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OCEANOGRAPHIC OBSERVATIONS
KENNEDY CHANNEL, KANE BASIN, SMITH SOUND
AND BAFFIN BAY

Summer 1963

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Summer 1963

by

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WASHINGTON, D.C. ⚓ OCTOBER 1964

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PREFACE

This report is a presentation of the oceanographic data collected from 28 July to 4 August 1963 during the U.S. Coast Guard Cutter *Evergreen's* special survey performed at the conclusion of the regular work that is done for the International Ice Patrol off the Grand Banks of Newfoundland and in the Labrador Sea every year. The areas surveyed consisted of Kennedy Channel, Kane Basin, Smith Sound, and upper Baffin Bay and the data covered in this report includes physical, chemical, geological oceanography, and bathymetry.

The author of the section on physical oceanography is Alfred P. Franceschetti, Oceanographer, U.S. Coast Guard Oceanographic Unit;¹ the section on nutrient distribution was written by David A. McGill and Nathaniel Corwin, both of the Woods Hole Oceanographic Institution; and that on the sediments and topography of Kane Basin was by Elazar Uchupi also of the Woods Hole Oceanographic Institution.

The author of the first section wishes to express his appreciation and gratitude to Mr. J. W. McGary of U.S. Coast Guard Oceanographic Unit and LCDR R. M. Morse, USCG, who reviewed the section of this manuscript on physical oceanography and made many valuable suggestions and to LCDR V. W. Driggers, USCG, for his assistance in data processing and quality control.

¹ Present employment: Oceanographer, National Oceanographic Data Center, Washington, D.C.

Oceanographic Conditions in Kennedy Channel, Kane Basin, Smith Sound, and Upper Baffin Bay, Summer 1963

By Alfred P. Franceschetti

In addition to the CGC *Evergreen's* normal post-season survey, which consists of a triangular 29-station survey off Cape Bonavista, Newfoundland, and a 24-station section between South Wolf Island, Labrador, and Cape Farewell, Greenland, *Evergreen* collected oceanographic data in Kennedy Channel, Kane Basin, Smith Sound, and upper Baffin Bay.

The survey was conducted at the request of the Office of Naval Research whereby the Coast Guard furnished the oceanographic team and facilities of *Evergreen*. Ice Island WH-5 had been blocking Kennedy Channel since the previous winter, which resulted in the surveyed areas being completely ice free with the exception of a few bergs along both shores. There are no records of a similar situation having occurred previous to the summer of 1963, although the area had been occasionally navigable with difficulty in the past by ice breakers. Figure 1 shows *Evergreen's* track in this area.

At the conclusion of the Labrador Sea section off Cape Farewell, Greenland, *Evergreen*, under the command of CDR C. S. Changaris, USCG, set course for Thule, Greenland, arriving on 25 July. After a 2-day layover in Thule during which time plans were made for the forthcoming survey, supplies were taken aboard and the three additional civilian scientists sponsored by ONR boarded. *Evergreen* left for Smith Sound to moor three toroidal buoys with Richardson current meters, anemometers, and radio beacons. The moorings were accomplished on 28 July between Cape Hatherton, Greenland, and Cape Herschel, Ellesmere Island. Because the ice island blocking Kennedy Channel had shifted and broken loose between 24 July and 26 July and was drifting south in three pieces, it was decided to conduct the section across Kane Basin from Cape Louis Napoleon, Ellesmere Island, to Cape Russell, Greenland first, in the event that the polar pack ice moved rapidly south.

The section across Kane Basin was begun on 28 July with station 8750 and was completed on 29 July. *Evergreen* then proceeded to the lower part of Kennedy Channel and took five oceanographic stations south of the descending pack ice in a line from Cape Madison, Greenland, to Collinson, Ellesmere Island. All were accomplished on 29 July. *Evergreen* then proceeded in a southwesterly direction taking an oceanographic station in the deepest part of the Kane Basin Channel off Cape Frazer, Ellesmere Island, and two stations between the Kane Basin section and Smith Sound section, also in the deepest part of the channel arrived at Cape Hatherton on 30 July. The same day a section consisting of six oceanographic stations was occupied across Smith Sound on a line parallel to the three oceanographic moorings.

The weather was deteriorating rapidly by the time *Evergreen* reached Cape Herschel, Ellesmere Island, so it was decided to haul aboard the current meter moorings. They were hauled in on 31 July whereupon *Evergreen* began an eight station grid of the lower Smith Sound and upper Baffin Bay area. By the time the fifth station was completed off Murchison Sound the weather had deteriorated to the point where it seemed prudent to return to Thule until the weather abated. Several hours away from Thule, the weather moderated and *Evergreen* returned to the location of the sixth station, off Whale Sound, and resumed taking oceanographic stations on 1 August. The last station of the grid was completed off Cape Combermere, Ellesmere Island, near Glacier Strait. *Evergreen* then started a section of 10 oceanographic stations which was completed at Cape Atholl, Greenland, on 2 August. The *Evergreen* then returned to Thule and after a 2-day layover, departed on 4 August for upper Baffin Bay. Here three oceanographic stations were taken at bottom contours of 1,000, 1,500, and 2,000 meters. The

last of these, number 8793, was completed shortly before midnight on 4 August. *Evergreen* then proceeded to Boston, Mass., arriving on 13 August.

To obtain an adequate cross-section of the current structure across Smith Sound, 10 Richardson-type current meters were suspended from 3 toroidal type buoys at the positions indicated by the triangles in figure 1. Bathythermographs were taken at all stations (figs. 26 through 31 inclusive are the corrected bathythermograph traces for the entire survey), and bottom samples were collected at eight stations with a modified Phleger corer and a Van Veen sampler. In addition, 417 dissolved oxygen determinations were made for selected depths at all stations. Also, 654 samples were collected for all depths at all stations and frozen in 8-ounce polyethylene bottles for the determination of inorganic phosphate, total phosphorus, nitrate, nitrite, and silicate content by the Woods Hole Oceanographic Institution.

A special effort was made to collect as much accurate bathymetric data as possible since most of soundings marked on the charts appeared to be inaccurate or poorly positioned. Icebergs abounded in numbers too great to count the majority of the time with the heaviest concentrations occurring in the vicinity of Cape York and Melville Bay, but they did not hinder operations at any time. Pack ice prevented *Evergreen* from getting as close to shore as desired on the transverse sections. Fog occasionally obscured the shoreline but was not of major concern and only 5 hours of operating time was lost because of weather.

The oceanographic work was under the supervision of oceanographer Alfred P. Franceschetti, USCGOU, assisted by LT R. M. O'Hagan, USCGR and R. M. Snyder of the Woods Hole Oceanographic Institution. Mr. Snyder was responsible for the preparation and mooring of the toroidal buoys and Richardson-type current meters. Other assistants in the observational work and reduction of data included P. R. Flowers and W. D. Eddowes, aerographer's mates first class; R. A. Lindsay, aerographer's mate second class; H. J. W. Daugherty and J. R. Blackwell, aerographer's mates third class. The Office of Naval Research's Program was coordinated by D. C. Nutt of Dartmouth College and L. K. Coachman of the University of Washington.

Temperature and salinity observations were made at each station with the observations extending from the surface to as near bottom as was

practicable utilizing NODC standard depths as a guide. Temperatures were measured with paired protected deep-sea reversing thermometers. Most were of Richter & Wiese manufacture but some manufactured by GM Manufacturing Co. and Kahl Scientific Instrument Corp. were also used. A program of intercomparison of protected thermometers was carried out in the field by rotating one of each pair of thermometers periodically so that a given thermometer eventually was paired with a number of other thermometers. Only protected thermometers having a range of -2°C to $+8^{\circ}\text{C}$ were used and the standard deviation between the corrected readings was $\pm 0.009^{\circ}\text{C}$. As most of the observed temperatures listed in the Table of Oceanographic Data are means of the corrected readings of a pair of thermometers and as many of the thermometers had recent ice-point determinations, it is considered that the tabulated observed temperatures are accurate within $\pm 0.01^{\circ}\text{C}$.

Salinities were measured with the Wenner salinity bridge with the exception of the surface water samples from stations 8757 and 8758 which, because of their low salinities, were measured on a Hytech inductive salinometer. The Wenner Bridge was standardized with sea water from an oil-sealed carboy, and Copenhagen standard water of batch P36 was measured as an unknown twice during each 8–12-hour salinity run. At the end of each survey, these measurements were used to correct the tentative value of the salinity and to determine the corrections to the salinities for the entire survey. All necessary corrections have been applied to the tabulated values appearing in the Table of Oceanographic Data. Temperature control of the samples in the electrolytic cells of the Coast Guard's Wenner bridge limit the precision of the individual measurements to $\pm 0.005\text{‰}$. In view of the precise chlorinity determinations it produced in the critical evaluation of February 1960 (Soule, et al. 1960) and the check runs on the calibration curve, it would appear that the salinities measured with the Wenner bridge were measured with an accuracy of about $\pm 0.01\text{‰}$.

Dissolved oxygen determinations were conducted according to the methods described by Jacobsen, J. P., et al. (1950); and modified slightly by the Woods Hole Oceanographic Institution.² Nansen-type water bottles with teflon-coated interiors

² Personal communication from Dayton B. Carritt.

Figure 1. Chart of the area surveyed showing station locations.

were used for all oxygen sampling. The samples were chemically treated and stored until analysis (storage time never exceeded 2 hours) in 150-milliliter glass bottle with ground and lapped glass stoppers. The sodium thiosulfate solution was standardized daily with a previously prepared potassium bi-iodate solution. Aliquot samples of the treated sea water were withdrawn by a 50 ml micro-burette. The precision of the method is considered to be $\pm .03$ ml/liter.

Programs in FORTAN for use on the digital computer of the Woods Hole Oceanographic Institution were prepared for the correction of reversing thermometers and determination of thermometric depths, the computation of sigma-t and specific volume anomaly, the determination of the amount of dissolved oxygen in milliliters per liter and the computation of percent oxygen saturation based on Fox (1909). Each of the above programs was used for processing the data from Kennedy Channel, Kane Basin, Smith Sound, and upper Baffin Bay used in preparing the illustrations. The raw data was reprocessed by the National Oceanographic Data Center for inclusion in the Table of Oceanographic Data (table V) at the end of this publication. A careful check was made of the processed data from both computers and it was found to be in perfect agreement.

The Richardson current meter data is presently in the possession of the Coast Guard Oceanographic Unit, Washington, D.C. Difficulties were encountered with the machine processing of the data causing the program to be temporarily halted. It is hoped that the difficulties can be solved and the program completed in the near future. When this is accomplished, the current data will be published as a separate report in this series.

The ice chart of 2 July showed the ice island straddling Kennedy Channel from the Canadian shore to Hans Island and the little ice that had moved past between Hans Island and Greenland was stopped 5 miles further south by Franklin Island. It appeared from reports that the ice island had been in this position for quite some time. An ice reconnaissance flight on 24 July showed that the ice island had shifted to the east side of the channel lodging against the north shore of Franklin Island allowing the polar ice to move south. A flight on 26 July showed the ice island in the middle of Kennedy Channel broken in three pieces, the largest of which was 4 by 7 miles and moving southward with the pack ice

that had been backing up into the Arctic Ocean. The positions determined from the reconnaissance flights and later positions furnished by the CGC *Westwind* (which was in Kane Basin conducting hull strength tests), showed a drift of about 13 miles per day for the ice island and 15 miles per day for the pack ice. This difference in drift afforded a lee (in the pack ice) south of the ice island fragments allowing *Evergreen* to occupy the last station of the Kennedy Channel section fairly close to shore.

The *Evergreen* found ice conditions unusually light throughout the survey due to the blocking action of the ice island across Kennedy Channel. Smith Sound was ice free and normally ice-choked Kane Basin was free of ice on the west side before the arrival of the polar pack. Peabody Bay, which constitutes the entire east side of Kane Basin, was still ice covered but some of the fast ice had broken loose and had begun drifting south to Smith Sound. Some remnants of fast ice from the bays on the west side of the basin had moved south but the concentration was low and it was easily avoided. The polar ice which had been held back by the ice island had moved halfway down the west side of Kane Basin.

Figure 2a shows the vertical temperature distribution between Cape Collinson, Ellesmere Island, and Cape Jefferson, Greenland, on a transverse section which for purposes of simplicity will be known as lower Kennedy Channel. It is interesting to note that the water below 200 meters in the central and eastern part of the channel is above 0° C and shows a slight and gradual warming to the bottom. The coldest water is found on the western or Ellesmere side of the channel above 100 meters with a narrow pocket at 80 meters that reaches to the center of the channel. This cold water appears closer to the surface further west. In figure 2b, the Kane Basin section from Cape Louis Napoleon to Cape Russell, the temperature minimum appears centered over the deepest part of the channel which is closer to the Greenland shore and with its core located at a depth of about 75 meters. The temperature minimum along the western shore is no longer in evidence although there still is some cold water following the western shore. Temperatures again rise gradually to the bottom in the western-central part of the channel. In figure 2c, the Smith Sound section shows a complete disappearance of the temperature minimum found further north. It is possible that the

temperature minimum could be hugging either shore but the lack of data close to shore precludes drawing any conclusion. Water colder than -1.0°C is found at greater depths than it was further north which very likely is the direct result of the increase in the depth to bottom and the narrowness of the strait between Cape Herschel and Cape Hatherton.

Figures 3a, 3b, and 3c show respectively the temperature distribution between Gale Point and Cape Alexander, Orne Island and Murchinson Sound, and Cape Combermere and Cape Parry. Surface temperatures show a warming trend while the core of the -1.0°C temperature minimum continues to remain at a depth of 100 meters. The extreme temperature minimum found much further north is again apparent in figure 3b with its core located at 75 meters depth at station 8776. Figure 3c shows the edge of a deep canyon at station 8778 with water warmer than 0°C at the bottom. The pocket of warmer than 0°C water can be better seen at station 8778 in figure 4, the upper Baffin Bay section from Cape Norton Shaw to Cape Atholl. There is a temperature maximum of 1.02°C in the core of this warmer water at approximately 340 meters depth. There are in evidence two areas of colder water with their cores located at approximately 75 meters depth between stations 8783 and 8784 and at station 8787. There is insufficient data to clearly demonstrate the formation of these cores of cold water but it has been shown that the coldest water lies at or above 100 meters depth and that the temperatures gradually decrease further south. Figure 5 is a longitudinal representation of vertical temperature distribution including the 1,000-, 1,500-, and 2,000-meter observations in Baffin Bay. In constructing this section an attempt was made to follow the center of the channel and the greater depths.

Figures 6a, 6b, and 6c show the transverse surface to bottom distribution of salinity in the Kennedy Channel, Kane Basin, and Smith Sound sections respectively. The low salinity water at the surface can be directly attributed to fresh water runoff and melting of ice from the Humboldt Glacier and from the fjords along the Ellesmere coast. This can be seen in figure 6a at station 8763 where the low salinity resulted from ice off Cape

Collinson, in figure 6b at station 8758 from Humboldt Glacier ice and at station 8750 from ice at Cape Louis Napoleon. The bottom water also becomes less saline further south through the further addition of fresh water and the mechanism of mixing. Figures 7a, 7b, and 7c depict the transverse surface to bottom distribution of salinity between the Smith Sound and upper Baffin Bay sections and figure 8 shows the conditions found at the upper Baffin Bay section. With the exception of the slightly more saline conditions found in the two northernmost sections, isohalines were fairly uniform for the entire area. This is illustrated by figure 9, the section showing the longitudinal distribution of salinity from Kennedy Channel to upper Baffin Bay.

Figures 10, 11, 12, and 13 show the density (sigma-t) distribution for all oceanographic sections. The deep water of upper Baffin Bay was found to be quite stable. The distribution of specific volume anomaly (10^8) for all sections is shown in figures 14, 15, 16, and 17.

Figures 18, 19, 20, and 21 show the vertical distribution of dissolved oxygen in the areas surveyed. Near surface oxygen values of the northernmost sections were exceptionally high with values as high as 11.20 ml/l at station 8757 and show a decrease with depth. Lower values are associated with the more southerly sections. The distribution of oxygen percent saturation, figures 22, 23, 24, and 25, followed a similar pattern. It is interesting to note that the areas of highest oxygen concentration were located where the greatest amount of ice melting was taking place and where the surface temperatures were moderately high. As an example, the highest oxygen content measured, 11.20 ml/l at station 8757, was located downstream from the Humboldt Glacier and was at the edge of a field of pack ice off Cape Russell with a relatively high surface water temperature of 5.05°C . It would appear that air entrapped in the ice had gone into solution with the sea water as the ice melted. Oxygen content gradually decreased further south although it remained high. The bottom water of Baffin Bay can be readily recognized by the lower oxygen content and percent saturation as noted in the data from stations 8791, 8792, and 8793.

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a

c

b

Figure 2. Temperature distribution ($^{\circ}\text{C}$): (a) Cape Collinson-Cape Jefferson (Stations 8759–8763), (b) Cape Louis Napolcon-Cape Russell (Stations 8750–8758), (c) Cape Herschel-Cape Hatherton (Stations 8767–8770).

Figure 5. Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

a

c

b

Figure 6. Salinity distribution (‰): (a) Cape Collinson-Cape Jefferson (Stations 8759–8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750–8758), (c) Cape Herschel-Cape Hatherton (Stations 8767–8770).

Figure 8. Salinity distribution (‰): Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 9. Salinity distribution (‰): Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

Figure 10. Density distribution (σ_t): (a) Cape Collinson-Cape Jefferson (Stations 8759-8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750-8758), (c) Cape Herschel-Cape Hatherton (Stations 8767-8770).

Figure 11. Density distribution (σ_t): (a) Gale Point-Cape Alexander (Stations 8773-8774), (b) Orne Island-Murchinson Sound (Stations 8775-8777), (c) Cape Combermere-Cape Parry (Stations 8778-8780).

Figure 12. Density distribution (σ_t): Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 13. Density distribution (σ_t): Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

Figure 14. Specific volume anomaly distribution (10^{-5}): (a) Cape Collinson-Cape Jefferson (Stations 8759-8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750-8758), (c) Cape Herschel-Cape Hatherton (Stations 8767-8770).

a

b

c

Figure 15. Specific volume anomaly distribution ($10^6\delta$): (a) Gale Point-Cape Alexander (Stations 8773-8774), (b) Orne Island-Murchinson Sound (Stations 8775-8777), (c) Cape Combermere-Cape Parry (Stations 8778-8780).

Figure 16. Specific volume anomaly distribution (10^5 g): Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 17. Specific volume anomaly distribution (10^5): Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

a

c

b

Figure 18. Oxygen distribution (ml/l): (a) Cape Collinson-Cape Jefferson (Stations 8759-8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750-8758), (c) Cape Herschel-Cape Hatherton (Stations 8767-8770).

Figure 19. Oxygen distribution (ml/l): (a) Gale Point-Cape Alexander (Stations 8773-8774), (b) Orne Island-Murchinson Sound Stations 8775-8777), (c) Cape Combermere-Cape Parry (Stations 8778-8780).

Figure 20. Oxygen distribution (ml/l) : Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 21. Oxygen distribution (ml/l) : Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

Figure 22. Oxygen percent saturation distribution: (a) Cape Collinson-Cape Jefferson (Stations 8759-8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750-8758), (c) Cape Herschel-Cape Hatherton (Stations 8767-8770).

Figure 23. Oxygen percent saturation distribution: (a) Gale Point-Cape Alexander (Stations 8773-8774), (b) Orne Island-Murchinson Sound (Stations 8775-8777), (c) Cape Combermere-Cape Parry (Stations 8778-8780).

Figure 24. Oxygen percent saturation distribution: Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 25. Oxygen percent saturation distribution: Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

Figure 26. Bathythermograph traces for Stations 8750 through 8757.

Figure 27. Bathymograph traces for Stations 8758 through 8765.

Figure 28. Bathymograph traces for Stations 8766 through 8773.

Figure 29. Bathymograph traces for Stations 8774 through 8781.

Figure 30. Bathythermograph traces for Stations 8782 through 8789.

Figure 31. Bathymetric traces for Stations 8790 through 8793.

Observations on the Nutrient Concentrations in the Northern Region of Baffin Bay and the Kane Basin, Summer 1963

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An ice jam in the Kennedy Channel in the spring of 1963 led to open water in the Kane Basin and the northern reaches of Baffin Bay, opening this area for survey work for the first time in many years. Nutt and Coachman (1963) have described the conditions existing at the time when hydrographic observations were made by the USCGC *Evergreen* following its regular annual cruises in more southern waters. In addition to routine observations of temperature, salinity, and oxygen distribution, samples were taken for analysis of various nutrients. The Danish *Godthaab* expedition of 1928 (Hagen, 1936) provides a limited coverage of the nutrient distribution in the area, but analytical techniques have greatly improved since that date. The only other pertinent data on the levels of concentration of nutrients that we have been able to locate occur in the reports from the various ice islands in the Arctic Ocean. Our results represent the most comprehensive coverage available for the area, and therefore the distribution of the quantities observed will be presented in detail.

