Cruise Report

R/V ALBATROSS IV Cruise 9505 to Georges Bank

US GLOBEC

NW ATLANTIC/GEORGES BANK STUDY

9 - 18 May 1995

Acknowledgements

We appreciate and acknowledge the efforts and professionalism of the officers and crew of the ALBATROSS IV. Their dedication and cooperation made the success of this cruise possible.

This cruise was sponsored by the National Oceanographic and Atmospheric Administration and the National Science Foundation. This report was prepared by David Mountain, Charles Miller, John Sibunka, Maureen Taylor and Peter Garrahan.

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Purpose of the Cruise

The cruise aboard ALBATROSS IV (ALB-9505) was the fourth in a series of six broad scale surveys conducted monthly from February to July to monitor the changing biological and physical status in the Georges Bank ecosystem. These six broad scale surveys are part of the 1995 U.S. Globec Georges Bank Program. The first cruise, EN-261 (Wiebe) was from 2-20 February, the second cruise EN-263 (Miller) was from 13-23 March and the third was EN-265 (Sibunka), from 11-22 April. The principle objectives of the cruise were to:

(1) determine the distribution and abundance of the ichthyoplankton and zooplankton community on the Bank and in adjacent Gulf of Maine and slope waters. Emphasis is on target fish (eggs, larval and juvenile cod and haddock) and copepod species (all stages of *Calanus finmarchicus* and *Pseudocalanus* sp.) and their predators and prey.

(2) provide systematic collections of larval and juvenile cod and haddock for age and growth estimates and feeding habits.

(3) collect individuals of *Calanus* and the euphausiid, *Meganyctiphanes norvegica*, for population genetics studies.

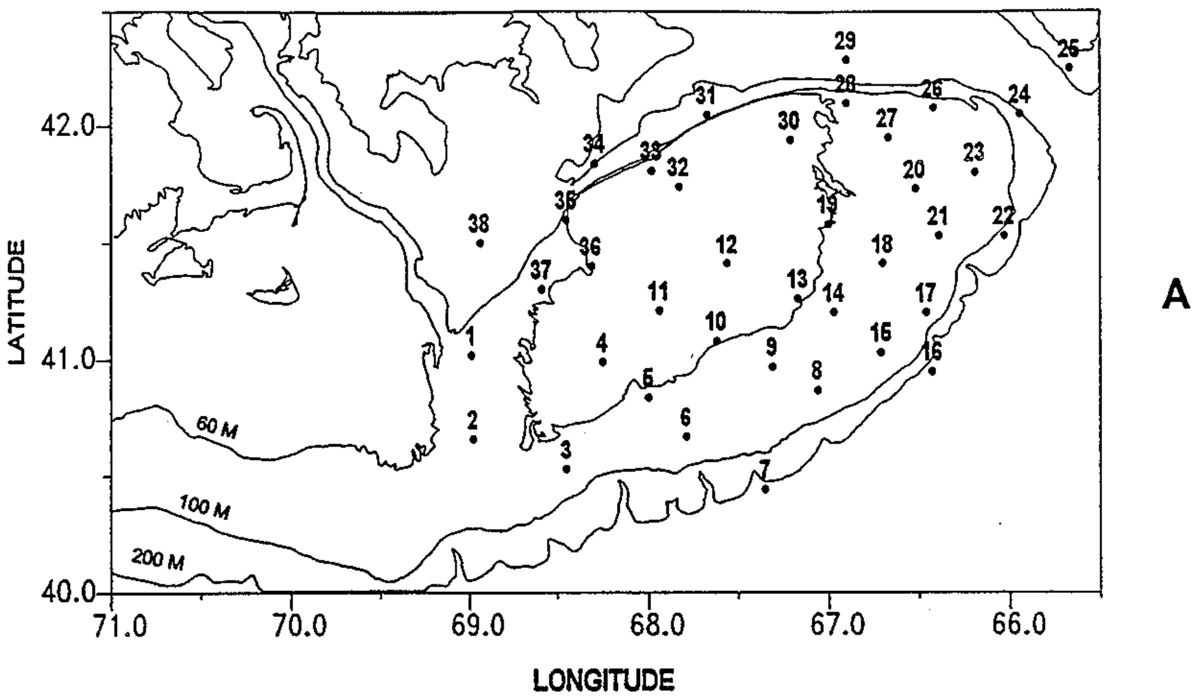
(4) conduct a hydrographic survey of the Bank.

(5) map the Bank wide velocity field using an Acoustic Doppler Current Profiler (ADCP).

Sampling Operations

The plan for the GLOBEC Broad Scale surveys is to accomplish the objectives above by first sampling at a grid of 38 "standard station" locations which covers the entire bank (Figure 1). Then a smaller scale grid of stations would be selected to focus on the area of the bank in which the highest concentrations of cod and haddock larvae were observed in the original, bank-wide survey.

The stations in the bank-wide grid are assigned standard numbers, 1-38, in the order they are intended to be occupied on each survey. On this cruise they were occupied in order. For sampling the 38 stations were separated into two groups, full stations and partial stations. At the 18 full stations, a complete set of sampling operations was conducted. This involved a double-oblique bongo net tow, a CTD cast, a 1-m^2 MOCNESS (Multiple Opening Closing Net Environmental Sampling System) tow, a plankton pump cast and a 10-m^2 MOCNESS tow. At the partial stations only the bongo tow, CTD cast and MOC-1 tow were done.



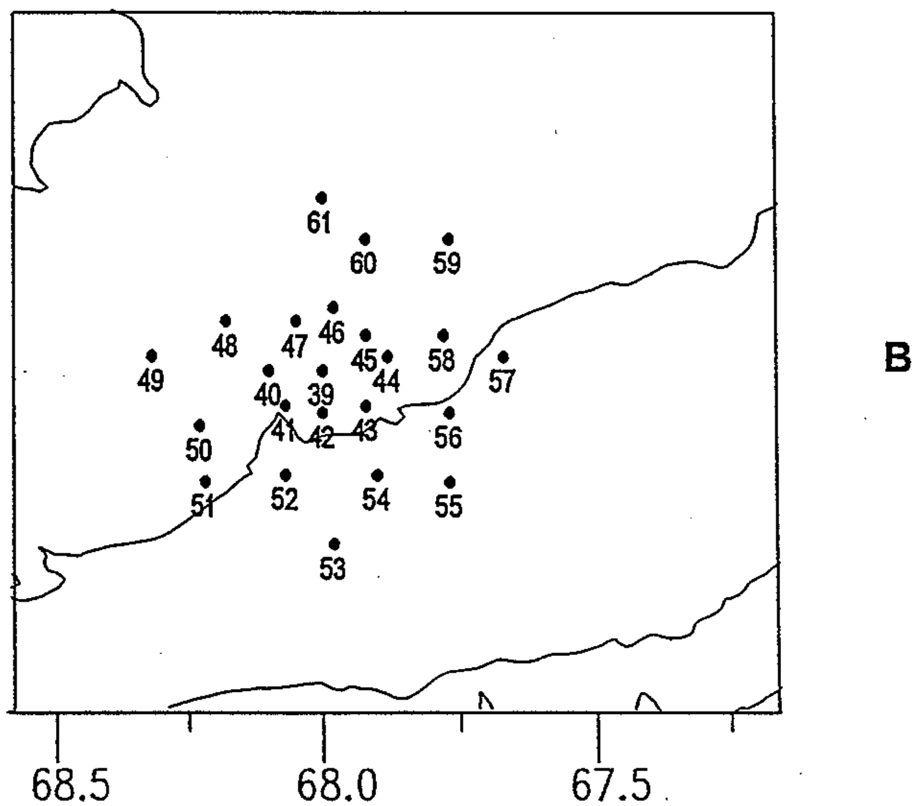


Figure 1. Standard stations (A) and post grid stations (B) occupied during the GLOBEC broad - scale survey ALB9505.

On the second, small-scale survey to define the distribution of larvae, the sampling operations alternated between both a bongo tow and a MOC-1 tow at about half of the stations and just a bongo tow at the other half. Since the locations of stations in the larval survey grid change for each Broad Scale survey cruise, they do not have "standard station" numbers, but were given consecutive station numbers (consecutive from the beginning of the cruise). The survey pattern was three concentric circles with eight stations each about a central station. The radii of the circles were 5, 10 and 15 nautical miles. The survey grid occupied is shown in figure 1b. On this cruise pump casts were added to the sampling at 4 of the stations on the larval grid to supply samples of larval prey organisms for J. Green.

Bongo tows were made with a 0.61-meter frame fitted with paired 0.335-mm mesh nets. A 45-kilogram (kg) ball was attached beneath the bongo frame to depress the sampler. Digital flow meters were suspended in the mouth of each net to determine the volume of water filtered. Tows were made according to standard MARMAP procedures, i.e. double oblique from surface to within five meters of bottom or to a maximum depth of 200 meters while maintaining a constant wire angle throughout the tow. Wire payout and retrieval rates were 50m/min and 20m/min respectively. These rates were adjusted down in shallow water (<60m) to obtain a minimum of a five minute tow. A Seabird CTD was attached to the towing wire above the bongo to monitor sampling depth in real time mode and to measure and record temperature and salinity. Once back on board, the 0.335-mm mesh nets were each rinsed with seawater into a 0.335-mm mesh sieve. The contents of one sieve was preserved in 4% formalin and kept for ichthyoplankton species composition, abundance and distribution. The sample from the other net was frozen if abundant *Calanus* and *Pseudocalanus* were present; otherwise the sample was discarded. These frozen samples provide fish food for an ongoing Coastal Ocean Program study on Atlantic mackerel at the University of Rhode Island.

The 1-m^2 MOCNESS (MOC-1) sampler was loaded with ten nets. Nets 1-4 were fitted with 0.150-mm mesh for the collection of older and larger copepodite and adult stages of the zooplankton. Nets 0, and 5-8 were fitted with 0.335-mm mesh for zooplankton (nets 0 and 5) and ichthyoplankton (nets 6-8) collection. Tows were double-double oblique from the surface to within 10 meters from the bottom. The maximum tow depth for nets 0 and 1 was 300 meters, and for nets 5 and 6 was 200 meters. Winch rates for nets 0-5 were 5m/min and for nets 6-8, 10m/min. The depth strata sampled were 0-15m, 15-40m, 40-100m, and >100m. The first (#0) and sixth (#5) nets are "down" nets. For shallow stations, with only 2 or 3 of the depth strata, not all nets were fished. The contents of nets 0-4 were sieved through 0.150-mm mesh, subsampled using a plankton splitter if the final volume was too large, then preserved in 10% formalin. Samples from nets 5-8 were sieved through 0.335-mm mesh and preserved in 95% ethanol. After 24 hours of initial preservation, the alcohol was changed. The used ethanol was retained for disposal or recycling ashore. At selected sites, a 90-ml subsample of the contents of the bottom and surface 0.150-mm mesh nets was removed and preserved separately in formalin. Fifteen live stage-five *Calanus* copepodites were videotaped and frozen in liquid nitrogen for future analysis of their lipid content. The MOC-1 used on this cruise was equipped with a 16 bit electronics unit.

The 10-m^2 MOCNESS (MOC-10) was loaded with five 3.0-mm mesh nets. Tows were double oblique from surface to 15 meters from bottom or a maximum depth of 300 meters. The same depth strata were sampled as with the 1-m^2 MOCNESS. The winch rate for retrieval varied between 5 and 15m/min depending on depth strata. The slow winch rates were used in order to filter at least 4,000-5,000m^3 of water per depth stratum sampled. A step oblique tow profile during retrieval was done if needed to achieve this. After sieving through a 0.335-mm mesh, samples were preserved in 10% formalin. The MOC-10 used on this cruise was equipped with a 12 bit electronics unit.

The Pacer high-volume pump was used to collect nauplii and younger copepodites stages of the zooplankton. The pump system was deployed by connecting the intake hose to a section of PVC clamped to the hydrowire along with a Seabird CTD. Two 45 kg weights were used to depress the array. Three 30 m sections of 7 cm diameter hose were connected to the pump, allowing a maximum depth of 70 m to be attained. At shallow stations the hose was lowered within 5 meters of the bottom. Three integrated samples were collected at depth strata similar to MOCNESS samples: bottom-40 m, 40-15 m, and 15-0 m. Samples were collected in 50 micron nets and preserved in 10% formalin. Before pumping started, the hose was flushed for 60 seconds at the maximum depth to assure that water from the desired strata was being sampled. Likewise the hose was held at the surface for 60 seconds to allow the collected water to pass from the hose. Pumping volumes were approximately 340 L/min. Wire retrieval rate was approximately 4-6 m/min. These rates resulted in volumes of 0.5 m3 for each 5 m depth interval sampled.

At the end of the cruise an additional station was occupied north of Great South Channel to collect *Calanus* for an ongoing feeding study at the University of Rhode Island (Durbin and Durbin) and for lipid analysis (Miller). The MOC-1 was deployed at 15m/min to 140 meters (station depth was 168 meters) and held at that depth while each net (#'s 1-4) was fished to obtain a volume of 300m^3 water filtered. Thereafter the MOC-1 was retrieved at 15m/min and nets # 5-9 were fished as follows: net 5(140-100m), net 6(100-75m), net 7 (75-50m), net 8(50-25m), and net 9(25-surface). A 3/4-meter ring net fitted with a 0.335-mm mesh net and depressed with a 45-kg weight. Tows were smooth double-oblique with a maximum of 50 meters of wire payed out. Winch rates were 10m/min for both payout and haulback. Vessel speed was 1.5 kts. Five ring net tows were made.

The ship's ADCP system (a 300 kHz, broad band unit) was used to make continuous measurements of the water current profile under the ship, in order to construct the current field over the whole Bank.

A listing of the sampling events during the cruise is presented in Appendix B. A summary of the sampling operations is listed below.

Sampling System	Tows/Casts	Number of Samples
Bongo nets, 0.61-m 0.335-mm mesh	61 tows	64 preserved, formalin 14 frozen
MOCNESS, 1-m^2	51 tows	
0.150-mm mesh		157 preserved, formalin
0.335-mm mesh		238 preserved, EtOH
MOCNESS, 10-m^2	17 tows	
3.0-mm mesh		75 preserved, formalin
Pump	22 profiles	
0.050-mm mesh		57 preserved, formalin
CTD/Rossette	38 casts	

Equipment notes:

The 1 m^2 MOCNESS system worked well during this cruise. There were only minor printing setup problems due to some software changes made prior to the cruise. After the first few tows, the net bar response stopped working. And during the cruise the net bar itself broke off the response unit. A few more people from the scientific crew were trained to fly the MOC-1 for future cruises.

The MOC-10 worked well, with not significant computer problems. There were some mechanical problems with the net bar release system (see Narrative below). Also during one cast, a piece of black electrical tape got caught in the flowmeter causing flow rates to appear decreased.

The zooplankton pump system caused few problems this cruise. Because the R/V Endeavor was conducting concurrent research with the Albatross IV, a second pump system was needed. The setup on this cruise was a duplicate of the original one on the Endeavor. A few design modifications were made based upon past experience. The pump barrel is now housed together with the pump manifold and both can be tied down simultaneously. The electronic flowmeter is of a newer design and was housed in a water-proof plastic box. Knife-type valves were inexpensive and effective replacements for the ball valves in the original pump system. The pump worked very well positioned sternward of the J-frame along the rail on the Albatross. The hose was forward of the J-frame, coiled well and seemed out of the way.

Cruise Narrative

Sailing was scheduled for 1300 on May 8. Due to strong winds sailing was delayed until 0600 on May 9. The scientific field party and the ship's personnel are listed in Appendix A. The watch schedules were established as 0600-1400, 1400-1800, 1800-2200, and 2200-0600. This allowed each watch an 8 hour period for sleep, while still having two meals occur at the change of the watch.

The vessel arrived at the first standard station, station #1, at 1415 on May 9 and began sampling operations. All systems functioned well. The scientific party included many individuals who had been on 2 or 3 of the earlier Broad Scale cruises and quickly oriented to the routine of the sampling operations.

At station #7 on May 11, the MOC-10 nets were too heavy to be lifted aboard by hand. The ship's boom had to be used to haul the nets aboard. The nets contained a very large catch of salps.

At station #18 on May 12, only one net tripped on the MOC-10 tow. The gearing on the release mechanism appeared stiff. After some turning of the mechanism is seemed to work freely again. But during the next MOC-10 tow on station #20, the control program cut off during the tow. The tow was terminated. Upon recovery, the gearing was again stiff to turn. The battery voltage also was low. After inspection by C. Miller and ET B. Stone, a small mis-alignment of the motor was believed to be the cause of the problems with the gear mechanism. The increased resistance to turning may have caused the gear stepper motor to draw the low battery voltage below the minimum to maintain the program communication, causing the program cut off. After realignment of the motor and a change of battery, no further problems were encountered with the MOC-10 system.

On May 13 a meeting of the scientific party was held to review the operations. The night watch found it difficult get a proper sleep during their 8 hour period, likely because it came during the morning and early afternoon. After discussion it was agreed to switch to a '6 and 6' schedule (0600-1200, 1200-1800, 1800-2400, 0000-0600) starting a 0000 on May 14.

On the evening of May 15, radio communications with the SEWARD JOHNSON were established to learn of their findings in order to help choose a location for the larval survey. G. Lough (Chief Scientist on SEWARD JOHNSON) reported finding larvae all along the southern flank of the bank between the 50 and 60 m isobaths, but with no area of large concentration. The highest catches in the first 38 stations were at stations #4, 5, 10 and 13. As a result the larval survey a chosen to be centered at 41' 00 N, 68 00' W (Figure 2). The 38 station survey was completed at 1300 on May 16, and the larval survey grid was begun at 1745 the same day.

The first 22 stations of the larval survey grid (consecutive stations #39 - #61) were conducted without incident. The winds then increased in speed and reached steady speeds above 30 knots, with gusts above 40 knots. The last two stations on the grid were dropped and the vessel proceeded toward a spot north of Great South Channel were special sampling was conducted to collect copepods for mackerel feeding studies underway at URI and for lipid analysis. After these special collections were complete, the vessel then proceeded to Woods Hole and arrived at 1630 on Thursday May 18.

Despite sailing 16 hours late, good weather conditions and efficient operations aboard ALBATROSS IV enabled the cruise to accomplish its sampling and to return 16 hours early.

Individual Reports

Hydrography (Maureen Taylor and David Mountain)

The objective of the hydrographic sampling on the broad scale survey cruises is to characterize the physical environment within which the target organisms reside. Of particular interest is the seasonal development of thermal and density stratification of the Georges Bank waters. The temperature and salinity data can also give an indication of the source of the waters on the Bank: Gulf of Maine, Scotian Shelf, and Slope water.

The primary hydrographic data presented here were collected using a Neil Brown Instrument Systems Mark V CTD instrument (MK5), which provides measurements of pressure, temperature, conductivity, and fluorescence. The MK5 records at a rate of 16 observations per second, and is equipped with a rosette for collecting water samples at selected depths.

A Seabird Electronics Seacat model 19 profiling instrument (SBE19 Profiler) was used on each bongo tow to provide depth information during the tow. Pressure, temperature, and salinity observations are recorded twice per second by the Profiler. The Profiler was also deployed during pump operations, again to provide depth information.

The following is a list of the CTD data collected with each of the sampling systems used on the cruise:

Instrument	# Casts
MK5	39
SBE19/Bongo	61
SBE19/Pump	22
SBE19 calibration	7

The MK5 was deployed with 6 bottles on the rosette and samples were collected for various investigators. On each MK5 cast, samples were collected for oxygen isotope analysis at selected depths for R. Houghton (LDGO) and a sample was taken at the bottom for calibrating the instrument's conductivity data. On stations which included pump operations, rosette samples for nutrient analysis were collected at selected depths for J. Bisagni and J. O'Reilly (NMFS), and samples for chlorophyll analysis were collected from 100 meters (or the bottom), 20 meters, and surface. Chlorophyll samples (three, 50 ml replicates) were filtered for three size fractions: total, < 20 microns, and < 5 microns. Total chlorophyll filtration results were also used for comparing the data from the MK5 fluorometer. Also on pump stations, surface samples for phytoplankton species composition were collected for J. O'Reilly (NMFS). The chlorophyll analysis was conducted at sea using an acetone extraction method and results were read 24 hours later on a fluorometer. These results are not presented here because the fluorometer used on this cruise requires calibrating before the calculation of chlorophyll in the samples can be made.

Parameter	**# samples taken**
MK5 calibration	39
Oxygen isotope	135
Nutrients	75
Chlorophyll	159
Species composition	16

The SBE19 Profiler and the MK5 data were post-processed at sea. The Profiler data were processed using the Seabird manufactured software: DATCNV, ALIGNCTD, BINAVG, DERIVE, ASCIIOUT to produce 1 decibar averaged ascii files. The raw MK5 data files were processed using the manufacturer's software CTDPOST in order to identify bad data scans by "first differencing." The latter program flags any data where the difference between sequential scans of each variable exceeds some preset limit. The "Smart Editor" within CTDPOST was then used to interpolate over the flagged values. The cleaned raw data were converted into pressure averaged, pressure centered 1 decibar files using algorithms provided by R. Millard of WHOI, which had been adapted for use with the MK5.

Surface samples for chlorophyll, oxygen isotope, and species composition were not taken at station #4 because the surface Niskin bottle did not close properly and the sample was lost.

Figure 1a shows the station locations occupied during the bank - wide survey. Stations occupied during the secondary larval fish survey are shown in figure 1b. The MK5 was deployed only at station 39 of this "star" pattern of stations. The data presented here are from the MK5 CTD system only. The surface and bottom temperature and salinity distributions are shown in Figures 2 - 3. Surface and bottom anomalies of temperature and salinity as well as a stratification index (sigma-t difference from the surface to 30 meters) were calculated using the NMFS MARMAP hydrographic data set as a reference. The anomaly distributions are shown in figures 4-6. Figures 8a and 8b show the surface and bottom fluorescence distribution. Profiles of each MK5 CTD cast with a compressed listing of the data are shown in Appendix C.

The surface distribution figures show that the southern portion of the Bank was warmer and saltier than the MARMAP reference, while the northeastern part of the Bank appeared colder and less saline than the reference. A satellite image from before the cruise (May 8) indicated a band of cooler surface water extending from the Scotian Shelf across Northeast Channel to the northeast part of the Bank and southwestward along the shallow part of the bank. The surface temperature and salinity distributions (figures 2a and 3a) also suggest the influence of the cool, low salinity Scotian shelf water extending from the northeast part of the bank to the southwest. Determining the percentage of Scotian Shelf water vs Georges Bank water in that area will require additional analysis of the data.

The most significant feature of the hydrography is the warm, saline water on the southern flank of the bank. Along the bottom salinities > 34 psu extend to near the 60 meter isobath. A warm core ring was observed in satellite imagery (May 20th) along the edge of the 200 meter isobath south of this region, and may be the cause of the encroachment of the warm saline water onto the bank. Still, even in other instances when rings were south of the bank, rarely (if ever) has such warm, saline water been observed extending so far onto the bank.

The stratification anomaly distribution (figure 6b) shows that most of the bank was less stratified than the expected level of stratification for mid - May. Our cruise departure had been delayed a day because of strong winds that passed through on May 8th. The strong winds and large seas may have mixed the surface layer and reduced the level of stratification on the Bank prior to this survey.

The volume average temperature and salinity of the upper 30 meters were calculated for the Bank as a whole and for four sub-regions. These values are compared with characteristic values that have been calculated from the MARMAP data set for the same areas and calendar days (figure 7). The volume of Georges Bank water (salinity < 34 psu) was also calculated and compared against the expected values. Georges Bank as a whole showed temperature and salinity properties slightly colder and fresher than the expected values for mid - May perhaps because of the lingering influence of Scotian Shelf water in the northeast region of the Bank. The southeast region showed a rather large negative anomaly of Georges bank water because of the presence of water >34 psu in the upper 30 meters in this region.

