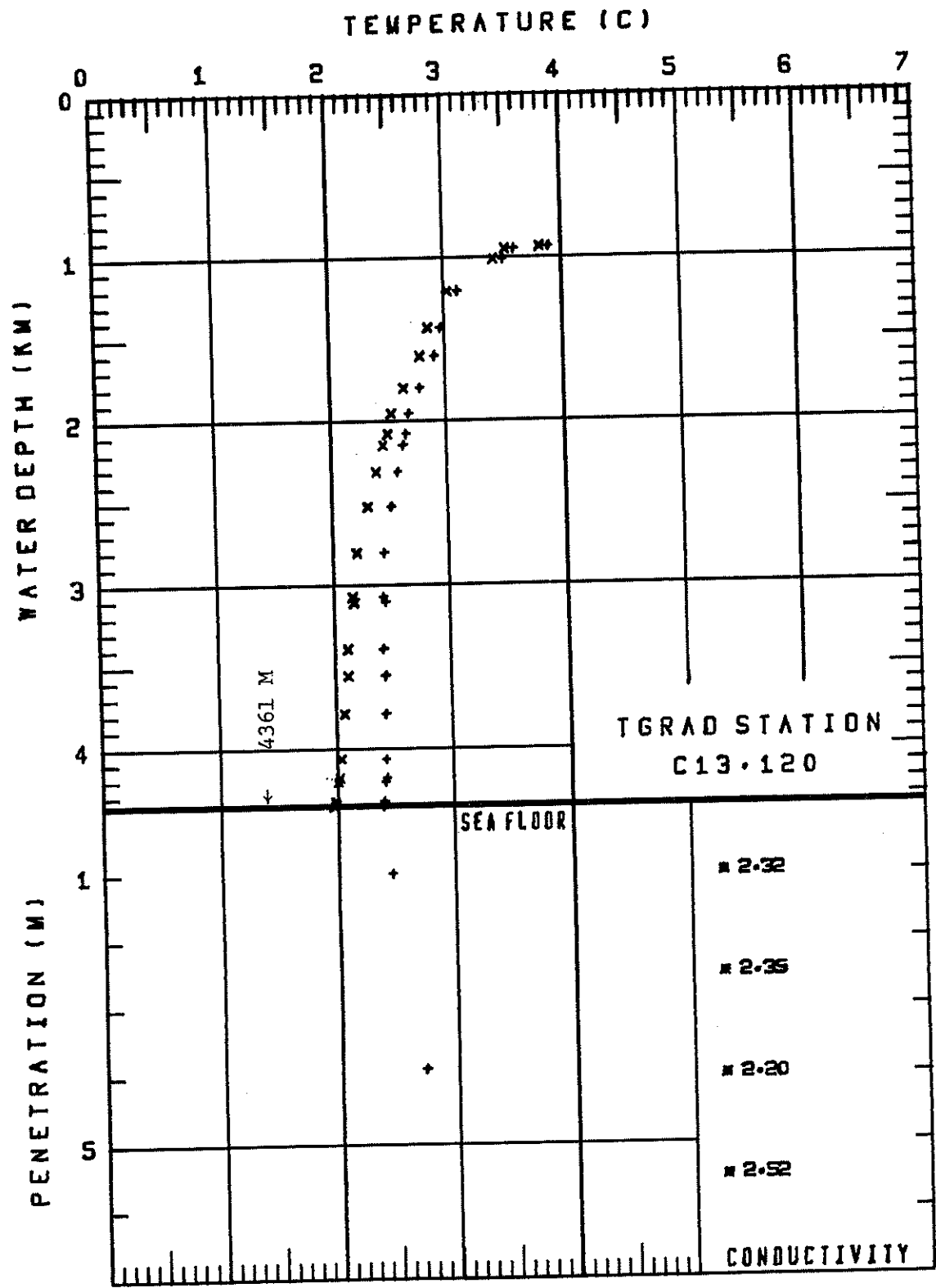
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 934 | 3.888 | 3.815 |
| 950 | 3.605 | 3.533 |
| 1010 | 3.508 | 3.433 |
| 1203 | 3.125 | 3.036 |
| 1425 | 2.974 | 2.868 |
| 1600 | 2.917 | 2.795 |
| 1792 | 2.785 | 2.647 |
| 1950 | 2.686 | 2.534 |
| 2077 | 2.659 | 2.495 |
| 2143 | 2.631 | 2.460 |
| 2307 | 2.578 | 2.391 |
| 2521 | 2.517 | 2.310 |
| 2802 | 2.447 | 2.210 |
| 3070 | 2.433 | 2.166 |
| 3104 | 2.448 | 2.178 |
| 3390 | 2.424 | 2.120 |
| 3558 | 2.440 | 2.117 |
| 3789 | 2.430 | 2.078 |
| 4065 | 2.425 | 2.036 |
| 4178 | 2.429 | 2.026 |
| 4206 | 2.420 | 2.012 |
| 4323 | 2.404 | 1.982 |
| 4338 | 2.414 | 1.990 |
| 4354 | 2.400 | 1.973 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE | |
|-----------------|---------------------------|---------|
| 1.00 | 2.467 | COOLING |
| 3.90 | 2.723 | COOLING |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.32 |
| 2.50 | 2.35 |
| 4.00 | 2.20 |
| 5.50 | 2.52 |