Methods

Sea water samples were collected on station in 8-ounce plax bottles and stored in deep-freeze lockers for the duration of the cruise. The analyses were carried out by the authors at the Woods Hole Oceanographic Institution, with the assistance of Mr. John Schilling and Mrs. Juanita Morgado. Inorganic phosphate and total phosphorus

determinations were made for all samples. Nitrate- and nitrite-nitrogen, and silicate-silicon concentrations were also measured. The techniques employed are summarized as follows:

Inorganic phosphate was determined by the use of ascorbic acid to reduce the phospho-molybdic complex formed with acidic molybdate solution (Murphy and Riley, 1962). The presence of antimony tartrate promotes more rapid color development and the color, once formed, is stable for long periods. Measurements were made using a model DU spectrophotometer with a 10-cm light path at 900 m μ .

Total phosphorus was analyzed by the modified Harvey method described by Ketchum, Corwin, and Keen (1955). Following digestion in a steam autoclave for 5 hours at a pressure of 40 lbs./sq. in., samples were determined colorimetrically for the molybdate complex as with the inorganic phosphate method, but using a stannous chloride solution as the reducing agent.

Nitrate-nitrogen was determined following reduction with hydrazine in the presence of copper, according to the method of Mullin and Riley (1955a). Samples were read on a DU spectrophotometer at 524 m μ . The value obtained is the total of both the nitrate and nitrite present in a sample.

Nitrite-nitrogen was measured colorimetrically following diazotization with sulfanilic acid coupling with alphanaphthylamine, according to the method of Rider and Mellon (1946). The sample was read on a DU spectrophotometer at 520 m μ .

Silicate-silicon was also measured colorimetrically, using the method described by Mullin and

¹This work has been supported in part by the Office of Naval Research under contract Nonr 2196 (00) NR 083-004. Contribution No. 1506 from the Woods Hole Oceanographic Institution.

Riley (1955b), which depends upon the development of a molybdenum blue complex in acid solution after oxidation with metol-sulfite-oxalate solution. Samples were read at 882 m μ on a DU spectrophotometer.

Profiles of the data for the sections in the Kane Basin, Smith Sound, and Baffin Bay are given in which the distribution of each nutrient measured is indicated by smooth contours, omitting any questionable points. The profiles are grouped by area to form a series of figures for each determination. A longitudinal section which intersects the east-west profiles is also given to indicate the distribution from the mouth of the Kennedy Channel to the deep water of Baffin Bay. Exact placement of the individual sections may be obtained from the map of station positions or the station data, given elsewhere in this publication.

We wish to acknowledge the assistance of the Coast Guard Oceanographic Unit in the preparation of the figures; and to thank all personnel for their cooperation in every phase of this study.

Distribution of Nutrients

Inorganic Phosphate (figs. 32 through 25).

The range of concentration for the inorganic phosphate in the Kane Basin is relatively small. Values at the surface are about 0.50 $\mu\text{gA/l}$, with a minimum surface concentration of less than 0.40 $\mu\text{gA/l}$ extending out from the Greenland coast in the northern sections. A concentration of more than 1.00 $\mu\text{gA/l}$ occurs in each section but is usually restricted to an area near the coasts. In the most northern profile (fig. 32a), this maximum value is found near 100 meters at the western end and at 200 meters at the eastern end of the basin. Contour values slope downward toward the east, although a small region of high concentration occurs near the bottom at the western side of the basin. The inorganic phosphate maximum in the center of the Kane Basin (fig. 32b) is found at about 100 meters on the eastern side of the basin and shows an increased extent away from the edge of the basin; a very restricted maximum is also seen at 50 meters along the western edge. The downward slope of values eastward is less pronounced in this section. At the southern end of the Kane Basin, the inorganic phosphate maximum extends across nearly the whole area at depths from 50 meters to 200 meters (fig. 32c). A pocket of reduced values appears on the eastern slope, while

high phosphate concentrations are found in the deepest water, close to the rugged bottom topography.

The areal extent of the inorganic phosphate maximum increases in the sections from Smith Sound southward, but the value of the maximum concentration remains only slightly above 1.00 $\mu\text{gA/l}$. The section from Gale Point to Cape Alexander (fig. 33a), composed of only two stations, shows a restricted maximum near 100 meters along the Greenland coast and a general value of 0.80 $\mu\text{gA/l}$ in the subsurface water. In the next section (fig. 33b), the inorganic phosphate maximum is confined to the region of the deep basin and does not extend into the more shallow waters of Murchison Sound, represented by station 8777. Subsurface values are about 0.90 $\mu\text{gA/l}$, with the lowest subsurface reading being obtained at station 8775 on the western end of the section. Between Cape Combermere and Cape Parry (fig. 33c) the inorganic phosphate maximum of 1.00 $\mu\text{gA/l}$ does not appear until a depth of 200 meters and then extends to the bottom of the basin at more than 500 meters. The highest values occur from 200 to 400 meters at station 8778. Low deep-water values are seen on the western end of the section, between stations 8779 and 8780.

The cross section from Cape Norton Shaw to Cape Atholl (fig. 34) has the inorganic phosphate maximum as a wide band across the whole profile at a depth of 100 to 300 meters. A value of more than 1.20 $\mu\text{gA/l}$ is found in the eastern part of the section at stations 8787 through 8789. A concentration of more than 1.00 $\mu\text{gA/l}$ occurs in the deep water near the bottom of the eastern part of the section. A region at a depth of 300 to 500 meters where phosphate values are less than 0.90 $\mu\text{gA/l}$ separates these two areas of high concentration.

The relative differences in inorganic phosphate distribution from the Kane Basin to the deep water of Baffin Bay can be seen in the longitudinal section (fig. 35). The value of the phosphate maximum gradually increases. The deep water of Baffin Bay, as seen at stations 8791 through 8793, shows its highest phosphate level on the edge of the basin. The concentration of 1.20 $\mu\text{gA/l}$ occurring between 600 and 800 meters in these stations seems to relate most directly to the phosphate maximum at station 8787 which reaches 1.20 $\mu\text{gA/l}$ at a depth of 300 meters. The range of values from surface to bottom is greater in Baffin Bay than in the Kane Basin.

Total Phosphorus (figs. 36 through 39).

An especially large difference is found between inorganic phosphate and total phosphorus distributions in the northern Kane Basin. The total phosphorus concentration rises rapidly from a surface value of $0.60 \mu\text{gA/l}$ at 50 meters on the eastern side of the basin and at a depth near 200 meters on the western side (fig. 36a). The slope of the sub-surface contours is thus the reverse of that seen for inorganic phosphate. Total phosphorus values near $1.00 \mu\text{gA/l}$ are found below 150 meters on the Greenland slope. In the middle of the Kane Basin (fig. 36b), a band of high values occurs at a depth of about 100 meters: a high concentration of $1.50 \mu\text{gA/l}$ total phosphorus is seen on the eastern side at stations 8756 and 8757 and values in the western region reach nearly as great a concentration. Values less than $1.00 \mu\text{gA/l}$ fill in the deep water of the basin below 150 meters—this is the only section which shows such low total phosphorus levels in the deep water, although some increase to high values immediately above the bottom in the center of the basin may be seen. The southern Kane Basin (fig. 36c) shows a high concentration of total phosphorus throughout the entire water column. Surface values are nearly $1.00 \mu\text{gA/l}$. The maximum value is not quite as great as seen further north: a value of $1.40 \mu\text{gA/l}$ has a limited occurrence on the Greenland slope and a concentration of $1.30 \mu\text{gA/l}$ extends a little further from the coast near 100 meters. Values in deep water drop to $1.10 \mu\text{gA/l}$ or less near the bottom.

In the region of Smith Sound the total phosphorus concentration decreases. Insufficient data are available to give the distribution from Gale Point to Cape Alexander. From Orne Island to Murchison Sound, however, the surface concentration of total phosphorus is $0.80 \mu\text{gA/l}$ in the east and $0.70 \mu\text{gA/l}$ in the west (fig. 37a). At 100 meters a value of $1.30 \mu\text{gA/l}$ is found across this section: a small area of $1.40 \mu\text{gA/l}$ occurs at station 8777 representing Murchison Sound. Concentrations near $1.00 \mu\text{gA/l}$ intrude in the deep water in the western part of the section below 300 meters. In the next section (fig. 37b) the maximum values are depressed to a depth near 200 meters. Concentrations rise to $1.30 \mu\text{gA/l}$ from 250 to 300 meters in the center of the basin. Values less than $1.00 \mu\text{gA/l}$ occur in the deep water on the western side of the basin but show a more restricted distribution than further north.

The section at the northern end of Baffin Bay shows an increase in the total phosphorus levels once more (fig. 38). A concentration of $1.40 \mu\text{gA/l}$ occurs at 100 meters on the eastern edge and values as high as $1.60 \mu\text{gA/l}$ are seen at 300 meters in the same area. In the western region the highest value is $1.30 \mu\text{gA/l}$ from 200 to 350 meters. A low concentration of less than $1.00 \mu\text{gA/l}$ occurs in the depths of the basin in the west while the eastern deep water has a high value of $1.50 \mu\text{gA/l}$.

In the longitudinal section (fig. 39) a high concentration appears at station 8764, the shallowest depth in the Kane Basin, and then a general restriction of the maximum is seen along with a decline of the values at mid-depths throughout the area of Smith Sound. At station 8787 the total phosphorus maximum reaches $1.50 \mu\text{gA/l}$ again at 200 to 400 meters. This value is also seen in the deep water of Baffin Bay from 800 to 1,500 meters. Surface water of the Baffin Bay stations appears to be somewhat lower in total phosphorus than the area of Smith Sound. The confused pattern of distribution in the deep water of Baffin Bay is noteworthy, but no apparent cause is suggested by the present examination.

The difference of the total phosphorus and the inorganic phosphate determinations represents the total organic phosphorus. The highest levels of organic phosphorus occur in the Kane Basin, as seen from a comparison of figures 32 and 36. A significant amount of organic phosphorus is present throughout the entire area, as will be shown by a statistical analysis for the mean frequency distribution which is presented later.

Nitrate-Nitrogen (figs. 40 through 43).

The highest nitrate concentrations in the region of the Kane Basin are found near the bottom. The most northern section (fig. 40a) shows a small area of nitrate as high as $13 \mu\text{gA/l}$ at a depth of 200 meters on the eastern side of the basin, while the surface concentrations are low and low values also occur to a depth of 150 meters on the western edge and near the bottom in the center of the basin. The section in the center of the Kane basin (fig. 40b) has the same low nitrate values for the surface with a small maximum appearing at 100 meters at stations 8758 and 8757 on the eastern side. A value of $11 \mu\text{gA/l}$ is observed here and also in the deepest part of this same region. A pronounced maximum occupies the deep water in the center of the southern Kane Basin (fig. 40c), with the highest

concentration of 14 $\mu\text{gA/l}$ at 200 meters and again at the bottom.

Lower nitrate concentrations occur in Smith Sound. A small area with a concentration of 10 $\mu\text{gA/l}$ is seen in figure 41a as a tongue dipping down from 150 meters near Cape Alexander to a little below 200 meters at station 8774. The general level of deep water is between 8 and 9 $\mu\text{gA/l}$, with isolated pockets of higher and lower concentrations also seen. A slight increase in the level of nitrate is seen in the next section (fig. 41b). Values greater than 10 $\mu\text{gA/l}$ are found from 100 meters near Murchison Sound and slope westward to the deep water. Similarly the low concentrations at the surface (less than 5 $\mu\text{gA/l}$) show a slope to the westward, reaching to a depth of 200 meters at station 8775. Maximum nitrate values remain concentrated on the eastern side in the section from Cape Combermere to Cape Parry (fig. 41c). Nitrate levels in the deep water rise to 13 $\mu\text{gA/l}$ and even values of 14 $\mu\text{gA/l}$ in the central basin, while the deep trench at station 8778 has reduced nitrate values in its greatest depths.

The section from Cape Norton Shaw to Cape Atholl, Greenland (fig. 42) introduces considerable more complexity in the nitrate distribution pattern. The surface concentrations across the section are less than 1 $\mu\text{gA/l}$, rising rapidly to values about 5 $\mu\text{gA/l}$ in most of the area. However, very low values persist along the eastern margin of the section and in a depression near the western border. The deep water on the western side reaches a maximum of 10 $\mu\text{gA/l}$ at a depth of 250 meters. The highest values in the section are found at 200 meters in the eastern part of the area, where nitrate concentrations as high as 15 $\mu\text{gA/l}$ occur. In this same region, however, the deepest water drops to a minimum value of 5 $\mu\text{gA/l}$, although a small increase at the bottom can be seen in the center of the basin.

The longitudinal variation (fig. 43) is presented in a more diagrammatic fashion, since only every fifth contour is indicated. Values in the Kane Basin and Smith Sound are lower than those occurring in the northern reaches of Baffin Bay. The slope area leading to deep water in Baffin Bay has high nitrate concentrations of 15 to 20 $\mu\text{gA/l}$.

Separate profiles have not been given for the nitrite-nitrogen which was also determined, but the data are presented in the records of the cruise. Low values were obtained throughout the area,

with a concentration as great as 0.1 $\mu\text{gA/l}$ being found only occasionally.

Silicate-Silicon (figs. 44 through 47).

High silicate concentrations of more than 10 $\mu\text{gA/l}$ are found at about 100 meters depth on the eastern and western rims of the northern Kane Basin (fig. 44a), while a band of 9 $\mu\text{gA/l}$ silicate occurs across the basin at a depth of 200 meters. Low values of 5 to 6 $\mu\text{gA/l}$ predominate at the bottom. In the central Kane Basin (fig. 44b) the maximum on the western slope at station 8750 reaches 12 $\mu\text{gA/l}$ at 100 meters, and the silicate values then decrease. On the eastern side, however, the silicates show a continual increase from surface to bottom at station 8758. The middle portion of the south Kane Basin (fig. 44c) attains values greater than 13 $\mu\text{gA/l}$ from 100 to 200 meters. Low values are seen on each slope. The deep water on the eastern side of the basin maintains a high concentration greater than 12 $\mu\text{gA/l}$, while on the western side the concentration decreases to less than 10 $\mu\text{gA/l}$ by 400 meters.

The highest silicate concentrations in Smith Sound (fig. 45a) occur as a tongue from the eastern side between 100 and 200 meters, where a value of 14 $\mu\text{gA/l}$ is attained. Below 250 meters the concentration decreases to 7 $\mu\text{gA/l}$ at 400 meters. Except for a small rise in the deep water of the eastern slope, the silicate remains low to the bottom. Conditions in the area of Murchison Sound (fig. 45b) are much the same, except that the deep water below 200 meters at station 8776 remains over 12 $\mu\text{gA/l}$ to the bottom while the eastern slope area decreases to 8 $\mu\text{gA/l}$. Surface values in the section from Cape Combermere to Cape Parry (fig. 45c) are low—a concentration of 5 $\mu\text{gA/l}$ is not found in the central basin until a depth of 100 meters. The highest silicate concentrations occur as a tongue near Cape Parry where a maximum of 19 $\mu\text{gA/l}$ is found just below 200 meters. Below 300 meters the deep water of the basin is about 9 $\mu\text{gA/l}$ except for a small area of high concentration along the bottom of the main basin, not extending into the deep trench near Cape Parry itself.

The section from Cape Norton Shaw to Cape Atholl shows considerable complexity in its distribution pattern (fig. 46). Near the Greenland coast surface values are depressed, but a large area of high silicate concentration appears off the eastern slope at a depth of 200 meters. A maximum

value of 20 $\mu\text{gA/l}$ is found here. Another region of high silicates is found on the western side of the section, where a value of 18 $\mu\text{gA/l}$ is attained. From 400 to 500 meters a band of lower silicate concentration (less than 10 $\mu\text{gA/l}$) stretches across the section. Silicate values rise once more to the bottom, however, and the concentration reaches 15 $\mu\text{gA/l}$ at 600 meters in the center of the basin.

The final figure presents the longitudinal variation in silicate distribution (fig. 47), adding the data from deep stations in Baffin Bay to that already presented. An intermediate silicate maximum greater than 10 $\mu\text{gA/l}$ exists throughout the area. Values near the bottom show only a small increase until the deep water of Baffin Bay is reached, where silicate levels increase uniformly with depth to values of more than 40 $\mu\text{gA/l}$. Still higher values are found along the steep slope of the deep basin, but with a very irregular pattern. It should be noted that silicate levels near the surface in Baffin Bay are not quite as great as to the north. The very pronounced increase in deep water commences at about 600 meters.

Discussion

The most northern stations in the present survey have nutrient characteristics most nearly similar to the Arctic Ocean. Silicate results from Station Bravo on Ice Island T3 are given by Kusumoki (1960) and Muguruma (1961) in which the waters of the Arctic Ocean are slightly richer at 100 meters than in the Kane Basin. Similarly, a higher value for total phosphorus is reported by Farlow (1958) at Ice Island Alpha (82°N. , 105°W.), though deep water concentrations are in agreement with our data. The pronounced halocline in Arctic Intermediate Water may provide an effective barrier to upward mixing of nutrients in the North Polar Sea, causing these increases in the maximum concentrations while also acting to keep down surface productivity.

From the southern end of Kane Basin southward, the nutrient conditions are most nearly like Baffin Bay, suggesting that water from the Kane Basin area flows into Baffin Bay and adds to the deep water there. Bailey (1956) has shown from temperature-salinity data that deep Baffin Bay water (below 1,250 m) originates in the Arctic Ocean at a depth of 250 m; and Timofeyev (1963) has calculated from observations of Collin (1960) that 12 percent of the total Arctic Ocean outflow

occurs through the Canadian Archipelago. The Kane Basin is intermediate in this circulation. The nutrients entering Baffin Bay are restricted by the sill depth of Davis Strait and hence tend to accumulate in the deep water (Corwin and McGill, 1963).

The difference of the total phosphorus concentration and the value of inorganic phosphate represents an estimate of the amount of organic phosphorus present. A statistical evaluation of this parameter is given in table I, where the number of available values (n), the mean organic phosphorus in $\mu\text{gA/l}(\bar{x})$, the variance (s^2), standard deviation (s), and the standard error of estimate ($s/\sqrt{n}$) are presented. The very high mean amounts of organic phosphorus obtained may be compared with the results of a similar determination on the standard U.S. Coast Guard Ice Patrol section in the Labrador Sea, where a level of 0.1513 $\mu\text{gA/l}$ is found in summer 1963 for the 0- to 1,000-meter depth increment (McGill and Corwin, 1964, in press). For the total of all data below 1,000 meters, a value of 0.1172 $\mu\text{gA/l}$ was obtained. The organic phosphorus is most probably a part of local circulation only and not exchanged over broad horizontal limits, the material being regenerated at depth in the region of its surface accumulation.

The observed nutrient quantities can be converted to ratios of the rate of change (by atoms) through a least squares regression. The general average for these ratios of change in Atlantic Ocean waters has been determined by Richards (1957) as

$$\Delta\text{Si} : \Delta\text{N} : \Delta\text{P} = 16 : 16 : 1.$$

Proportions of this general magnitude are observed in most of the area here analysed, although there is a distinct decline in the relative nitrogen level for the most northern region (Kane Basin, Section A). The general average from the mean values of the respective sections is given in table II:

$$\Delta\text{Si} : \Delta\text{N} : \Delta\text{P} = 19.64 : 16.63 : 1.$$

The relative proportions show a tendency to increase southward, with highest results appearing as Baffin Bay is reached. The three deep stations in Baffin Bay are subdivided into a surface segment (0-500 m) and a deep water segment (below 500 m), since there is a considerable accumulation of silicate near the bottom and determinations of the silicate to phosphorus ratio for the total water column would give an anomalous high value.

Richards (1957) has suggested that the increase in silicate relative to phosphorus in deep water originates from *in situ* resolution of skeletal remains of diatoms or from resolution of bottom deposits followed by upward diffusion.

Summary

Low nutrient values and a limited range of concentrations from surface to bottom are found in the Kane Basin. As Baffin Bay is approached the

range of values increases and more distinct intermediate-depth maxima occur. An excessive accumulation of nutrient salts in the deep water of Baffin Bay is found. It is suggested that this represents at least partly a reservoir of excess nutrients from Kane Basin and Smith Sound. The organic phosphorus level suggests a considerable biomass. Ratios of change (by atoms) between the nutrient elements are not markedly different from those in other areas.

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a

c

b

Figure 32. Inorganic phosphate distribution ($\mu\text{gA/l}$): (a) Cape Collinson-Cape Jefferson (Stations 8759X8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750–8758), (c) Cape Herschel-Cape Hatherton (Stations 8767–8770).

Figure 33. Inorganic phosphate distribution ($\mu\text{gA/l}$): (a) Gale Point-Cape Alexander (Stations 8773-8774), (b) Orne Island-Murchinson Sound (Stations 8775-8777), (c) Cape Combermere-Cape Parry (Stations 8778-8780).