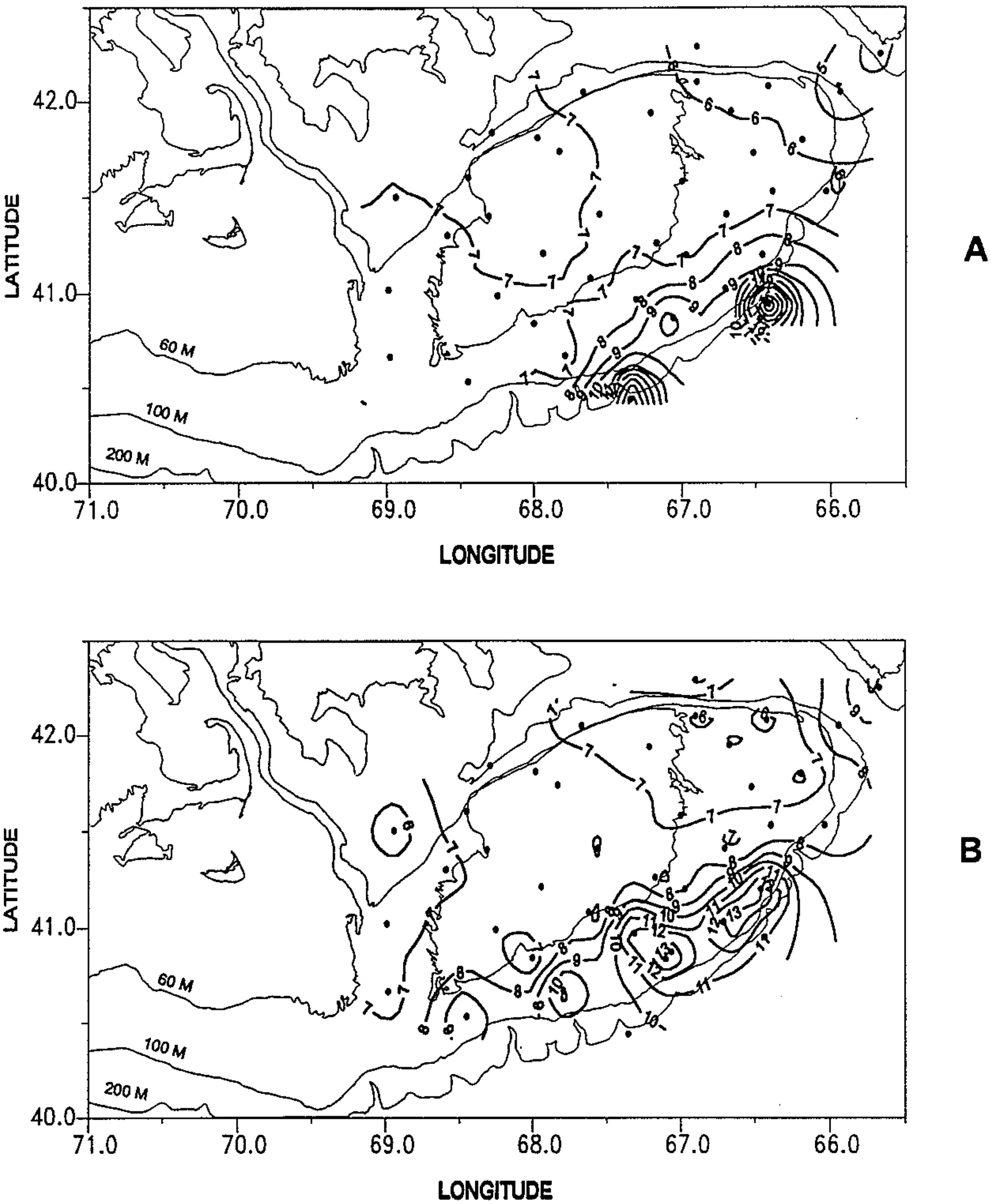


Figure 2. Surface (A) and bottom (B) temperature distributions during broad - scale survey ALB9505.

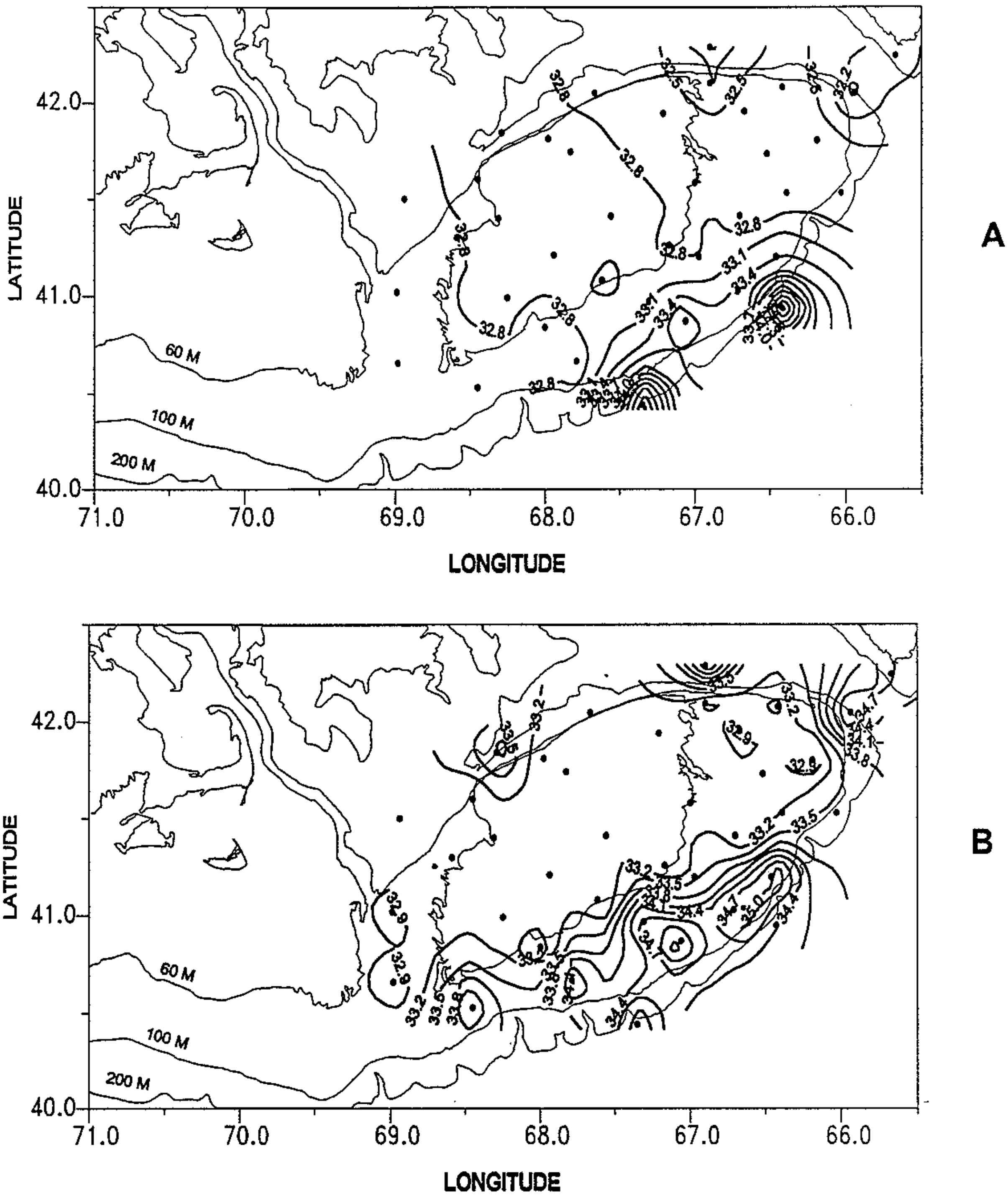


Figure 3. Surface (A) and bottom (B) salinity distributions (psu) during broad - scale survey ALB9505.

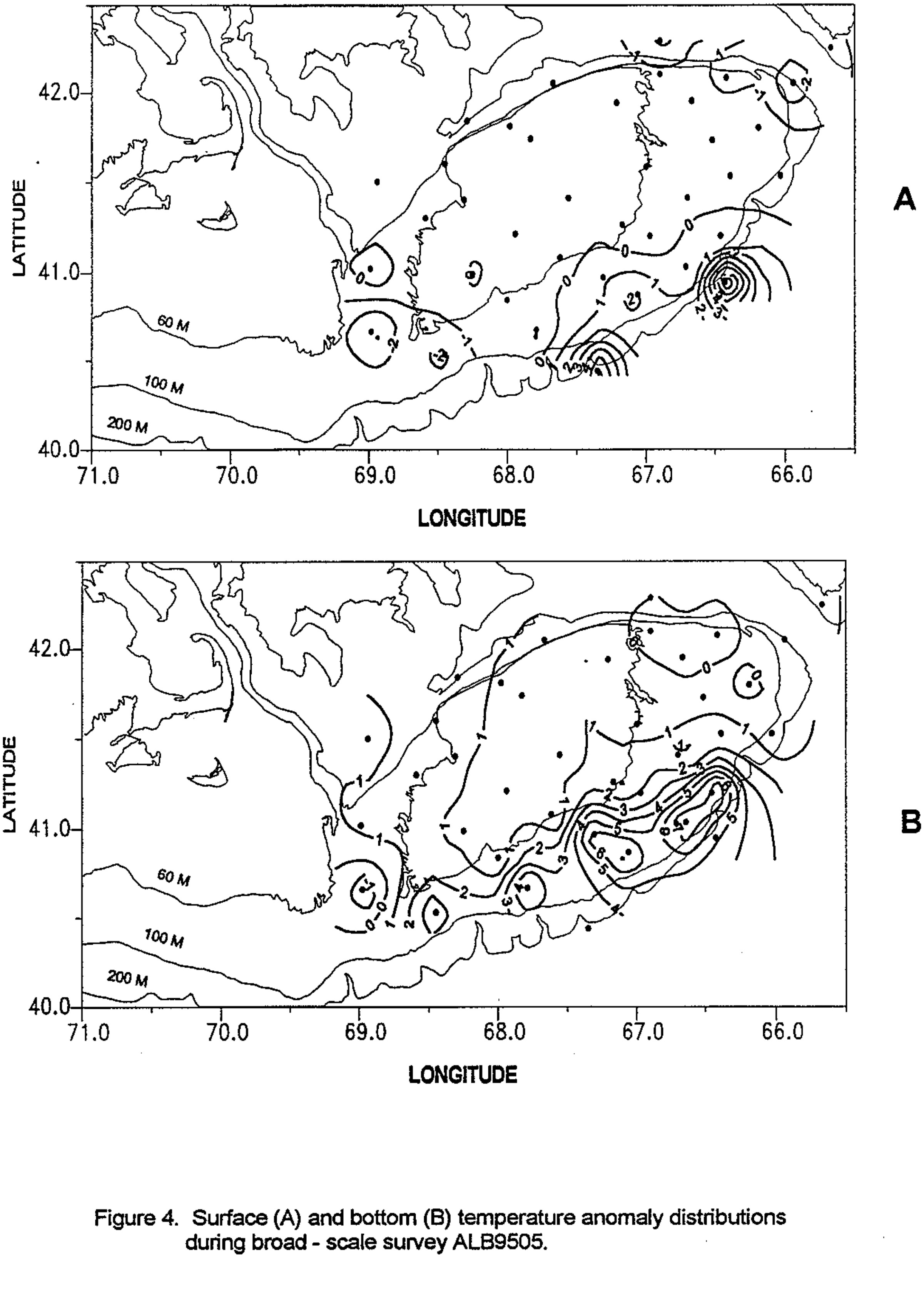


Figure 4. Surface (A) and bottom (B) temperature anomaly distributions during broad - scale survey ALB9505.

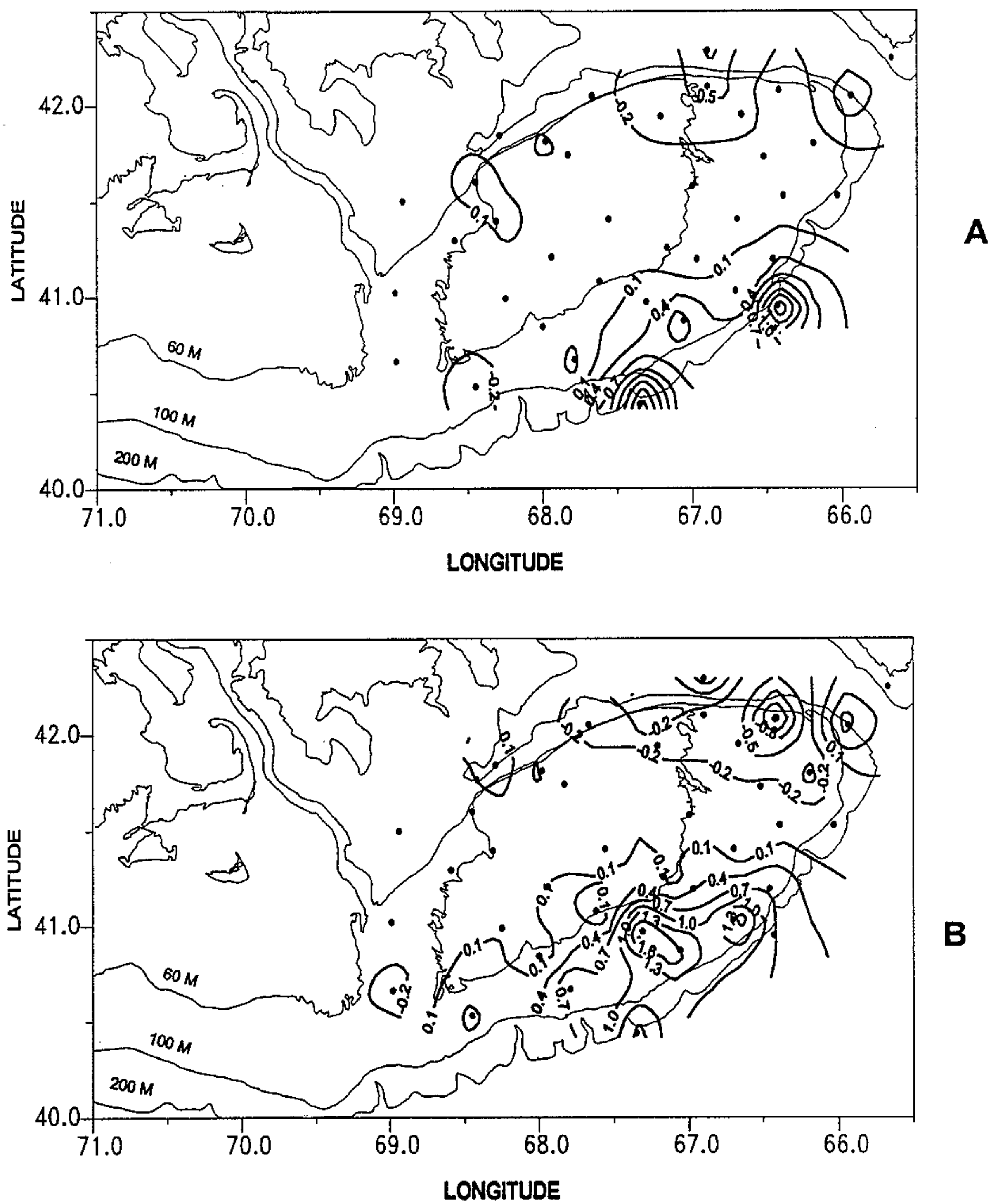
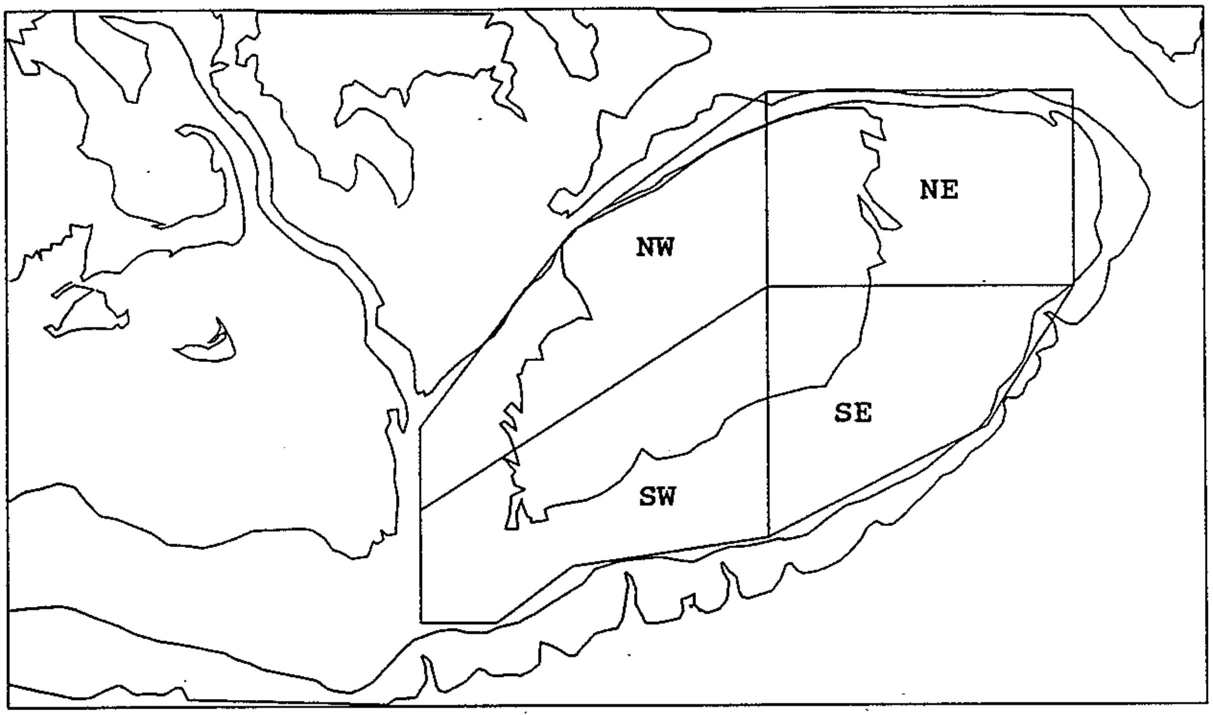


Figure 5. Surface (A) and bottom (B) salinity anomaly distributions (psu) during broad - scale survey ALB9505.

Figure 7. Volume Average Water Properties (0-30m depth)

Temperature, Salinity and Volume of Georges Bank Water (<34 PSU)



Area	Day	Temp	Anom	Salt	Anom	Volume	Anom
Bank	134.	6.56	-0.48	32.77	-0.02	992.	-36.6
NW	137.	7.04	-0.45	32.87	0.02	240.	0.0
NE	133.	6.28	-0.20	32.69	-0.18	280.	0.0
SE	132.	7.05	0.52	32.95	0.20	178.	-66.0
SW	136.	6.41	-1.09	32.69	-0.14	260.	1.9

[preliminary data]

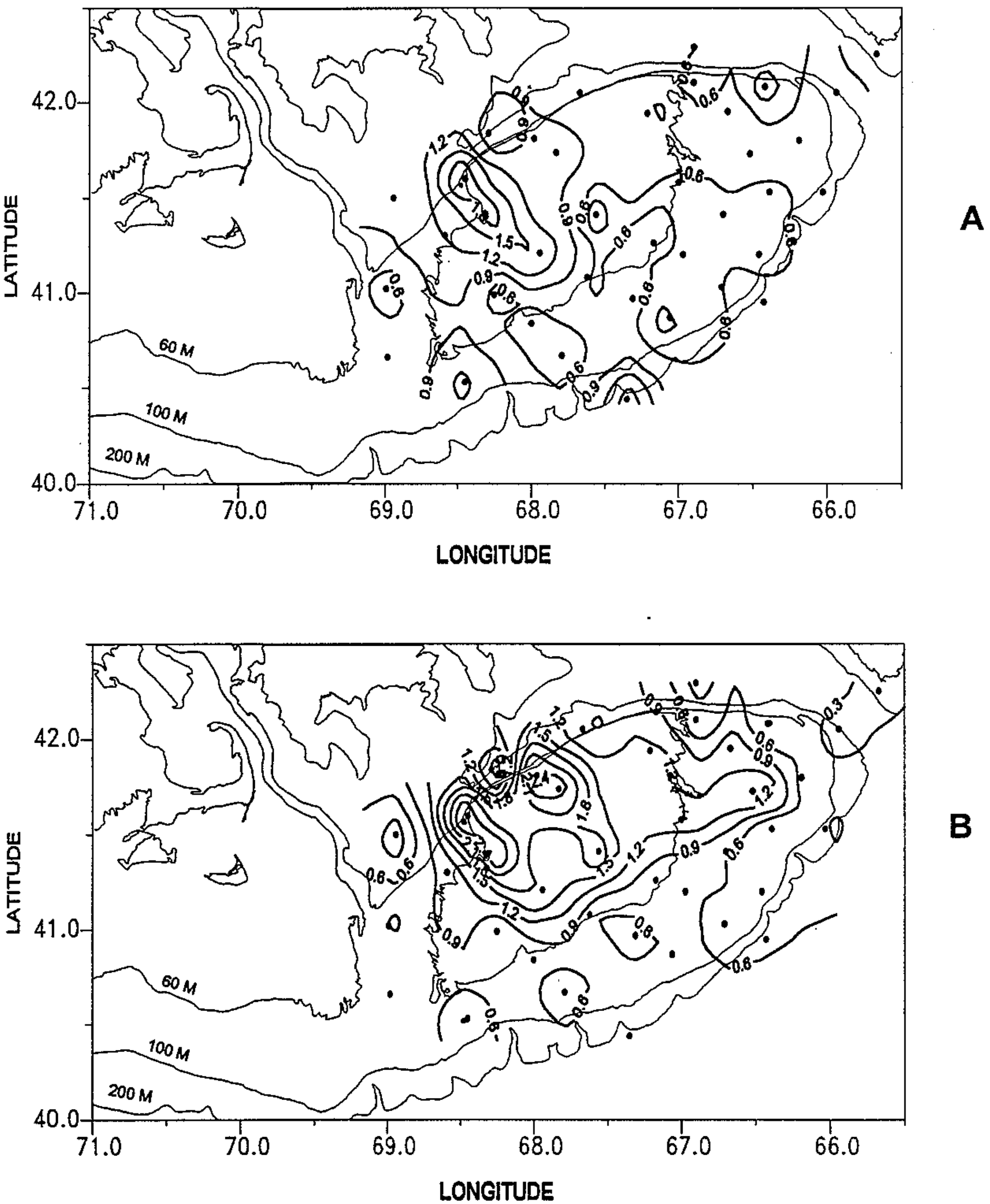


Figure 8. Surface (A) and bottom (B) fluorescence distribution (in volts) during broad - scale survey ALB9505.

Zooplankton (Charlie Miller)

Zooplankton stocks all across the Georges Bank region (Great South Channel, southern Gulf of Maine, Georges Bank, slope water, NE Channel, Nova Scotian shelf) were dominated during mid-May 1995 by *Calanus finmarchicus*. Stage composition of *Calanus* varied somewhat with location, but consistently. On the outward bound Stations 1 and 2 C4 was strongly dominant with a few C3, C5 and a very few adults. Then on the entire southern flank, southern bank and NE peak C5 was dominant with many adults but few C4 in the mixture. At some stations the males outnumbered females and many females carried spermatophores. On return to the Gulf of Maine (particularly Stations 34 and 38) we 'returned' to the situation first observed at Stations 1 and 2, only presumably advanced by a week. The dominant stage was C5, a few C4 remaining and a few adults in the mix. Again, females frequently carried spermatophores.