TGRAD STATION C13-121
 034 54 S 008 34 W
 CRUISE STATION 263

WATER TEMPERATURES

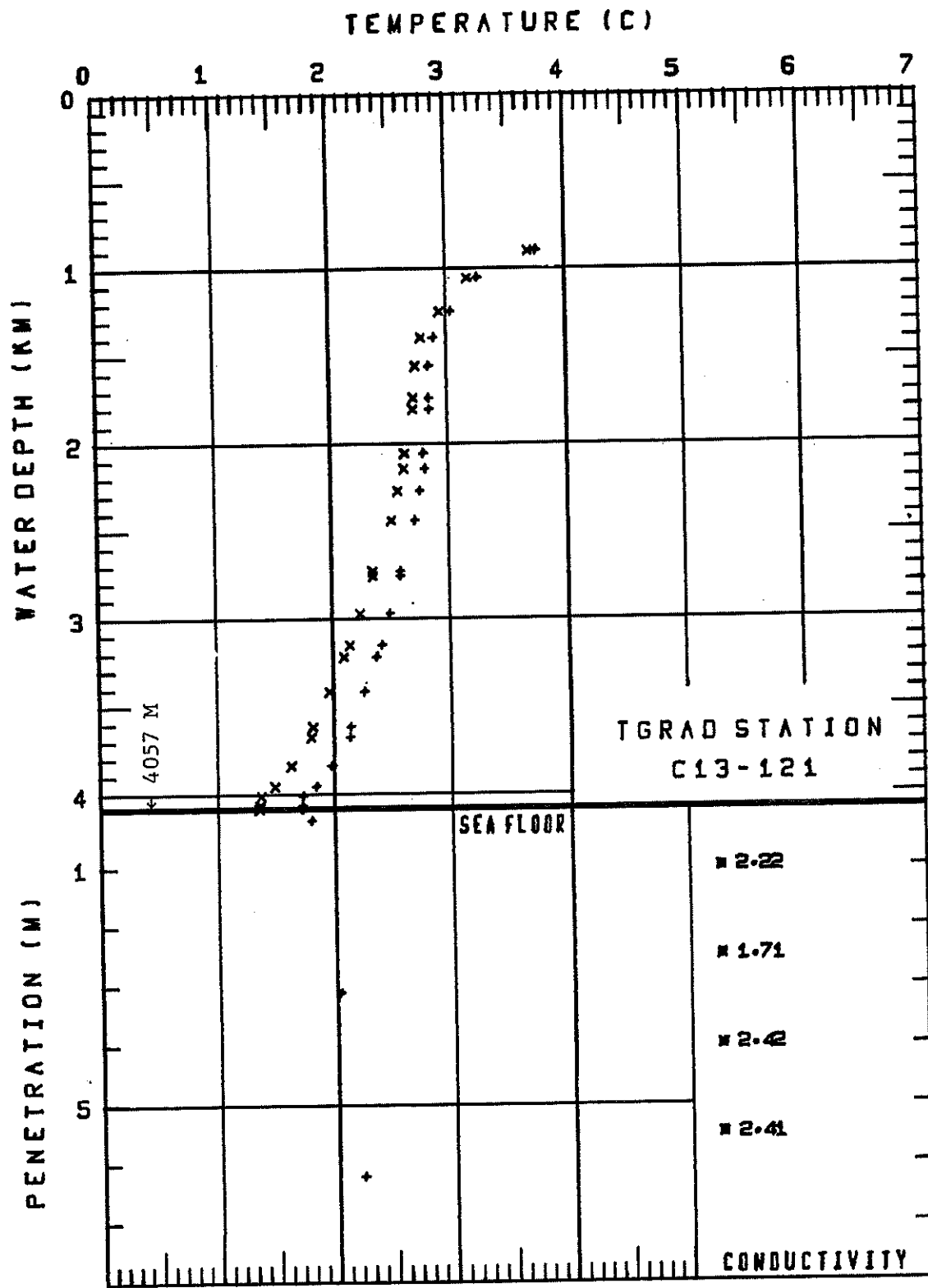
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|--------------|---------------------|-----------------------|
| 896 | 3.759 | 3.690 |
| 1053 | 3.265 | 3.187 |
| 1243 | 3.041 | 2.949 |
| 1392 | 2.895 | 2.791 |
| 1558 | 2.855 | 2.736 |
| 1738 | 2.851 | 2.717 |
| 1800 | 2.850 | 2.710 |
| 2054 | 2.800 | 2.635 |
| 2140 | 2.809 | 2.634 |
| 2267 | 2.764 | 2.579 |
| 2436 | 2.718 | 2.515 |
| 2724 | 2.591 | 2.359 |
| 2753 | 2.594 | 2.361 |
| 2968 | 2.500 | 2.244 |
| 3149 | 2.424 | 2.150 |
| 3217 | 2.377 | 2.096 |
| 3416 | 2.275 | 1.973 |
| 3617 | 2.148 | 1.826 |
| 3676 | 2.141 | 1.813 |
| 3839 | 1.983 | 1.641 |
| 3955 | 1.852 | 1.499 |
| 4011 | 1.740 | 1.385 |
| 4066 | 1.730 | 1.369 |
| 4082 | 1.729 | 1.365 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|--------------|------------------------|
| 0.20 | 1.803 |
| 3.10 | 2.030 |
| 6.20 | 2.223 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|--------------|------------------|
| 1.00 | 2.22 |
| 2.50 | 1.71 |
| 4.00 | 2.42 |
| 5.50 | 2.41 |



