CSS HUDSON Cruise 90031

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CONTENTS

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Summary of objectives

The Cruise was designed to collect data and material for studies of late glacial / postglacial sedimentary and oceanographic history in Gulf of St. Lawrence, Cabot Strait and Laurentian Channel by taking sediment cores, bottom grabs and water samples at key locations. The exact station locations were determined by seismic surveys to ascertain sufficient sediment for coring and to assist core data interpretation in terms of regional depositional environment.

During deglaciation, large volumes of meltwater passed through the Gulf of St. Lawrence System of the St. Lawrence Estuary, Cabot Strait and mixed also with the waters of Laurentian Channel. The participating multidisciplinary scientific team will investigate the extent of influence of the meltwater fluxes on paleoceanography in Gulf of St. Lawrence and paleoclimate off eastern Canada. The basic data are the downcore trends in foraminifers, dinoflagellates and pollen supported by stable isotope profiles of foraminifers. ^{14}C dates on biogenic carbonate will provide absolute chronology of paleoenvironmental changes. The paleoenvironmental synthesis also depends on geochemical and micropalaeontological baseline data from water filtrates and boxcore samples.

UQAM SCIENTIFIC PROGRAM:

Research objectives:

(1) To define geochemical and micropaleontological indicators of biotic (productivity) and abiotic (salinity) environmental parameters
(2) To trace the organic matter origin and fluxes from the water column and sediments
(3) To document biogeochemical processes in the water column and at the water/sediment interface
(4) To investigate remnant magnetisation acquisition by sediments
(5) To study late Quaternary to recent environmental changes at time scales ranging from 10^1 to 10^4 years.

Onboard studies and sampling (see appendix for sampling procedure).

(1) Water column:
1.1.Establishment of salinity and temperature profiles (CTD) to identify the water masses.
1.2.Sampling of water in each water mass and filtration of particulate matter for further analysis of the chemical and isotopic composition of water, dissolved carbon, suspended particulate matter....etc.

(2) Surface sediments (Box cores)
2.1.Measurement of redox potential (Eh) at 1 cm interval from a push core.
2.2.Sampling of sediments and interstitial waters under nitrogen atmosphere at 1 or 2 cm interval for further high resolution analyses in aliquot subsamples: physical (porosity), geochemical (C, N, Th/U, ^{13}C...etc.), and micropaleontological (palynomorphs,diatoms etc...).

(3) Cored sequences (TWCores & Pcores)
3.1.Continuous sampling for high resolution paleomagnetism studies.
3.2 Additional sampling at ca. 10 cm intervals for further geochemical (C, N, Th/U, ^{13}C-^{18}O in foraminifers) and micropaleontological analyses.

HUDSON 90-031

EQUIPMENT LIST

SAMPLES/TAPES/RECORDS INVENTORY

PARAMETER LINE KILOMETRES

compiled by

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HUDSON 90-031 FACTS SHEET

SAMPLE INVENTORY:

VANVEEN GRABS ---- 02

AGC LONG CORES --- 20

CTD STATIONS ----- 15

BOTTLE CASTS ----- 12

BOXCORES --------- 15

KILOMETRES RUN:

Huntec DTS ---------- 518 Km

3.5 KHz Bathymetry --------- 3100 Km

Sleevegun Seismics --------- 1053 Km

BIO REFLECTION SEISMICS

Seismics Reflection equipment consisted of an T.I. sleeve gun sound source of 40 cubic inch received on a combination of an NSRF-Type LT-18 element 25 foot streamer, a 25 foot S.E. streamer and a 100 foot S.E. streamer. The air compressor was a RIX J-196, 65 cfm running at 1800 psi. Lab equipment consisted of a NSRF pre-amp, coupled to the AGC Time Varied Gain (TVG) unit onto a Krohn-Hite Model 3323 Filter, (band pass set for 180-650 Hz); and a Raytheon LSR1811 Graphic Recorder, running at a 1 second sweep. The 100 foot streamer inputs to an amplifier coupled to the AGC time varying gain control unit, via a Kron-Hite filter set at 120-850 Hz. displayed on a Raytheon LSR 1811 recorder at a 1 second sweep. This LSR, however, had a bad jitter which makes the data look slightly out of focus.

The seismic data was tape recorded onto VHS cassette tapes on the TEAC XR-5000 multi-track unit (see cruise set-up specifications for sweep, paper speeds, etc). The TEAC tape recorder occasionally stopped recording for no apparent reason. Meticulous cleaning of all surfaces touched by the tape would decrease the frequency of such occurrences. If the tape back tension is the problem, consideration for future purchasing of higher quality tapes may be required. The two tension measuring devices in the unit are sealed spring-units deep inside the transport mechanism and have no obvious adjustment.

The timing control was accomplished by using the Airgun Seismics Computer coupled to a Ship Clock Repeater triggering the Airgun Firing/Control Unit and the TVG unit. Ship time was based on the Cesium Beam controlled SHIPCLOCK computer, which provided accurate timing to the various Ship Clock Repeaters located throughout the ship. All graphic recorders were synchronized using the 6.4 Khz from the Huntec Deep Tow System (DTS) to prevent record cross-talk. The 5-minute pulse output of the AGC Ship's Clock Repeater was used to trigger the event annotation time for the TSS 312B annotator, to write "day/time, course/speed" on the records of all systems.

The seismic system performed well. The only breakdown was a hole in one of the umbilical air lines. This was repaired while on station and no time was lost.

The sleeve gun stopped working on the last line. The problem was traced to a parted conductor on the firing line. It was repaired with a time loss of about 3.5 hours.

HUNTEC DEEP TOW SYSTEM (DTS)

The Huntec Deep Tow System (DTS) number AGC 3 was deployed this cruise to generate high resolution seismic data. A high voltage boomer sound source of 540 Joules generated signals for a LC-10 single hydrophone internally mounted under the boomer plate. A Nova Scotia Research Foundation (NSRF) type 10 element 15 foot streamer was towed behind the vehicle and connected to the ship via a 750 meter tow cable on the Hydromac winch.

The LC-10 hydrophone data is the "internal hydrophone" data which is amplified and TVG'd through an adaptive signal processor unit and bandpass filtered in the system console before displaying on a EPC 4100 graphic recorder.

The towed streamer data is the "external hydrophone" data which is processed similarly but at lower filter setting through an external Krohn-Hite Model 3700 Bandpass Filter. This external hydrophone data is also displayed on another EPC 4100 graphic recorder.

The internal and external data is magnavox tape recorded on a TEAC XR-5000 VHS cassette recorder on Direct Record channels along with two other channels for (a) the Trigger/Sync. signal of 1 volt peak, 6.4 Khz EPC sync. pulse train with a negative master trigger pulse and a positive fire point pulse; and (b) a zero pulse graphic recorder trigger signal. All data is tow vehicle heave compensated in the pressure mode.

The small 1000 winch and power pack was replaced in Quebec City due to slip ring problems on the larger winch.

Problems were encountered with the system when it was deployed in questionable weather. During the recovery, the sidescan transducer was damaged. The PCC began to malfunction and could not be repaired.

For settings, gains, power output, etc., please see cruise set-up specifications.

BATHYMETER 3.5 Khz ACOUSTIC PROFILER (HULL MOUNTED)

Bathymetry information is recorded every 5 minutes as measured on a EPC 4100 recorder triggering the ORE 140 Transceiver to a hull mounted transducer.

The 3.5 Khz was run during transit between stations, while on station and during transit to new survey areas. Having the 3.5 going while on station, records a true indication of the sub-bottom at the time the sampling equipment hits bottom. The 3.5 worked very well in good to fair weather conditions but deteriorates with increased ship motion. On a few occasions due to the sea conditions the ram mounted on the 12 KHZ transducer was switched on.

NAVIGATION

Primary navigation was provided by a Trimble 10X GPS receiver. The present satellite configuration consists of 15 high altitude satellites (space vehicles) providing for coverage of from 20 to 21 hours per day.

A secondary navigation source was provided by a NORTHSTAR 800/800X receiver (ship's equipment-bridge mounted) using the 5930 chain with a master station at Caribou (Main), and secondary stations at Nantucket, Fox Harbour and Cape Race.

Both receivers were configured into the newly purchased (Hydrography) ISAH integrated navigation package to provide real time displays to the bridge and GP lab. Neither of the two video output displays provided all necessary information, therefore, three video monitors were installed on the bridge and one in the GP lab. Two bridge monitors provided information for the officer of the watch and the quartermaster for station keeping and line running, and the third provided latitude and longitude information for the officer of the watch. A slave monitor to the one showing Latitude and Longitude was mounted in the GP lab for watchkeepers. This was not 100% satisfactory as this screen does not show course and speed. This was only a minor problem as this information was available from the bridge ISAH, which performed 99% up to its capabilities with the exception of a ship's head value which gyrated back and forth between true value and 270 degrees west.

Because the GPS coverage is not complete, the ships position symbol on the Polar plot screen would freeze when GPS could no longer position. This caused considerable inconvenience when it occurred while the ship was zeroing in on site to drop the sampler. To solve this problem, a Loran-C lat and long was taken at the site location (located by GPS) and punched in as a separate examination point. If the GPS froze up, this Loran-C

Exam point would be put on the screen and the Primary and Secondary nav systems (GPS and Loran-C) would be switched (because ISAH always uses the Primary). Loran-C would become the Primary and GPS the Secondary. Because the Loran-C lats and longs were true in relation to the GPS site lats and longs, the position on the monitor would change only slightly. Disregard the fact that the GPS and Loran-C lats and longs differ considerably. Using Loran-C on station has the advantage of being a continuous source of fixing but the disadvantage of being jumpy. Therefore GPS should be used when possible with the Loran-C site punched in as a reserve should the screen freeze for any period of time. The Primary and Secondary nav sources would then be swapped again prior to leaving the station to insure the GPS data was being logged to the Vax.

ISAH has been developed specifically for the Hydrographic service, mainly for launch work. It will need significant modifications in two key areas to meet the needs of AGC and the ships officers who will be mostly affected by its final configuration.

(A) Monitor displays

ISAH is designed with two video output displays, one for the helmsman and one for the hydrographer. Neither of the two video displays include all necessary information for the bridge or for the lab and probably now contain information which is not necessary to the type of operation typically done by AGC.

Suggestions are:

(1) Larger monitors (color)

(2) A note field (30 characters) should be associated with each entry in the LINE, WAYPOINT and EXAM databases to allow the operator to include a short descriptor of the entry. This descriptor would then appear on the screen while each entry is displayed. (EXAM example = AGC LCF # 14) (LINE example = sidescan line 26 over scours 126,127) (WAYPOINT example = Halifax harbour survey grid). This avoids confusion between the lab and the bridge and insures the same sample number is entered in all logs and sample sheets.

(3) When in line running mode the screen should display(with examples in brackets to show number of decimals):
   (a) the number and name of the line being run;
   (b) the latitude and longitude of the vessel expressed in degrees, minutes and decimal minutes (not seconds, BIO never use seconds, always minutes and decimal minutes!); 48 23.456N 64 21.341W

(c) ships speed (knots) over the ground; 11.5
(d) ships speed (knots) through the water (ie ships log);
(e) azimuth of the line being run; 235
(f) ships head (degrees);
(g) course made good (degrees);
(h) SOL and EOL distances expressed in kilometres and nautical miles (two decimal places); 234.21 km
(i) cross track error (metres) (- port, + stbd); 34 metres
(j) depth (fathoms and metres) (calibrated for draft); 2451 fms

(k) the screen scale must be clearly shown and must clearly indicate what it denotes (ex. distance from line indicator to screen edge);
(l) colors should be used to clearly convey the information to the watch officer;
(j) the screen should be split in such a way as to have information required at a glance (ie. the line indicator, ship symbol, cross track error) separate from the remainder of the information on the screen.

(3) When in homing mode (polar plot) the screen should display:

(a) the number and name of the target (ie. sample site);
(b) the latitude and longitude of the vessel expressed in degrees, minutes and decimal minutes (not seconds);
(c) the bearing (degrees) of the target from the ship;
(d) distance to target (metres);
(e) use bulls eye rings overlain on a cross hair (north up) where the scale of the rings from the centre point will automatically increase or decrease at preset ranges as distance to target changes. This feature allows the ship to home on a target from twenty or more miles away and always have the target displayed on a workable scale down to metres when on position.

The ring scales must be clearly shown on the screen;

(f) the vessel position should be indicated on the screen by a ship symbol where the symbol ships head denotes the true ships head;

The size of the ship displayed should be drawn to true scale. (ISAH will have to know the ship length.) This gives an immediate feel for how far

something is in "ship lengths", the most universal unit of measure. At very long ranges this does not work so a square box with a heading line can be used.

(g) course made good (degrees);

(h) SOL and EOL distances expressed in kilometres and nautical miles (two decimal places);

(j) depth (fathoms and metres) (calibrated for draft);

(B) Operator interaction with the system

The routine jobs of data entry into the three databases (waypoints, lines and exams) must be made less complicated.

Suggestions are:

(1) Replace the present keyboard with a PC style keyboard. The keyboard now used is designed for harsh environments.Keys are small, indented and have a raised rubber seal around each key, making for a very slow and uncomfortable input device.

(2) A number of key strokes are now necessary to move from the data entry stage to the data display stage, requiring a sound knowledge of the workings of ISAH.

The software must be made more friendly for the entry/verification of waypoints, lines etc.

Consideration should be given to installing a monitor and keyboard on the bridge to allow the officer of the watch to enter such information in the absence of a navigation tech.

(D) Overall system modifications required

(1) The ability to define a priority list for receivers and auto selection down the list as receivers fail or are temporarily at rest because of a lack of input data. The navigation source being used <u>must</u> be displayed prominently at <u>all times</u> on all monitors.

(2) Positions from Loran-C receivers must be calculated from the TD's and not from algorithms within the receivers. As an example the Northstar receiver used as backup on this trip compared very well with GPS when TD's were used to plot locations but were in discrepancy by 3-5 cables when lats and longs were compared.

(3) ISAH time should be synchronized with the ships master clock to ensure that navigation times and record annotation times are the same. A substantial drift rate of 5-6 seconds per day for the ISAH clock was observed on this cruise.

(E) General comments

The ISAH system performed well during the survey. It provided line running and station keeping capabilities. A number of interesting features not before available in BIONAV are included in this package and deserve attention as to whether they can be used by AGC. The system has the ability to track and display the location of a towed body at all times which could be very useful on some AGC cruises. Also a digitized coastline can be displayed on the COAST video option with selected waypoints. This option might be more useful on smaller vessels such as the NAVICULA which are primarily used for near shore work. Full GPS coverage will make this very attractive.

Does AGC want to purchase a ISAH system for navigation? The system did function well, but is very cumbersome to use. It is limited in its ability to detect if the primary Navigation source currently in use is unstable. It is felt that the ISAH front-end will need to be completely replaced in order to implement a user-friendly interface. In order to implement a good navigation system, it will require a multi-tasking operating system. We will have to replace the console and displays (with color) of the ISAH system. A simple single tasking system (PC configuration could be put together for as little as $30K. This would include a PC386, several monitors, a Trimble 10X and the software on contract). It would be very simple to operate, and maintain. Once we acquire a more sophisticated system , we will have to acquire a more sophisticated level of navigation tech.

NAVIGATION LOGGING

Data were logged via an RS232 link from the printer output port of ISAH at 9600 baud directly into port TXA5: on the VAX. A routine was written to reformat this file into SHIPAC format for processing via the shipboard system.

Navigation quality was excellent with the GPS positions and positions plotted with Loran-C TD's agreeing at all times. A discrepancy with radar when at long range was noted.

DATA PROCESSING (VAX)

Data processing was carried out on a Microvax II minicomputer using the SHIPAC shipboard/shore geophysical processing and display software. The Microvax was configured with 4Mb of memory, three 72Mb RD53 hard disk drives, a 640 Mb disc and a 95 Mb Tk50 tape cartridge. Communications with the Vax were accomplished through two VT220 (System Console) and one VT240 graphics terminal. An LXY12 line printer was available for

printing and an HP7586E pen plotter for plotting.

As explained above, a new input routine was written to accommodate the output from ISAH as well as several routines to improve overall processing efficiency. All routines are callable from the Shipac menus.

All navigation files from the multi-parameter database should be available from a library of Vax compatible tapes and such tapes should travel with the shipboard system at all times. Tapes to be updated at regular intervals.

The final cruise data files were backed up to a TK50 data cartridge. The backup tape will then be loaded to the shore VAX at BIO where the navigation and bathymetry data will be transferred to the CYBER and then into our multi-parameter database where it will be available to all users.

FINS INVENTORY SYSTEM (RECORDS,TAPES,SAMPLES)

The dBase III Plus based inventory system (FINS) was used to handle the storage and report generation of all samples, records and tapes collected on the cruise. A full inventory generated by FINS of all collected data is included at the end of this report.

Hardware for this system includes a NEC Power Mate 386-SX computer operating at 16 MHz with a 1.2 Mb floppy drive and a 40 Mb hard disc. Printing capability was provided by a HEWLETT PACKARD Thinkjet and a backup EPSON FX-100 printer.

FINSS INVENTORY SYSTEM (SUBSAMPLE ANALYSIS)

This cruise was the sixth trip at sea for the subsampling version of FINSS. A lot of improvements have been made since the spring but work remains to be done. One remaining bug will be gone shortly and further improvements must be made in the area of speed and on screen cursor movement. Dbase III has a serious drawback in its ability to allow error checking of input from the screen at entry time and still leave the user able to move backwards to previously entered data. Full screen freedom is easily available at the expense of no error checking of input until the entire screen is to be processed by a (PgDn) command. The user could be informed of any errors at this point and the screen could be refreshed for editing. (maybe this is the solution)
FINSS will be converted to Dbase IV this winter and hopefully methods exist in Dbase IV to solve this problem. Improvements in speed can be achieved by more efficient programming now that the majority of the required code exists and is in working order. The code will be reviewed this winter and improvements made in this area. A faster machine would also be an improvement. All suggestion for improvements which have accumulated from this field season will be addressed now that the field season is over (almost).In general it has proved to be an asset to the sampling program will be even better for next season.

SAMPLING EQUIPMENT

AGC Large Diameter Corer
General

The piston coring system used on cruise 90031 is a large diameter system, 30 meter design that was modified for shipboard use on the CSS Hudson. The core sample obtained is 11 cm. diameter with potential lengths varying from 10 m to 30 m. Corer components consist of the following:

(1) Core head: 3m long, 0.6m diameter
(2) Core pipe: 4,25" I.D. with 3/8" and 3/4" wall thickness
(3) Couplings, straight and reduced for connecting barrels
(4) CAB liner
(5) Split Piston
(6) Core Catcher and Cutter
(7) Trip Arm
(8) 4.25" diameter gravity corer, used as trigger weight
(9) 3/4" diameter wire cable (6000m long) and end termination.
(10) Associated appurtenances such as set screws etc.

Due to the size of the corer, (maximum 30m long weighing approximately 4300 lbs) a special handling system was installed on the Hudson. This system consists of the following:

(1) Rotating core cradle
(2) Outboard support brackets
(3) Monorail transport system
- Trolly
- Chain hoists
(4) Lifting winches
(5) Process container which consists of storing, cutting and handling facilities for the core pipe and sample

Deployment/Recovery of piston Core

The core barrels are stored in the process container located on the starboard waist. Barrels are sequentially loaded onto the trolley on the monorail and transported to the foredeck where they are coupled to the core head. The core head is secured in a rotating "cradle" resting outboard of the starboard rail. Using the appropriate coupling, each barrel is connected until the desired length of core is obtained. The barrels are nominally 3m. long. Plastic liners are inserted into the barrels to contain the sample.
Once rigged, the piston corer is rotated from its horizontal position at the rail to the vertical position. This is accomplished using pickup winches located near the process

container. Wire cable runs from the winches to the appropriate pickup points along the core barrel. The corehead rests in the core cradle until vertical, then it is released and loaded with the trip arm. The corer is a standard oceanographic piston corer which is fitted with a split (breakaway piston) to eliminate sample flow-in during pullout. Recovery of the corer is basically reverse sequence of the above. The corehead is placed into its cradle, rotated to the horizontal position at the rail and secured. The barrels are decoupled and transported to the process container. Here the linered sample is removed, capped, labelled and cut into 1.53 m. sections. The sample is then stored in a refrigerated container until further processing is completed.

Metrox Shive Block

The Metrox Block is a micro-processor based metering device. The system consists of a shive spool through which the Pengo winch cable passes, and a console located in the forward winch room. It continuously measures cable extension rates using a series of magnets located on the face of a spool and a Hall Effect switch fixed to the spool support structure. Cable tension is measured with a load cell located in the shive axel. The two signals are fed to the console by a multicore cable. The console has analog metering of tension and extension rates located on the cabinet front.

The micro-processor within the Metrox console has a standard serial communications port which allows the user to input certain control parameters, and may also be used as a source of serial data for tension and extension rate. Upon set up, the cable diameter correction factor is entered into the micro-processor. The correction factor entered prior to leaving BIO proved to be about 10% low. This error will be corrected in harbour before the next cruise. It should be noted that the tension reading was inaccurate by a factor of two (approximately). It is unclear why this occurred and an investigation is required.

The data from the Metrox proved to be extremely useful working in very deep water, as a visible change in cable tension reflected a trip of the core equipment into the bottom. It also allowed the winch operator to have a more accurate idea of cable extension. Further development of the system will allow scientists to compare data sets for various core sites, in particular, the pullout force (tension).
In order to improve operational use, it is recommended that the tension be displayed graphically so that the operator can better distinguish between true tension drops or increases and those caused by the ship's heave.

Box Coring

Surface sediments (0 - 1 cm) from the Box Cores were systematically subsampled for geochemical (C,N), isotopic (U,Th,C,N) and micropalaeontological (microfauna, palynomorphs, diatoms,) analyses. In addition, push core were taken for detailed studies of the paleoenvironmental changes, and early diagenetic processes.

CORE PROCESSING

The deck procedures which were followed utilized the half height core pipe handling and extrusion container located forward of the AGC refrigerated core container. The core samples were removed one section at a time from the core barrels and cut into 1.5 m (nominal) sections, labelled, capped and taped, and stored vertically in the container. The labelling at this stage of the processing was cruise number, sample number, zero depth mark, up arrow, and the section letter code (starting with 'A' at the bottom of the core. The core sections were moved into the refrigerated container. The cores were cut using the tube liner cutter.

Approximately 200 metres of core collected on Hudson 90-031. About 120 metres were fully processed onboard in the General Purpose (GP) Lab. Whole round sections for all cores were tested for magnetic susceptibility with the Saphire susceptibility and anisotropy instrument (SI-2). All magnetic susceptibility measurements were made at 5 cm intervals down core after the cores reached a minimum of 16° C.

Core samples were brought up to the GP lab for further processing one section at a time. The core liners were split with the Duitz splitter. The splitter was in excellent condition when we got on board and worked well throughout the cruise. Following splitting of the core liner the core sample was split with either a wire saw or an osmotic knife for very soft or clayey sediments. The split sections of core were measured with white centimetre tape and labelled as archive and working halves. The marker line on the liner was always the archive half to maintain relative orientation for paleomagnetics. The archive half was photographed and described for colour, texture, structure and consistency. Colour measurements were made at 5 cm intervals on the archive half sections for some cores with the Colormet instrument. The Colormet developed flash problems and measurements were stopped.

Undrained shear strength was measured on all cores at 10 cm intervals on the 5's with the AGC motorized miniature vane device. A 1.27 cm^2 vane was used at a rotation rate of 50° /

minute. Residual strength was measured by continuation of the test post-peak. Shear vane measurements were initially made in the centre of the working half. The shear vane was offset from centre and the measurements were made on the archive half of the core to speed up core processing.

The working half of the core was used for subsampling. Subsamples for bulk density, salinity and water content were taken at 10 cm intervals on the 5's (5 cms, 15 cms, 25 cms etc) . Samples for forams, palynology/diatoms, uranium/thorium, carbon/nitrogen and geochemistry were taken at 10 cm intervals on the 10's (10 cms, 20cms 30 cms etc). Continuous paleomagnetics plugs were taken at 2 cm intervals for most cores. The sampling interval for the top section of piston cores or trigger weight cores, at stations where no box core was taken, was increased to every 2 cms for carbon/nitrogen, palynology/diatoms, forams and geochemistry for the top 20 cms and every 5 cms to the end of the section. The working half for box core sections was sampled for bulk density, salinity and water content at 10 cm intervals on the 5's (5 cms, 15 cms 25 cms etc). Foram samples were taken at 1 cm intervals for the top 10 cms and then every 5 cms to the bottom of the section. Shear vane measurements were taken at 10 cm intervals on the 5's (working or archive).

All test and subsample information was entered directly into FINSS. Hand written sheets were annotated as the sections were being tested/subsampled and the information was entered into FINSS before subsample sheets were printed out. Two data bases were opened for this cruise due to the number of analysis and subsamples being extracted from the cores.

All subsampling voids in the working halves were filled with foam prior to wrapping until we ran short of foam. Many core section were not stuffed at all. The tops of the cores and the soft sections were the only sections stuffed for most cores. (core #'s 015P, 036P, 030P, 027P, 043P, 033P, 044P) It is recommended that the AGC curation staff open all these sections and stuff them as soon as possible after returning to BIO. Each half was wrapped plastic film and plastic sleeving and sealed with black tape. The bags were labelled with cruise number, sample number, section depth interval, working or archive and a top arrow. Bagged cores were then stored in fully labelled D-tubes. All processed cores were stored in the refrigerated lock up. Unsplit sections were refrigerated and secured in an upright position. All unsplit section ends were sealed with beeswax.

The Colormet instrument developed problems part way through the cruise. The unit was outputting the error message "No Flash". It became unreliable after several more sections and color measurement as part of the core logging was suspended.

Water Sampling Procedures

Water sampling was based on stations using 12 l Niskin bottles (3 or 4 for surface water, 4 to 6 for deeper water masses). It was the intention to collect water samples for chemical and isotopic analysis, avoid isotopic exchange with atmosphere water vapour or CO2, and restrict bacterial activity during storage.

A CTD (using a portable CTD) was run prior to each water station, to determine the water depths to sample. The water samples were taken using Niskin bottles attached to a single wire, and lowered to the depths defined by the CTD profile. A messenger weight was dropped down the cable to close the bottles and the bottles were retrieved. The water samples were then transferred to the Forward lab for processing.

The lab processing involved subsampling the water in a vacuum chamber. The samples were processed as non-filtered water, filtered water on pre-weighted 0.45mm filters, and filtered on pre-weighted glass fibre filters.

LAB EQUIPMENT SET-UP SPECIFICATIONS

Seismics

Raytheon 1811
Sweep = 1.0 second, 100 lines per inch
Sleeve gun firing rate = 3.0-4.0 seconds
40 in^3 Sleeve gun on a 20" Norweigan Float
N.S.R.F. LT-18 Streamer on side boom, port
Filtered 180- Hz, 20 db gain + TVG
SEISMICS ENGINEERING 100 ft. Streamer, midships
Filtered 120-650 Hz, 20 db gain + TVG

Huntec D.T.S.

AGC # 3
with 2nd adaptive processor
EPC 4100 x 2 each - S/N 317 & 181
Boomer firing rate = 0.75 sec.
Boomer power = 4 Volts (app. 400 joules)
Bottom tracking (adaptive) TVG to max. 4 volt level
Tow vehicle heave compensated in pressure mode
Internal hydrophone filtered - 0.5 to 10 Khz
External hydrophone filtered - 0.5 to 10 Khz

Automatic Graphic Annotation

Technical Survey Services Model 312B-S/N 040
External Event - each 5 min. from seismics clock/timing unit
channel 1 - Hull Profiler 3.5Khz data on EPC 4100
channel 2 - Seismics data on LSR 1811 in series
channel 4 - Huntec DTS data on Two EPC 4100 recorders

TEAC XR5000 Multitrack VHS Cassette Recorder

S/N 723346
Tape speed = 2.4 cm/sec
T120 tape = 2 hr. 52 min.
ID code every 4 seconds in TIME CODE priority
Search for file # 0007 - Title: HUDSON 90-031 for recording conditions on tape with time and tape counter (0.1 m)

Recording Conditions

Cha. #	Data	Mode	Input Range	Input Zero	Output Level	Output Zero	Filter # Band # Type
1	Raw Seismics NSRF	DR	0.3v		2v		
2	Seismics Trigger	FM	3.0v	+000%	5v	0v	LP
7							
3	Raw 100'SE eel Seismics	DR	0.7v		2v		
4	DTS Internal Signal	DR	0.3v		2v		
5	DTS Trigger/Sync.	DR	1.0v		5v		
6	DTS External Signal	DR	0.7v		2v		
7	3.5 Profiler Trigger	FM	2.0v		2v		
8	3.5 Profiler Signal	DR	3.0v		5v		
15	DR - Voice Memo from microphone						

TEAC System Set-up

*	1.	Tape servo ch.:	Data
	2.	Ch. 13 memo read:	Off
	3.	Inhibit on rec.:	On
	4.	Erase:	On
*	5.	FM band select:	Hi Band
	6.	I.D. code format:	5000
	7.	Reverse rec.:	Off
*	8.	Reset initialize:	1
	9.	Power fail restart:	0
	10.	Power SW. off mode:	2
	11.	Cal. switch mode:	0
	12.	Tape remain:	min
	13.	Beep tone:	on

Bandwidth for DR mode is 100 Hz to 4.69 Khz - S/N = 28db
Bandwidth for FM mode on high band is: DC to 2.5 Khz - 5N = 33db
Carrier frequency = 259.2 Khz

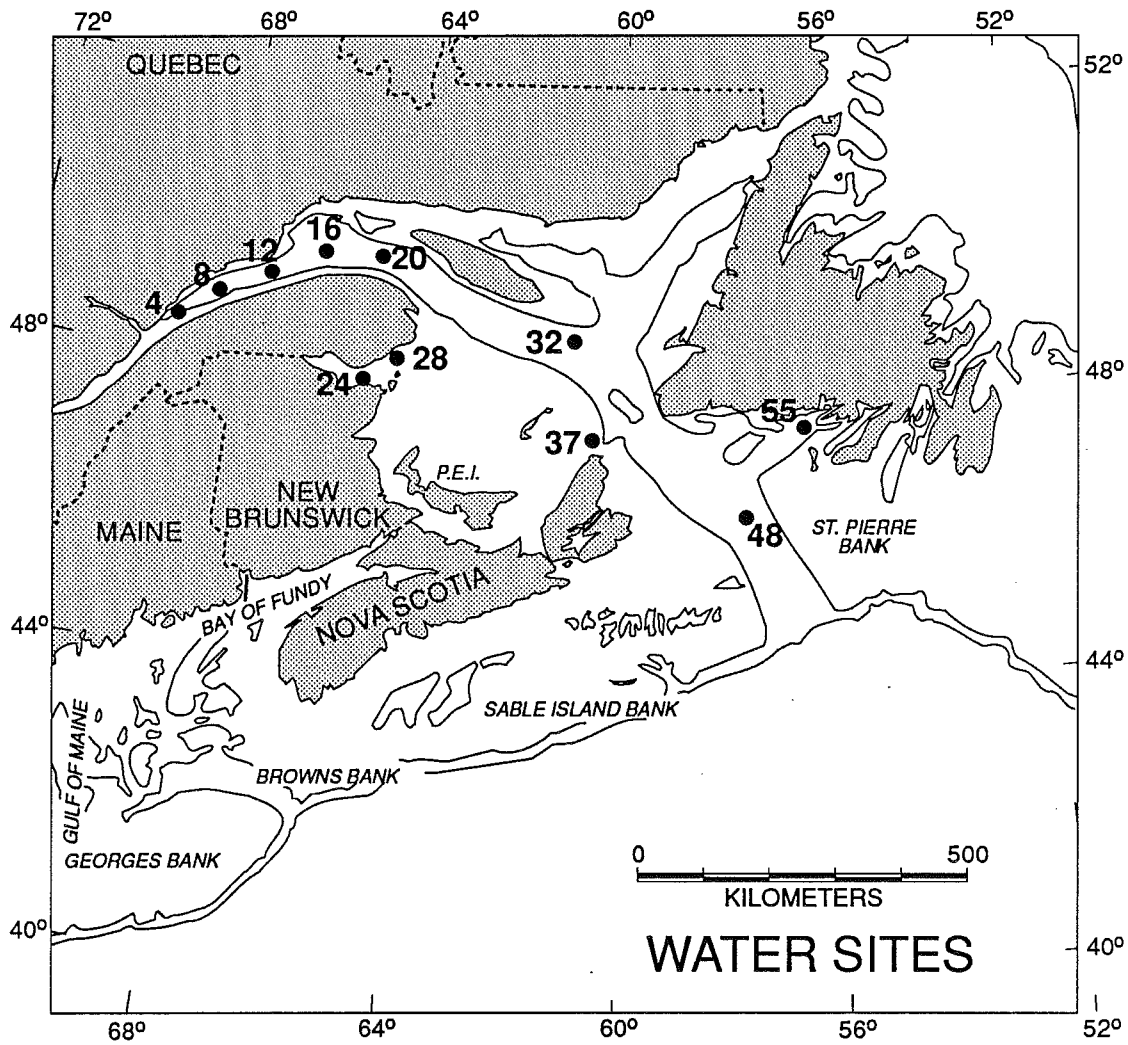


Figure 1. Water station locations

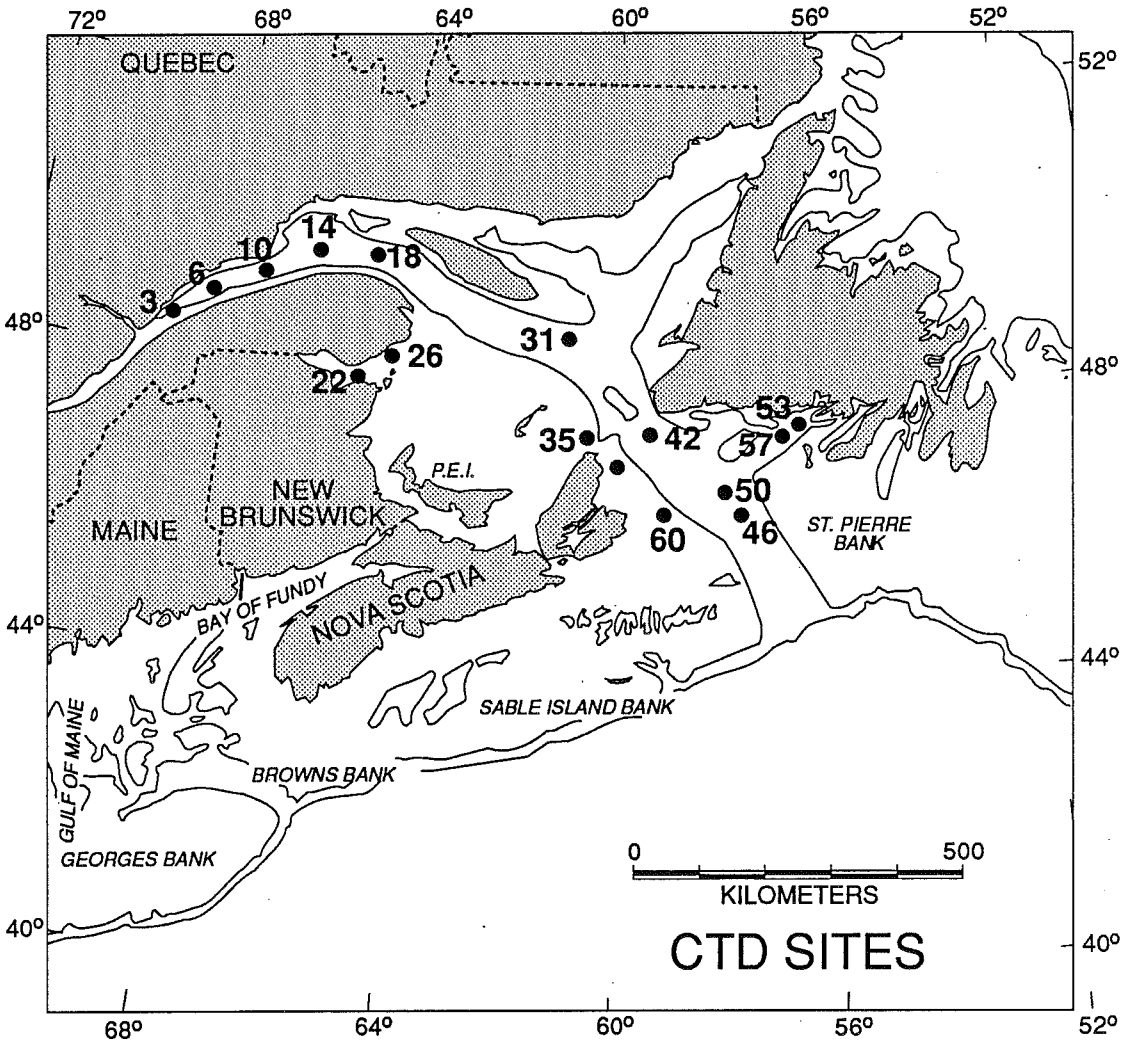


Figure 2. CTD station locations

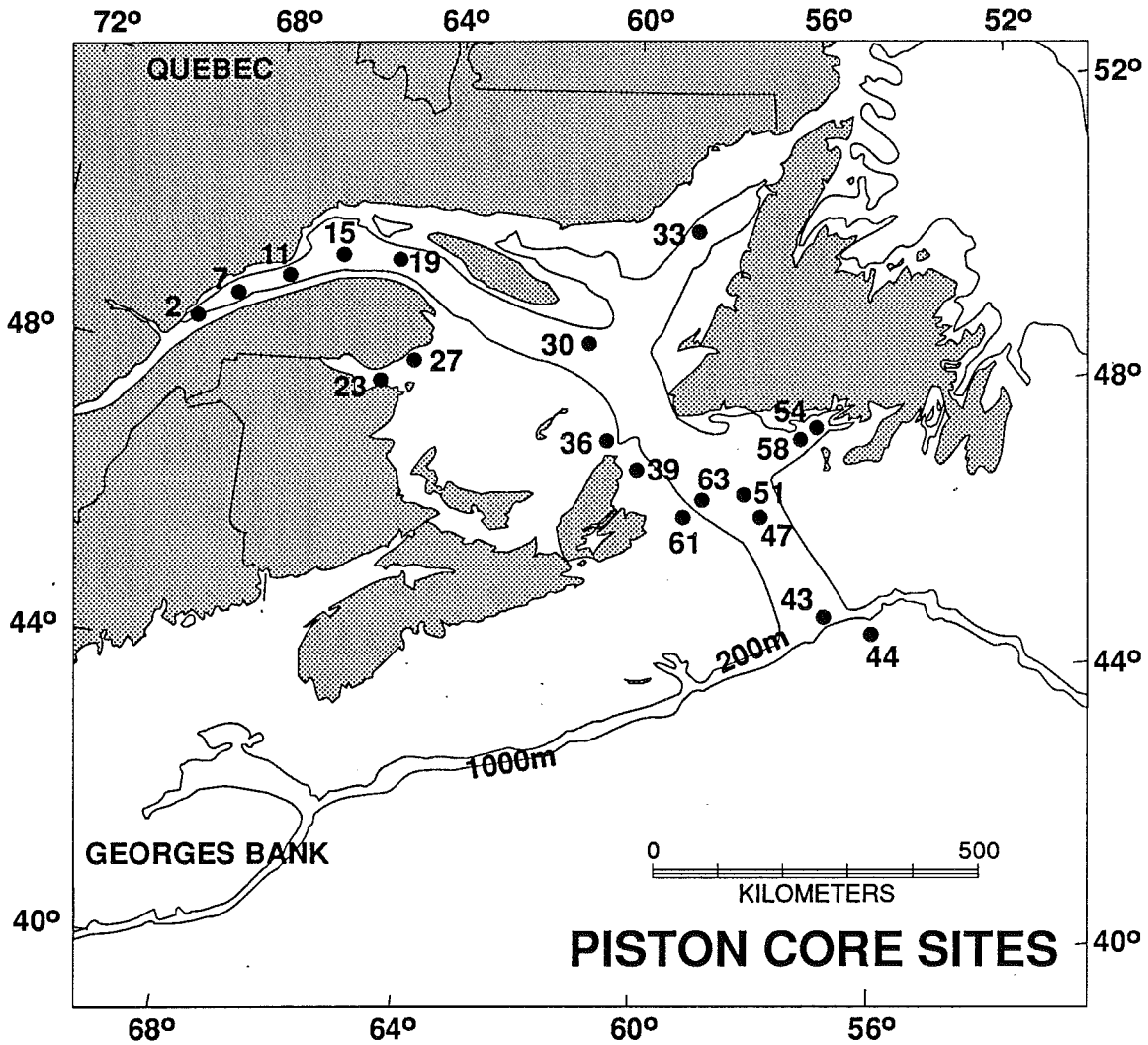


Figure 3. Piston core station locations.

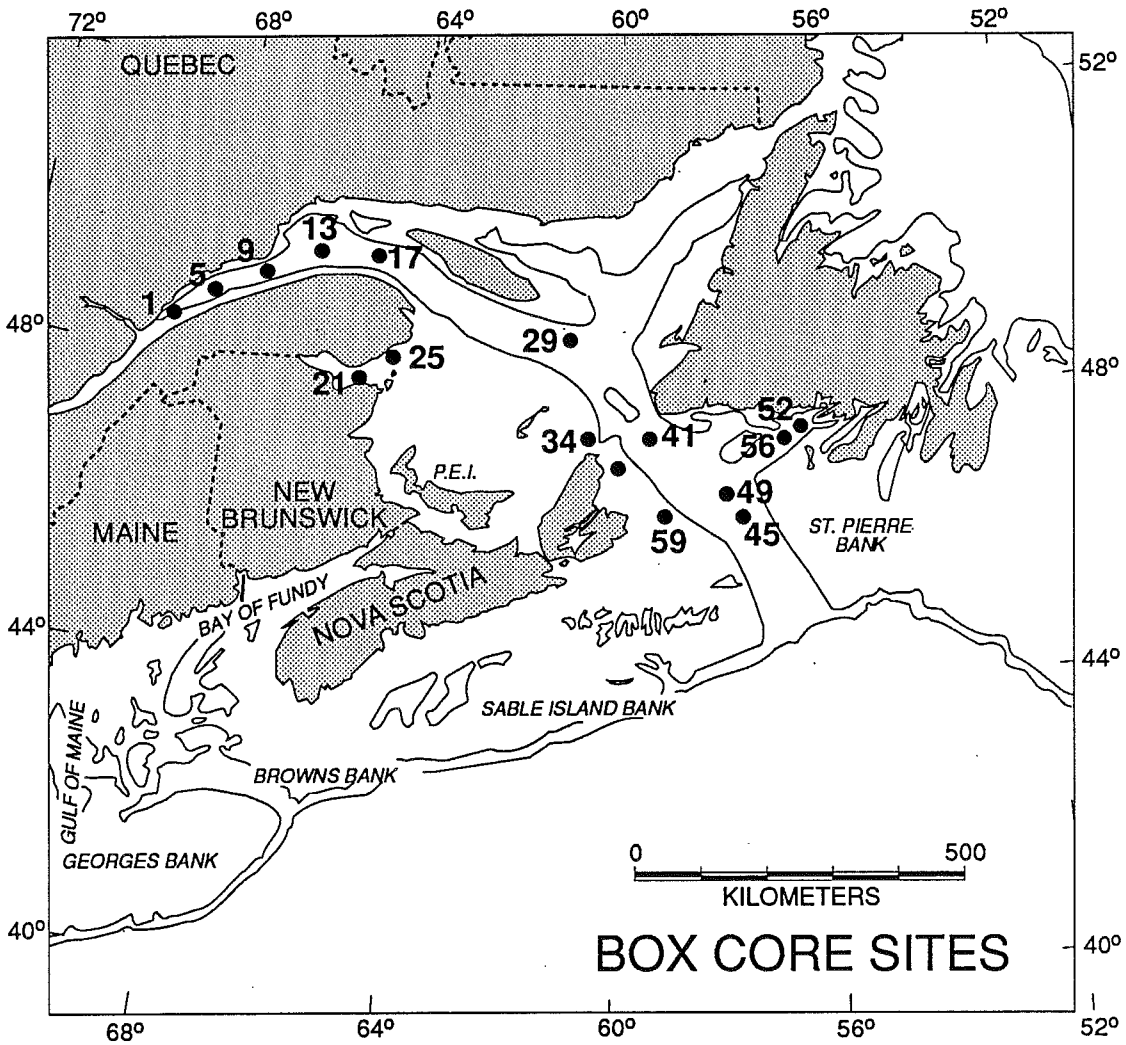


Figure 4. Box core station locations.