Figure 34. Inorganic phosphate distribution ($\mu\text{gA/l}$): Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 35. Inorganic phosphate distribution ($\mu\text{gA/l}$): Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

Figure 36. Total phosphorus distribution ($\mu\text{gA/l}$): (a) Cape Collinson-Cape Jefferson (Stations 8759–8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750–8758), (c) Cape Herschel-Cape Hatherton (Stations 8767–8770).

Figure 37. Total phosphorus distribution ($\mu\text{gA/l}$): (a) Orne Island-Murchinson Sound (Stations 8775-8777), (b) Cape Combermere-Cape Parry (Stations 8778-8780).

Figure 38. Total phosphorus distribution ($\mu\text{g/l}$): Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 39. Total phosphorus distribution ($\mu\text{gA/l}$): Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

a

c

b

Figure 40. Nitrate-nitrogen distribution ($\mu\text{gA/l}$): (a) Cape Collinson-Cape Jefferson (Stations 8759–8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750–8758), (c) Cape Herschel-Cape Hatherton (Stations 8767–8770).

a

b

c

Figure 41. Nitrate-nitrogen distribution ($\mu\text{gA/l}$): (a) Gale Point-Cape Alexander (Station 8773-8774), (b) Orne Island-Murchinson Sound (Stations 8775-8777), (c) Cape Combermere-Cape Parry (Stations 8778-8780).

Figure 42. Nitrate-nitrogen distribution ($\mu\text{g A/l}$): Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 43. Nitrate-nitrogen distribution ($\mu\text{gA/l}$): Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

a

c

b

Figure 44. Silicate-silicon distribution ($\mu\text{gA/l}$): (a) Cape Collinson-Cape Jefferson (Stations 8759–8763), (b) Cape Louis Napoleon-Cape Russell (Stations 8750–8758), (c) Cape Herschel-Cape Hatherton (Stations 8767–8770).

Figure 45. Silicate-silicon distribution ($\mu\text{gA/l}$): (a) Gale Point-Cape Alexander (Station 8773-8774), (b) Orne Island-Murchinson Sound (Station 8775-8777) (c) Cape Combermere-Cape Parry Station (8778-8780).

Figure 46. Silicate-silicon distribution ($\mu\text{gA/l}$): Cape Norton Shaw-Cape Atholl (Stations 8781-8790).

Figure 47. Silicate-silicon distribution ($\mu\text{gA/l}$): Kane Basin, Smith Sound, Baffin Bay (longitudinal section).

TABLE I. Determination of mean values ($\bar{x}$, $\mu\text{gA/l}$) and statistical limits for organic phosphorus in selected sections in the Kane Basin and Baffin Bay

Area	Approximate latitude		Depth interval	
			0-999 meters	Over 1,000 meters
Kane Basin	~80° N.	n	56	(maximum depth 309 meters)
		$\bar{x}$	0.4045	
		s^2	0.1694	
		s	0.4116	
		$s/\sqrt{n}$	0.0550	
	~79°20' N.	n	97	(maximum depth 301 meters)
		$\bar{x}$	0.2644	
		s^2	0.0800	
		s	0.2829	
		$s/\sqrt{n}$	0.0287	
	~78°30' N.	n	82	(maximum depth 503 meters)
		$\bar{x}$	0.2854	
		s^2	0.0892	
		s	0.2987	
		$s/\sqrt{n}$	0.0330	
Smith Sound	~77°30' N.	n	89	(maximum depth 953 meters)
		$\bar{x}$	0.2663	
		s^2	0.0761	
		s	0.2759	
		$s/\sqrt{n}$	0.0292	
Baffin Bay, northern limit	~76°20' N.	n	134	(maximum depth 588 meters)
		$\bar{x}$	0.2653	
		s^2	0.0610	
		s	0.2469	
		$s/\sqrt{n}$	0.0213	
Baffin Bay, deep basin	~74°50' N.	n	71	26 (maximum depth 2085 meters)
		$\bar{x}$	0.2789	
		s^2	0.0725	
		s	0.2693	
		$s/\sqrt{n}$	0.0320	

TABLE II. The ratio of change, by atoms, for nutrient quantities in the total water column in various regions of the Kane Basin and Baffin Bay

Area	Approximate latitude	ΔSi :	ΔN :	ΔP
Kane Basin:				
1. Section A: Sta. 8759-8763, Cape McClintock to Cape Madison.	$\sim 80^\circ \text{N}$ -----	16.25:	7.62:	1
2. Section B: Sta. 8750-8758, Cape Louis Napoleon to Cape Russell.	$\sim 79^\circ 20' \text{N}$ -----	15.64:	13.76	1
3. Section C: Sta. 8767-8772, Cape Herschel to Cape Hatherton.	$\sim 78^\circ 30' \text{N}$ -----	18.37:	19.54:	1
Smith Sound, Sections A, B, C, Sta. 8773-8780-----	$\sim 77-78^\circ \text{N}$ -----	19.18:	19.06:	1
Baffin Bay, northern limit, Sta. 8781-8790-----	$\sim 76^\circ 20' \text{N}$ -----	24.18:	23.19:	1
Baffin Bay, Sta. 8791-8793-----	$\sim 74^\circ 50' \text{N}$ -----			
1. Surface to 500 m-----	-----	21.42:	20.45:	1
2. Below 500 m-----	-----	27.08:	12.76:	1
General average for all data (mean of above means).		19.64:	16.63:	1

Sediments and Topography of Kane Basin¹

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Introduction

Kane Basin, located between Greenland and Ellesmere Island, has an area of about 27,000 km², approximately the size of the State of New Jersey. With the exception of a few scattered soundings, no data on the submarine geology of the area are available. Sediment samples from USCGC *Evergreen* described in this report are the first that have been collected from the region.

Kane Basin was first explored by the Second Grinnell Expedition under the command of Elisha Kent Kane. The destination of this expedition was the northernmost penetrable point of Baffin Bay from which a search for the missing vessels of Sir John Franklin was to be attempted. Kane and the other members of the expedition sailed as far north as 78°45' N. aboard the brig *Advance* before they were stopped by the ice. During their stay in the region, from the fall of 1853 to the spring of 1855, the coasts of Kane Basin were charted and Kennedy Channel and Humboldt Glacier were discovered (fig. 48). In addition, meteorological, magnetic, astronomical, tidal, geological, and botanical observations were made and the animal and eskimo life of the area were investigated (Kane, 1856, 1857a, 1857b, 1858, 1859, and 1860). In May 1855 *Advance*, still trapped in the ice, was abandoned and the party reached Upernavik in south Greenland (Latitude 73° N.) in 83 days where they were found by a Government expedition under the command of Lieut. H. J. Hartstene.

Geologic Setting

Imposing sea-cliffs hundreds of meters high border most of Kane Basin. On the east side, Humboldt Glacier, a 100-meter high and 100-kilometer long feature extending from Cape Agassiz in the south to Cape Forbes in the north, divides the ice-free Greenland coastal strip in two

(figs. 48 and 49). South of the glacier is Inglefield Land with a relief of 300 to 700 meters along the coast and reaching an elevation of 1,000 meters near the inland ice (Malaurie, 1955). Washington Land, an ice-free 120-kilometer wide plateau, north of Humboldt Glacier is bordered on its seaward side by an escarpment hundreds of meters high. Along the Ellesmere Island side of Kane Basin the cliffs are incised by seven rather narrow fjords that trend in an east-west direction and extend inland for nearly 100 kilometers. The remarkably linear coast along the Kane Basin and the region to the north and south suggests that the east coast of Ellesmere Island may be a fault scarp (fig. 50). Wilson (1963) has named this fracture the Wegener Fault. Left lateral movement along this fracture supposedly caused Greenland to migrate eastward, separating it from the Canadian Archipelago, leading to the formation of Kane Basin and the other basins and channels between Ellesmere Island and Greenland.

Rocks in the region range in age from Precambrian to lower Paleozoic. Archean granites, granitic and garnetiferous gneisses and gneissoid quartzites associated with acid and basic igneous rocks occur throughout the area south of Johan Peninsula in Ellesmere Island and Inglefield Land in Greenland (Berthelsen, 1961, and Blackadar and Fraser, 1961). In these two areas the Archean rocks are unconformably overlain by Proterozoic dolomites, coarse sandstones and sandy conglomerates. From Johan Peninsula to Cape Collinson on the Ellesmere Island side of Kane Basin and from Inglefield Land to Washington Land on the Greenland side, a thin sequence of relatively undisturbed Paleozoic limestones and detrital sedimentary rocks rest unconformably on the Precambrian rocks (Cowie, 1961, and Thorsteinsson and Tozer, 1961). North of Cape Collinson a thick sequence of Ordovician limestones, dolomites, red, white, and gray sandstones and bituminous shales is exposed along the sea cliffs.

¹Woods Hole Oceanographic Institution Contribution No. 1463.

Figure 49. Positions of spot soundings and echo sounding tracklines used in contouring figure 51.

Figure 50. Structure of the region between Greenland and the Canadian Archipelago. From Wilson (1963).

Figure 51. Bottom topography of Kane Basin.

Bottom Topography

Knowledge of the bottom topography of Kane Basin is based on scattered soundings from H.O. Chart 6606 and the Edo tracklines taken by USCGC *Evergreen* in the area during late July and early August, 1963. The area has been contoured at a 200-meter interval (figs. 49 and 51). Depths are based on a sound velocity of 1,463 meters (800 fathoms) per second, the calibration of the instrument, as no velocity correction has been applied to the soundings.

Humboldt Glacier is bordered on its seaward side by a broad platform or shelf that dips gently in a seaward direction (figs. 51 and 52). At a depth of about 200 meters is a slight increase in gradient and the bottom deepens gradually to about 300 meters in the vicinity of Ellesmere Island. Near the island the bottom shoals to less than 10 meters in just a few kilometers. This broad platform which fills most of Kane Basin may represent a sedimentary prism deposited by Humboldt Glacier. A broad flat-bottomed channel which appears to extend into Smith Sound cuts the southwest margin of this platform. The southern entrance to Kane Basin is extremely irregular, but Smith Sound farther south is an almost featureless plain whose surface is broken by a small seamount and a narrow depression having a maximum depth of 1,080 meters. A number of small channels, seaward extensions of the fjords along the coast, incise the side slopes of Smith Sound and debouch onto the smooth plain in the middle of the sound.

Bottom Deposits

Textural analyses of eight samples collected by USCGC *Evergreen* were made using standard pipette techniques for silt and clay, a settling tube for the sand fraction and sieving for the gravel fraction (Krumbein and Pettijohn, 1938, and Emery, 1938). Calcium carbonate was measured by the gasometric technique (Bien, 1952). The sand fractions were examined under a binocular microscope and percentages of the major constituents were estimated. Clasts in the gravel were identified with the aid of a hand lens.

All the samples contain angular to subrounded clasts which range in size from 2 mm to 10 cm. These fragments, which are believed to have been rafted by ice to their present position, are mainly black to tan coarse to fine grained limestones, followed by granite, sandstone, and quartz diorite (figs. 53 and 54).

Sediments vary in color from gray to reddish-brown and have median diameters ranging from 10 to 54 microns (table III). Standard deviation values lie between 2.06 and 4.05, meaning that 68 percent of the weight of the samples consist of grains within a range of 2.06 to 4.05 Wentworth size grades. With the exception of sample 8773 which is probably a normal hemipelagic deposit, the cumulative curves of the sediments from this area bear a strong resemblance to a curve of Pleistocene till from Wisconsin (fig. 55). Although the curves are similar, the sediments from Kane Basin are probably mainly ice-rafted rather than deposited by the ice as was the till.

TABLE III. Sediment parameters

Sample No.	Color	Percent gravel	Percent sand	Percent silt	Percent clay	Md. Dm. (microns)	Standard ¹ deviation σ_{ϕ}	Percent CaCO ₃
8752	Gray	3.2	21.9	45.0	29.9	18	3.32	11.7
8758	Gray	9.9	38.2	31.3	20.6	58	3.66	17.3
8761	Reddish-brown	3.1	30.1	50.2	16.6	58	3.06	13.2
8762	Gray	6.2	28.7	51.4	13.7	44	3.03	30.2
8765	Gray	5.7	22.8	42.5	29.0	26	3.63	13.6
8766	Gray	6.3	21.1	50.7	21.9	32	3.24	18.6
8770	Reddish-brown	8.1	42.8	27.3	21.8	72	4.05	21.3
8773	Reddish-brown	0.0	6.9	58.7	34.4	10	2.94	-----
8777	Gray	1.7	44.6	44.1	9.6	54	2.06	1.6

¹ Computed from moment measures (Krumbein and Pettijohn, 1938, p. 249).

Figure 52. Bottom profiles of Kane Basin. Vertical exaggeration 57X.

Figure 53. Limestone pebble recovered at Station 8762.

Figure 54. Pebbles recovered at Station 8770. The three at the left are limestone, the ones in the center granite, the one at the upper right coarse sandstone, and the one at the lower right quartz-diorite.

Figure 55. Comparison of sediment cumulative curves from Kane Basin with a curve of Pleistocene till from Wisconsin. The till curve is from Pettijohn (1949).

TABLE IV. Composition of sand fraction

Constituents	Stations								
	8752	8758	8761	8762	8765	8766	8770	8773	8777
	<i>Percent</i>								
Quartz-feldspar.....	96	93	92	88	97	84	81	99	83
Rock fragments.....	2	6	6	7	2	15	15	1	13
Coal.....	1	0	1	4	0	0	0	0	0
Foraminifera.....	0	<1	<1	<1	<1	<1	3	<1	<1
Shell fragments.....	0	0	0	<1	0	0	0	0	0
Dark minerals.....	1	<1	<1	<1	<1	<1	<1	<1	<1
Frosted grains.....	<1	<1	<1	<1	<1	<1	<1	<1	<1

The sand fraction in each sample is dominated by angular to subangular grains of quartz and feldspar (table IV). Rock fragments are the next most abundant constituent. Well-rounded frosted quartz grains and red-stained quartz grains are also present. Benthic foraminiferal tests and shell fragments occur in amounts of less than one percent. An unusual component of the sand fraction is angular to subangular coal fragments. Source of these fragments may be the Paleozoic bituminous shales that crop out on both sides of Kane Basin, or the Eureka Sound Formation of Mesozoic-Cenozoic age, inliers of which occur along the east coast of Ellesmere Island (Tozer, 1961).

Calcium carbonate in the sediments ranges from 1.6 to 30.2 percent. It appears to be mainly in the form of limestone fragments; calcium carbonate of organic origin, foraminiferal tests, and shell fragments constitute less than 5 percent of the

carbonate present. The carbonate fraction in the sediment also appears to be concentrated in the finer fractions. For example, of the 30.2 percent calcium carbonate present in sample 8762, 3.8 percent is in the gravel, 4.6 in the sand, 19.6 in the silt, and 2.2 in the clay fraction.

Summary

Except for a narrow channel, Kane Basin consists of a broad platform or shelf that dips gently in a westward direction. This platform is probably a sedimentary prism deposited by Humboldt Glacier which has filled most of the basin. The strait separating Kane Basin from Smith Sound is extremely irregular and has the appearance of a rocky bottom, but Smith Sound farther south is a smooth depositional plain. Sediments in the region are gray to reddish-brown, poorly sorted calcareous sandy silts containing appreciable quantities of gravel. They consist mainly of ice-rafted material.

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TABLE V. Table of oceanographic data

The following is the observed and interpolated data for the Coast Guard Oceanographic Unit oceanographic stations taken in Kennedy Channel, Kane Basin, Smith Sound, and upper Baffin Bay from CGC *Evergreen*, 28 July–4 August 1963. Presentation is from National Oceanographic Data Center Cruise Listing No. 31-174.

Notes:

Depth to bottom—Uncorrected sounding depth in meters based on a speed of sound in sea water of 4,800 ft./sec.

Depth (m)—Postscript T indicates a depth determined by thermometric calculations.

Sound Velocity—In meters per second to tenths according to Wilson's formula.

A complete description of codes can be found in NODC publication M-2, "Processing Physical and Chemical Data from Oceanographic Stations."

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DATE INDICATOR	MARSDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER						10°	1°	MONTH		DAY	HR 1/10			CRUISE NUMBER	STATION NUMBER	DIR	HGT		PER	SEA AMT		TYPE	AMT
31	174	EV	7934 N	07239 W	260	92	07	28	191	1963	PPS 8750	0241	02	02			2		2	2		0001		
		WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS												
		COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)		DRY BULB	WET BULB															
								02	F02	064	078	061												
MESSANGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T		SPECIFIC VOLUME ANOMALY - X10 ³		Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₄ - Si μg-at/l	O ₂ % sat						
		STD	0000	-0005	3071	2467		0032768		0000	14431													
195	OBS	0000		-0005	3071	2467					14431				067	102	006	007	006					
	STD	0010		-0091	3113	2504		0029263		0031	14398	909												
195	OBS	0010		-0091	3113	2504					14398	909			082	112	007	017	008	1071				
	STD	0020		-0119	3156	2540		0025878		0059	14393	873												
195	OBS	0020		-0119	3156	2540					14393				092	120	005	040	011					
	STD	0030		-0123	3164	2546		0025245		0084	14394	839												
195	OBS	0030		-0123	3164	2546					14394	839			082	125	004	023	008	984				
	STD	0050		-0109	3249	2615		0018742		0128	14416	779												
195	OBS	0050		-0109	3249	2615					14416	779			103	133	006	054	012	923				
195	OBS	0074		-0100	3334	2683					14436				080	105	007	045	007					
	STD	0075		-0100	3336	2685		0012089		0167	14436	709												
195	OBS	0099		-0100	3376	2717					14446	668			094	119	002	070	013	801				
	STD	0100		-0099	3377	2718		0008943		0193	14447	668												
195	OBS	0124		-0087	3401	2737					14460				092	097	004	060	010					
	STD	0125		-0087	3402	2737		0007069		0213	14460	665												
195	OBS	0148		-0074	3416	2748					14472	663			083	102	005	061	008	804				
	STD	0150		-0073	3417	2749		0005970		0229	14473	665												
195	OBS	0173		-0058	3432	2761					14485	677			072	094	001	063	007	825				
195	OBS	T0198		-0038	3444	2769					14501	680			074	089	003	062	007	834				
	STD	0200		-0036	3445	2770		0003993		0254	14502	680												
195	OBS	T0232		-0005	3464	2784					14524	677			105	122	007	073	006	838				

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DATE INDICATOR	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
COUNTRY CODE	IDENTITY NUMBER					10°	1°	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	
31	174	EV	79289N	072351W	260	92	07	28	203	1963	PPS	8751	0260	02	00			0		2	2	0002	
		WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS											
		COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)		DRY BULB	WET BULB														
MESSANGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T		SPECIFIC VOLUME ANOMALY - X10 ³		Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₄ - Si μg-at/l	O ₂ % sat					
		STD	0000	0042	3105	2493		0030357		0000	14457												
211		OBS	0000	0042	3105	2493					14457				051	093	006	004					
211		OBS	0010	0126	3151	2525					14504	1010	049	084	003	001	002	1262					
		STD	0010	0126	3151	2525		0027272		0029	14504	1010											
211		OBS	0019	0067	3215	2580					14487		045	094	006	001	001						
		STD	0020	0063	3220	2584		0021669		0053	14486	996											
211		OBS	0029	0024	3263	2621					14476	944	049	104	007	001	001	1159					
		STD	0030	0014	3267	2624		0017841		0073	14472	929											
211		OBS	0048	-0104	3321	2673					14428	714			005	085	015	852					
		STD	0050	-0103	3323	2674		0013088		0104	14429	714											
211		OBS	0072	-0098	3346	2693					14438		074	106	006	036	006						
		STD	0075	-0099	3349	2695		0011097		0134	14439	707											
211		OBS	0096	-0100	3369	2711					14444	690	078	105	006	049	007	827					
		STD	0100	-0099	3372	2714		0009326		0160	14446	684											
211		OBS	0121	-0095	3385	2724					14453		082	113	003	055	013						
		STD	0125	-0094	3387	2726		0008185		0182	14454	645											
211		OBS	0145	-0091	3401	2737					14461	614	082	103	006	059	010	740					
		STD	0150	-0087	3404	2739		0006904		0200	14464	632											
211		OBS	0169	-0060	3423	2753					14483	672	080	102	015	066	008	818					
211		OBS	T0193	-0003	3463	2783					14518	661	081	107	006	056	007	812					
		STD	0200	-0003	3464	2784		0002744		0225	14520	661											
211		OBS	T0240	0000	3468	2787					14528	663	089	095	002	066	006	823					