TGRAD STATION C13-122
 035 39 S 006 50 W
 CRUISE STATION 264

WATER TEMPERATURES

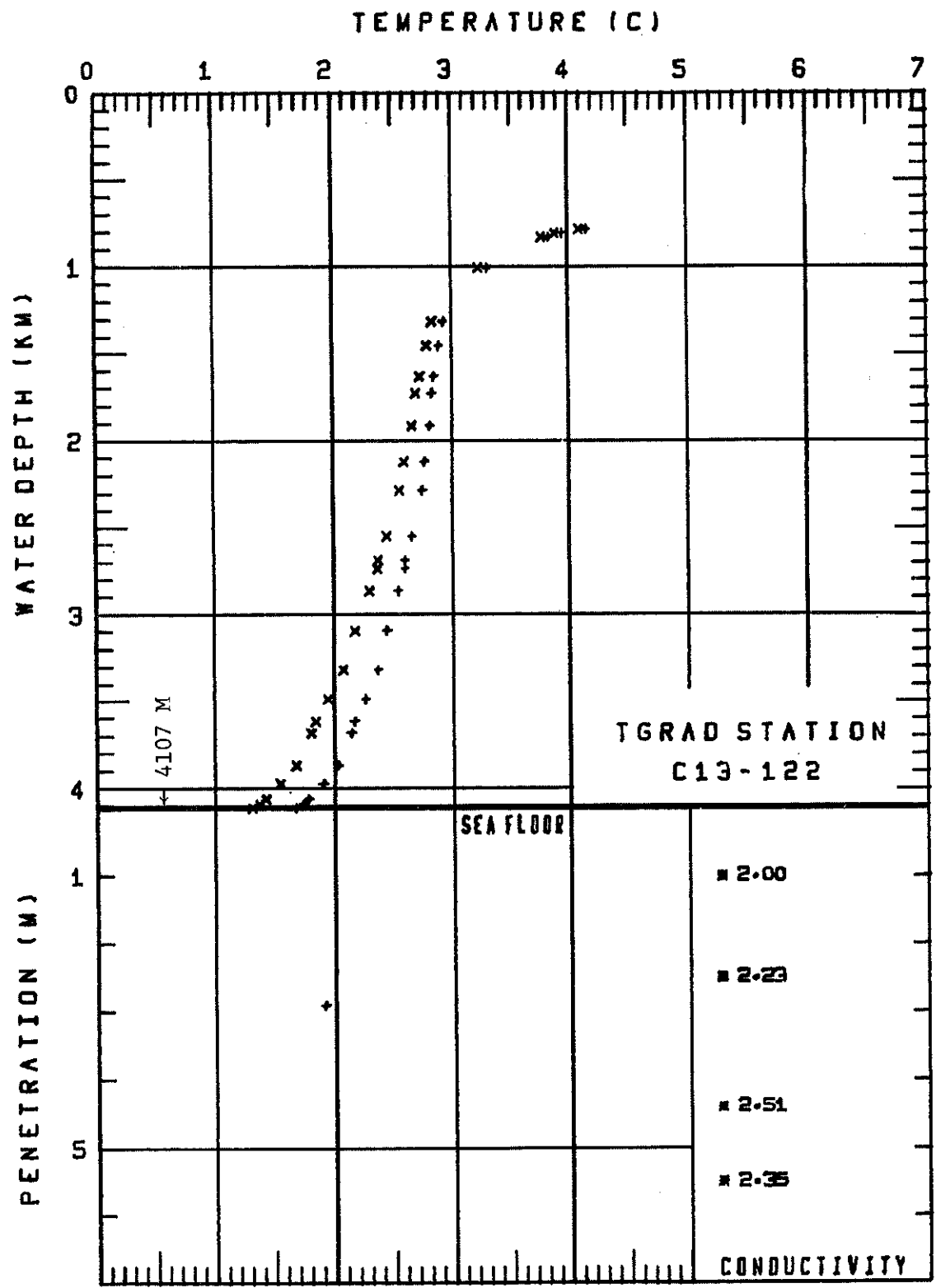
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 781 | 4.151 | 4.089 |
| 805 | 3.946 | 3.884 |
| 826 | 3.835 | 3.772 |
| 1006 | 3.308 | 3.232 |
| 1314 | 2.925 | 2.829 |
| 1450 | 2.889 | 2.782 |
| 1629 | 2.848 | 2.723 |
| 1726 | 2.826 | 2.693 |
| 1911 | 2.811 | 2.660 |
| 2118 | 2.764 | 2.593 |
| 2284 | 2.743 | 2.554 |
| 2548 | 2.655 | 2.442 |
| 2687 | 2.599 | 2.372 |
| 2735 | 2.595 | 2.362 |
| 2862 | 2.540 | 2.296 |
| 3091 | 2.447 | 2.177 |
| 3316 | 2.374 | 2.080 |
| 3483 | 2.264 | 1.954 |
| 3611 | 2.171 | 1.851 |
| 3681 | 2.144 | 1.815 |
| 3866 | 2.032 | 1.684 |
| 3974 | 1.911 | 1.555 |
| 4060 | 1.793 | 1.430 |
| 4085 | 1.744 | 1.381 |
| 4110 | 1.681 | 1.316 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 2.90 | 1.915 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.00 |
| 2.50 | 2.23 |
| 4.40 | 2.51 |
| 5.50 | 2.35 |