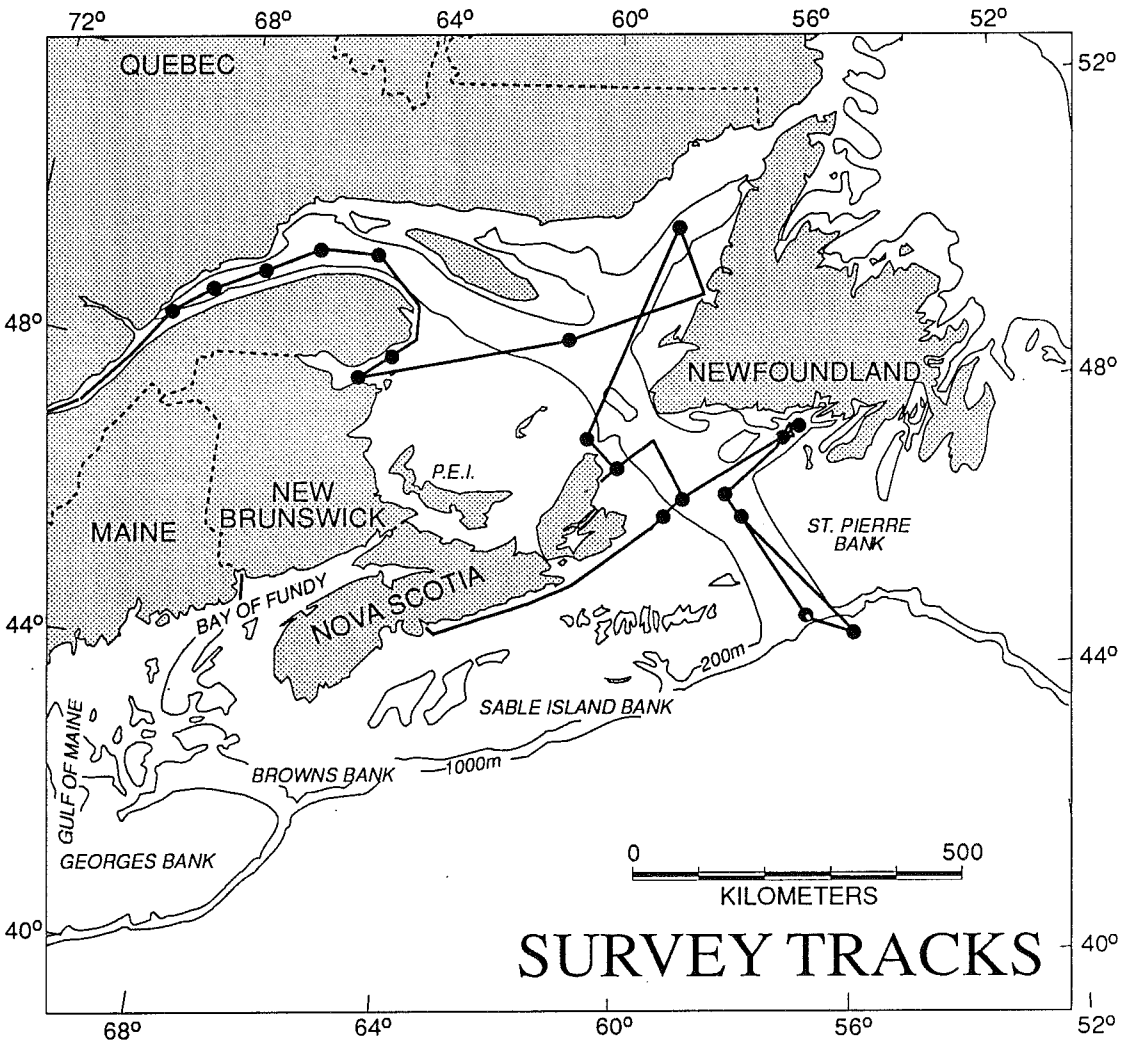


Figure 5. Seismic survey track locations.

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 1

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

TOTAL SAMPLE INVENTORY

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (M)	GEOGRAPHIC LOCATION
001	BOXCORE	3241319	48 24.85	69 11.50W	309	INNER ESTUARY ST. LAWRENCE RIVER
002	CORE	3241446	48 24.85	69 11.50W	309	LWR ST. LAWRENCE ESTUARY
002TWC	CORE	3241446	48 24.85	69 11.50W	309	LWR ST. LAWRENCE ESTUARY
003	CTD	3241725	48 24.85	69 11.50W	309	INNER ESTUARY ST. LAWRENCE RIVER
004	WATER	3241822	48 24.85	69 11.50W	309	INNER ESTUARY ST. LAWRENCE RIVER
005	BOXCORE	3242048	48 44.03	68 27.17W	355	LWR ST. LAWRENCE ESTUARY
006	CTD	3242041	48 44.03	68 27.17W	355	LWR ST. LAWRENCE ESTUARY
007	CORE	3242226	48 44.02	68 27.27W	355	LWR ST. LAWRENC ESTUARY
007TWC	CORE	3242226	48 44.02	68 27.27W	355	LWR ST. LAWRENC ESTUARY
008	WATER	3242318	48 44.02	68 27.27W	355	LWR ST. LAWRENC ESTUARY
009	BOXCORE	3251338	49 05.34	67 26.30	311	GULF OF ST. LAWRENCE
010	WATER	3251338	49 05.34	67 26.30	311	GULF OF ST. LAWRENCE
011	CORE	3251435	49 05.24	67 26.22	311	GULF OF ST. LAWRENCE
011TWC	CORE	3251435	49 05.24	67 26.22	311	GULF OF ST. LAWRENCE

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 1

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

TOTAL SAMPLE INVENTORY

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (M)	GEOGRAPHIC LOCATION
012	WATER	3251528	49 05.16	67 26.28	311	GULF OF ST. LAWRENCE
013	BOXCORE	3261326	49 25.42	66 19.45W	322	GULF OF ST. LAWRENCE
014	CTD	3261320	49 25.42	66 19.45W	322	GULF OF ST. LAWRENCE
015	CORE	3261421	49 25.42	66 19.45W	322	GULF OF ST. LAWRENCE
015TWC	CORE	3261421	49 25.42	66 19.45W	322	GULF OF ST. LAWRENCE
016	WATER	3261527	49 25.42	66 19.45W	322	GULF OF ST. LAWRENCE
017	BOXCORE	3271223	49 17.44	63 59.57W	373	GULF OF ST. LAWRENCE
018	CTD	3271217	49 17.44	63 59.57W	373	GULF OF ST. LAWRENCE
019	CORE	3271317	49 17.44	63 59.57W	373	GULF OF ST. LAWRENCE
019TWC	CORE	3271317	49 17.44	63 59.57W	373	GULF OF ST. LAWRENCE
020	WATER	3271408	49 17.44	63 59.57W	373	GULF OF ST. LAWRENCE
021	BOXCORE	3281219	47 55.43	65 12.31W	73	BAIE DE CHALEUR
022	CTD	3281219	47 55.43	65 12.31W	73	BAIE DE CHALEUR
023	CORE	3281303	47 55.43	65 12.31W	73	BAIE DE CHALEUR
023TWC	CORE	3281303	47 55.43	65 12.31W	73	BAIE DE CHALEUR
024	WATER	3281340	47 55.43	65 12.31W	73	BAIE DE CHALEUR

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 1

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

TOTAL SAMPLE INVENTORY

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (M)	GEOGRAPHIC LOCATION
025	BOXCORE	3281707	48 19.48	64 23.54W	109	BAIE DE CHALEUR
026	CTD	3281707	48 19.48	64 23.54W	109	BAIE DE CHALEUR
027	CORE	3281759	48 19.48	64 23.54W	109	BAIE DE CHALEUR
027TWC	CORE	3281759	48 19.48	64 23.54W	109	BAIE DE CHALEUR
028	WATER	3281841	48 19.48	64 23.54W	109	BAIE DE CHALEUR
029	BOXCORE	3291231	48 31.51	61 10.21W	408	GULF OF ST. LAWRENCE
030	CORE	3291334	48 31.51	61 10.21W	408	GULF OF ST. LAWRENCE
030TWC	CORE	3291334	48 31.51	61 10.21W	408	GULF OF ST. LAWRENCE
031	CTD	3291445	48 32.00	61 10.21W	409	GULF OF ST. LAWRENCE
032	WATER	3291511	48 32.04	61 10.20W	409	GULF OF ST. LAWRENCE
033	CORE	3301324	49 56 09	59 08 25W	268	GULF OF ST. LAWRENCE ESQUIMAN CHANNEL
033TWC	CORE	3301324	49 56 09	59 08 25W	268	GULF OF ST. LAWRENCE ESQUIMAN CHANNEL
034	BOXCORE	3321248	47 09 15	60 32 54W	170	CABOT STRAIT
035	CTD	3321242	47 09 15	60 32 54W	170	CABOT STRAIT
036	CORE	3321350	47 09 15	60 32 55W	170	CABOT STRAIT
036TWC	CORE	3321350	47 09 15	60 32 55W	170	CABOT STRAIT

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 1

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

TOTAL SAMPLE INVENTORY

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (M)	GEOGRAPHIC LOCATION
037	WATER	3321442	47 09 47	60 31 57W	170	CABOT STRAIT
038	GRAB	3321820	46 43 46	60 13 15W	154	CABOT STRAIT
039	CORE	3321848	46 43 47	60 13 16W	154	CABOT STRAIT
039TWC	CORE	3321848	46 43 47	60 13 16W	154	CABOT STRAIT
040	GRAB	3542131	46 40 50	60 22 00W	18	SOUTH INGONISH CAPE BRETON
041	BOXCORE	3331259	46 59.56	59 04 46W	448	LAURENTIAN CHANNEL
042	CTD	3331249	46 59.56	59 04 46W	448	LAURENTIAN CHANNEL
043	CORE	3341812	44 49.18	56 29.47W	387	LAURENTIAN CHANNEL
043TWC	CORE	3341812	44 49.18	56 29.47W	387	LAURENTIAN CHANNEL
044	CORE	3352220	44 39.42	55 37.13W	1378	LAURENTIAN FAN
044TWC	CORE	3352220	44 39.42	55 37.13W	1378	LAURENTIAN FAN
045	BOXCORE	3361228	45 51.16	57 35.48W	478	LAURENTIAN CHANNEL
046	CTD		45 51.16	57 35.48W	473	LAURENTIAN CHANNEL
047	CORE	3361324	45 51.15	57 35.56W	473	LAURENTIAN CHANNEL
047TWC	CORE	3361324	45 51.15	57 35.56W	473	LAURENTIAN CHANNEL
048	WATER		45 51.15	57 35.56W	473	LAURENTIAN CHANNEL

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 1

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

TOTAL SAMPLE INVENTORY

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (M)	GEOGRAPHIC LOCATION
049	BOXCORE	3361736	46 11.21	57 56.17W	468	LAURENTIAN CHANNEL
050	CTD	3361727	46 11.22	57 56.14W	468	LAURENTIAN CHANNEL
051	CORE	3361833	46 11.22	57 56.14W	468	LAURENTIAN CHANNEL
051TWC	CORE	3361833	46 11.22	57 56.14W	468	LAURENTIAN CHANNEL
052	BOXCORE	3371243	47 14.29	56 40.17W	355	HERMITAGE CHANNEL
053	CTD	3371230	47 14.29	56 40.17W	355	HERMITAGE CHANNEL
054	CORE	3371334	47 14.29	56 40.17W	355	HERMITAGE CHANNEL
054TWC	CORE	3371334	47 14.29	56 40.17W	355	HERMITAGE CHANNEL
055	WATER	3371418	47 14.29	56 40.17W	355	HERMITAGE CHANNEL
056	BOXCORE	3371744	47 04.38	57 07.32W	333	HERMITAGE CHANNEL
057	CTD	3371744	47 04.38	57 07.32W	333	HERMITAGE CHANNEL
058	CORE	3371843	47 04.37	57 03.07W	333	HERMITAGE CHANNEL
058TWC	CORE	3371843	47 04.37	57 03.07W	333	HERMITAGE CHANNEL
059	BOXCORE	3381225	45 50.36	58 34.19W	268	SCOTIAN SHELF

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 1

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

TOTAL SAMPLE INVENTORY

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE	LONGITUDE	DEPTH (M)	GEOGRAPHIC LOCATION
060	CTD	3381220	45 50.36	58 34.19W	268	SCOTIAN SHELF
061	CORE	3381317	45 50.36	58 34.19W	268	SCOTIAN SHELF
061TWC	CORE	3381317	45 50.36	58 34.19W	268	SCOTIAN SHELF
062	WATER	3381402	45 50.53	58 33.54W	268	SCOTIAN SHELF
063	CORE	3381720	46 00.38	58 24 40W	329	SCOTIAN SHELF
063TWC	CORE	3381720	46 00.38	58 24 40W	329	SCOTIAN SHELF

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 2

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

GRAB SAMPLES

SAMPLE NUMBER	TYPE OF SAMPLER	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (M)	NO. OF ATTEMPTS	GEOGRAPHIC LOCATION	GRAB SAMPLE NOTES
038	VANVEEN	3321820	46 43 46 60 13 15W	154	1	CABOT STRAIT	REDDISH BROWN SILTY MUD BLACK BROWN BELOW 10 CM FEW WORM TUBES VERY GOOD SAMPLE SURFACE DEVERNAL/RODRIGUES 0 - 10 CM AGC
040	VANVEEN	3542131	46 40 50 60 22 00W	18	1	SOUTH INGONISH CAPE BRETON	2 SUBSAMPLES SAND

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 3

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

CORE SAMPLES

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	GEOGRAPHIC LOCATION	NOTES
002	AGC LONG CORE	3241446	48 24.85 69 11.50W	309	2124	2124	1501	10	LWR ST. LAWRENCE ESTUARY	SHATTERED 20-30 CM RUNS SECTION C-D G -> G 2 - 3 CM CUTTER AND CATCHER ON 1/2 ROUND 10 SECTIONS AND CUTTER SECTION
002TWC	TRIGGER WEIGHT	3241446	48 24.85 69 11.50W	309	150	170	94	1	LWR ST. LAWRENCE ESTUARY	
007	AGC LONG CORE	3242226	48 44.02 68 27.27W	355	2124	2200	1534	11	LWR ST. LAWRENCE ESTUARY	SHATTERED J->K 30-40 CM 10 SECTIONS + CUTTER SECTION
007TWC	TRIGGER WEIGHT	3242226	48 44.02 68 27.27W	355	150	190	121	1	LWR ST. LAWRENCE ESTUARY	1 SECTION + BAGGED CUTTER
011	AGC LONG CORE	3251435	49 05.24 67 26.22	311	1520		1243	9	GULF OF ST. LAWRENCE	C -> D SHATTERED 150 CM
011TWC	TRIGGER WEIGHT	3251435	49 05.24 67 26.22	311	150	150	61	1	GULF OF ST. LAWRENCE	NO SAMPLE IN CUTTER
015	AGC LONG CORE	3261421	49 25.42 66 19.45W	322	1520	1520	1069	7	GULF OF ST. LAWRENCE	CUTTER DAMAGED NOT USEABLE B - C BOTTOM CAP BLEW OFF FROM GAS A - B CAPS BULGING DUE TO GAS
015TWC	TRIGGER WEIGHT	3261421	49 25.42 66 19.45W	322	180	160	169	1	GULF OF ST. LAWRENCE	CUTTER AND CATCHER BAGGED
019	AGC LONG CORE	3271317	49 17.44 63 59.57W	373	1520	1520	1173	9	GULF OF ST. LAWRENCE	GAS SAMPLE TAKEN CUTTER INCLUDED AS SECTION IN LINER

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 3

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

CORE SAMPLES

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	GEOGRAPHIC LOCATION	NOTES
019TWC	TRIGGER WEIGHT	3271317	49 17.44 63 59.57W	373	150	180	99	1	GULF OF ST. LAWRENCE	CATCHER IN BAG
023	AGC LONG CORE	3281303	47 55.43 65 12.31W	73	1520	1400	759	5	BAIE DE CHALEUR	CUTTER DAMAGED . NOT USEABLE
023TWC	TRIGGER WEIGHT	3281303	47 55.43 65 12.31W	73	150	100	36	1	BAIE DE CHALEUR	CUTTER IN STICKY MUD
027	AGC LONG CORE	3281759	48 19.48 64 23.54W	109	1520	1520	1130	9	BAIE DE CHALEUR	IMPLOSION IN SECTION (I - H) SHATTERED AT BOTTOM (D - C) 20-30 CM CUTTER INCLUDED IN TOTAL NUMBER OF SECTIONS - IN LINER
027TWC	TRIGGER WEIGHT	3281759	48 19.48 64 23.54W	109	150	150	108	1	BAIE DE CHALEUR	GOOD SAMPLE SMALL CATCHER SAMPLE BAGGED
030	AGC LONG CORE	3291334	48 31.51 61 10.21W	408	1520	1250	1009	7	GULF OF ST. LAWRENCE	CUTTER DAMAGED NOT USEABLE CATCHER INVERTED SEISMIC TIME ALSO FROM 89007 DAY 248 TIME 0725
030TWC	TRIGGER WEIGHT	3291334	48 31.51 61 10.21W	408	150	150	157	2	GULF OF ST. LAWRENCE	2 SECTIONS CUTTER IN BAG
033	AGC LONG CORE	3301324	49 56 09 59 08 25W	268	1216	1100		5	GULF OF ST. LAWRENCE ESQUIMAN CHANNEL	CUTTER DAMAGED

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 3

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

CORE SAMPLES

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	GEOGRAPHIC LOCATION	NOTES
033TWC	TRIGGER WEIGHT	3301324	49 56 09 59 08 25W	268	150	150	148	1	GULF OF ST. LAWRENCE ESQUIMAN CHANNEL	
036	AGC LONG CORE	3321350	47 09 15 60 32 55W	170	1520	1216	850	7	CABOT STRAIT	CUTTER IN LINER INCLUDED AS SECTION TOP 2 SECTIONS 112CM EACH
036TWC	TRIGGER WEIGHT	3321350	47 09 15 60 32 55W	170	150	100	36	1	CABOT STRAIT	CUTTER IN BAG
039	AGC LONG CORE	3321848	46 43 47 60 13 16W	154	1520	1300		5	CABOT STRAIT	
039TWC	TRIGGER WEIGHT	3321848	46 43 47 60 13 16W	154	150				CABOT STRAIT	NO SAMPLE RECOVERED CUTTER IN BAG
043	AGC LONG CORE	3341812	44 49.18 56 29.47W	387	1520	1520		3	LAURENTIAN CHANNEL	IMPLOSION ABOVE BOTTOM 1/2 OF PISTON STOP. LINES ABOVE GOING DOWN CUTTER PLACED IN LINER
043TWC	TRIGGER WEIGHT	3341812	44 49.18 56 29.47W	387	150			1	LAURENTIAN CHANNEL	CUTTER IN BAG (SMALL)
044	AGC LONG CORE	3352220	44 39.42 55 37.13W	1378	1520	1311	941	7	LAURENTIAN FAN	CUTTER IN LINER

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 3

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

CORE SAMPLES

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	GEOGRAPHIC LOCATION	NOTES
044TWC	TRIGGER WEIGHT	3352220	44 39.42 55 37.13W	1378	150		73	1	LAURENTIAN FAN	DOING E/P ON TWC CUTTER IN BAG
047	AGC LONG CORE	3361324	45 51.15 57 35.56W	473	1520	1520	1162	8	LAURENTIAN CHANNEL	E -> E 1 CM OF CORE IN CAP
047TWC	TRIGGER WEIGHT	3361324	45 51.15 57 35.56W	473	150	100	107	1	LAURENTIAN CHANNEL	NO SAMPLE
051	AGC LONG CORE	3361833	46 11.22 57 56.14W	468	1860	1860	1233	9	LAURENTIAN CHANNEL	C -> D LINER BROKEN AT 30CM E -> F LINER SHATTERED 0 - 10CM C -> C IN CORE CAP CATCHER IN BAG
051TWC	TRIGGER WEIGHT	3361833	46 11.22 57 56.14W	468	150	180	110	1	LAURENTIAN CHANNEL	
054	AGC LONG CORE	3371334	47 14.29 56 40.17W	355	1520	1300	830	6	HERMITAGE CHANNEL	CUTTER IN LINER
054TWC	TRIGGER WEIGHT	3371334	47 14.29 56 40.17W	355	150	100	23	1	HERMITAGE CHANNEL	
058	AGC LONG CORE	3371843	47 04.37 57 03.07W	333	1520	1490	1060	6	HERMITAGE CHANNEL	
058TWC	TRIGGER WEIGHT	3371843	47 04.37 57 03.07W	333	150	100	86	1	HERMITAGE CHANNEL	

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 3

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

CORE SAMPLES

SAMPLE NUMBER	SAMPLE TYPE	DAY/TIME (GMT)	LATITUDE LONGITUDE	DEPTH (MTRS)	CORER LENGTH (CM)	APP. PENN (CM)	CORE LENGTH (CM)	NO OF SECT	GEOGRAPHIC LOCATION	NOTES
061	AGC LONG CORE	3381317	45 50.36 58 34.19W	268	1520	1280	721	6	SCOTIAN SHELF	C -> C 33CM E -> E 32CM NO SAMPLE IN CUTTER
061TWC	TRIGGER WEIGHT	3381317	45 50.36 58 34.19W	268	150	150		1	SCOTIAN SHELF	CUTTER IN BAG
063	AGC LONG CORE	3381720	46 00.38 58 24 40W	329	1216	1216	937	7	SCOTIAN SHELF	CUTTER IN LINER CATCHER IN BAG
063TWC	TRIGGER WEIGHT	3381720	46 00.38 58 24 40W	329	150	150	60	1	SCOTIAN SHELF	

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 4

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SAMPLE NUMBER	TYPE OF BOXCORE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	BOXCORE SAMPLES NO OF ATTEMPTS	BOXCORE SAMPLES NO OF SUBSAMPLES	NO OF CORES	PHOTOS TAKEN	GEOGRAPHIC LOCATION	NOTES
001	BOXCORE	3241319	48 24.85 69 11.50W	309	2	3	6	Y	INNER ESTUARY ST. LAWRENCE RIVER	BROWN SILTY MUD (THIN LAYER) VERTICAL WORM BURROWS BIVALVE SHELL BRITTLE STARFISH BOX FULL A 15CM X 45CM B 6.605CM C 6.605CM D 9.9CM E 9.9CM F 1.0CM X 10CM 3 SURFACE SUBSAMPLES 2 X 0-0.5CM VILKS/UQUAM 1 X 0-1.0CM VILKS
005	BOXCORE	3242048	48 44.03 68 27.17W	355	1	1	5	N	LOWER ST. LAWRENCE ESTUARY	BROWNISH SILTY MUD 1CM WORM TUBES ABUNDANT BRITTLE STARS COMMON CRUSTACEAN BOX FULL A 9.9CM UQUAM B 6.6CM UQUAM C 6.6CM UQUAM D 9.9CM AGC E 9.9CM AGC
013	BOXCORE	3261326	49 25.42 66 19.45W	322	1	2	5	Y	GULF OF ST. LAWRENCE	CORE FULL APPROX 5 CM FROM TOP, BROWN GRAY MUD FEW ANENOMES A - 15CM B - 10CM C - 10CM D - 7CM E - 7CM UPPER SURFACE SCRAPPED OFF BY A. DEVERNAL AND C. RODRIGUES

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 4

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SAMPLE NUMBER	TYPE OF BOXCORE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	BOXCORE SAMPLES NO OF ATTEMPTS	BOXCORE SAMPLES NO OF SUBSAMPLES	NO OF CORES	PHOTOS TAKEN	GEOGRAPHIC LOCATION	NOTES
017	BOXCORE	3271223	49 17.44 63 59.57W	373	1	2	5	Y	GULF OF ST. LAWRENCE	BROWNISH/SLIGHT GREEN MUD FEW WORM TUBES A - 15CM B - 10CM C - 10CM D - 7CM (SLIGHT PULL UP @BOTT) E - 7CM A. DEVERNAL (SURFACE LAYER) C. RODRIGUES (SURFACE LAYER)
021	BOXCORE	3281219	47 55.43 65 12.31W	73	1	2	5	Y	BAIE DE CHALEUR	REDDISH GRAY SILTY MUD A - 15CM B - 10CM C - 10CM D - 7CM E - 7CM 80 % FULL DEVERNAL/RODRIGUESSURFACE SPOON SAMPLE. 10 CM SAMPLE FROZEN
025	BOXCORE	3281707	48 19.48 64 23.54W	109	1	2	5	Y	BAIE DE CHALEUR	LIGHT GRAY SOUPY MUD, FEW WORM TUBES A - 10CM B - 10CM C - 10CM D - 7CM E - 7CM DEVERNAL - SURFACE SCOOP RODRIGUES - SURFACE SCOOP DEVERNAL - SAMPLE FOR FREEZING

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 4

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

BOXCORE SAMPLES

SAMPLE NUMBER	TYPE OF BOXCORE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	NO OF ATTEMPTS	NO OF SUBSAMPLES	NO OF CORES	PHOTOS TAKEN	GEOGRAPHIC LOCATION	NOTES
029	BOXCORE	3291231	48 31.51 61 10.21W	408	1	3	5	Y	GULF OF ST. LAWRENCE	LIGHT GRAY SURFACE SURFACE WASHED AND DRAINED SIEVE A - 15CM B - 15CM C - 10CM D - 7CM E - 7CM SURFACE SCOOP - DEVERNAL 1 BACTERIAL SAMPLE
041	BOXCORE	3331259	46 59.56 59 04 46W	448	1	2	5	Y	LAURENTIAN CHANNEL	REDDISH BROWN CLAY, FEW WORM CARTRIDGES CORER 80 PERCENT FULL A - 15CM B - 10CM C - 10CM D - 7CM E - 7CM M - 10CM
045	BOXCORE	3361228	45 51.16 57 35.48W	478	1	3	6	Y	LAURENTIAN CHANNEL	LIGHT GRAY LIQUID MUD VERY LITTLE BENTICO 90 % FULL A - 15CM B - 10CM C - 10CM D - 10CM E - 10CM M - 10CM SURFACE SUBSAMPLE FOR DEVERNAL, MUDIE, RODRIGUES

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 4

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

BOXCORE SAMPLES

SAMPLE NUMBER	TYPE OF BOXCORE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	NO OF ATTEMPTS	NO OF SUBSAMPLES	NO OF CORES	PHOTOS TAKEN	GEOGRAPHIC LOCATION	NOTES
049	BOXCORE	3361736	46 11.21 57 56.17W	468	1	3	6	Y	LAURENTIAN CHANNEL	BROWN TO DARK BROWN, ONE CLEAN RELAY ROD, WORM BURROWS A - 10CM B - 10CM C - 10CM D - 7CM E - 7CM M - 10CM DEVERAL AND RODRIGUES SURFACE SCOOPS. DEVERNAL X TUBE (BACTERIA)
052	BOXCORE	3371243	47 14.29 56 40.17W	355	1	3	6	F	HERMITAGE CHANNEL	LIGHT GRAY MUD SMALL PELECY PODS A - 15CM B - 10CM C - 10CM D - 10CM E - 10CM X - BACTERIA DEVERNAL AND RODRIGUES SURFACE SCOOPS 1 BACTERIA SAMPLE
056	BOXCORE	3371744	47 04.38 57 07.32W	333	1	3	6	Y	HERMITAGE CHANNEL	LIGHT GRAY MUD FEW MOLLUSKS A - 10CM B - 10CM C - 10CM D - 7CM E - 7CM M - 10CM ENTERED ON ANGLE 60 % FULL DEVERNAL, RODRIGUES SURFACE SCOOPS.

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 4

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SAMPLE NUMBER	TYPE OF BOXCORE	JULIAN DAY/TIME	LATITUDE LONGITUDE	DEPTH (MTRS)	BOXCORE SAMPLES NO OF ATTEMPTS	BOXCORE SAMPLES NO OF SUBSAMPLES	NO OF CORES	PHOTOS TAKEN	GEOGRAPHIC LOCATION	NOTES
059	BOXCORE	3381225	45 50.36 58 34.19W	268	1	3	6	Y	SCOTIAN SHELF	LIGHT BROWNISH GRAY MUD WORM TUBES A - 15CM B - 10CM C - 10CM D - 7CM E - 7CM M - 10CM SURFACE SCOOPS DEVERNAL, MUDIE,RODRIGUES

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 5

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SEISMICS/SIDESCAN COMBINED ON-LINE DATA TAPES

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	CHANNEL INFORMATION	
001	3240237	3240549	ST. LAWRENCE RIVER	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
002	3240549	3240830	ST. LAWRENCE RIVER	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
003	3240830	3242000	ST. LAWRENCE RIVER	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
004	3242000	3250519	ST. LAWRENCE RIVER	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
005	3250520	3252003	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
006	3250822	3252003	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
007	3252003	3252306	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
008	3252306	3260217	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
009	3260218	3260514	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
010	3260218	3260514	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
011	3260810	3262008	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 5

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SEISMICS/SIDESCAN COMBINED ON-LINE DATA TAPES

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	CHANNEL INFORMATION	
012	3262006	3262303	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
013	3262304	3270208	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
014	3270208	3270507	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
015	3270508	3270803	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
016	3270804	3272153	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
017	3272124	3280049	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
018	3280214	3280521	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
019	3280521	3280816	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
020	3280817	3281120	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
022	3320127	3320448	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
023	3320450	3320745	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 5

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SEISMICS/SIDESCAN COMBINED ON-LINE DATA TAPES

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	CHANNEL INFORMATION	
024	3320745	3321040	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
024	3320745	3321040	GULF OF ST. LAWRENCE	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
025	3321042	3330634	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
026	3330635	3330908	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
027	3330908	3331036	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
028	3331036	3331502	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
029	3331201	3331756	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
030	3331757	3332056	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
031	3332057	3340001	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
032	3340002	3340254	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
033	3340255	3340647	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 5

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SEISMICS/SIDESCAN COMBINED ON-LINE DATA TAPES

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	CHANNEL INFORMATION	
034	3340647	3340942	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
035	3340943	3341237	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
036	3341238	3341541	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
037	3341543	3342030	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
038	3342031	3342333	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
039	3342333	3361700	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
040	3361700	3362000	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
041	3352331	3370226	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
042	3370227	3370525	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
043	3370527	3370821	LAURENTIAN CHANNEL	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 5

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SEISMICS/SIDESCAN COMBINED ON-LINE DATA TAPES

TAPE NUMBERS	START DAY/TIME	STOP DAY/TIME	GEOGRAPHIC LOCATION	CHANNEL INFORMATION	
044	3370821	3380440	SCOTIAN SHELF	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
045	3380442	3380737	SCOTIAN SHELF	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
046	3380737	3381515	SCOTIAN SHELF	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)
047	3381517	3381635	SCOTIAN SHELF	CH 1-3 SEISMICS (NSRF-TRIGGER-25' S.E.) CH 7-8 3.5 KHZ (TRIGGER-DATA)	CH 4-6 HUNTEC (INT-TRIG-EXT) CH 10-12 SIDESCAN (PORT-TRIG-STB'D)

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 6

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SEISMIC RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	HYDROPHONE	LINE NUMBERS	RECORD TYPE	GEOGRAPHIC LOCATION	RECORDER	SYSTEM / SOUND SOURCE
001	3240240	3241025	100' S.E.	1,2	SINGLE	ST. LAWRENCE AND GULF OF ST. LAWRENCE	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
002	3250220	3250935	100' S.E.	4	SINGLE	ST. LAWRENCE AND GULF OF ST. LAWRENCE	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
003	3251809	3270855	100' S.E.	5,6	SINGLE	ST. LAWRENCE AND GULF OF ST. LAWRENCE	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
004	3240240	3270855	NSRF EEL	1,2,3,4,5,6	SINGLE	ST. LAWRENCE AND GULF OF ST. LAWRENCE	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
005	3271950	3281120	100' S.E.	7,8	SINGLE	BAY OF CHALEUR	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
006	3271947	3281120	NSRF EEL	7,8	SINGLE	BAY OF CHALEUR	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
007	3320054	3370950	100' S.E.	10,12,14	SINGLE	GULF OF ST. LAWRENCE LAURENTIAN FAN	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
008	3380310	3381640	100' S.E.	15,15A	SINGLE	GULF OF ST. LAWRENCE LAURENTIAN FAN	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
009	3320100	3341605	NSRF EEL	10,11,12	SINGLE	LAURENTIAN FAN	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
010	3341613	3370950	NSRF EEL	12,14	SINGLE	LAURENTIAN FAN	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 6

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

SEISMIC RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	HYDROPHONE	LINE NUMBERS	RECORD TYPE	GEOGRAPHIC LOCATION	RECORDER	SYSTEM / SOUND SOURCE
011	3380310	3381640	NSRF EEL	15,15A	SINGLE	LAURENTIAN FAN	EPC 4100	AGC SEISMICS SLEEVE GUN 40 C
012	3331733	3370950	100' S.E.	12,14	SINGLE	LAURENTION FAN	EPC 8700	AGC SEISMICS SLEEVE GUN 40 C
013	3380310	3381640	100' S.E.	15,15A	SINGLE	LAURENTIAN FAN	EPC 8700	AGC SEISMICS SLEEVE GUN 40 C

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 7

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

HUNTEC RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	HYDROPHONE	LINE NUMBERS	RECORD TYPE	GEOGRAPHIC LOCATION	RECORDER	HUNTEC SYSTEM
01E	3240235	3250935	EXTERNAL	1,2,3,4	SINGLE	ST. LAWRENCE RIVER GULF OF ST. LAWRENCE	EPC 4100	HUNTEC DTS (AGC 3)
02E	3251810	3262355	EXTERNAL		SINGLE	ST. LAWRENCE RIVER GULF OF ST. LAWRENCE	EPC 4100	HUNTEC DTS (AGC 3)
03E	3270000	3270855	EXTERNAL		SINGLE	ST. LAWRENCE RIVER GULF OF ST. LAWRENCE	EPC 4100	HUNTEC DTS (AGC 3)
04E	3281110	3291040	EXTERNAL	8,9	SINGLE	GULF OF ST. LAWRENCE	EPC 4100	HUNTEC DTS (AGC 3)
01I	3240235	3250935	INTERNAL	1,2,3,4	SINGLE	ST. LAWRENCE RIVER GULF OF ST. LAWRENCE	EPC 4100	HUNTEC DTS (AGC 3)
02I	3251810	3270020	INTERNAL		SINGLE	ST. LAWRENCE RIVER GULF OF ST. LAWRENCE	EPC 4100	HUNTEC DTS (AGC 3)
03I	3270855	3281120	INTERNAL	6,7,8	SINGLE	ST. LAWRENCE RIVER GULF OF ST. LAWRENCE	EPC 4603	HUNTEC DTS (AGC 3)
04I	3290920	3291040	INTERNAL	9	SINGLE	GULF OF ST. LAWRENCE	EPC 4603	HUNTEC DTS (AGC 3)

ATLANTIC GEOSCIENCE CENTRE

DATA SECTION

-FINS- REPORTING PACKAGE

TABLE 8

CRUISE NUMBER = 90031

CHIEF SCIENTIST = G.VILKS

PROJECT NUMBER = 830045

3.5 KHZ RECORDS

ROLL NUMBERS	START DAY/TIME	STOP DAY/TIME	LINE NUMBERS	GEOGRAPHIC LOCATION	RECORDER	SYSTEM / SOUND
001	3240210	3241335	1,2	UPPER ST. LAWRENCE ESTUARY	LSR	HULL MOUNTED
002	3241340	3260800	2,3,4,5	GULF OF ST. LAWRENCE	LSR	HULL MOUNTED
003	3260805	3271630	5,6	GULF OF ST. LAWRENCE	LSR	HULL MOUNTED
004	3271740	3281800	7,8	BAIE DE CHALEUR	LSR	HULL MOUNTED
005	3281805	3291320	8,9	GULF OF ST. LAWRENCE	LSR	HULL MOUNTED
006	3291335	3301915		GULF OF ST. LAWRENCE	LSR	HULL MOUNTED
007	3320026	3322005	10,11	CABOT STRAIT	LSR	HULL MOUNTED
008	3330015	3341730	12	LAURENTIAN CHANNEL	LSR	HULL MOUNTED
009	3341736	3370520	12,13,14	HERMITAGE CHANNEL	LSR	HULL MOUNTED
010	3370523	3381745	14,15,15A	SCOTIAN SHELF	LSR	HULL MOUNTED

APPENDIX 1

Cruise HU-90-031; Estuary and Gulf of St.Lawrence & adjacent NW North Atlantic

Preliminary report of onboard studies and sampling by the GEOTOP (UQAM) group*

Geochemical & micropaleontological tracers in transitional marine environments

Onboard participants:

Anne de Vernal (Prof. UQAM): micropaleontology
René Canuel (Technician-UQAM): hydrochemistry
Ted Irwin (Technician UQAM): micropaleontology
Martine Lapointe (PhD student-UQAM): micropaleontology
Nicolas Quash (PhD student-UQAM): ^{14}C by AMS
Anasse Jennane (MSc student-UQAM): Short lived radio-isotopes
Patrick Louchouarn (MSc student-UQAM): biogeochemistry
Robert Lebel (BSc student-UQAM)

Onshore participants:

Claude Hillaire-Marcel (Prof. UQAM): isotope geochemistry
Marc Lucotte (Prof. UQAM): chemical oceanography
Alfonso Mucci (Prof. McGill): elemental geochemistry
Stephen Macko (Prof. U. of Virginia): organic geochemistry
Jim Channell (Prof. U. of Miami): paleomagnetism
Fouad Hamidi (MSc student-UQAM): trace elements (Ba, Cd, Pb) in foraminifers
Bernadette Quémerais (Post-doctoral fellow-UQAM): Th/U disequilibria
Sophie Tran (Technician-UQAM): hydrochemistry
Sylvain Vallières (PhD student-UQAM): Th/U disequilibria

* The on going studies of Quaternary and recent sediments in the Gulf of St.Lawrence region by the GEOTOP group is part of a multi-institutional collaborative research program with the Atlantic Geoscience Centre (G. Vilks, H. Josenhans) and the University of Windsor (C. Rodrigues). This research program is specifically funded by *Energy, Mines & Resources* (*c f.* Rodrigues *et al.*)

UQAM SCIENTIFIC PROGRAM:

Research objectives:

(1) To define geochemical and micropaleontological indicators of biotic (productivity) and abiotic (salinity) environmental parameters
(2) To trace the organic matter origin and fluxes from the water column and sediments
(3) To document biogeochemical processes in the water column and at the water/sediment interface
(4) To investigate remnant magnetisation acquisition by sediments
(5) To study late Quaternary to recent environmental changes at time scales ranging from 10^1 to 10^4 years.

Onboard studies and sampling (see appendix for sampling procedure).

(1) Water column:
1.1.Establishment of salinity and temperature profiles (CTD) to identify the water masses.
1.2.Sampling of water in each water mass and filtration of particulate matter for further analysis of the chemical and isotopic composition of water, dissolved carbon, suspended particulate matter....etc.

(2) Surface sediments (Box cores)
2.1.Measurement of redox potential (Eh) at 1 cm interval from a push core.
2.2.Sampling of sediments and interstitial waters under nitrogen atmosphere at 1 or 2 cm interval for further high resolution analyses in aliquot subsamples: physical (porosity), geochemical (C, N, Th/U, ^{13}C...etc.), and micropaleontological (palynomorphs,diatoms etc...).

(3) Cored sequences (TWCores & Pcores)
3.1.Continuous sampling for high resolution paleomagnetism studies.
3.2 Additional sampling at ca. 10 cm intervals for further geochemical (C, N, Th/U, ^{13}C-^{18}O in foraminifers) and micropaleontological analyses.

HU-90-031-001: Box core

Julian day: 324 GMT Time: 13:40

Latitude: 48°24.85N Longitude: 69°11.50W

Water depth: 309 m Recovery: 48 cm

Seismic record day-time: 324/06:00

Geographic location:Lower Estuary of St.Lawrence (Laurentian channel)

Description:Surface sediment (ca. 1cm) consists of brown silty mud with abundant worm tubes, shells and ; it overlies gray silty mud.

Subsampling:1 push-core (A; 45 cm long, 15 cm in diameter) processed onboard

2 push-cores (B & C; 7 cm in diameter, UQAM)

2 push-core (D & E; 10 cm in diameter, for archive BIO)

1 "micro-core" (10 cm^3, for bacterial counting at U.of Virginia)

1 sample (ca. 100 ml, of surface sediments, ca. 0.5 cm, UQAM).

Onboard measurements (under nitrogen atmosphere):redox potential (Fig. 1)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	40	12	-170	24	-179	36	-148
1	- 5	13	-139	25	-175	37	-137
2	-103	14	-165	26	-155	38	-135
3	- 95	15	-148	27	-163	39	-147
4	-155	16	-151	28	-186	40	-157
5	-156	17	-181	29	-150	41	-157
6	-169	18	-190	30	-136	42	-153
7	-160	19	-173	31	-138		
8	-137	20	-180	32	-169		
9	-143	21	-176	33	-142		
10	-154	22	-192	34	-141		
11	-140	23	-179	35	-142		

Onboard subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample seds	Squeezed sample	Porosity
* 0-1x	x	x	x	x	
* 1-2	x	x	x	x	x
* 2-3	x	x	x	x	x
* 3-4	x	x	x	x	x
* 4-5	x	x	x	x	x
* 5-7	x	x	x	x	x
* 7-9	x	x	x	x	x
* 9-10	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	x	x	x	x	x
*18-20	-	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	-	x	x	x	x
*26-28	x	x	x	x	x
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-
34-36	-	x	x	-	-
36-38	-	x	x	-	-
38-40	-	x	x	-	-
40-42	-	x	x	-	-

HU-90-031-002 (TWC & P)

Julian day: 324 GMT Time: 17:25

Latitude: 48°24.85 N Longitude: 69°11.50 W

Water Depth: 309 m Seismic record (day-time): 324/06:00

Geographic location: Lower Estuary of St.Lawrence (Laurentian channel).

TWCore: Penetration: 160 cm length: 94 cm

Sediment description. Dark gray (5Y4/1) silty mud with darker mottles; presence of black dots (sulphides); scattered shell fragments

Onboard subsampling: Continuous sampling for paleomagnetism,8 cc-cubes; Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals from the following depths (cm):

00-02	30-32	60-62	90-92
10-12	40-42	70-72	
18-20	50-52	80-82	

Note: due to soft consistency of sediments in the TWCore, subsamples for paleomagnetism might be disturbed.

PCore: Penetration: 18 m length: 1501 cm (10 sections & cutter)

Sediment description: Lithology is relatively uniform through the sequence. Sediments consist of dark gray (5Y4/1) silty mud with biotubations, scattered granules and shell fragments (0-ca. 1100cm) grading to dark gray (5Y4/1) clayey mud (ca. 1100-base).

At depth of 570-576 cm, a layer of stiff gray (5Y5/1) mud with black stringers (roots?) is observed: it probably corresponds to a large clast.

Onboard subsampling: Continuous sampling for paleomagnetism, 8 cc-cubes; Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals from the following depths :

9.5	111.2	210.8	310.3	409.8
19.3	120.8	220.0	319.2	419.3
29.5	130.7	231.0	330.8	431.0
39.3	140.3	240.2	340.3	440.6
*49.0	149.8	251.2	349.8	450.0
58.8	159.2	260.5	359.5	461.0
69.0	171.0	270.3	371.2	470.2
80.3	180.5	280.0	380.8	479.0
89.3	190.0	291.5	390.0	490.5
100.5	199.8	301.3	399.3	499.5
510.8	610.0	711.5	810.5	910.0
520.0	619.7	720.5	819.8	921.5
531.7	631.0	731.8	831.6	930.7
540.5	640.3	741.2	841.0	940.0
549.8	* * - - - -	750.3	850.6	949.5
559.0	661.5	761.5	860.3	961.0
569.8	670.8	770.8	870.3	970.5
580.0	680.2	780.0	879.8	980.0
589.3	690.0	791.8	891.5	991.5
601.0	699.7	801.0	900.8	1001.0
1010.8	1110.0	1209.5	1310.0	1411.0
1022.0	1119.6	1221.0	1319.3	1420.3
1031.4	1131.0	1230.0	1329.3	1429.8
1040.5	1140.0	1241.3	1340.7	1439.5
1049.8	1149.8	1250.4	1350.0	1451.0

1061.5	1159.0	1259.5	1359.2	1458.0
1070.5	1171.0	1268.8	1371.0	1470.0
1079.8	1179.0	1280.1	1380.4	1479.2

HU-90-031-002 cont'd

1091.2	1190.5	-----	1389.8	1489.3
1100.6	1199.8	1301.0	1399.0	1499.0

*Shell fragment in the 50-52 cm micropaleo sample.**Gap in core between 559 and 662 cm.

HU-90-031-003: CTD (Figs. 2-3)
Julian day: 324 GMT Time: 17:25
Latitude: 48°24.85N Longitude: 69°11.50 W
Water depth: 309 m

HU-90-031-004; Water Sampling
Julian day: 324 GMT Time: 18:22
Latitude: 48°24.85 N Longitude: 69°11.50W
Water depth: 309 m
Depth intervals sampled: I= 2-23 m; II= 60-81m; III= 200-221 m
Summary: 3 sets of 4 x [12 L-Niskin] bottles were used to sample each water mass (I, II & III; cf. CTD - HU-90-031-003; Figs. 2-3).
Onboard sampling:
I) 2-23 m interval
a) Non filtered water

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC(1)
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 µm filter: 2 L
Volume of water filtered through Glass Fibre Filter: 11.2,10 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM(2)+ SiO2	90-033
---	E	30	SiO2 + NH3	------
---	F	13	Alkali	------
GFF	-	- -	13C,15N,CHNS	90-040
GFF	-	- -	" " "	90-042
---	H	13	TIDC(1)	------

1. TIDC: Total Inorganic Dissolved Carbon ($\Sigma CO2$)
2. SPM: Suspended Particular Matter

II) 40-61 m interval
a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 micron filter: 3.1 L
Volume of water filtered through Glass Fibre Filter: 14 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-034
- - -	E	30	SiO2 + NH3	------
---	F	13	Alkali	------
GFF	-	- -	13C,15N,CHNS	90-042
- - -	H	13	TIDC	------

HU-90-031-004 cont'd

III) 200-221 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 22 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-035
---	E	30	SiO2 + NH3	- - - - - -
---	F	13	Alkali	- - - - - -
GFF	-	- -	13C,15N,CHNS	90-043
---	H	13	TIDC	- - - - - -

HU-90-031-005: Box core

Julian day: 324 GMT Time: 20:48

Latitude: 48°44.03N Longitude: 68°27.17W

Water depth: 355 m Recovery: 54 cm

Seismic record day-time: 324/20:12

Geographic location: Lower Estuary of St.Lawrence (Laurentian channel)

Description:Surface sediment (ca. 1cm) consists of brown silty mud with abundant worm tubes,shells and echinoderms; it overlies gray silty mud.