Based on these observations and those from the previous cruises, *Calanus* is finishing the G2 generation throughout the region. The northern and western portions lag behind the southern and eastern portions by about one stage interval. This entire schedule is advanced about a month from what we observed in May-June of 1994 (C.O. ISELIN 9407). At that time I interpreted the stock (based on older slope water and Gulf of Maine data) as finishing G1. Now it appears more likely they were actually finishing G2 (as suggested then by Cabell Davis).

At Stations 34 and 38 just out into the Gulf of Maine, the deeper stock was mostly C5 showing signs of the diapause phase. They had full lipid stores, assumed a resting posture in dishes, had empty guts and no readily observed gonadal development. In the surface the C5 were various in lipid accumulation, including some with only a tiny squib of oil posteriorly. Many had strongly developing gonads and were obviously going to mature. These facts make it appear that the G2 generation of 1995 is dividing (as did that of 1994) into groups maturing and groups initiating diapause. Conditions in respect to temperature have been quite uniform across the region, so it is difficult to see what cues that could provide for the rest/mature decision.

Other copepod species were minor contributors to biomass region wide. *Pseudocalanus* spp. were present everywhere, but did not approach the abundances seen in 1994 when they were particularly abundant over shallow portions of the bank. Populations of *Centropages hamatus* and *Centropages typicus* were sparse as well. I only saw one female specimen of *C. typicus* on the whole cruise. *C. hamatus* were more numerous than *Calanus* at a few shallow stations, but not individually large enough to make up much biomass. Presumably their late-spring to summer population maximum lies ahead.

Sagitta elegans was very abundant at many sites. It was present in significant numbers at all stations inside the 60 m line. At Station 31 on the northern edge of the bank we hit a massive concentration of them. In the double MOCNESS haul there were none collected on the first arrival at the surface (nets 3 and 4), but the second arrival (nets 8 and 9) produced samples almost entirely *Sagitta*. Sitting in the sieve they looked like saimin to serve six. All specimens were juveniles, some a little farther along than others were bearing seminal vesicles. Some seminal vesicles seemed burst, although they may just have been injured. All ovaries were far from mature. Chaetognath patches have been reported from this region before (Lough and others), and they have been seen occasionally in the Pacific. Those I have observed there were also juveniles. The reason for such dense accumulations of small predators is not known. These did have some copepods mixed in with them, and many seemed to have dined well before capture. Others, of course, had gobbled a copepod in the net.

Hydroïds (*Clytia*) were present at a number of stations, particularly 4, 5, 10 and 11. At a few stations they made up a significant portion of the biomass, but none showed really high abundance as seen in 1994. They were absent (rare at least) from the NE peak and not seen (except in one MOC-10 haul) in stations along the entire northern leg of the cruise. If on this expedition we had been looking freshly at the plankton without special attention to the possible presence of *Clytia*, we might have noted them but certainly would not have been tempted to assign them special ecological significance. However, there were enough of them that they could be very abundant by June.

Coiled pteropods (*Spiratella/Limacina*) were abundant at some stations, particularly a few in the Gulf of Maine and several during the 'star' pattern (Stations 39-61).

Virtually all shallow stations over the bank and many of those along the south slope and on the NW peak produced large quantities of *Coscinodiscus*, a centric diatom. Once aboard these cells sink like bits of lead, but since they are caught at all levels they must either have better buoyancy before rubbing in the net or they are powerfully mixed through the water column by tidal turbulence. I suspect they have a mucilage covering that amounts to a buoyant collar and that it is rubbed off by netting. This same plant was very abundant in March (and presumably April) as well, making it appear as if they are sustained in a perpetual bloom in shallow areas. *Coscinodiscus* were joined by numerous *Rhizosolenia* wherever the hydrography indicated intrusion of (cold, slightly dilute) Nova Scotian shelf current water. We need to learn more about these plants and about the relations prevailing between primary productivity and nutrient supplies over the bank. It is very hard to see how even a very large copepod, an adult *Calanus*, for example, could deal with one of these cells as a foodstuff. Some feeding experiments or direct examinations (ala Jeff Turner) of fecal material for frustule bits are in order.

Ichthyoplankton (J. Sibunka, A. Weiner, A. Tesolin, and R. Jones.)

Samples collected at 38 Globec broad scale standard stations for ichthyoplankton analysis from both the bongo and MOC-1 (nets 6-9) were examined on shipboard for the presence of fish eggs and larvae. This was done in an attempt to determine their occurrence on the

Bank and obtain a gross estimate of distribution, abundance and size range. The following discussion on ichthyoplankton catches is based on these findings.

Cod and Haddock Larvae:

Larval cod (size range 10-25mm) dominated the catches this cruise in both abundance and distribution on Georges Bank. The largest catches and highest occurrence of cod larvae were found at stations occupied in the western and south-central portion of the Bank. The sizes of these larvae were from 10-22mm , with most between 10-15mm total length. Smaller and intermittent catches of cod were collected from the northern flank area of the Bank. These larvae were generally larger, between 18-25mm in length (figure 9).

It was difficult to distinguish larval cod from haddock in these samples. This was partly due to the gross nature of examination of preserved samples in jars and also due to the large volumes of zooplankton in samples which obscured fish larvae. Haddock larvae however were seen in samples collected at Station #'s 4 and 5 located in the south-western portion of the Bank. Catches were approximately 10 larva/station; and the size range of 10-20mm length was the same as for larval cod collected at these stations.

In a comparison of cod and haddock larvae collected on this survey with results of the ten-year MARMAP program for May, a similar distribution and abundance pattern is evident. The MARMAP data shows the highest catches of both cod and haddock occurred along the southern and south-central portion of the Bank. However, these high catches consisted of larvae between 5 and 8mm in length. Larger larvae (>10mm) were widespread across the Bank. No explanation can be given at this time regarding the concentration of larger larvae seen in samples collected during this survey.

Cod and Haddock Eggs:

Collections of large sized gadid eggs (cod and haddock, >1.2mm diameter) during this cruise were both infrequent and small in numbers caught. These results indicate that the peak in spawning for these two species on the Bank had past for this season. The only two occurrences of great abundance (200+ eggs/station) were at Station # 25, located south of Nova Scotia and at Station # 32, located on the north central portion of the Bank. Historical (MARMAP) data indicate April and May as the principle spawning months, with the greatest abundance of eggs occurring on the Northeast Peak area of the Bank. With water temperatures across the Bank for this winter/spring season of 1995 similar to those of years past, no explanation can be given to why cod/haddock spawning seems to be about a month earlier than expected.

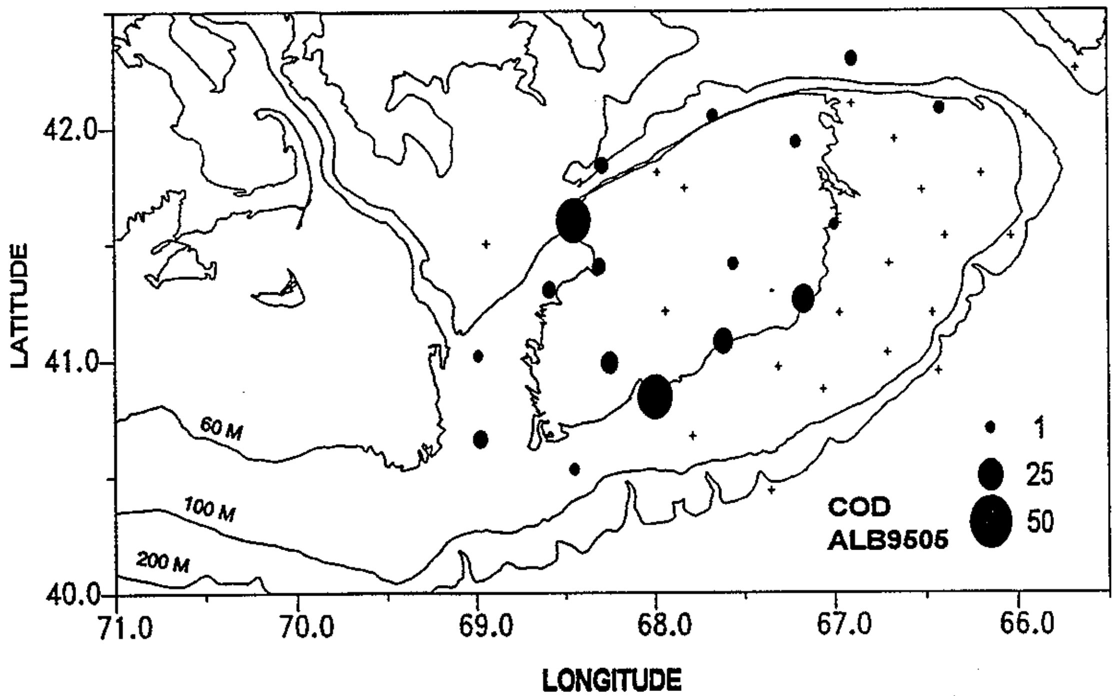


Figure 9. Preliminary distribution and relative abundance of cod larvae from R/V ALBATROSS IV GLOBEC broadscale cruise AL95-05, 5-18 May.

Miscellaneous Fish Larvae:

The following fish larvae were also identified in the ichthyoplankton samples collected during this broad scale survey.

1.	American Plaice	*Hippoglossoides platessoides*
2.	Witch flounder	*Glyptocephalus cynoglossus*
3.	Atlantic mackerel	*Scomber scombrus*
4.	Sculpins	*Myxocephalus* spp.
5.	Lanternfish	Myctophidae
6.	Sea snail	*Liparis* spp.
7.	Rockfish	*Sebastes* spp.
8.	Butterfish	*Pepilus triacanthus*
9.	Eels (Leptocephali)	Anguilliformes
10.	Atlantic herring	*Clupea harengus*
11.	Sand lance	*Ammodytes spp.*
12.	Hake	*Urophycis spp.*
13.	Flounder	*Bothus spp.*

Brief analysis of MOC-10 samples (P. Garrahan, J. Sibunka, T. Rotunno, J. Peterson, P. Heredia, A. Jacquet, and J. Bechtel)

Stn 03 -	Zooplankton (ZP) - medusae, ctenophores, amphipods, chaetognaths, phoronomids. Ichthyoplankton (IP) - 1 leptocephalus, 1 cod (28 mm).
Stn 04 -	ZP - ctenophores, medusae, amphipods. IP - ~75 cod (15-30 mm), 1 American plaice (28 mm), 1 leptocephalus, unidentified larvae.
Stn 07 -	ZP - garbage cans full of salps, phoronomids.
Stn 09 -	ZP - ctenophores, chaetognaths, amphipods, shrimp, phoronomids, lobster larvae. IP - ~8 butterfish (16-25 mm), 2 leptocephali, 1 Goosefish (40 mm), Myctophids, 1 Gulf Stream or small mouth flounder (~18 mm), unidentified larvae.
Stn 12 -	IP - ~50 herring (~40 mm), 10 cod (18-40 mm).
Stn 13 -	IP - 25-35 cod (15-40 mm), few haddock (~18 mm).
Stn 16 -	ZP - medusae, lobster larvae. IP - 1-3 cod (24 mm), hatchetfish, 1 leptocephalus, Bothus sp., unidentified deep sea types, unidentified larvae/juveniles - Carangidae?
Stn 17 -	ZP - many salps, amphipods at surface. IP - few Myctophids.

Stn 18 - IP - ~20-30 cod (20-30 mm), 2 leptocephali, 3-5 herring (35-40 mm).

Stn 20 - aborted tow.

Stn 23 - IP - 5-10 cod (20-40 mm), ~25 herring (45-55 mm), 1 sand lance? (35 mm).

Stn 25 - samples in opaque gal. jars - no observations recorded.

Stn 27 - IP - 10-15 cod (18-38 mm), 2 sculpins (15-20 mm).

Stn 29 - ZP - Many krill, ctenophores at surface, pteropods.

Stn 30 - ZP - amphipods, ctenophores, brachyurans, chaetognaths, mysids, pteropods, euphausids, medusae, isopods, salps, phoronomids, hydroids, siphonophores, squid.
IP - 2 cod (~15 mm), 1 deep sea type.

Stn 34 - samples in opaque gal. jars - no observations recorded.
Stn 30 - ZP - isopods.
IP - 11 pipefish.

Stn 38 - ZP - amphipods.
IP - 8-10 cod (18-28 mm), 1 sand lance (40 mm).

APPENDIX A

Officers and Crew of the ALBATROSS IV

CO	Gary Bulmer
XO	Jason Maddox
NAV	Leslie Redmond
CME	Kevin Cruse
3AE	Larry Jackson
2AE	Chuck Hersey
OIL	Orlando Thompson
CB	Kenneth Rondeau
SF	John Cravo
SF	Antonio Alvernaz
SF	Eugene Magan
SF	Anthime Brunette
CS	John Braxton
2C	Jerome Nelson
RET	Bruce Stone

Scientific Party

David Mountain (Chief Scientist)	NMFS, Woods Hole, MA
Maureen Taylor	NMFS, Woods Hole, MA
Amy Tesolin	NMFS, Woods Hole, MA
John Sibunka	NMFS, Sandy Hook, NJ
Alyce Weiner	NMFS, Sandy Hook, NJ
Rebecca Jones	NMFS, Narragansett, RI
Charles Miller	OSU, Corvallis, OR
Maria Pilar Heredia	URI, Narragansett, RI
Peter Garrahan	URI, Narragansett, RI
Janis Peterson	URI, Narragansett, RI
Theresa Rotunno	URI, Narragansett, RI
Jamie Bechtel	URI, Narragansett, RI
Alyce Jaquet	URI, Narragansett, RI

APPENDIX B

Event log for cruise ALB 95-05 (see following pages)..

				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL12995.1	Depart	0	0	0	5	9	600	s	4131.5	7040.4	7	7	Mountain	
AL12995.2	BongoSB	1	1	1	5	9	1427	s	4100.4	6859.6	81	76	Sibunka	
AL12995.3	BongoSB	1	1	1	5	9	1438	e	4100.6	6858.9	75	76	Sibunka	
AL12995.4	MkVCTD	1	1	1	5	9	1527	s	4101.4	6859.5	90	84	Mountain	
AL12995.5	MOC1	1	1	1	5	9	1604	s	4102.2	6859.7	93	85	Durbin	
AL12995.6	MOC1	1	1	1	5	9	1647	e	4104.9	6858.7	97	86	Durbin	
AL12995.7	BongoSB	2	2	2	5	9	1947	s	4039.5	6859.5	67	62	Sibunka	
AL12995.8	BongoSB	2	2	2	5	9	1955	e	4039.9	6859.1	67		Sibunka	
AL12995.9	MKVCTD	2	2	2	5	9	2004	s	4039.9	6858.8	66	60	Mountain	
AL12995.10	MOC1	2	2	2	5	9	2019	s	4040.6	6857.9	69	61	Durbin	
AL12995.11	MOC1	2	2	2	5	9	2106	e	4041.7	6856.5	69	60	Durbin	
AL12995.12	SBwater	1	3	3	5	9	2323	s	4031.5	6827.0	90	87	Mountain	
AL12995.13	BongoSB	3	3	3	5	9	2335	s	4031.5	6826.9	91	87	Sibunka	
AL12995.14	BongoSB	3	3	3	5	9	2345	e	4031.7	6826.8	92	87	Sibunka	
AL12995.15	MKVCTD	3	3	3	5	9	2355	s	4031.7	6826.9	92	86	Mountain	
AL13095.1	MOC1	3	3	3	5	10	14	s	4031.6	6826.7	93	87	Durbin	
AL13095.2	MOC1	3	3	3	5	10	56	e	4032.2	6825.9	92	87	Durbin	
AL13095.3	PUMP	1	3	3	5	10	200	s	4031.4	6826.5	92	77	Durbin	
AL13095.4	MOC10	1	3	3	5	10	319	s	4030.3	6826.7	96	80	Madin	
AL13095.5	MOC10	1	3	3	5	10	411	e	4029.3	6826.4	96	80	Madin	
AL13095.6	BongoSB	4	4	4	5	10	728	s	4059.7	6814.9	57	53	Sibunka	
AL13095.7	BongoSB	4	4	4	5	10	734	e	4059.3	6814.8	57	53	Sibunka	
AL13095.8	MKVCTD	4	4	4	5	10	745	s	4059.5	6814.8	56	49	Mountain	
AL13095.9	MOC1	4	4	4	5	10	800	s	4059.6	6814.8	56	49	Durbin	
AL13095.10	MOC1	4	4	4	5	10	824	e	4100.3	6814.9	56	49	Durbin	
AL13095.11	PUMP	2	4	4	5	10	840	s	4100.3	6814.9	55	51	Durbin	
AL13095.12	MOC10	2	4	4	5	10	928	s	4059.9	6814.0	55	49	Madin	
AL13095.13	MOC10	2	4	4	5	10	1009	e	4058.2	6811.1	55	49	Madin	
AL13095.14	BongoSB	5	5	5	5	10	1121	s	4050.9	6759.9	64	61	Sibunka	
AL13095.15	BongoSB	5	5	5	5	10	1128	e	4050.5	6800.2	64	61	Sibunka	
AL13095.16	MKVCTD	5	5	5	5	10	1130	s	4050.4	6800.1	66	59	Mountain	
AL13095.17	MOC1	5	5	5	5	10	1157	s	4050.2	6800.1	66	60	Durbin	
AL13095.18	MOC1	5	5	5	5	10	1231	e	4048.7	6801.5	66	60	Durbin	
AL13095.19	BongoSB	6	6	6	5	10	1355	s	4040.1	6747.4	79	74	Sibunka	
AL13095.20	BongoSB	6	6	6	5	10	1403	e	4039.9	6747.3	80	74	Sibunka	
AL13095.21	MKVCTD	6	6	6	5	10	1407	s	4040.0	6747.3	79	73	Mountain	
AL13095.22	MOC1	6	6	6	5	10	1423	s	4040.1	6747.5	81	76	Durbin	

				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL13095.23	MOC1	6	6	6	5	10	1456	e	4039.9	6746.7	80	76	Durbin	
AL13095.24	SBwater	2	7	7	5	10	1730	s	4027.3	6718.4	268	58	Mountain	
AL13095.25	BongoSB	7	7	7	5	10	1735	s	4026.9	6718.6	279	200	Sibunka	
AL13095.26	BongoSB	7	7	7	5	10	1808	e	4026.6	6718.6	264	200	Sibunka	
AL13095.27	MKVCTD	7	7	7	5	10	1820	s	4026.5	6721.3	264	247	Mountain	
AL13095.28	MOC1	7	7	7	5	10	1845	s	4026.7	6722.0	412	339	Durbin	initial depth 264; increased to 426; ran out of
AL13095.29	MOC1	7	7	7	5	10	2052	e	4028.0	6725.5	246	200	Durbin	wire at 339m depth; at end depth 246
AL13095.30	PUMP	3	7	7	5	10	2109	s	4027.7	6725.6	231	72	Durbin	
AL13095.31	MOC10	3	7	7	5	10	2156	s	4028.0	6725.0	321	303	Madin	
AL13095.32	MOC10	3	7	7	5	10	2301	e	4028.1	6723.5	336	303	Madin	
AL13195.1	BongoSB	8	8	8	5	11	200	s	4052.0	6703.8	88	84	Sibunka	
AL13195.2	BongoSB	8	8	8	5	11	210	e	4052.3	6703.5	88	84	Sibunka	
AL13195.3	MKVCTD	8	8	8	5	11	217	s	4052.4	6703.5	88	83	Mountain	
AL13195.4	MOC1	8	8	8	5	11	248	s	4052.8	6704.0	89	82	Durbin	
AL13195.5	MOC1	8	8	8	5	11	341	e	4053.4	6705.7	87	82	Durbin	
AL13195.6	BongoSB	9	9	9	5	11	459	s	4058.2	6718.9	77	73	Sibunka	
AL13195.7	BongoSB	9	9	9	5	11	509	e	4058.3	6718.6	77	73	Sibunka	
AL13195.8	MKVCTD	9	9	9	5	11	518	s	4058.3	6718.5	77	73	Mountain	
AL13195.9	MOC1	9	9	9	5	11	531	s	4058.5	6718.7	77	76	Durbin	
AL13195.10	MOC1	9	9	9	5	11	602	e	4058.5	6717.9	77	76	Durbin	
AL13195.11	PUMP	4	9	9	5	11	620	s	4058.6	6718.0	76	64	Durbin	
AL13195.12	MOC10	4	9	9	5	11	716	s	4059.1	6719.5	74	69	Madin	
AL13195.13	MOC10	4	9	9	5	11	749	e	4059.5	6721.2	74	69	Madin	
AL13195.14	BongoSB	10	10	10	5	11	914	s	4105.2	6739.0	56	53	Sibunka	
AL13195.15	BongoSB	10	10	10	5	11	919	e	4104.9	6739.1	56	53	Sibunka	
AL13195.16	MKVCTD	10	10	10	5	11	927	s	4104.9	6739.1	56	50	Mountain	
AL13195.17	MOC1	10	10	10	5	11	940	s	4104.9	6739.1	56	46	Durbin	
AL13195.18	MOC1	10	10	10	5	11	1004	e	4103.7	6738.8	58	47	Durbin	
AL13195.19	BongoSB	11	11	11	5	11	1200	s	4113.3	6756.9	47	44	Sibunka	
AL13195.20	BongoSB	11	11	11	5	11	1207	e	4112.9	6756.7	47	44	Sibunka	
AL13195.21	MkVCTD	11	11	11	5	11	1217	s	4112.6	6756.6	49	45	Mountain	
AL13195.22	MOC1	11	11	11	5	11	1232	s	4112.3	6756.6	49	40	Durbin	
AL13195.23	MOC1	11	11	11	5	11	1258	e	4110.8	6756.3	50	40	Durbin	
AL13195.24	SBwater	3	12	12	5	11	1545	s	4124.4	6732.9	42	35	Mountain	
AL13195.25	BongoSB	12	12	12	5	11	1550	s	4124.5	6732.9	40	37	Sibunka	
AL13195.26	BongoSB	12	12	12	5	11	1556	e	4124.5	6733.3	42	37	Sibunka	
AL13195.27	MKVCTD	12	12	12	5	11	1607	s	4124.5	6733.5	42	36	Mountain	