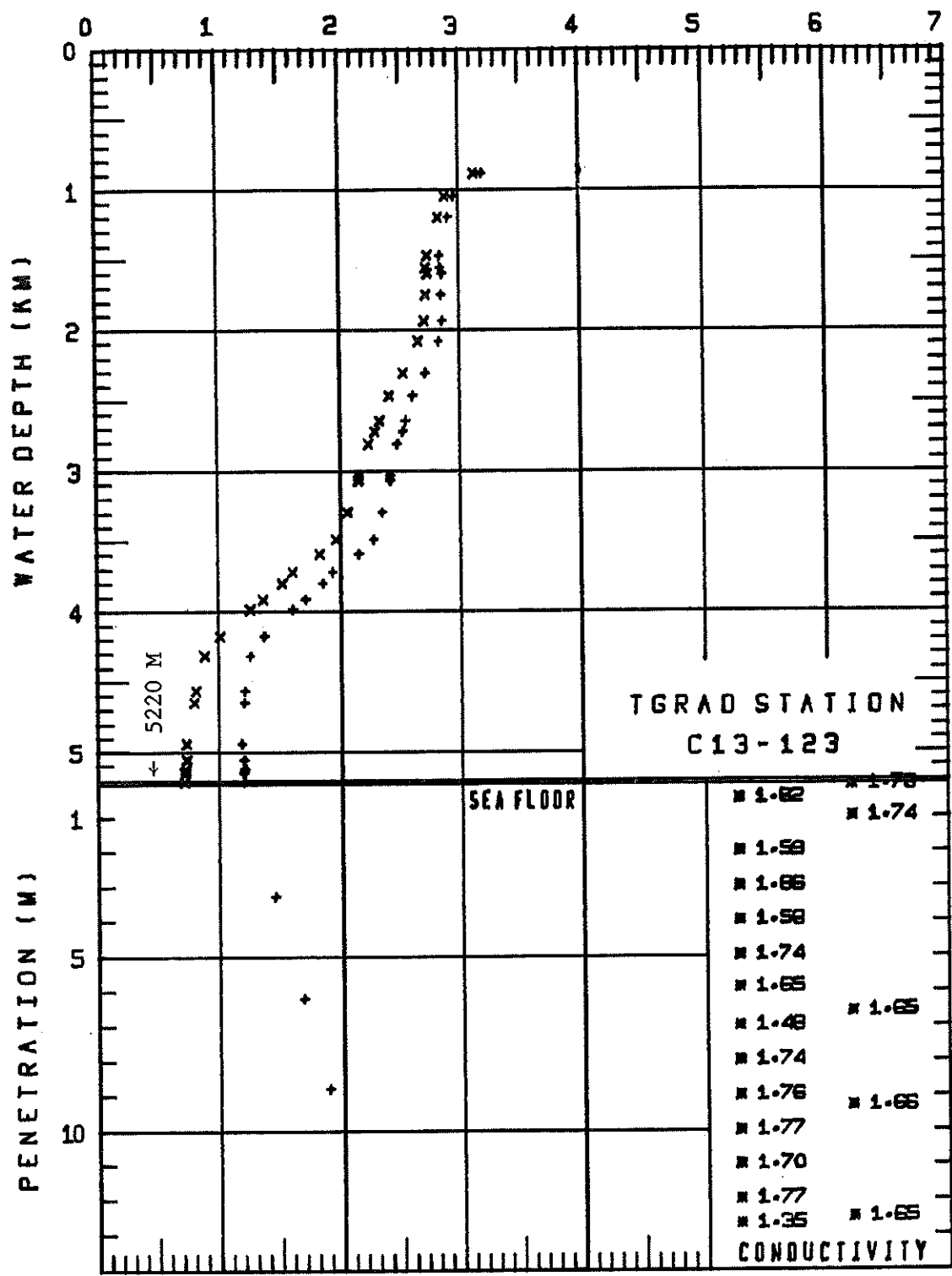


TGRAD STATION C13-123
 036 31 S 003 33 E
 CRUISE STATION 268

| WATER TEMPERATURES | | | SEDIMENT TEMPERATURES | |
|--------------------|---------------------|-----------------------|-----------------------|------------------------|
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE | DEPTH METERS | TEMPERATURE CENTIGRADE |
| | | | 3.30 | 1.459 |
| | | | 6.20 | 1.683 |
| | | | 8.80 | 1.892 |
| 884 | 3.204 | 3.140 | | |
| 1048 | 2.973 | 2.898 | | |
| 1199 | 2.925 | 2.838 | | |
| 1470 | 2.854 | 2.743 | | |
| 1558 | 2.851 | 2.733 | | |
| 1600 | 2.869 | 2.747 | | |
| 1748 | 2.864 | 2.729 | | |
| 1933 | 2.871 | 2.717 | | |
| 2077 | 2.835 | 2.667 | | |
| 2304 | 2.726 | 2.538 | | |
| 2471 | 2.620 | 2.416 | | |
| 2648 | 2.558 | 2.335 | | |
| 2721 | 2.529 | 2.300 | | |
| 2812 | 2.483 | 2.245 | | |
| 3038 | 2.424 | 2.163 | | |
| 3073 | 2.425 | 2.158 | | |
| 3295 | 2.357 | 2.067 | | |
| 3490 | 2.285 | 1.974 | | |
| 3591 | 2.158 | 1.839 | | |
| 3720 | 1.946 | 1.618 | | |
| 3799 | 1.865 | 1.530 | | |
| 3917 | 1.723 | 1.380 | | |
| 3985 | 1.618 | 1.270 | | |
| 4177 | 1.384 | 1.023 | | |
| 4316 | 1.269 | 0.897 | | |
| 4564 | 1.224 | 0.823 | | |
| 4644 | 1.220 | 0.809 | | |
| 4944 | 1.196 | 0.746 | | |
| 5057 | 1.211 | 0.746 | | |
| 5120 | 1.216 | 0.741 | | |
| 5148 | 1.210 | 0.732 | | |
| 5214 | 1.214 | 0.726 | | |

| SEDIMENT CONDUCTIVITIES | |
|-------------------------|------------------|
| DEPTH METERS | CONDUCTIVITY CGS |
| 0.10 | 1.78 |
| 0.50 | 1.82 |
| 1.00 | 1.74 |
| 2.00 | 1.59 |
| 3.00 | 1.86 |
| 4.00 | 1.58 |
| 5.00 | 1.74 |
| 5.90 | 1.65 |
| 6.60 | 1.65 |
| 7.00 | 1.48 |
| 8.00 | 1.74 |
| 9.00 | 1.76 |
| 9.30 | 1.66 |
| 10.00 | 1.77 |
| 11.00 | 1.70 |
| 12.00 | 1.77 |
| 12.50 | 1.65 |
| 12.70 | 1.35 |

TEMPERATURE (C)