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DRIFT INDICATOR	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA		TYPE	AMT			
31	174	EV	79283N	07159 W		260	91	07	28	220	1963	PPS 8752	0241	02	00			0		2	2		0003		
						WATER		WIND		AIR TEMP °C		VIS CODE		ADD'L OBS	SPECIAL OBSERVATIONS										
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbars)	DRY BULB	WET BULB													
									00	F00	061	111	083												
MESSANGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X10 ³		Σ Δ DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₂ - Si μg-at/l	O ₃ ‰ sat.								
		STD	0000	0265	3144	2510	0028719		0000	14563															
223	OBS	0000	0265	3144	2510					14563		037	078	004	000	001									
		STD	0010	0033	3184	2557	0024275		0026	14466	1062														
223	OBS	0010	0033	3184	2557					14466	1062	045	102	004	001	002	1299								
		STD	0020	-0056	3248	2612	0019010		0048	14435	919														
223	OBS	0020	-0056	3248	2612					14435		066	100	005	021	005									
		STD	0030	-0081	3280	2639	0016467		0066	14430	812														
223	OBS	0030	-0081	3280	2639					14430	812	076	103	003	031	006	971								
		STD	0050	-0108	3351	2697	0010927		0093	14430	706														
223	OBS	0050	-0108	3351	2697					14430	706	082	100	006	043	009	844								
223	OBS	0074	-0087	3372	2713					14447		080	112	005	054	007									
		STD	0075	-0088	3373	2714	0009339		0119	14447	705														
223	OBS	0099	-0096	3384	2723					14449	700	095	122	005	081	013	842								
		STD	0100	-0094	3385	2724	0008350		0141	14450	699														
223	OBS	0124	-0064	3409	2742					14471		071	094	002	053	006									
		STD	0125	-0064	3410	2743	0006552		0159	14472	688														
223	OBS	0148	-0055	3432	2760					14483	679	081	090	004	065	009	828								
		STD	0150	-0052	3434	2762	0004765		0173	14485	678														
223	OBS	0173	-0021	3452	2775					14505	672	079	104	003	066	007	829								
223	OBS	T0198	0001	3468	2787					14522	677	068	084	003	058	005	840								
		STD	0200	0002	3469	2788	0002366		0191	14523	677														
223	OBS	T0230	0002	3469	2788					14528	679	075	095	001	074	006	843								

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DRIFT INDICATOR	MARSDEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIR	HGT	PER		SEA AMT	TYPE		AMT
31	174	EV	7924 N	07143 W		260	91	07	28	233	1963	PPS 8753	0238	02	00			0		2	2	0004	
						WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS							
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	(mbs)	DRY BULB	WET BULB											
								34	F01	061		072	061										
MESSANGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T		SPECIFIC VOLUME ANOMALY - X10 ³		Σ Δ DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₂ - Si μg-at/l	O ₃ ‰ sat.					
		STD	0000	0303	3154	2515		0028254		0000	14580												
236	OBS	0000	0303	3154	2515						14580		041	073	008	001	001						
		STD	0010	0038	3200	2569		0023076		0026	14470	1083											
236	OBS	0010	0038	3200	2569						14470	1083	048	099	008	001	001	1328					
		STD	0020	-0052	3269	2629		0017417		0040	14440	875											
236	OBS	0020	-0052	3269	2629						14440		067	099	003	023	004						
236	OBS	0029	-0112	3300	2656						14418	754	096	120	007	051	010	896					
		STD	0030	-0112	3303	2658		0014605		0062	14419	752											
236	OBS	0049	-0115	3349	2696						14427	712	075	090	008	026	004	849					
		STD	0050	-0115	3350	2696		0010982		0088	14427	711											
236	OBS	0073	-0110	3378	2719						14437		081	095	005	066	009						
		STD	0075	-0109	3380	2720		0008690		0112	14438	692											
236	OBS	0098	-0093	3399	2735						14452	679	078	097		057	006	818					
		STD	0100	-0092	3400	2736		0007226		0132	14453	678											
236	OBS	0122	-0078	3409	2743						14465		073	093	012	057	008						
		STD	0125	-0073	3413	2746		0006283		0149	14468	669											
236	OBS	0146	-0040	3439	2765						14490	667	083	102	013	059	006	816					
		STD	0150	-0031	3446	2771		0003950		0162	14496	668											
236	OBS	0171	-0001	3468	2787						14516	672	080	098	012	086	006	834					
236	OBS	T0195	0003	3469	2787						14522	676	070	091	018	083	006	839					
		STD	0200	0004	3469	2788		0002362		0177	14524	676											
240	OBS	T0220	0005	3470	2788						14528	675	145	195		134	010	838					

REFERENCE		SHIP CODE	LATITUDE ° 1/10	LONGITUDE ° 1/10	MARS DEN INDICATOR	MARS DEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT.		TYPE	AMT.	
31	174	EV	791 N	07104 W	260	91	07	29	026	1963	PPS	8755	0205	02	32			1		2	2	0006	
		WATER		WIND		AIR TEMP. °C						SPECIAL OBSERVATIONS											
		COLOUR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB	VIS CODE	ADD'L DBS													
				32	F1	061	061	056															
MESSANGER TIME HR 1/10	CASST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA—T	SPECIFIC VOLUME ANOMALY—X10 ³	Σ Δ D DYN. M. X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ —P μg-at/l	TOTAL—P μg-at/l	NO ₃ —N μg-at/l	NO ₃ —N μg-at/l	SiO ₂ —Si μg-at/l	O ₂ % sat							
		STD	0000	0590	3044	2399	0039273	0000	14686														
029	ORS	0000	0590	3044	2399				14686		037	063	008	002	001								
		STD	0010	0240	3133	2503	0029373	0034	14552	1010													
029	ORS	0010	0240	3133	2503				14552	1010			080	008	001	1296							
		STD	0020	-0084	3186	2563	0023670	0061	14414	907													
029	ORS	0020	-0084	3186	2563				14414		069	095	009	017	004								
		STD	0030	-0114	3226	2596	0020507	0083	14407	832													
029	ORS	0030	-0114	3226	2596				14407	832	113	135	008	048		983							
		STD	0050	-0127	3303	2659	0014548	0118	14415	768													
029	ORS	0050	-0127	3303	2659				14415	768	001	129	009	043	004	909							
		STD	0075	-0142	3349	2696	0010961	0190	14418	715													
029	ORS	0076	-0143	3350	2697				14418	714			008	043	005	846							
		STD	0100	-0126	3372	2715	0004234	0175	14433	697													
029	ORS	0101	-0125	3373	2715				14434	696	105	139	012	074									
		STD	0125	-0116	3384	2724	0008365	0197	14444	678													
029	ORS	0126	-0116	3384	2724				14444		074	084	010	066									
		STD	0150	-0101	3397	2734	0007345	0217	14457	667													
029	ORS	0152	-0099	3398	2735				14458	666	095	117	013	092		800							
029	ORS	T0177	-0066	3420	2751				14481	664	097	127	014	072	009	807							
029	ORS	T0187	-0060	3422	2753				14485	653	098	150	017	086		799							

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INDICATOR	MARS DEN SQUARE	STATION TIME (GMT)				YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIR	HGT	PER		SEA AMT	TYPE	
31	174	EV	79122N	07036 W		260	90	07	29	037	1963	PPS	5756	0232	12	00					2	2	0007
							WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS						
							COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	(mbs)	DRY BULB	WET BULB										
									00	F00	061	078	067										
MESSENGER TIME HR 1/10	CARD NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY-X10 ³		X & D DYN M X 10 ³		SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₃ ‰ sat					
		STD	0000	0562	2978	2350	0043923		0000		14666												
041	ORS	0000	0562	2978	2350						14666			071	007	001	001						
		STD	0010	0420	3138	2492	0030477		0037		14030	981											
041	ORS	0010	0420	3138	2492						14030	981	042	063	008	001	001	1315					
		STD	0020	0019	3173	2550	0024891		0065		14442	920											
041	ORS	0020	0019	3173	2550						14442		055	089	010	002	002						
041	ORS	0029	0092	3217	2588						14416	870	071	095	007	020	005	1030					
		STD	0030	0094	3221	2591	0020948		0080		14415	364											
041	ORS	0049	0116	3286	2645						14417	772	075	094	010	037	05	916					
		STD	0050	0117	3289	2647	0015651		0124		14418	771											
041	ORS	0074	0127	3344	2692						14425	742	084	104	008	053	006	884					
		STD	0075	0127	3345	2693	0011313		0150		14425	741											
041	ORS	0098	0126	3367	2711						14432	712				073	012	948					
		STD	0100	0126	3368	2711	0004541		0184		14433	710											
041	ORS	0122	0123	3361	2722						14440					067	011						
		STD	0125	0121	3362	2722	0006472		0207		14441	692											
041	ORS	0147	0104	3395	2731						14454	679	083	088	009	070	008	815					
		STD	0150	0102	3395	2732	0007610		0227		14456	678											
041	ORS	0172	0076	3411	2744						14474		079	081	010	071	009						
041	ORS	T0196	0033	3446	2771						14503	663	078	088	013	071	000	814					
		STD	0200	0030	3446	2771	0003931		0250		14503	662											
041	ORS	T0214	0029	3447	2771						14508	658	100	114	019	094	010	800					

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INDICATOR	MARS DEN SQUARE	STATION TIME (GMT)				YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIR	HGT	PER		SEA AMT	TYPE		AMT
31	174	EV	79082N	07018 W	260	90	07	29	051		1963	PPS	8757	0196	02	00					2	2		0008
						WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS								
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	(mbs)	DRY BULB	WET BULB												
								00	F00		61	106	072											
MESSENGER TIME HR 1/10	CARD NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY-X10 ³		X & D DYN M X 10 ³		SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₃ ‰ sat						
055		STD	0000	0505	2797	2214	0057002		0000		14619													
		ORS	0000	0505	2797	2214					14619		033	048	006	005	001							
		STD	0010	0175	3146	2518	0027948		0041		14525	1120												
055	ORS	0010	0175	3146	2518						14525	1120	048	085	013	006	001	1416						
		STD	0020	0107	3187	2564	0023528		0008		14403	955												
055	ORS	0020	0107	3187	2564						14403		087	118	009	035								
		STD	0030	0110	3237	2605	0019674		0090		14410	836												
055	ORS	0030	0110	3237	2605						14410	836	079	127	004	026	006	989						
		STD	0050	0129	3309	2664	0014082		0124		14415	741												
055	ORS	0051	0130	3312	2666						14415	738	086	118	006	048	005	875						
		STD	0075	0157	3345	2694	0011220		0155		14411	735												
055	ORS	0076	0158	3346	2694						14411	734	090	150	007	065	009	865						
		STD	0100	0131	3360	2712	0009448		0181		14430	697												
055	ORS	0101	0130	3370	2713						14431	696	110	121	010	107		828						
		STD	0125	0117	3382	2722	0008465		0203		14442	695												
055	ORS	0127	0116	3383	2723						14444		119	131	011	122								
		STD	0150	0110	3390	2729	0007886		0224		14452	683												
055	ORS	T0152	0109	3391	2729						14453	682	092	125	008	076	010	817						
055	ORS	T0177	0095	3401	2737						14465	660	081	127	006	008	008	794						

REFERENCE	SHIP CODE	LATITUDE ° 1/10	LONGITUDE ° 1/10	DRIFT INDICATOR	MARDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
						10°	1°	10'		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	

MESSENGER TIME HR 1/10		CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA—T	SPECIFIC VOLUME ANOMALY—X10 ³	Σ Δ D DYN M. X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ —P μg-at/l	TOTAL—P μg-at/l	NO ₂ —N μg-at/l	NO ₃ —N μg-at/l	SiO ₄ —Si μg-at/l	O ₃ % sat.
			STD	0000	0039	2437	1957	0081647	0000	14365							
069		ORS	0000	0039	2437	1957				14365				036	083	002	001
		STD	0010	0454	3124	2477		0031856	0057	14642	963						
069		ORS	0010	0454	3124	2477				14642	963	045	088	003	001	001	1300
		STD	0020	-0023	3165	2544		0025488	0085	14439	1083						
069		ORS	0020	-0023	3165	2544				14439	1083	063	108	010	002		1304
		STD	0030	-0038	3229	2596		0020526	0108	14443	977						
069		ORS	0030	-0038	3229	2596				14443	977	052	071	003	000		1178
		STD	0050	-0142	3320	2673		0013202	0142	14410	753						
069		ORS	0051	-0145	3323	2675				14409	746	100	144	007	079	007	880
		STD	0075	-0149	3353	2700		0010636	0172	14416	715						
069		ORS	0076	-0149	3354	2701				14416	714	104	117	011	106		844
		STD	0100	-0133	3369	2712		0009441	0197	14430	697						
069		ORS	0101	-0132	3370	2713				14430	696	108	110	009	112		827
		STD	0125	-0121	3378	2719		0008778	0220	14441	689						
069		ORS	0127	-0120	3379	2720				14442	688	099		008	084	011	821
		STD	0150	-0114	3387	2726		0008102	0241	14449	683						
069		ORS	T0152	-0113	3388	2727				14450	682	099	106	010	094	012	816
076		ORS	0173	-0110	3394	2732				14456	671	080		003	075		805
076		ORS	0198	-0097	3400	2736				14467	677		117	020		015	815
		STD	0200	-0096	3400	2737		0007123	0279	14468	677						
076		ORS	0248	-0079	3410	2744				14485	674	082	087	006	087		815
		STD	0250	-0078	3410	2744		0006433	0313	14486	672						
076		ORS	T0297	-0062	3416	2748				14502	655				139	019	796
		STD	0300	-0062	3417	2749		0005973	0344	14503	656						
076		ORS	T0301	-0062	3418	2749				14503	656				117		798

REFERENCE	SHIP CODE	LATITUDE ° 1/10	LONGITUDE ° 1/10	DRIFT INDICATOR	MARDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
						10°	1°	10'		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	

																	16	F02	058	072	061																	
MESSANGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY-X10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₃ % sat																						
		STD	0000	0378	3136	2494	0030243	0000	14610																													
153		ORS	0000	0378	3136	2494			14610		036	058	003	000																								
		STD	0010	0260	3223	2573	0022697	0026	14573	999																												
153		ORS	0010	0260	3223	2573			14573	999	047	096	006	002	001	1298																						
153		ORS	0019	0094	3270	2622			14507		054		004	010	002																							
		STD	0020	0082	3273	2626	0017730	0047	14502	900																												
153		ORS	0029	-0005	3294	2647			14467	840	077	106	007	036	003	1027																						
		STD	0030	-0009	3295	2648	0015599	0063	14465	838																												
153		ORS	0048	-0066	3317	2668			14445	802	069	172	006	040		967																						
		STD	0050	-0071	3319	2670	0013505	0092	14443	797																												
153		ORS	0072	-0107	3343	2690			14433		097	142	008	081	010																							
		STD	0075	-0106	3345	2692	0011378	0124	14435	741																												
153		ORS	T0096	-0102	3363	2706			14443	710	087	124	008	058	008	851																						
		STD	0100	-0101	3368	2711	0009624	0150	14444	708																												
153		ORS	0120	-0081	3399	2735			14461		092	111	005	082	011																							
		STD	0125	-0067	3410	2743	0006537	0170	14470	699																												
153		ORS	0144	-0027	3443	2768			14497	693	084	103	006	076	007	852																						
		STD	0150	-0019	3450	2773	0003705	0183	14502	692																												
153		ORS	0168	-0001	3464	2784			14515		089	099	005	126	010																							
153		ORS	T0192	0005	3467	2786			14522	684	117	093	010	126		849																						
		STD	0200	0006	3469	2787	0002388	0198	14525	680																												
153		ORS	T0239	0010	3473	2790			14533	678	064	092	002	052	003	844																						
		STD	0250	0011	3473	2790	0002112	0209	14536	682																												
153		ORS	T0263	0011	3471	2789			14538	689	061	103	002	057	004	857																						

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INDICATOR	MARS DEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH		DAY	HR 1/10			CRUISE NUMBER	STATION NUMBER	DIR	HGT		PER	SEA AMT		TYPE	AMT
31	174	EV	80063N	06827 W		907	08	07	29	160	1963	PPS	8760	0315	03	00				0		7	3	0011
		WATER		WIND		BAROMETER (mbs)	AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS													
		COLOR CODE	TRANS (m)	DIR	SPED OR FORCE		DRY BULB	WET BULB																
				16	F02		054	050					044											
MESSANGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY-X10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₃ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₂ -Si μg-at/l	O ₂ ‰ sat								
		STD	0000	0374	3171	2522	0027564	0000	14613															
166		ORS	0000	0374	3171	2522			14613								035	056	005	002				
		STD	0010	0280	3216	2566	0029382	0025	14581	1041														
166		ORS	0010	0280	3216	2566			14581	1041			052	083	004	005	001	1358						
		STD	0020	0095	3254	2610	0019250	0047	14505	936														
166		ORS	0021	0080	3258	2614			14499				048	072	004	003								
		STD	0030	-0036	3289	2644	0015944	0064	14452	853														
166		ORS	0031	-0045	3292	2647			14448	846			056	070	006	025		1023						
		STD	0050	-0070	3331	2679	0012591	0093	14445	759														
166		ORS	0052	-0071	3335	2683			14446	752			088	138	008	069	007	907						
		STD	0075	-0070	3371	2712	0009521	0121	14455	727														
166		ORS	0077	-0070	3374	2714			14456				095	127	005	070	008							
		STD	0100	-0052	3408	2741	0006761	0141	14473	706														
166		ORS	T0103	-0051	3412	2744			14474	704			088	115	008	100	008	858						
		STD	0125	-0048	3436	2763	0004637	0155	14483	693														
166		ORS	0126	-0048	3437	2764			14483				089		019	110								
		STD	0150	-0024	3446	2770	0003984	0166	14499	685														
166		ORS	0153	-0022	3447	2771			14501	684			088	121	008	096	008	842						
166		ORS	0178	-0008	3460	2781			14513				113	148	004	132	010							
		STD	0200	-0001	3466	2786	0002548	0182	14521	679														
166		ORS	T0202	0000	3467	2786			14522	679			099	130	004	139	010	843						
166		ORS	0248	0009	3474	2791			14535				097	129	005	125	010							
		STD	0250	0009	3474	2791	0002025	0194	14535	676														
166		ORS	T0249	0009	3474	2791			14543	672			087	129	004	117	009	836						
		STD	0300	0009	3474	2791	0002025	0204	14543	673														
166		ORS	T0309	0010	3472	2790			14545	679														

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INDICATOR	MARS DEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX. DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH		DAY	HR 1/10			CRUISE NUMBER	STATION NUMBER	DIR	HGT		PER	SEA AMT		TYPE
31	174	EV	80031N	06905 W		907	09	07	29	172	1963	PPS	8761	0274	C3	00			0		7	6	0012
		WATER		WIND		BAROMETER (mba)	AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS												
COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	DRY BULB	WET BULB																		
				11	F02	051	056	050															
MESSANGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY-X10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₂ -Si μg-at/l	O ₂ ‰ sat							
		STD	0000	0469	3145	2492	0030415	0000	14650														
176		ORS	0000	0469	3145	2492			14650				042	086	007	004	001						
		STD	0010	0067	3215	2580	0022073	0026	14486	1056													
176		ORS	0010	0067	3215	2580			14486	1056			047	089	003	002	001	1307					
176		ORS	0019	-0039	3263	2623			14445				061	122	005	009	003						
		STD	0020	-0043	3267	2627	0017604	0046	14444	901													
176		ORS	0029	-0073	3298	2653			14436	802			064	100	004	020	004	963					
		STD	0030	-0077	3301	2656	0014872	0062	14435	796													
176		ORS	0048	-0123	3347	2694			14423	716			079	125	004	029	006	853					
		STD	0050	-0122	3350	2697	0010959	0088	14424	715													
176		ORS	0072	-0112	3374	2716			14435				082		007	044							
		STD	0075	-0108	3375	2716	0009077	0113	14438	707													
		STD	0100	-0074	3392	2729	0007892	0134	14460	698													
176		ORS	T0102	-0071	3394	2730			14462	697			098	138	008	084	012	844					
		STD	0125	-0044	3428	2757	0005265	0151	14483	689													
176		ORS	0126	-0043	3429	2757			14484				071	138	005	049	006						
		STD	0150	-0021	3453	2776	0003466	0162	14502	679													
176		ORS	0151	-0020	3454	2777			14502	679			073		004	055	006	837					
176		ORS	0175	-0006	3464	2784			14514				089	153	005	107							
176		ORS	T0198	0002	3467	2786			14522	675			087	133	006	104	010	837					
		STD	0200	0002	3467	2786	0002497	0177	14523	674													
176		ORS	T0241	0007	3473	2791			14532	670			072	122	005	048	005	833					
		STD	0250	0007					674														
176		ORS	T0257	0006					678												842		