Subsampling:1 push-core (A; 10 cm in diameter; 54 cm long, UQAM)

2 push-cores (B & C; 54 cm long, 7 cm in diameter, UQAM)

2 push-core (D & E; 54 cm long, 10 cm in diameter, for BIO archive)

1 "micro-core" (10 cm^3, for bacterial counting by U. of Virginia)

1 subsample (ca. 100 ml of surface sediments; ca. .5 cm UQAM).

Note: Because of time constraints, no sub-sampling was performed under nitrogen atmosphere (sampling of Box core 90-031-001A was still in progress when core 90-031-005 was on the deck)

HU-90-031-006: CTD (Figs. 4-5)

Julian day: 324 GMT Time: 20:48

Latitude: 48°44.03N Longitude: 68°27.17W

Water depth: 355 m

Note: CTD was installed on the Box core

HU-90-031-007 (TWC & P)

Julian day: 324 GMT Time: 22:26

Latitude: 48°44.032N Longitude: 69°27.27 W

Water Depth: 355 m Seismic record (day-time): 324/06:00

Geographic location: Lower Estuary of St.Lawrence (Laurentian channel)

TWCore: Penetration: 160 cm length: 121 cm

Sediment description: Dark gray (5Y4/1) silty mud with darker mottles; scattered shell fragments and granules; presence of plant remains.

Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes) was done

Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U

(8cc) was done over 2 centimetre intervals from the following depths:

01.0	11.5	21.7	41.2	59.8	69.5
81.2	90.5	101.8	111.3	121.0	

Note: the upper 50 cm of sediments are soupy and, therefore, inadequate for paleomagnetism measurements.

HU-90-031-007 cont'd

PCore: Penetration: 18 m length: 1534 cm (10 sections & cutter)

Sediment description: Lithology is relatively uniform through the sequence. Sediments consist of dark gray (5Y4/1) silty mud with biotubations, scattered granules and shell fragments (0-ca. 1000cm) grading to dark gray (5Y4/1) clayey mud (ca. 1000-base); presence of rare plant macro remains.

Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes)

Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals from the following depths :

- - -	110.8	210.5	310.3	410.3
- - -	122.2	220.0	319.8	419.9
- - -	131.4	229.0	331.0	429.5
40.3	140.7	238.5	340.0	438.8
49.4	149.5	250.2	349.2	448.2+450.2
60.7	161.0	259.4	360.8	459.4
70.0	170.5	271.0	370.0	471.1
81.3	179.8	280.2	379.4	480.2
90.3	189.2	292.1	388.8	491.5
101.5	201.2	300.8	400.7	500.8
510.0	610.7	710.8	810.6	910.3
519.2	620.7	720.2	822.0	922.0
530.8	629.5	729.8	831.2	931.2
540.0	638.5	739.3	840.6	941.2
549.4	650.2	750.1	849.8	950.7
561.0	659.3	759.3	861.2	960.0
570.3	668.5	770.5	870.0	969.5
579.6	680.1	780.0	879.1	980.8
591.6	689.5	789.4	890.5	990.0
600.2	699.0	801.0	900.0	999.2
1010.5	1109.7	1209.5	1309.0	1409.0
1019.8	1121.3	1219.9	1320.3	1420.5
1030.8	1130.8	1229.0	1330.4	1429.6
1040.0	1142.2	1240.5	1340.0	1441.0
1051.2	1151.5	1250.6	1349.6	1450.3
1060.3	1160.7	1259.5	1361.3	1459.7
1069.7	1170.0	1269.9	1369.8	1468.8
1081.5	1181.5	1280.4	1379.3	1480.5
1091.0	1190.9	1289.8	1390.7	1489.8
1100.5	1200.2	1299.0	1399.8	1499.3
1509.8	1520.0	1531.5		

Note: the upper 40 cm of the PCore are disturbed.

HU-90-031-008: Water sampling

Julian day: 324 GMT Time: 23:18

Latitude: 48°44.02 N Longitude: 68°27.27W

Water depth: 355 m

Depth intervals sampled: I= 2-23 m; II= 40-61m; III= 210-231 m

Summary: 3 sets of 4 x [12 L-Niskin] bottles were used to sample each water mass (I, II & III; cf. CTD HU-90-031-006; Figs. 4-5).

HU-90-031-008 cont'd

Onboard processing:

I) 2-23 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 µm filter: 3 L

Volume of water filtered through Glass Fibre Filter: 12,13.2 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM(3)+ SiO2	90-036
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	13C,15N,CHNS	90-044
GFF	-	- -	" " "	90-047
- - -	H	13	TIDC	- - - - - -

II) 40-61 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 20 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-037
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	13C,15N,CHNS	90-046
- - -	H	13	TIDC	- - - - - -

III) 210-231 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 16,16.5L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-038
- - -	E	30	SiO2 + NH3	- - - - - -

- - -	F	13	Alkali	- - - - - -
GFF	-	- -	13C,15N,CHNS	90-045
GFF	-	- -	" " "	90-048
- - -	H	13	TIDC	- - - - - -

HU-90-031-009: Box core

Julian day: 325 GMT Time: 13:40
Latitude:49°05.24N Longitude: 67°26.22W
Water depth: 311 m Recovery: 54 cm
Seismic record day-time: 324/06:00

Geographic location: Lower Estuary of St.Lawrence (Laurentian channel)

Description:Surface sediment (ca. 1cm) consists of brown silty mud with few worm tubes; presence of pebble and unknown pink and soft sea animals. The thin surface layer overlies gray silty mud.

Subsampling: 1 push-core (A; 45 cm long, 15 cm in diameter)processed on board
2 push-cores (B & C; 7 cm in diameter,UQAM)
2 push-core (D & E; 10 cm in diameter) BIO archives
1 "micro-core" (10 cm3 for bacterial counting by U. of Virginia)
1 sample (ca. 100 ml of surface sediments ca 5 cm for UQAM).

On-board measurements(under nitrogen atmosphere): redox potential (Fig. 6)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	7	12	-148	24	-116	36	-106
1	-29	13	-151	25	-130	37	-88
2	-29	14	-138	26	-126	38	-81
3	-44	15	-140	27	-111		
4	-43	16	-143	28	-105		
5	-72	17	-156	29	-104		
6	-70	18	-144	30	-109		
7	-91	19	-144	31	-89		
8	-103	20	-135	32	-90		
9	-111	21	-120	33	-100		
10	-132	22	-134	34	-93		
11	-153	23	-106	35	-99		

On-board subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	x	x	x	x	x
*3-4	x	x	x	x	x
*4-5	x	x	x	x	x
*5-7	x	x	x	x	x
*7-9	x	x	x	x	x
*9-11	x	x	x	x	x
*12-14	-	x	x	x	x
*14-16	x	x	x	x	x
*16-18	-	x	x	x	x
*18-20	x	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	x	x	x	x	x

*26-28	x	x	x	x	x
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-
34-36	-	x	x	-	-
36-38	-	x	x	-	-

HU-90-031-010: CTD (Figs. 7-8)
Julian day: 325 GMT Time: 13:40
Latitude: 49°05.24N Longitude: 67°26.22W
Water depth: 311 m
Note: CTD installed on the box corer

HU-90-031-011 (TWC & P)
Julian day: 325 GMT Time: 14:35
Latitude: 49°05.24 N Longitude: 67°26.22 W
Water Depth: 311 m Seismic record (day-time): 324/06:00
Geographic location: End member of the Lower Estuary of St.Lawrence (Laurentian channel)
TWCore: Penetration:160 cm length:61 cm
Sediment description: Dark gray (5Y4/1) bioturbated silty mud.
Onboard subsampling: Continuous sampling for paleomagnetism, 8 cc-cubes;
Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) wsa done over 2 centimetre intervals from the following depths:

1.0	10.9	20.4	29.8	39.8
49.5	59.0			

Note:Due to soft consistency of sediments in the TWCore, subsamples for paleomagnetism might be disturbed.
PCore: Penetration: 18 m length: 1245 cm + cutter (9 sections)
Sediment description:Sediment consists of dark gray (5Y4/1) silty, bioturbated mud with scattered granules and shell fragments. Silty to sandy lenses were observed at the following depths: 308 cm, 802-811,820-827,831-860. The core is disturbed: gas is responsible for cracks below 500 cm; liner of section D-C was shattered and pieces of plastic liners were recovered in the sediments at 76-139 and 840-844 cms.
Onboard subsampling: Continuous sampling for paleomagnetism from 10 to 79 cm, 90 to 105 cm and 138 to 632 cm (8 cc-cubes). Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals from the following depths:

10.0	110.2	210.0	310.1	410.0	511.2	610.0	710.0
19.0	119.2	221.5	321.5	421.2	520.7	619.1	720.0
30.3	130.0	230.7	331.2	430.3	529.8	630.7	730.0
40.0	139.8	239.9	341.0	439.4	539.4	640.0	740.0
49.5	150.4	249.2	350.7	451.0	550.7	650.0	750.0
60.6	161.0	260.3	360.5	460.0	559.8	660.0	760.0
70.2	170.1	269.8	370.5	469.0	568.8	670.0	770.0
80.5	179.8	278.9	379.9	481.2	580.2	680.0	780.0
89.2	189.2	291.0	389.5	490.3	589.5	690.0	
100.2	200.7	300.0	401.0	501.7	601.0	700.0	

Note: because of disturbed sediments the sampling was discontinuous.

HU-90-031-012: Water sampling
Julian: day:325 GMT Time: 15:28
Latitude: 49°04.16 N Longitude: 67°26.28W
Water depth: 311 m

Depth intervals sampled: I= 2-23 m; II= 80-101m; III= 250-271 m

Summary: 3 sets of 4 x [12 L-Niskin] bottles were used to sample each water mass (I, II & III; cf. CTD HU-90-031-010; Figs. 7-8).

HU-90-031-012 cont'd

Sampling & Onboard processing:

I) 2-23 m interval

a)Non filtered water:

Sample	Volume(ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 µm filter: 6 L

Volume of water filtered through Glass Fibre Filter: 28 L

Filter type	Sample#	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM(3)+ SiO2	90-039
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	13C,15N,CHNS	90-075
- - -	H	13	TIDC	- - - - - -

II) 80-101 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6L

Volume of water filtered through Glass Fibre Filter: 36L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter#
0.45 µm	-	- -	SPM+ SiO2	90-040
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	13C,15N,CHNS	90-074
- - -	H	13	TIDC	- - - - - -

III) 250-271 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 24 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	- -	- -	SPM+ SiO2	90-041
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	- -	- -	13C,15N,CHNS	90-050
- - -	H	13	TIDC	- - - - - -

HU-90-031-013: Box core

Julian day: 326 GMT Time: 13:26

Latitude: 49°25.42N Longitude: 66°19.45W

Water depth: 322 m Recovery: 56 cm

Seismic record day-time: 326/00:40

Geographic location: Mouth of the Estuary in the Gulf of St.Lawrence (Laurentian channel)
HU-90-031-013 cont'd
Description: Surface sediment (ca. 1cm) consists of brown silty mud with a few worm tubes; it overlies gray silty mud.
Subsampling: 1 push-core (A; 45 cm long, 15 cm in diameter) for on-board processing
2 push-cores (B & C; 7 cm in diameter) (UQAM)
2 push-core (D & E; 10 cm in diameter) for archives (BIO)
1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).
Onboard measurements (under nitrogen atmosphere): redox potential (Fig.9)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	5	12	-101	24	-105	36	-80
1	18	13	-112	25	-80	37	-101
2	-10	14	-108	26	-56		
3	-16	15	-78	27	-60		
4	-54	16	-85	28	-64		
5	-79	17	-81	29	-75		
6	-88	18	-72	30	-78		
7	-92	19	-63	31	-78		
8	-112	20	-59	32	-54		
9	-114	21	-89	33	-64		
10	-102	22	-79	34	-65		
11	-90	23	-84	35	-69		

Onboard subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	x	x	x	x	x
*3-4	x	x	x	x	x
*4-5	x	x	x	x	x
*5-7	x	x	x	x	x
*7-9	x	x	x	x	x
*9-11	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	x	x	x	x	x
*18-20	x	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	x	x	x	x	x
*26-28	x	x	x	x	x
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-
34-36	-	x	x	-	-
36-37	-	x	x	-	-

HU-90-031-014: CTD (Figs. 10-11)
Julian day: 326 GMT Time: 13:26
Latitude: 49°25.42N Longitude: 66°19.45W
Water depth: 322 m
Note: the CTD was installed on the box corer

HU-90-031-015 (TWC & P)

Julian day: 326 GMT Time: 14:21
Latitude: 49°25.42N Longitude: 66°19.45W
Water depth: 322 m Seismic record (day-time): 326/00:40

Geographic location: Mouth of the Estuary in the Gulf of St.Lawrence (Laurentian channel)

TWCore: Penetration: 160 cm length: 185 cm(2 sections + cutter)

Sediment description: Dark gray (5Y4/1) silty mud.

Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes). Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 centimetre intervals from the following depths:

1.0	29.4	59.2	91.5	120.0	150.0	180.8
10.5	41.0	70.7	101.0	129.3	159.7	
20.0	50.0	79.9	110.4	149.0	170.9	

Note: due to soft consistency of sediments in the TWCore, subsamples for paleomagnetism might be disturbed.

PCore: Penetration: 18 m length: 1069 cm (7 sections+ cutter)

Sediment description: Sediments consist of dark gray to gray mud, silty to clayey.

0-80 cm = dark gray (5Y 4/1) silty mud grading to:
80-607 cm = gray (5Y 5/1) clayey mud.
607-710 cm = dark gray (5Y 4/1) clayey mud with, sand , granules and gravels.
710-733 cm = gray (5Y 5/1) clayey mud.
733-764 cm = dark gray (5Y 4/1) clayey mud with, sand , granules and gravels.
764-1028 cm = dark gray (2.5 Y 4/1) clayey mud
1028-1069 cm = dark gray (10YR 4/1) clayey mud.

Note: Strong H2S odour from the core sections. The base of the core (catcher) is more red in colour, has a sparse microfauna and may correspond to glacial or pro-glacial accumulation.

Onboard subsampling: Continuous sampling for paleomagnetism, 8 cc-cubes.
Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals from the following depths:

0.5	98.7	199.9	302.2	401.2	500.3	600.7	700.9
9.8	111.2	208.9	310.7	410.9	509.7	610.7	710.2
19.1	120.6	220.3	320.2	420.2	521.2	-----	720.0
31.2	130.3	229.2	329.7	431.8	530.3	630.4	729.3
40.5	142.0	241.2	341.2	441.0	539.5	-----	741.3
50.2	151.2	249.9	350.7	449.0	550.3	649.0	748.4
59.6	160.8	259.1	359.9	460.7	559.4	660.9	761.5
71.3	167.7	270.1	371.4	470.0	570.6	670.7	770.8
80.4	179.3	279.7	381.0	481.5	579.8	680.0	780.2
89.6	191.2	288.7	390.2	491.0	588.9	689.3	789.5

798.7	904.4	1000.0
808.3	911.0	1011.6
817.5	920.3	1020.8
830.7	929.6	1030.2
839.8	941.4	1037.7
850.9	951.0	1049.1
860.0	960.4	1059.8
869.0	969.5	
881.6	981.2	
889.7	990.5	

HU-90-031-016: Water sampling

Julian day: 326 GMT Time: 15:27
Latitude: 49°25.42N Longitude: 66°19.45W
Water depth: 322 m

Depth intervals sampled: I = 2-23 m; II = 60-81 m; III = 260-281 m

HU-90-031-016 cont'd

Summary: 3 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (I, II and III; cf. CTD-HU-90-031-014; Figs. 10-11).

Sampling & Onboard processing:

I) 2-23 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 µm filter: 6 L

Volume of water filtered through Glass Fibre Filter: 26 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-043
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-078
- - -	H	13	TIDC	- - - - - -

II)60-81 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 29 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter
0.45 µm	-	- -	SPM+ SiO2	90-042
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-079
- - -	H	13	TIDC	- - - - - -

III) 260-281 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 28 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-044
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-081
- - -	H	13	TIDC	- - - - - -
- - -	-	- -	zooplankton	90-082

HU-90-031-017: Box core

Julian day: 327 GMT Time: 13:40

Latitude: 49°17.44N Longitude: 63°59.57W

Water depth: 373 m Recovery: 52 cm

Seismic record day-time: 327/05:55

Geographic location: Gulf of St.Lawrence (Laurentian channel), SW to Anticosti Island

Description: Surface sediment (ca. 1cm) consists of brown silty mud with few worm tubes. The thin surface layer overlies gray silty mud.

Subsampling: 1 push-core (A; 45 cm long, 15 cm in diameter) for on-board processing
2 push-cores (B & C; 7 cm in diameter) (UQAM)
2 push-core (D & E; 10 cm in diameter) for archives (BIO)
1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).

Onboard measurements (under nitrogen atmosphere): redox potential (Fig. 12)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	45	12	-29	24	-12	36	-34
1	43	13	-27	25	-49		
2	19	14	-4	26	-32		
3	-29	15	-8	27	-56		
4	-52	16	-1	28	-23		
5	-56	17	-54	29	-58		
6	-56	18	-19	30	-47		
7	-58	19	-36	31	-52		
8	-48	20	-28	32	-37		
9	-23	21	-32	33	-30		
10	-18	22	-54	34	-27		
11	-30	23	-20	35	-27		

On-board subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	-	x	x	x	x
*3-4	x	x	x	x	x
*4-5	x	x	x	x	x
*5-7	x	x	x	x	x
*7-9	x	x	x	x	x
*9-11	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	x	x	x	x	x
*18-20	x	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	x	x	x	x	x
*26-28	x	x	x	x	x
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-
34-36	-	x	x	-	-

HU-90-031-018: CTD (Figs. 13-14)
Julian day: 327 GMT Time: 12:23
Latitude: 49°17.44N Longitude: 63°59.57W
Water depth: 373 m
Note: the CTD was installed on the box corer

HU-90-031-019 (TWC & P)
Julian day: 326 GMT Time: 14:21
Latitude: 49°17.44N Longitude: 63°59.57W
Water depth: 322 m Seismic record (day-time): 327/05:55
Geographic location: Gulf of St.Lawrence (Laurentian channel), SW to Anticosti Island
TWCore: Penetration: 160 cm length: 99 cm
Sediment description: Dark gray (5Y4/1) mud.
Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes). Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 centimetre intervals from the following depths:

10.8	20.3	29.7	41.6	51.0
60.1	69.1	80.4	87.9	

Note: due to soft consistency of sediments in the TWCore, subsamples for paleomagnetism might be disturbed.
PCore: Penetration: 15 m length: 1173 cm (8 sections+ cutter)
Sediment description: Sediments consist of gray clayey mud (0-533 cm) overlying dark gray to reddish clayey mud with sand, granules, gravels (533-1173 cm)
0-533 cm = gray (5Y 5/1) clayey mud with scattered sand and granules; below 400 cm, granules and gravels occurrence is increasing;
533-560 cm = dark gray (5Y 4/1) clayey mud, with sand and granules;
560-578 cm = dark gray (10YR 4/1) clayey mud with, sand , granules and gravels (pebble at 679 cm);
778-791 cm = dark gray (5Y 4/1) clayey mud, with sand, granules and gravels
791-865 cm = dark reddish gray (5Y 4/2) clayey mud with, sand, granules and gravels;
865-891 cm = reddish brown (5YR 4/3) clayey mud with, sand, granules and gravels;
891 cm = sharp and mottled transition;
891-903 cm = dark brown (7.5YR 4/2) clayey mud with, sand, granules and gravels; presence of reddish mottles;
903-929 cm = dark reddish brown (5YR 4/2) clayey mud with, sand, granules and gravels (pebble at 924-928 cm);
929-937 cm = reddish brown (5YR 4/3) clayey mud with, sand, granules and gravels;
937-950 cm = dark reddish brown (5YR 4/2) grading to dark gray (5YR 4/!) clayey mud with, sand, granules (pebble at 941-945 cm);
950-953 cm = sharp and mottled transition;
953- 971 cm =gray (5Y 5/1) clayey mud with sand and granules;
971- 997 cm = greyish clayey mud; sub-horizontal and mottled laminae (marble-like structure) (pebble at 983 cm);
997-1007 cm = gray (5Y 5/1) clayey mud with, sand , granules and gravels (pebble at 999 cm);
1007-1043 cm = gray (5YR 5/1) clayey mud with, sand , granules and gravels;
1043 cm = mottled transition;
1043- 1085 cm = gray (5Y 5/1) sandy clay with gravels;
1085-1125 cm = gray (5YR 5/1) clayey mud with sand, granules and gravels (marbled mottling);
1125- 1173 cm =gray (5Y 5/1) sandy clay with gravels.

HU-90-031-019 cont'd

Onboard subsampling: Continuous sampling for paleomagnetism, 8 cc-cubes; Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals from the following depths:

1.1	101.2	200.7	300.7	399.3	496.2	599.5
10.7	110.7	210.0	310.7	410.9	510.8	611.1
20.6	121.0	219.7	319.3	419.9	520.0	620.5
30.2	130.3	231.3	331.3	429.9	529.9	629.9
41.5	139.8	240.6	340.8	439.2	540.8	641.5
50.6	151.7	251.3	350.3	450.6	550.0	651.0
59.7	160.9	260.8	359.8	460.0	559.5	660.5
70.8	170.3	269.9	369.1	469.3	571.5	672.2
79.9	179.5	279.4	380.7	480.8	580.7	681.6
91.3	191.2	291.1	390.0	490.0	590.1	691.0

700.4	800.3	902.2	1000.5	1099.6
710.3	809.8	911.5	1010.5	1109.0
720.0	821.8	920.8	1019.8	1120.7
731.9	831.4	930.8	1031.4	1130.2
741.3	840.8	940.2	1040.9	1139.6
750.8	850.3	950.0	1050.2	1149.4
760.2	860.6	959.3	1061.5	
769.7	872.3	970.8	1070.4	
781.4	881.6	980.0	1080.8	
790.7	890.8	989.8	1090.0	

HU-90-031-020: Water sampling

Julian day: 327 GMT Time: 14:08

Latitude: 49°17.44 N Longitude: 63°59.57W

Water depth: 373 m

Depth intervals sampled: I = 2-23 m; II = 65-86 m; III = 290-311 m

Summary: 3 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (I, II and III; cf. CTD-HU-90-031-018; Figs.13-14).

Sampling & on board processing:

I) 2-23 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 µm filter: 6 L

Volume of water filtered through Glass Fibre Filter: 30 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-047
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-086
- - -	H	13	TIDC	- - - - - -

II)65-86 m interval

HU-90-031-021 cont'd

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TID
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 37.2 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-045
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N,CHNS	90-084
- - -	H	13	TIDC	- - - - - -

III) 290-311 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 34.9 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-046
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N,CHNS	90-085
- - -	H	13	TIDC	- - - - - -
- - -	-	- -	zooplankton tries	90-087

HU-90-031-021: Box core

Julian day: 328 GMT Time: 12:21

Latitude: 47°55.43N Longitude: 65°12.31W

Water depth: 73 m Recovery: 40 cm

Seismic record day-time: 328/06:45

Geographic location: Inner part of Chaleur Bay; Gulf of St.Lawrence

Description: Surface sediment (ca. 1cm) consists of brown silty mud with rare worm tubes, scattered gravel and shells; it overlies black and brown marbled silty mud. Presence of 3 living sea stars at the surface

Subsampling: 1 push-core (A; 40 cm long, 15 cm in diameter) for on-board processing

2 push-cores (B & C; 7 cm in diameter) (UQAM)

2 push-core (D & E; 10 cm in diameter) for archives (BIO)

1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)

1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).

HU-90-031-021 cont'd

Onboard measurements (under nitrogen atmosphere): redox potential (Fig. 15)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	-49	12	-142	24	-210
1	-76	13	-168	25	-190
2	-114	14	-173	26	-248
3	-112	15	-177	27	-259
4	-126	16	-174	28	-210
5	-134	17	-192	29	-209
6	-132	18	-246	30	-239
7	-134	19	-242		
8	-87	20	-234		
9	-132	21	-142		
10	-109	22	-150		
11	-116	23	-194		

Onboard subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	x	x	x	x	x
*3-4	x	x	x	x	x
*4-5	x	x	x	x	x
*5-7	-	x	x	x	x
*7-9	x	x	x	x	x
*9-11	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	x	x	x	x	x
*18-20	x	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	x	x	x	x	x
*26-28	x	x	x	x	x
28-30	-	x	x	-	-

HU-90-031-022: CTD (Figs. 16-17)

Julian day: 328 GMT Time: 12:21

Latitude: 47°55.43N Longitude: 65°12.31W

Water depth: 73 m

Note: the CTD was installed on the box corer

HU-90-031-023 (TWC & P)

Julian day: 328 GMT Time: 13:03

Latitude: 47°55.43N Longitude: 65°12.31W

Water depth: 73 m Seismic record (day-time): 328/06:45

Geographic location: Inner part of Chaleur Bay; Gulf of St.Lawrence)

TWCore: Penetration: 100 cm length: 37 cm

Sediment description: Very dark greyish brown (10YR 3/2) silty mud overlying very dark greyish brown (10YR 3/2) mud marbled with black (7.5YR 2/0) mud.

HU-90-031-023 cont'd

Onboard subsampling. :Continuous sampling for paleomagnetism (8 cc-cubes) was done . Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 centimetre intervals from the following depths:

20.9 30.6

Note: due to soft consistency of sediments in the TWCore, subsamples for paleomagnetism might be disturbed.

PCore: Penetration: 14 m length: 759 cm (5 sections)

Sediment description: 0-27 cm: very dark greyish brown (10YR 3/2) mud densely marbled with black (7.5YR 2/0) mud;

27-344 cm: dark gray (10YR 4/1) mud marbled with blackish biotubations (the density of blackish bioturbation decreases with depth) ;pebble at 240cm; piece of wood at 338-342 cm;

344-510 cm: gradation to dark gray (5Y4/1) bioturbated mud marbled with blackish mottles; presence of shell fragments;

510-552 cm: dark gray (10YR 4/1) sandy mud; pebble at 546 cm;

552-622 cm: very dark greyish brown (10YR 3/2) sandy gravelly clay with shell fragments and pebbles (563, 570, 590-595, 606 cm);

622-737 cm: dark reddish gray (5YR 4/2) clay with scattered granules and gravels; abundant black dots (sulphides?) especially at 634-642 and 668-692 depth intervals; pebble (shale) at 687 cm;

737-759 cm: dark reddish brown (5YR 4/2) clay laminated with dark greyish brown (10YR 4/2) and black clay laminae

Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes) was done throughout the sequence, with the exception of the sandy gravelly mud interval (520-622 cm). Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals from the following depths:

10.6	110.5	209.7	319.8	409.8	511.7	611.7	711.3
20.0	119.7	221.0	321.5	419.2	521.3	618.4	721.2
31.3	129.3	230.8	331.0	431.3	530.1	629.8	730.8
41.7	140.7	241.7	340.5	441.0	539.4	640.0	740.3
50.0	150.0	251.0	350.0	450.5	550.0	649.2	749.5
59.4	162.1	260.4	361.8	449.3	559.3	660.8	
71.1	171.5	270.0	370.9	471.0	568.2	670.7	
80.0	181.0	281.7	380.3	480.5	580.0	680.0	
89.3	190.6	290.9	391.6	489.8	590.7	689.8	
101.0	200.0	300.1	400.6	501.1	600.5	699.5	

Note: A ca. 10 cm long piece of wood has been sampled for ^{14}C measurements

HU-90-031-024: Water sampling

Julian day: 328 GMT Time: 13:40

Latitude: 47°55.43 N Longitude: 65°12.31W

Water depth: 73 m

Depth intervals sampled: I = 2-23 m ; II = 40-61 m

Summary: 2 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (I and II; cf. CTD-HU-90-031-022, Figs. 16-17).

Sampling & Onboard processing:

I) 2-23 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

HU-90-031-024 cont'd

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 µm filter: 4,6 L

Volume of water filtered through Glass Fibre Filter:10 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-049
- - -	-	- -	" " "	90-050
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-088
- - -	H	13	TIDC	- - - - - -

II)40-61 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	13C of TIDC
B	250	Phytoplankton
C	30	18O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 12 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-048
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-089
- - -	H	13	TIDC	- - - - - -

HU-90-031-025: Box core

Julian day: 328 GMT Time: 17:07

Latitude: 48°19.48N Longitude: 64°23.54W

Water depth: 109 m Recovery: 50 cm

Seismic record day-time: 327/21:45

Geographic location: Outer part of Chaleur Bay; Gulf of St.Lawrence

Description: Surface sediment (ca. 1cm) consists of brown silty mud with rare worm tubes, scattered gravel and shells; it overlies very dark mud.

Subsampling: 1 push-core (A; 10 cm in diameter) (UQAM)

2 push-cores (B & C; 7 cm in diameter) (UQAM)

2 push-core (D & E; 10 cm in diameter) for archives (BIO)

1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)

1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).

HU-90-031-026: CTD (Figs. 18-19)

Julian day: 328 GMT Time: 17:07

Latitude: 48°19.48N Longitude: 64°23.54W

Water depth: 109 m

Note: CTD installed on the Box corer

HU-90-031-027: TWC & P

Julian day: 328 GMT Time: 17:59

Latitude: 48°19.48N Longitude: 64°23.54W

Water depth: 109 m Seismic record: 327/21:45

Geographic location: Outer Chaleur Bay; Gulf of St.Lawrence

TWCore: Penetration : 150 cm length: 99 cm

Sediment description: Very dark gray (5Y3/1) to olive gray (5Y 4/2) bioturbated mud.
Onboard subsampling: Sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and

HU-90-031-027 cont'd

Th/U (8cc) was done over 2 centimetre intervals from the following depths:

10.0	20.0	30.0	40.0	50.0
60.0	70.0	80.0	90.0	99.0

PCore: Penetration: 15.20 m length: 1130 cm (8 sections+ cutter)

Sediment description: 0-456 cm: very dark gray to olive gray (5Y 3/1-4/2) bioturbated mud;
456-492 cm: sandy-gravelly mud with shell fragments;
498-642 cm : dark greenish gray (5GY 4/1) clayey mud;
642-663 cm : dark greenish gray (5GY 4/1) sandy-gravelly mud with shell fragments;
663-679 cm: dark reddish gray (5YR 4/2) mud with lenticular dark greenish gray (5GY 4/1)mud;
679-733 cm: dark reddish gray (5YR 4/2) sandy-silty clay with granules and gravels;
733-797 cm: dark reddish gray (5YR 4/2) clayey mud;
797-977 cm: dark reddish gray (5YR 4/2) silty clay;
977-1123 cm: dark reddish gray (5YR 4/2) clay with abundant black dots (sulphides);
1123-1130 cm: dark reddish gray (5YR 4/2) clay with black laminae; pebble at 1130 cm;

Onboard subsampling: Sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals from the following depths:

10.0	110.0	210.0	310.0	410.0
20.0	120.0	220.0	320.0	420.0
30.0	130.0	230.0	330.0	430.0
40.0	140.5	240.0	340.0	440.0
50.0	151.0	250.0	350.0	450.0
60.0	159.5	260.0	360.0	460.0
70.0	170.5	270.0	370.0	470.0
80.0	180.0	280.0	380.0	480.0
90.0	190.0	290.0	390.0	490.0
100.0	200.0	300.0	400.0	500.0
510.0	610.0	710.0	810.0	910.0
520.0	620.0	720.0	820.0	920.0
530.0	630.0	730.0	830.0	930.0
540.0	640.0	740.0	840.0	940.0
550.0	650.0	750.0	850.0	950.0
560.0	660.0	760.0	860.0	960.0
570.0	670.0	770.0	870.0	970.0
580.0	680.0	780.0	880.0	980.0
590.0	690.0	790.0	890.0	990.0
600.0	700.0	800.0	900.0	1000.0
1010.0	1020.0	1030.0	1040.0	1050.0
1060.0	1070.0	1080.0	1090.0	1100.0
1120.0	1129.0			

HU-90-031-028: Water sampling

Julian day: 328 GMT Time: 18:41
Latitude: 48°19.48 N Longitude: 64°23.54W
Water depth: 109 m

Depth intervals sampled: I = 2-23 m; II =70-91 m

Summary: 2 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (I and II; cf. CTD HU-90-031-026; Figs.18-19).

HU-90-031-028 cont'd

Sampling & on board processing:

I) 2-23 m interval:

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 µm filter: 6.3 L

Volume of water filtered through Glass Fibre Filter: 12 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-024
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N, CHNS	90-090
- - -	H	13	TIDC	- - - - - -

II) 70-91 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 12 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-025
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N, CHNS	90-091
- - -	H	13	TIDC	- - - - - -

HU-90-031-029: Box core

Julian day:	329	GMT Time:	12:31
Latitude:	48°32.00N	Longitude:	61°10.20W
Water depth:	408 m	Recovery:	50 cm

Seismic record day-time: 328/06:45

Geographic location: South-East of Anticosti Island; Gulf of St.Lawrence

Description: Sediment consists of gray silty mud. Note that the surface sediments (usually brownish) were probably washed out during the way up of the corer because of wavy conditions.

Subsampling: 1 push-core (A; 40 cm long, 15 cm in diameter) for on-board processing
2 push-cores (B & C; 7 cm in diameter) (UQAM)
2 push-core (D & E; 10 cm in diameter) for archives (BIO)
1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).

HU-90-031-029 cont'd

On-board measurements (under nitrogen atmosphere): redox potential (Fig. 20)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	- -	12	-38	24	-56
1	-41	13	-45	25	-55
2	-87	14	-43	26	-40
3	-78	15	-37	27	-73
4	-55	16	-37	28	-102
5	-66	17	-43	29	-41
6	-95	18	-60	30	-43
7	-48	19	-87	31	-57
8	-53	20	-80		
9	-64	21	-50		
10	-54	22	-29		
11	-35	23	-28		

Onboard subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-2	x	x	x	x	x
*2-4	x	x	x	x	x
*4-6	x	x	x	x	x
*6-8	x	x	x	x	x
*8-10	x	x	x	x	x
*10-12	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
16-18	-	x	x	-	-
18-20	-	x	x	-	-
20-22	-	x	x	-	-
22-24	-	x	x	-	-
24-26	-	x	x	-	-
26-28	-	x	x	-	-
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-
34-36	-	x	x	-	-

Note: the upper part of the sequence was disturbed and surface 1 or 2 cm are probably missing.

HU-90-031-030 (TWC & P)

Julian day: 329 GMT Time: 13:34
Latitude: 48°32.00 N Longitude: 61°10.21W
Water depth: 409 m Seismic record (day/time): 329/09:57
TWCore: penetration: 150 cm length: 157 cm
Sediment description: Dark gray (5Y4/1) mud.
Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes) was done
Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 centimetre intervals at the following depths:

1.7	11.7	21.4	31.4	41.1	50.6	60.2
69.8	78.9	89.8	98.8	109.8	119.1	130.3
139.1	148.2					

Note: due to soft consistency of sediments in the TWCore, subsamples for paleomagnetism might be disturbed.

HU-90-031-030 cont'd
PCore: Penetration: 12.50 m length: 1009 cm (7 sections)
Sediment description: 0-760 cm: dark gray (5Y 4/1) mud;
760-790 cm: grading to brown (7.5YR 4/4) mud;
790-833 cm : grading to dark reddish brown (5YR 4/1) clayey mud;
883-844 cm : grading to reddish brown (5YR 4/4) silty-sandy mud with gravel;
844-878 cm: reddish gray (5YR 4/4) sandy mud with gravel;
878-912 cm: reddish gray (2.5YR 4/4) sandy mud with gravel;
912-948 cm: dark reddish gray (5YR 4/2) sandy mud with gravel;
948-991 cm: dark reddish brown (5YR 3/4) sandy mud with gravel;
991-1009 cm: dark reddish gray (5YR 4/2) sandy mud with gravel;
Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes) was done .
Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 centimetre intervals at the following depths:

10.5	110.0	210.3	311.1	410.3
20.2	119.2	221.9	321.0	422.0
29.6	129.4	231.1	329.8	431.5
39.2	141.1	240.5	341.7	441.1
50.0	150.3	252.0	351.4	450.4
59.9	160.0	261.0	360.6	460.2
70.2	172.5	270.3	370.4	469.7
79.4	181.9	282.2	380.0	481.4
89.6	191.3	289.8	389.7	491.1
99.2	200.7	301.7	401.3	503.1
510.4	612.0	710.4	811.6	911.1
520.0	621.5	719.8	820.8	920.6
529.6	631.0	731.2	830.1	929.8
541.3	640.5	740.3	841.5	942.1
550.7	650.1	752.1	850.8	951.3
560.0	659.6	- - - -	860.2	960.5
571.8	672.0	770.3	869.5	970.0
581.5	681.0	781.8	881.2	981.7
591.0	690.7	790.0	890.3	991.3
600.3	700.0	802.5	900.7	1000.7

HU-90-031-031 CTD (Figs. 21-22)
Julian day: 329 GMT Time: 14:45
Latitude: 48°32.00 N Longitude: 61°10.21W
Water depth:409 m

HU-90-031-032: Water sampling
Julian day: 329 GMT Time: 15:11
Latitude: 48°32.04 N Longitude: 61°10.20W
Water depth: 409 m
Depth intervals sampled: I = 2-23 m; II = 60-81 m; III = 300-321 m
Summary: 3 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (I, II and III; cf. CTD HU-90-031-031; Figs. 21-22).
Sampling & on board processing:
I) 2-23 m interval

a) Non filtered water:	Sample	Volume (ml)	Analytical purpose
	A	250	^{13}C of TIDC
	B	250	Phytoplankton
	C	30	^{18}O of water

D	30	PO4 & NO3 analyses	

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 µm filter: 6 L
Volume of water filtered through Glass Fibre Filter:32 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM(3)+ SiO2	90-021
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-051
- - -	H	13	TIDC	- - - - - -

II) 60-81 m interval

a) Non filtered water:	Sample	Volume (ml)	Analytical purpose
	A	250	^{13}C of TIDC
	B	250	Phytoplankton
	C	30	^{18}O of water
	D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 micron filter: 6 L
Volume of water filtered through Glass Fibre Filter: 36 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-022
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-092
- - -	H	13	TIDC	- - - - - -

III) 300-321 m interval

a) Non filtered water:	Sample	Volume (ml)	Analytical purpose
	A	250	^{13}C of TIDC
	B	250	Phytoplankton
	C	30	^{18}O of water
	D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 micron filter: 6 L
Volume of water filtered through Glass Fibre Filter: 34 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-023
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-052
- - -	H	13	TIDC	- - - - - -

HU-90-031-033 (TWC & P)
Julian day: 330 GMT Time: 13:24
Latitude: 49°56.09N Longitude: 59°08.25W
Water depth: 322 m Seismic record (day-time): 330/12:43
Geographic location: Esquiman Channel; Gulf of St.Lawrence
TWCore: Penetration: 150 cm length: 148 cm
Sediment description: 0-4 cm: very dark greyish brown (2.5Y3/2) silty mud;
4-70 cm: dark greyish brown (2.5Y 4/2) mud grading to;
70-148 cm: dark gray (10YR 4/1) mud.

HU-90-031-033 cont'd

Onboard subsampling: Sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 centimetre intervals from the following depths:

1.5	50.5	100.0
10.0	60.0	110.0
20.0	69.5	120.0
30.0	80.0	130.0
40.0	90.0	140.0

PCore: Penetration: 11 m length: 614 cm (5 sections)

Sediment description: 0-10 cms: dark greyish brown (2.5Y 4/2) mud;

10-527 cm: dark gray (5Y4/1) clayey mud with increasingly darker bioturbations between ca. 300 cm and 527 cm;

527-557cms: dark gray (10YR 4/1) clayey mud with blackish bioturbations;

557-571 cm: dark gray (10YR 4/1) clayey mud;

571-593 cm dark gray-reddish gray (5YR 4/1-4/2) sandy mud;

593-614 cm: gray (7.5-5 YR 5/1) sandy-gravelly mud with pebbles.

Onboard subsampling: Sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm from the following depths:

10.0	20.0	30.0	40.0	50.0	60.0	70.0
80.0	90.0	100.0	110.0	120.0	130.0	140.5
151.0	159.5	170.5	180.0	190.8	200.0	210.0
220.0	230.5	240.0	250.5	260.2	270.0	280.2
290.0	299.5	310.0	320.0	330.0	340.0	350.0
360.0	370.0	380.0	390.0	400.0	410.0	420.0
430.0	440.0	450.0	460.0	470.0	480.0	490.0
500.5	510.0	520.0	530.0	540.0	550.0	560.0
570.0	580.0	590.0	600.0	610.0	620.0	630.0
640.0	650.0	660.0	670.0	680.0	690.0	700.0
710.0						

HU-90-031-034: Box core

Julian day: 332 GMT Time: 12:48

Latitude: 47°09.15N Longitude: 60°32.54W

Water depth: 174 m Recovery: 50 cm

Seismic record day-time: 332/11:26

Geographic location: North-West of Cape Breton Island

Description: Surface sediment (a few centimetres) consists of brown silty mud with abundant macrophytes (?), juvenile echinoderms and a few worm tubes;

Subsampling: 1 push-core (A; 45 cm long, 15 cm in diameter) for on-board processing

2 push-cores (B & C; 7 cm in diameter) (UQAM)

3 push-cores (D & E; 10 cm in diameter) for archives (BIO)

1 "micro-core" (10 cm3) for bacterial counting (U. of Virginia)

1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).

Onboard measurements (under nitrogen atmosphere): redox potential (Fig. 23)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	-30	12	-199	24	-324
1	-65	13	-220	25	-306
2	-150	14	-206	26	-320
3	-167	15	-215	27	-330
4	-188	16	-235	28	-292
5	-164	17	-247	29	-306
6	-168	18	-266	30	-336
7	-175	19	-268	31	-333

8	-155	20	-293	32	-266

HU-90-031-034 cont'd

9	-152	21	-272	33	-317
10	-163	22	-325	34	-245
11	-184	23	-247	35	-301
				36	-265

Onboard subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	x	x	x	x	x
*3-4	x	x	x	x	x
*4-5	-	x	x	x	x
*5-7	x	x	x	x	x
*7-9	x	x	x	x	x
*10-12	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	x	x	x	x	x
*18-20	x	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	x	x	x	x	x
26-28	x	x	x	x	x
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-
34-36	-	x	x	-	-

HU-90-031-035: CTD (Figs. 24-25)
Julian day: 332 GMT Time: 12:48
Latitude: 47°09.15N Longitude: 60°32.54W
Water depth: 174 m
Note: CTD was installed on the box corer

HU-90-031-036: TWC & P
Julian day: 332 GMT Time: 13:50
Latitude: 47°09.06N Longitude: 60°32.55W
Water depth: 170 m Seismic record day-time: 332/11:26
Geographic location: North-West of Cape Breton Island
TWCore: Penetration: 100 cm length: 37 cm
Sediment description: Very dark brown (10YR 2/2) bioturbated silty mud with black mottling (0-21 cm) overlying dark olive gray (5YR 3/2) bioturbated silty mud (21-37 cm).
Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes) were done . Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 centimetre intervals from the following depths :

1.1 20.2 30.6

Note: due to soft consistency of sediments in the TWCore, subsamples for paleomagnetism might be disturbed.
PCore: Penetration: 12 m length: 850 cm (6 sections+ cutter)
Sediment description: Gray mud (0-350 cm) grading to (350-448 cm) reddish brown clayey mud with scattered granules and gravels (448-850 cm).
0-2 cm: very dark brown (10YR 2/2) silty mud-disturbed-;

1-13 cm: dark olive gray (5Y 5/2) silty mud;

HU90-031-036 cont'd

13-22 cm: olive gray (5Y3/2) very hard carbonaceous silty clay (probably a clast - not recovered in TWC)-;
22-38 cm: dark olive gray (5Y5/2) silty mud;
38-61 cm: dark gray (5Y 4/1) silty mud;
61-66 cm: gradation to dark gray (10YR 4/1) sandy mud;
66-260 cm: dark gray (5Y 4/1) bioturbated mud;
260-330 cm: dark gray (10YR 4/1) bioturbated mud;
330-350 cm: dark gray (5YR 4/1) bioturbated mud;
350-394 cm: dark reddish gray (5YR 4/2) bioturbated sandy mud (392-394: pebble);
394-448 cm: dark reddish gray (5YR 4/2) clayey mud;
448-850 cm: dark reddish brown (10YR 4/1) clayey mud with scattered granules and gravels.

Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes) was done. Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over a 2 cm interval from the following depths:

- - -	109.9	210.5	310.8	409.6
- - -	121.3	219.7	319.3	421.1
29.0	129.8	231.6	330.8	430.4
40.6	139.1	240.9	339.7	439.7
49.9	150.8	250.3	348.8	451.1
59.0	160.1	261.0	360.2	460.3
70.8	169.6	269.4	369.2	469.4
80.2	181.0	280.7	380.5	480.9
89.9	190.0	289.8	389.9	490.0
100.3	199.3	298.8	400.3	498.9
510.3	610.0	709.5	811.0	
519.4	619.2	721.0	820.0	
529.3	630.6	730.2	829.5	
541.1	639.9	739.9	841.5	
550.5	651.3	750.9		
559.6	660.4	760.1		
571.0	669.8	769.0		
580.3	679.4	781.0		
588.8	691.0	790.0		
599.5	700.3	799.5		

HU-90-031-037: Water sampling

Julian day: 332 GMT Time: 14:48
Latitude: 47°09.47 N Longitude: 60°31.57 W
Water depth: 170 m

Depth intervals sampled: I = 2-23 m; II = 95-116 m

Summary: 2 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (I and II; cf. CTD-HU-90-031-035; Figs. 24-25).