				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL13195.28	MOC1	12	12	12	5	11	1617	s	4124.6	6733.8	31	25	Durbin	
AL13195.29	MOC1	12	12	12	5	11	1635	e	4125.0	6735.5	41	31	Durbin	
AL13195.30	PUMP	5	12	12	5	11	1725	s	4126.5	6737.2	37	30	Durbin	
AL13195.31	MOC10	5	12	12	5	11	1803	s	4127.7	6737.3	46	33	Madin	
AL13195.32	MOC10	5	12	12	5	11	1838	e	4127.0	6737.0	44	33	Madin	
AL13195.33	BongoSB	13	13	13	5	11	2132	s	4116.2	6710.5	56	55	Sibunka	
AL13195.34	BongoSB	13	13	13	5	11	2138	e	4116.0	6710.3	56	55	Sibunka	
AL13195.35	MKVCTD	13	13	13	5	11	2145	s	4115.9	6710.0	56	50	Mountain	
AL13195.36	MOC1	13	13	13	5	11	2200	s	4115.9	6709.5	56	50	Durbin	
AL13195.37	MOC1	13	13	13	5	11	2225	e	4115.0	6708.7	62	50	Durbin	
AL13195.38	PUMP	6	13	13	5	11	2240	s	4114.8	6708.4	60	54	Durbin	
AL13195.39	MOC10	6	13	13	5	11	2317	s	4114.4	6707.4	63	55	Madin	
AL13195.40	MOC10	6	13	13	5	11	2355	e	4113.6	6706.0	66	55	Madin	
AL13295.1	BongoSB	14	14	14	5	12	50	s	4112.3	6658.3	67	64	Sibunka	
AL13295.2	BongoSB	14	14	14	5	12	58	e	4111.9	6658.3	69	64	Sibunka	
AL13295.3	MKVCTD	14	14	14	5	12	107	s	4111.8	6658.3	68	63	Mountain	
AL13295.4	MOC1	14	14	14	5	12	149	s	4111.3	6658.3	70	67	Durbin	
AL13295.5	MOC1	14	14	14	5	12	223	e	4109.6	6700.0	70	67	Durbin	
AL13295.6	BongoSB	15	15	15	5	12	458	s	4102.1	6642.2	77	73	Sibunka	
AL13295.7	BongoSB	15	15	15	5	12	508	e	4101.6	6642.6	77	73	Sibunka	
AL13295.8	MKVCTD	15	15	15	5	12	517	s	4101.5	6642.7	76	70	Mountain	
AL13295.9	MOC1	15	15	15	5	12	532	s	4101.5	6643.1	76	70	Durbin	
AL13295.10	MOC1	15	15	15	5	12	607	e	4101.6	6644.4	76	70	Durbin	
AL13295.11	BongoSB	16	16	16	5	12	817	s	4055.5	6626.9	844	201	Sibunka	
AL13295.12	BongoSB	16	16	16	5	12	845	e	4956.7	6625.9	812	201	Sibunka	
AL13295.13	MKVCTD	16	16	16	5	12	854	s	4056.9	6625.6	771	301	Mountain	
AL13295.14	MOC1	16	16	16	5	12	1032	s	4057.0	6625.2	901	280	Durbin	
AL13295.15	MOC1	16	16	16	5	12	1212	e	4100.3	6622.6	901	200	Durbin	
AL13295.16	PUMP	7	16	16	5	12	1241	s	4100.7	6622.1	860	77	Durbin	
AL13295.17	MOC10	7	16	16	5	12	1326	s	4100.7	6621.6	1036	301	Madin	
AL13295.18	MOC10	7	16	16	5	12	1443	s	4057.7	6623.0	903	301	Madin	
AL13295.19	BongoSB	17	17	17	5	12	1608	s	4112.0	6627.2	95	92	Sibunka	
AL13295.20	BongoSB	17	17	17	5	12	1617	e	4112.0	6627.6	96	92	Sibunka	
AL13295.21	MKVCTD	17	17	17	5	12	1625	s	4112.3	6627.7	96	90	Mountain	
AL13295.22	MOC1	17	17	17	5	12	1640	s	4112.2	6628.1	98	89	Durbin	
AL13295.23	MOC1	17	17	17	5	12	1729	e	4112.9	6631.0	93	90	Durbin	
AL13295.24	PUMP	8	17	17	5	12	1801	s	4113.4	6631.5	92	72	Durbin	

				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL13295.25	MOC10	8	17	17	5	12	1840	s	4114.4	6632.2	89	80	Madin	
AL13295.26	MOC10	8	17	17	5	12	1924	e	4116.0	6633.2	91	80	Madin	
AL13295.27	BongoSB	18	18	18	5	12	2058	s	4124.3	6641.8	84	79	Sibunka	
AL13295.28	BongoSB	18	18	18	5	12	2106	e	4124.6	6641.9	84	79	Sibunka	
AL13295.29	SBWater	4	18	18	5	12	2108	s	4124.7	6642.0	85	9	Mountain	
AL13295.30	MKVCTD	18	18	18	5	12	2115	s	4124.7	6642.0	85	79	Mountain	
AL13295.31	MOC1	18	18	18	5	12	2132	s	4125.1	6641.9	85	79	Durbin	
AL13295.32	MOC1	18	18	18	5	12	2206	e	4125.6	6642.6	87	79	Durbin	
AL13295.33	PUMP	9	18	18	5	12	2333	s	4125.6	6642.4	84	65	Durbin	
AL13395.1	MOC10	9	18	18	5	13	16	s	4125.2	6640.1	86	77	Madin	
AL13395.2	MOC10	9	18	18	5	13	54	e	4125.3	6640.5	85	77	Madin	
AL13395.3	BongoSB	19	19	19	5	13	300	s	4135.2	6658.9	64	59	Sibunka	
AL13395.4	BongoSB	19	19	19	5	13	307	e	4135.3	6659.3	64	59	Sibunka	
AL13395.5	MKVCTD	19	19	19	5	13	331	s	4135.0	6659.8	62	56	Mountain	
AL13395.6	MOC1	19	19	19	5	13	344	s	4134.7	6700.2	65	58	Durbin	
AL13395.7	MOC1	19	19	19	5	13	418	e	4134.0	6702.2	62	58	Durbin	
AL13395.8	BongoSB	20	20	20	5	13	717	s	4143.3	6631.6	75	75	Sibunka	
AL13395.9	BongoSB	20	20	20	5	13	726	e	4143.5	6631.3	75	75	Sibunka	
AL13395.10	MKVCTD	20	20	20	5	13	738	s	4143.7	6631.7	77	72	Mountain	
AL13395.11	MOC1	20	20	20	5	13	753	s	4144.4	6631.4	78	67	Durbin	
AL13395.12	MOC1	20	20	20	5	13	822	e	4144.6	6630.7	79	74	Durbin	
AL13395.13	PUMP	10	20	20	5	13	840	s	4145.0	6630.6	78	72	Durbin	
AL13395.14	MOC10	10	20	20	5	13	924	s	4145.7	6630.7	76	71	Madin	Abort. tow. Trip motor-
AL13395.15	MOC10	10	20	20	5	13	945	e			76		Madin	malfunct. No samples.
AL13395.16	BongoSB	21	21	21	5	13	1117	s	4132.3	6623.9	90	85	Sibunka	
AL13395.17	BongoSB	21	21	21	5	13	1125	e	4132.0	6623.4	91	85	Sibunka	
AL13395.18	MKVCTD	21	21	21	5	13	1131	s	4131.9	6623.2	91	85	Mountain	
AL13395.19	MOC1	21	21	21	5	13	1144	s	4131.8	6623.1	91	83	Durbin	
AL13395.20	MOC1	21	21	21	5	13	1226	e	4130.1	6620.9	90	82	Durbin	
AL13395.21	BongoSB	22	22	22	5	13	1430	s	4132.8	6602.2	113	108	Sibunka	
AL13395.22	BongoSB	22	22	22	5	13	1443	e	4132.1	6601.6	117	108	Sibunka	
AL13395.23	MKVCTD	22	22	22	5	13	1448	s	4132.0	6601.5	125	118	Mountain	
AL13395.24	MOC1	22	22	22	5	13	1505	s	4131.4	6601.7	128	120	Durbin	
AL13395.25	MOC1	22	22	22	5	13	1624	e	4129.8	6559.4	155	120	Durbin	
AL13395.26	BongoSB	23	23	23	5	13	1828	s	4148.1	6611.6	86	82	Sibunka	
AL13395.27	BongoSB	23	23	23	5	13	1837	e	4148.2	6611.5	86	82	Sibunka	
AL13395.28	MKVCTD	23	23	23	5	13	1844	s	4148.3	6611.7	86	79	Mountain	

				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL13395.29	MOC1	23	23	23	5	13	1857	s	4148.4	6612.2	86	76	Durbin	
AL13395.30	MOC1	23	23	23	5	13	1932	e	4149.8	6612.0	83	77	Durbin	
AL13395.31	PUMP	11	23	23	5	13	1948	s	4149.8	6612.0	83	65	Durbin	
AL13395.32	MOC10	11	23	23	5	13	2023	s	4150.6	6612.9	82	67	Madin	
AL13395.33	MOC10	11	23	23	5	13	2100	e	4151.8	6111.9	85	67	Madin	
AL13395.34	BongoSB	24	24	24	5	13	2235	s	4202.4	6557.3	170	169	Sibunka	
AL13395.35	BongoSB	24	24	24	5	13	2257	e	4202.8	6556.1	192	169	Sibunka	
AL13395.36	MKVCTD	24	24	24	5	13	2303	s	4202.9	6556.0	194	187	Mountain	
AL13395.37	MOC1	24	24	24	5	13	2318	s	4202.9	6559.9	196	168	Durbin	
AL13495.1	MOC1	24	24	24	5	14	57	e	4201.9	6548.3	260	203	Durbin	
AL13495.2	SBwater	5	25	25	5	14	235	s	4215.1	6540.7	117	77	Mountain	
AL13495.3	BongoSB	25	25	25	5	14	243	s	4214.9	6540.8	119	116	Sibunka	
AL13495.4	BongoSB	25	25	25	5	14	300	e	4214.7	6540.3	117	116	Sibunka	
AL13495.5	MKVCTD	25	25	25	5	14	305	s	4214.7	6540.4	117	113	Mountain	
AL13495.6	MOC1	25	25	25	5	14	339	s	4216.0	6540.6	118	200	Durbin	
AL13495.7	MOC1	25	25	25	5	14	510	e	4215.5	6546.1	221	200	Durbin	
AL13495.8	PUMP	12	25	25	5	14	555	s	4215.4	6547.2	220	68	Durbin	
AL13495.9	MOC10	12	25	25	5	14	645	s	4216.1	6549.3	223	200	Madin	
AL13495.10	MOC10	12	25	25	5	14	752	e	4217.5	6555.0	230	200	Maidn	
AL13495.11	BongoSB	26	26	26	5	14	1026	s	4204.2	6626.0	87	81	Sibunka	
AL13495.12	BongoSB	26	26	26	5	14	1034	e	4204.5	6625.4	86	81	Sibunka	
AL13495.13	MKVCTD	26	26	26	5	14	1039	s	4204.7	6625.3	86	79	Mountain	
AL13495.14	MOC1	26	26	26	5	14	1051	s	4204.9	6625.3	86	80	Durbin	
AL13495.15	MOC1	26	26	26	5	14	1129	e	4205.9	6624.3	86	78	Durbin	
AL13495.16	BongoSB	27	27	27	5	14	1310	s	4157.1	6641.0	67	65	Sibunka	
AL13495.17	BongoSB	27	27	27	5	14	1317	e	4157.1	6640.3	70	65	Sibunka	
AL13495.18	MKVCTD	27	27	27	5	14	1323	s	4157.1	6640.1	70	65	Mountain	
AL13495.19	MOC1	27	27	27	5	14	1334	s	4156.9	6639.7	71	64	Durbin	
AL13495.20	MOC1	27	27	27	5	14	1409	e	4156.2	6637.5	77	64	Durbin	
AL13495.21	PUMP	13	27	27	5	14	1458	s	4154.0	6637.9	71	65	Durbin	
AL13495.22	MOC10	13	27	27	5	14	1545	s	4153.1	6638.5	79	65	Madin	
AL13495.23	MOC10	13	27	27	5	14	1627	e	4152.8	6640.4	73	65	Madin	
AL13495.24	BongoSB	28	28	28	5	14	1818	s	4205.9	6653.9	67	64	Sibunka	
AL13495.25	BongoSB	28	28	28	5	14	1824	e	4206.1	6653.7	67	64	Sibunka	
AL13495.26	MKVCTD	28	28	28	5	14	1829	s	4206.3	6653.7	67	61	Mountain	
AL13495.27	MOC1	28	28	28	5	14	1845	s	4206.8	6653.9	66	58	Madin	
AL13495.28	MOC1	28	28	28	5	14	1908	e	4207.9	6653.4	73	59	Madin	

				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL13495.29	BongoSB	29	29	29	5	14	2016	s	4217.9	6654.1	297	200	Sibunka	
AL13495.30	BongoSB	29	29	29	5	14	2046	e	4217.1	6653.9	292	200	Sibunka	
AL13495.31	MKVCTD	29	29	29	5	14	2054	s	4217.1	6653.9	291	281	Mountain	
AL13495.32	MOC1	29	29	29	5	14	2130	s	4216.6	6654.5	286	280	Durbin	
AL13495.33	MOC1	29	29	29	5	14	2324	e	4216.4	6655.6	280	200	Durbin	
AL13495.34	PUMP	14	29	29	5	14	2336	s	4216.4	6655.8	281	72	Durbin	
AL13595.1	MOC10	14	29	29	5	15	28	s	4216.4	6655.9	280	260	Madin	
AL13595.2	MOC10	14	29	29	5	15	138	e	4215.5	6657.8	265	260	Madin	
AL13595.3	SBWater	6	30	30	5	15	345	s	4157.8	6712.3	52	40	Mountain	
AL13595.4	BongoSB	30	30	30	5	15	350	s	4157.3	6712.4	55	51	Sibunka	
AL13595.5	BongoSB	30	30	30	5	15	357	e	4156.9	6712.4	56	51	Sibunka	
AL13595.6	MKVCTD	30	30	30	5	15	402	s	4156.6	6712.4	55	50	Mountain	
AL13595.7	MOC1	30	30	30	5	15	415	s	4156.2	6712.3	67	65	Durbin	
AL13595.8	MOC1	30	30	30	5	15	447	e	4155.0	6711.2	69	65	Durbin	
AL13595.9	PUMP	15	30	30	5	15	510	s	4154.8	6711.4	60	53	Durbin	
AL13595.10	MOC10	15	30	30	5	15	553	s	4154.9	6712.7	62	40	Madin	
AL13595.11	MOC10	15	30	30	5	15	608	e	4155.9	6714.1	59	40	Madin	
AL13595.12	BongoSB	31	31	31	5	15	808	s	4202.9	6738.9	119	124	Sibunka	
AL13595.13	BongoSB	31	31	31	5	15	825	e	4203.1	6740.0	146	124	Sibunka	
AL13595.14	MKVCTD	31	31	31	5	15	830	s	4203.1	6740.2	152	145	Mountain	
AL13595.15	MOC1	31	31	31	5	15	848	s	4203.3	6740.7	161	150	Durbin	
AL13595.16	MOC1	31	31	31	5	15	954	e	4202.3	6743.4	161	150	Durbin	
AL13595.17	BongoSB	32	32	32	5	15	1152	s	4144.7	6749.9	35	32	Sibunka	
AL13595.18	BongoSB	32	32	32	5	15	1158	e	4144.5	6749.8	35	32	Sibunka	
AL13595.19	MKVCTD	32	32	32	5	15	1205	s	4144.4	6749.8	35	30	Mountain	
AL13595.20	MOC1	32	32	32	5	15	1220	s	4144.4	6749.5	34	29	Durbin	
AL13595.21	MOC1	32	32	32	5	15	1235	e	4143.9	6749.4	34	29	Durbin	
AL13595.22	BongoSB	33	33	33	5	15	1350	s	4149.5	6759.6	57	53	Sibunka	
AL13595.23	BongoSB	33	33	33	5	15	1356	e	4149.1	6759.0	55	53	Sibunka	
AL13595.24	MKVCTD	33	33	33	5	15	1403	s	4148.9	6758.9	52	46	Mountain	
AL13595.25	MOC1	33	33	33	5	15	1415	s	4148.7	6758.6	52	40	Durbin	
AL13595.26	MOC1	33	33	33	5	15	1436	e	4147.6	6758.1	44	40	Durbin	
AL13595.27	BongoSB	34	34	34	5	15	1620	s	4150.5	6818.9	215	200	Sibunka	
AL13595.28	BongoSB	34	34	34	5	15	1650	e	4150.2	6817.7	200	200	Sibunka	
AL13595.29	MKVCTD	34	34	34	5	15	1656	s	4150.2	6817.5	197	190	Mountain	
AL13595.30	MOC1	34	34	34	5	15	1712	s	4150.1	6817.8	198	185	Durbin	
AL13595.31	MOC1	34	34	34	5	15	1852	e	4147.0	6826.8	177	164	Durbin	

				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL13595.32	PUMP	16	34	34	5	15	1905	s	4147.1	6820.8	179	68	Durbin	
AL13595.33	MOC10	16	34	34	5	15	1952	s	4147.5	6821.3	191	180	Madin	
AL13595.34	MOC10	16	34	34	5	15	2048	e	4149.0	6820.0	203	180	Madin	
AL13595.35	BongoSB	35	35	35	5	15	2224	s	4136.2	6826.9	74	70	Sibunka	
AL13595.36	BongoSB	35	35	35	5	15	2233	e	4136.1	6827.0	75	70	Sibunka	
AL13595.37	MKVCTD	35	35	35	5	15	2241	s	4136.2	6827.2	75	69	Mountain	
AL13595.38	MOC1	35	35	35	5	15	2256	s	4136.7	6827.2	77	68	Durbin	
AL13595.39	MOC1	35	14	35	5	15	2333	e	4136.1	6827.4	64	72	Durbin	
AL13695.1	SBWater	7	14	36	5	16	52	s	4124.6	6819.0	64	36	Mountain	
AL13695.2	BongoSB	36	36	36	5	16	59	s	4124.5	6818.9	53	50	Sibunka	
AL13695.3	BongoSB	36	36	36	5	16	105	e	4124.2	6818.8	55	50	Sibunka	
AL13695.4	MKVCTD	36	36	36	5	16	112	s	4124.0	6818.8	54	49	Mountain	
AL13695.5	MOC1	36	36	36	5	16	124	s	4123.9	6818.9	57	47	Durbin	
AL13695.6	MOC1	36	36	36	5	16	149	e	4122.6	6818.3	57	47	Durbin	
AL13695.7	PUMP	17	36	36	5	16	228	s	4123.1	6818.6	57	45	Durbin	
AL13695.8	MOC10	17	36	36	5	16	309	s	4121.4	6818.4	58	41	Madin	prob. w/ flow count &
AL13695.9	MOC10	17	36	36	5	16	403	e	4118.7	6817.8	54	41	Madin	net release.
AL13695.10	BongoSB	37	37	37	5	16	542	s	4118.0	6835.8	67	64	Sibunka	
AL13695.11	BongoSB	37	37	37	5	16	550	e	4118.1	6835.6	69	64	Sibunka	
AL13696.12	MKVCTD	37	37	37	5	16	556	s	4118.1	6835.6	70	63	Mountain	
AL13695.13	MOC1	37	37	37	5	16	609	s	4118.0	6835.8	69	60	Durbin	
AL13695.14	MOC1	37	37	37	5	16	636	e	4118.4	6834.7	62	55	Durbin	
AL13695.15	BongoSB	38	38	38	5	16	834	s	4129.4	6856.9	155	150	Sibunka	
AL13695.16	BongoSB	38	38	38	5	16	848	e	4129.8	6856.5	155	150	Sibunka	
AL13695.17	MKVCTD	38	38	38	5	16	855	s	4129.9	6856.3	155	149	Mountain	
AL13695.18	MOC1	38	38	38	5	16	907	s	4130.1	6856.5	156	147	Durbin	
AL13695.19	MOC1	38	38	38	5	16	1020	e	4131.9	6853.9	157	150	Durbin	
AL13695.20	PUMP	18	38	38	5	16	1132	s	4133.1	6854.6	156	72	Durbin	problem with ground on termination
AL13695.21	MOC10	18	38	38	5	16	1209	s	4133.6	6851.7	152	140	Madin	
AL13695.22	MOC10	18	38	38	5	16	1254	e	4132.6	6855.2	157	140	Madin	
AL13695.23	BongoSB	39	39	999	5	16	1745	s	4059.8	6800.0	52	50	Sibunka	Begin star grid
AL13695.24	BongoSB	39	39	999	5	16	1751	e	4059.8	6800.0	53	50	Sibunka	
AL13695.25	MKVCTD	39	39	999	5	16	1758	s	4059.8	6759.4	53	45	Mountain	
AL13695.26	MOC1	39	39	999	5	16	1829	s	4059.9	6800.0	53	45	Sibunak	
AL13695.27	MOC1	39	39	999	5	16	1835	e	4100.0	6800.0	53	45	Sibunka	
AL13695.28	Pump	19	39	999	5	16	1901	s	4100.2	6801.3	51	45	Green	

				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL13695.29	BongoSB	40	40	999	5	16	1954	s	4059.9	6806.3	39	34	Sibunka	
AL13695.30	BongoSB	40	40	999	5	16	1958	e	4057.8	6806.6	39	34	Sibunka	
AL13695.31	BongoSB	41	41	999	5	16	2028	s	4056.9	6804.7	45	41	Sibunka	
AL13695.32	BongoSB	41	41	999	5	16	2033	e	4056.8	6804.7	45	41	Sibunka	
AL13695.33	MOC1	40	41	999	5	16	2050	s	4056.8	6804.7	46	40	Sibunka	
AL13695.34	MOC1	40	41	999	5	16	2108	e	4056.7	6804.6	47	40	Sibunka	
AL13695.35	BongoSB	42	42	999	5	16	2145	s	4055.2	6800.0	52	49	Sibunka	
AL13695.36	BongoSB	42	42	999	5	16	2150	e	4055.0	6759.9	52	49	Sibunka	
AL13695.37	BongoSB	43	43	999	5	16	2222	s	4056.5	6755.5	59	54	Sibunka	
AL13695.38	BongoSB	43	43	999	5	16	2229	e	4056.4	6755.6	59	54	Sibunka	
AL13695.39	MOC1	41	43	999	5	16	2239	s	4056.3	6755.6	60	50	Sibunka	
AL13695.40	MOC1	41	43	999	5	16	2300	e	4056.1	6755.4	60	50	Sibunka	
AL13695.41	BongoSB	44	44	999	5	16	2336	s	4100.2	6753.5	50	46	Sibunka	
AL13695.42	BongoSB	44	44	999	5	16	2341	e	4100.1	6753.5	52	46	Sibunka	
AL13795.1	BongoSB	45	45	999	5	17	11	s	4102.9	6755.3	43	40	Sibunka	
AL13795.2	BongoSB	45	45	999	5	17	17	e	4103.4	6755.6	46	40	Sibunka	
AL13795.3	MOC1	42	45	999	5	17	27	s	4103.7	6755.9	46	40	Sibunka	
AL13795.4	MOC1	42	45	999	5	17	47	e	4104.2	6756.5	45	40	Sibunka	
AL13795.5	BongoSB	46	46	999	5	17	112	s	4104.7	6759.6	48	46	Sibunka	
AL13795.6	BongoSB	46	46	999	5	17	119	e	4105.0	6759.8	50	46	Sibunka	
AL13795.7	BongoSB	47	47	999	5	17	148	s	4103.5	6803.5	44	41	Sibunka	
AL13795.8	BongoSB	47	47	999	5	17	154	e	4103.2	6803.6	46	41	Sibunka	
AL13795.9	MOC1	43	47	999	5	17	201	s	4103.4	6803.9	48	40	Sibunka	
AL13795.10	MOC1	43	47	999	5	17	225	e	4103.2	6804.4	46	40	Sibunka	
AL13795.11	BongoSB	48	48	999	5	17	320	s	4103.7	6811.9	48	44	Sibunka	
AL13795.12	BongoSB	48	48	999	5	17	328	e	4103.6	6812.3	48	44	Sibunka	
AL13795.13	BongoSB	49	49	999	5	17	418	s	4100.1	6819.6	48	45	Sibunka	
AL13795.14	BongoSB	49	49	999	5	17	425	e	4059.5	6819.9	48	45	Sibunka	
AL13795.15	MOC1	44	49	999	5	17	433	s	4059.3	6820.0	48	40	Sibunka	
AL13795.16	MOC1	44	49	999	5	17	453	e	4058.1	6820.1	50	40	Sibunka	
AL13795.17	MOC1	45	50	999	5	17	536	s	4056.5	6813.5	59	50	Sibunka	
AL13795.18	MOC1	45	50	999	5	17	610	e	4055.4	6813.8	54	50	Sibunka	
AL13795.19	PUMP	20	50	999	5	17	617	s	4055.4	6813.8	54	50	Green	
AL13795.20	BongoSB	50	50	999	5	17	646	s	4054.7	6814.5	52	45	Sibunka	
AL13795.21	BongoSB	50	50	999	5	17	651	e	4054.4	6814.5	52	45	Sibunka	
AL13795.22	BongoSB	51	51	999	5	17	725	s	4049.6	6813.8	52	46	Sibunka	
AL13795.23	BongoSB	51	51	999	5	17	731	e	4049.4	6813.9	50	46	Sibunka	