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DUTY INDICATOR	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	
31	174	EV	7959 N	06944 W		259	99	07	29	184	1963	PPS	8762	0269	02	00					7	3	0013
						WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS							
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	(mbs)	DRY BULB	WET BULB											
								11	F02	058	128	100											
MESSANGER TIME HR 1/10		CARD NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	Σ Δ D DYN M. X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₃ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₄ - Si μg-at/l	O ₂ ‰ sat.						
			STD	0000	0429	3170	2516	0028144	0000	14636													
189			ORS	0000	0429	3170	2516			14636		050	083	004	002	001							
			STD	0010	0188	3190	2552	0024688	0026	14537	1092												
189			ORS	0010	0188	3190	2552			14537	1092	042	102	007	001	001	1390						
			STD	0020	0033	3231	2594	0020682	0049	14474	971												
189			ORS	0020	0033	3231	2594			14474		054	114	006	002								
			STD	0030	-0062	3279	2637	0016610	0068	14439	866												
189			ORS	0030	-0062	3279	2637			14439	866		117	008	022	004	1041						
			STD	0050	-0117	3356	2701	0010515	0095	14427	705												
189			ORS	0050	-117	3356	2701			14427	705	095	150	011	073	011	841						
			STD	0075	-0083	3391	2728	0007942	0118	14452	696												
189			ORS	0075	-0083	3391	2728			14452		078	138	007	042								
			STD	0100	-0057	3414	2746	0006282	0136	14471	690												
189			ORS	T0100	-0057	3414	2746			14471	690	097	145	008	099	011	840						
189			ORS	0124	-0041	3430	2758			14485		095	159	005	100	010							
			STD	0125	-0041	3431	2759	0005052	0150	14485	687												
189			ORS	0148	-0032	3449	2773			14496	684	065	133	002	041		840						
			STD	0150	-0029	3450	2774	0003655	0161	14498	684												
189			ORS	0172	-0009	3462	2782			14512		091	136	003	122	009							
189			ORS	T0196	-0006	3465	2785			14518	679	080	121	005	069	006	842						
			STD	0200	-0005	3466	2785	0002556	0176	14519	679												
189			ORS	T0238	0005	3472	2790			14531	677	206	286	025	100		841						
189			ORS	T0246	0006	3472	2790			14533	672	127	164	010	118	009	836						

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DUTY INDICATOR	MARSDEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS			WEATHER CODE	CLOUD CODES		NODC STATION NUMBER			
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIR	HGT		PER	SEA AMT		TYPE	AMT	
31	174	FV	7958 N	07016 W		260	90	07	29	199	1963	PPS	8763	0256	02	00			0		7	3	0014	
						WATER		WIND		AIR TEMP °C		VIS CODE		ADD'L OBS		SPECIAL OBSERVATIONS								
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB							WET BULB						
								18	F02	058	089							067						
MESSANGER TIME HR 1/10	CARD NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA—T	SPECIFIC VOLUME ANOMALY—X 10 ³		Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ —P μg-at/l	TOTAL—P μg-at/l	NO ₃ —N μg-at/l	NO ₃ —N μg-at/l	SiO ₄ —Si μg-at/l	O ₂ % sat.							
		STD	0000	-0015	3035	2439	0035492		0000	14421														
202		ORS	0000	-0015	3035	2439				14421		066	119	007	013	006								
		STD	0010	0150	3074	2462	0033275		0034	14504	916													
202		ORS	0010	0150	3074	2462				14504	916	090	145	006	020	008	1059							
		STD	0020	-0149	3123	2514	0028352		0065	14374	857													
202		ORS	0020	-0149	3123	2514				14374		093	145	006	037	010								
		STD	0030	-0142	3174	2555	0024433		0092	14386	825													
202		ORS	0030	-0142	3174	2555				14386	825	253	261	006	032	008	964							
		STD	0050	-0003	3290	2644	0016001		0132	14471	842													
202		ORS	0050	-0003	3290	2644				14471	842	073	151	007	023		028							
		STD	0075	-0106	3356	2701	0010538		0165	14436	756													
202		ORS	0075	-0106	3356	2701				14436		112	174	004	100	015								
		STD	0100	-0077	3409	2743	0006581		0187	14461	700													
202		ORS	T0100	-0077	3409	2743				14461	700	077	124	002	046	007	848							
202		ORS	0124	-0042	3433	2761				14485		082	128	004	085	009								
		STD	0125	-0042	3434	2761	0004817		0201	14485	685													
202		ORS	0149	-0039	3446	2771				14492	678	071	109	004	048	006	831							
		STD	0150	-0038	3446	2771	0003893		0212	14493	678													
202		ORS	0173	-0026	3453	2776				14503		085	133	002	092	009								
202		ORS	T0197	-0018	3459	2781				14512	684	093	129	003	092	009	844							
		STD	0200	-0016	3460	2781	0002954		0229	14513	683													
202		ORS	T0215	-0007	3464	2784				14520	677		107	002	104	010	838							
202		ORS	T0238	-0003	3465	2785				14526	672						833							

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	SUNET INDICATOR	MARS DEN SQUARE	STATION TIME (GMT)				YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIR	HGT	PER		SEA AMT	TYPE		AMT
31	174	EV	79405N	06905 W	259	99	07	30	002	1963	PPS	8764		0141	01	11			1		2	2		0015
							WATER		WIND		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS									
							COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB				WET BULB								
									11	F03		064	056	056										
MESSENGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	Σ AD DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₂ - Si μg-at/l	O ₂ ‰ sat.								
		STD	0000	0608	3144	2476	0031975	0000	14707															
004		ORS	0000	0608	3144	2476			14707		057	079	004	002	001									
		STD	0010	0232	3196	2554	0024536	0028	14557	1049														
004		ORS	0010	0232	3196	2554			14557	1049	046	108	002	001	001	1350								
		STD	0020	-0072	3278	2637	0016656	0049	14432	840														
004		ORS	0020	-0072	3278	2637			14432	840	086	121	005	028	006	1008								
		STD	0030	-0136	3303	2659	0014537	0064	14407	754														
004		ORS	0030	-0136	3303	2659			14407	754	106	172	010	055	006	891								
		STD	0050	-0133	3340	2689	0011693	0091	14417	733														
004		ORS	0050	-0133	3340	2689			14417	733	085	140	006	046	007	869								
		STD	0075	-0144	3354	2701	0010543	0118	14418	715														
004		ORS	0075	-0144	3354	2701			14418	714	090	140	007	052		846								
		STD	0100	-0141	3364	2709	0009800	0144	14425	697														
004		ORS	0101	-0140	3365	2709			14426	696	103	151	013	081	012	825								
		STD	0125	-0101	3399	2735	0007275	0163	14453	662														
004		ORS	T0126	-0099	3400	2736			14454	661	085	132	007	065		795								
004		ORS	T0130	-0099	3400	2736			14455	658	088	131	009	051	009	792								

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	SUNET INDICATOR	MARS DEN		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS			WIND CODE	CLOUD CODES		NODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER					SQ	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIE	HGT	PER		SEA AMT	TYPE		AMT	
31	174	EV	7857 N	071301W		260	81	07	30	072	1963	PPS	9765		0287	03	20			2		2	2	0016
						WATER		WIND		BAROMETER (mbs)		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS								
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	DRY BULB	WET BULB													
								20	F04	071	044	039												
MESSNGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	Σ AD DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₂ - Si μg-at/l	O ₂ % sat.								
		STD	0000	0540	3075	2429	0036407	0000	14670															
078		ORS	0000	0540	3075	2429			14670		034	057	005	000	001									
		STD	0010	0431	3094	2456	0033898	0035	14629	985														
078		ORS	0010	0431	3094	2456			14629	985	052	074	001	000	001	1320								
		STD	0020	0181	3155	2525	0027301	0066	14530	979														
078		ORS	0020	0181	3155	2525			14530		053	085	004	002	002									
		STD	0030	-0043	3211	2587	0021885	0090	14438	948														
078		ORS	0031	-0059	3216	2586			14431	944	062	092	003	014	002	1130								
		STD	0050	-0128	3283	2642	0016080	0128	14412	812														
078		ORS	0051	-0130	3286	2645			14411	807	067	087	003	018	003	954								
		STD	0075	-0135	3335	2685	0012056	0163	14420	760														
078		ORS	0076	-0135	3337	2686			14420		089	117	013	059	007									
		STD	0100	-0120	3361	2705	0010095	0191	14435	722														
078		ORS	T0102	-0119	3362	2706			14435	720	092	109	005	055	010	859								
		STD	0125	-0116	3374	2715	0009138	0215	14442	701														
078		ORS	0126	-0116	3374	2716			14443		101	125	010	099	014									
		STD	0150	-0116	3385	2725	0008247	0237	14448	685														
078		ORS	0150	-0116	3385	2725			14448	685	084	099	010	065	011	819								
		STD	0174	-0102	3394	2732			14460		097	121	010	085	014									
078		ORS	T0197	-0093	3401	2737			14469	670	083	095	006	057	009	807								
		STD	0200	-0092	3402	2738	0007017	0275	14470	669														
078		ORS	0245	-0078	3410	2744			14485		092	111	015	098	012									
		STD	0250	-0078	3411	2744	0006373	0309	14486	658														
078		ORS	T0269	-0077	3414	2747			14490	654	091	111	009	078	012	792								
078		ORS	T0285	-0074	3416	2748			14494	682	109	134	013	100	016	826								

REFERENCE COUNTRY CODE	IDENTITY NUMBER	SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	RELATION TO STATION	MARS DEN SQUARE	STATION TIME (GMT)				YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER						
							10"	1"	MONTH	DAY		HR	1/10			CRUISE NUMBER	STATION NUMBER	DIR	SPEED OR FORCE		BAROMETER (mb)	AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS	TYPE	AMT	
																						WET BULB							DRY BULB
31	174	EV	7848 N	07314 W		260	83	07	30	105	1963	PPS	8766		0406	04	20				2		2	2		0017			
						WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS													
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	(mb)	DRY BULB	WET BULB																	
								20	F04	078	072	056																	
MESSENGER TIME HR		CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T		SPECIFIC VOLUME ANOMALY - X 10 ³		# & D DYN - M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₂ % sat.										
			STD	0000	0306	3128	2494		0030246		0000	14578																	
108			OBS	0000	0306	3128	2494					14578		054	087	005	002												
			STD	0010	0299	3129	2495		0030118		0030	14577	901																
108			OBS	0010	0299	3129	2495					14577	901	054	100	002	001	001	1172										
			STD	0020	0182	3150	2521		0027688		0059	14530	915																
108			OBS	0020	0182	3150	2521					14530		054	096	002	001	002											
108			OBS	0029	0005	3191	2564					14457	928	054	082	005	002	002	1127										
			STD	0030	-0000	3194	2566		0023356		0085	14455	921																
108			OBS	0049	-0079	3246	2611					14429	806	094	133	006	044	008	962										
			STD	0050	-0082	3249	2614		0018827		0127	14428	804																
108			OBS	0074	-0126	3309	2664					14420		073	111	004	030												
			STD	0075	-0125	3311	2665		0013924		0168	14421	757																
108			OBS	T0098	-0116	3352	2698					14435	723	081	090	007	066		863										
			STD	0100	-0116	3354	2700		0010645		0198	14435	721																
108			OBS	0122	-0114	3371	2713					14442		099	129	012	087	013											
			STD	0125	-0114	3373	2715		0009186		0223	14443	696																
108			OBS	T0146	-0110	3385	2725					14450	683	097	129	008	070	010	818										
			STD	0150	-0108	3387	2726		0008123		0245	14452	683																
113			OBS	T0173	-0096	3399	2735					14463		074	083	008	068	010											
113			OBS	0197	-0084	3406	2741					14474	679	078	105	006	055	008	821										
			STD	0200	-0082	3407	2741		0006677		0282	14475	679																
113			OBS	0246	-0065	3419	2750					14493	672	093	112	007	094	011	817										
			STD	0250	-0064	3420	2751		0005786		0313	14494	672																
113			OBS	0295	-0058	3425	2755					14505		080	118	009	077	010											
			STD	0300	-0057	3426	2756		0005320		0341	14506	666																
113			OBS	T0344	-0044	3434	2762					14521	661	104	113	010	114		808										
113			OBS	T0384	-0022	3451	2774					14540	669	097	131	005	120	012	824										

REFERENCE COUNTRY CODE	IDENTITY NUMBER	SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DATE 1/10	HARSDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS			WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
							10"	1"	MONTH		DAY	HR			1/10	CRUISE NUMBER	STATION NUMBER		DIR	HGT		PER
31	174	EV	78272N	07257 W	260	82	07	30	146	1963	PPS	8767	0241	02	18		2		6	5	0018	
							WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS					
							COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	(mbx)	DRY BULB	WET BULB									
									18		F03	088	044	039								
MESSANGER TIME HR	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³		# & D DYN - M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₂ % sat.					
147		STD	0000	0230	3116	2490	0030592		0000	14543												
		OBS	0000	0230	3116	2490				14543		046	075	002	001							
147		STD	0010	0215	3123	2497	0029958		0030	14539	990											
		OBS	0010	0215	3123	2497				14539	990	049	086	002	002	001	1262					
147		STD	0020	0009	3189	2562	0023781		0057	14457	884											
		OBS	0020	0009	3189	2562				14457		074	110	011	007	003						
147		STD	0030	-0079	3241	2607	0019462		0079	14425	809											
		OBS	0030	-0079	3241	2607				14425	809	073	110	002	026	005	966					
147		STD	0050	-0106	3313	2666	0013845		0112	14426	749											
		OBS	0050	-0106	3313	2666				14426	749	102	149	009	070	011	893					
147		STD	0075	-0110	3342	2690	0011597		0144	14432	737											
		OBS	0076	-0110	3343	2691				14433		102	134	008	085	011						
147		STD	0100	-0107	3364	2707	0009909		0171	14441	724											
		OBS	T0101	-0107	3365	2708				14441	723	103	145	008	084	013	866					
147		STD	0125	-0109	3378	2719	0008789		0194	14446	703											
		OBS	0126	-0109	3379	2720				14447		083	117	006	050	008						
147		STD	0150	-0108	3385	2724	0008275		0215	14452	690											
		OBS	0150	-0108	3385	2724				14452	690	081	117	006	071	008	827					
147		OBS	0173	-0101	3393	2731				14460		071	099	008		006						
147		OBS	T0197	-0086	3404	2739				14473	690	102	139	013	099	014	833					
147		STD	0200	-0085	3405	2740	0006817		0253	14474	689											
		OBS	T0226	-0075	3412	2745				14484	672	084	118	011	054	008	814					

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INDICATOR	MARS DEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIR	HGT	PER		SEA AMT	TYPE		AMT
31	174	EV	78282N	073135W	260	83	07	30	154	1963	PPS	8768	0448	04	20			2		6	5	0019	
						WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS							
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	DRY BULB	WET BULB												
								20		F04		085		056		044							
MESSANGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA—T	SPECIFIC VOLUME ANOMALY—X10 ³	Σ Δ D DYN. M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ —P μg-at/l	TOTAL—P μg-at/l	NO ₂ —N μg-at/l	NO ₃ —N μg-at/l	SiO ₂ —Si μg-at/l	O ₂ % sat.							
		STD	0000	0275	3095	2470	0032509	0000	14560														
164	OBS	0000	0275	3095	2470				14560		083	115											
164	OBS	0009	0083	3153	2529				14484	1009	059	116	004	001	001	1247							
	STD	0010	0073	3155	2531	0026681	0030		14480	1004													
164	OBS	0017	0023	3169	2545				14460		060	116	009	001	002								
	STD	0020	0017	3170	2546	0025269	0056		14458	953													
164	OBS	0026	0003	3178	2553				14454	920	071	149	006	002	003	1117							
	STD	0030	-0016	3190	2564	0023596	0080		14447	892													
164	OBS	0044	-0067	3237	2604				14433	815	089	139	008	034	008	976							
	STD	0050	-0080	3264	2625	0017684	0121		14431	807													
164	OBS	0065	-0104	3315	2668				14430		084	127	012	029	007								
	STD	0075	-0110	3333	2683	0012286	0159		14431	776													
164	OBS	T0087	-0113	3348	2695				14434	762	104	137	010	074	012	909							
	STD	0100	-0111	3355	2700	0010586	0187		14438	743													
164	OBS	0108	-0109	3360	2704				14441		096	127	011	068	011								
	STD	0125	-0115	3371	2713	0009333	0212		14442	713													
164	OBS	0128	-0116	3373	2715				14443		104	143	008	083	013								
164	OBS	0148	-0116	3383	2723				14447		091	124	018	058	010								
	STD	0150	-0115	3384	2724	0008327	0234		14448	689													
164	OBS	T0168	-0108	3390	2729				14455	677	106	140	010	086	012	812							
	STD	0200	-0099	3396	2733	0007447	0274		14466	675													
164	OBS	0215	-0094	3400	2736				14471		110	133	011	141	015								
	STD	0250	-0079	3411	2744	0006367	0308		14486	673													
164	OBS	T0264	-0073	3416	2748				14491	672	106	122	011	142	014	815							
	STD	0300	-0055	3429	2758	0005094	0337		14508	672													
164	OBS	T0309	-0052	3431	2759				14511	672	077	096	010	102		821							
164	OBS	T0386	-0045	3436	2763				14527	691	098	123	010	141	013	845							

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INDICATOR	MARS DEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	
31	174	EV	7830 N	07337 W	260	83	07	30	172	1963	PPS	8769	0494	04	20			2		6	4	0020	
						WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS							
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	DRY BULB	WET BULB												
										20	F04	085	050	044									
MESSANGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X10 ³	Σ Δ D DYN. M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₂ - Si μg-at/l	O ₂ % sat.							
		STD	0000	0279	3096	2471	0032463	0000	14562														
176	OBS	0000	0279	3096	2471				14562		090	094	005	000	001								
	STD	0010	0080	3153	2529	0026870	0030		14483	992													
176	OBS	0010	0080	3153	2529				14483	992	051	090	006	003	001	1226							
176	OBS	0019	0009	3175	2551				14455		059	095	005	003	003								
	STD	0020	0007	3176	2551	0024805	0056		14454	947													
176	OBS	0029	-0009	3180	2555				14449	910	063	107	005	006		1101							
	STD	0030	-0012	3182	2557	0024224	0080		14448	906													
176	OBS	0048	-0061	3224	2592				14434	846	077	101	007	033		1014							
	STD	0050	-0066	3230	2598	0020336	0125		14433	840													
176	OBS	0073	-0104	3289	2647				14427		094	113	008	073	010								
	STD	0075	-0105	3293	2650	0015365	0169		14428	777													
176	OBS	T0097	-0113	3336	2685				14434	732	114	128	015	108		872							
	STD	0100	-0112	3342	2690	0011576	0203		14436	729													
176	OBS	0120	-0106	3370	2712				14446		089	106	008	094	010								
	STD	0125	-0105	3373	2715	0009216	0229		14447	703													
176	OBS	0144	-0099	3384	2723				14455		098	130	010	116	012								
	STD	0150	-0097	3388	2727	0008087	0251		14457	683													
176	OBS	0166	-0090	3396	2733				14464		105	140	013	130	013								
176	OBS	T0189	-0081	3406	2740				14474	662	083	096	011			800							
	STD	0200	-0077	3409	2743	0006546	0287		14478	663													
176	OBS	0238	-0063	3420	2751				14492		089	104	011	105									
	STD	0250	-0060	3423	2753	0005540	0317		14496	668													
176	OBS	T0287	-0050	3431	2759				14508	670	073	091	008		007	818							
	STD	0300	-0047	3434	2762	0004754	0343		14512	670													
176	OBS	T0385	-0034	3444	2769				14533	672	102	106	009	134	012	825							
	STD	0400	-0033	3444	2769	0004049	0387		14536	673													
176	OBS	T0435	-0031	3447	2767				14543	675	100	115	009	136	012	829							

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	RELATION INDICATOR	MARSDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
COUNTRY CODE	IDENTITY NUMBER						10°	1°	MONTH DAY HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	
31	174	EV	7831 N	07350 W		260	83	07 30 189	1963	PPS	8770	0549	05	20			2		7	6		0021
		WATER		WIND		BAROMETER (mbs)	AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS											
COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	DRY BULB	WET BULB																	
			22	F04	081	033	033															
MESSENGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X10 ³	Σ δ DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₃ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₂ % sat						
		STD	0000	0095	3107	2492	0030460	0000	14482													
194		ORS	0000	0095	3107	2492			14482													
		STD	0010	0081	3108	2493	0030309	0030	14477	1032												
194		ORS	0010	0081	3108	2493			14477	1032	060	104	004	000	003	1270						
		STD	0020	0002	3126	2511	0028571	0060	14445	941												
194		ORS	0020	0002	3126	2511			14445		058	095	005	003	004							
		STD	0030	-0094	3167	2548	0025091	0087	14408	876												
194		ORS	0031	-0100	3171	2551			14406	871	081	102	005	032	008	1028						
		STD	0050	-0067	3236	2603	0019874	0132	14434	823												
194		ORS	0051	-0065	3239	2605			14435	821	095	114	007	050	008	983						
		STD	0075	-0106	3307	2661	0014290	0174	14429	769												
194		ORS	0076	-0107	3309	2663			14429		097	113	007	073	010							
		STD	0100	-0102	3343	2690	0011532	0207	14440	722												
194		ORS	T0102	-0102	3345	2692			14441	710	094	106	013	092	010	860						
		STD	0125	-0100	3369	2711	0009541	0233	14449	714												
		STD	0150	-0097	3390	2728	0007934	0255	14458	709												
194		ORS	0152	-0097	3391	2729			14458		106	133	011	134	014							
		STD	0200	-0069	3415	2747	0006123	0290	14482	699												
194		ORS	0203	-0068	3416	2748			14484		103	112	011	147	014							
		STD	0250	-0056	3426	2756	0005331	0319	14498	691												
		STD	0300	-0044	3435	2762	0004693	0344	14513	684												
194		ORS	0303	-0043	3436	2763			14515		094	112	009	136	011							
194		ORS	T0352	-0031	3445	2770			14529	678	089	104	007	124	010	833						
		STD	0400	-0029	3445	2770	0003995	0387	14538	672												
194		ORS	0402	-0029	3445	2770			14539		097	107	007	148	012							
194		ORS	T0452	-0026	3448	2772			14549	671	084	104	006	110	008	826						
194		ORS	T0475	-0026	3449	2773			14553	672	078	095	006	103	008	827						
		STD	0500	-0025	3448	2772	0003776	0426	14557	672												
194		ORS	T0503	-0025	3448	2772			14558	672	101	115	007	144	011	827						