Onboard processing: I) 2-23 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

HU-90-031-037 cont'd

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 µm filter: 5 L

Volume of water filtered through Glass Fibre Filter: 10.8 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-052
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N,CHNS	90-054
- - -	H	13	TIDC	- - - - - -

II) 95-116 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 5.2 L

Volume of water filtered through Glass Fibre Filter: 10 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-051
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N,CHNS	90-053
- - -	H	13	TIDC	- - - - - -

HU-90-031-038: Van Veen grab

Julian day: 332 GMT Time: 18:20

Latitude: 46°43.47N Longitude: 60°13.16W

Water depth: 154 m Seismic record (Day/Time): 332/01:55

Geographic location: NE of Cape Breton Island

Sediment description: surface sediments (ca. 10 cm) consist of brownish silty mud; subsurface sediments are very dark brown to black mud. Subsample of ca. 100 cc of surface ca. 0-1 cm

HU-90-031-039: TWC & P

Julian day: 332 GMT Time: 18:48

Latitude: 46°43.47N Longitude: 60°13.16W

Water depth: 154 m Seismic record (Day/Time): 332/01:55

Geographic location: NE of Cape Breton Island

TWCore: no recovery

PCore: Penetration: 1300 cm

HU-90-031-040: Van Veen grab

Julian day: 332 GMT Time: 21:30

Latitude: 46°40.50N Longitude: 60°22.00W

Water depth: 18.3 m

Geographic location: NE of Cape Breton Island

Sediment description: sand, subsample of ca. 100 cc.

HU-90-031-041: Box core

Julian day: 333 GMT Time: 12:51
Latitude: 46°59.56N Longitude: 59°04.56W
Water depth: 448 m Seismic record day-time: 333/12:00
Geographic location: Cabot Strait; N Atlantic
Description: Sediment consists of brownish silty mud (ca. 2 cm) overlying greyish mud.
Subsampling:1 push-core (A; 40 cm long, 15 cm in diameter) for on-board processing
2 push-cores (B & C; 7 cm in diameter) (UQAM)
3 push-core (M, D & E; 10 cm in diameter) for archives (BIO)
1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).
Onboard measurements(under nitrogen atmosphere): redox potential (Fig. 26)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	17	12	-103	24	-140
1	-28	13	-102	25	-136
2	-56	14	-116	26	-99
3	-80	15	-110	27	-143
4	-84	16	-76	28	-122
5	-84	17	-73	29	-154
6	-89	18	-106	30	-130
7	-118	19	-66	31	-152
8	-74	20	-91	32	-186
9	-105	21	-109	33	-190
10	-97	22	-72	34	-205
11	-101	23	-97	35	-196

Onboard subsampling(*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	x	x	x	x	x
*3-4	x	x	x	x	x
*4-5	x	x	x	x	x
*5-7	x	x	x	x	x
*7-9	x	x	x	x	x
*9-11	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	-	x	x	x	x
*18-20	x	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	x	x	x	x	x
*26-28	x	x	x	x	x
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-

HU-90-031-042: CTD (Figs.27-28)

Julian day: 333 GMT Time: 12:51
Latitude: 46°59.56N Longitude :59°04.56W
Water depth: 448 m
Note: CTD was installed on the box corer

HU-90-031-043: TWC & P

Julian day: 334 GMT Time: 18:12
Latitude: 44°49.19N Longitude: 56°29.47W
Water depth: 387 m
Seismic record (Day/Time): 334/17:26
Geographic location: End member of the Laurentian channel
TWCore: No recovery
PCore: Penetration: 9 m Length: 483 cm (4 sections & cutter)
Sediment description: 0-2 cm: Olive gray (5Y 4/2) silty mud;
2-54 cm: dark gray (5Y 4/1) mud; barely visible laminations between 2 and 19 cm;
54-115 cm : dark gray (10YR 4/1 grading to 5YR 4/1) clayey mud;
115-148 cm : dark gray (10YR 4/1) clayey mud with barely visible laminations;
148-152 cm: reddish gray (5YR 4/2) sandy mud layer;
152-335 cm: dark gray (10YR 4/1) clay with granules and gravels;
335-411 cm: dark gray (5YR 4/1) clayey mud with barely visible bioturbation;
411-483 cm: dark gray (5YR 4/1) clayey mud with abundant black (sulphides ?) mottles;
Onboard subsampling: Sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over a 2 cm interval from the following depths:

1.2				
10.0	110.0	210.0	310.0	410.0
20.0	120.0	220.0	320.0	420.0
30.0	130.0	230.0	330.0	430.0
40.5	140.0	240.0	340.0	440.0
50.3	150.0	250.0	350.0	450.0
60.0	160.0	260.0	360.0	460.0
70.2	170.0	270.0	370.5	470.0
80.0	180.0	280.0	380.5	480.0
90.0	190.2	290.0	390.0	
100.0	200.0	300.0	400.0	

In the upper part of the sequence, additional sampling for micropaleontology and C/N was done at 2 cm intervals from the following depths :

1.0	11.0	33.0	58.0
3.0	13.0	38.0	63.0
5.0	18.0	43.0	68.0
7.0	23.0	48.0	73.0
9.0	28.0	53.0	78.0

Note: Shells have been sampled for ^{14}C at 250 cm (bivalve) and 329 cm (1 valve).

HU-90-031-044: TWC & P

Julian day: 335 GMT Time: 22:21
Latitude: 44°39.41N Longitude: 55°37.13W
Water depth: 1381 m Seismic record (day-time): 335/17:14
Geographic location: Eastern Laurentian fan
TWCore: length: 73 cm
Onboard measurements (redox potential under nitrogen atmosphere):

depth (cm)	eh (mv)	depth (cm)	eh (mv)
0	---	12	-96
1	---	13	-108
2	-92	14	-135
3	-112	15	-129
4	-98	16	-85
5	-41	17	-58

6	-78	18	-97
7	-81	19	-57
8	-42	20	-21

HU-90-031-044 cont'd

9	-49	21	-120
10	-54	22	-140
11	-57	23	-118
24	-125		

Sediment description: 0-46 cm: olive gray (5Y 4/2) mud; 46-73 cm: dark gray (5Y 4/1) m

Onboard subsampling.: Continuous sampling for paleomagnetism (8 cc-cubes) have been done . Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 centimetre intervals at the following depths:

.05	2.0	4.0	6.0	8.0
10.0	12.0	14.0	18.0	20.0
25.0	30.0	35.0	40.0	45.0
50.0	55.0	60.0	65.0	70.0

Note: due to soft consistency of sediments in the TWCore, subsamples for paleomagnetism might be disturbed.

PCore: Penetration: 13 m Length: 941 cm (7 sections & cutter)

Sediment description: 0-36 cm: olive gray (5Y 4/2) mud;
36-344 cm: dark gray (5Y 4/1) mud with barely visible bioturbation;
344-514 cm: dark gray (10YR 4/1) clayey mud;
514-601 cm: dark greenish gray (5GY 4/1) clayey mud;
601-624 cm: dark gray (5Y 4/1) clayey mud with black dots;
624-941 cm: dark gray (5YR 4/1) clayey mud with scattered granules and black dots.

Onboard subsampling: Continuous sampling for paleomagnetism (8 cc-cubes) has been done. Additional sampling for micropaleontology (30cc), geochemistry (8cc), C/N (2cc) and Th/U (8cc) was done over 2 cm intervals at the following depths:

1.0	11.2	111.2	211.1	310.9	410.4
	20.3	120.1	220.5	319.3	420.7
	29.6	129.4	229.7	329.0	430.3
	41.3	140.6	241.1	340.6	439.5
	50.6	149.7	250.3	349.7	448.9
	59.8	158.9	259.8	361.4	460.5
	69.0	171.1	269.0	370.3	469.3
	80.5	180.3	280.0	379.7	481.0
	90.0	190.0	289.8	389.0	490.1
	99.8	199.4	301.2	400.4	501.8
	510.9	610.7	710.4	809.8	910.4
	519.9	619.6	719.8	822.0	920.3
	531.3	629.2	731.2	831.6	
	540.3	640.9	738.9	841.1	
	549.3	650.0	751.2	850.5	
	560.7	659.8	760.4	859.8	
	567.6	671.2	770.3	871.8	
	581.0	680.7	781.2	881.5	
	590.0	689.8	790.8	891.0	
	599.4	701.2	800.4	900.6	

HU-90-031-045: Box core

Julian day: 336 GMT Time: 12:28
Latitude: 45°51.17N Longitude: 57°35.51W
Water depth: 473 m Recovery: 50 cm
Seismic record (day-time): 334/04:30
Geographic location: Laurentian Channel

Description: Brownish mud (<1cm) overlying greyish mud.
Subsampling: 1 push-core (A; 45 cm long, 15 cm in diameter) for on-board processing
2 push-cores (B & C; 7 cm in diameter) (UQAM)
3 push-cores (D & E & M; 10 cm in diameter) for archives (BIO)
1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).
On-board measurements (under nitrogen atmosphere): redox potential (Fig. 29)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	-57	12	-80	24	-157
1	-94	13	-91	25	-194
2	-106	14	-89	26	-193
3	-97	15	-94	27	-198
4	-121	16	-117	28	-218
5	-97	17	-118	29	-213
6	-79	18	-109	30	-264
7	-76	19	-130	31	-252
8	-63	20	-133	32	-254
9	-64	21	-170	33	-271
10	-58	22	-160	34	-224
11	-60	23	-153		

Onboard subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	-	x	x	x	x
*3-4	x	x	x	x	x
*4-5	x	x	x	x	x
*5-7	x	x	x	x	x
*7-9	x	x	x	x	x
*9-11	x	x	x	x	x
*10-12	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	x	x	x	x	x
*18-20	x	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	x	x	x	x	x
*26-28	x	x	x	x	x
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-

HU-90-031-046: CTD (Figs. 30-31)
Julian day: 336 GMT Time: 12:28
Latitude: 45°51.17N Longitude: 57°35.51W
Water depth: 473 m
Note: the CTD was installed on the Box corer

HU-90-031-047: TWC & P

Julian day: 336 GMT Time: 13:24
Latitude: 45°51.14N Longitude: 57°35.56W
Water depth: 473 m Seismic record (day-time): 334/04:30
Geographic location: Laurentian Channel

HU-90-031-048: water sampling

Julian day: 336 GMT Time: 14:58
Latitude: 45°51.15 N Longitude: 57°35.56W
Water depth: 473 m
Geographic location: Laurentian Channel
Depth intervals sampled: I = 2-23 m; II = 70-91 m; III = 230 m and IV = 375-396 m.
Summary: 3 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (I, II and IV; cf. CTD HU-90-031-031; Figs. 21-22), and one bottle of 40 L was used for sampling water mass III.

Sampling & on board processing:

I) 2-23 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 µm filter: 6 L
Volume of water filtered through Glass Fibre Filter:26 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM$^{(3)}$+ SiO2	90-054
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-056
- - -	H	13	TIDC	- - - - - -

II) 70-91 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 micron filter: 6 L
Volume of water filtered through Glass Fibre Filter: 41.7 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-055
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-057
- - -	H	13	TIDC	- - - - - -

III) 230 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 micron filter: 6 L
Volume of water filtered through Glass Fibre Filter: 22 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-053
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N,CHNS	90-055
- - -	H	13	TIDC	- - - - - -

IV) 375-396 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 micron filter: 6 L
Volume of water filtered through Glass Fibre Filter: 24 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-056
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N,CHNS	90-058
- - -	H	13	TIDC	- - - - - -
- - -	-	- -	zooplankton	90-059

HU-90-031-049: Box core
Julian day: 336 GMT Time: 17:35
Latitude: 46°11.21N Longitude: 57°56.17W
Water depth: 468 m
Geographic location: Laurentian Channel
Description: Brownish mud (<1cm) overlying greyish mud.
Subsampling: 3 push-cores (B & C; 7 cm in diameter) (UQAM)
3 push-cores (D & E & M; 10 cm in diameter) for archives (BIO)
1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).

HU-90-031-050: CTD (Figs. 32-33)
Julian day: 336 GMT Time: 17:35
Latitude: 46°11.21N Longitude: 57°56.17W
Water depth: 468 m
Note: CTD was installed on the Box corer

HU-90-031-051: TWC & P
Julian day: 336 GMT Time: 13:24
Latitude: 46°11.21N Longitude: 57°56.17W
Water depth: 466 m
Geographic location: Laurentian Channel

HU-90-031-052: Box core-
Julian day: 337 GMT Time:
Latitude: 43°30.56N Longitude: 56°22.15W
Water depth: 355m Recovery: 50 cm
Seismic record (day-time): 337/05:45
Geographic location: Hermitage Channel (between Miquelon & Newfound Land)
Description: Brownish mud (<1cm) overlying greyish mud.
Subsampling: 1 push-core (A; 45 cm long, 15 cm in diameter) for on-board processing
2 push-cores (B & C; 7 cm in diameter) (UQAM)
3 push-cores (D & E & M; 10 cm in diameter) for archives (BIO)
1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).
Onboard measurements (under nitrogen atmosphere): redox potential (Fig. 34)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	27	12	-108	24	-105
1	-21	13	-95	25	-190
2	-62	14	-103	26	-102
3	-90	15	-94	27	-62
4	-60	16	-135	28	-96
5	-125	17	-106	29	-61
6	-99	18	-125	30	-61
7	-98	19	-95	31	-81
8	-120	20	-99	32	-260
9	-145	21	-96	33	-84
10	-120	22	-152	34	-63
11	-110	23	-97	35	-92

Onboard subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	x	x	x	x	x
*3-4	-	x	x	x	x
*4-5	x	x	x	x	x
*5-7	x	x	x	x	x
*7-9	x	x	x	x	x
*9-11	x	x	x	x	x
*10-12	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	x	x	x	x	x
*18-20	x	x	x	x	x
*20-22	x	x	x	x	x
*22-24	x	x	x	x	x
*24-26	x	x	x	x	x
*26-28	x	x	x	x	x
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-

HU-90-031-053: CTD (Figs. 35-36)
Julian day: 337 GMT Time: 11.43
Latitude: 47°30.56N Longitude: 56°22.15W
Water depth: 355 m
Note: the CTD was installed on the box corer

HU-90-031-054: TWC & P
Julian day: 337 GMT Time: 12:42
Latitude: 47°14.21N Longitude: 56°40.06W
Water depth: 355 m Seismic record (day/time): 337/05:45
Geographic location: Hermitage Channel

HU-90-031-055: water sampling
Julian day: 337 GMT Time: 14:18
Latitude: 47°14.29 N Longitude: 56°40.17W
Water depth: 355 m
Geographic location: Hermitage Channel
Depth intervals sampled: I = 2-23 m; II = 65-86 m; III = 230-251 m.
Summary: 3 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (I, II and III; cf. CTD Hu-90-031-053; Figs. 35-36).
Sampling & onboard processing: I) 2-23 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 µm filter: 6 L
Volume of water filtered through Glass Fibre Filter:28 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM(3)+ SiO2	90-057
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-060
- - -	H	13	TIDC	- - - - - -

II) 65-86 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):
Volume of water filtered through 0.45 micron filter: 6 L
Volume of water filtered through Glass Fibre Filter: 27 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-058
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-061
- - -	H	13	TIDC	- - - - - -

HU-90-031-055 cont'd

III) 230-251 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 20.2 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-059
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C, ^{15}N, CHNS	90-062
- - -	H	13	TIDC	- - - - - -

HU-90-031-056: Box Core

Julian day: 337 GMT Time: 17:44

Latitude: 47°04.37N Longitude: 57°03.07W

Water depth: 333 m Seismic record (day/time): 337/02:00

Geographic location: Hermitage Channel

Description: Brownish mud (a few cm) overlying greyish mud.

Subsampling: 1 push-core (A; 45 cm long, 15 cm in diameter) for on-board processing
2 push-cores (B & C; 7 cm in diameter) (UQAM)
3 push-cores (D & E & M; 10 cm in diameter) for archives (BIO)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).

HU-90-031-057: CTD (Figs. 37-38)

Julian day: 337 GMT Time: 17:44

Latitude: 47°04.37N Longitude: 57°03.07W

Water depth: 333 m

Note: the CTD was installed on the Box corer

HU-90-031-058: TWC & P

Julian day: 337 GMT Time: 18:43

Latitude: 47°04.37N Longitude: 57°03.07W

Water depth: 332 m Seismic record (day/time): 337/02:00

Geographic location: Hermitage Channel

HU-90-031-059: Box core

Julian day: 338 GMT Time: 12:25

Latitude: 45°50.36N Longitude: 58°34.19W

Water depth: 268 m Recovery: 50 cm

Geographic location: Southeast Cape Breton Island

Description: Brownish mud (a few cm) overlying greyish mud.

Subsampling: 1 push-core (A; 45 cm long, 15 cm in diameter) for on-board processing
2 push-cores (B & C; 7 cm in diameter) (UQAM)
3 push-cores (D & E & M; 10 cm in diameter) for archives (BIO)
1 "micro-core" (10 cm^3) for bacterial counting (U. of Virginia)
1 sample (ca. 100 ml) of surface sediments (ca. .5 cm) (UQAM).

HU-90-031-059 cont'd

Onboard measurements (under nitrogen atmosphere): redox potential (Fig. 39)

depth (cm)	Eh (mv)	depth (cm)	Eh (mv)	depth (cm)	Eh (mv)
0	-19	12	-83	24	-95
1	-62	13	-82	25	-81
2	-68	14	-99	26	-80
3	-85	15	-85	27	-100
4	-86	16	-70	28	-59
5	-98	17	-95	29	-73
6	-88	18	-76	30	-49
7	-106	19	-117	31	-70
8	-86	20	-86	32	-86
9	-94	21	-101	33	-58
10	-100	22	-101	34	-40
11	-82	23	-56	35	-73

Onboard subsampling (*under nitrogen atmosphere)

Depth (cm)	Pore water	Frozen sample	Sediment sample	Squeezed seds.	Porosity sample
*0-1	x	x	x	x	x
*1-2	x	x	x	x	x
*2-3	x	x	x	x	x
*3-4	x	x	x	x	x
*4-5	x	x	x	x	x
*5-7	x	x	x	x	x
*7-9	x	x	x	x	x
*9-11	x	x	x	x	x
*10-12	x	x	x	x	x
*12-14	x	x	x	x	x
*14-16	x	x	x	x	x
*16-18	x	x	x	x	x
18-20	-	x	x	-	-
20-22	-	x	x	-	-
22-24	-	x	x	-	-
24-26	-	x	x	-	-
26-28	-	x	x	-	-
28-30	-	x	x	-	-
30-32	-	x	x	-	-
32-34	-	x	x	-	-

HU-90-031-060: CTD (Figs. 40-41)

Julian day: 338 GMT Time: 12:25

Latitude: 45°50.36N Longitude: 58°34.19W

Water depth: 268 m

Note: the CTD was installed on the box corer

HU-90-031-061: TWC & P

Julian day: 338 GMT Time: 13:18

Latitude: 45°50.37N Longitude: 58°34.23W

Water depth: 267 m

HU-90-031-062: Water sampling

Julian day: 338 GMT Time: 12:20

Latitude: 45°50.36N Longitude: 58°34.19W

Water depth: 268 m

Depth intervals sampled: I = 10 m; II = 125-146 m; III = 210-231m.

Summary: 2 sets of 4 x [12 L-Niskin] bottles were used for sampling water masses (II and III; cf. CTD Hu-90-031-060; Figs. 40-41), and one bottle of 40 L was used for sampling water mass I.

Sampling & onboard processing:

I) 10 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 µm filter: 6 L

Volume of water filtered through Glass Fibre Filter:32 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM(3)+ SiO2	90-060
- - -	E	30	SiO2 + NH3	- - - - - - - -
- - -	F	13	Alkali	- - - - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-063
- - -	H	13	TIDC	- - - - - - - -

II) 125-146 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 36 L

III) 210-231 m interval

a) Non filtered water:

Sample	Volume (ml)	Analytical purpose
A	250	^{13}C of TIDC
B	250	Phytoplankton
C	30	^{18}O of water
D	30	PO4 & NO3 analyses

b) Filtered water (pre-weighed filters):

Volume of water filtered through 0.45 micron filter: 6 L

Volume of water filtered through Glass Fibre Filter: 18 L

Filter type	Sample #	Volume (ml)	Analytical purpose	Filter #
0.45 µm	-	- -	SPM+ SiO2	90-062
- - -	E	30	SiO2 + NH3	- - - - - -
- - -	F	13	Alkali	- - - - - -
GFF	-	- -	^{13}C,^{15}N,CHNS	90-065
- - -	H	13	TIDC	- - - - - -

APPENDIX 1A. Sampling procedures for paleomagnetic measurements

Scientific objective — to measure paleomagnetic declination and inclination of the sediments in order to reconstruct secular fluctuations of the magnetic field.

Rationale — (1) basic studies of high resolution paleomagnetic changes;
(2) their possible link with climatic fluctuations (due to rotational changes induced by loading/unloading of continents by ice sheets?);
(3) magnetostratigraphy and correlations of cored sequences based on secular changes. [Ref.: Thouveny: *J. can. Sci. Terre* 25 (1988), 833-843].

Sampling objective — to sample sediments as undisturbed as possible and as carefully oriented as possible with 2 cc-edge plastic cubes pushed in continuity along half-sections;

Material needed — Centimetric tape; Cutting blade; Curved spatula; Permanent markers (fine)
Tweezers; Metallic plate (aluminum)
Sticking plaster (band-aid™) cut into 25 mm² sqares
8-cc plastic cubes (2 cc-edge) and covers for sampling
Hermetic plastic box for storage

Procedures

01. Drill a hole (*ca* 1mm²) in the corner of the face of each cube opposite to the cover [event to let the air out when pushing the cube into the sediment].
02. Try to cut as evenly as possible each working half-section of the core (electric knife or wire) along the lines already made on liners when recovered from the barrels (in order to limit relative rotation of sections).
03. Push the cubes into the sediment along the working half axis, with a uniform and vertical pression; insure that the drilled face of the cube is parallel to the surface of the sediment and maintain the other faces of the cubes parallel (lateral faces) or perpendicular (fore and aft faces) to the axis.
04. Plug the cube events with the already cut sticking plaster pieces (the plaster should be cut first into 25 mm² sqares on the aluminum plate).
05. Indicate the core top direction with an arrow on each cube; alternately, only on the top and bottom cubes of each working half, if all working halves are processed similarly, *e.g.*, with the top of the section at left hand and writings (see below) from left (=top) to right (=bottom).
06. On each cube, indicate the core section number on left top, and the depth (from top of the section) of the center of the face (at ± 1 mm). Indicate the core number on the top cube of each section.
07. On the log book: note the exact length of each section in cm. Note sampling hiatuses if any (*e.g.*, disturbance due to sample processing, pebbles, coarse layers...).
08. Remove the cubes as gently as possible with tweezers and a curved spatula (to cut the mud at the base of the cube); avoid to twist the sampled mud.
09. Cut and remove the mud in excess.
10. Put the covers on the cubes.
11. Clean the cubes and store them in numerical order in a hermetic box.
12. Put a wet paper towel in the box (to prevent dehydration) before storage in a refrigerator.

APPENDIX 1B. Water sampling procedures

Based on casts with 12 L-Niskin bottles (1 or 2 for surface water; 4 to 6 for deeper water masses).

Scientific objective	to analyse the chemical and isotopic composition of water, dissolved carbon, suspended particulate matter, etc.
Rationale	basic studies of water mass properties and of organic matter composition. [Ref.: Lucotte (1989a), *Can J. Fish. Aquat. Sci.* 46, 59-65; (1989b); *Estuar. Coastal Shelf Sci.* 29, 293-304; Lucotte *et al.* (1990), in print: *Estuar. Coastal Shelf Sci*].
Sampling objective	to collect sample large enough for all chemical and isotopic analyses; to avoid (when necessary) isotopic exchange with atmospheric water vapor, or CO_2, during storage; to restrict (when necessary) bacterial activity during storage.
Material needed	Nalgene™ vials (250 ml, 30 ml, 13 ml) Filters: 0.45 mm; Glass Fiber Filters; Funnels; vacuum pump (to force percolation through filters when needed); Hoses; vacuum chamber or oven to dry samples on filters; Tweezers (to avoid contamination of filters); plastic bags; markers, etc.

Procedures

1.2.1. *Non filtered water.*

(A) Fill a 250 ml Nalgene™ vial (with hermetic caps) for ^{13}C analysis. Add a few drops of $HgCl_2$ and store at room temperature.
(B) Fill a 250 ml Nalgene™ vial for phytoplankton studies. Add a few drops of Lugol and store at room temperature.
(C) Fill a 30 ml Nalgene™ vial (with hermetic cap) for ^{18}O (and ^{2}H if planned) analysis. Refrigerate.
(D) Fill a 30 ml Nalgene™ vial for PO_4 and NO_3 analysis. Freeze.

1.2.2. *Filtered water on pre-weighted 0.45 mm filters*

(E) Fill a 30 ml Nalgene™ vial for SiO_2 and NH_3 analysis. Freeze.
(F) Fill a 13 ml Nalgene™ vial for alkali analysis. Add a few drops of HCl (30%) and refrigerate.
(G) For SPM+SiO_2 (biogenic) analysis: poor the sampled water on the filter until it is "plugged" and note the volume (generally ≥ 4L). Remove the zooplankton (*e.g.*, copepods) and transfer it on a Glass Fiber Filter. Dry the filters, then store them.

1.2.3. *Filtered water on pre-weighted Glass Fiber Filters*

(H) Fill a 13 ml Nalgene™ vial for CO_2 analysis. Add a few cristals of $HgCl_2$, close hermetically and refrigerate.
(I) For ^{13}C, ^{15}N and C, H, N, S, analysis: poor water on the filter until it is "plugged" and note the volume (as much as possible). Remove zooplankton as above and transfer it on another Glass Fiber Filter. Dry the filters.

APPENDIX 1C Box core sampling procedures

Scientific objective to measure Eh and O_2, to sample pore water and surface sediments, to measure the porosity.

Rationale
(1) to investigate biogeochemical processes occuring at the water/sediment interface;
(2) to study the early diagenesis of the organic matter;
(3) to sample fossil assemblages, carbonates and organic matter really representative of modern conditions in the water column and in nearby neritic zones.

Sampling objective to measure Eh and dissolved oxygen as little changed from original values as possible; to extract and "settle" pore water; to avoid further chemical and/or bacterial activity in the pore water samples.

Material needed
"push corers" (pieces of liners) of 1 cm, 7 cm and 15 cm in diameter, with caps;
a glove box to process the sub-cores under nitrogen atmosphere;
nitrogen tanks and regulators;
squeezers for mud with filter holders and tubing attachments; syringes to recover the filtered pore water;
pH meter; probe for dissolved oxygen measurements;
hermetic plastic vials; towels; plastic bags; a plastic cutter to slice the sediment;
wood blocks -or a jack- to lift the sediment into the liner; plastic film; etc.

Procedures

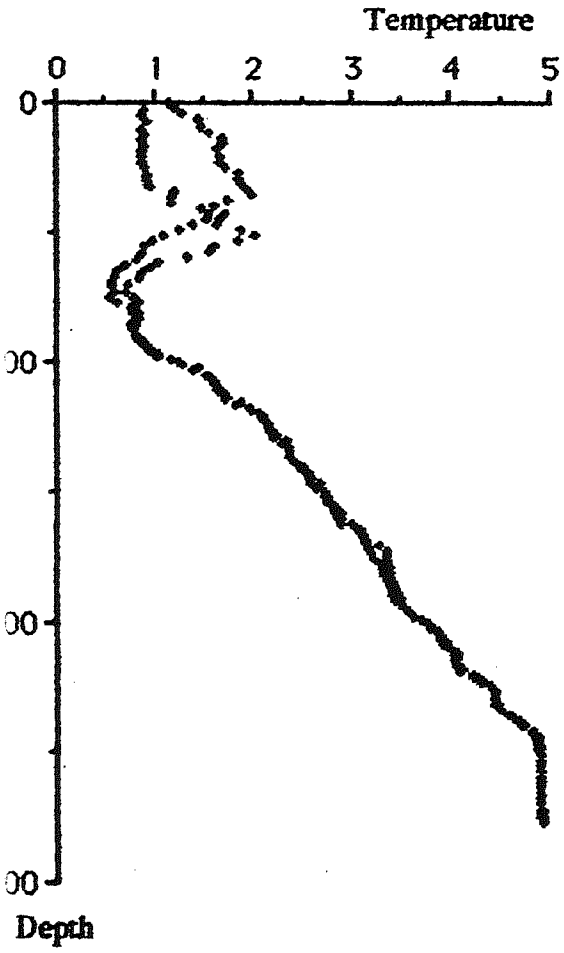
01. Holes (2 to 3 mm in diameter) should be drilled longitudinally at 1 cm intervals in one or two plastic cylinders of *ca* 15 cm in diameter to be used as "push [working] corers"; a plastic tape should be used to plug the holes untill the working core(s) is (are) stored in the glove box (to avoid oxydation).
02. When the box-core is on deck, take a picture of the surface and collect "macros" if any and if needed.
03. Insert rapidly as many "push corers" as needed (f: 1 cm, 7 cm , 15 cm).
04. Collect the first mm of "liquid mud" at the surface of the box core and store it in a numbered vial.
05. Remove the push cores and protect the 15 cm-working core top and bottom with a plastic film (to restrict Eh changes); transfer the working core in the glove box under N_2 flow.
06. Seal the 7 cm-push cores; one should be labelled for archives and all should be stored in a refrigerator untill further processing as needed; subsample the 1 cm-diameter push core at 1 cm intervals; transfer each 1 cc sample in centrifuge tubes containing some $HgCl_2$; refrigerate for further bacterial counting.
07. All other operations will be done in the glove box; most sampling operations will then be made with plastic tools (to avoid sample contamination).
08. Use the drilled holes at 1 cm intervals to measure Eh and dissolved oxygen profiles (a 2 mm in diameter platinium wire -of a few cm in length- should be introduced as deeply as possible in the working core for Eh measurements; note that artefacts may often occur when introducing the O_2 probe in the holes).
09. By using the wood blocks (or the jack), lift progressively the working core out of the liner in 1 cm steps.
10. At 1 cm intervals: (1) collect 1 cc for amino-acid studies, store the sample in a pre-numbered vial; at the end of sampling operations in the glove box, these will be kept frozen; (2) collect 30 cc for micropaleontological studies in an appropriate pre-numbered vial to be refrigerated later on; (3) collect 2 cc for porosity measurements and store as appropriate.
11. Take as much as possible of each 1 cm-thick slice of sediment by using a plastic cutter, avoid to tuse the possibly contaminated outer ring of the core; transfer the sediment into the pre-set (with filters) sample-squeezer, close it; when all squeezers are filled and closed, transfer them on the

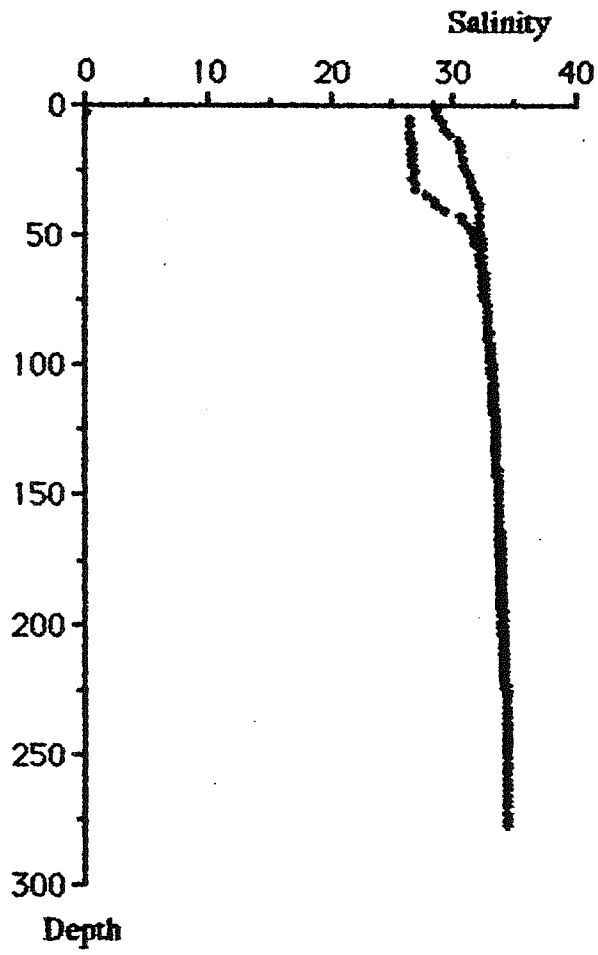
squeezerrack.

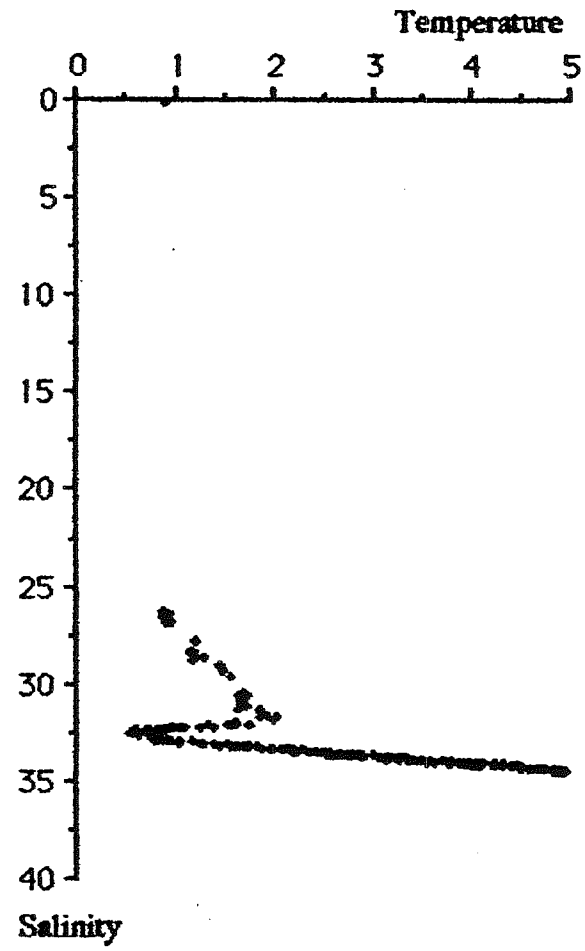
12. Further processing takes place on the rack; set the sample squeezers in place and plug tubings and syringes; start squeezing; rince the syringes with the firts cc of pore water recovered and put them back in place; squeeze again until maximum volume of pore water is obtained.
13. Subsample pore water in Nalgene™ vials:
    - 10 ml for U isotope measurements, add 0.5 ml of HCl (30%);
    - 6 ml for Total Inorganic Dissolved Carbon -TIDC-studies ($\$CO_2$ & ^{13}C), add $HgCl_2$ (powder);
    - 4 ml for alkali, add $HgCl_2$ (powder);
    - 3 ml for Ca^{2+} and SO_4^{2-};
    - 5 ml for Fe^{2+} & Mn^{2+}, add 0.5 ml of HCl (30%);
    - 2 ml for dissolved organic carbon -DOC- in a centrifuge tube to store frozen;
    - 15 ml for nutrient studies, freeze;
14. Store squeezed sediments in plastic labelled bags and freeze.
15. Clean carefully all equipments and set everything back in place for next box coring operation.

HU-90-031-003: CTD profile

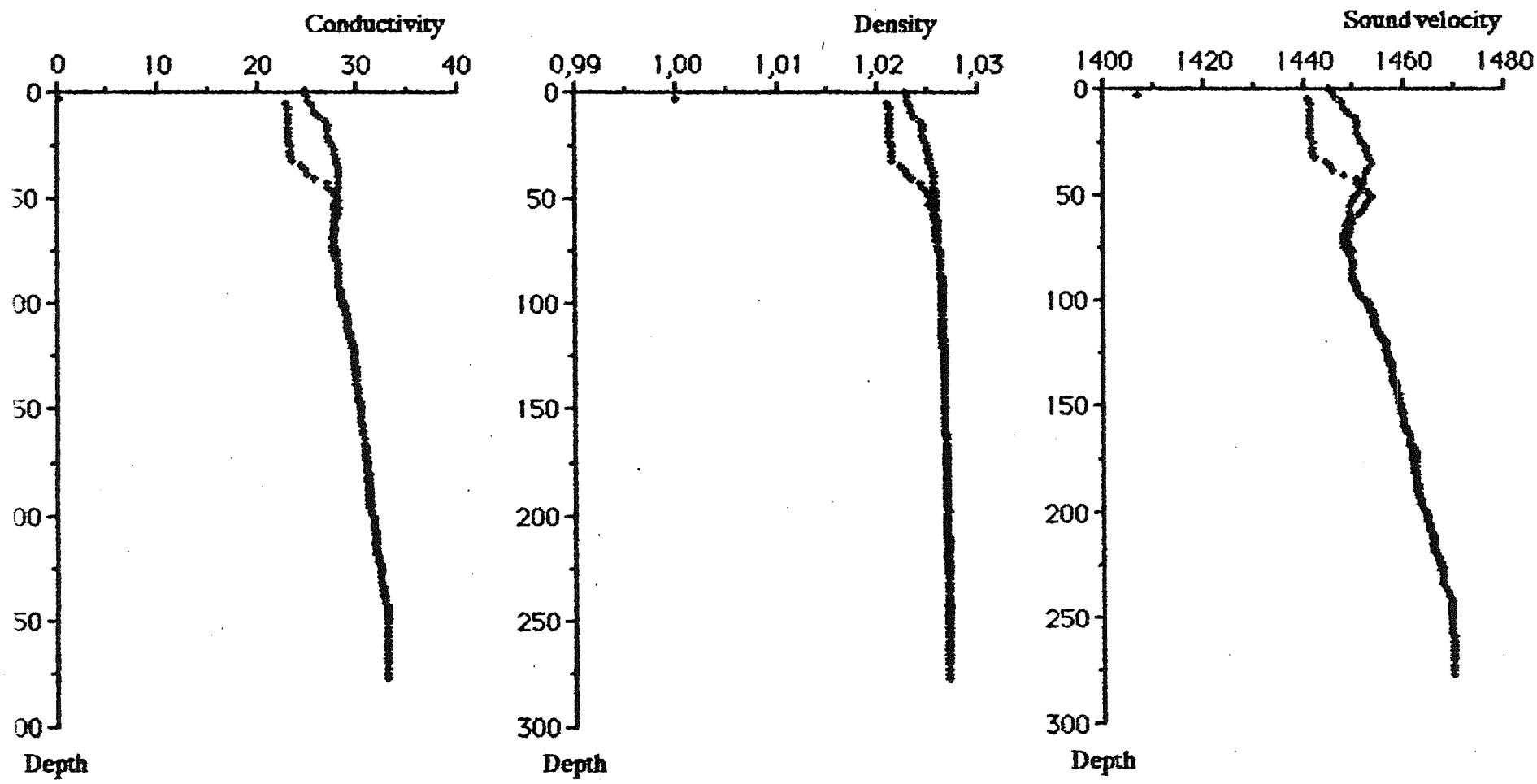
Julian day: 324 Latitude: 48°24.85 N
GMT Time: 17:25 Longitude: 69°11.50 W
Depth: 309 m.





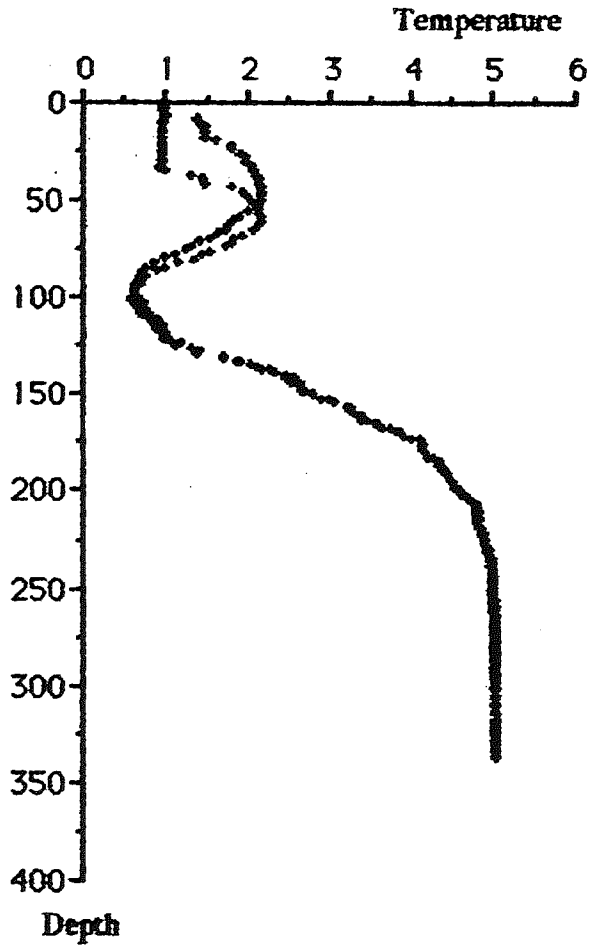


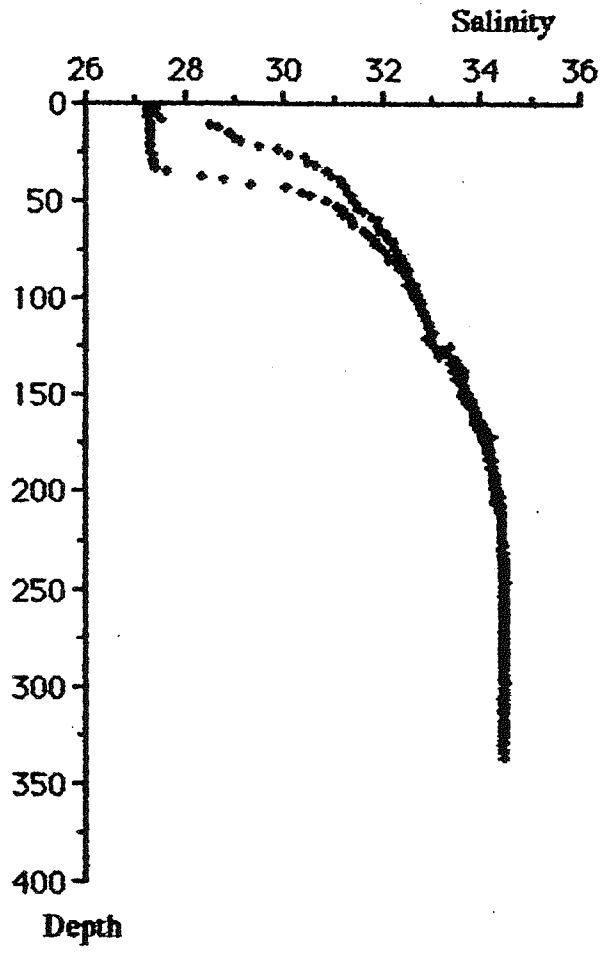
HU-90-031-003: (Cont'd)

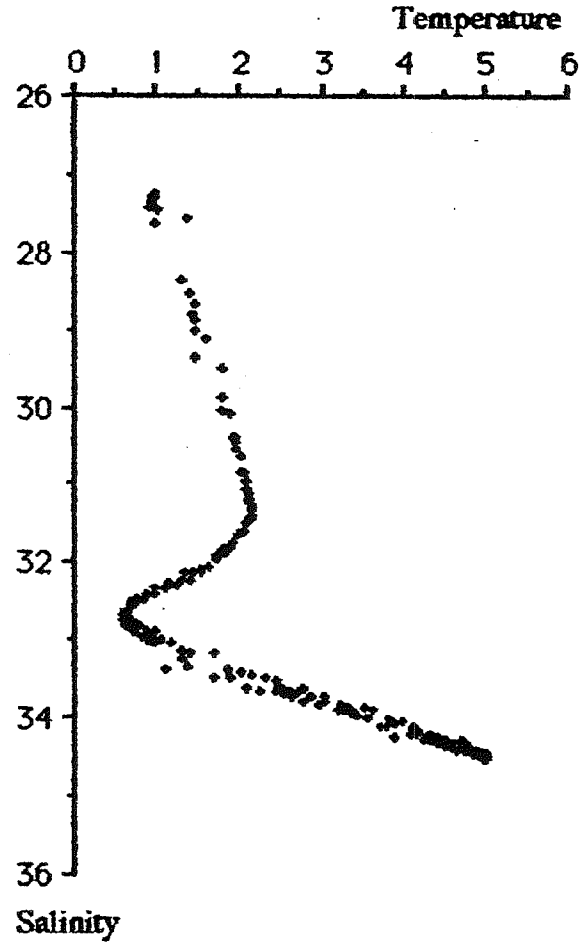


HU-90-031-006: CTD profile (attached to the Box Core)

Julian day: 324 Latitude: 48°44.03N
GMT Time: 20:41 Longitude: 68°27.17W
Depth: 355 m.