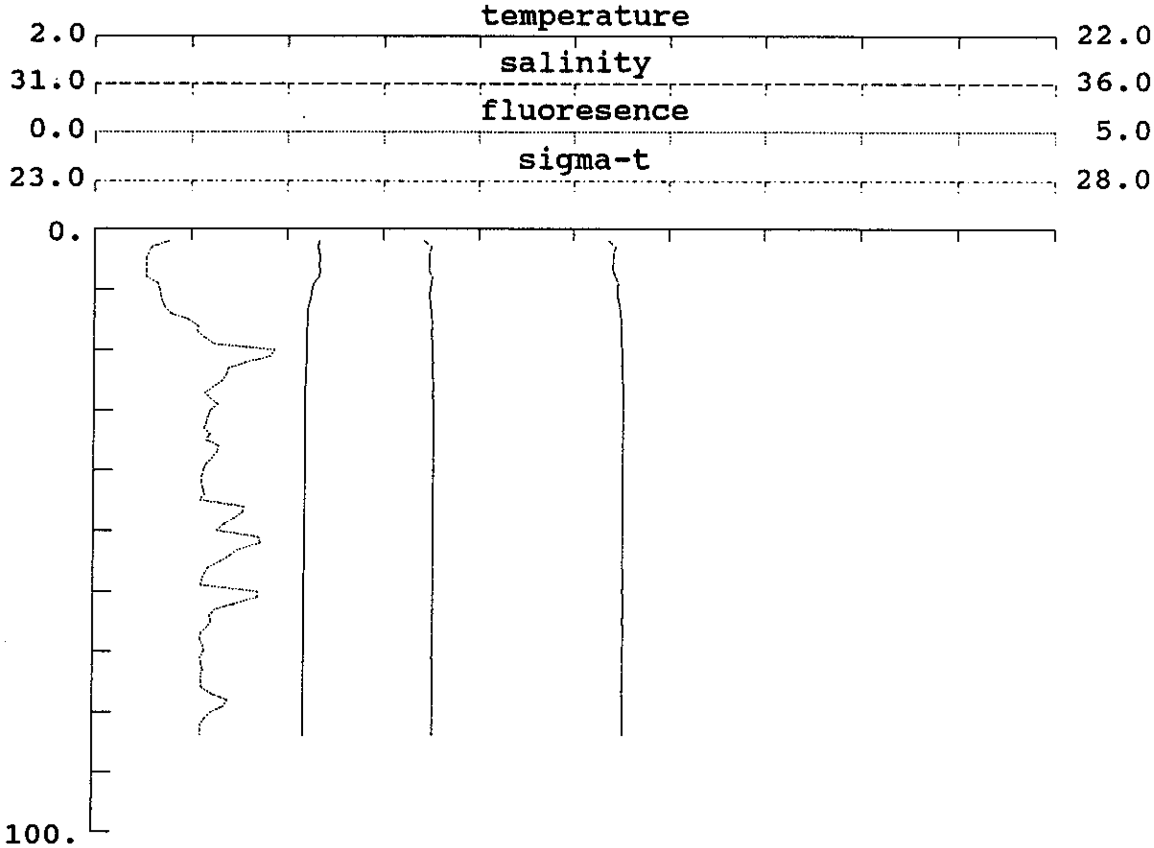
				L	O	C	A L				Water	Cast		
event#	Instr	cast#	Sta#	BrdSt#	Mth	Day	hhmm	s/e	Lat	Lon	Depth	Depth	PI	Comments
AL13795.24	BongoSB	52	52	999	5	17	834	s	4050.0	6804.8	64	61	Sibunka	
AL13795.25	BongoSB	52	52	999	5	17	840	e	4049.9	6804.8	64	61	Sibunka	
AL13795.26	BongoSB	53	53	999	5	17	934	s	4044.9	6759.9	76	68	Sibunka	
AL13795.27	BongoSB	53	53	999	5	17	942	e	4044.7	6759.9	77	68	Sibunka	
AL13795.28	PUMP	21	53	999	5	17	1000	s	4044.7	6800.1	76	68	Green	
AL13795.29	MOC1	46	53	999	5	17	1040	s	4045.1	6800.3	76	68	Sibunka	
AL13795.30	MOC1	46	53	999	5	17	1107	e	4044.7	6800.2	76	68	Sibunka	
AL13795.31	MOC1	47	54	999	5	17	1152	s	4049.5	6755.2	70	63	Sibunka	
AL13795.32	MOC1	47	54	999	5	17	1223	e	4049.1	6754.9	71	63	Sibunka	
AL13795.33	BongoSB	54	54	999	5	17	1316	s	4050.5	6754.1	67	63	Sibunka	Rel. shackle not secure-
AL13795.34	BongoSB	54	54	999	5	17	1327	e	4050.2	6754.0	68	63	Sibunka	Bongo-lost. Retow.
AL13795.35	BongoSB	55	55	999	5	17	1410	s	4049.3	6746.9	67	63	Sibunka	
AL13795.36	BongoSB	55	55	999	5	17	1416	e	4048.9	6746.7	68	63	Sibunka	
AL13795.37	BongoSB	56	56	999	5	17	1510	s	4055.7	6746.8	59	55	Sibunka	
AL13795.38	BongoSB	56	56	999	5	17	1516	e	4055.6	6747.2	59	55	Sibunka	
AL13795.39	BongoSB	57	57	999	5	17	1615	s	4100.9	6740.3	63	60	Sibunka	
AL13795.40	BongoSB	57	57	999	5	17	1622	e	4100.5	6740.1	63	60	Sibunka	
AL13795.41	MOC1	48	57	999	5	17	1628	s	4100.3	6740.0	63	55	Sibunka	
AL13795.42	MOC1	48	57	999	5	17	1652	e	4059.1	6739.2	66	55	Sibunka	
AL13795.43	MOC1	49	58	999	5	17	1803	s	4103.9	6746.9	53	48	Sibunka	
AL13795.44	MOC1	49	58	999	5	17	1825	e	4102.7	6747.3	54	48	Sibunka	
AL13795.45	PUMP		58	999	5	17								No pump cast - pump would not start
AL13795.46	BongoSB	58	58	999	5	17	1904	s	4102.7	6747.8	54	47	Sibunka	
AL13795.47	BongoSB	58	58	999	5	17	1909	e	4102.7	6748.2	54	47	Sibunka	
AL13795.48	BongoSB	59	59	999	5	17	2020	s	4110.2	6746.2	42	38	Sibunka	
AL13795.49	BongoSB	59	59	999	5	17	2025	e	4110.0	6746.3	43	38	Sibunka	
AL13795.50	BongoSB	60	60	999	5	17	2109	s	4110.2	6755.2	53	47	Sibunka	
AL13795.51	BongoSB	60	60	999	5	17	2114	e	4110.1	6755.3	54	47	Sibunka	
AL13795.52	BongoSB	61	61	999	5	17	2149	s	4114.9	6800.3	49	44	Sibunka	
AL13795.53	BongoSB	61	61	999	5	17	2153	e	4114.8	6800.5	48	44	Sibunka	
AL13795.54	MOC1	50	61	999	5	17	2207	s	4114.7	6800.7	48	42	Sibunka	
AL13795.55	MOC1	50	61	999	5	17	2222	e	4114.7	6801.3	46	33	Sibunka	
AL13795.56	PUMP	22	61	999	5	17	2235	s	4114.9	6800.8	45	42	Green	Last 2 stations on star dropped , high winds
AL13895.1	MOC1	51	62	999	5	18	508	s	4119.2	6905.3	163	140	Miller	Calanus haul
AL13895.2	MOC1	51	62	999	5	18	615	e	4116.3	6904.9	158	140	Miller	
AL13895.3	Ring Net	1	62	999	5	18	700	s	4116.3	6904.9	158	50	Durbin/Miller	six ring net hauls for calanus
AL13895.4	Ring Net	1	62	999	5	18	800	e	4116.3	6904.9	158	50	Durbin/Miller	

APPENDIX C

Plots and compressed listings of the MKV CTD hydrographic data.

Cast: 001
Lat: 41 1.3 N
Lon: 68 59.5 W

Date(y\m\d): 95\5\9
Hour (GMT): 19.4
Bottom depth: 90

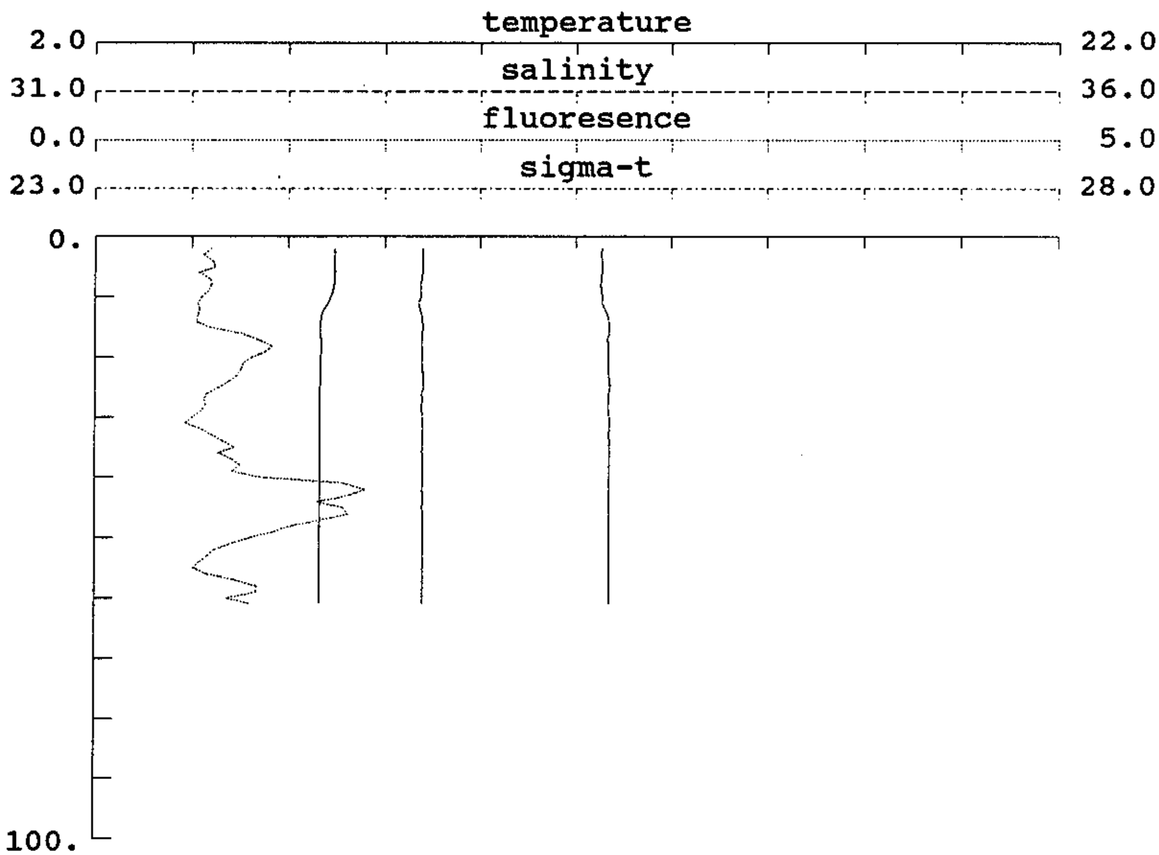


Depth	Temp	Salt	Flur	Sigma-t
1.00	6.66	32.69	0.42	25.67
5.00	6.67	32.74	0.27	25.71
10.00	6.52	32.75	0.34	25.73
15.00	6.43	32.76	0.49	25.75
20.00	6.41	32.76	0.93	25.76
25.00	6.39	32.76	0.66	25.76
30.00	6.38	32.77	0.60	25.76
40.00	6.38	32.77	0.57	25.76
50.00	6.39	32.77	0.64	25.76
75.00	6.38	32.77	0.56	25.77
84.00	6.37	32.77	0.56	25.77

[** Note: this is uncorrected data **]

Cast: 002
Lat: 40 39.8 N
Lon: 68 58.7 W

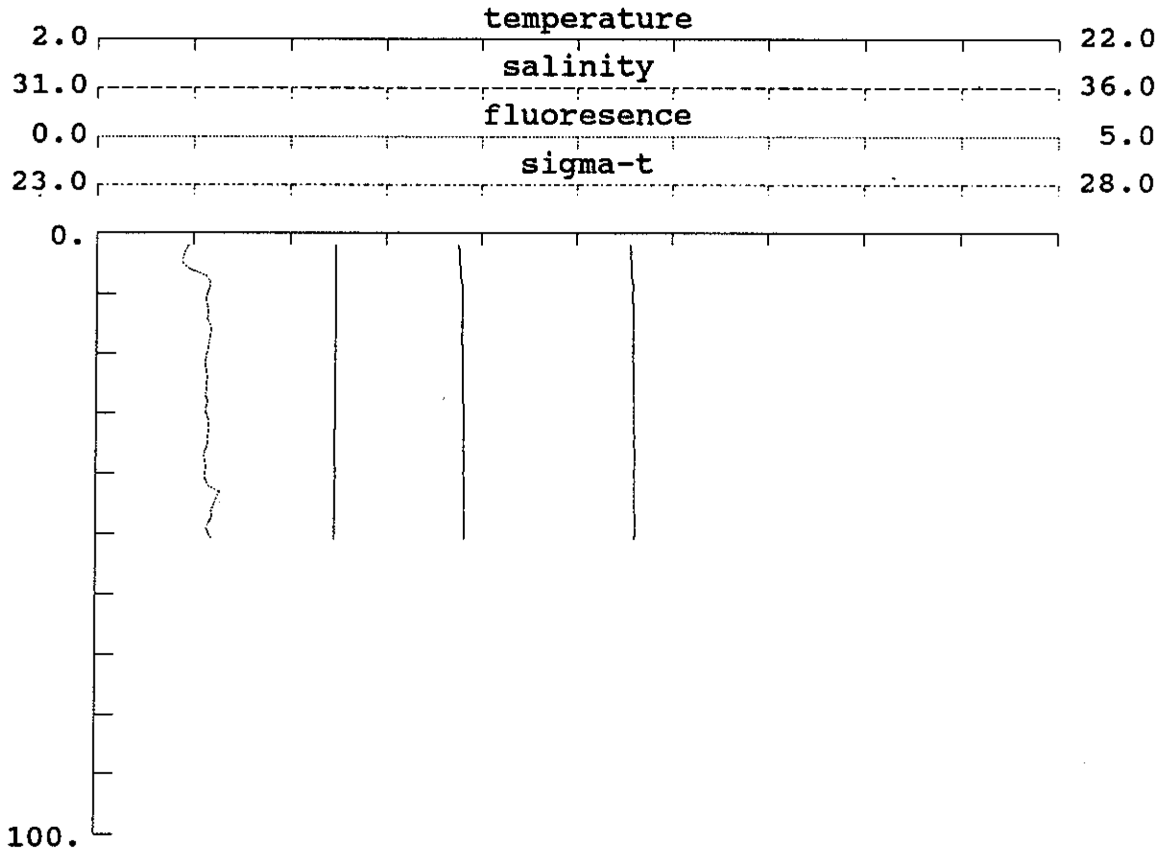
Date(y\m\d): 95\5\9
Hour (GMT): 20.
Bottom depth: 66



Depth	Temp	Salt	Flur	Sigma-t
1.00	6.95	32.70	0.43	25.64
5.00	6.94	32.70	0.62	25.64
10.00	6.87	32.69	0.55	25.64
15.00	6.66	32.70	0.59	25.68
20.00	6.67	32.69	0.81	25.67
25.00	6.66	32.70	0.64	25.68
30.00	6.65	32.70	0.50	25.68
40.00	6.65	32.70	0.85	25.68
50.00	6.65	32.70	0.80	25.68
61.00	6.65	32.70	0.80	25.68

[** Note: this is uncorrected data **]

Cast:	004	Date(y\m\d):	95\5\10
Lat:	40 59.5 N	Hour (GMT):	11.7
Lon:	68 14.7 W	Bottom depth:	56

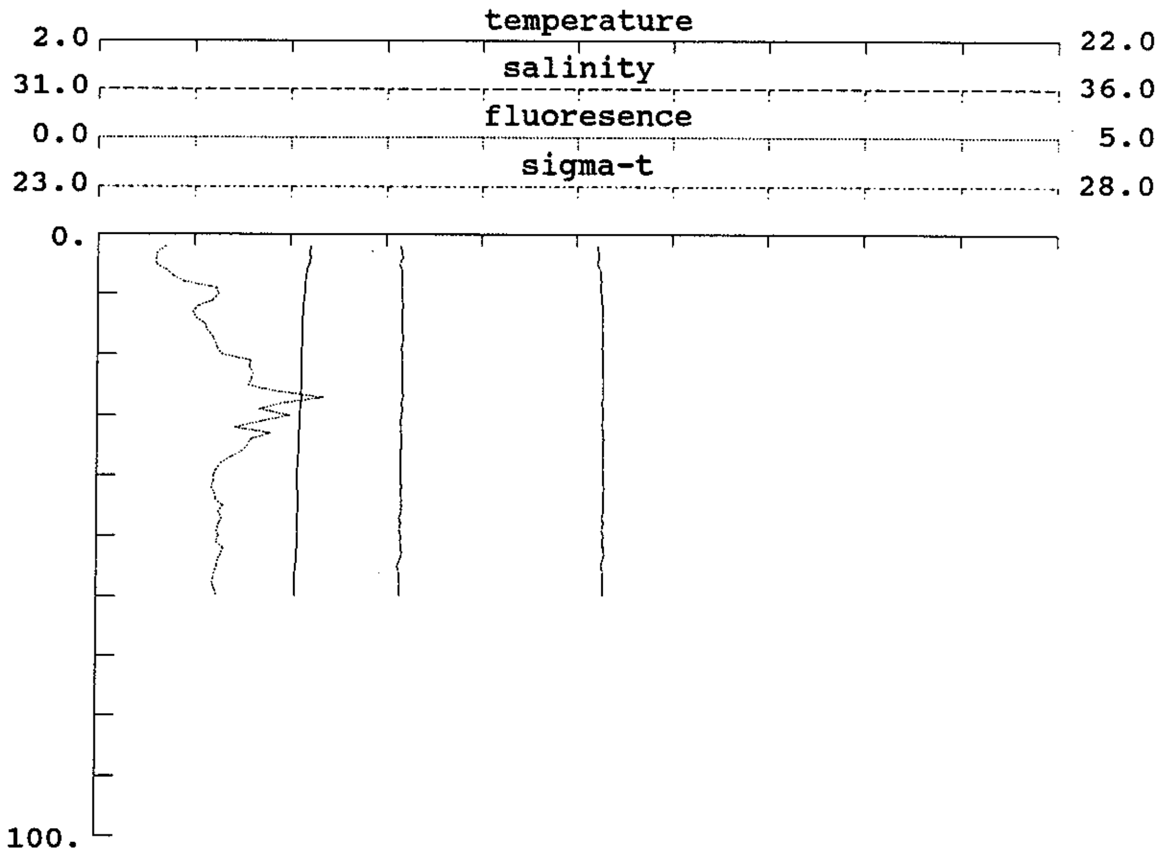


Depth	Temp	Salt	Flur	Sigma-t
1.00	6.95	32.88	0.48	25.78
5.00	6.95	32.89	0.44	25.79
10.00	6.95	32.90	0.57	25.79
15.00	6.95	32.90	0.59	25.80
20.00	6.95	32.90	0.57	25.80
25.00	6.95	32.90	0.57	25.80
30.00	6.95	32.91	0.57	25.80
40.00	6.94	32.91	0.56	25.81
50.00	6.94	32.92	0.58	25.81
51.00	6.94	32.91	0.61	25.81

[** Note: this is uncorrected data **]

Cast: 005
Lat: 40 50.3 N
Lon: 68 .1 W

Date(y\m\d): 95\5\10
Hour (GMT): 15.5
Bottom depth: 66

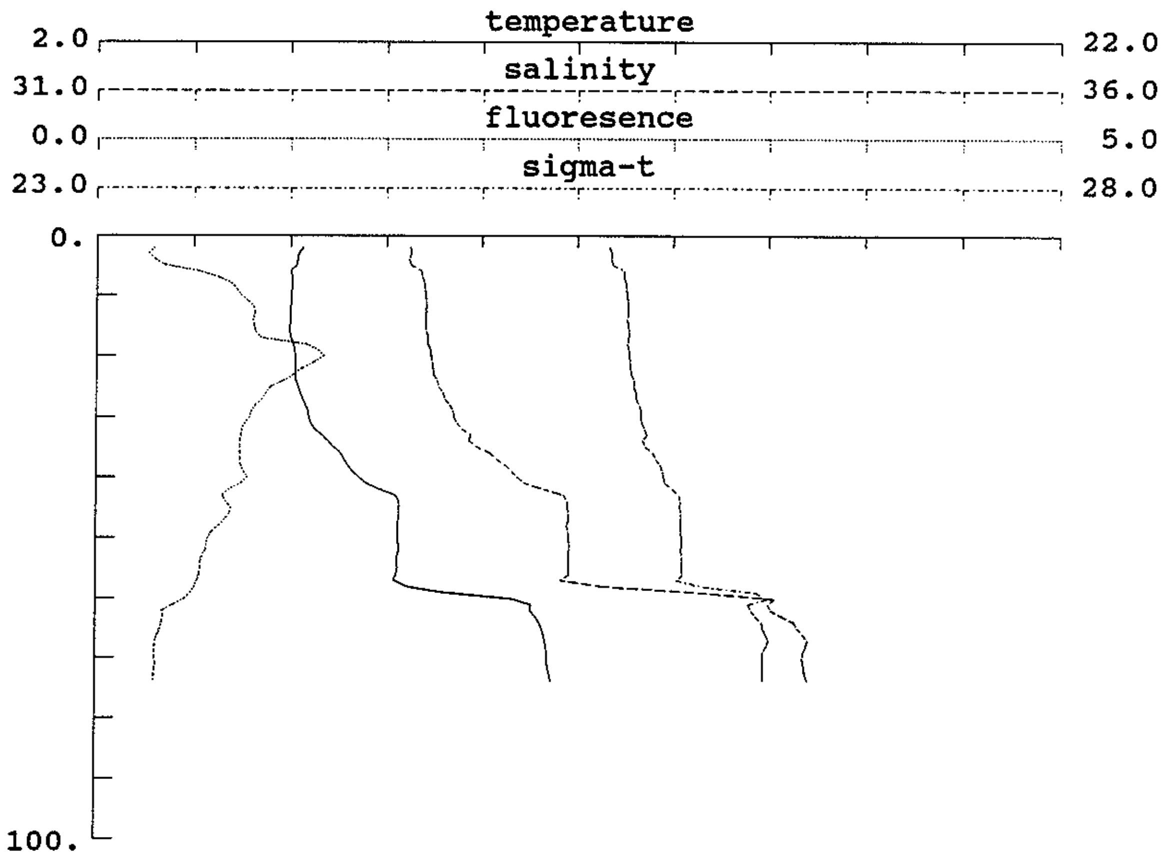


Depth	Temp	Salt	Flur	Sigma-t
2.00	6.41	32.57	0.35	25.61
5.00	6.38	32.57	0.30	25.61
10.00	6.29	32.58	0.63	25.63
15.00	6.25	32.58	0.56	25.64
20.00	6.24	32.58	0.64	25.64
25.00	6.24	32.59	0.78	25.64
30.00	6.20	32.58	1.00	25.64
40.00	6.16	32.58	0.60	25.65
50.00	6.17	32.58	0.63	25.65
60.00	6.12	32.58	0.62	25.65

[** Note: this is uncorrected data **]