WATER TEMPERATURES

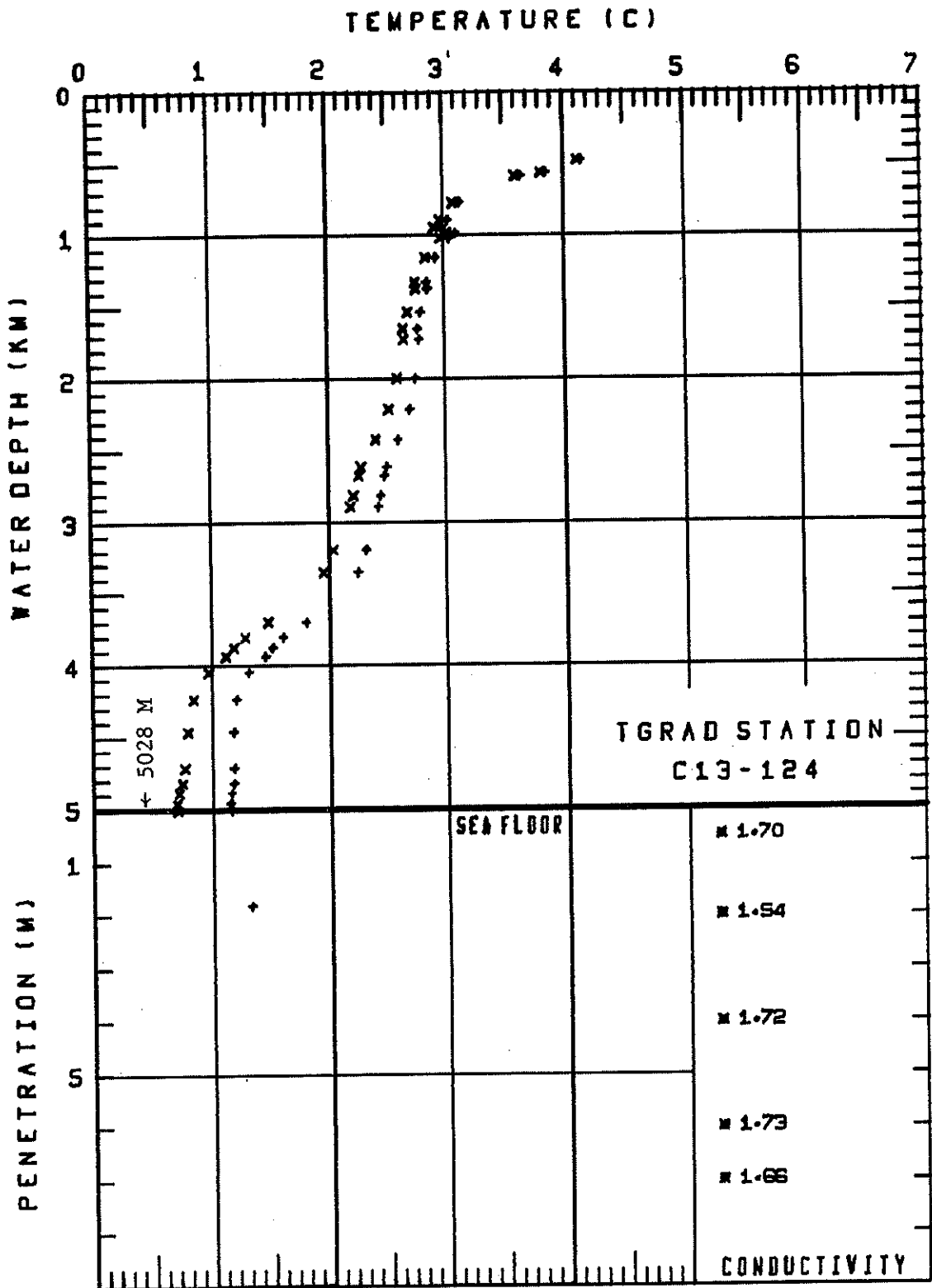
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 477 | 4.153 | 4.119 |
| 565 | 3.855 | 3.815 |
| 592 | 3.650 | 3.607 |
| 773 | 3.138 | 3.084 |
| 895 | 3.035 | 2.973 |
| 947 | 2.990 | 2.924 |
| 983 | 3.105 | 3.034 |
| 1020 | 3.049 | 2.976 |
| 1159 | 2.934 | 2.851 |
| 1331 | 2.856 | 2.758 |
| 1374 | 2.863 | 2.762 |
| 1533 | 2.803 | 2.688 |
| 1652 | 2.779 | 2.653 |
| 1724 | 2.791 | 2.658 |
| 1994 | 2.758 | 2.600 |
| 2212 | 2.706 | 2.527 |
| 2426 | 2.607 | 2.408 |
| 2613 | 2.505 | 2.288 |
| 2672 | 2.486 | 2.264 |
| 2813 | 2.454 | 2.217 |
| 2889 | 2.434 | 2.188 |
| 3194 | 2.322 | 2.045 |
| 3349 | 2.250 | 1.957 |
| 3692 | 1.803 | 1.484 |
| 3797 | 1.612 | 1.289 |
| 3867 | 1.519 | 1.191 |
| 3929 | 1.460 | 1.127 |
| 4043 | 1.319 | 0.978 |
| 4231 | 1.210 | 0.851 |
| 4460 | 1.184 | 0.797 |
| 4712 | 1.187 | 0.769 |
| 4817 | 1.187 | 0.754 |
| 4883 | 1.164 | 0.724 |
| 4956 | 1.154 | 0.705 |
| 5004 | 1.167 | 0.712 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.80 | 1.326 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.50 | 1.70 |
| 2.00 | 1.54 |
| 4.00 | 1.72 |
| 6.00 | 1.73 |
| 7.00 | 1.66 |