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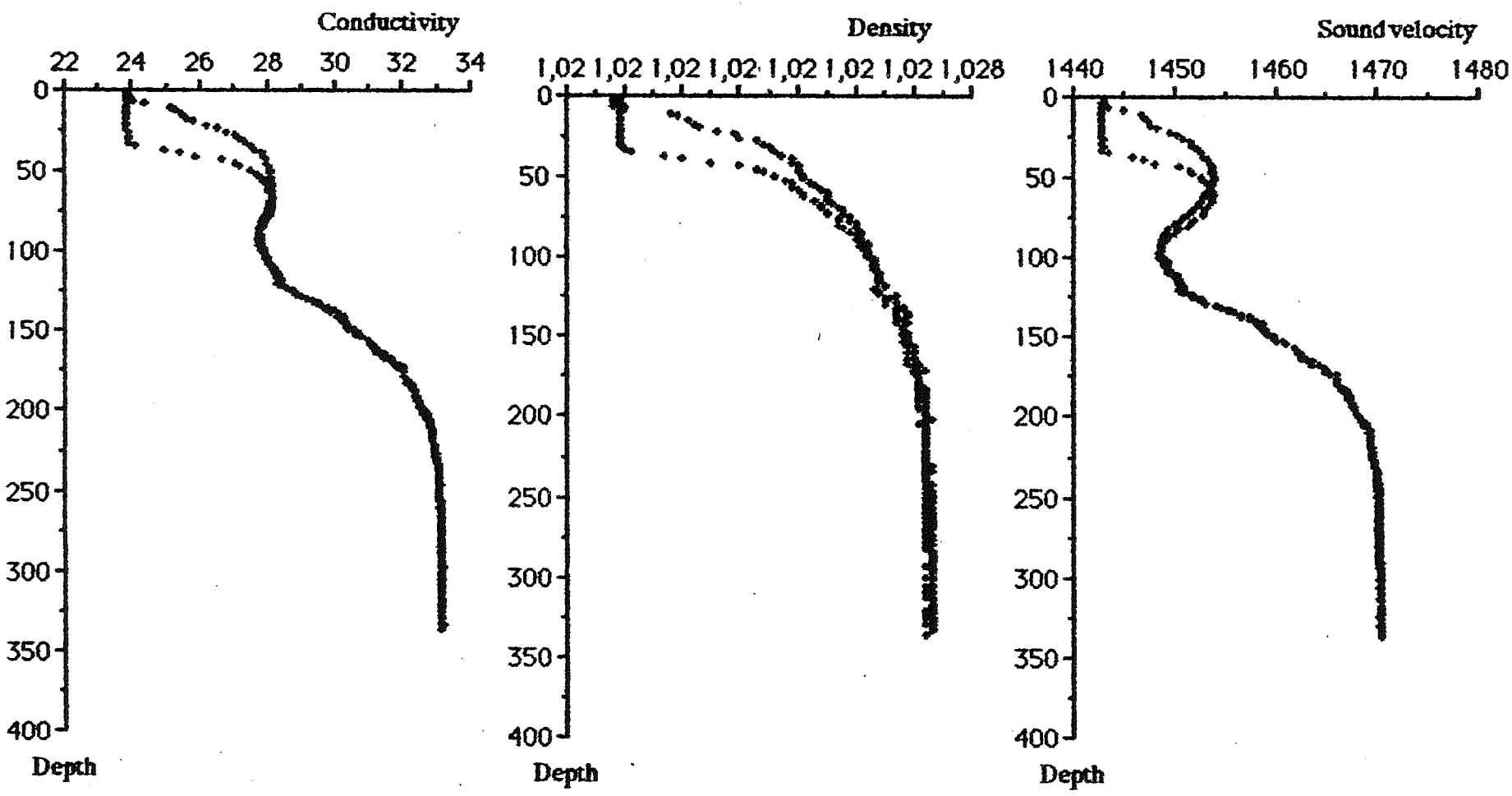
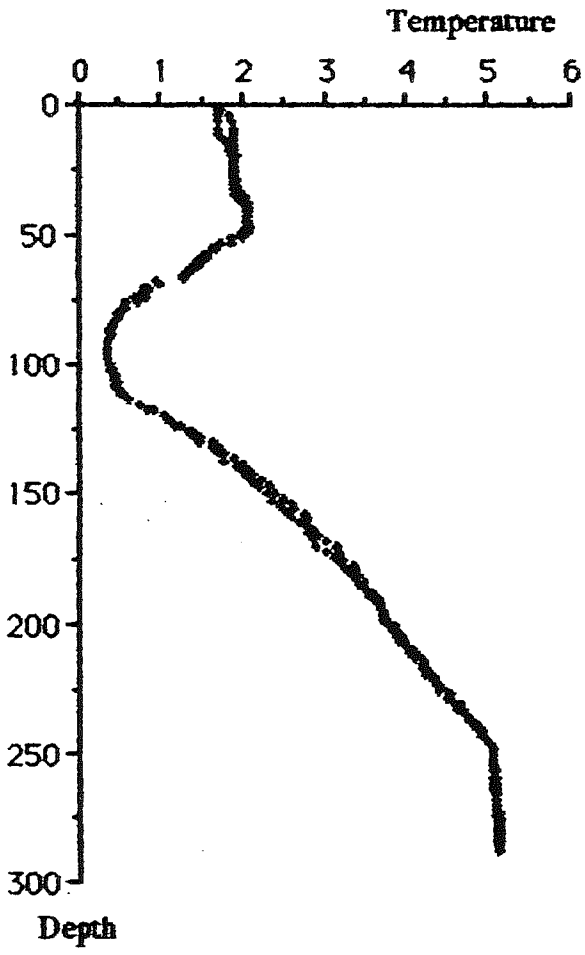


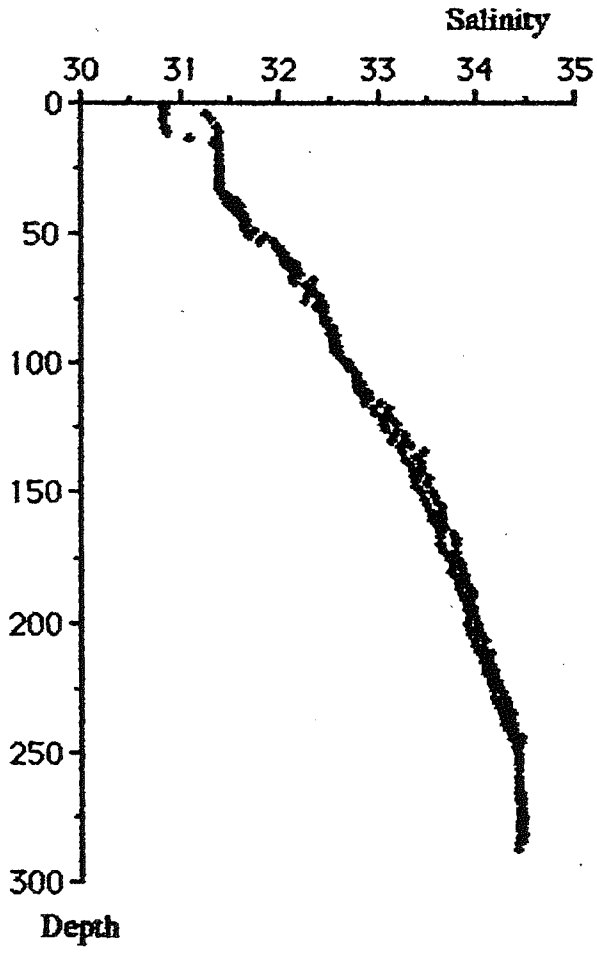
Fig. 3

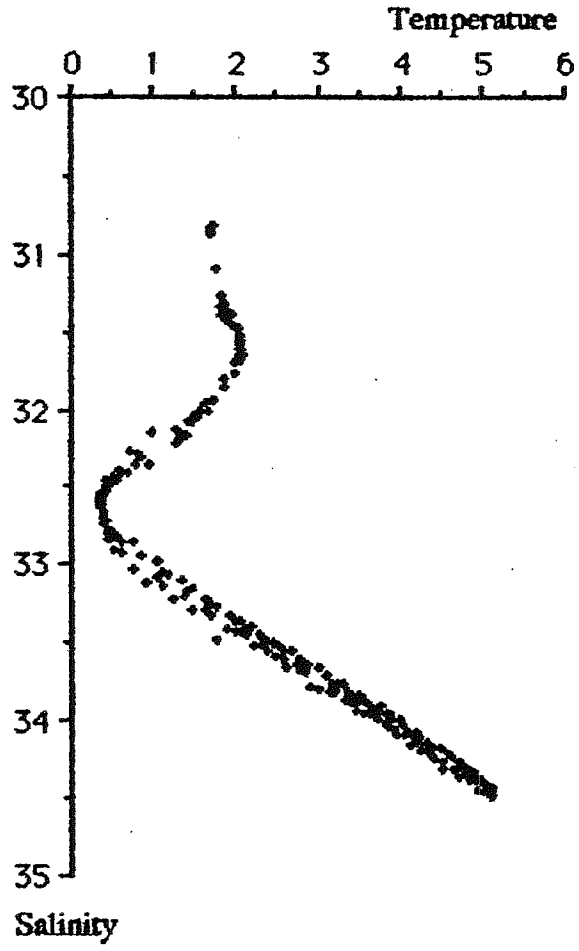
HU-90-031-010: CTD profile (attached to the Box Core)

Julian day: 325
GMT Time: 13:38
Depth: 311 m.

Latitude: 49°05.34 N
Longitude: 67°26.30 W







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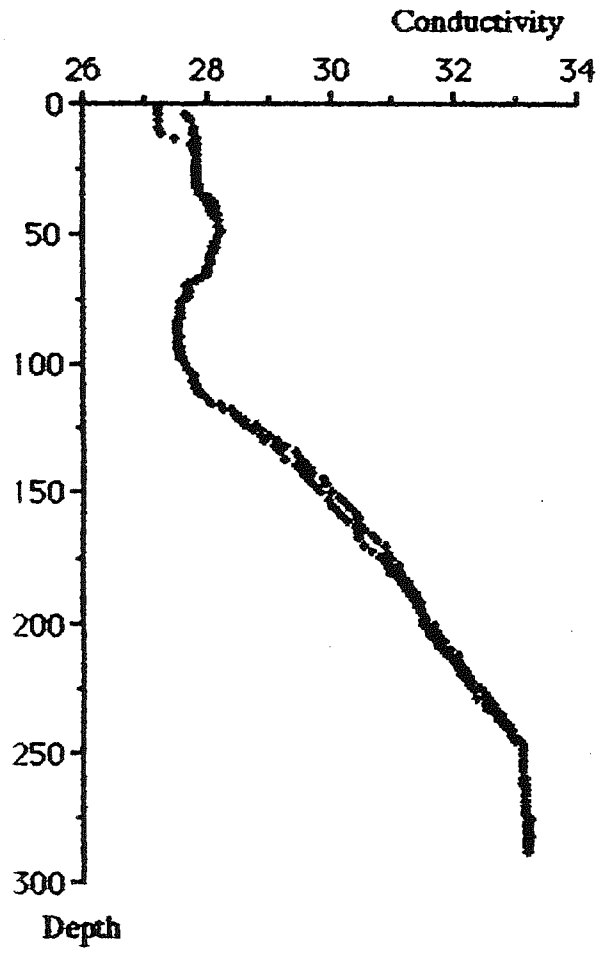
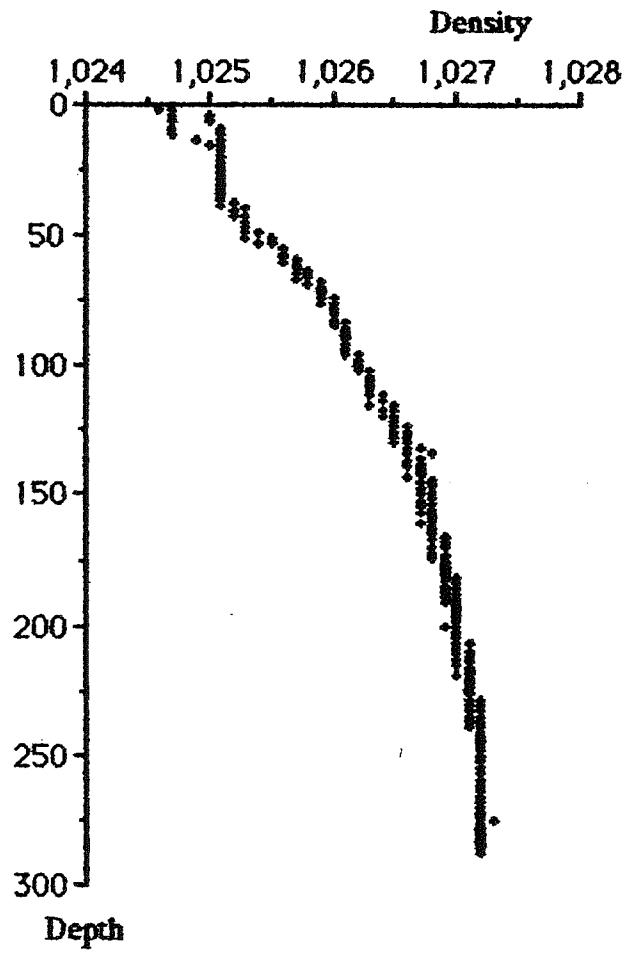
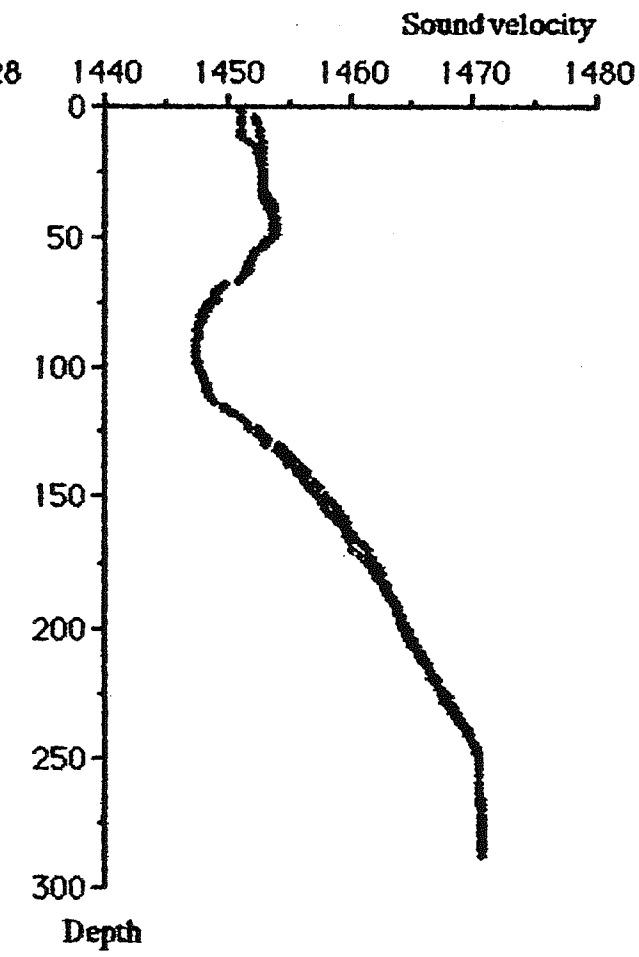
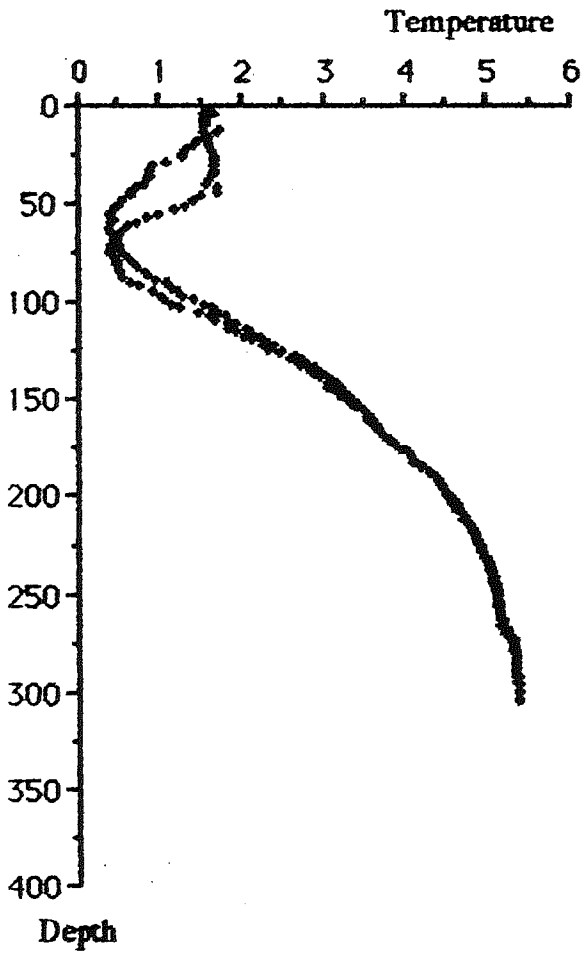


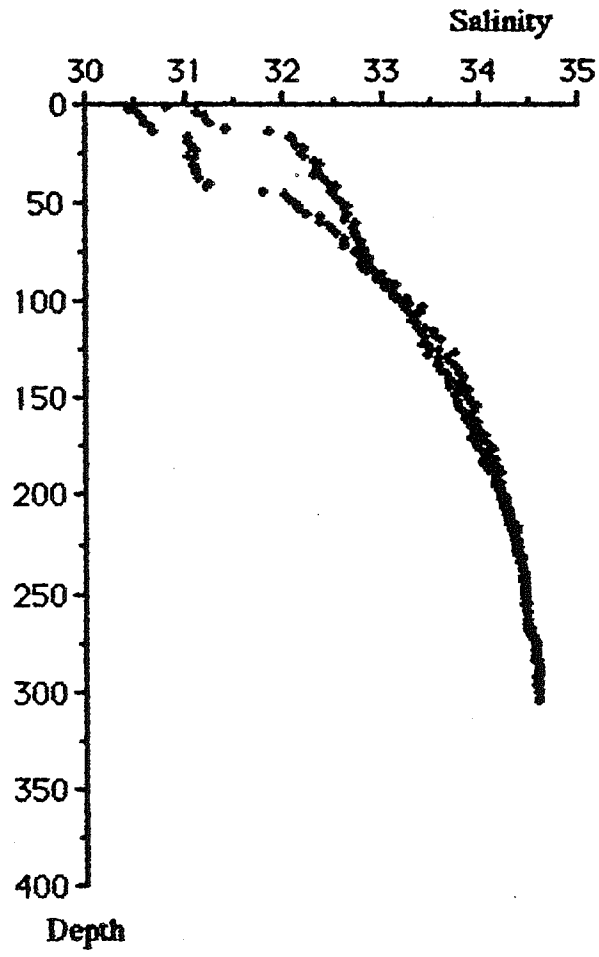


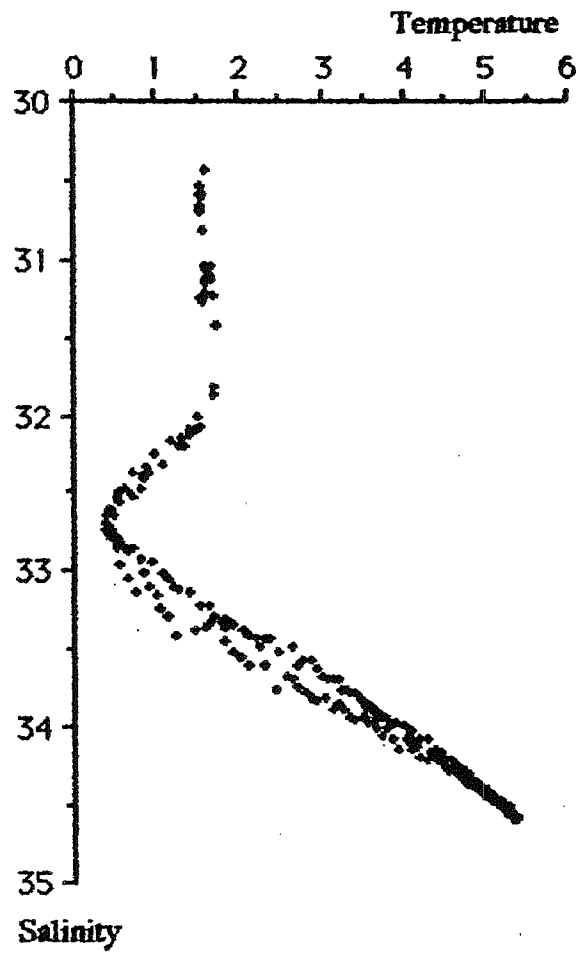


HU-90-031-014: CTD profile (attached to the Box Core)

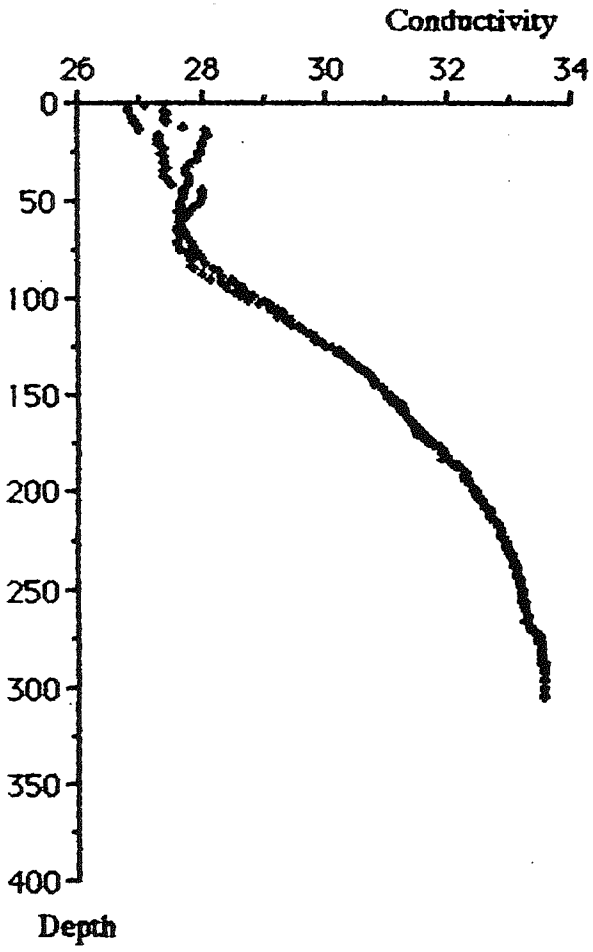
Julian day: 326 Latitude: 49°25.42 N
GMT Time: 13:25 Longitude: 66°19.45 W
Depth: 322 m.

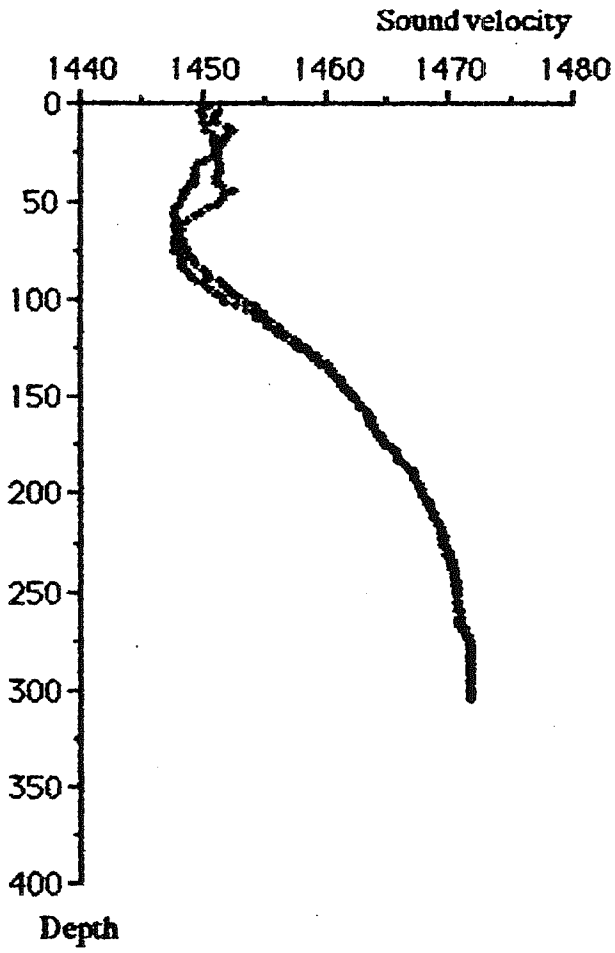






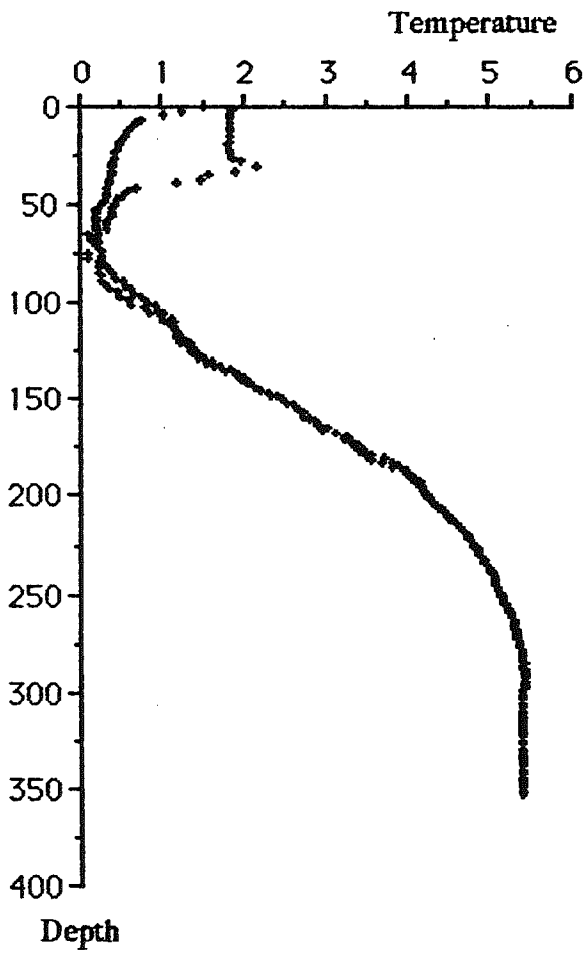
HU-90-031-014: (Cont'd)

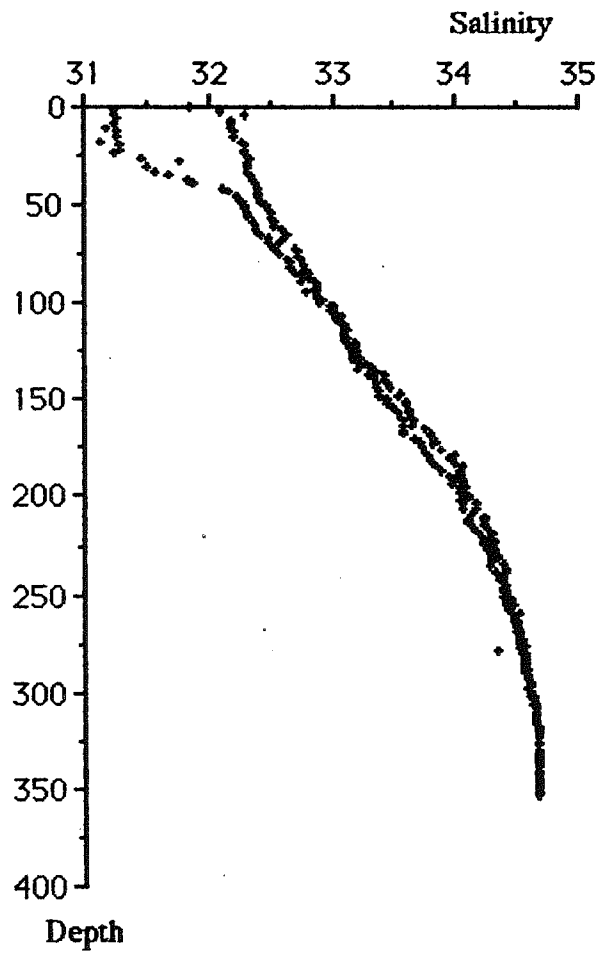


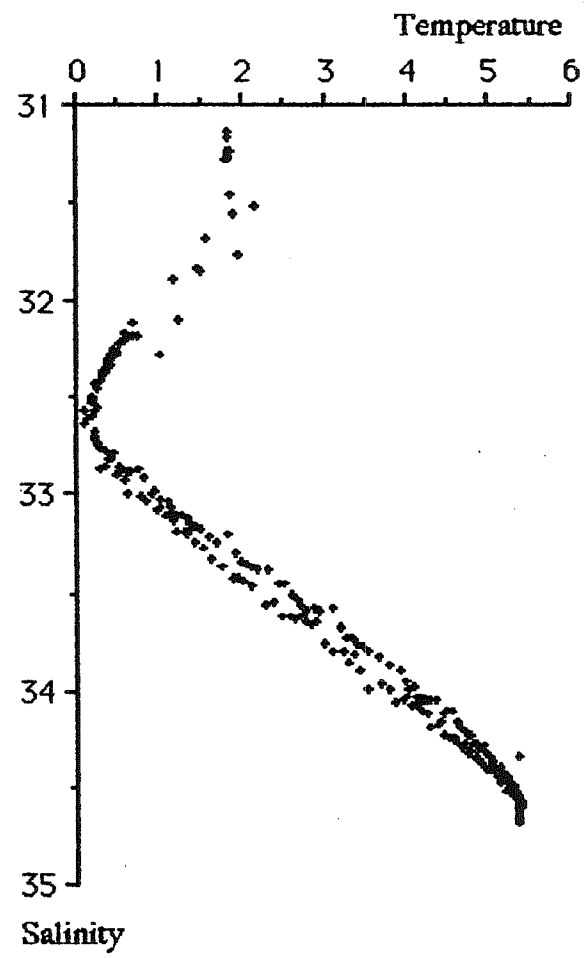


HU-90-031-018: CTD profile (attached to the Box Core)

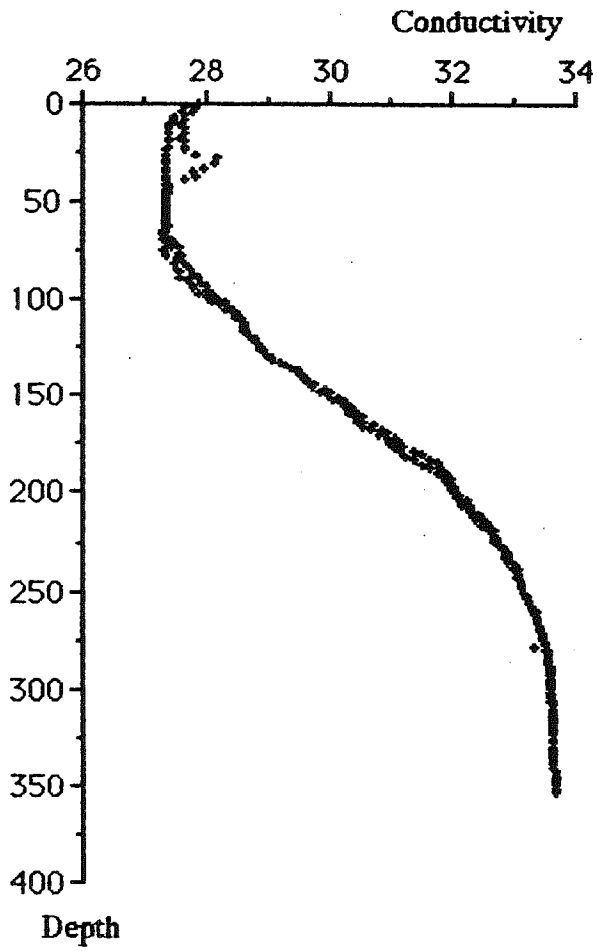
Julian day: 327 Latitude: 49°17.44 N
GMT Time: 12:23 Longitude: 63°59.57 W
Depth: 373 m.

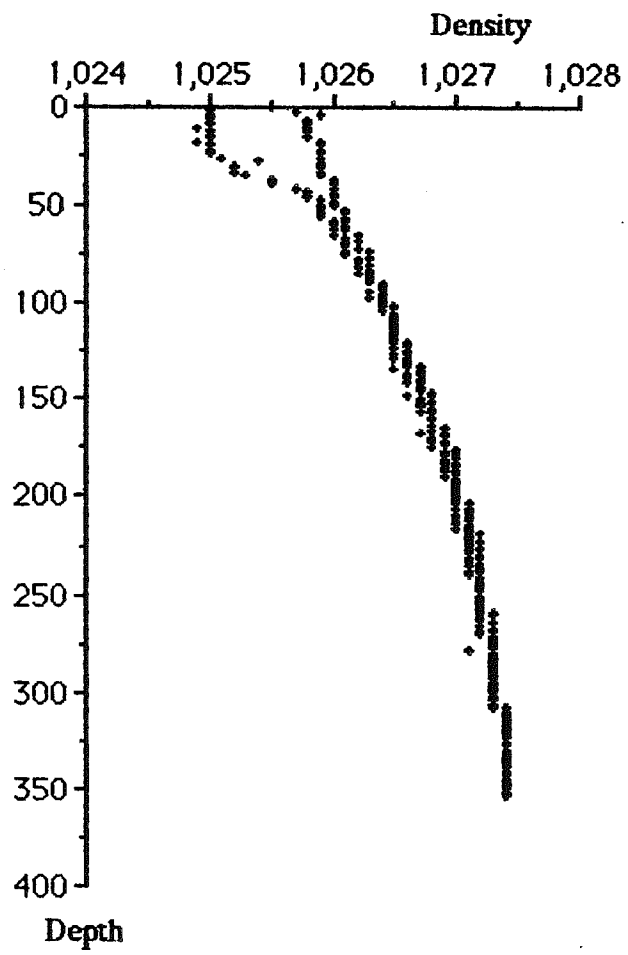


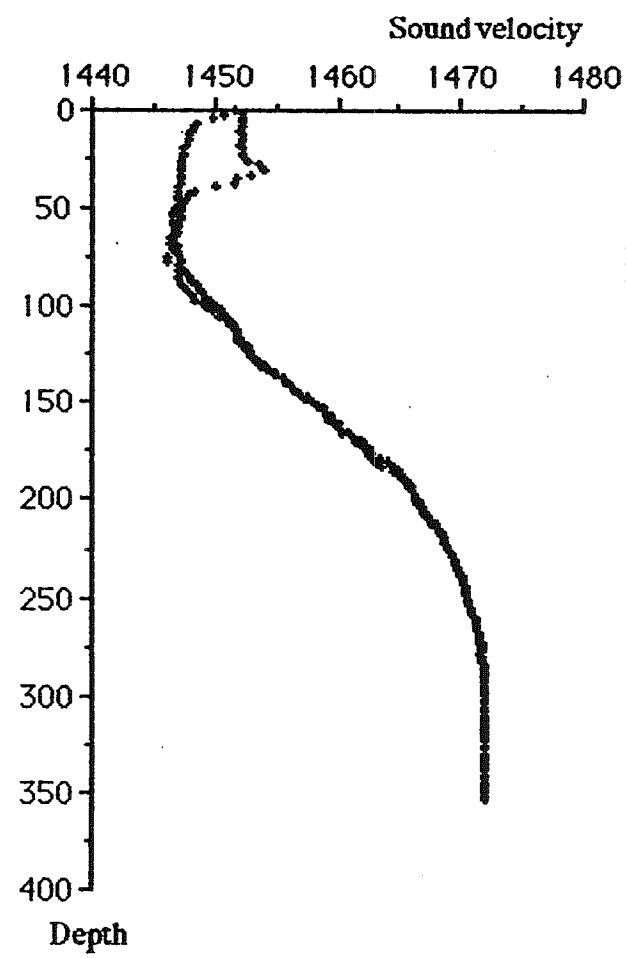




HU-90-031-018: (Cont'd)

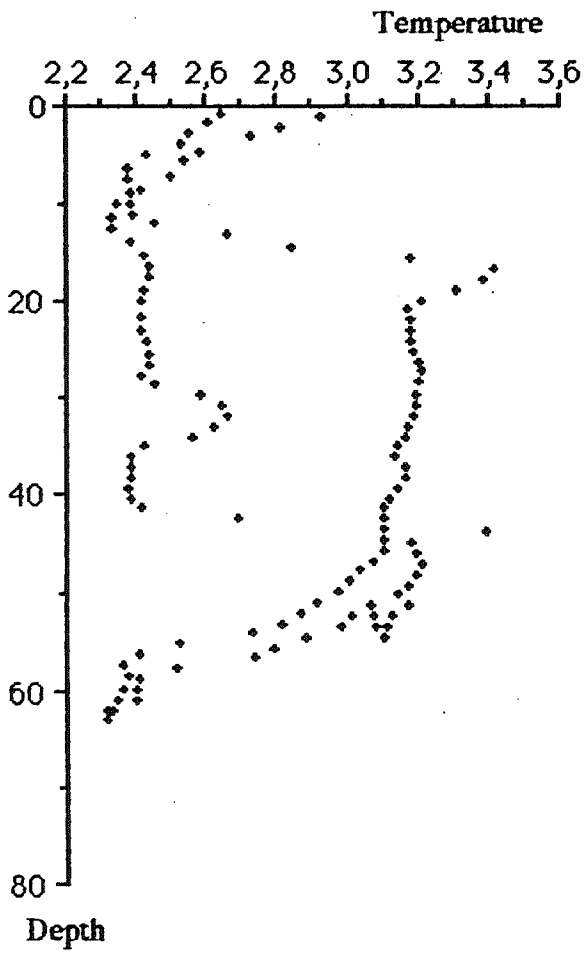


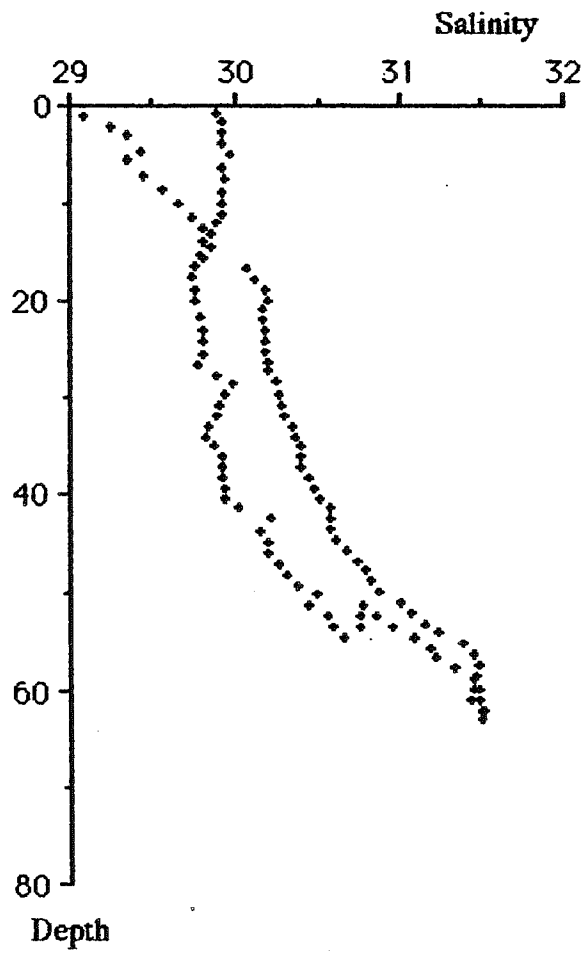


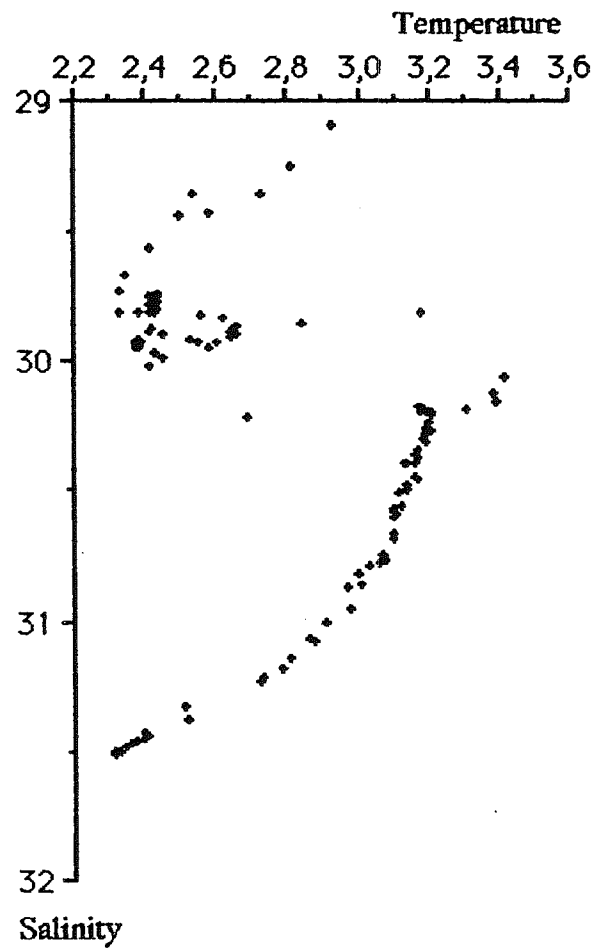


HU-90-031-022 : CTD profile (attached to the Box Core)

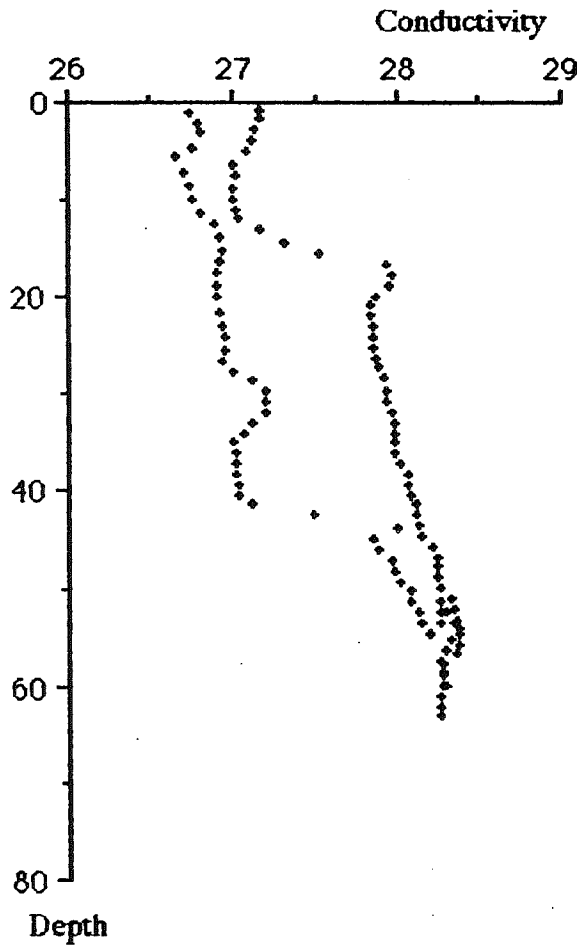
Julian day: 328 Latitude: 42°55.43 N
GMT Time: 12:21 Longitude: 65°12.31 W
Depth: 73 m.