Cast: 006
Lat: 40 40. N
Lon: 67 47.2 W

Date(y\m\d): 95\5\10
Hour (GMT): 18.1
Bottom depth: 79

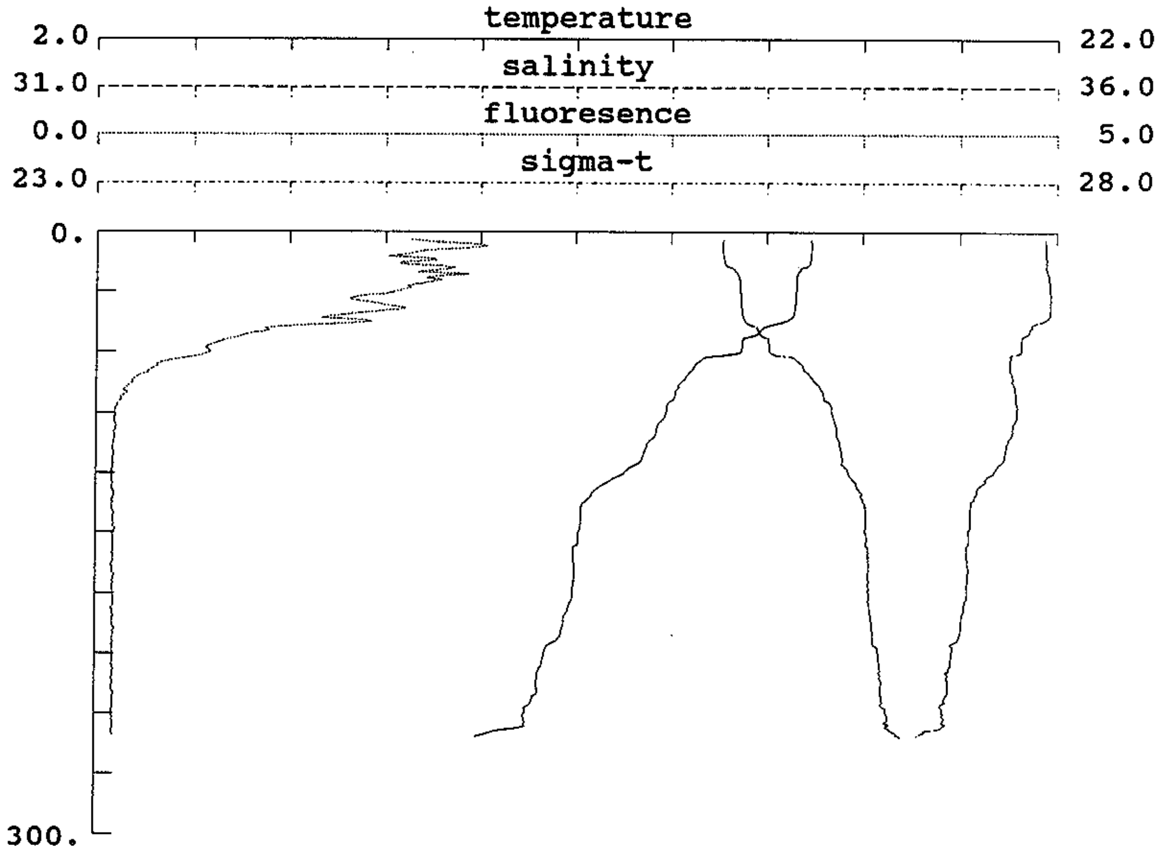


Depth	Temp	Salt	Flur	Sigma-t
1.00	6.29	32.56	0.44	25.61
5.00	6.13	32.63	0.35	25.69
10.00	6.02	32.70	0.74	25.76
15.00	5.98	32.70	0.81	25.77
20.00	6.10	32.73	1.18	25.77
25.00	6.17	32.77	0.90	25.80
30.00	6.38	32.85	0.79	25.83
40.00	7.44	33.19	0.78	25.95
50.00	8.26	33.46	0.58	26.05
74.00	11.48	34.71	0.30	26.49

[** Note: this is uncorrected data **]

Cast: 007
Lat: 40 26.5 N
Lon: 67 21.2 W

Date(y\m\d): 95\5\10
Hour (GMT): 22.3
Bottom depth: 264

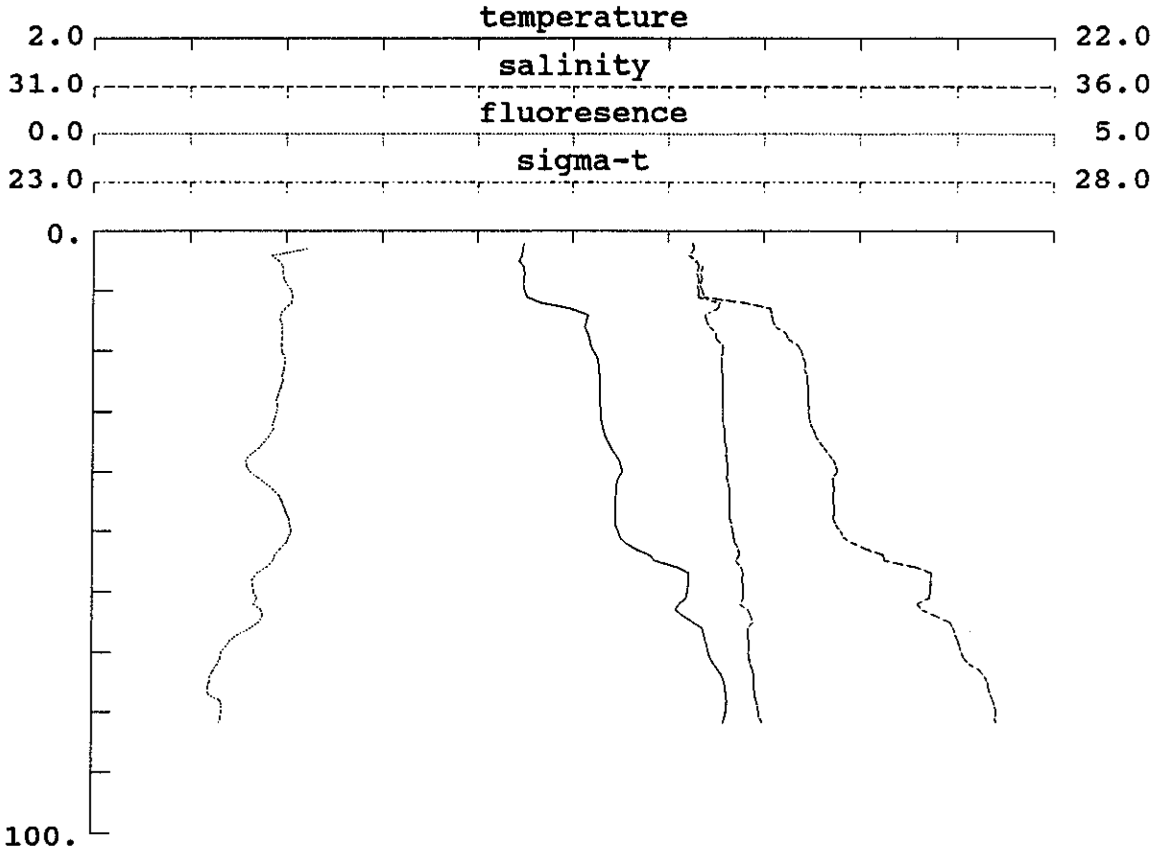


Depth	Temp	Salt	Flur	Sigma-t
1.00	16.90	35.94	1.65	26.27
5.00	16.93	35.94	1.77	26.27
10.00	16.93	35.94	1.66	26.27
15.00	16.90	35.94	1.58	26.28
20.00	16.66	35.95	1.67	26.34
25.00	16.63	35.96	1.74	26.36
30.00	16.62	35.97	1.54	26.36
40.00	16.58	35.97	1.40	26.37
50.00	15.85	35.86	0.86	26.46
75.00	14.19	35.78	0.19	26.76
100.00	13.69	35.77	0.09	26.87
150.00	12.07	35.55	0.09	27.02
200.00	11.72	35.51	0.10	27.06
250.00	10.08	35.29	0.09	27.18
251.00	9.92	35.29	0.09	27.21

[** Note: this is uncorrected data **]

Cast: 008
Lat: 40 52.3 N
Lon: 67 3.5 W

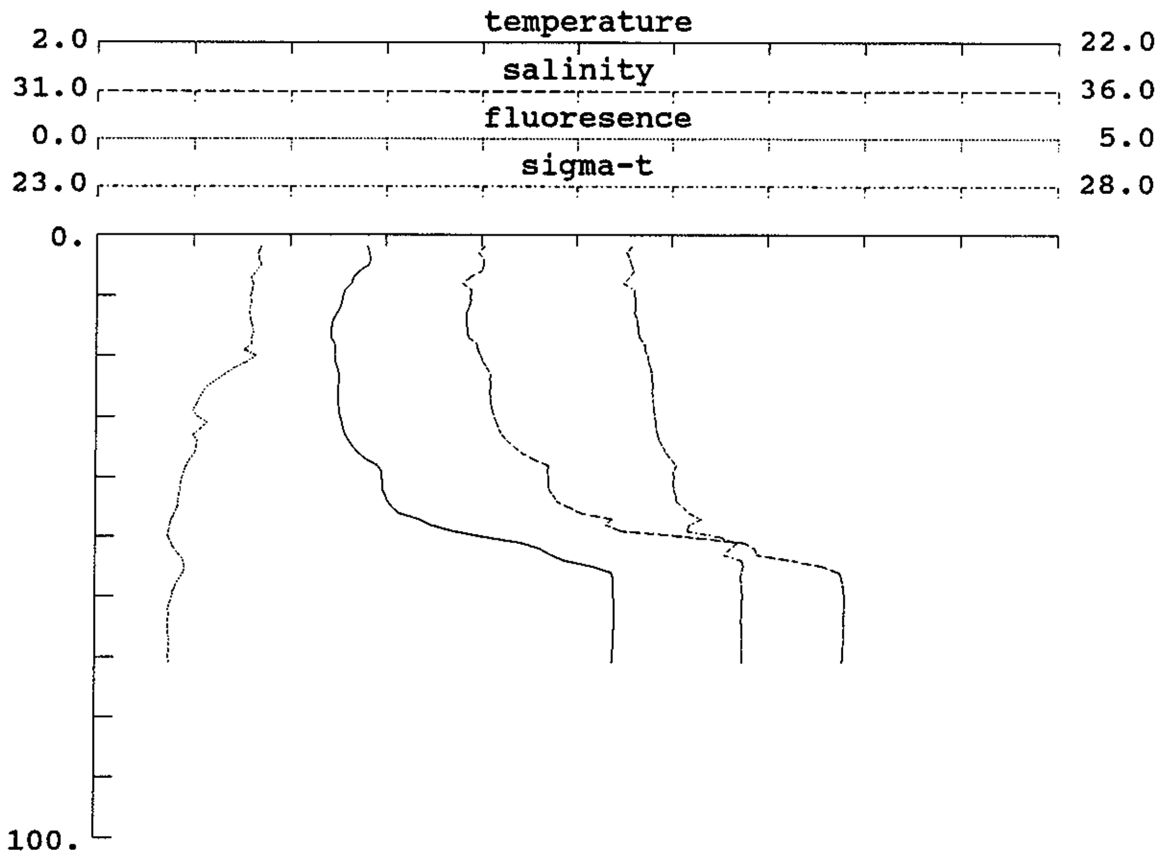
Date(y\m\d): 95\5\11
Hour (GMT): 6.2
Bottom depth: 88



Depth	Temp	Salt	Flur	Sigma-t
2.00	10.97	34.13	0.05	26.12
5.00	10.87	34.14	0.96	26.15
10.00	10.98	34.18	1.03	26.16
15.00	12.29	34.55	0.97	26.20
20.00	12.44	34.70	0.98	26.29
25.00	12.57	34.73	0.98	26.29
30.00	12.59	34.74	0.95	26.29
40.00	13.05	34.89	0.82	26.32
50.00	12.97	34.90	1.03	26.34
75.00	15.20	35.67	0.61	26.46
82.00	15.17	35.71	0.65	26.50

[** Note: this is uncorrected data **]

Cast:	009	Date(y\m\d):	95\5\11
Lat:	40 58.3 N	Hour (GMT):	9.3
Lon:	67 18.5 W	Bottom depth:	77

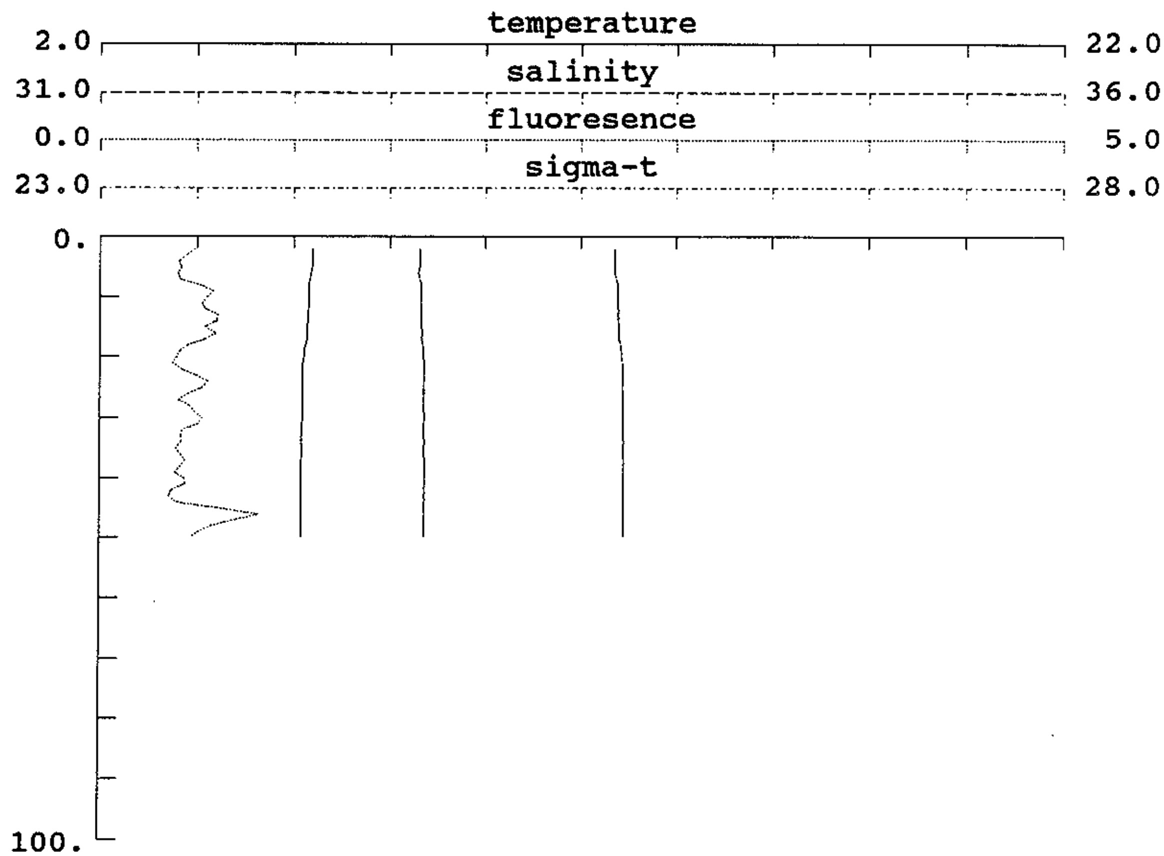


Depth	Temp	Salt	Flur	Sigma-t
2.00	7.62	33.01	0.85	25.79
5.00	7.64	33.01	0.85	25.79
10.00	7.11	32.94	0.79	25.81
15.00	6.87	32.92	0.80	25.82
20.00	6.93	33.00	0.82	25.87
25.00	7.02	33.05	0.57	25.90
30.00	7.05	33.07	0.52	25.92
40.00	7.94	33.36	0.45	26.02
50.00	10.03	34.09	0.37	26.26
71.00	12.79	34.90	0.38	26.37

[** Note: this is uncorrected data **]

Cast: 010
Lat: 41 4.8 N
Lon: 67 37.1 W

Date(y\m\d): 95\5\11
Hour (GMT): 9.4
Bottom depth: 56

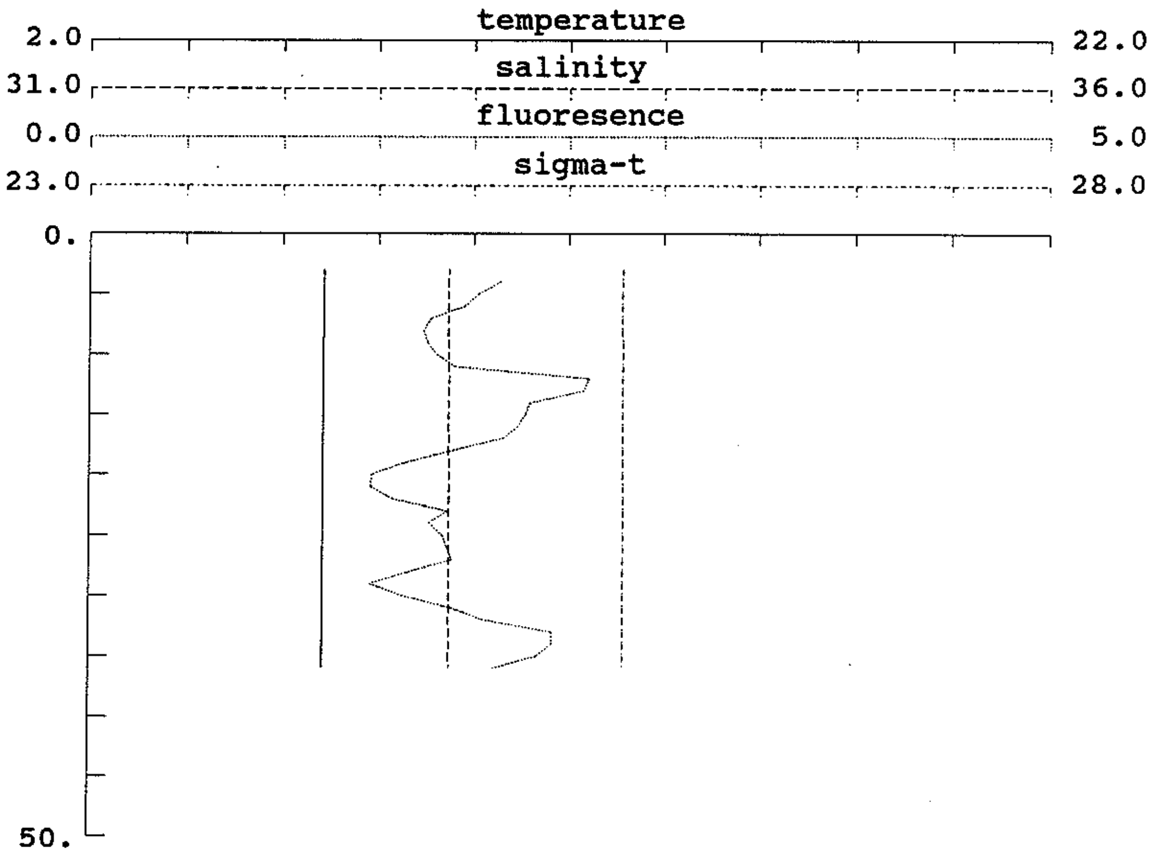


Depth	Temp	Salt	Flur	Sigma-t
1.00	6.39	32.66	0.42	25.68
5.00	6.39	32.66	0.42	25.68
10.00	6.31	32.67	0.55	25.70
15.00	6.28	32.67	0.54	25.70
20.00	6.22	32.68	0.40	25.71
25.00	6.18	32.68	0.53	25.72
30.00	6.18	32.68	0.53	25.72
40.00	6.16	32.68	0.44	25.73
50.00	6.16	32.68	0.47	25.73
50.00	6.16	32.68	0.47	25.73

[** Note: this is uncorrected data **]

Cast: 012
Lat: 41 24.7 N
Lon: 67 33.5 W

Date(y\m\d): 95\5\11
Hour (GMT): 20.1
Bottom depth: 42

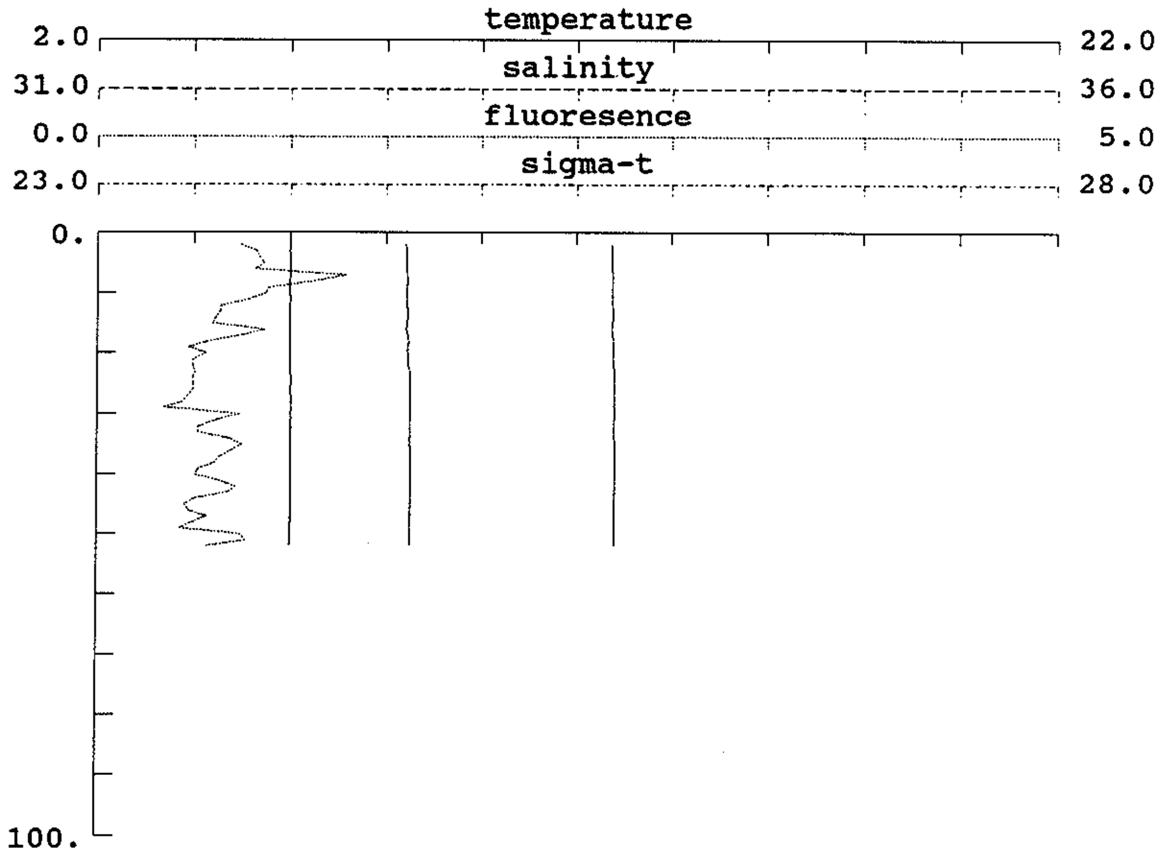


Depth	Temp	Salt	Flur	Sigma-t
3.00	6.85	32.87	0.05	25.79
5.00	6.85	32.87	2.03	25.78
10.00	6.84	32.87	1.81	25.79
15.00	6.84	32.87	2.27	25.79
20.00	6.84	32.87	1.47	25.79
25.00	6.84	32.87	1.84	25.79
30.00	6.84	32.87	1.63	25.79
36.00	6.84	32.88	2.10	25.79

[** Note: this is uncorrected data **]