TGRAD STATION C13-125
036 17 S 010 17 E
CRUISE STATION 270

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 806 | 3.769 | 3.709 |
| 884 | 3.667 | 3.601 |
| 919 | 3.521 | 3.454 |
| 1065 | 3.170 | 3.092 |
| 1318 | 2.933 | 2.835 |
| 1529 | 2.921 | 2.805 |
| 1701 | 2.855 | 2.723 |
| 1901 | 2.863 | 2.712 |
| 2000 | 2.821 | 2.660 |
| 2154 | 2.789 | 2.614 |
| 2379 | 2.638 | 2.443 |
| 2497 | 2.584 | 2.376 |
| 2683 | 2.550 | 2.324 |
| 2865 | 2.477 | 2.233 |
| 2906 | 2.471 | 2.223 |
| 3130 | 2.380 | 2.108 |
| 3332 | 2.282 | 1.990 |
| 3221 | 2.285 | 2.006 |
| 3584 | 2.055 | 1.742 |
| 3752 | 1.858 | 1.530 |
| 3866 | 1.703 | 1.367 |
| 4089 | 1.380 | 1.029 |
| 4281 | 1.269 | 0.902 |
| 4428 | 1.207 | 0.824 |
| 4608 | 1.187 | 0.781 |
| 4825 | 1.187 | 0.754 |
| 4885 | 1.173 | 0.732 |
| 4932 | 1.200 | 0.752 |
| 4999 | 1.200 | 0.742 |
| 5018 | 1.194 | 0.735 |
| 5073 | 1.174 | 0.708 |

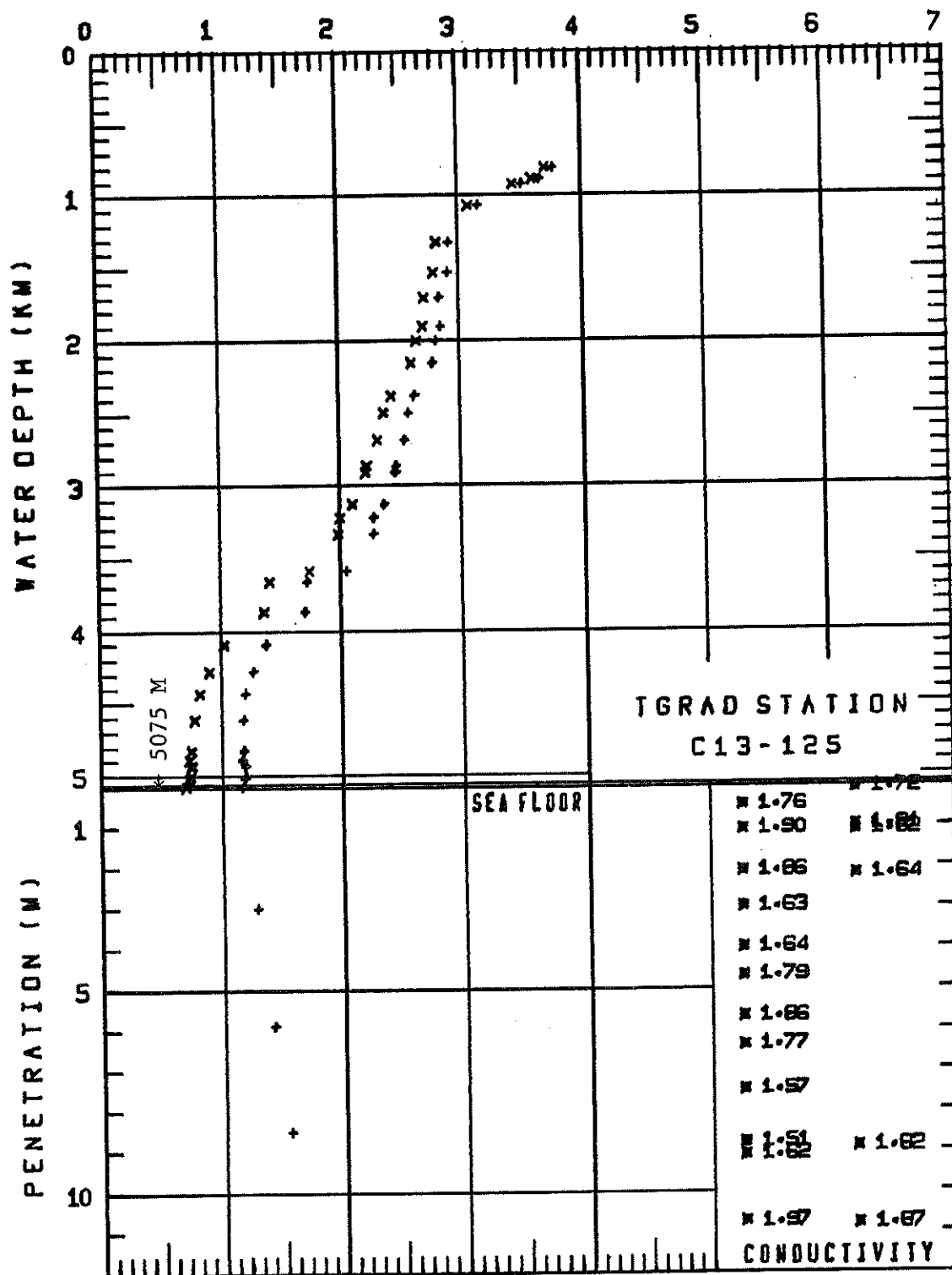
SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 3.00 | 1.283 |
| 5.90 | 1.421 |
| 8.50 | 1.543 |