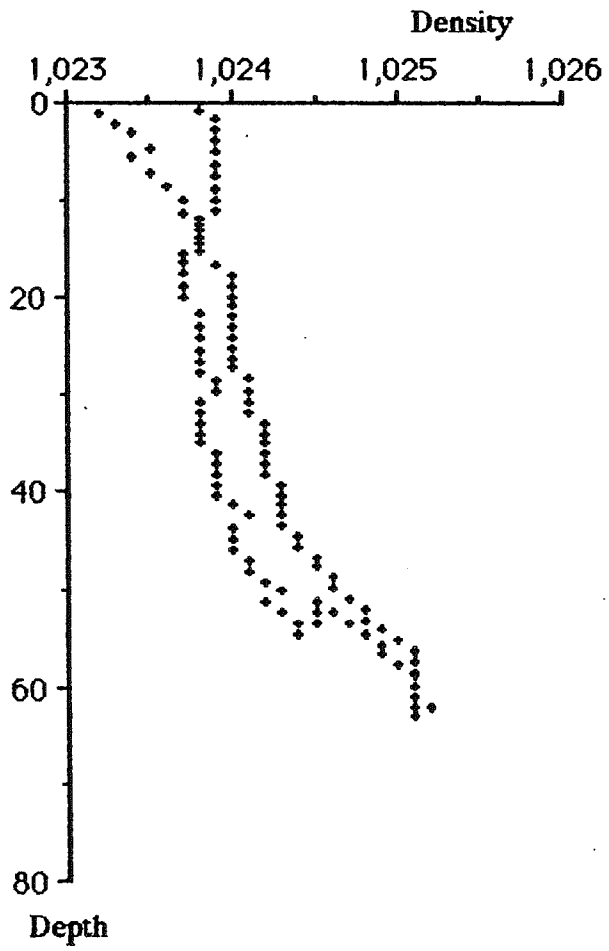


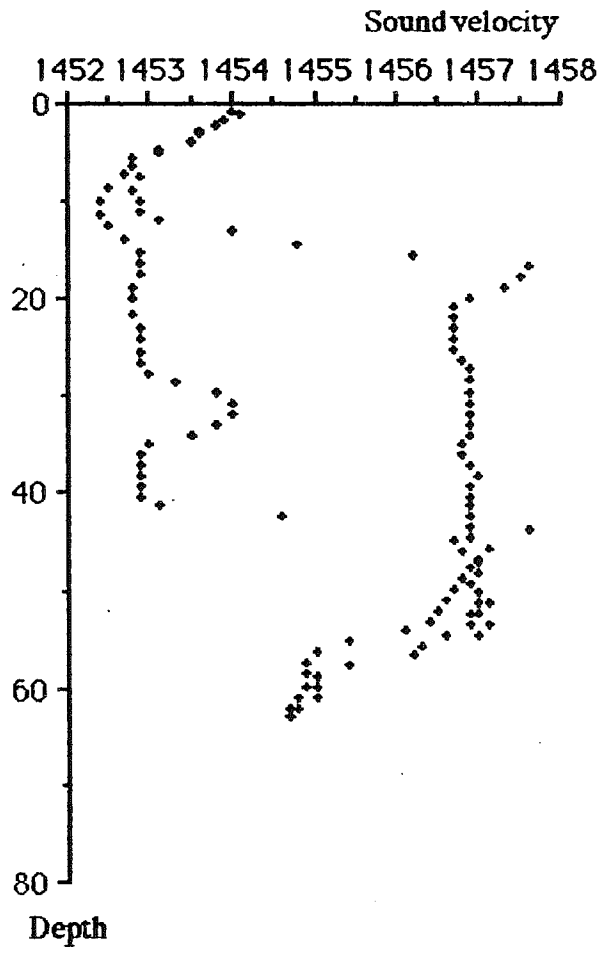




HU-90-031-022: (Cont'd)

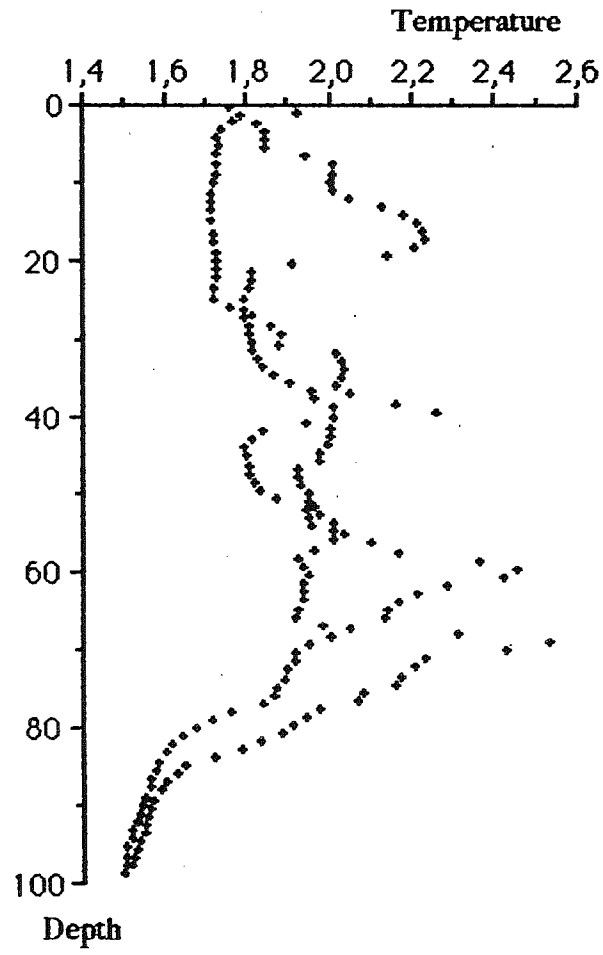


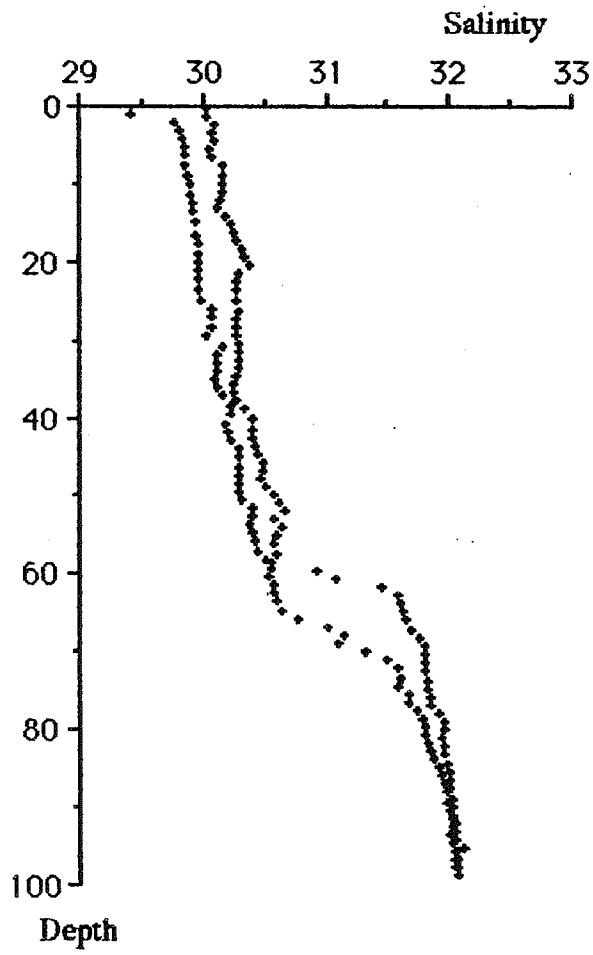


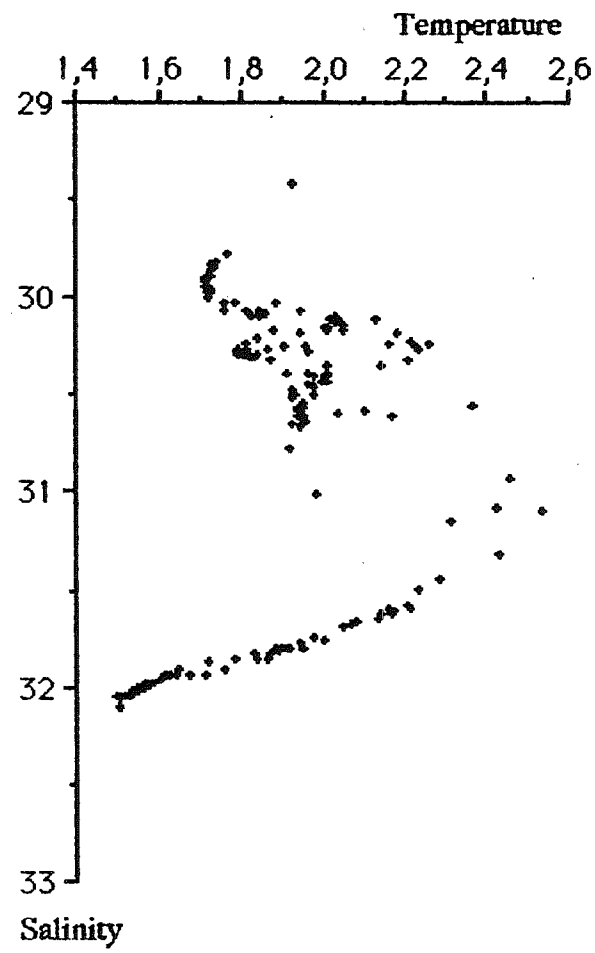


HU-90-031-026: CTD profile (attached to the Box Core)

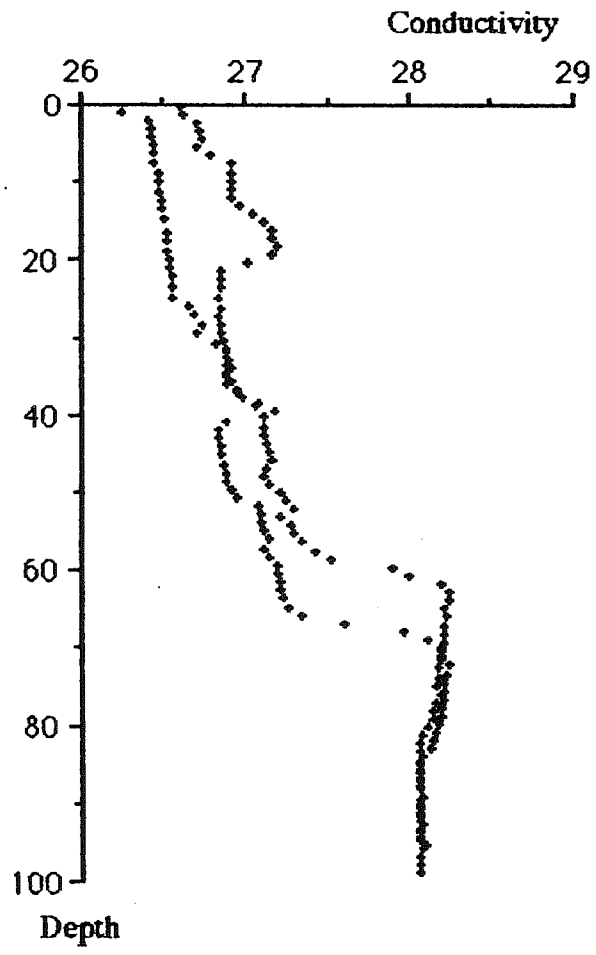
Julian day: 328 Latitude: 48°19.48 N
GMT Time: 17:10 Longitude: 64°23.54 W
Depth: 109 m.

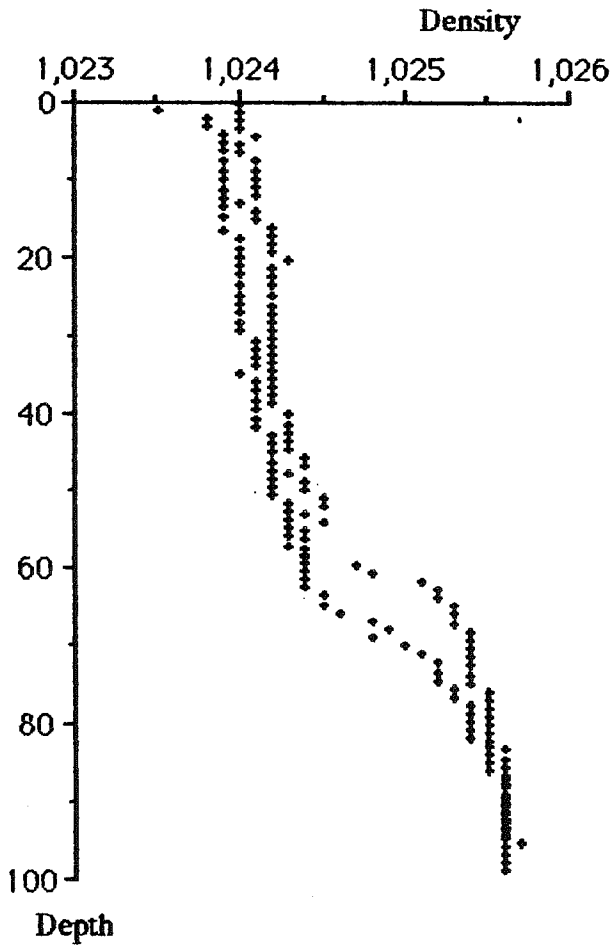


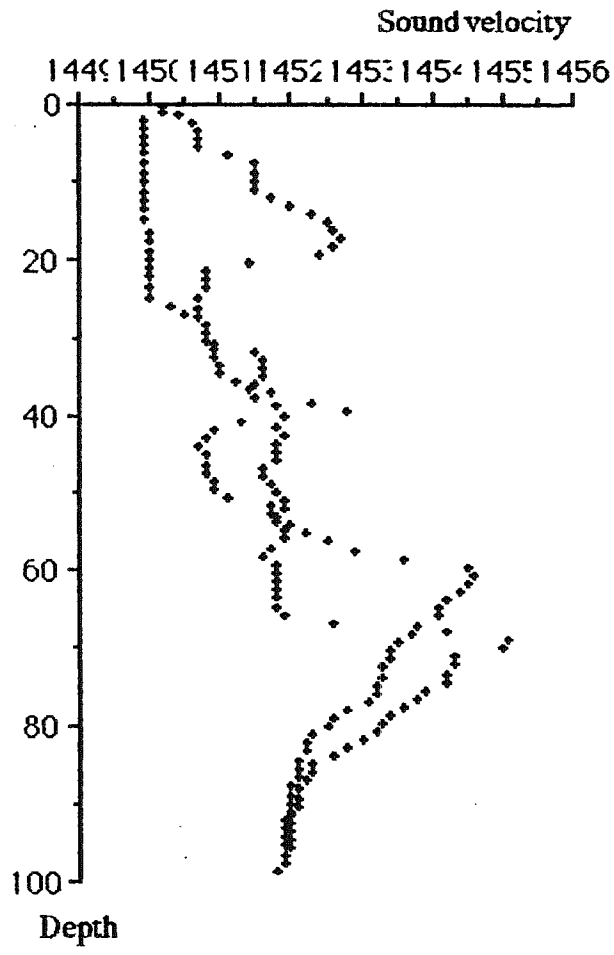




HU-90-031-026: (Cont'd)



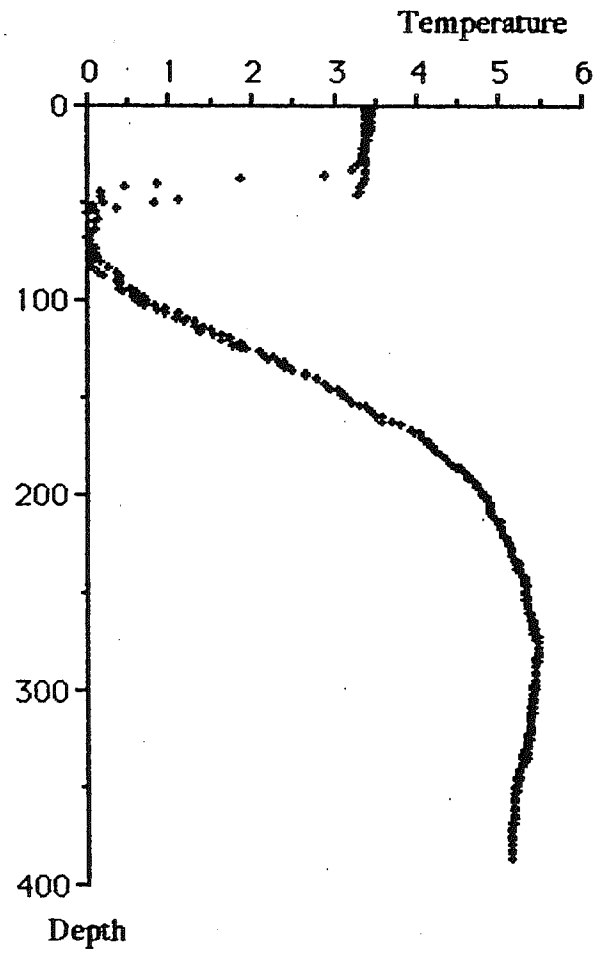


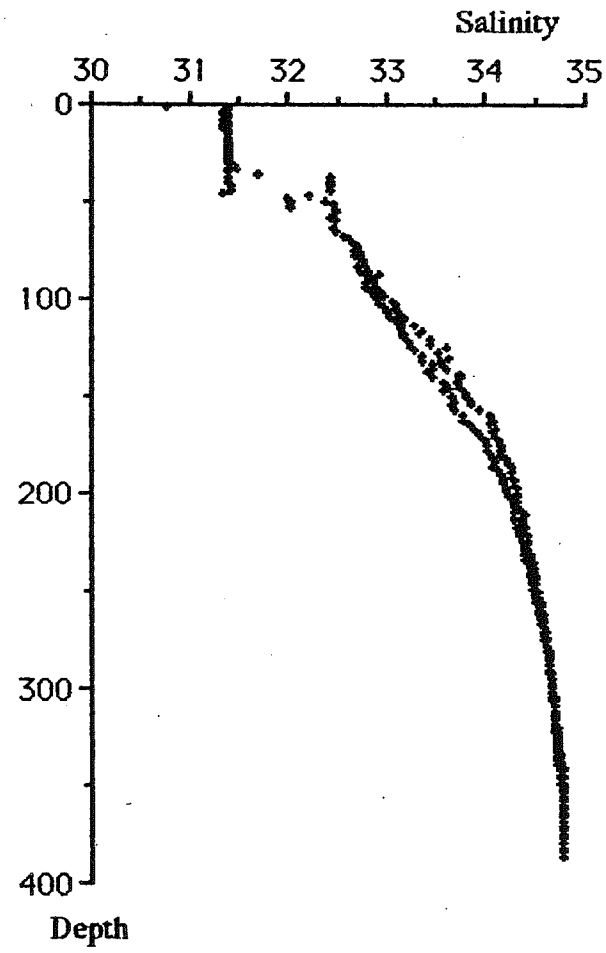


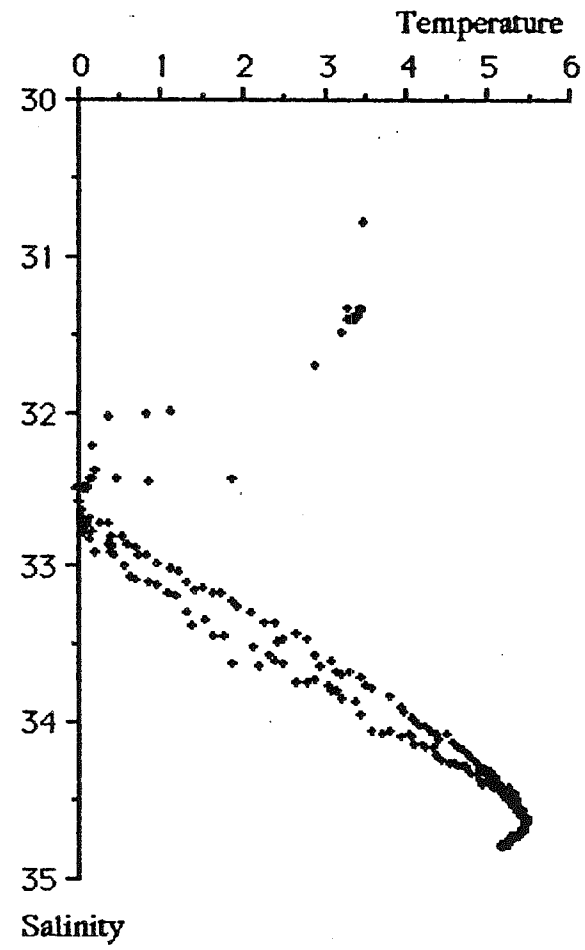
HU-90-031-031: CTD profile

Julian day: 329
GMT Time: 14:45
Depth: 409 m.

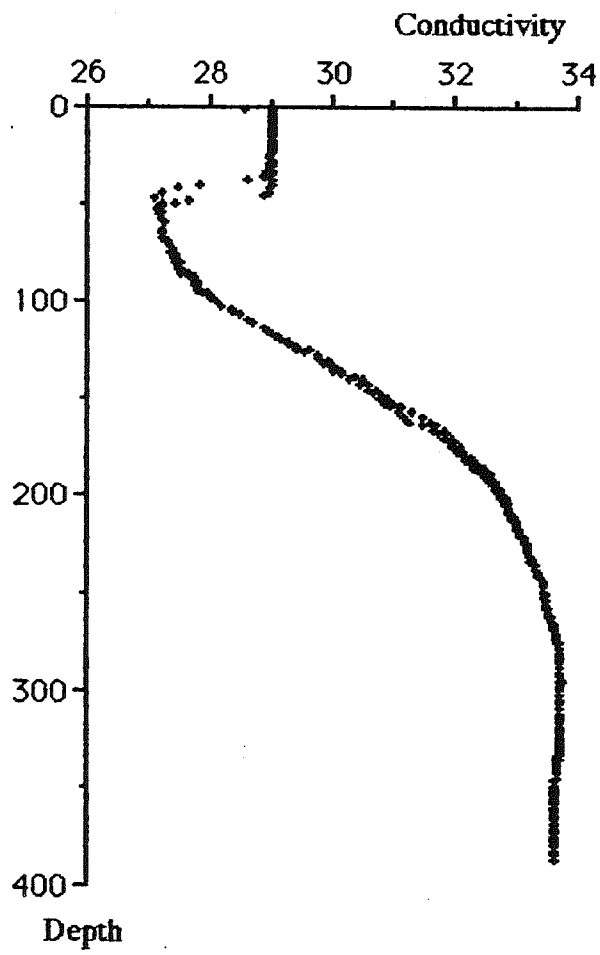
Latitude: 49°32.00 N
Longitude: 61°10.21 W

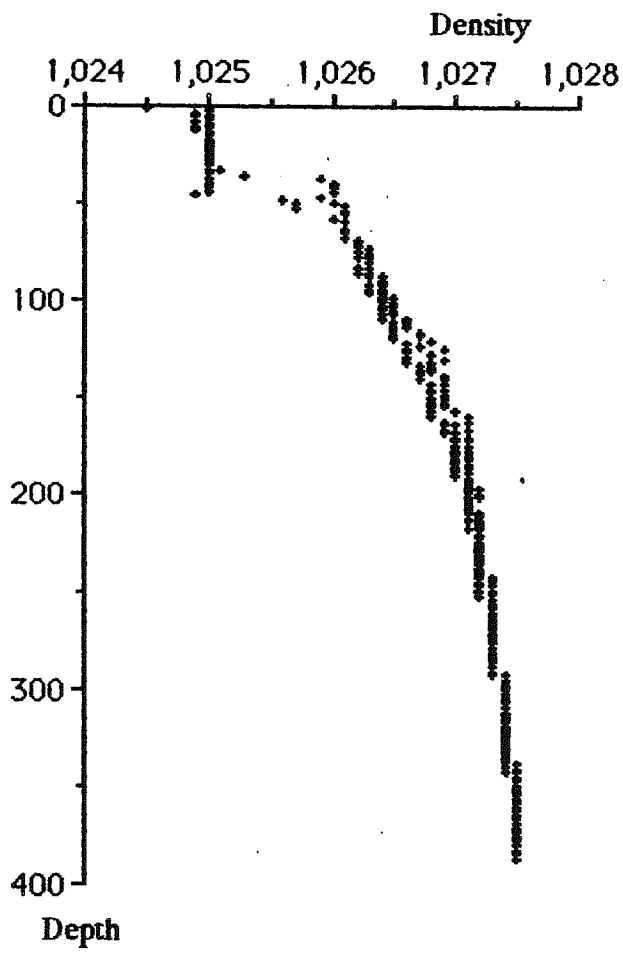


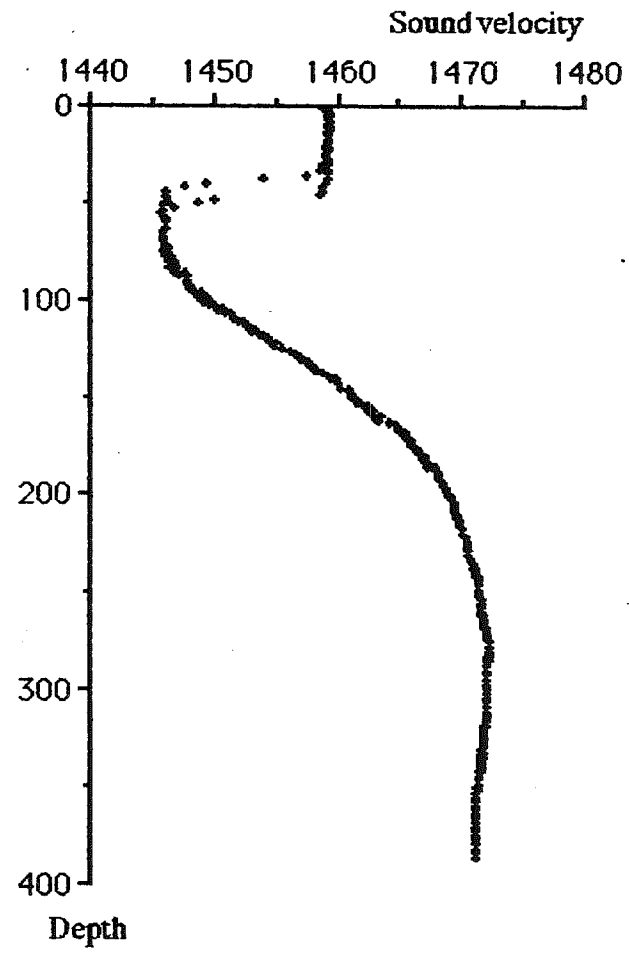




HU-90-031-031: (Cont'd)







HU-90-031-035: CTD profile (attached to the Box Core)

Julian day: 332 Latitude: 47°09.15 N
GMT Time: 12:42 Longitude: 60°32.54 W
Depth: 170 m.

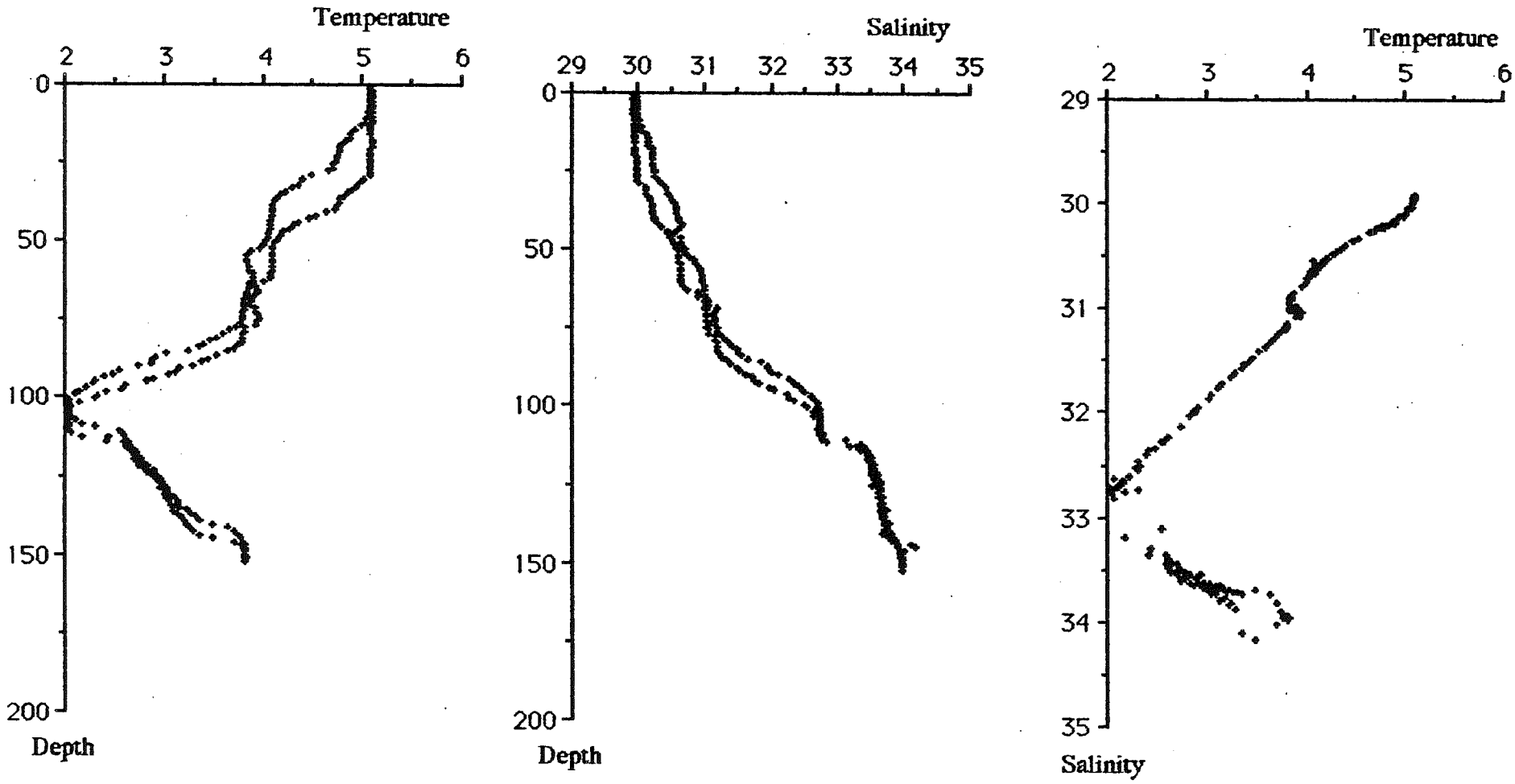
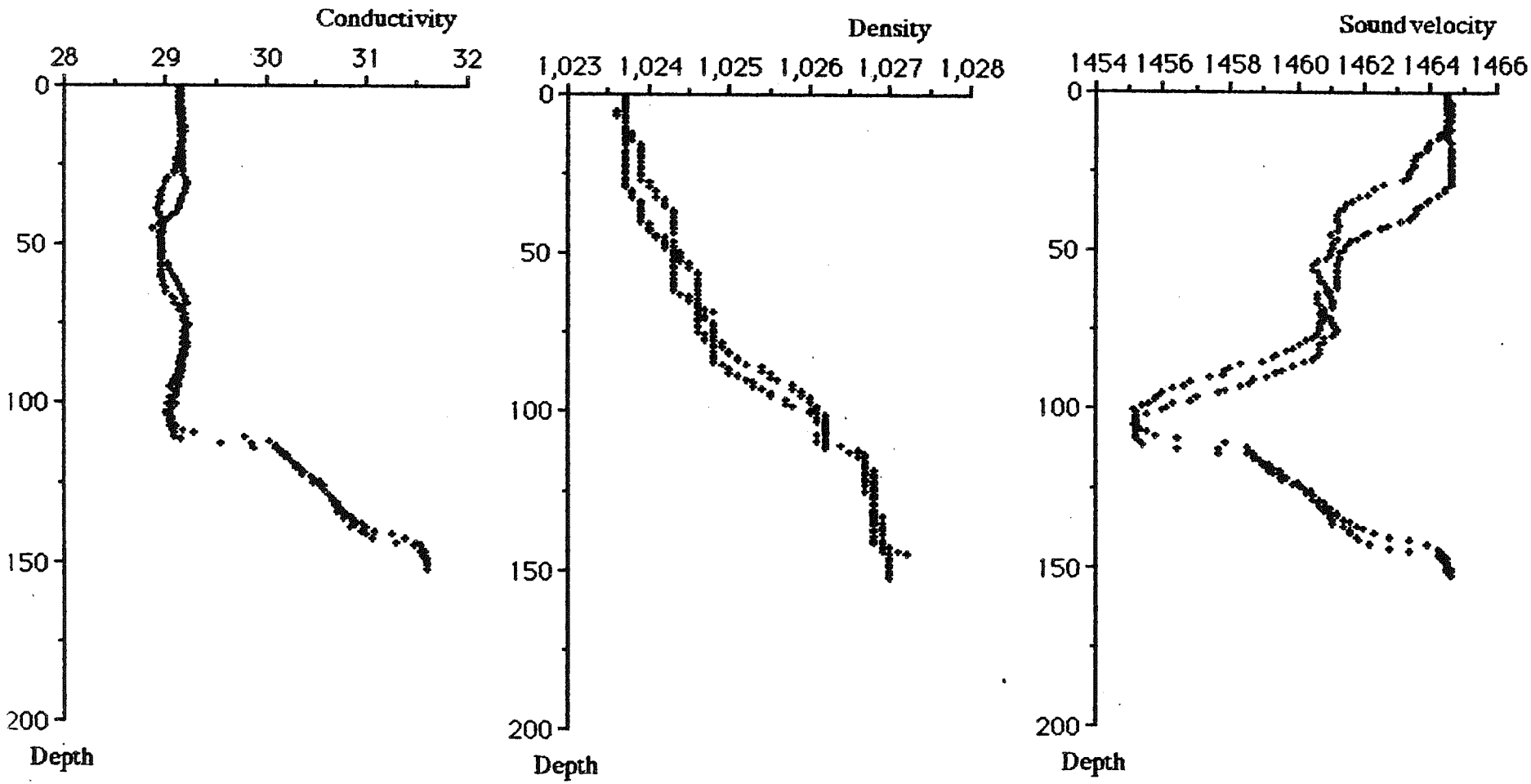


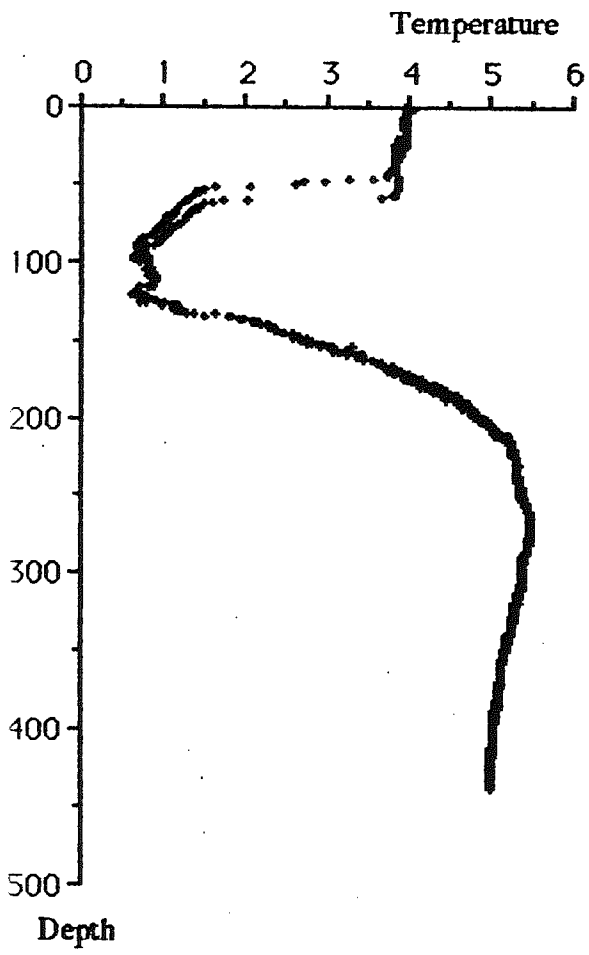
Fig. 2.

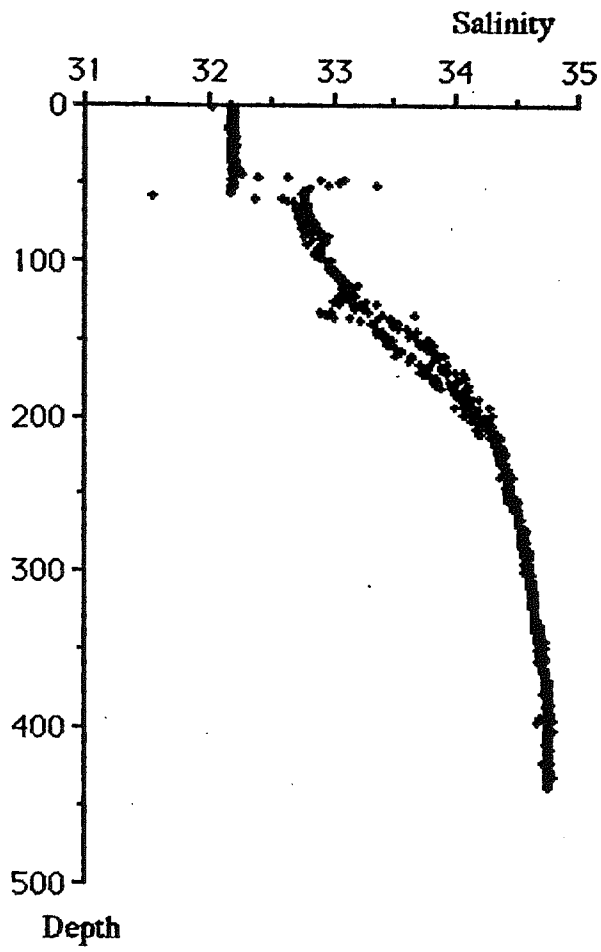
HU-90-031-035: (Cont'd)



HU-90-031-042: CTD profile (attached to the Box Core)

Julian day: 333 Latitude: 46°59.56 N
GMT Time: 12:49 Longitude: 59°04.46 W
Depth: 448 m.





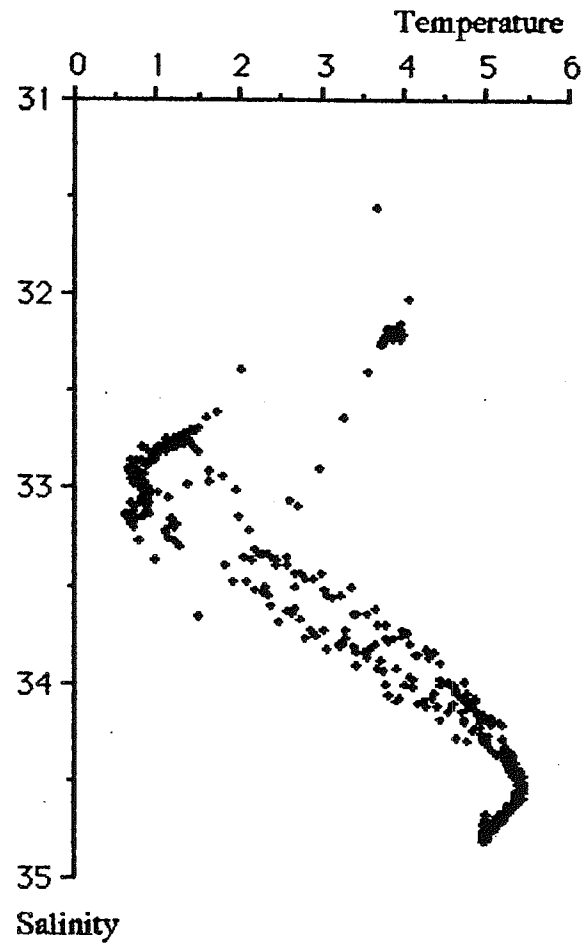
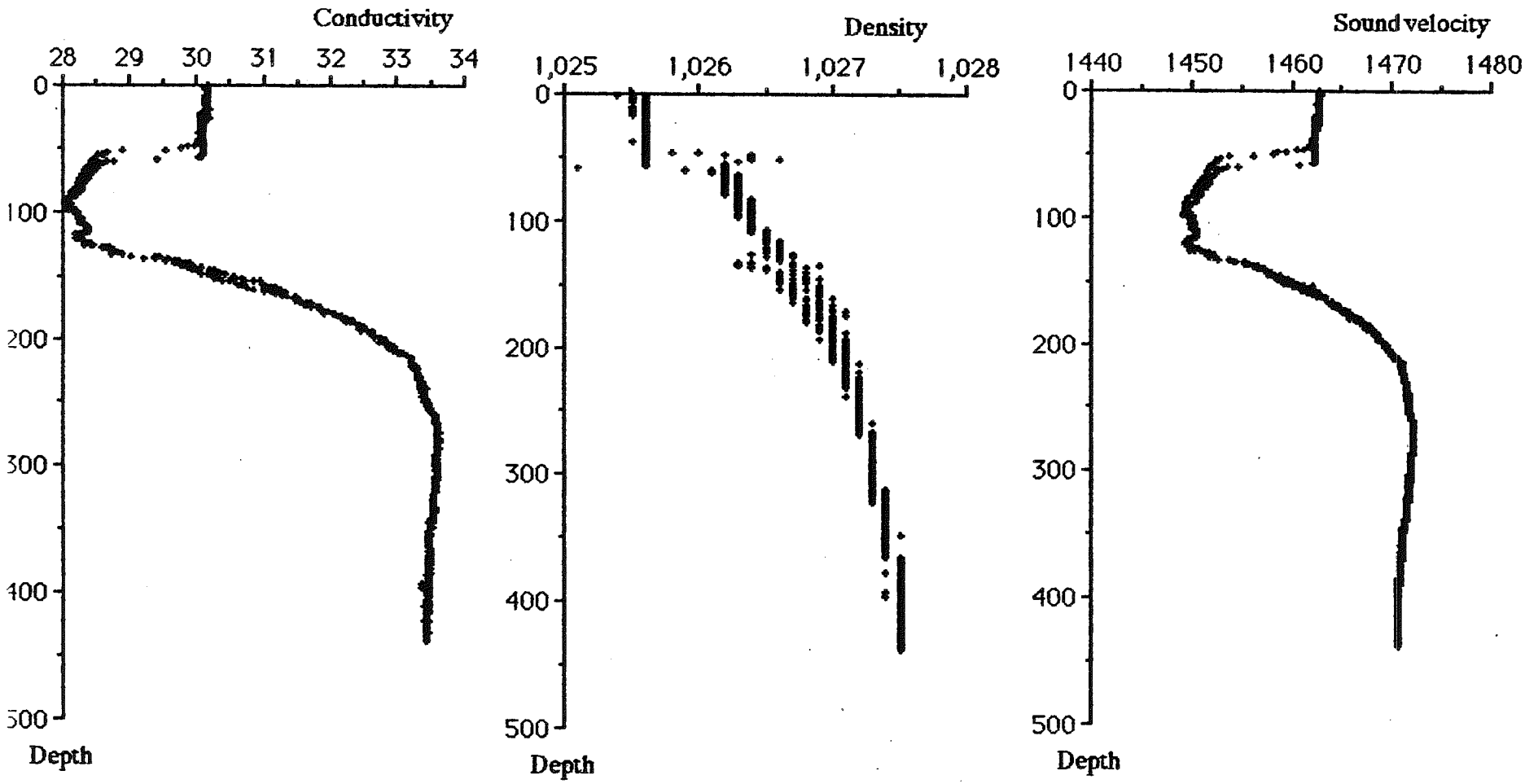


Fig. 3.7

HU-90-031-042: (Cont'd)



HU-90-031-046: CTD profile (attached to the Box Core)

Julian day: 336 Latitude: 45°51.16 N
GMT Time: 12:20 Longitude: 57°35.48 W
Depth: 473 m.

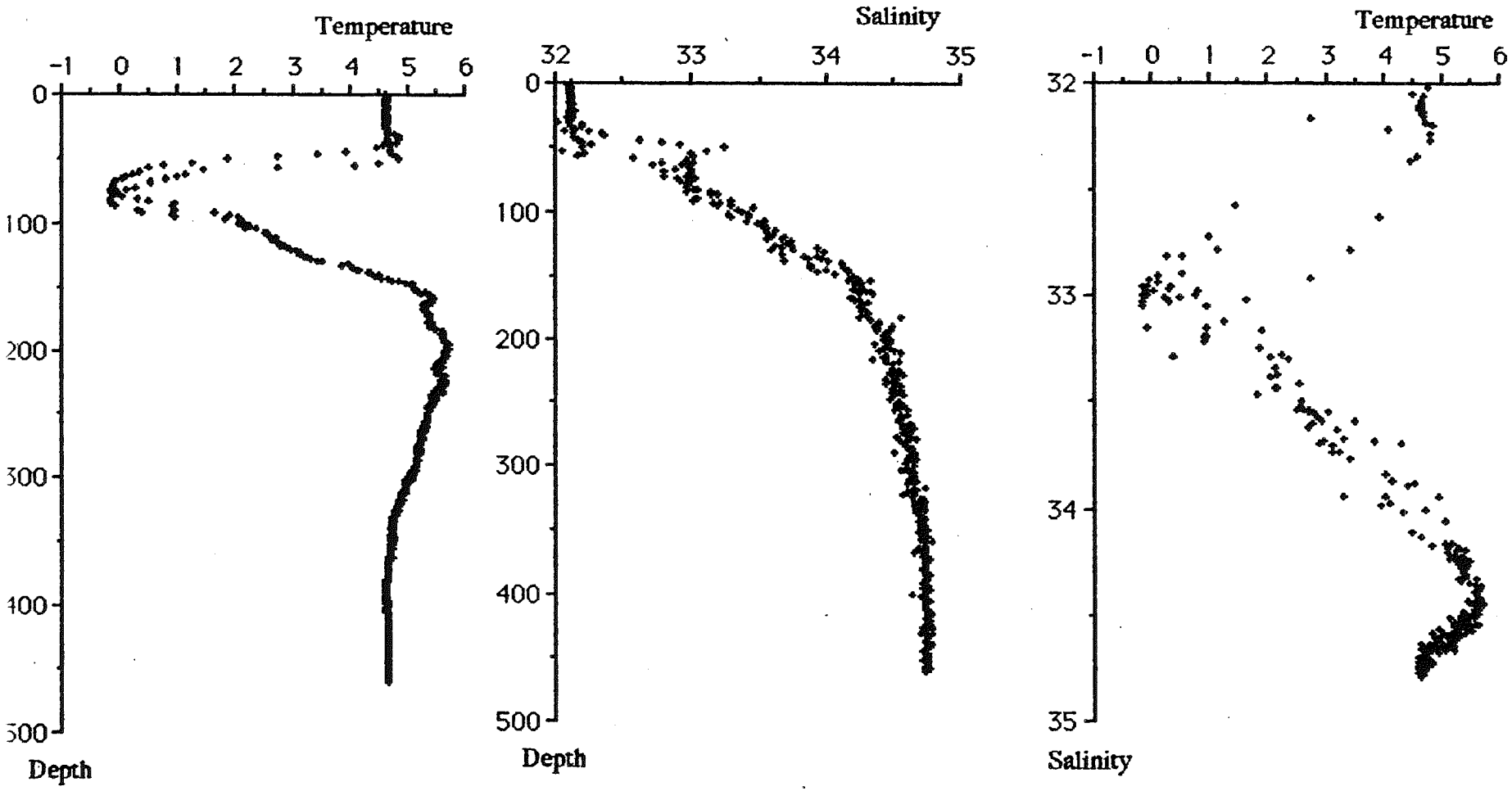
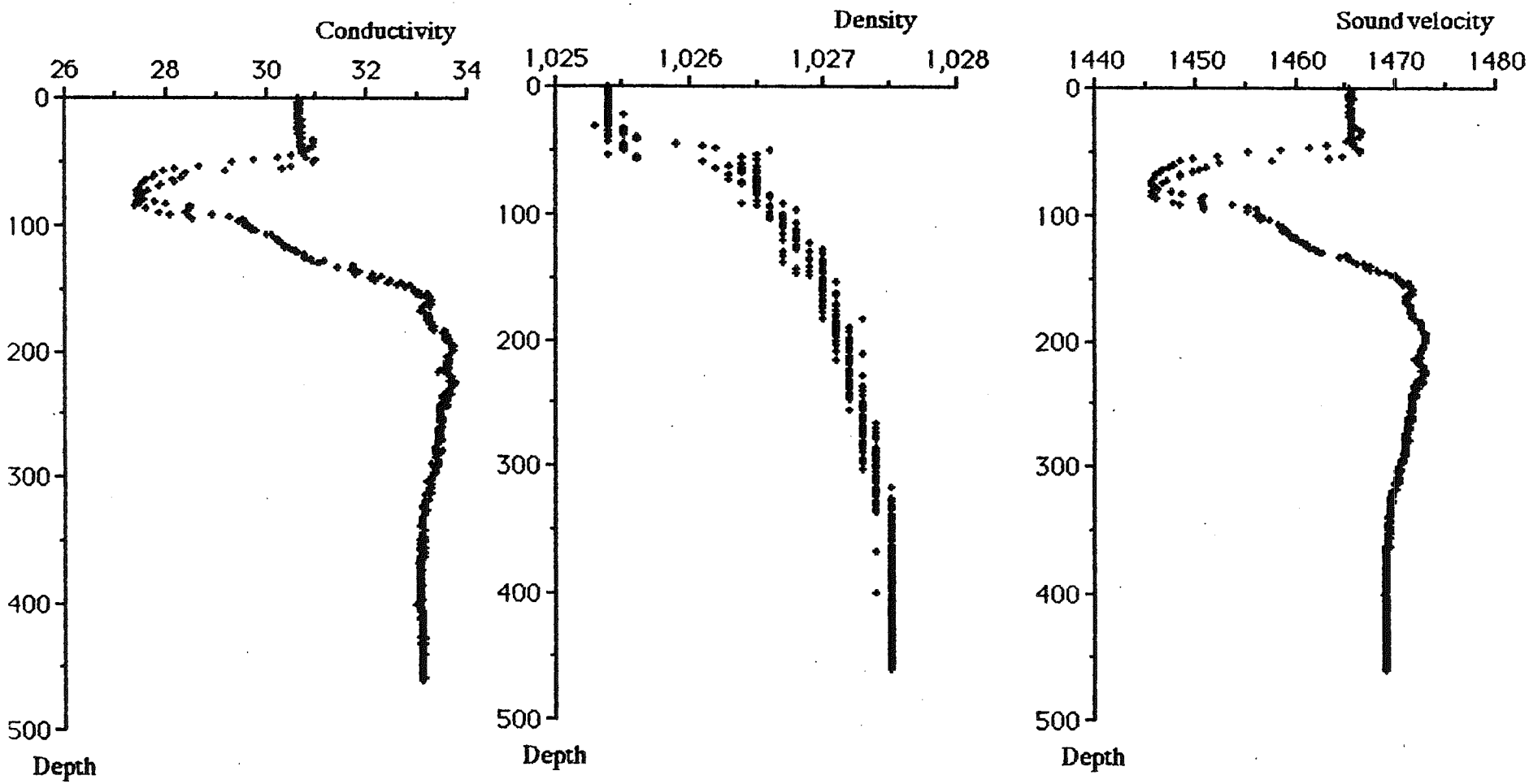


Fig. 3

HU-90-031-046: (Cont'd)



HU-90-031-050: CTD profile (attached to the Box Core)

Julian day: 336 Latitude: 46°11.22 N
GMT Time: 17:27 Longitude: 57°56.14 W
Depth: 468 m.