Cast: 013
Lat: 41 15.8 N
Lon: 67 10. W

Date(y\m\d): 95\5\12
Hour (GMT): 1.7
Bottom depth: 56

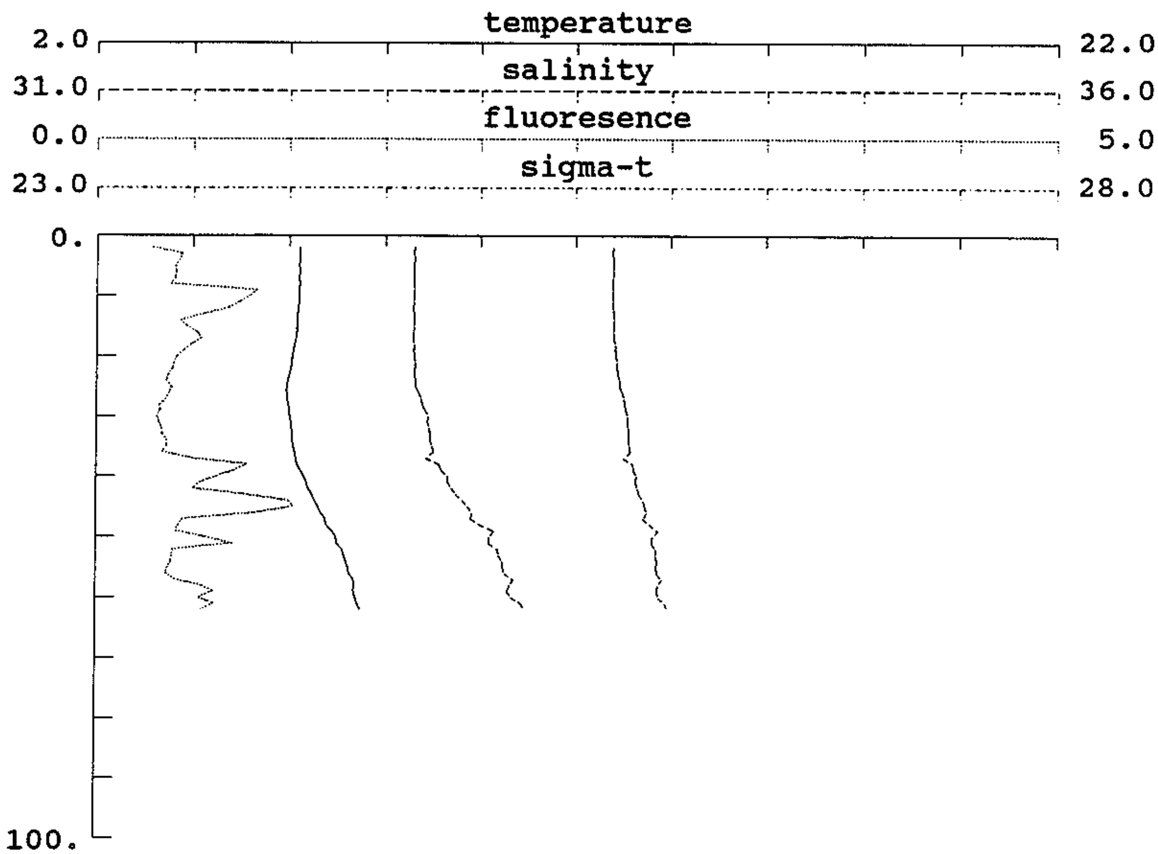


Depth	Temp	Salt	Flur	Sigma-t
1.00	6.01	32.60	0.56	25.68
5.00	6.00	32.61	0.86	25.69
10.00	5.99	32.61	0.87	25.69
15.00	5.99	32.61	0.60	25.69
20.00	5.99	32.61	0.56	25.69
25.00	6.01	32.63	0.50	25.70
30.00	6.01	32.63	0.74	25.70
40.00	6.01	32.63	0.51	25.70
50.00	6.00	32.63	0.74	25.70
52.00	6.00	32.63	0.57	25.70

[** Note: this is uncorrected data **]

Cast: 014
Lat: 41 11.7 N
Lon: 66 58.2 W

Date(y\m\d): 95\5\12
Hour (GMT): 5.1
Bottom depth: 68

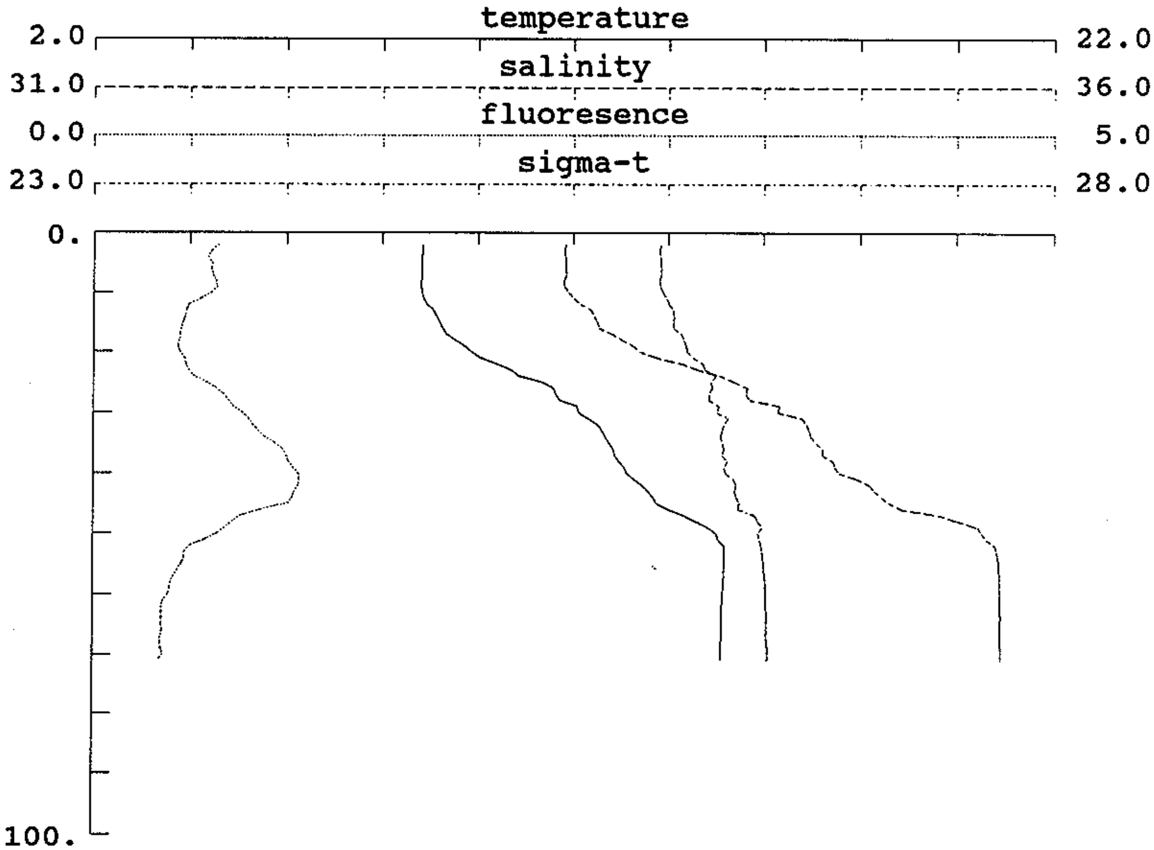


Depth	Temp	Salt	Flur	Sigma-t
2.00	6.21	32.65	0.29	25.70
5.00	6.21	32.65	0.41	25.70
10.00	6.20	32.65	0.80	25.70
15.00	6.16	32.65	0.46	25.70
20.00	6.07	32.65	0.42	25.71
25.00	5.95	32.66	0.39	25.73
30.00	6.02	32.73	0.31	25.78
40.00	6.31	32.83	0.63	25.82
50.00	6.99	33.05	0.57	25.91
62.00	7.51	33.24	0.55	25.99

[** Note: this is uncorrected data **]

Cast: 015
Lat: 41 1.5 N
Lon: 66 42.7 W

Date(y\m\d): 95\5\12
Hour (GMT): 9.2
Bottom depth: 76

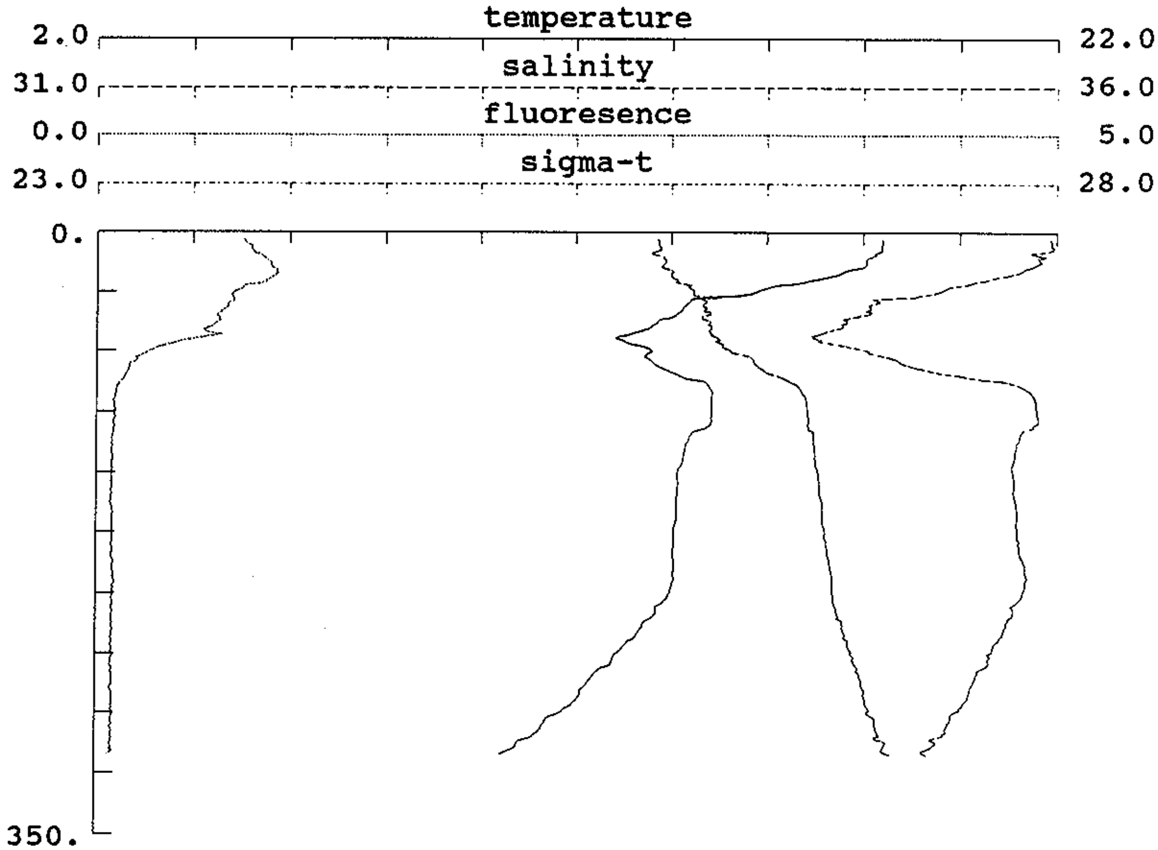


Depth	Temp	Salt	Flur	Sigma-t
2.00	8.84	33.46	0.65	25.96
5.00	8.83	33.46	0.61	25.96
10.00	8.82	33.48	0.61	25.97
15.00	9.21	33.63	0.46	26.03
20.00	9.87	33.86	0.45	26.10
25.00	11.34	34.35	0.58	26.23
30.00	12.13	34.58	0.77	26.26
40.00	13.13	34.90	1.06	26.30
50.00	15.02	35.63	0.65	26.47
71.00	15.13	35.73	0.34	26.53

[** Note: this is uncorrected data **]

Cast: 016
Lat: 40 56.8 N
Lon: 66 25.6 W

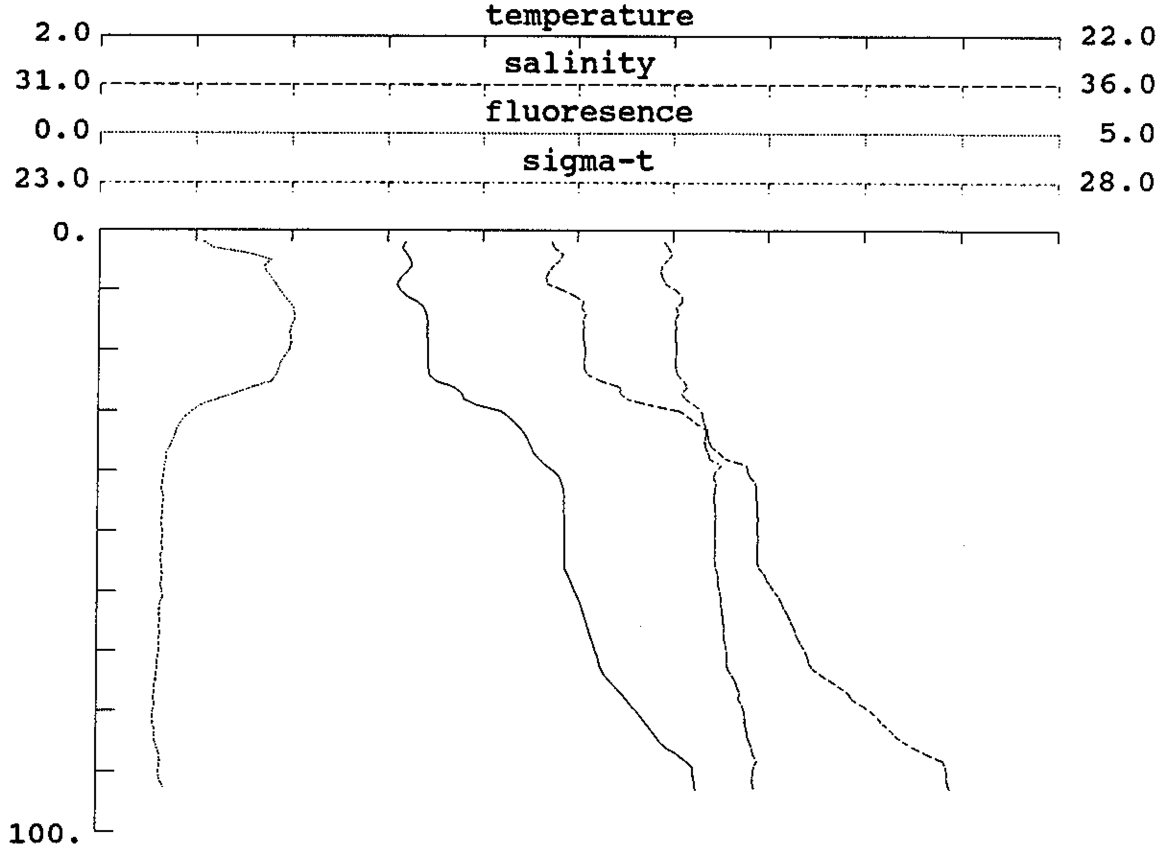
Date(y\m\d): 95\5\12
Hour (GMT): 12.9
Bottom depth: 777



Depth	Temp	Salt	Flur	Sigma-t
1.00	18.40	35.97	0.64	25.93
5.00	18.41	35.97	0.76	25.93
10.00	18.39	35.98	0.80	25.94
15.00	18.10	35.91	0.87	25.96
20.00	18.02	35.87	0.90	25.95
25.00	17.44	35.75	0.93	26.00
30.00	16.52	35.55	0.84	26.07
40.00	14.41	35.08	0.71	26.18
50.00	13.97	34.93	0.64	26.16
75.00	13.57	35.18	0.21	26.43
100.00	14.85	35.89	0.09	26.71
150.00	14.14	35.78	0.08	26.78
200.00	14.06	35.85	0.09	26.85
250.00	12.78	35.66	0.08	26.96
300.00	10.77	35.36	0.08	27.12
304.00	10.46	35.34	0.06	27.16

[** Note: this is uncorrected data **]

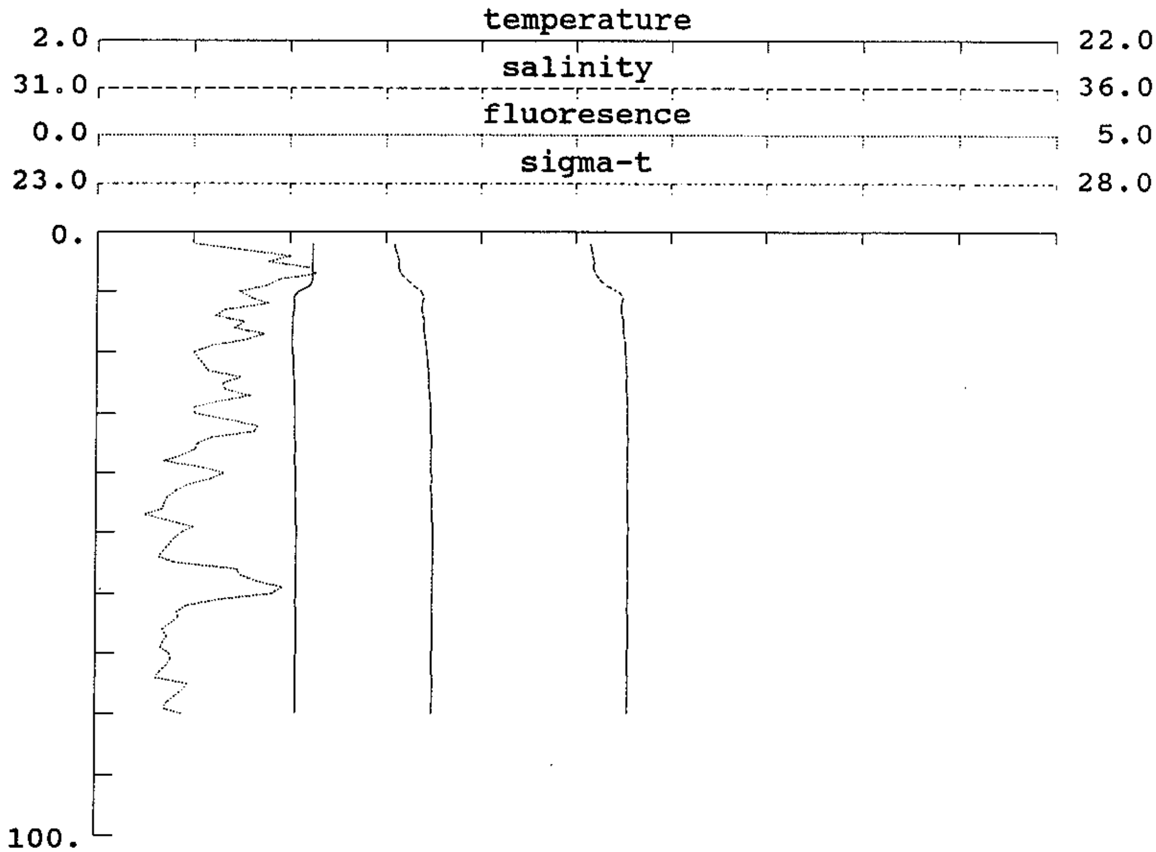
Cast:	017	Date(y\m\d):	95\5\12
Lat:	41 12.2 N	Hour (GMT):	20.4
Lon:	66 27.7 W	Bottom depth:	96



Depth	Temp	Salt	Flur	Sigma-t
2.00	8.37	33.36	0.54	25.96
5.00	8.48	33.41	0.89	25.97
10.00	8.25	33.42	0.94	26.01
15.00	8.84	33.53	1.02	26.01
20.00	8.86	33.54	0.99	26.02
25.00	9.02	33.63	0.90	26.06
30.00	10.40	34.04	0.49	26.16
40.00	11.52	34.40	0.34	26.23
50.00	11.76	34.45	0.34	26.23
75.00	12.73	34.84	0.31	26.34
93.00	14.55	35.46	0.36	26.45

[** Note: this is uncorrected data **]

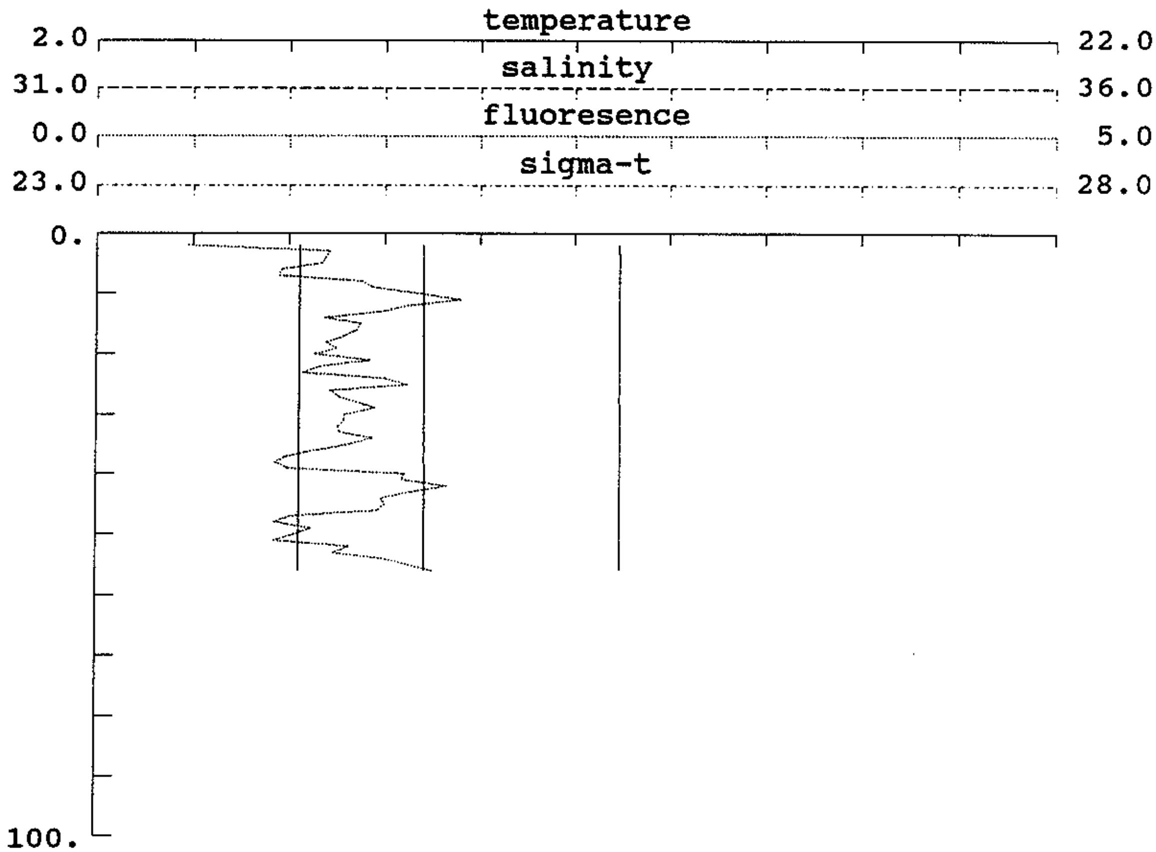
Cast: 018 Date(y\m\d): 95\5\13
Lat: 41 24.7 N Hour (GMT): 1.2
Lon: 66 42. W Bottom depth: 85



Depth	Temp	Salt	Flur	Sigma-t
1.00	6.49	32.55	0.51	25.58
5.00	6.48	32.57	0.89	25.60
10.00	6.17	32.69	0.74	25.73
15.00	6.06	32.70	0.76	25.75
20.00	6.07	32.72	0.51	25.76
25.00	6.10	32.73	0.66	25.77
30.00	6.12	32.74	0.51	25.78
40.00	6.13	32.74	0.66	25.78
50.00	6.16	32.75	0.44	25.78
75.00	6.15	32.75	0.48	25.78
80.00	6.15	32.75	0.46	25.78

[** Note: this is uncorrected data **]