SEDIMENT CONDUCTIVITIES

| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 0.10 | 1.72 |
| 0.50 | 1.76 |
| 1.00 | 1.81 |
| 1.10 | 1.90 |
| 1.11 | 1.82 |
| 2.11 | 1.86 |
| 2.20 | 1.64 |
| 3.00 | 1.63 |
| 4.00 | 1.64 |
| 4.70 | 1.79 |
| 5.70 | 1.86 |
| 6.40 | 1.77 |
| 7.50 | 1.57 |
| 8.80 | 1.51 |
| 8.90 | 1.82 |
| 9.10 | 1.62 |
| 10.75 | 1.97 |
| 10.80 | 1.87 |

TEMPERATURE (C)



TGRAD STATION C13-126
 035 46 S 013 52 E
 CRUISE STATION 271

WATER TEMPERATURES

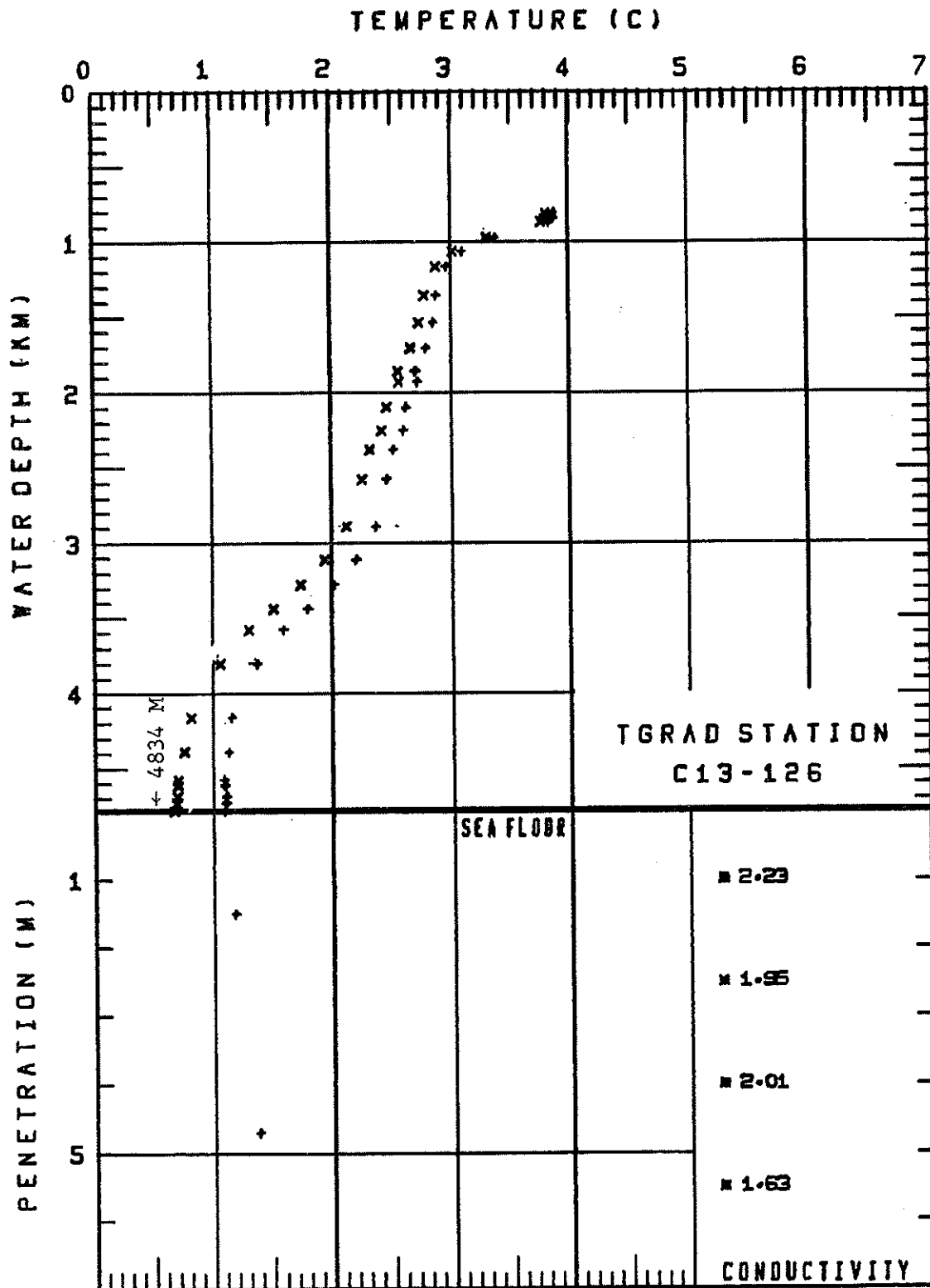
| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 806 | 3.862 | 3.802 |
| 845 | 3.863 | 3.798 |
| 865 | 3.832 | 3.766 |
| 972 | 3.374 | 3.302 |
| 1063 | 3.096 | 3.019 |
| 1164 | 2.961 | 2.876 |
| 1356 | 2.878 | 2.778 |
| 1533 | 2.849 | 2.733 |
| 1706 | 2.792 | 2.661 |
| 1860 | 2.704 | 2.559 |
| 1927 | 2.716 | 2.565 |
| 2097 | 2.627 | 2.462 |
| 2250 | 2.605 | 2.423 |
| 2377 | 2.516 | 2.324 |
| 2574 | 2.467 | 2.256 |
| 2853 | 2.066 | 1.835 |
| 2898 | 2.369 | 2.125 |
| 3112 | 2.205 | 1.941 |
| 3276 | 2.023 | 1.746 |
| 3433 | 1.805 | 1.516 |
| 3575 | 1.608 | 1.311 |
| 3804 | 1.381 | 1.065 |
| 4160 | 1.165 | 0.817 |
| 4387 | 1.137 | 0.761 |
| 4572 | 1.099 | 0.703 |
| 4609 | 1.107 | 0.705 |
| 4684 | 1.111 | 0.700 |
| 4728 | 1.108 | 0.691 |
| 4779 | 1.095 | 0.673 |