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	COLLECTOR	MARSDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
COUNTRY CODE	IDENTITY NUMBER						10°	1°	MONTH DAY HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	
31	174	FV	7833N	07407 W	260	84	07	30	202	1963	PPS	8771	0457	04	20			2		7	6	0022
		WATER		WIND		BAROMETER (mbs)	AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS											
COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	DRY BULB	WET BULB																	
		20	F04	191	044	039																
MESSNGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X10 ³	Σ δ DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₃ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₂ % sat.						
207		STD	0000	0090	3142	2520	0027763	0000	14484													
	ORS	0000	0090	3142	2520				14484													
	STD	0010	0087	3143	2521		0027668	0028	14485	974												
207	ORS	0010	0087	3143	2521				14485	974	058	083	004	002	001	1204						
	STD	0020	0071	3145	2523		0027431	0055	14479	928												
207	ORS	0020	0071	3145	2523				14479		091	120	005	039								
	STD	0030	-0092	3157	2540		0025865	0082	14407	881												
207	ORS	0030	-0092	3157	2540				14407	881	077	099	006	031	009	1041						
	STD	0050	-0108	3224	2594		0020662	0128	14413	788												
207	ORS	0050	-0108	3224	2594				14413	788	111	128	007	082		933						
	STD	0075	-0108	3278	2638		0016505	0175	14424	744												
207	ORS	0075	-0108	3278	2638				14424		076	092	004	055	007							
	STD	0100	-0112	3330	2680		0012495	0211	14434	707												
207	ORS	T0100	-0112	3330	2680				14434	707	127	137	007	080		843						
	STD	0125	-0106	3364	2707		0009900	0239	14446	700												
	STD	0150	-0099	3388	2727		0008050	0262	14456	695												
207	ORS	0150	-0099	3388	2727				14456		104	129	011	083	013							
	ORS	0199	-0079	3408	2742				14477		107	122	012	102	014							
207	STD	0200	-0078	3409	2743		0006542	0298	14477	686												
	ORS	0248	-0050	3434	2762				14502		102	116	007	096	012							
207	STD	0250	-0050	3434	2762		0004744	0326	14502	680												
	ORS	T0296	-0044	3437	2764				14513	678	099	109	009	093	011	830						
207	STD	0300	-0044	3437	2764		0004535	0350	14514	678												
	ORS	0323	-0042	3438	2765				14519		100	119	007	100	011							
207	ORS	T0350	-0040	3441	2767				14524	679						832						
207	ORS	T0372	-0040	3441	2767				14528	672	097	123	007	104	011	824						
207	ORS	T0397	-0038	3442	2768				14533	670	098	107	005	086	010	833						

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DRIFT 10°	MARS DEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS			WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10°	1°	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIB	HGT		PER	SEA AMT		TYPE
31	174	FV	7834 N	07427 W	260	84	07	30	215	1963	PPS	8772	0265	07	18			2		7	6	0023
						WATER		WIND		BAROMETER (mbs)		AIR TEMP °C DRY BULB WET BULB		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS						
						COLOR CODE	TRANS (m)	DIB	SPEED OR FORCE													
								18	F04	095	044	039										
MESSANGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA—T	SPECIFIC VOLUME ANOMALY—X 10 ³		Σ AD DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ —P μg-at/l	TOTAL—P μg-at/l	NO ₂ —N μg-at/l	NO ₃ —N μg-at/l	SiO ₄ —Si μg-at/l	O ₂ % sat.					
220		STD	0000	0155	3141	2515	0028205		0000	14514												
	ORS	0000	0155	3141	2515					14514		048	100	009	003	002						
220		STD	0010	0093	3152	2528	0027014		0028	14489	934											
	ORS	0010	0093	3152	2528					14489	934	050	101	007	002	002	1158					
220		STD	0020	0028	3198	2571	0022942		0053	14441	862											
	ORS	0020	0028	3198	2571					14441		064	110	008	017	004						
220		STD	0030	0078	3232	2600	0020155		0074	14425	809											
	ORS	0031	0082	3235	2602					14423	805	075	115	005	027	007	959					
220		STD	0050	0099	3264	2626	0017622		0112	14422	761											
	ORS	0051	0100	3265	2627					14422	759	090	126	007	041	009	903					
220		STD	0075	0107	3285	2644	0015973		0154	14426	718											
	ORS	0076	0107	3287	2645					14426		083	128	008	062	010						
220		STD	0100	0107	3349	2695	0011057		0188	14439	691											
	ORS	T0102	0107	3353	2659					14440	690	089	122	009	069	011	825					
220		STD	0125	0104	3361	2705	0010136		0214	14446	690											
	ORS	0126	0104									091	117	008	081	011						
220		STD	0150	0105	3374	2715	0009127		0238	14452	688											
	ORS	T0150	0105	3374	2715					14452	688	096	137	009	073	009	824					
220		ORS	0175	0094	3393	2731				14463		088	128	010	072	008						
	STD	0200	0082	3404	2739		0006902		0278	14474	674											
220		ORS	T0201	0082	3405	2740				14475	674	071	114	008	088	010	814					
220		ORS	T0222	0069	3417	2749				14486	675	077	102	011	072	009	819					

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DRIFT 10°	MARS DEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS			WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10°	1°	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIB	HGT		PER	SEA AMT		TYPE
31	174	FV	78065N	07358 W	260	83	07	31	057	1963	PPS	8773	0722	07	20			1		6	8	0024
		WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS										
		COLOR CODE	TRANS (m)	DIB	SPEED OR FORCE	(mbs)	DRY BULB	WET BULB														
				20	F03	102	061	056														
MESSANGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA—T	SPECIFIC VOLUME ANOMALY—X 10 ³		Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ —P μg-at/l	TOTAL—P μg-at/l	NO ₂ —N μg-at/l	NO ₃ —N μg-at/l	SiO ₄ —Si μg-at/l	O ₃ ‰ sat.					
		STD	0000	0365	3145	2502	0029449		0000	14606												
067		ORS	0000	0365	3145	2502				14606		044	107	011	003	001						
		STD	0010	0227	3149	2517	0028067		0029	14548	933											
067		ORS	0010	0227	3149	2517				14548	933	041	086	005	002	001	1195					
067		ORS	0019	0074	3192	2561				14487			132	009	004	001						
		STD	0020	0065	3199	2567	0023281		0054	14484	885											
067		ORS	0028	0004	3244	2606				14464	851	058	124	009	012	001	1038					
		STD	0030	0010	3249	2611	0019109		0076	14458	843											
067		ORS	0047	0094	3288	2646				14428	788	081		011	052	007	941					
		STD	0050	0095	3295	2651	0015260		0110	14429	782											
067		ORS	0070	0102	3333	2682				14434		095		009	073	010						
		STD	0075	0102	3338	2686	0011929		0144	14436	739											
067		ORS	T0094	0103	3356	2701				14441	712	090		013	088	010	852					
		STD	0100	0102	3358	2702	0010385		0172	14442	710											
		STD	0125	0099	3369	2711	0009543		0197	14450	702											
067		ORS	0140	0097	3377	2718				14454		109		014	119	014						
		STD	0150	0095	3384	2723	0008400		0219	14458	696											
067		ORS	0185	0085	3404	2739				14471		088		012	099	012						
		STD	0200	0080	3407	2741	0006686		0257	14476	686											
067		ORS	0230	0070	3415	2747				14487		084		011	084	010						
		STD	0250	0062	3421	2752	0005683		0288	14495	680											
067		ORS	T0273	0055	3427	2756				14503	679	082		016	080	008	828					
		STD	0300	0049	3432	2760	0004896		0314	14511	682											
067		ORS	0321	0046	3435	2762				14516		083		013	086	008						
067		ORS	T0370	0042	3437	2764				14526	684	081		013	091	009	837					
		STD	0400	0037	3441	2767	0004255		0360	14534	680											
057		ORS	T0472	0029	3447	2771				14551	674	091	133	010	068	006	828					
		STD	0500	0028	3448	2772	0003756		0400	14556	673											
057		ORS	0569	0027	3449	2773				14568	670	081	126	010	073	007	824					
		STD	0600	0026	3449	2773	0003682		0437	14574	670											
057		ORS	T0643	0024	3449	2773				14582	669	073	118	015	089	009	823					
057		ORS	T0660	0025	3450	2774				14584	668	082	122	013	088	009	822					

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DRAFT INDICATION	MARS DEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT		
31	174	EV	78095N	074425W		P60	84	07	31	080	1963	PPS	8774		0677	06	18			1		7	8	0025
		WATER		WIND		BAROMETER		AIR TEMP °C		VIS. CODE	ADD'L OBS	SPECIAL OBSERVATIONS												
COLOR CODE	TEARS (m)	DIR	SPEED OR FORCE	DRY BULB	WET BULB	DRY BULB	WET BULB																	
		18	F04	105	056	050																		
MESSENGER TIME HR 1/10	CASST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X10 ³	Σ Δ D DYN. M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₂ - Si μg-at/l	O ₂ % sat.								
		STD	0000	0285	3121	2490	0030613	0000	14568															
099		ORS	0000	0285	3121	2490			14568		052			007	000	001								
		STD	0010	0236	3138	2507	0028965	0030	14551	992				008	001	001 1273								
099		ORS	0010	0236	3138	2507			14551	992	046													
		STD	0020	0103	3149	2525	0027293	0058	14495	956				009	002	001								
099		ORS	0021	0094	3150	2526			14491		054													
		STD	0030	0047	3161	2537	0026089	0085	14472	922				008	002	002 1125								
099		ORS	0031	0042	3162	2539			14470	919	065													
		STD	0050	-0013	3203	2574	0022604	0133	14454	858				007	002	002 1031								
099		ORS	0052	-0018	3207	2577			14453	852	068													
		STD	0075	-0077	3259	2622	0018063	0184	14436	801				011	044	007								
099		ORS	0078	-0082	3265	2627			14435		087													
		STD	0100	-0097	3308	2662	0014729	0225	14438	755				011	047	008 895								
099		ORS	T0104	-0099	3315	2668			14439	749	085													
		STD	0125	-0099	3341	2689	0011682	0257	14445	729														
		STD	0150	-0100	3367	2710	0009681	0284	14453	709														
099		ORS	0155	-0100	3371	2713			14454		079			008	060	009								
		STD	0200	-0086	3398	2734	0007347	0326	14472	681				008	082	009 820								
099		ORS	0205	-0084	3401	2737			14474	679	086													
		STD	0250	-0058	3424	2754	0005473	0358	14497	677				010	110	011								
099		ORS	0255	-0056	3426	2756			14499		091													
		STD	0300	-0048	3433	2761	0004802	0384	14511	674														
099		ORS	T0304	-0047	3434	2762			14513	674	089	127	010	080	007 823									
087		ORS	T0335	-0042	3436	2763			14520	086			009	076	008									
087		ORS	0384	-0035	3442	2768			14533	674	077		013	071	006 826									
		STD	0400	-0033	3442	2768	0004201	0429	14536	673														
087		ORS	0432	-0030	3442	2767			14543		069		010	078	007									
087		ORS	0482	-0028	3445	2770			14552	672	081		014	088	008 827									
		STD	0500	-0028	3446	2770	0003912	0469	14556	672														
087		ORS	0531	-0027	3447	2771			14561		073		014	112	010									
087		ORS	0580	-0026	3447	2771			14570	574	073		013	088	008 829									
		STD	0600	-0025	3447	2771	0003836	0508	14574	676														
087		ORS	T0605	-0025	3447	2771			14575	677	082		012	084	008 833									
087		ORS	T0624	-0024						674	088		010	107	010 829									

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INDICATOR	MARS DEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT			
31	174	EV	7745 N	07530 W		260	75	07	31	124	1963	PPS	8775		0668	06	16				2		7	8	0026
		WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS													
COLOR CODE	TEAMS (m)	DIR	SPEED OR FORCE	(mbars)	DRY BULB	WET BULB																			
						16	F04	098	044	044															
MESSANGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	READ DYN. M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	Si O ₄ - Si μg-at/l	O ₃ % sat.									
		STD	0000	0347	3089	2459	0033530	0000	14591																
133		ORS	0000	0347	3089	2459			14591		054	086	005	002	001										
		STD	0010	0286	3120	2489	0030699	0032	14570	909															
133		ORS	0010	0286	3120	2489			14570	909	051	072	004	001	001	1178									
		STD	0020	0042	3161	2538	0026069	0060	14468	902															
133		ORS	0020	0042	3161	2538			14468		060	108	005	002	002										
		STD	0030	0012	3181	2555	0024401	0086	14459	882															
133		ORS	0030	0012	3181	2555			14459	882	084	141	006	006	004	1073									
		STD	0050	-0083	3257	2620	0018210	0126	14429	803															
133		ORS	0050	-0083	3257	2620			14429	803	102	124	008	044	009	959									
		STD	0075	-0100	3299	2655	0014921	0170	14431	757															
133		ORS	0076	-0101	3301	2656			14431		078	110	006	030	005										
		STD	0100	-0105	3334	2683	0012212	0204	14438	721															
133		ORS	0101	-0105	3335	2684			14438	720	083	120	005	028	007	860									
		STD	0125	-0105	3360	2704	0010211	0232	14446	709															
		STD	0150	-0104	3380	2720	0008672	0255	14453	697															
133		ORS	0151	-0104	3381	2721			14453		099	140	012	084	012										
		STD	0200	-0085	3403	2738	0006999	0294	14473	673															
133		ORS	0201	-0085	3403	2738			14474	672	085	108	009	045	008	812									
		STD	0250	-0062	3422	2753	0005607	0326	14495	673															
133		ORS	0252	-0061	3423	2753			14496		090	103	010	080	010										
		STD	0300	-0045	3436	2763	0004652	0352	14513	674															
133		ORS	T0302	-0044	3436	2763			14514	674	080	096	008	058	007	824									
143		ORS	T0354	-0037	3441	2767			14526	677	097	117	009	122	012	830									
		STD	0400	-0036	3441	2767	0004260	0396	14535	672															
143		ORS	0404	-0036	3441	2767			14535	672	077	093	006	052	006	825									
143		ORS	0455	-0034	3443	2768			14545	672	065	090	006	050	006	825									
		STD	0500	-0033	3443	2768	0004107	0438	14553	672															
143		ORS	0506	-0033	3443	2768			14554	672	100	115	020	118	012	825									
143		ORS	0557	-0030	3446	2771			14564	674	080	091	007	062	007	828									
		STD	0600	-0028	3447	2771	0003834	0478	14572	671															
143		ORS	T0608	-0027	3447	2771			14574	670	092	107	010	094	009	824									
143		ORS	T0646	-0023	3450	2773			14583	669						824									

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DRIFT INDICATOR	MARSDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH		DAY	HR 1/10			CRUISE NUMBER	STATION NUMBER	DIR	HGT		PER	SEA AMT		TYPE
31	174	EV	7744 N	07426 W	260	74 07 31	157	1963	PPS	8776		0540	05	16				4			5	8	0027
						WATER		WIND		AIR TEMP °C													
						COLOR	TRANS	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB	VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS								
								16	F05	091	050	050											
MESSENGER TIME HR 1/10	CARD NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₂ - Si μg-at/l	O ₂ % sat.							
		STD	0000	0451	3102	2460	0033479	0000	14637														
163		ORS	0000	0451	3102	2460			14637		062	068	006	001									
		STD	0010	0412	3109	2469	0032591	0033	14623	813													
163		ORS	0010	0412	3109	2469			14623	813	057	077	002	002	003	1085							
		STD	0020	-0025	3189	2563	0023643	0061	14441	887													
163		ORS	0020	-0025	3189	2563			14441		063	089	006	004	004								
		STD	0030	-0012	3216	2584	0021624	0084	14453	960													
163		ORS	0030	-0012	3216	2584			14453	960	067	095	006	005	001	1164							
		STD	0050	-0137	3289	2648	0015595	0121	14408	814													
163		ORS	0050	-0137	3289	2646			14408	814	095	118	010	047	008	960							
163		ORS	0074	-0152	3305	2661			14407		103	128	010	079	012								
		STD	0075	-0151	3306	2662	0014235	0158	14408	769													
163		ORS	0099	-0124	3336	2685			14429	734	106	124	011	083	013	872							
		STD	0100	-0123	3337	2686	0011923	0191	14420	733													
		STD	0125	-0107	3366	2709	0009744	0218	14445	706													
163		ORS	0149	-0095	3386	2725			14458	689	106	133	013	116	015	828							
		STD	0150	-0095	3386	2725	0008226	0241	14458	689													
163		ORS	0199	-0084	3400	2736			14473	679	106	130	012	116	014	820							
		STD	0200	-0084	3400	2736	0007181	0279	14474	679													
163		ORS	0248	-0069	3415	2747			14490	677	098		008	119	012	822							
		STD	0250	-0068	3416	2748	0006036	0312	14491	677													
163		ORS	T0298	-0056	3426	2756			14506	678						826							
		STD	0300	-0056	3426	2756	0005304	0340	14507	678													
172		ORS	03190	-0042	3428	27570			672	099	115	012	121	013	822								
172		ORS	03650	-0045	3437	27640			674	100	115	012	122	012	824								
		STD	0400	-0041	3437	2764	0004542	0390	14532	673													
172		ORS	0417	-0040	3438	2765			14534	672	097	119	011	123	012	824							
172		ORS	T0456	-0035	3443	2768			14545	668	099	118	009	134	012	819							

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DRIFT INDICATOR	MARSDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX. DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH		DAY	HR 1/10			CRUISE NUMBER	STATION NUMBER	DIR	HGT		PER	SEA AMT		TYPE	AMT
							WATER		WIND		AIR TEMP °C													
				COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mba)	DRY BULB	WET BULB	VIS CODE	ADD'L OBS												
						11	F04	098	056	044														
MESSENGER TIME HR 1/10	CARD NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X10 ³	Σ Δ D. DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₂ - Si μg-at/l	O ₂ % sat.								
		STD	0000	0352	3139	2499	0029791	0000	14600															
206		ORS	0000	0352	3139	2499			14600		053	081	003	002										
		STD	0010	0314	3141	2504	0029329	0030	14585	862														
206		ORS	0010	0314	3141	2504			14585	862	056	092	003	001	001	1128								
		STD	0020	0064	3183	2554	0024496	0056	14482	945														
206		ORS	0021	0047	3187	2558			14474	953	066	090	003	002	002	1170								
		STD	0030	-0041	3230	2597	0020438	0079	14441	841														
206		ORS	0031	-0049	3234	2600			14438	832	087	121	005	034	006	1001								
		STD	0050	-0097	3280	2639	0016402	0116	14426	777														
206		ORS	0052	-0100	3285	2643			14425	772	079		007	019	005	920								
		STD	0075	-0109	3358	2703	0010375	0149	14415	739														
206		ORS	0077	-0110	3362	2706			14436	736	091	145	013	073	008	880								
		STD	0100	-0115	3368	2711	0009561	0174	14438	702														
206		ORS	T0103	-0115	3369	2712			14438	698	081	111	013	065	009	834								