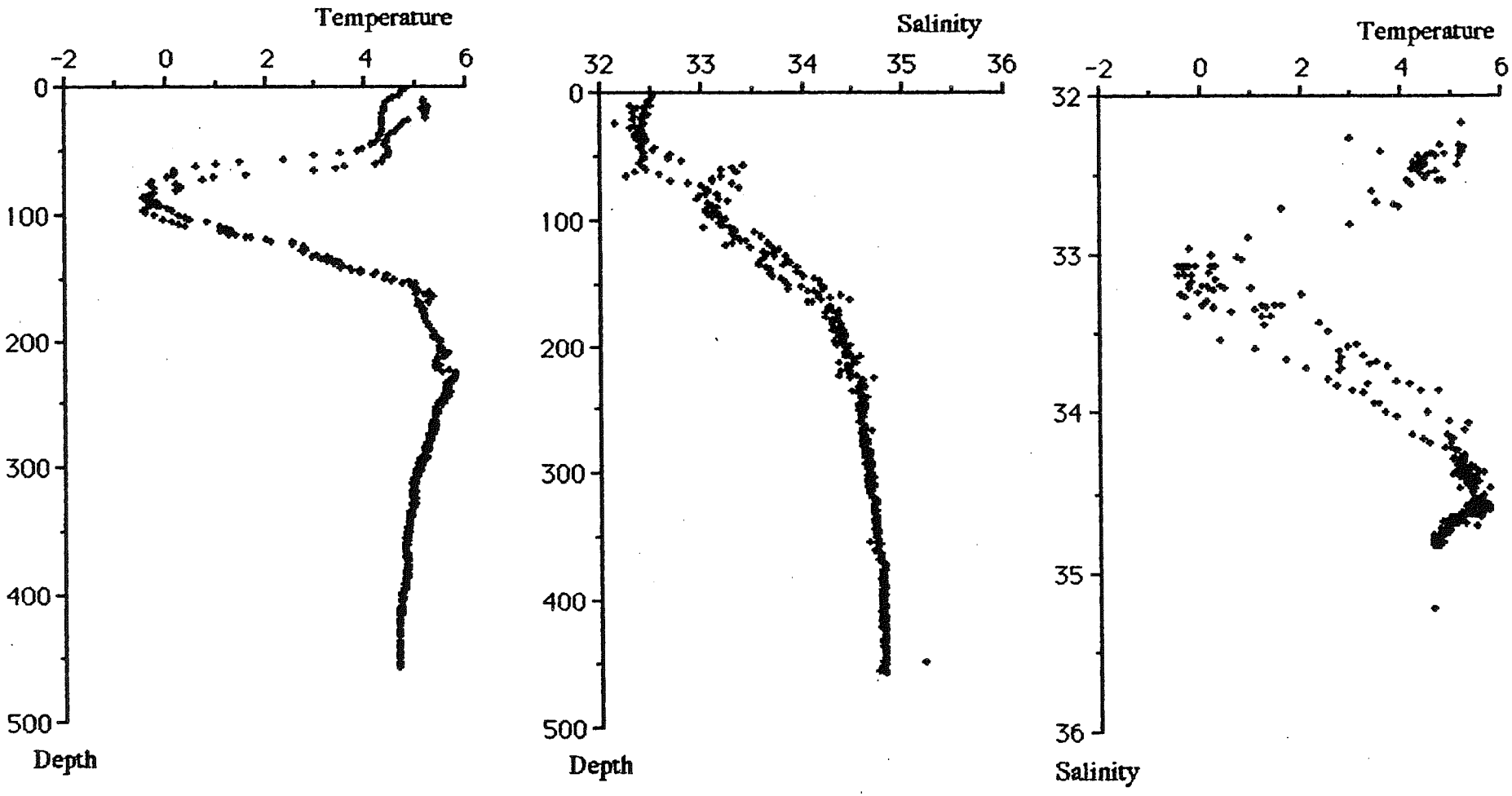
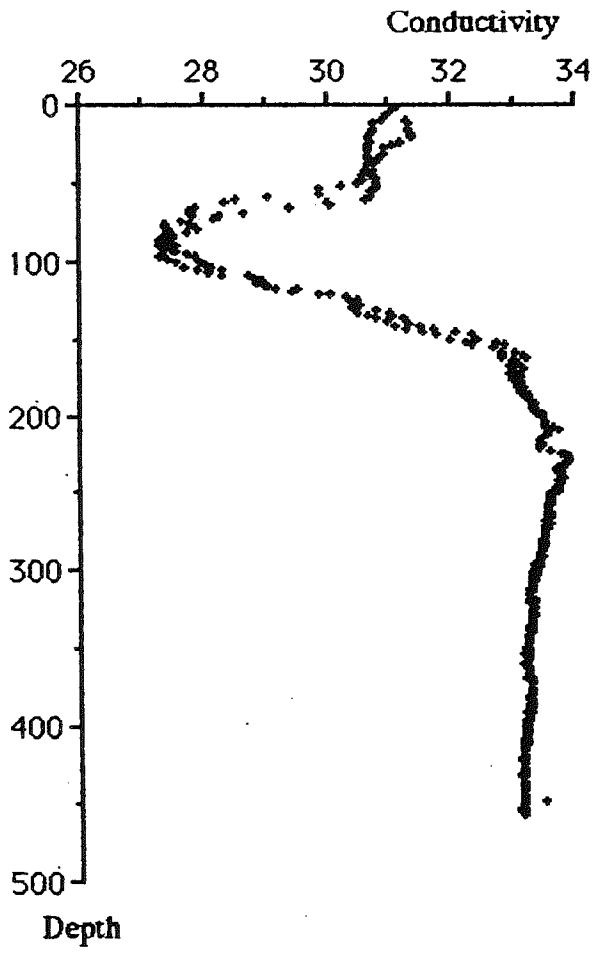
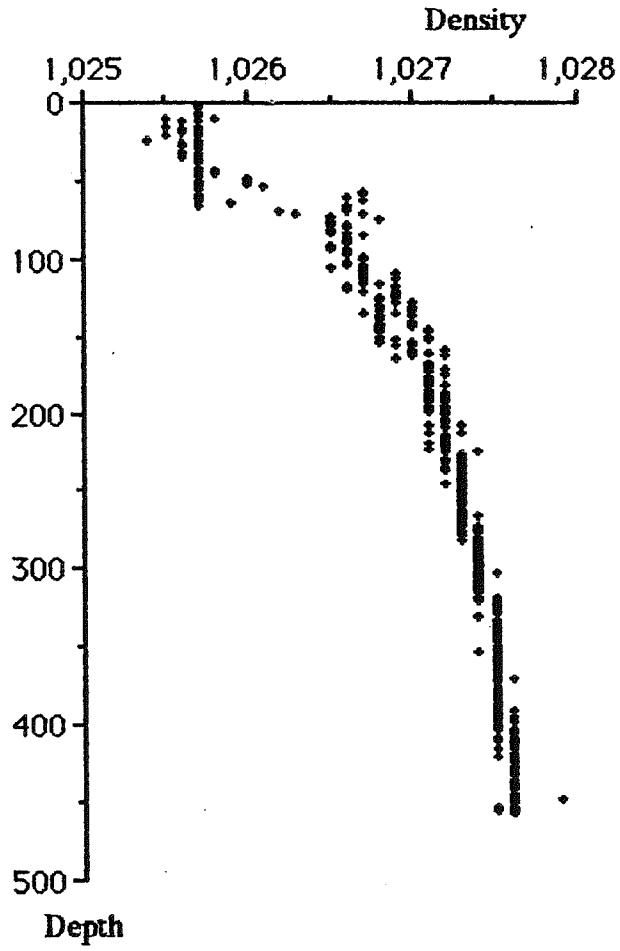
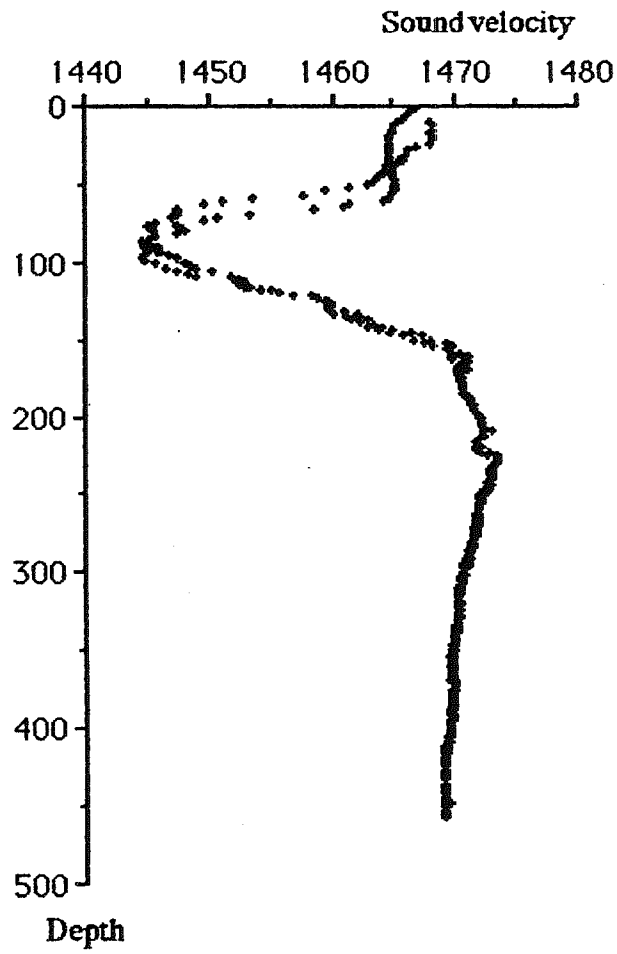


Fig. 32

HU-90-031-050: (Cont'd)

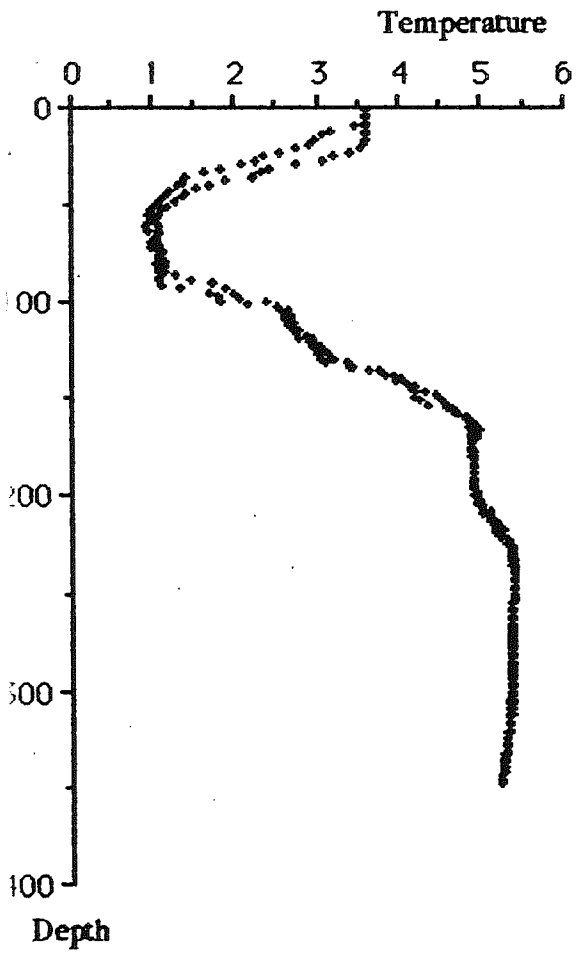


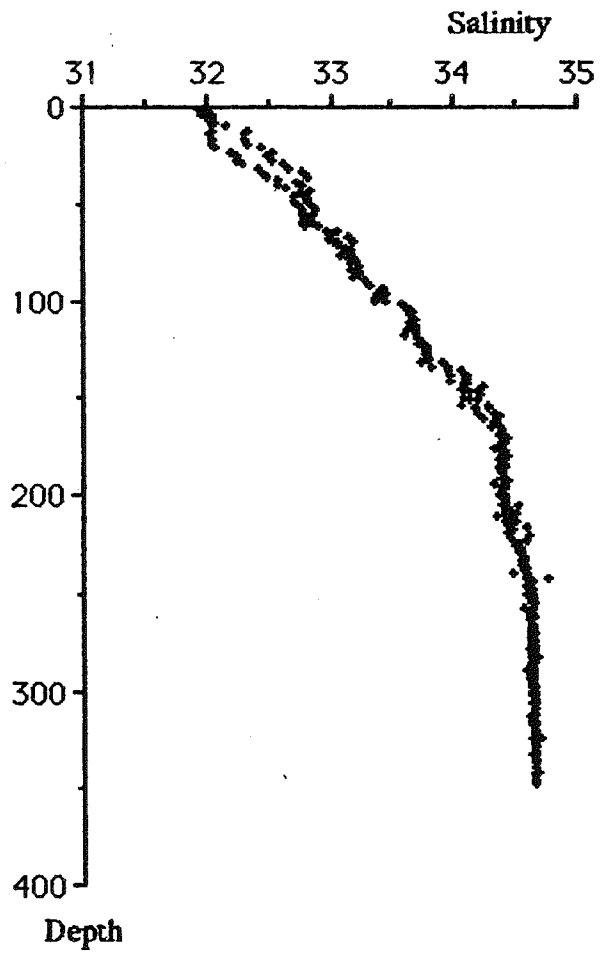


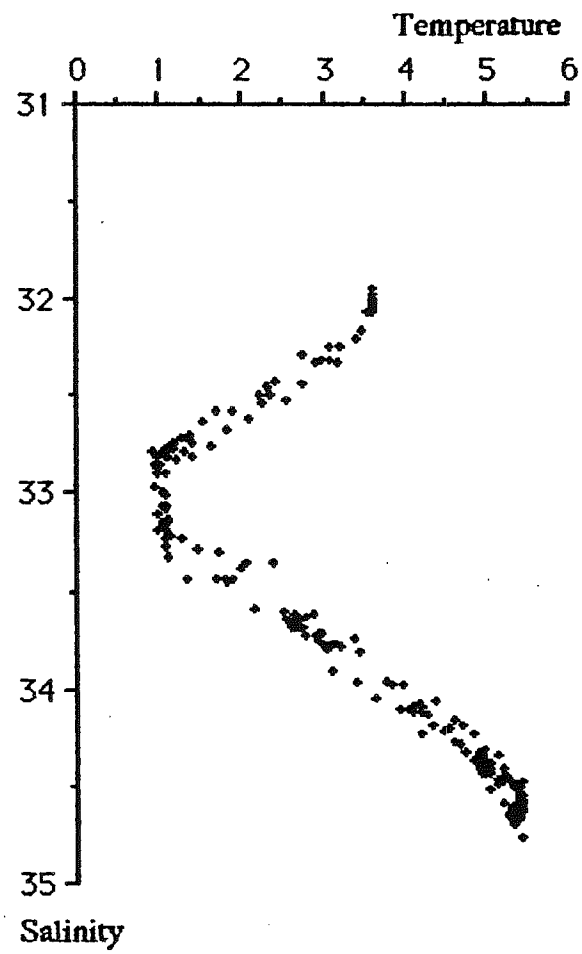


HU-90-031-053: CTD profile (attached to the Box Core)

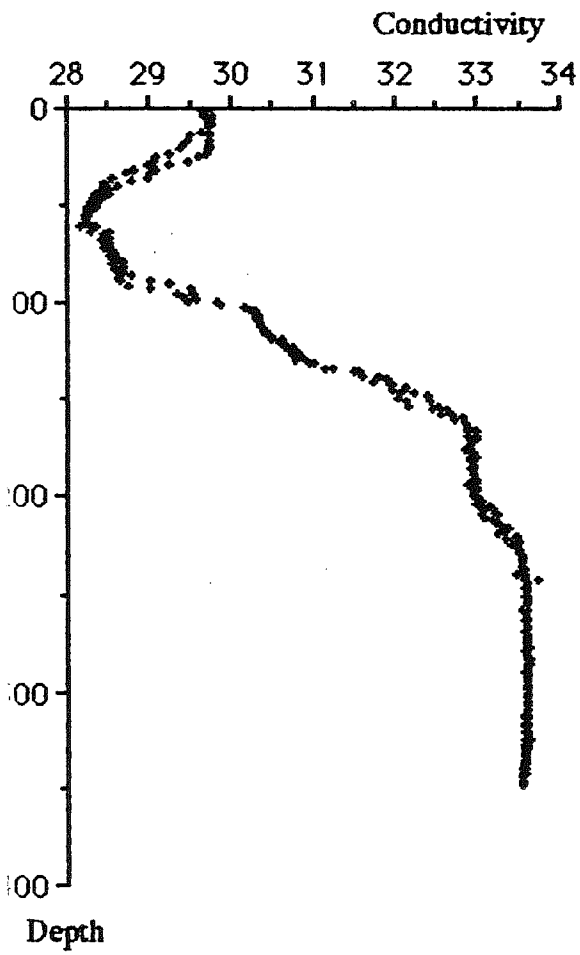
Julian day: 337 Latitude: 47°14.29 N
GMT Time: 12:30 Longitude: 56°40.17 W
Depth: 355 m.
Geographical location: Hermitage Strait

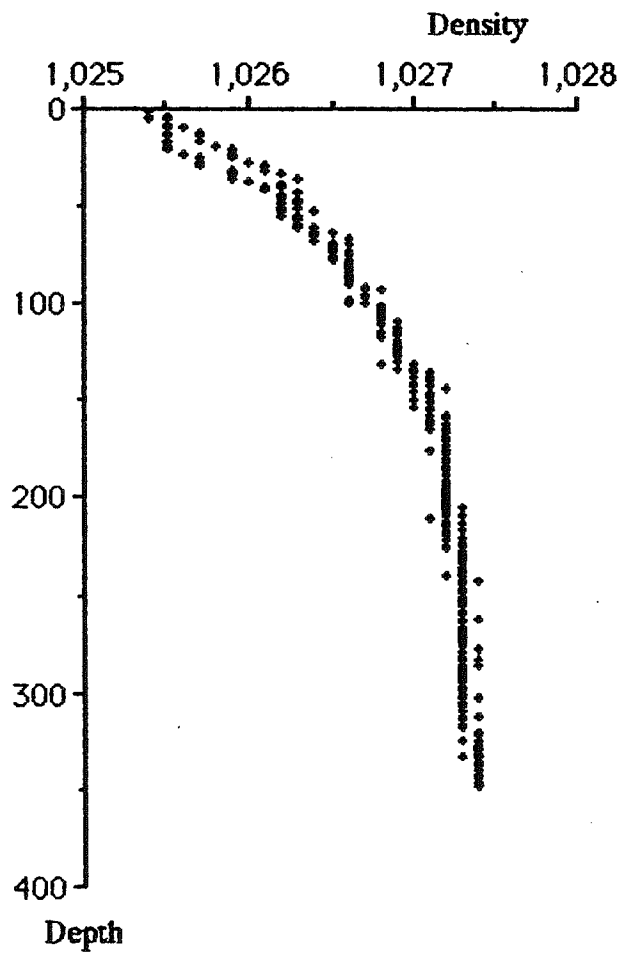


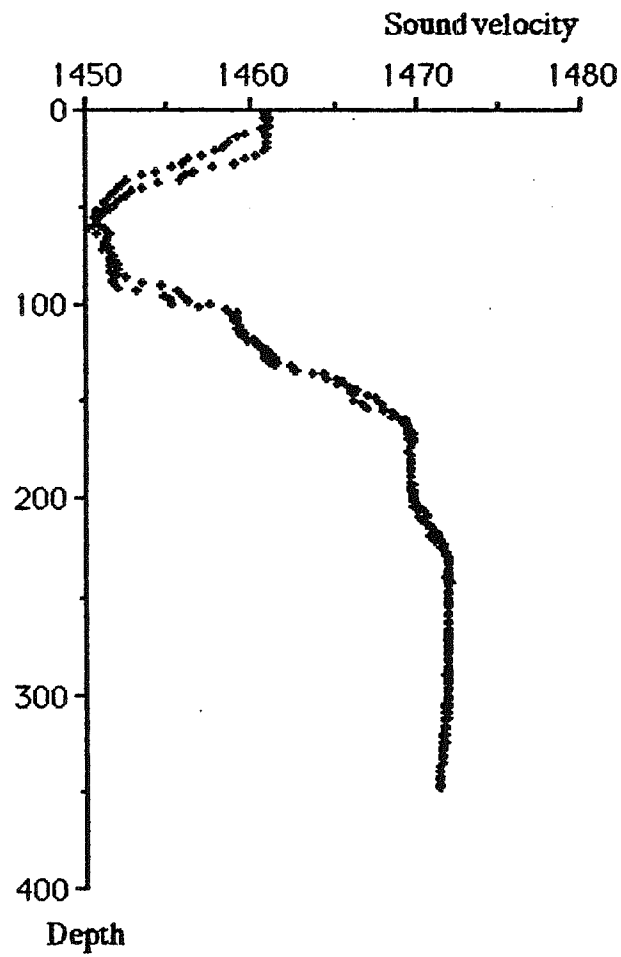




HU-90-031-053: (Cont'd)

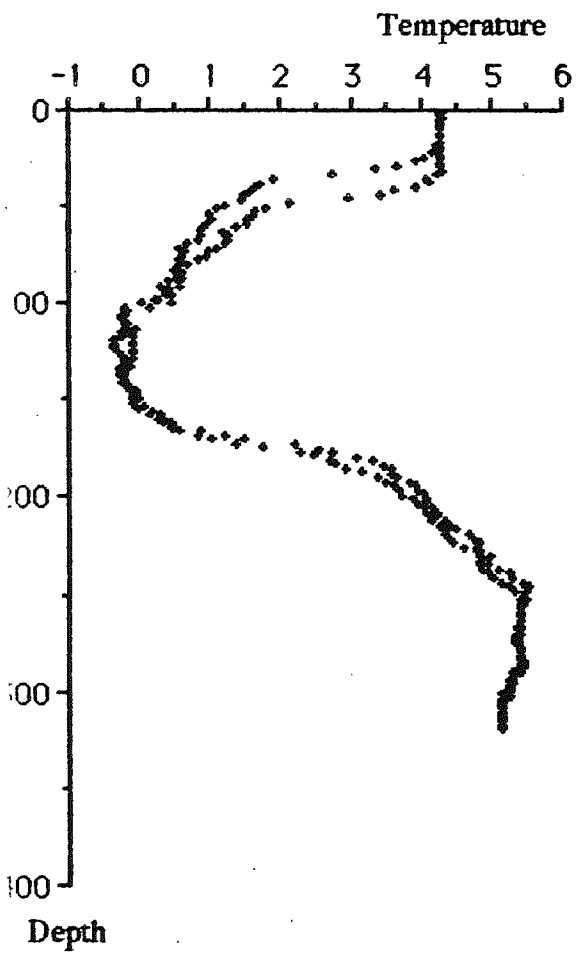


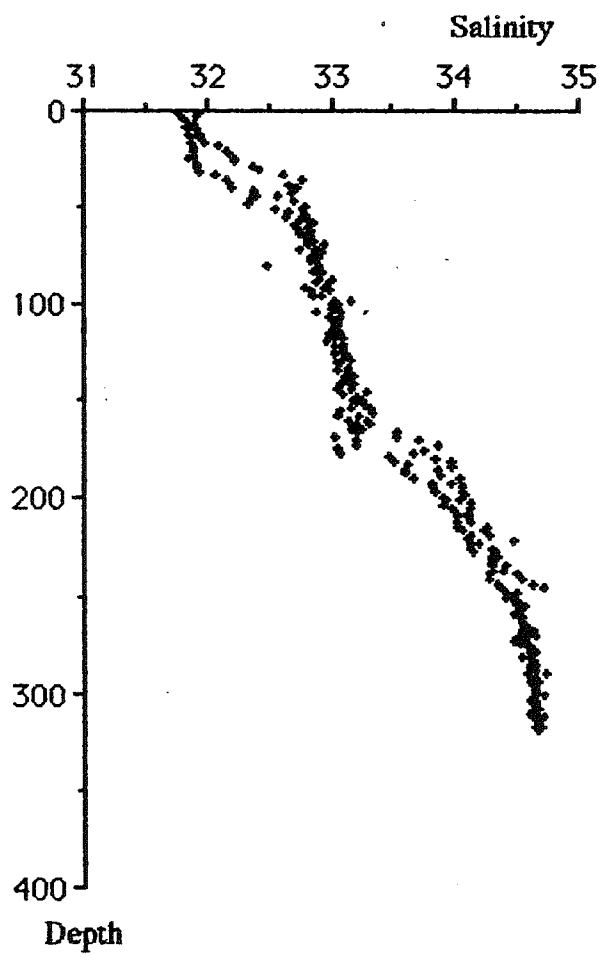


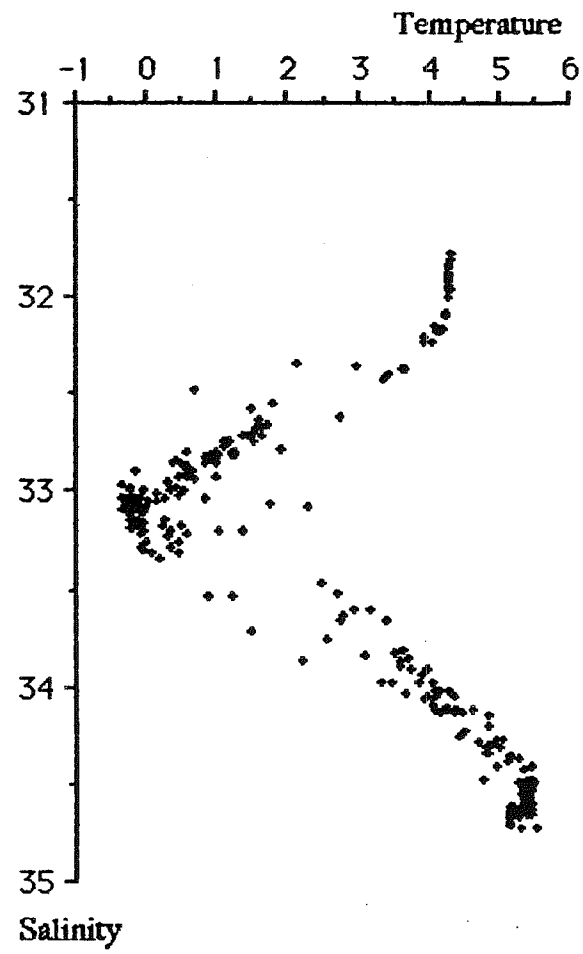


HU-90-031-057: CTD profile (attached to the Box Core)

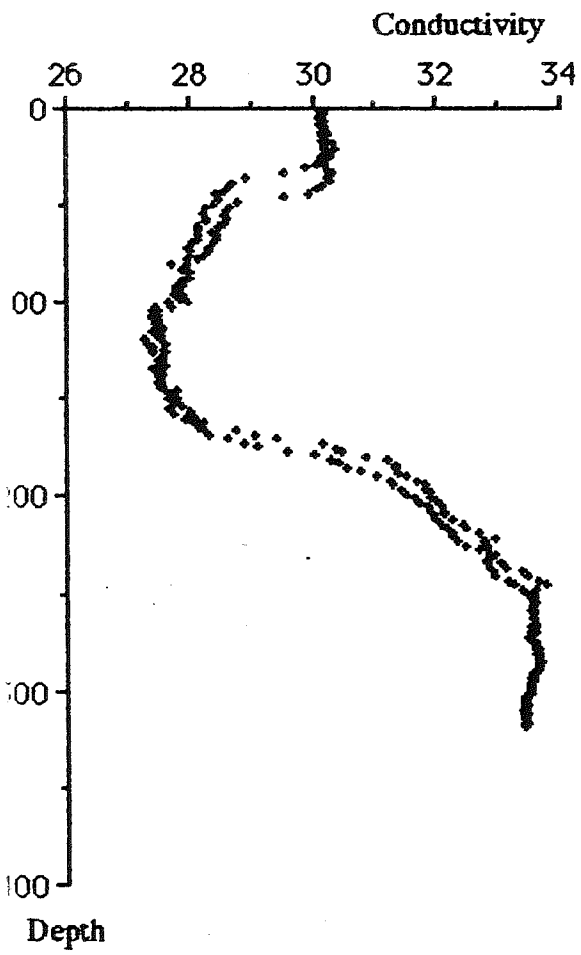
Julian day: 337 Latitude: 47°04.38 N
GMT Time: 17:44 Longitude: 57°07.32 W
Depth: 333 m.

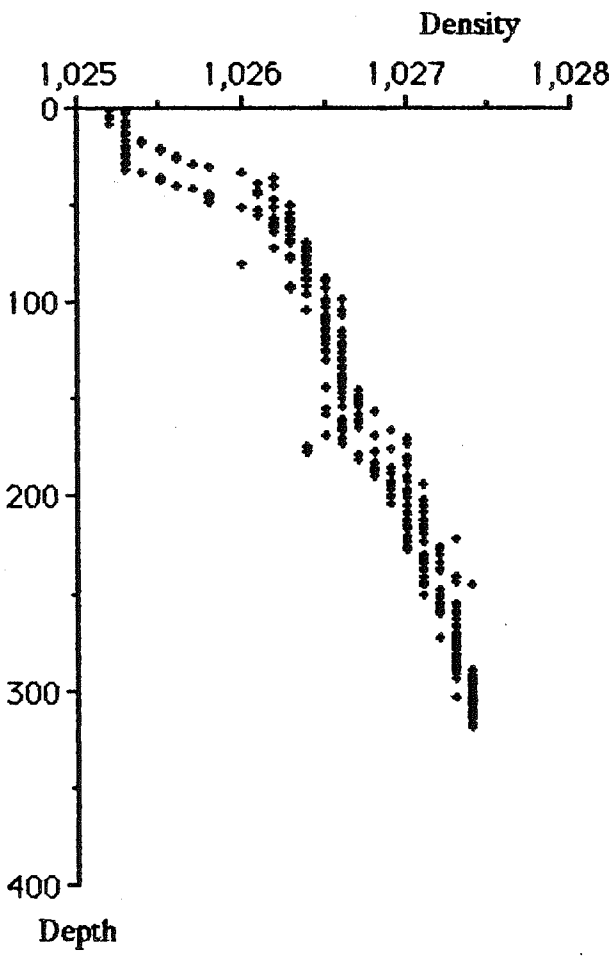


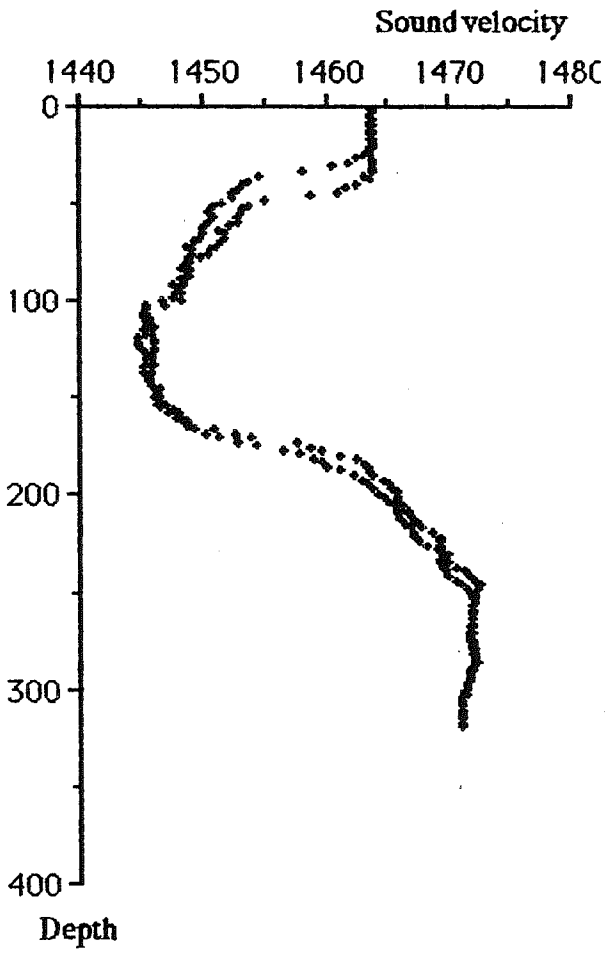




HU-90-031-057: (Cont'd)

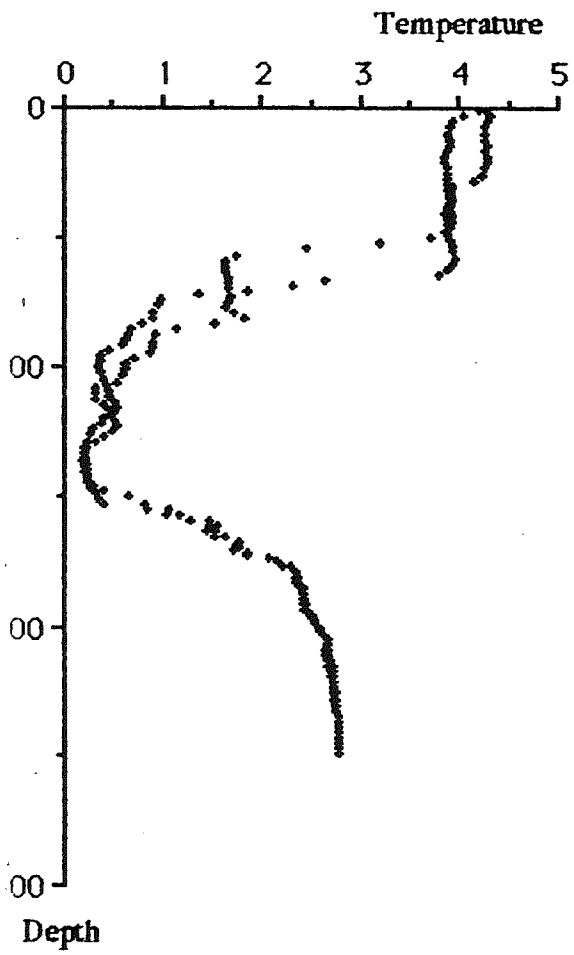


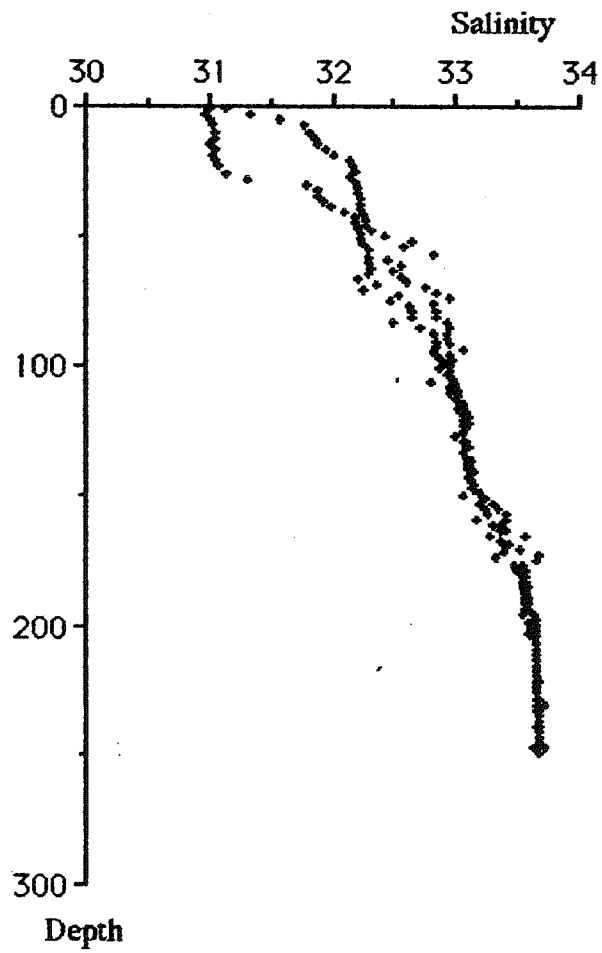


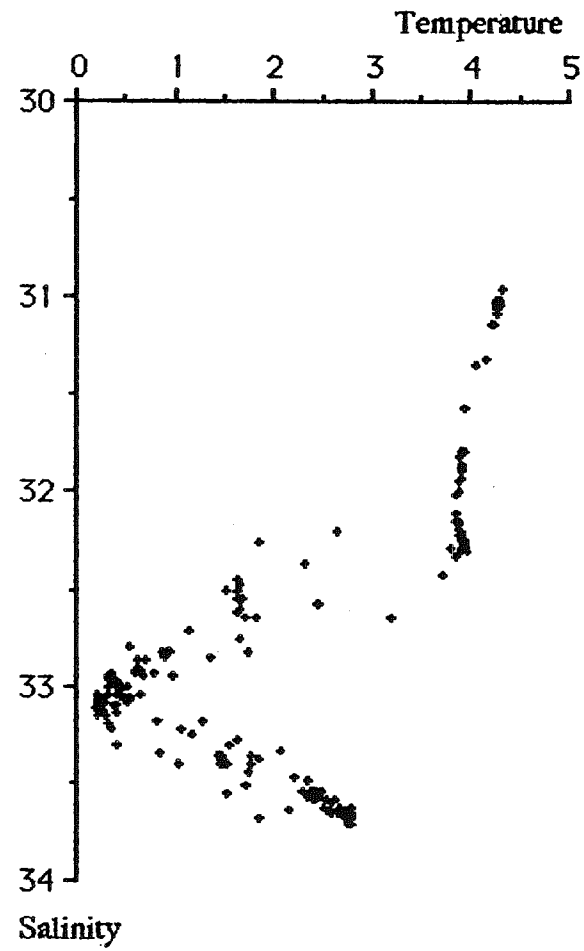


HU-90-031-060: CTD profile (attached to the Box Core)

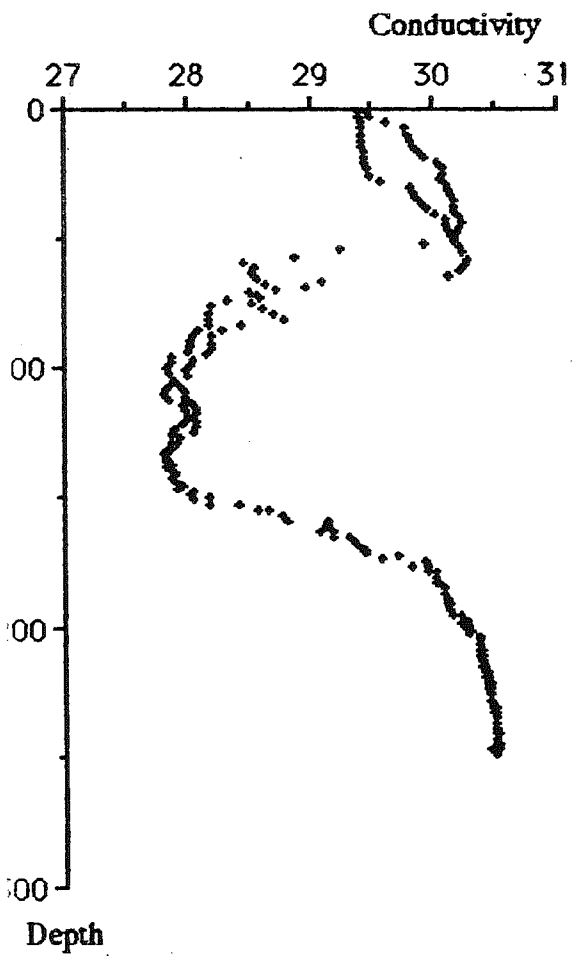
Julian day: 338 Latitude: 45°50.36 N
GMT Time: 12:20 Longitude: 58°34.19 W
Depth: 268 m.
Geographical location: Scotian Shelf