SEDIMENT TEMPERATURES

| DEPTH METERS | TEMPERATURE CENTIGRADE |
|-----------------|---------------------------|
| 1.50 | 1.183 |
| 4.70 | 1.377 |

SEDIMENT CONDUCTIVITIES

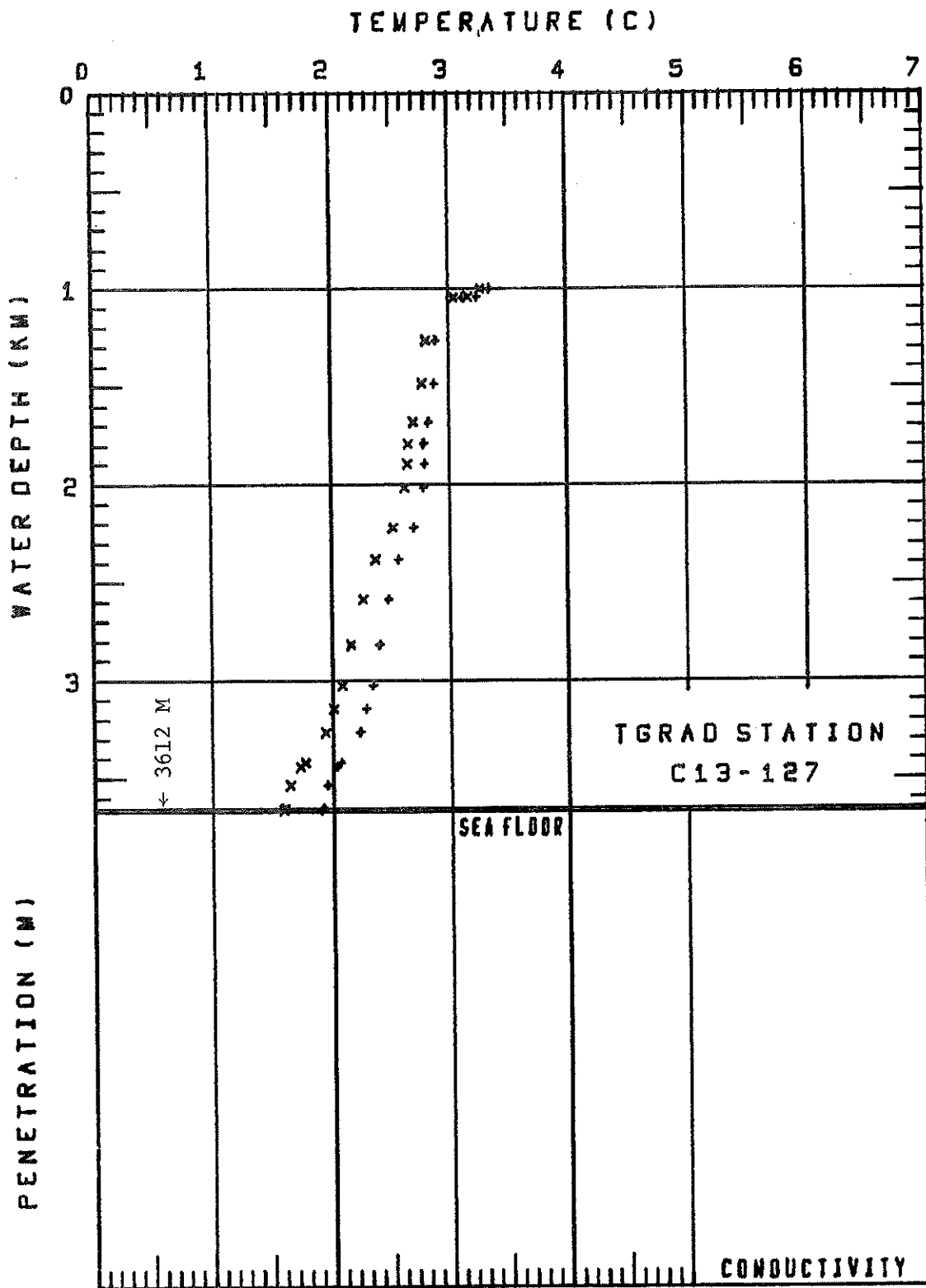
| DEPTH METERS | CONDUCTIVITY CGS |
|-----------------|---------------------|
| 1.00 | 2.23 |
| 2.50 | 1.95 |
| 4.00 | 2.01 |
| 5.50 | 1.63 |



TGRAD STATION C13-127
035 49 S 017 37 E
CRUISE STATION 272

WATER TEMPERATURES

| DEPTH METERS | IN SITU TEMPERATURE | POTENTIAL TEMPERATURE |
|-----------------|------------------------|--------------------------|
| 1000 | 3.346 | 3.272 |
| 1039 | 3.245 | 3.170 |
| 1045 | 3.124 | 3.047 |
| 1264 | 2.894 | 2.802 |
| 1483 | 2.881 | 2.769 |
| 1683 | 2.824 | 2.696 |
| 1793 | 2.788 | 2.648 |
| 1894 | 2.795 | 2.645 |
| 2018 | 2.780 | 2.619 |
| 2220 | 2.697 | 2.517 |
| 2384 | 2.566 | 2.372 |
| 2585 | 2.475 | 2.263 |
| 2816 | 2.395 | 2.159 |
| 3025 | 2.346 | 2.087 |
| 3140 | 2.283 | 2.014 |
| 3264 | 2.229 | 1.946 |
| 3418 | 2.074 | 1.779 |
| 3439 | 2.036 | 1.740 |
| 3532 | 1.957 | 1.651 |
| 3652 | 1.921 | 1.604 |
| 3658 | 1.914 | 1.595 |





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