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	OBT INDICATOR	MARS DEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS			WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HT	PER		SEA AMT	TYPE		AMT
31	174					EV	7701 N	07221 W	260	72		08	01			103	1963	PPS		8778	1152		10
		WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS											
COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	(mbs)	DRY BULB	WET BULB																	
						14	F05	132	050	044													
MESSANGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³		Σ AD DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₄ - Si μg-at/l	O ₃ ‰ sat.						
		STO	0000	0239	3232	2582	0021856		0000	14563													
108		OBS	0000	0239	3232	2582				14563													
		STD	0010	0239	3232	2582	0021858		0022	14565	902	040	074	006	003	001							
108		OBS	0010	0239	3232	2582				14565	902	047	089	007	001	001	1116						
108		OBS	0019	0008	3325	2671				14475		046	074	007	005	000							
		STD	0020	0002	3326	2672	0013284		0039	14473	860												
108		OBS	0029	-0044	3338	2684				14455	828	057	088	008	014	001	1005						
		STD	0030	-0046	3339	2685	0012080		0052	14454	825												
108		OBS	0048	-0084	3356	2700				14442	776	058	107	012	049	004	933						
		STD	0050	-0088	3357	2701	0010536		0075	14441	774												
108		OBS	0072	-0118	3369	2712				14432		079	097	013	049	005							
		STD	0075	-0120	3370	2712	0009458		0100	14432	750												
108		OBS	0096	-0133	3373	2716				14429	729	083		012	063	006	867						
		STD	0100	-0134	3374	2716	0009056		0123	14430	723												
		STD	0125	-0138	3380	2721	0008568		0145	14433	688												
108		OBS	0144	-0142	3384	2725				14435		077	091	010	058	006							
		STD	0150	-0134	3385	2725	0008185		0166	14440	657												
108		OBS	0193	-0087	3395	2732				14470	614	094	106	004	079	010	741						
		STD	0200	-0082	3396	2732	0007516		0205	14474	606												
108		OBS	0241	-0048	3405	2738				14498		114	129	008	128	016							
		STD	0250	-0038	3407	2740	0006863		0241	14504	577												
108		OBS	T0289	-0003	3416	2745				14528	563	100	116	006	128	014	695						
		STD	0300	0002	3419	2747	0006154		0274	14532	563												
120		OBS	T0373	0023	3431	2756				14556	566	112	135	006	132	016	704						
		STD	0400	0021	3432	2756	0005304		0331	14559	569												
120		OBS	0468	0015	3433	2758				14568	582	100	124	004	123	016	723						
		STD	0500	0012	3435	2760	0004985		0382	14572	595												
120		OBS	0563	0007	3437	2762				14581	612	083	105	002	071	009	759						
		STD	0600	0004	3438	2762	0004700		0431	14586	610												
120		OBS	0660	0000	3439	2763				14594		084	100	005	096								
		STD	0700	-0001	3438	2763	0004658		0478	14600	606												
120		OBS	0757	-0002	3437	2762				14609	603	101	120	007	132		746						
		STD	0800	-0003	3439	2764	0004560		0524	14616	608												
120		OBS	0855	-0005	3440	2765				14625	610	108	125	005	143	016	754						
		STD	0900	-0006	3441	2765	0004379		0568	14632	607												
120		OBS	T0953	-0007	3441	2765				14640	599						741						

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	MARS SQUAD	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER					MARS SQUARE		MONTH DAY HR 1/10		CRUISE NUMBER	STATION NUMBER			OBSERVATIONS					CLOUD CODES				
						10"	1"	10"						1"	DIR	SPEED OR FORCE	BAROMETER (mbars)		DRY BULB	WET BULB		VIS CODE	ADD'L OBS
31	174	EV	77063N	07455 W	260	74	08	01	155	1963	PPS	8779	0677	06	14			5		6	6		0030

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	SHIFT INDICATOR	MARSDEN SQUARE	STATION TIME (GMT)				YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		MODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIB	HGT	PER		SEA AMT	TYPE		AMT	
31	174	EV	7655 N	07620 W		260	66	08	01	200	1963	PPS	8787		0183	02	14			2		6	8		0031
						WATER		WIND		AIR TEMP °C		BAROMETER (mb)		VIS CODE		ADD'L OBS		SPECIAL OBSERVATIONS							
						COLOR CODE		TRANS (m)		DIR		SPEED OR FORCE		DRY BULB		WET BULB									
										14		FC 3		119		067		056							
MESSANGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₃ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₂ -Si μg-at/l	O ₂ % sat.									
		STD	0000	0372	3126	2487	0020946	0000	14606																
205	ORS	0000	0372	3126	2487				14606		057	097	000	001	002										
		STD	0010	0313	3137	2500	0029623	0030	14584	849															
205	ORS	0010	0313	3137	2500				14584	849	039	056	003	002	001	1109									
		STD	0020	0018	3206	2577	0022369	0056	14447	857															
205	ORS	0020	0018	3206	2577				14447		046	073	000	002	001										
		STD	0030	0078	3227	2526	0020438	0079	14424	865															
205	ORS	0030	0078	3227	2526				14424	865	085	100	006	026	004	1031									
		STD	0050	0142	3276	2637	0016579	0115	14404	800															
205	ORS	0050	0142	3276	2637				14404	800	086	105	009	047	006	1042									
		STD	0075	0071	3319	2670	0013494	0152	14447	791															
205	ORS	0075	0071	3319	2670				14447	791	084	091	009	032	002	952									
		STD	0100	0115	3352	2696	0010801	0153	14436	754															
205	ORS	0100	0115	3352	2696				14436	754	090	110	010	060	010	899									
		STD	0125	0133	3366	2710	0000657	0203	14423	744															
205	ORS	0125	0133	3366	2710				14423	744	072	095	008	039	005	885									
		STD	0150	0133	3385	2725	0000818	0211	14440	672															
205	ORS	0150	0133	3385	2725				14440	672	097	121	014	072	010	800									
205	ORS	0155	0133	3386	2726				14441	656	086	101	011	053	007	784									

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	SHIFT INDICATOR	MARSDEN SQUARE	STATION TIME (GMT)				YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		MODC STATION NUMBER		
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIB	HGT	PER		SEA AMT	TYPE		AMT	
31	174	EV	76191N	07802 W		260	68	08	02	003	1963	PPS	8781		0159	01	14			2		6	8		0032
						WATER		WIND		AIR TEMP °C		BAROMETER		VIS CODE		ADD'L OBS		SPECIAL OBSERVATIONS							
						COLOR CODE	TRANS (m)	DIB	SPEED OF FORCE	DRY BULB	WET BULB	DRY BULB	WET BULB												
									14	FN4	102	044	044												
MESSANGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY-X 10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₃ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₂ -Si μg-at/l	O ₂ ‰ sat.									
		STD	0000	0438	3141	2492	0030415	0000	14636																
006	ORS	0000	0438	3141	2492				14636		043	064	003	003											
		STD	0010	0129	3200	2564	0023558	0027	14512	937															
006	ORS	0010	0129	3200	2564				14512	937	063	087	005	002		1176									
006	ORS	0019	0011	3239	2602				14465		060	088	008	002											
		STD	0020	0005	3242	2605	0019670	0049	14458	862															
006	ORS	0029	0115	3267	2629				14412	817	095	119	008	054	008	968									
		STD	0030	0116	3268	2630	0017278	0067	14412	816															
006	ORS	0048	0122	3292	2650				14415	793	101	123	011	067	008	940									
		STD	0050	0119	3296	2653	0015108	0099	14418	792															
006	ORS	0072	0104	3333	2682				14433		085	105	010	062											
		STD	0075	0107	3337	2686	0011989	0133	14432	774															
006	ORS	0096	0125	3361	2706				14432	760	071	085	008	044	004	906									
		STD	0100	0129	3365	2709	0009760	0161	14431	748															
006	ORS	0120	0136	3379	2721				14433	698	095	117	013	092	008	830									
		STD	0125	0135	3382	2723	0008426	0183	14435	688															
006	ORS	0145	0121	3388	2727				14445	655	093	124	012	079	010	782									

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INCLINATION	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	
31	174	EV	76225N	07724 W	260	67	08	02	017	1963	PPS	8782		0375	03	14			2		X	9	0033
						WATER		WIND		AIR TEMP °C													
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB	VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS								
								14	F04	085	044	044											
MESSINGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³		Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₄ - Si μg-at/l	O ₃ ‰ sat						
		STD	0000	0183	3101	2482	0031421		0000	14521													
019		OBS	0000	0183	3101	2482				14521													
		STD	0010	0406	3235	2570	0023034		0027	14637	828	046	076	002	000	001							
019		OBS	0010	0406	3235	2570				14637	828	035	063	001	000		1114						
		STD	0020	0228	3341	2670	0013521		0046	14576	833												
019		OBS	0020	0228	3341	2670				14576		041	073	002	003	001							
		STD	0030	0033	3335	2678	0012745		0059	14490	837												
019		OBS	0030	0033	3335	2678				14490	837	061	091	005	016	003	1036						
		STD	0050	-0102	3359	2703	0010334		0062	14434	794												
019		OBS	0050	-0102	3359	2703				14434	794	075	104	008	024	005	951						
019		OBS	0074	-0137	3371	2714				14424		089	116	010	068	008							
		STD	0075	-0137	3372	2715	0009214		0106	14424	729												
019		OBS	0099	-0134	3385	2725				14431	679	079	098	005	031	007	809						
		STD	0100	-0134	3385	2726	0008190		0128	14431	678												
019		OBS	0124	-0134	3392	2731				14436		095	113	011	057	010							
		STD	0125	-0133	3392	2731	0007651		0148	14437	653												
019		OBS	0148	-0108	3396	2733				14453		085	103	007	056	010							
		STD	0150	-0106	3397	2734	0007366		0166	14454	633												
019		OBS	T0198	-0062	3410	2743				14485	603	117	139	009	104	017	733						
		STD	0200	-0061	3410	2743	0006517		0201	14486	603												
019		OBS	0246	-0048	3417	2748				14500		109	132	005	098	018							
		STD	0250	-0046	3417	2748	0006048		0223	14502	594												
019		OBS	T0292	-0035	3419	2749				14514	584	106	132	005	078	015	715						
		STD	0300	-0034	3419	2749	0005937		0263	14516	582												
019		OBS	T0343	-0033	3421	2751				14524	570	105	123	006	074	016	699						

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORBIT INCLINATION	MARSDEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER																																																
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT																																																	
31	174	EV	7622 N	07620 W	260	66	08	02	036	1963	PPS	8782	0165	01	02			2		7	6	0034																																																	
<table><tr><th colspan="4">WATER</th><th colspan="4">WIND</th><th colspan="4">AIR TEMP °C</th><th colspan="4" rowspan="3">SPECIAL OBSERVATIONS</th></tr><tr><th>COLOR CODE</th><th>TRANS (m)</th><th>DIR</th><th>SPEED OR FORCE</th><th>BAROMETER (mbs)</th><th>DRY BULB</th><th>WET BULB</th><th>VIS CODE</th><th>ADD'L OBS</th><th colspan="7"></th></tr><tr><td></td><td></td><td></td><td>09</td><td>F04</td><td>078</td><td>056</td><td>056</td><td></td><td colspan="7"></td></tr></table>																								WATER				WIND				AIR TEMP °C				SPECIAL OBSERVATIONS				COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB	VIS CODE	ADD'L OBS											09	F04	078	056	056								
WATER				WIND				AIR TEMP °C				SPECIAL OBSERVATIONS																																																											
COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB	VIS CODE	ADD'L OBS																																																															
			09	F04	078	056	056																																																																
MESSANGER TIME HR 1/10	CAST NO.	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ - P μg-at/l	TOTAL - P μg-at/l	NO ₂ - N μg-at/l	NO ₃ - N μg-at/l	SiO ₄ - Si μg-at/l	O ₃ ‰ sat																																																							
		STD	0000	0503	3224	2551	0024818	0000	14675																																																														
039		OBS	0000	0503	3224	2551			14675																																																														
		STD	0010	0514	3283	2596	0020512	0023	14689	768	045	077	002	001	001																																																								
039		OBS	0010	0514	3283	2596			14689	768																																																													
		STD	0020	0109	3347	2683	0012255	0039	14524	826	038	059	001		001	1063																																																							
039		OBS	0020	0109	3347	2683			14524																																																														
		STD	0030	0052	3352	2691	0011549	0051	14501	883	041	067	000	002	001																																																								
039		OBS	0030	0052	3352	2691			14501	883																																																													
		STD	0050	-0124	3369	2712	0009497	0072	14425	792																																																													
039		OBS	0051	-0129	3370	2713			14423	788	084	106	009	044	004	936																																																							
		STD	0075	-0151	3380	2721	0008590	0095	14418	733																																																													
039		OBS	0076	-0152	3380	2722			14418		077	101	005	043	005																																																								
		STD	0100	-0153	3385	2726	0008167	0116	14422	689																																																													
039		OBS	0102	-0153	3385	2726			14423	686	106	125	011	091	010	813																																																							
		STD	0125	-0139	3388	2728	0007969	0136	14434	658																																																													
039		OBS	T0127	-0138	3388	2728			14434	656	090	107	006	047	008	780																																																							
		STD	0150	-0129	3392	2731	0007567	0155	14443	649																																																													
039		OBS	T0150	-0129	3392	2731			14443	649	116	136	009	086	015	774																																																							

REFERENCE COUNTRY CODE	IDENTITY NUMBER	SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORIT INDICATOR	MARSDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER																										
							10"	1"	MONTH DAY HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT																											
							COLOR CODE	TRANS (m)	DIR														SPEED OR FORCE	BAROMETER (mbars)	DRY BULB	WET BULB	VIS CODE	ADDITIONAL OBS	SPECIAL OBSERVATIONS																			
31	174	EV	76212N	07520 W	260	65	08	2	057	1963	PPS	8784	0439	04	00			4			0	6	0015																									
<table><tr><th colspan="2">WATER</th><th colspan="2">WIND</th><th colspan="2">AIR TEMP °C</th><th rowspan="2">VIS CODE</th><th rowspan="2">ADDITIONAL OBS</th><th rowspan="2">SPECIAL OBSERVATIONS</th></tr><tr><th>COLOR CODE</th><th>TRANS (m)</th><th>DIR</th><th>SPEED OR FORCE</th><th>BAROMETER (mbars)</th><th>DRY BULB</th><th>WET BULB</th></tr><tr><td></td><td></td><td></td><td>06</td><td>178</td><td>061</td><td>61</td><td></td><td></td></tr></table>																								WATER		WIND		AIR TEMP °C		VIS CODE	ADDITIONAL OBS	SPECIAL OBSERVATIONS	COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbars)	DRY BULB	WET BULB				06	178	061	61		
WATER		WIND		AIR TEMP °C		VIS CODE	ADDITIONAL OBS	SPECIAL OBSERVATIONS																																								
COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbars)	DRY BULB				WET BULB																																							
			06	178	061	61																																										
MESSAGE TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY—X 10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ —P μg-at/l	TOTAL—P μg-at/l	NO ₂ —N μg-at/l	NO ₃ —N μg-at/l	SiO ₄ —Si μg-at/l	O ₃ ‰ sat																																
		STD	0000	0103	3206	2571	0022954	0000	14499																																							
060		OBS	0000	0103	3206	2571			14499		053	081	002	001	001																																	
		STD	0010	0101	3206	2571	0022941	0023	14500	882																																						
060		OBS	0010	0101	3206	2571			14500	882	058	077	004	001	002	1100																																
060		OBS	0019	-0076	3242	2608			14425	077	101	006	013	004																																		
		STD	0020	-0083	3244	2610	0019225	0044	14422	854																																						
060		OBS	0029	-0130	3263	2626			14404	829	088	122	008	027	007	978																																
		STD	0030	-0131	3265	2628	0017467	0062	14404	826																																						
060		OBS	0048	-0149	3296	2654			14403	778	106	129	013	063	011	916																																
		STD	0050	-0150	3298	2655	0014870	0090	14402	777																																						
060		OBS	0073	-0155	3322	2675			14408		107	130	011	070	012																																	
		STD	0075	-0155	3324	2676	0012845	0129	14409	758																																						
060		OBS	0097	-0180	3345	2693			14418	742	092	101	010	055	009	877																																
		STD	0100	-0143	3348	2696	0011020	0159	14422	740																																						
060		OBS	0121	-0117	3367	2710			14440		087	103	012	064	007																																	
		STD	0125	-0121	3369	2712	0007466	0185	14439	721																																						
060		OBS	0146	-0140	3377	2719			14435		092	119	011	080	008																																	
		STD	0150	-0142	3378	2720	0008695	0227	14435	703																																						
060		OBS	T0194	-0151	3385	2726			14434	672	104	132	011	102	011	797																																
		STD	0200	-0149	3386	2727	0007032	0240	14441	665																																						
060		OBS	0244	-0120	3393	2731			14463		112	131	008	125	016																																	
		STD	0250	-0109	3395	2733	0007402	0255	14469	621																																						
060		OBS	T0293	-0052	3408	2741			14505	605	119	138	005	137	013	737																																
		STD	0300	-0048	3411	2744	0005497	0323	14506	610																																						
060		OBS	T0340	-0035	3423	2757			14523		104	121	004	123	017																																	
060		OBS	T0389	-0037	3431	2759			14531	643	107	120	003	123	016	788																																
060		OBS	T0398	-0038	3434	2761			14532	643	078	092	005	152	002	788																																

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	ORIT INDICATOR	MARSDEN SQUARE	STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER																										
COUNTRY CODE	IDENTITY NUMBER						10"	1"	MONTH DAY HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT																											
31	174	EV	76212N	07422 W	260	64	08	02	083	1963	PPS	8785	0488	05	11			4		5	2	0036																										
<table><tr><th colspan="2">WATER</th><th colspan="2">WIND</th><th colspan="2">AIR TEMP °C</th><th rowspan="2">VIS CODE</th><th rowspan="2">ADDITIONAL OBS</th><th rowspan="2">SPECIAL OBSERVATIONS</th></tr><tr><th>COLOR CODE</th><th>TRANS (m)</th><th>DIR</th><th>SPEED OR FORCE</th><th>BAROMETER (mbs)</th><th>DRY BULB</th><th>WET BULB</th></tr><tr><td></td><td></td><td>11</td><td>F05</td><td>071</td><td>078</td><td>050</td><td></td><td></td></tr></table>																								WATER		WIND		AIR TEMP °C		VIS CODE	ADDITIONAL OBS	SPECIAL OBSERVATIONS	COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB			11	F05	071	078	050		
WATER		WIND		AIR TEMP °C		VIS CODE	ADDITIONAL OBS	SPECIAL OBSERVATIONS																																								
COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB				WET BULB																																							
		11	F05	071	078	050																																										
MESSAGE TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₃ ‰ sat																																
		STD	0000	0342	3214	2559	0024038	0000	14605																																							
088		OBS	0000	0342	3214	2559			14605		047	072	002	001	002																																	
		STD	0010	0339	3215	2560	0023941	0024	14606	824																																						
088		OBS	0010	0339	3215	2560			14606	824	039	064	001	001	001	1090																																
		STD	0020	0371	3330	2665	0015946	0043	14550	526																																						
088		OBS	0020	0371	3330	2665			14550		038	062	002	000	001																																	
		STD	0030	0353	3354	2695	0011144	0055	14479	832																																						
088		OBS	0030	0003	3354	2695			14479	832	054	095	007	009	003	1024																																
088		OBS	0049	-0106	3370	2712			14434	750	083	110	003	046	004	939																																
		STD	0050	-0107	3370	2713	0009452	0076	14434	757																																						
088		OBS	0074	-0132	3377	2719			14427		097	122	009	067	008																																	
		STD	0075	-0132	3377	2719	0008720	0093	14427	717																																						
088		OBS	0099	-0135	3383	2724			14430	664	086	100	002	059	003	214																																
		STD	0100	-0135	3383	2724	0008356	0120	14431	663																																						
088		OBS	0124	-0131	3386	2726			14437		109	140	010	108	014																																	
		STD	0125	-0130	3386	2726	0008120	0141	14438	652																																						
088		OBS	0148	-0112	3390	2729			14450		107	132	008	097	013																																	
		STD	0150	-0110	3390	2729	0007836	0161	14452	629																																						
088		OBS	0159	-0070	3401	2735			14480	605	091	111	006	070	010	753																																
		STD	0200	-0069	3402	2737	0007114	0198	14481	606																																						
088		STD	0250	-0046	3415	2744	0006216	0233	14501	622																																						
088		OBS	0256	-0037	3424	2755			14514	638	080	107	002	076	010	781																																
		STD	0300	-0039	3425	2757	0006454	0261	14515	642																																						
088		OBS	T0346	-0041	3421	2753			14522		086	111	003	082	011																																	
088		OBS	0355	-0039	3436	2762			14532	677	074	007	002	067	009	829																																
		STD	0400	-0039	3437	2764	0006450	0311	14533	670																																						
088		OBS	T0444	-0034	3442	2767			14543		071	087	006	092	006																																	
088		OBS	T0465	-0031	3442	2767			14548	643						790																																

REFERENCE		SHIP CODE	LATITUDE ° ' "/10	LONGITUDE ° ' "/10	MARS DEN SQUARE INCLINE	STATION TIME (GMT)						YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		MODE STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10"	3"	MOUTH	DAY	RE	1/10		CRUISE NUMBER	STATION NUMBER			BUE	HGT	PER	SEA		AMT	TYP		AMT
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BARDMETER (mbars)	AIR TEMP °C														
31	174	EV	7620 N	072465 W	260	62	08	12	125	1963	PPS	8787	0558	05	11			4		5	6		0038		