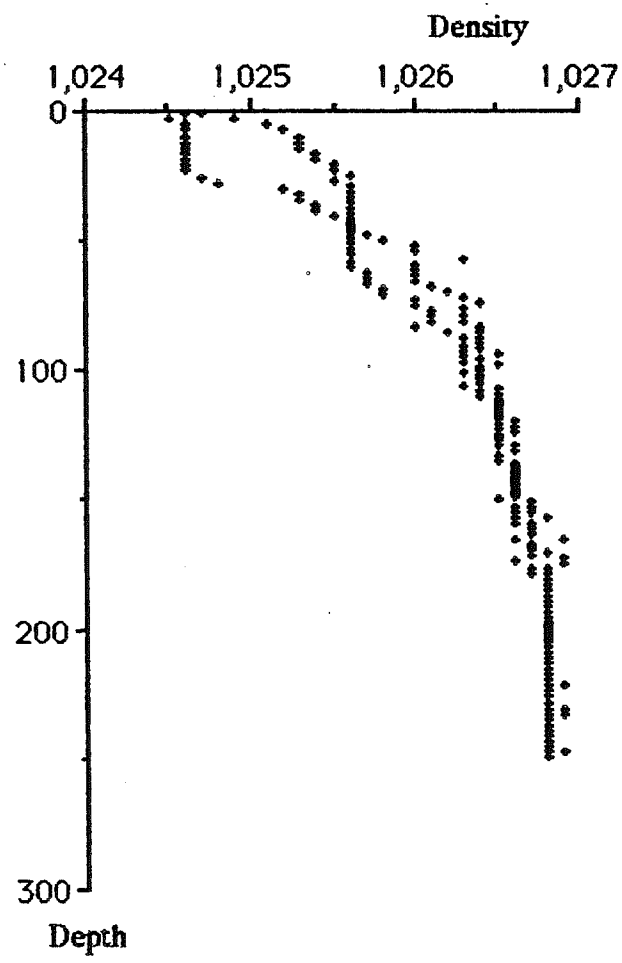


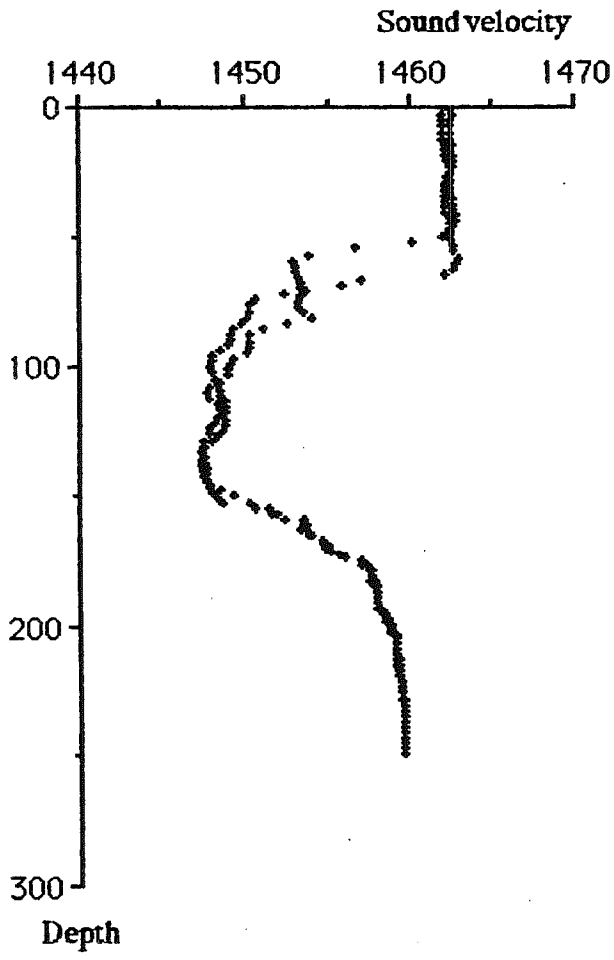




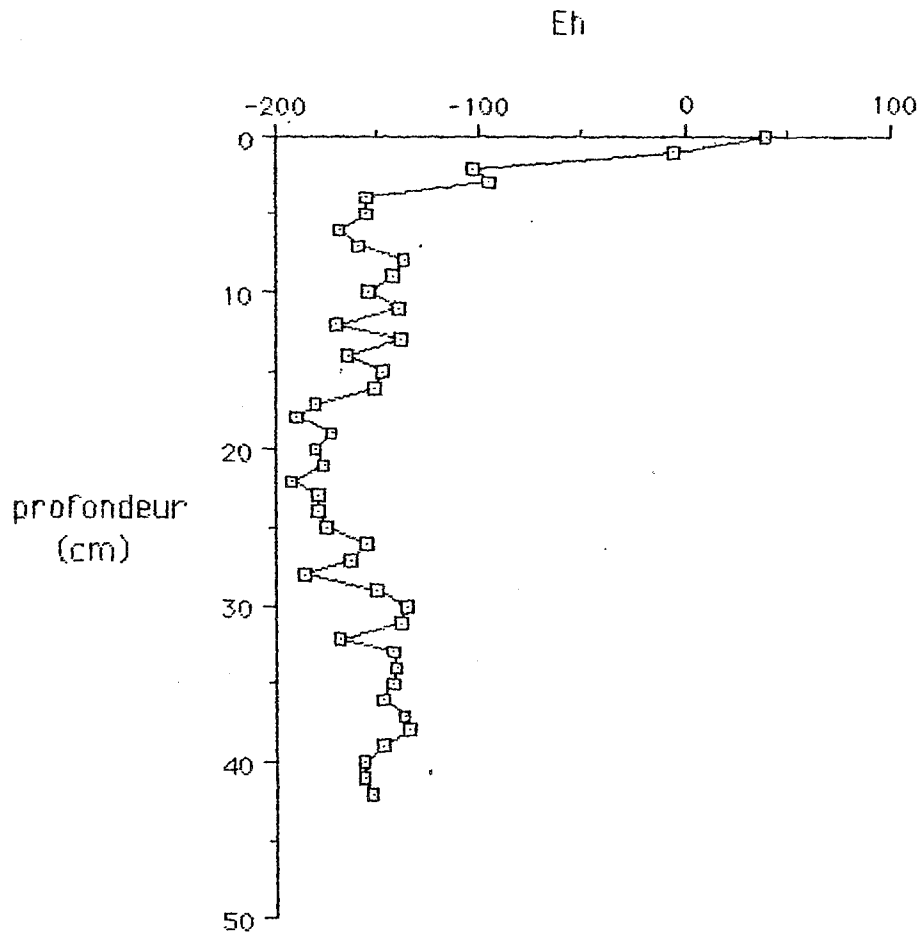
HU-90-031-060: (Cont'd)







Profil Redox 90031-001A - box core
(20 Nov)



Profil Redox 90031-009A - Box core
(21 Nov)

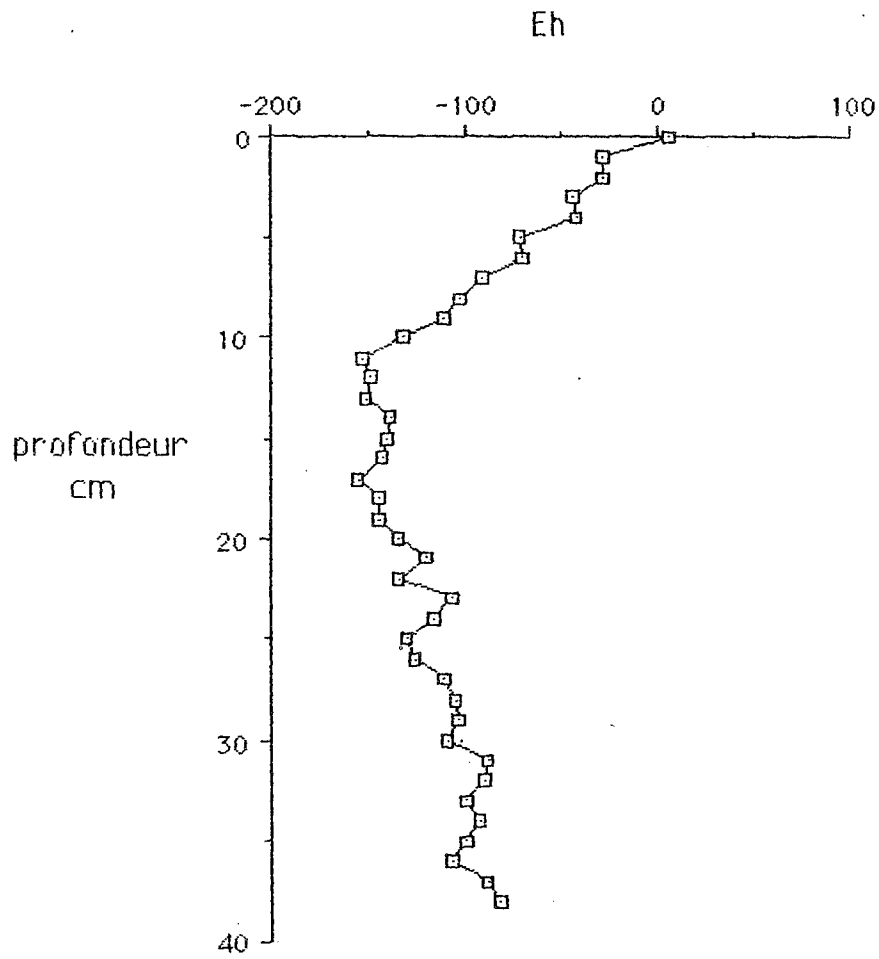
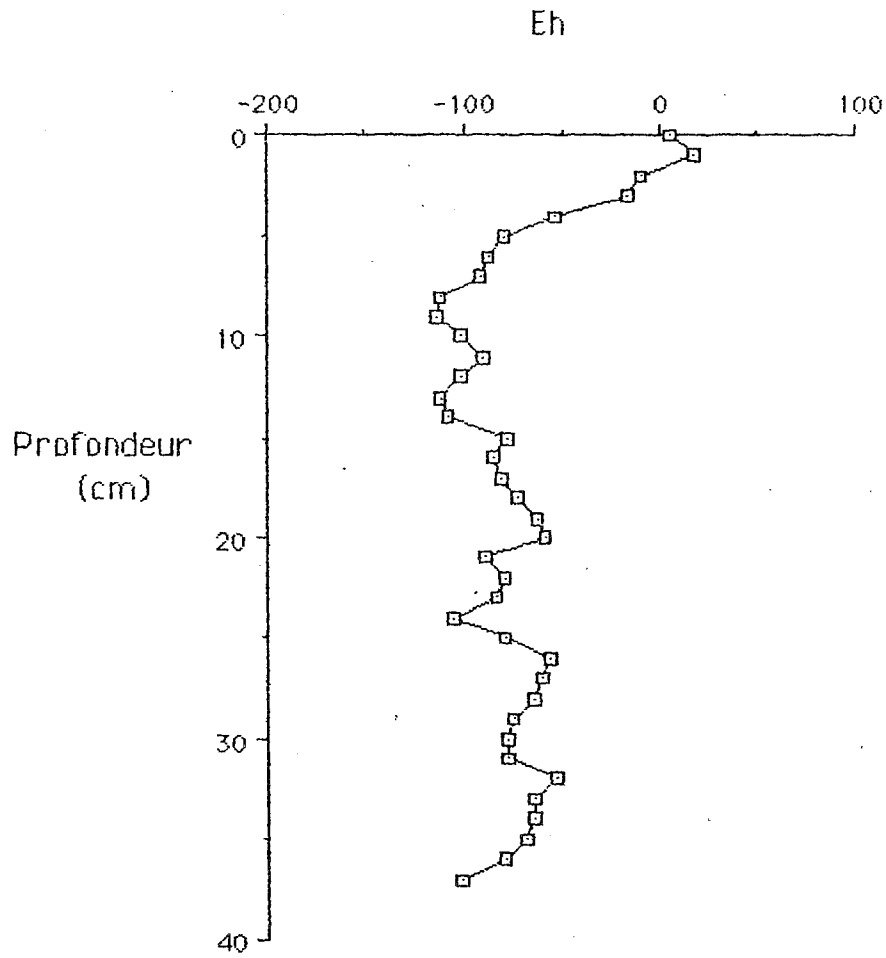


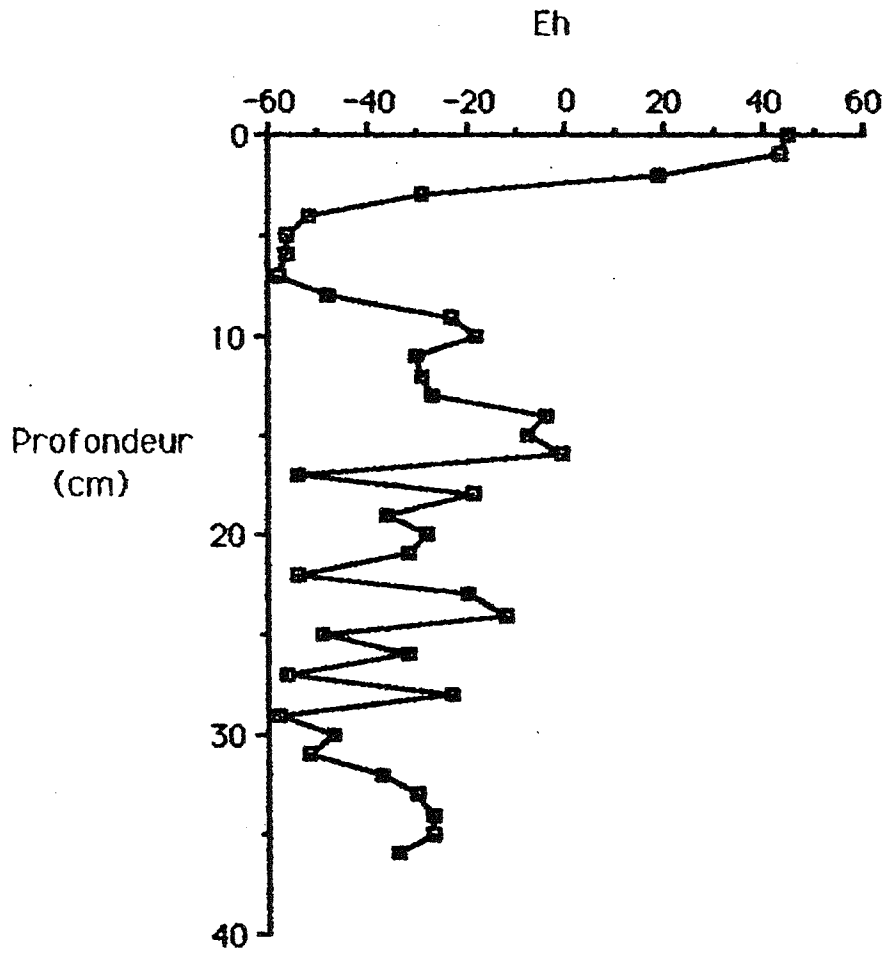
Fig. 6

Fig. 9

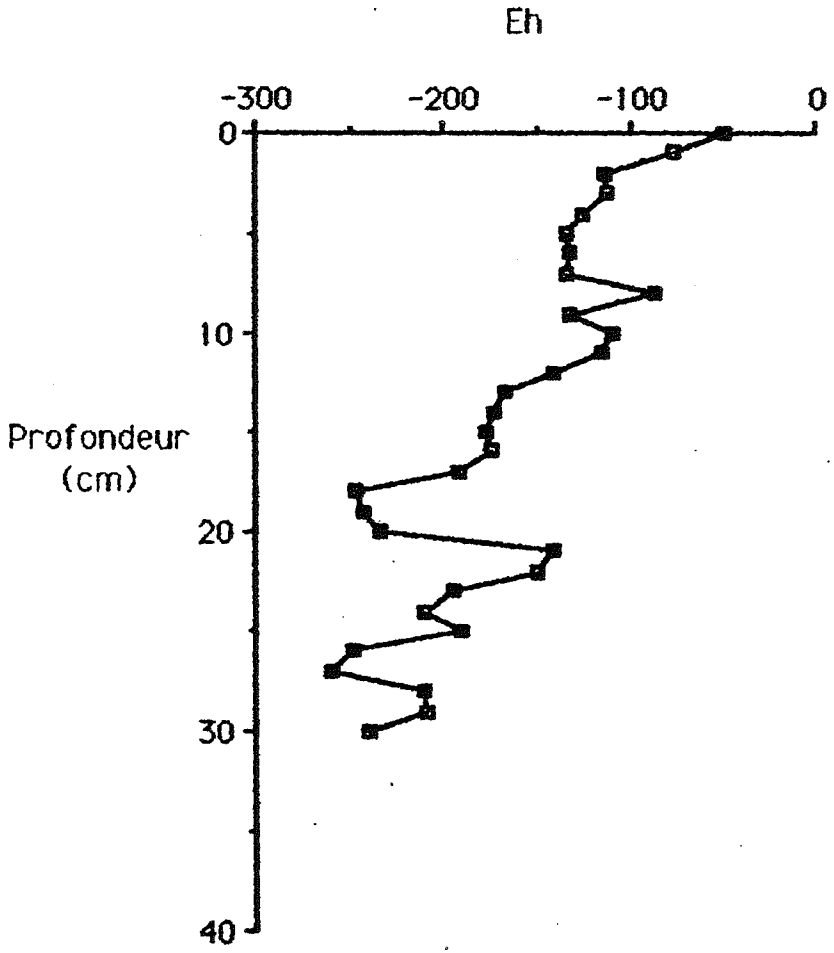
Profil Redox 90031-013A . Box core
(22 Nov)



Profil Redox 90031-017A - box core
(23 Nov)



Profil Redox 90031-0021A - box core
(24 Nov)



Profil Redox 90031-029A - box core
(25 Nov)

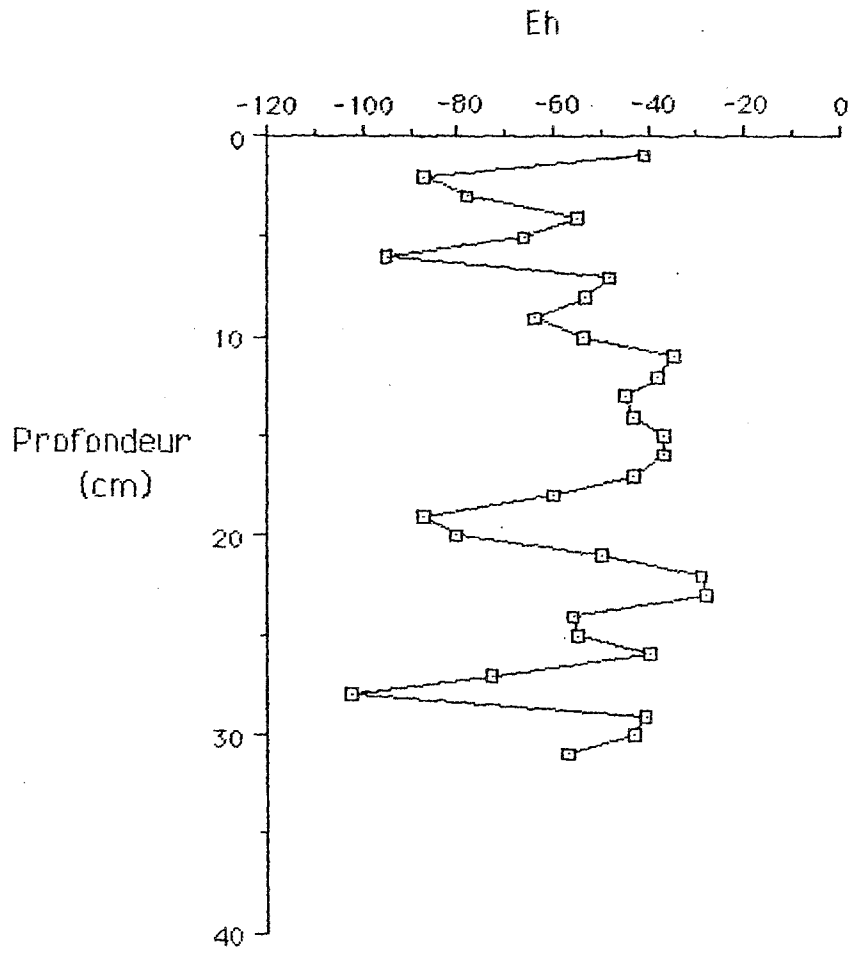
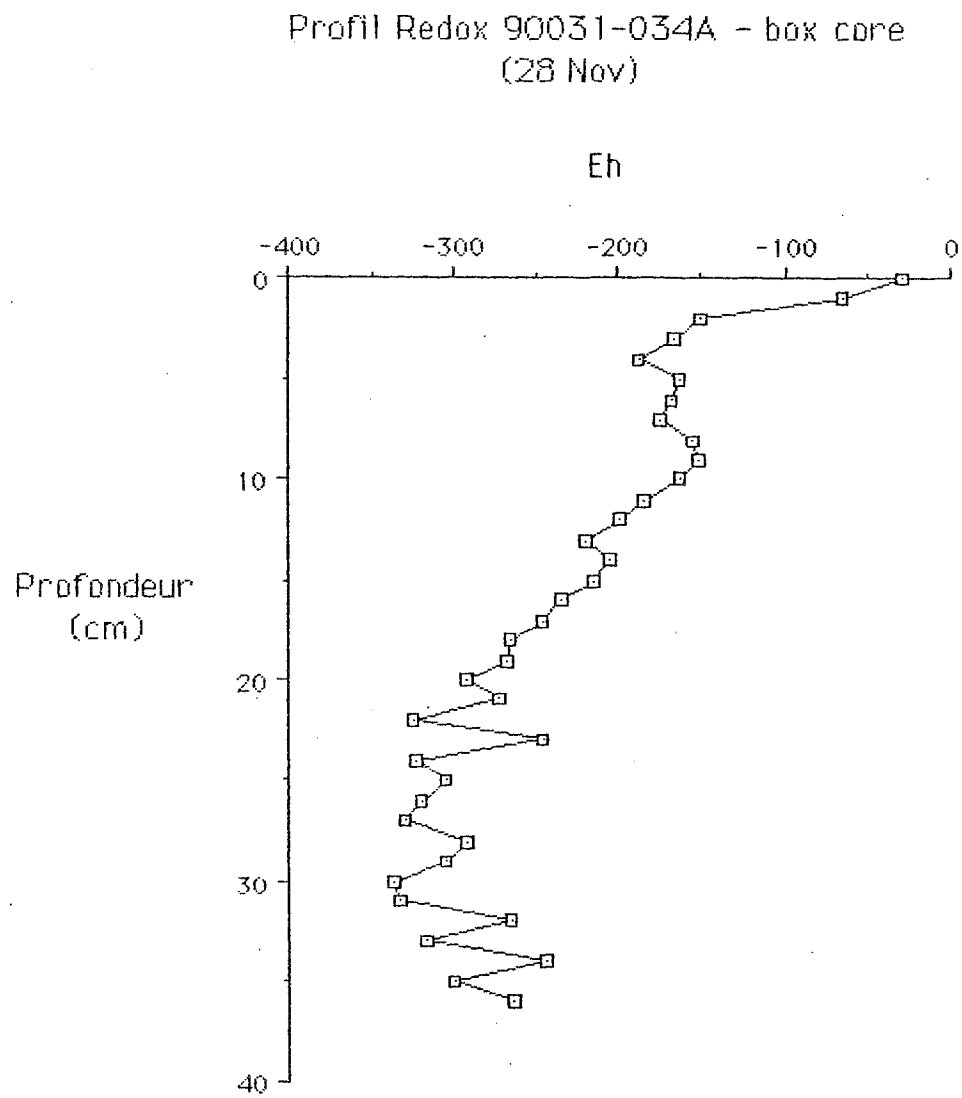


Fig. 23


Profil Redox 90031-034A - box core
(28 Nov)
Eh
-400
-300
-200
-100
0
Profondeur
(cm)
0
10
20
30
40

Profil Redox 90031-041A - Box core
(29 Nov)

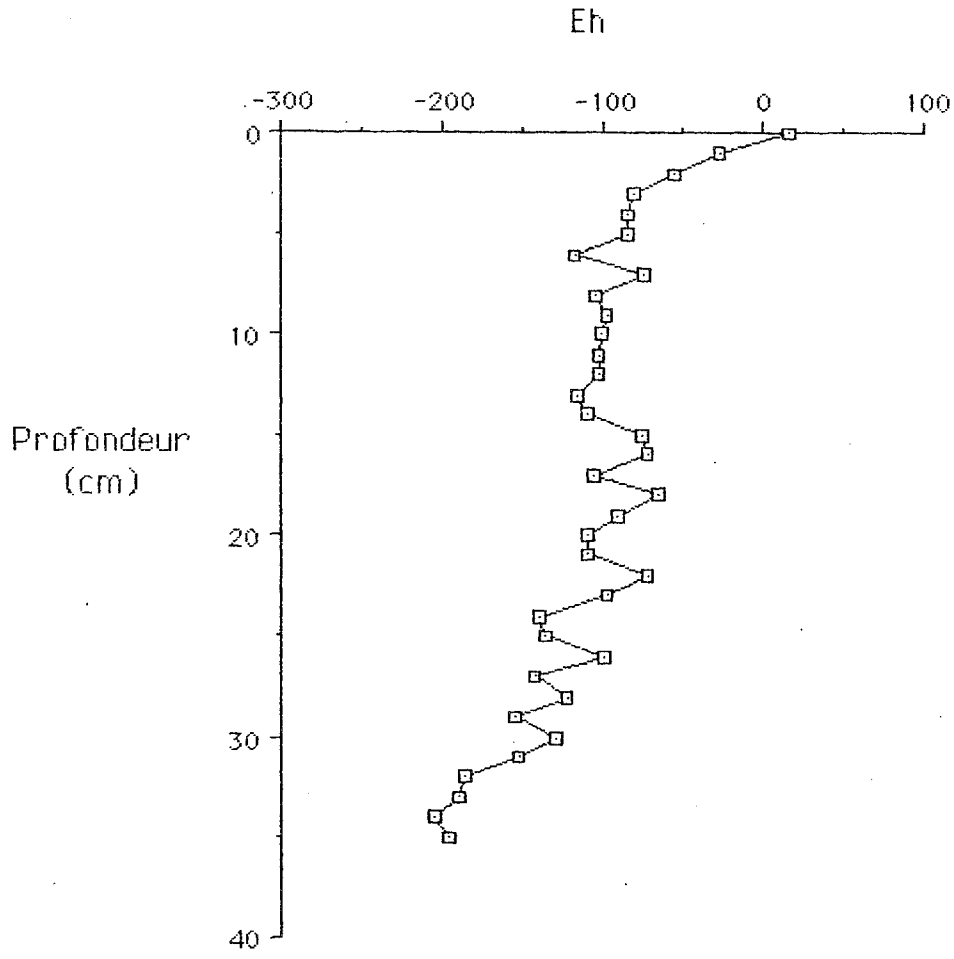


Fig. 29 A

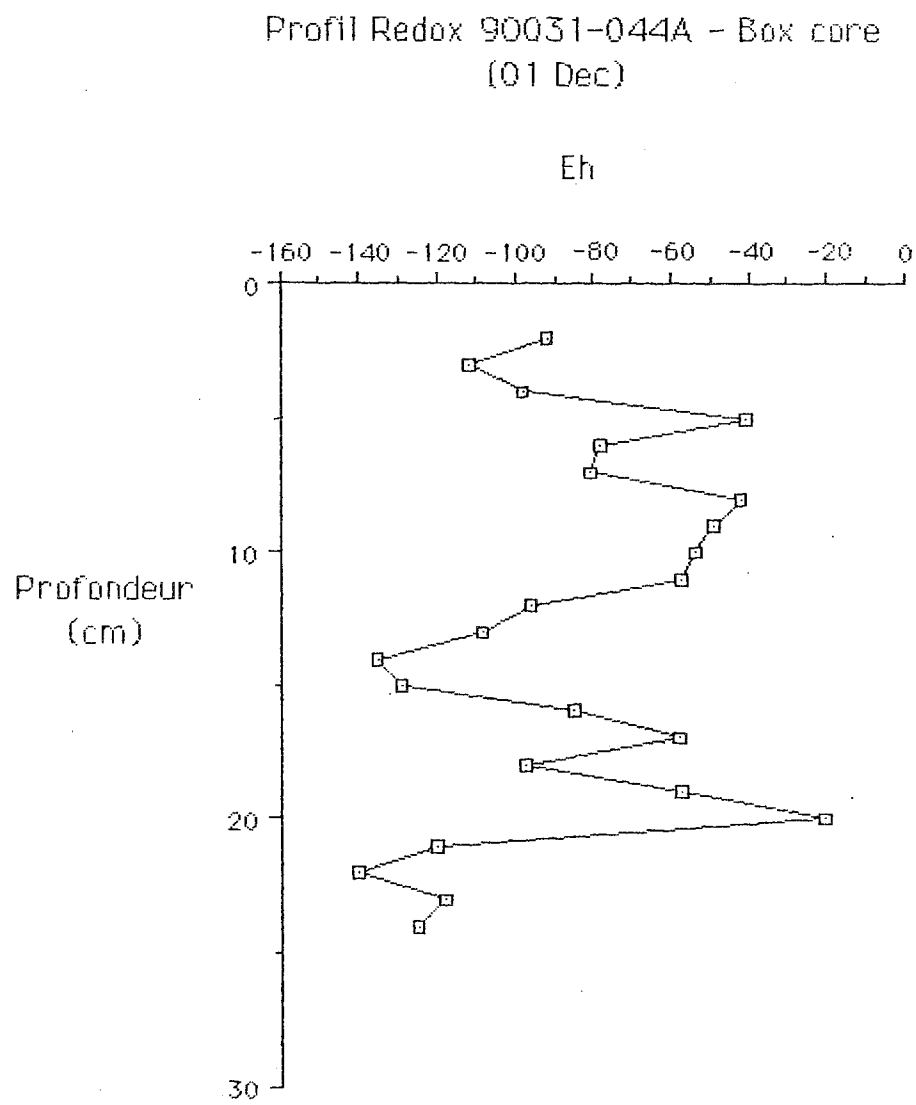
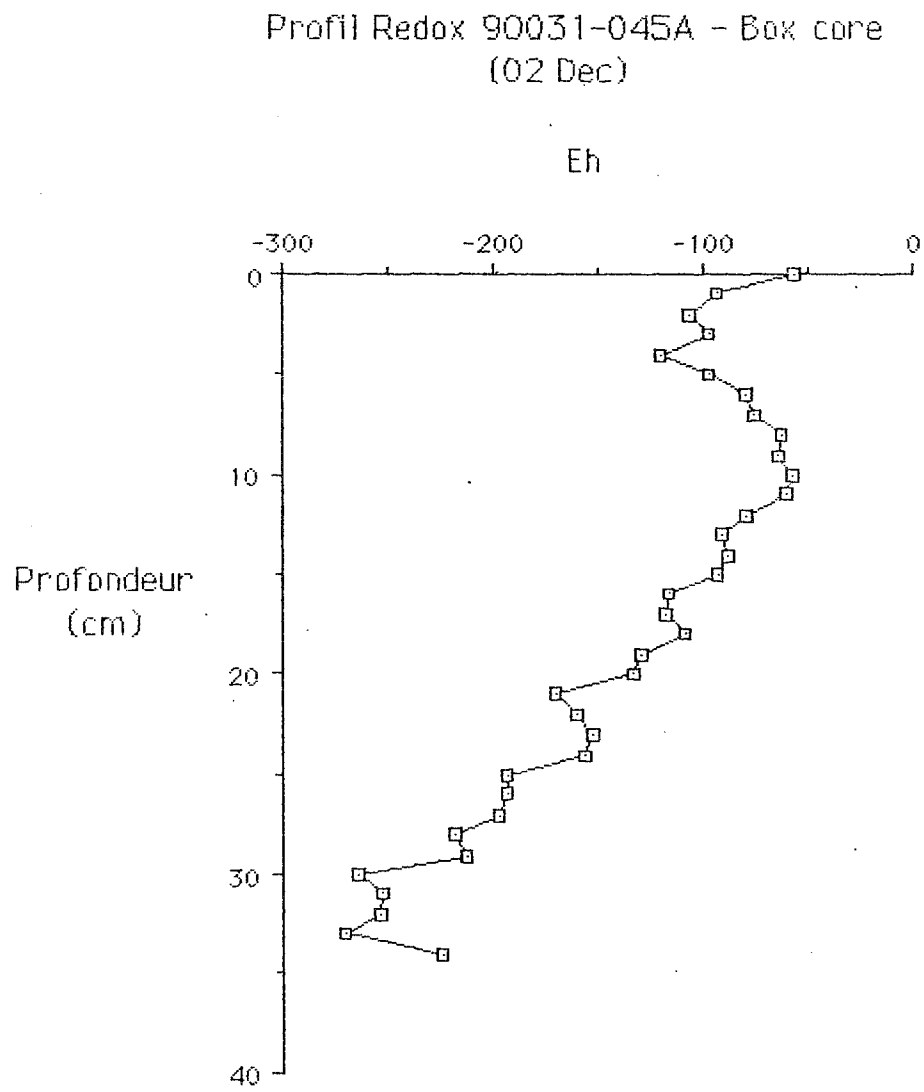

Profil Redox 90031-044A - Box core
(01 Dec)
Eh
-160 -140 -120 -100 -80 -60 -40 -20 0
0
10
20
30
Profondeur
(cm)

Fig. 29 B


Profil Redox 90031-045A - Box core
(02 Dec)
Eh
-300
-200
-100
0
Profondeur
(cm)
0
10
20
30
40

Profil Redox 052A 90031-052A - Box core
(03 Dec)

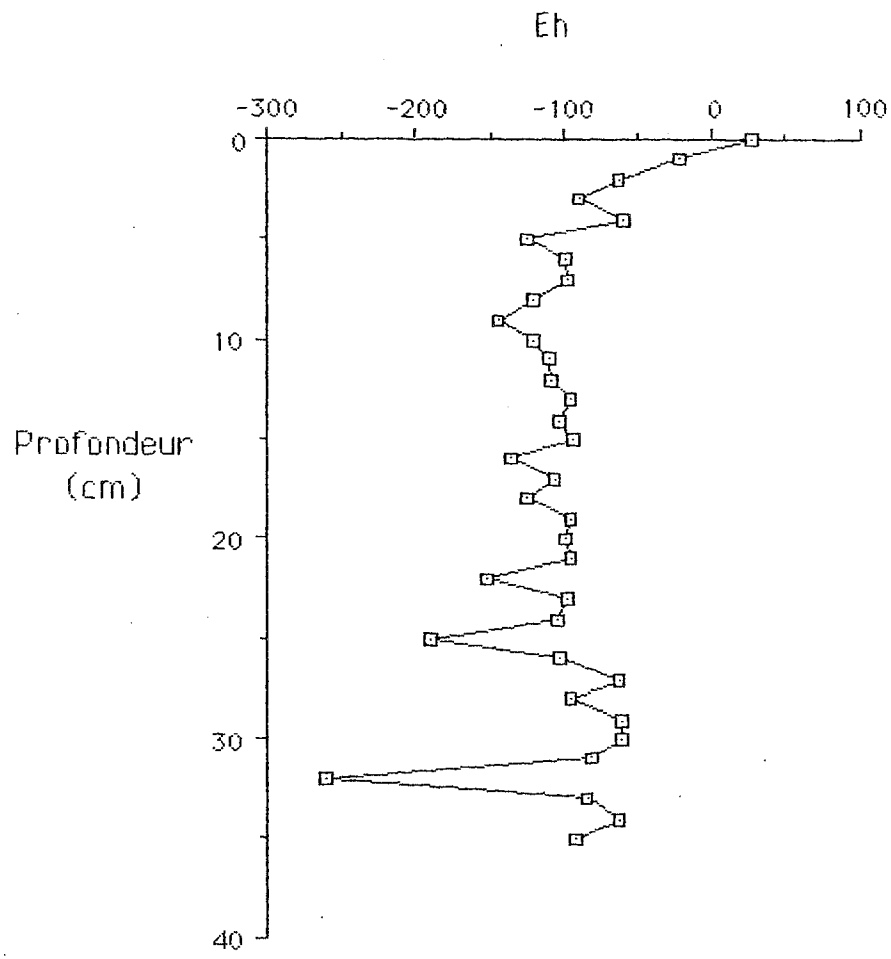
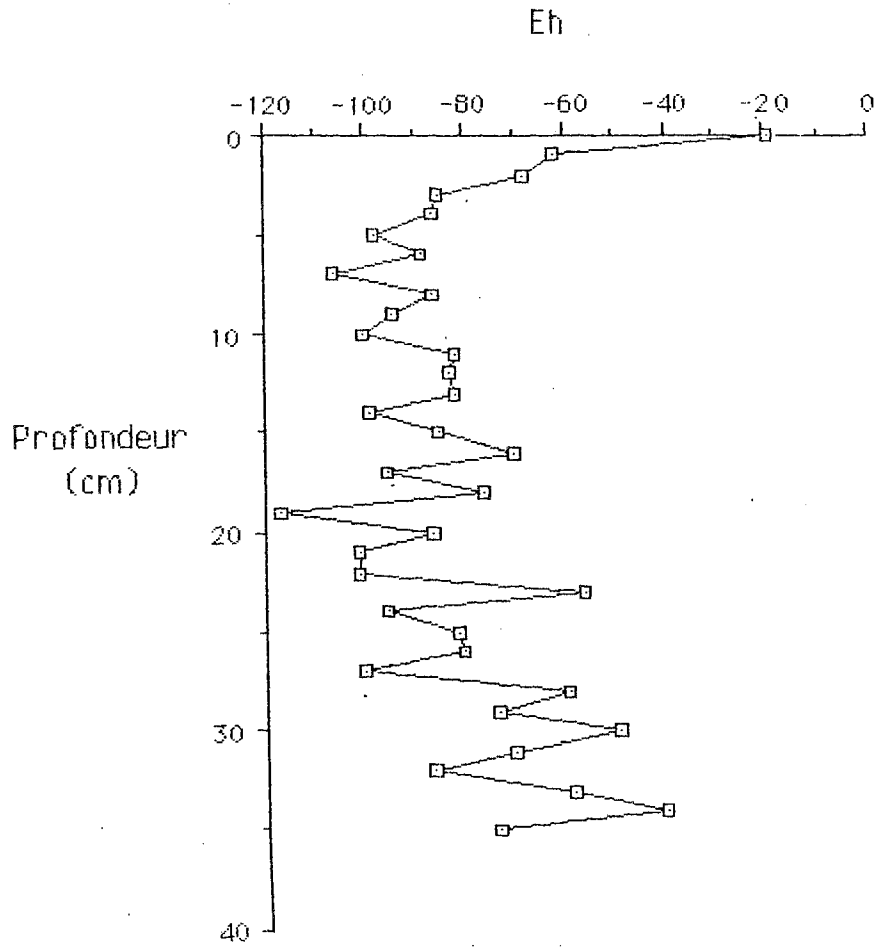


Fig. 34

Profil Redox 90031-059A - Box core
(04 Dec)



1.2.39

Station 90-031-001 : Box-core
eaux interstitielles

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	162	X	X	X	X	5	Non	Non
1 - 2	163	X	X	X	X	6	2	12
2 - 3	164	X	X	X	X	6	6	8
3 - 4	165	X	X	X	X	5	2	Non
4 - 5	166	X	X	X	X	Non	3	Non
5 - 7	167	X	X	X	X	6	3	2
7 - 9	168	X	X	X	X	6	3	4
9 - 11	169	X	X	X	X	2	3	Non
12 - 14	170	X	X	X	X	6	2	5
14 - 16	171	X	X	X	X	2	2	Non
16 - 18	172	X	X	X	Non	Non	Non	Non
18 - 20	173	Non	4	Non	Non	Non	Non	Non
20 - 22	174	X	X	X	X	6	2	4
22 - 24	175	X	X	X	X	6	2	2
24 - 26	176	Non	Non	Non	Non	Non	Non	Non
26 - 28	177	X	X	X	X	6	2	Non

Station 90031 : Box-core 009A

Eaux Interstitielles

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	178	X	X	X	X	6	8 + 3	8 + 5
1 - 2	179	X	X	X	X	6	8	7
2 - 3	180	X	X	X	X	5	2	2
3 - 4	181	X	X	X	X	4	Non	Non
4 - 5	182	X	X	X	X	Non	3	Non
5 - 7	183	X	X	X	4	Non	2	Non
7 - 9	185	X	X	X	X	Non	2	Non
9 - 11	186	X	X	X	X	Non	3	Non
12 - 14	187	Non	Non	Non	Non	Non	Non	Non
14 - 16	188	X	X	X	X	6	2	2
16 - 18	189	Non	Non	Non	Non	Non	Non	Non
18 - 20	190	X	X	X	2	Non	Non	Non
20 - 22	191	X	X	X	X	4	2	Non
22 - 24	192	X	X	X	X	4	Non	Non
24 - 26	193	X	X	X	X	Non	2	Non
26 - 28	195	X	X	X	4	Non	Non	Non

Station 90-031 : Box-core 017A

Eaux Interstitielles.

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	212	X	X	X	X	6	8 + 4	8
1 - 2	213	X	X	X	X	6	8	6
2 - 3	214	Non	Non	Non	Non	Non	Non	Non
3 - 4	215	X	X	X	X	6	2	Non
4 - 5	216	X	X	X	X	6	3	Non
5 - 7	217	X	X	X	Non	5	Non	Non
7 - 9	218	X	X	X	X	6	5	5
9 - 11	219	X	X	X	X	6	5	5
12 - 14	220	x	x	x	x	6	2	Non
14 - 16	221	X	X	X	X	6	2	3
16 - 18	222	X	X	X	X	6	4	5
18 - 20	223	X	X	X	X	6	2	2
20 - 22	224	X	X	X	X	6	6	4
22 - 24	225	X	X	X	X	6	5	4
24 - 26	226	X	X	X	3	Non	Non	Non
26 - 28	227	X	X	X	X	1	Non	Non

Station 90031 ; Box-core 021A

Eaux Interstitielles

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	228	X	X	X	X	6	7	5
1 - 2	229	X	X	X	X	6	5	5
2 - 3	230	X	X	X	X	6	4	Non
3 - 4	231	X	X	X	X	6	2	5
4 - 5	232	X	X	X	X	6	2	Non
5 - 7	233	Non	Non	Non	Non	Non	Non	Non
7 - 9	234	X	X	X	X	6	3	Non
9 - 11	235	X	X	X	X	Non	3	Non
12 - 14	236	X	X	X	X	Non	3	Non
14 - 16	237	X	X	X	X	5	2	Non
16 - 18	238	X	X	X	X	6	2	2
18 - 20	239	X	X	X	2	6	2	1
20 - 22	240	X	X	X	X	6	2	2
22 - 24	241	X	X	X	X	Non	1	Non
24 - 26	242	X	X	X	X	5	Non	Non
26 - 28	243	X	X	X	Non	Non	Non	Non

Station 90-0[illegible] Box-core 029

eaux interstitielles

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 2	245	X	X	X	X	8	6	6
2 - 4	246	X	X	X	X	8	8	9
4 - 6	248	X	X	X	X	8	6	7
6 - 8	249	X	X	X	X	6	6	6
8 - 10	250	x	x	x	x	6	2	5
10 - 12	194	X	X	X	X	6	2	2
12 - 14	247	X	X	X	X	6	2	2
14 - 16	251	X	X	X	X	Non	2	Non

Station 90-031 : Box-core 034A

Eaux Interstitielles.

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	252	X	X	X	X	6	5	5
1 - 2	253	X	X	X	X	6	4	Non
2 - 3	254	X	X	X	6	Non	Non	Non
3 - 4	255	X	X	X	3	Non	Non	.Non
4 - 5	256	Non	Non	Non	Non	Non	Non	Non
5 - 7	257	X	X	X	X	6	2	5
7 - 9	258	X	X	X	X	6	4	Non
10 - 12	260	X	X	X	X	6	2	2
12 - 14	261	X	X	X	X	6	3	2
14 - 16	262	X	X	X	X	6	5	4
16 - 18	263	X	X	X	X	6	3	2
18 - 20	264	X	X	X	4	Non	Non	Non
20 - 22	265	X	X	X	X	6	5	4
22 - 24	266	X	X	X	X	6	2	2
24 - 26	267	X	X	X	X	6	5	4

Station 90031 : Box-core 041A

Eaux Interstitielles

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	268	X	X	X	X	6	12	8
1 - 2	269	X	X	5	X	6	8	8
2 - 3	270	X	X	X	X	6	3	Non
3 - 4	271	X	X	X	X	Non	6	Non
4 - 5	272	X	3	X	X	3	4	5
5 - 7	273	X	X	X	X	6	6	5
7 - 9	274	X	X	X	X	6	5	5
9 - 11	275	X	X	X	X	6	5	5
12 - 14	276	X	X	X	X	6	8	7
14 - 16	277	X	X	X	X	6	5	4
16 - 18	278	Non	Non	Non	Non	Non	Non	Non
18 - 20	279	X	X	X	3	Non	Non	Non
20 - 22	280	X	X	X	X	6	2	3
22 - 24	281	X	X	X	X	6	7	7
24 - 26	282	X	X	X	X	Non	2	Non
26 - 28	283	X	X	X	6	6	Non	Non

Station 90-031-045 Box-core

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	284	X	X	X	X	6	5	8
1 - 2	285	X	X	5	X	6	6	Non
2 - 3	286	Non	Non	Non	N on	Non	Non	Non
3 - 4	287	X	X	X	X	Non	5	5
4 - 5	288	X	X	X	X	6	4	Non
5 - 7	289	X	X	X	X	6	5	8
7 - 9	290	X	X	X	X	6	4	Non
9 - 11	291	X	X	X	X	Non	6	Non
12 - 14	292	X	X	X	X	6	5	5
14 - 16	293	X	X	X	X	6	5	5
16 - 18	294	X	X	X	X	6	5	4
18 - 20	295	X	X	X	X	6	5	5
20 - 22	296	X	X	X	X	Non	4	Non
22 - 24	297	X	X	X	X	6	5	4
24 - 26	298	X	X	X	X	6	5	3
26 - 28	299	X	X	X	6	6	8	5

Station 90031 : Box-core 052A

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	300	X	X	X	X	6	8	8
1 - 2	301	X	X	5	X	6	4	Non
2 - 3	302	X	X	X	4	Non	Non	Non
3 - 4	303	Non	Non	Non	Non	Non	Non	Non
4 - 5	304	X	X	X	X	Non	Non	Non
5 - 7	305	X	3	X	X	Non	Non	Non
7 - 9	306	X	X	X	4	Non	Non	Non
9 - 11	307	X	X	X	X	Non	2	Non
12 - 14	308	X	X	X	4	Non	Non	Non
14 - 16	309	X	X	X	3	Non	Non	Non
16 - 18	310	X	X	X	Non	Non	Non	Non
18 - 20	311	X	X	X	Non	Non	Non	Non
20 - 22	312	X	3	X	Non	Non	Non	Non
22 - 24	313	Non	Non	Non	Non	Non	Non	Non
24 - 26	314	X	Non	X	Non	Non	Non	Non
26 - 28	315	X	X	X	2	Non	Non	Non

Station 90031 : Box-core 059A

Profondeur (cm)	n°bouteilles porosité	Acides aminés (2 ml)	Alcalinité (4 ml) (HgCl2) (non lavés)	Ca2+ (3 ml) (lavés)	Fe2+ (5 ml) (lavés) (.5ml HCl)	C13 (min. 6ml) (HgCl2) (non lavés)	U/Th (min 2ml) (.5ml HCl)	Sels nutritifs (HgCl2) (min 5ml)
0 - 1	316	X	X	X	X	6	5	5
1 - 2	317	X	X	5	X	6	3	5
2 - 3	318	X	X	X	4	Non	Non	Non
3 - 4	319	X	X	X	X	6	3	Non
4 - 5	320	X	X	X	X	Non	3	Non
5 - 7	321	X	3	X	X	6	4	Non
7 - 9	322	X	X	X	4	6	4	Non
9 - 11	323	X	X	X	X	Non	Non	Non
12 - 14	324	X	X	X	X	6	4	Non
14 - 16	325	X	X	X	X	5	Non	Non
16 - 18	326	X	X	X	X	5	Non	Non