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	UNIT INDICATOR	MARSDEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX. DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10"	1"	MONTH	DAY	HR 1/10	CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT		
31	174	EV	7622 N	07108 W	260	61	08	02	171	1963	PPS	8789		0530	04	11		4		6	6		0040
						WATER		WIND		AIR TEMP °C													
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB	YES	NO	ADD'L ONS	SPECIAL OBSERVATIONS							
								11	F05	085	061	050											
MESSINGER TIME HR 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY-X10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₂ -Si μg-at/l	O ₂ % sat							
		STD	0000	0298	3307	2637	0016639	0000	14599														
175		OR5	0000	0298	3307	2637			14599		048	096	002	003	002								
		STD	0010	0297	3307	2637	0016636	0017	14600	829													
175		OR5	0010	0297	3307	2637			14600	829	035	077	007	001	001	1093							
		STD	0020	0299	3307	2637	0016657	0035	14603	326													
175		OR5	0020	0299	3307	2637			14603		034	075	003	002	001								
175		OR5	0029	0295	3310	2640			14603	827	032	064	007	001	001	1089							
		STD	0030	0272	3313	2644	0015987	0050	14593	826													
175		OR5	0049	0036	3352	2695			14464	803	054	086	006	014	002	978							
		STD	0050	0038	3353	2696	0011036	0077	14463	801													
175		OR5	0074	0080	3365	2707			14449		057	087	006	029	003								
		STD	0075	0083	3365	2709	0009900	0103	14448	756													
175		OR5	0098	0128	3374	2716			14432	714	077	106	011	036	005	856							
		STD	0100	0129	3374	2717	0009042	0124	14432	716													
		STD	0125	0136	3380	2721	0008613	0140	14434	670													
175		OR5	0147	0143	3384	2725			14435	654	081	113	012	063	008	776							
		STD	0150	0139	3385	2725	0008169	0170	14437	652													
175		OR5	0197	0083	3394	2731			14473	624	113	148	010	125	016	753							
		STD	0200	0077	3395	2731	0007613	0209	14476	621													
175		OR5	0246	0023	3405	2737			14510	586	115	139	007	120	016	718							
		STD	0250	0024	3406	2738	0007010	0246	14510	586													
175		OR5	T0295	0028	3410	2746			14517	583	098	124	006	069	011	715							
		STD	0300	0027	3416	2746	0006255	0279	14519	583													
182		OR5	T0351	0007	3422	2750			14537	581	085	122	007	056	010	717							
182		OR5	0375	0008	3429	2755			14549	577	086	123	004	063	011	715							
182		OR5	T0398	0020	3436	2760			14559	582	087	110	002	092	014	724							

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	OBS INDICATOR	MARS DEN SQUARE		STATION TIME (GMT)		YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10°	1°	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIR	HGT	PER		SEA AMT	TYPE		AMT
31	174	EV	7622 N	06950 W	259	69	08	02	1963	PPS	8790	0139	01	11			4		6	6	0041		
						WATER		WIND		BAROMETER (mbs)	AIR TEMP °C		VIS CODE	ADD'L OBS	SPECIAL OBSERVATIONS								
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE		DRY BULB	WET BULB											
								11	F05	085	061	061											
MESSINGER TIME 1/10	CAS NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X 10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ -P μg-at/l	TOTAL-P μg-at/l	NO ₂ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₂ -Si μg-at/l	O ₂ % sat							
210		STD	0000	0235	3295	2633	0017051	0000	14570														
		OBS	0000	0235	3295	2633			14570		033	065	003	002	001								
		STD	0010	0234	3296	2634	0016971	0017	14571	862													
210		OBS	0010	0234	3296	2634			14571	862	026	060	002	002	001	1119							
		STD	0020	0210	3307	2644	0015954	0033	14564	905													
210		OBS	0020	0210	3307	2644			14564	905	025	052	004	002	000	1169							
210		OBS	0029	0182	3310	2649			14553	910	024	050	004	002	000	1167							
		STD	0030	0169	3312	2651	0015300	0049	14548	906													
210		OBS	0049	-0007	3341	2685			14476	840	050	091	006	010	001	1030							
		STD	0050	-0010	3342	2686	0011999	0076	14475	836													
210		OBS	0073	-0058	3362	2704			14459	773	059	089	005	019	003	937							
		STD	0075	-0060	3362	2704	0010257	0104	14458	771													
210		OBS	0098	-0079	3361	2704			14453	746	073	102	008	041	005	898							
		STD	0100	-0080	3362	2705	0010160	0130	14453	742													
210		OBS	0122	-0087	3373	2714			14455	704	070	096	008	036	005	847							
		STD	0125	-0086	3374	2715	0009208	0154	14456	700													
210		OBS	T0132	-0085	3376	2716			14458	690	077	095	010	038	006	831							

REFERENCE		SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	OBS INDICATOR	MARS DEN SQUARE		STATION TIME (GMT)			YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER			
COUNTRY CODE	IDENTITY NUMBER					10°	1°	MONTH	DAY	HR 1/10		CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT				
31	174	EV	74525N	067095W	259	47	08	04	121	1963	PPS	8791	1059	09	14			4		5	8	0042				
						WATER		WIND		AIR TEMP °C						SPECIAL OBSERVATIONS										
						COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB	VIS CODE	ADD'L OBS												
								14	F04	095	056	056														
MESSANGER TIME 1/10	CAS NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA—T	SPECIFIC VOLUME ANOMALY—X 10 ³	Σ Δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₂ —P μg-at/l	TOTAL—P μg-at/l	NO ₂ —N μg-at/l	NO ₃ —N μg-at/l	SiO ₂ —Si μg-at/l	O ₂ % sat										
		STD	0000	0368	3197	2543	0025548	0000	14614																	
126		OBS	0000	0368	3197	2543			14614		041	065	006	002	003											
		STD	0010	0230	3251	2598	0020352	0023	14563																	
126		OBS	0010	0230	3251	2598			14563		041	072	004	002	003											
		STD	0020	-0102	3349	2695	0011115	0039	14428																	
126		OBS	0020	-0102	3349	2695			14428		072	102	009	023	005											
		STD	0030	-0155	3354	2701	0010572	0050	14405																	
126		OBS	0031	-0159	3355	2702			14404	768	075	097	010	032	007	905										
		STD	0050	-0166	3366	2710	0009649	0070	14405	738																
126		OBS	0051	-0166	3366	2711			14405	737	077	099	003	048	008	869										
		STD	0075	-0164	3374	2717	0009037	0093	14411	721																
126		OBS	0076	-0164	3374	2717			14412		078	099	003	049	007											
		STD	0100	-0154	3379	2721	0008643	0115	14421	704																
126		OBS	0102	-0153	3379	2721			14422	703	083	104	004	065	009	832										
		STD	0125	-0145	3383	2724	0008310	0136	14420	689																
		STD	0150	-0131	3388	2727	0005004	0157	14441	673																
126		OBS	0153	-0129	3388	2725			14443	671	093	115	002	088	012	800										
		STD	0200	-0091	3393	2730	0007708	0196	14469	638																
126		OBS	0203	-0087	3394	2731			14472	636	092	110	004	082	012	767										
		STD	0250	0008	3411	2741	0006800	0232	14526	592																
126		OBS	0254	0014	3412	2741			14529		092	110	004	084	012											
		STD	0300	0070	3424	2748	0006188	0265	14564	563																
126		OBS	T0305	0075	3425	2746			14567	561	093	123	003	070	010	707										
		STD	0400	0138	3440	2756	0005479	0323	14613	559																
126		OBS	T0404	0143	3442	2757			14616	559	085	111	002	073	010	717										
140		OBS	T0424	0168	3454	2765			14632	565	094	107	003	073		730										
126		OBS	T0430	0147	3445	2759			14623		079	097	002	094	012											
140		OBS	0447	0157	3451	2763			14631		111	146	001	152	021											
126		OBS	T0453	0160	3449	2762			14633		094	111	002	080	014											
140		OBS	0470	0156	3453	2765			14635		096	125	002	088												
126		OBS	T0478	0161	3451	2763			14638		090	110	004	084	013											
140		OBS	0492	0146	3452	2765			14634		129	159	001	080	015											
		STD	0500	0145	3452	2765	0004660	0374	14635	550																
140		OBS	T0515	0144	3452	2765			14637	547	118	136	002	114	022											
		STD	0600	0116	3451	2766	0004523	0420	14638	537																
		STD	0700	0080	3450	2768	0004334	0464	14639	525																
140		OBS	T0705	0078	3450	2768			14639	524	123	149	003	124												
140		OBS	0728	0069	3449	2768			14638		118	137	002	093												
140		OBS	0752	0062	3449	2768			14639		121	112	002	138	032											
140		OBS	0776	0057	3448	2768			14641		111	137	002	072												
		STD	0800	0053	3449	2769	0004218	0507	14643	520																
140		OBS	0800	0053	3449	2769			14643	520	126	163	004	125												
140		OBS	0823	0048	3448	2768			14644		136	188	004	157												
140		OBS	T0848	0043	3448	2766			14646	511	104	136	002	065												
140		OBS	0873	0041	3449	2769			14650		092	121	002	042												
140		OBS	T0896	0035	3449	2770			14651	495	104	154	003	068	032											

REFERENCE		SHIP CODE	LATITUDE ° 1/10	LONGITUDE ° 1/10	MARS DEN SQUARE	STATION TIME (GMT)				YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		NODC STATION NUMBER	
COUNTRY CODE	IDENTITY NUMBER					10°	1°	MONTH	DAY		HR 1/10	CRUISE NUMBER			STATION NUMBER	DIR	HGT	PER		SEA AMT	TYPE		AMT
31	174	EV	74492N	06642 W	259	46	08	04	148	1963	PPS	8792	1555	15	14			3		7	8		0043
		WATER		WIND		BAROMETER		AIR TEMP °C		VIS CODE	SPECIAL OBSERVATIONS												
COLOR CODE	TRANS (m)	DIR	SPD OR FORCE	DRY BULB	WET BULB	DRY BULB	WET BULB	DRY BULB	WET BULB		ADD'L OBS												
				14	FO4	098	050	050															
MESSENGER TIME 1/10	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY - X10 ³	Σ δ D DYN M X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₃ -N μg-at/l	NO ₂ -N μg-at/l	Sr O ₄ -Sr μg-at/l	O ₂ % sat.							
		STD	0000	0395	3131	2488	0000772	0000	14617														
151		OBS	0000	0395	3131	2488			14617														
		STD	0010	0050	3285	2637	0016647	0024	14488	970													
151		OBS	0010	0050	3285	2637			14488	970	050	091	003	001		1201							
		STD	0020	0114	3341	2689	0011691	0038	14421	868													
151		OBS	0020	0114	3341	2689			14421		074	116	009	012	007								
		STD	0030	0157	3350	2696	0010674	0049	14404	796													
151		OBS	0030	0157	3350	2696			14404	796	086	120	014	026	008	940							
		STD	0050	0165	3359	2705	0010150	0070	14405	746													
151		OBS	0050	0165	3359	2705			14405	746	103	133	010	056	011	878							
		STD	0075	0165	3368	2712	0009442	0095	14410	742													
151		OBS	0075	0165	3368	2712			14410		080	109	004	028	005								
		STD	0100	0161	3374	2717	0008976	0116	14417	737													
151		OBS	0100	0161	3374	2717			14417	737	094	127	004	073	010	871							
		STD	0125	0151	3379	2721	0008606	0140	14427	708													
		STD	0150	0131	3385	2725	0008195	0161	14441	679													
151		OBS	0150	0131	3385	2725			14441	679	116	151	004	104	015	809							
		STD	0200	0060	3399	2734	0007383	0200	14484	623													
151		OBS	0200	0060	3399	2734			14484	623	121	138	003	097	014	756							
		STD	0250	0044	3417	2743	0006544	0234	14543	571													
151		OBS	0250	0044	3417	2743			14543		123	142	004	134									
		STD	0300	0131	3435	2752	0005778	0265	14593	547													
151		OBS	T0300	0131	3435	2752			14593	547	099	124	003	068	014	700							
181		OBS	T0382	0163	3446	2759			14622	570	104	126	002	100	016	736							
		STD	0400	0158	3446	2759	0005183	0320	14623	566													
181		OBS	0405	0157	3446	2759			14623		112	143	002	107	018								
181		OBS	0429	0152	3448	2761			14625		106	141	002	089	016								
181		OBS	0452	0178	3452	2763			14641		114	139	003	119	021								
181		OBS	0476	0177	3454	2764			14645	558	126	154	003	144	025	722							
181		OBS	0499	0165	3454	2765			14644		095	118	002	070	015								
		STD	0500	0164	3454	2765	0004664	0369	14643	552													
181		OBS	0522	0146	3453	2766			14639		102	132	002	091	017								
181		OBS	0545	0133	3451	2765			14637		123	145	002	147	024								
181		OBS	T0568	0116	3449	2765			14633	540	121	149	003	156	025	689							
		STD	0600	0106	3449	2765	0004602	0410	14633	540													
		STD	0700	0077	3449	2767	0004393	0461	14637	538													
181		OBS	0760	0062	3449	2768			14640	534	108	150	004	094	021	672							
		STD	0800	0052	3449	2769	0004211	0504	14643	532													
		STD	0900	0032	3449	2774	0004061	0545	14650	520													
181		OBS	T0952	0025	3449	2770			14656	510	123	153	002	148	036	636							
		STD	1000	0021	3449	2770	0004013	0585	14662	498													
181		OBS	1050	0017	3448	2770			14669	483	113	142	003	094	029	601							
181		OBS	1099	0014	3449	2771			14676		130	186	003	150	036								
		STD	1100	0014	3449	2771	0003918	0625	14676	464													
181		OBS	T1148	0011	3448	2770			14682	444	136	172	003	129	036	551							
		STD	1200	0003	3450	2772	0003787	0664	14688	418													
170		OBS	T1216	0001	3450	2772			14690		140	179	002	144	051								
170		OBS	1265	0006	3450	2773			14695	393	143	183	002	148	052	486							
		STD	1300	0011	3449	2772	0003732	0701	14698	385													
170		OBS	1314	0013	3448	2771			14700		157	184	004	180	063								
170		OBS	1362	0018	3449	2772			14705	373	144	188	002	145	052	460							
170		OBS	1386	0020							166	200	003	219	073								
		STD	1400	0022	3451	2774	0003452	0737	14710	366													
170		OBS	1411	0023	3451	2774			14712		170	203	004	188	072								
170		OBS	1435	0024	3450	2774			14715		177	212	003	197	077								
170		OBS	1460	0027	3449	2772			14718	356	173	211	003	205	078	438							

REFERENCE	SHIP CODE	LATITUDE ° ' 1/10	LONGITUDE ° ' 1/10	DATE	MARS DEN SQUARE	STATION TIME (GMT)	YEAR	ORIGINATOR'S		DEPTH TO BOTTOM	MAX DEPTH OF SAMPLES	WAVE OBSERVATIONS				WEATHER CODE	CLOUD CODES		HODC STATION NUMBER
								CRUISE NUMBER	STATION NUMBER			DIR	HGT	PER	SEA AMT		TYPE	AMT	
31 174	EV	7442 N	06655 W	259	46	14	193	DPS	8793	2085	19	14			3		5	8	0044
		WATER		WIND		AIR TEMP °C		VIS CODE		SPECIAL OBSERVATIONS									
		COLOR CODE	TRANS (m)	DIR	SPEED OR FORCE	BAROMETER (mbs)	DRY BULB	WET BULB	WET BULB										
				14	F04	098	044	044											
MESSAGE TIME HR	CAST NO	CARD TYPE	DEPTH (m)	T °C	S ‰	SIGMA-T	SPECIFIC VOLUME ANOMALY-X10 ³	Σ Δ D DYN. M. X 10 ³	SOUND VELOCITY	O ₂ ml/l	PO ₄ -P μg-at/l	TOTAL-P μg-at/l	NO ₃ -N μg-at/l	NO ₃ -N μg-at/l	SiO ₄ -Si μg-at/l	O ₂ ‰ sat.			
		STD	0000	0374	3460	2441	0035271	0000	14600										
222	ORS	0000	0274	3069	2441				14600		038	062	005	001	004				
	STD	0010	0000	3312	2662		0014270	0025	14469	1004									
222	ORS	0010	0000	3313	2662				14469	1004	051	083	005	001	005	1230			
	STD	0020	-0144	3342	2691		0011529	0039	14407	870									
222	ORS	0020	-0144	3342	2691				14407		070	094	011	021	005				
	STD	0030	-0161	3347	2695		0011095	0049	14402	784									
222	ORS	0030	-0161						784		084	126	014	037	007				
222	ORS	0049	-0168	3357	2704				14403	756	085	128	013	043	008	890			
	STD	0050	-0168	3358	2704		0010220	0070	14403	756									
222	ORS	0074	-0166	3368	2712				14410		073	109	005	035	006				
	STD	0075	-0166	3368	2713		0009424	0095	14410	757									
222	ORS	0099	-0167	3372	2716				14414	758	067	086	004	046	005	894			
	STD	0100	-0167	3372	2716		0009106	0118	14414	758									
	STD	0125	-0162	3374	2717		0008949	0141	14421	756									
222	ORS	0148	-0158	3376	2719				14427	754	071	095	004	066	007	891			
	STD	0150	-0155	3377	2719		0008732	0163	14429	749									
222	ORS	0197	-0092	3391	2729				14468	654	083	101	004	059	008	787			
	STD	0200	-0088	3392	2729		0007796	0204	14470	651									
222	ORS	0247	-0024	3405	2737				14510	619	090	106	004	078	011	759			
	STD	0250	-0020	3416	2738		0007030	0241	14512	620									
222	ORS	T0296	0039	3416	2743				14548	621	087	107	003	081	010	775			
	STD	0300	0042	3417	2744		0006541	0275	14550	617									
	STD	0400	0110	3440	2758		0005270	0334	14601	552									
211	ORS	T0400	0110	3440	2758				14601	552	098	130	007	122	017	702			
211	ORS	0425	0126	3444	2760				14613		082	113	003	077	011				
211	ORS	0449	0125	3446	2762				14616		094	109	004	115	016				
211	ORS	0474	0150	3449	2762				14632		088	119	004	086	014				
211	ORS	0498	0142	3450	2764				14633	550	087	113	004	099	014	705			
	STD	0500	0143	3450	2764		0004779	0344	14633	550									
211	ORS	0522	0144	3452	2765				14638		087	121	004	096	014				
211	ORS	0547	0135	3452	2766				14638		086	129	018	153	021				
211	ORS	0571	0110	3450	2765				14635		090	107	006	094	015				
211	ORS	T0595	0118	3451	2766				14638	543	073	111	007	091	014	692			
	STD	0600	0116	3451	2766		0004530	0431	14638	543									
	STD	0700	0093	3450	2768		0004365	0475	14640	542									
211	ORS	0793	0058	3449	2768				14644	537	115	150	006	179	033	675			
	STD	0800	0056	3449	2768		0004249	0518	14644	537									
	STD	0900	0036	3448	2769		0004174	0561	14652	533									
211	ORS	T0901	0024	3447	2769				14662	517	103	123	005	097	023	644			
	STD	1000	0023	3447	2769		0004126	0602	14663	515									
211	ORS	1091	0019	3449	2771				14677	486	121	163	004	188		605			
	STD	1100	0019	3449	2771		0003957	0642	14678	481									
211	ORS	1141	0018	3448	2770				14684		098	122	005	132					
211	ORS	T1190	0012	3449	2771				14690	434	104	132	005	104	028	538			
	STD	1200	0011	3449	2771		0003899	0682	14691	430									
	STD	1300	-0003	3449	2771		0003805	0720	14702	398									
197	ORS	T1392	-0015	3448	2771				14713	378	128	161	006	158	050	466			
	STD	1400	-0015	3448	2771		0004733	0757	14713	378									
197	ORS	1443	-0021	3449	2772				14719		131	163	006	169	053				
197	ORS	1494	-0025	3449	2773				14725	369	152	189	004	192	065	454			
	STD	1500	-0026	3449	2773		0003547	0794	14725	368									
197	ORS	1541	-0030	3450	2774				14731		120	141	003	122	047				
197	ORS	T1588	-0032						350	112	136	003	109	040					
197	ORS	1638	-0033	3450	2774				14746		117	148	003	103	043				
197	ORS	1688	-0036	3450	2774				14753	338	140	173	009	156	038	415			
197	ORS	1737	-0037	3451	2775				14761		130	165	004	130	055				
	STD	1750	-0038	3451	2775		0003264	0879	14763	338									
197	ORS	T1788	-0039	3450	2774				14769	336	121	163	005	113	058	412			
197	ORS	1811	-0038	3450	2774				14773		126	159	002	106	046