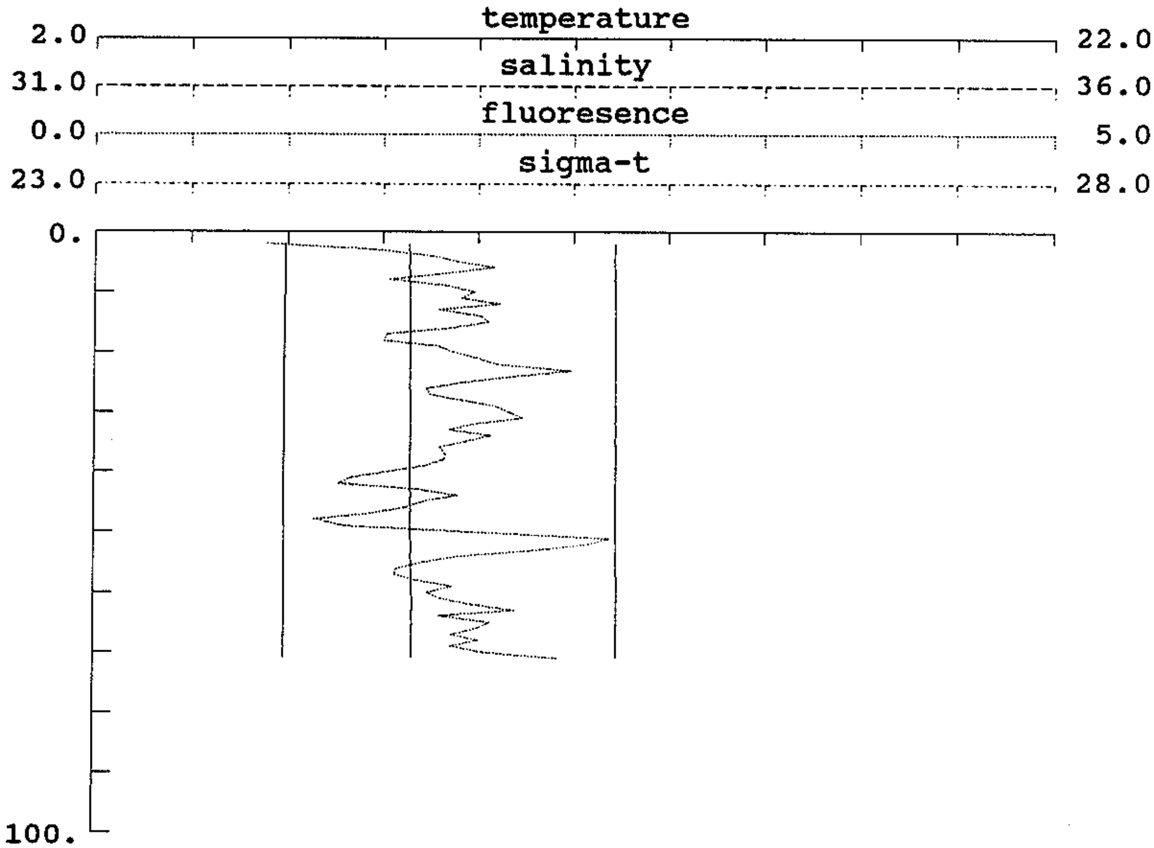
Cast:	019	Date(y\m\d):	95\5\13
Lat:	41 35. N	Hour (GMT):	7.5
Lon:	66 59.7 W	Bottom depth:	62



Depth	Temp	Salt	Flur	Sigma-t
2.00	6.22	32.70	0.47	25.73
5.00	6.21	32.70	1.17	25.74
10.00	6.21	32.70	1.67	25.74
15.00	6.21	32.70	1.37	25.74
20.00	6.21	32.71	1.14	25.74
25.00	6.22	32.71	1.62	25.74
30.00	6.22	32.71	1.29	25.74
40.00	6.22	32.71	1.61	25.74
50.00	6.22	32.71	1.03	25.74
56.00	6.22	32.71	1.76	25.74

[** Note: this is uncorrected data **]

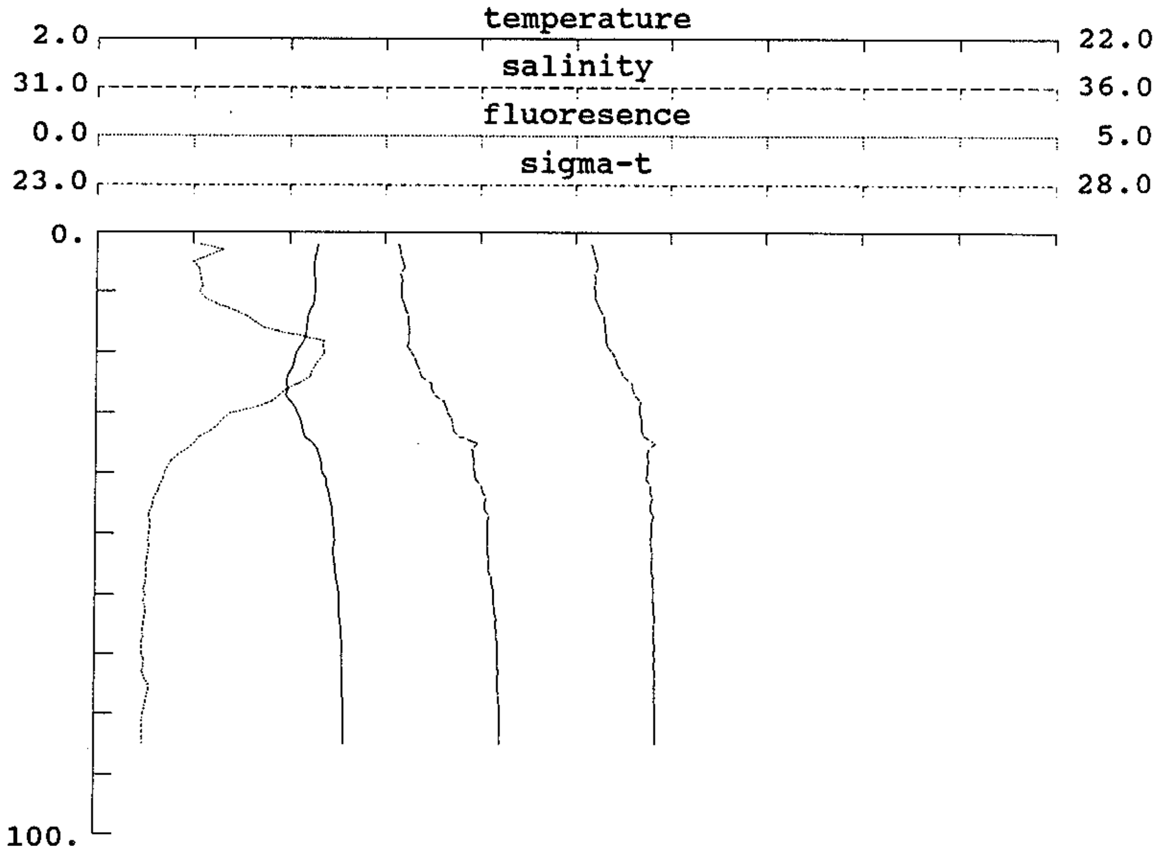
Cast: 020 Date(y\m\d): 95\5\13
Lat: 41 43.7 N Hour (GMT): 11.6
Lon: 66 31.2 W Bottom depth: 77



Depth	Temp	Salt	Flur	Sigma-t
1.00	5.96	32.63	0.92	25.71
5.00	5.94	32.64	1.89	25.72
10.00	5.94	32.64	1.98	25.72
15.00	5.94	32.64	2.05	25.72
20.00	5.94	32.64	1.87	25.72
25.00	5.94	32.64	1.91	25.72
30.00	5.94	32.65	2.17	25.73
40.00	5.94	32.65	1.53	25.73
50.00	5.94	32.65	1.95	25.73
71.00	5.95	32.66	2.43	25.73

[** Note: this is uncorrected data **]

```
Cast:    021            Date(y\m\d):  95\5\13
Lat:   41 31.8 N        Hour (GMT):     15.5
Lon:   66 23.2 W        Bottom depth:  91
```

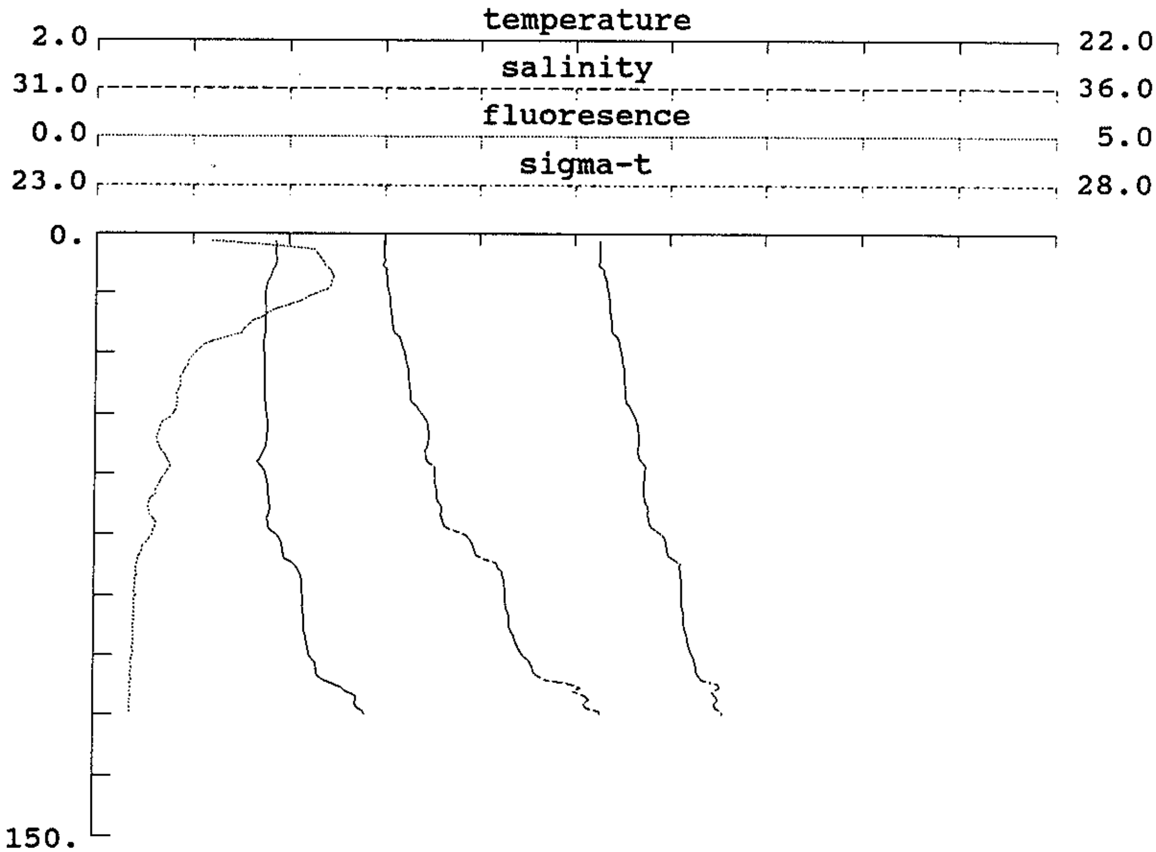


Depth	Temp	Salt	Flur	Sigma-t
1.00	6.59	32.58	0.55	25.59
5.00	6.52	32.59	0.50	25.61
10.00	6.53	32.59	0.53	25.60
15.00	6.37	32.62	0.82	25.65
20.00	6.14	32.64	1.18	25.70
25.00	5.95	32.75	1.05	25.80
30.00	6.17	32.83	0.70	25.84
40.00	6.71	32.98	0.36	25.89
50.00	6.95	33.04	0.28	25.91
75.00	7.14	33.10	0.28	25.93
85.00	7.18	33.11	0.25	25.93

[** Note: this is uncorrected data **]

Cast: 022
Lat: 41 32. N
Lon: 66 1.5 W

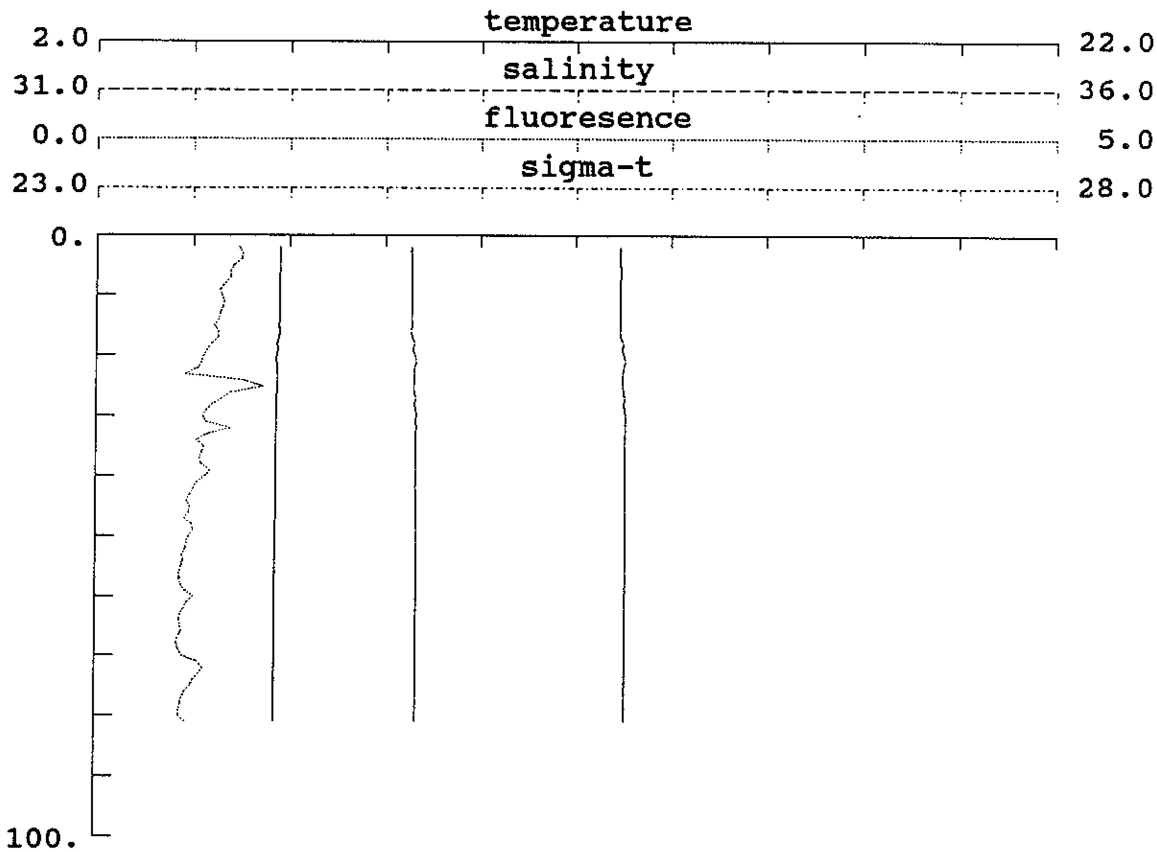
Date(y\m\d): 95\5\13
Hour (GMT): 18.8
Bottom depth: 125



Depth	Temp	Salt	Flur	Sigma-t
2.00	5.73	32.49	0.60	25.63
5.00	5.73	32.50	1.15	25.63
10.00	5.64	32.50	1.22	25.65
15.00	5.51	32.52	1.15	25.68
20.00	5.52	32.53	0.89	25.69
25.00	5.50	32.55	0.76	25.70
30.00	5.49	32.61	0.52	25.75
40.00	5.51	32.64	0.42	25.77
50.00	5.56	32.74	0.33	25.84
75.00	5.77	32.93	0.30	25.97
100.00	6.38	33.19	0.21	26.10
120.00	7.64	33.65	0.19	26.29

[** Note: this is uncorrected data **]

Cast:	023	Date(y\m\d):	95\5\13
Lat:	41 48.2 N	Hour (GMT):	22.7
Lon:	66 11.7 W	Bottom depth:	86

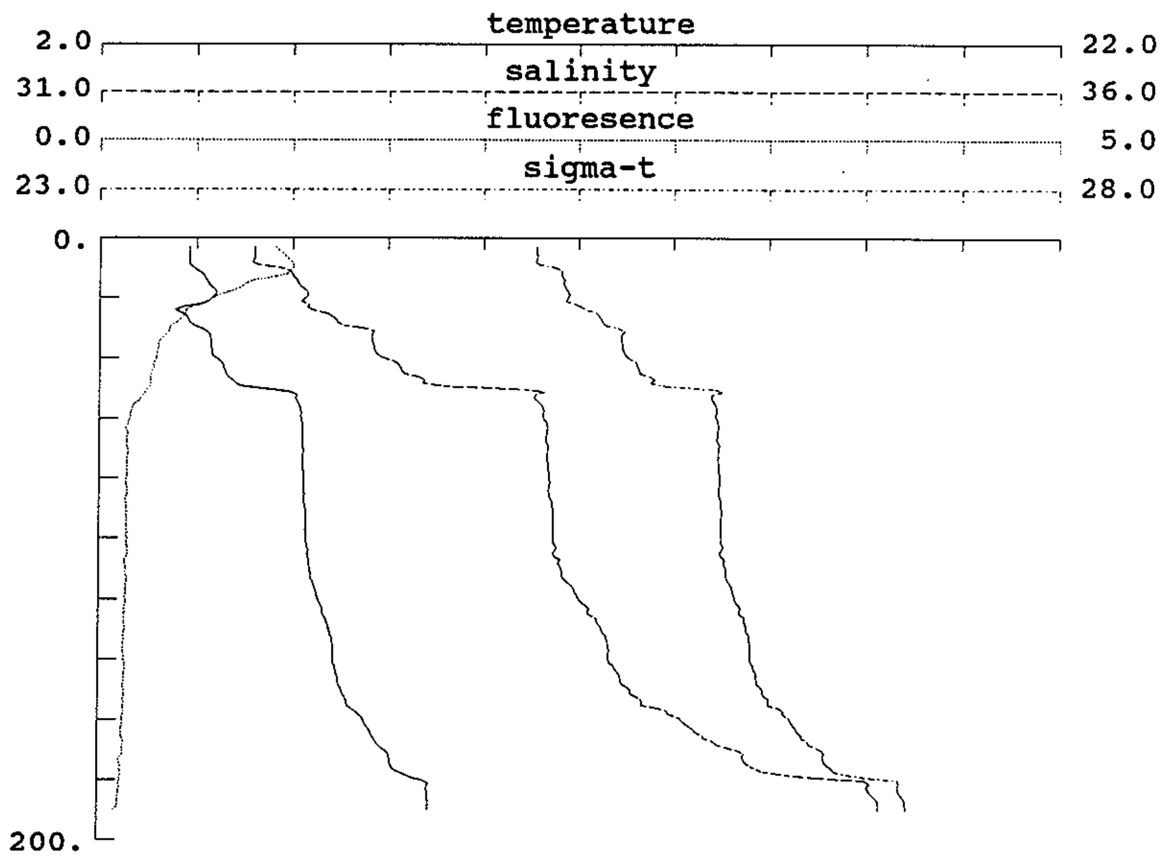


Depth	Temp	Salt	Flur	Sigma-t
1.00	5.80	32.63	0.79	25.73
5.00	5.80	32.64	0.71	25.73
10.00	5.79	32.64	0.65	25.73
15.00	5.79	32.64	0.61	25.74
20.00	5.74	32.66	0.56	25.76
25.00	5.76	32.65	0.86	25.75
30.00	5.73	32.66	0.55	25.76
40.00	5.73	32.66	0.57	25.76
50.00	5.72	32.67	0.48	25.77
75.00	5.72	32.67	0.50	25.77
81.00	5.72	32.67	0.47	25.77

[** Note: this is uncorrected data **]

Cast: 024
Lat: 42 2.8 N
Lon: 65 56.1 W

Date(y\m\d): 95\5\14
Hour (GMT): 3.
Bottom depth: 194

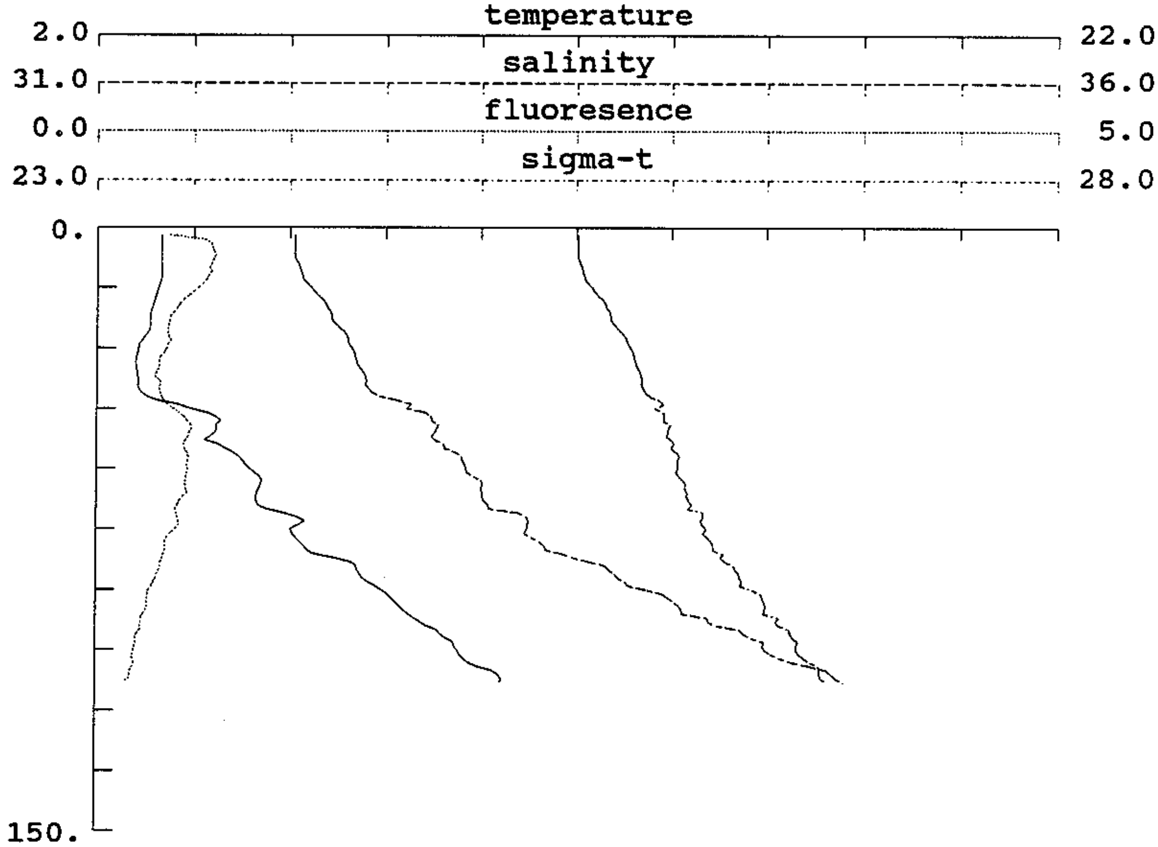


Depth	Temp	Salt	Flur	Sigma-t
1.00	3.85	31.80	0.90	25.28
5.00	3.85	31.80	0.94	25.28
10.00	3.93	31.93	1.01	25.38
15.00	4.26	32.03	0.76	25.42
20.00	4.32	32.07	0.58	25.45
25.00	3.70	32.18	0.44	25.60
30.00	4.08	32.37	0.36	25.71
40.00	4.41	32.48	0.29	25.77
50.00	5.53	33.21	0.25	26.22
75.00	6.22	33.34	0.14	26.24
100.00	6.29	33.38	0.15	26.26
150.00	7.06	33.78	0.13	26.47
190.00	8.87	35.08	0.08	27.22

[** Note: this is uncorrected data **]

Cast: 025
Lat: 42 14.7 N
Lon: 65 40.3 W

Date(y\m\d): 95\5\14
Hour (GMT): 7.
Bottom depth: 117

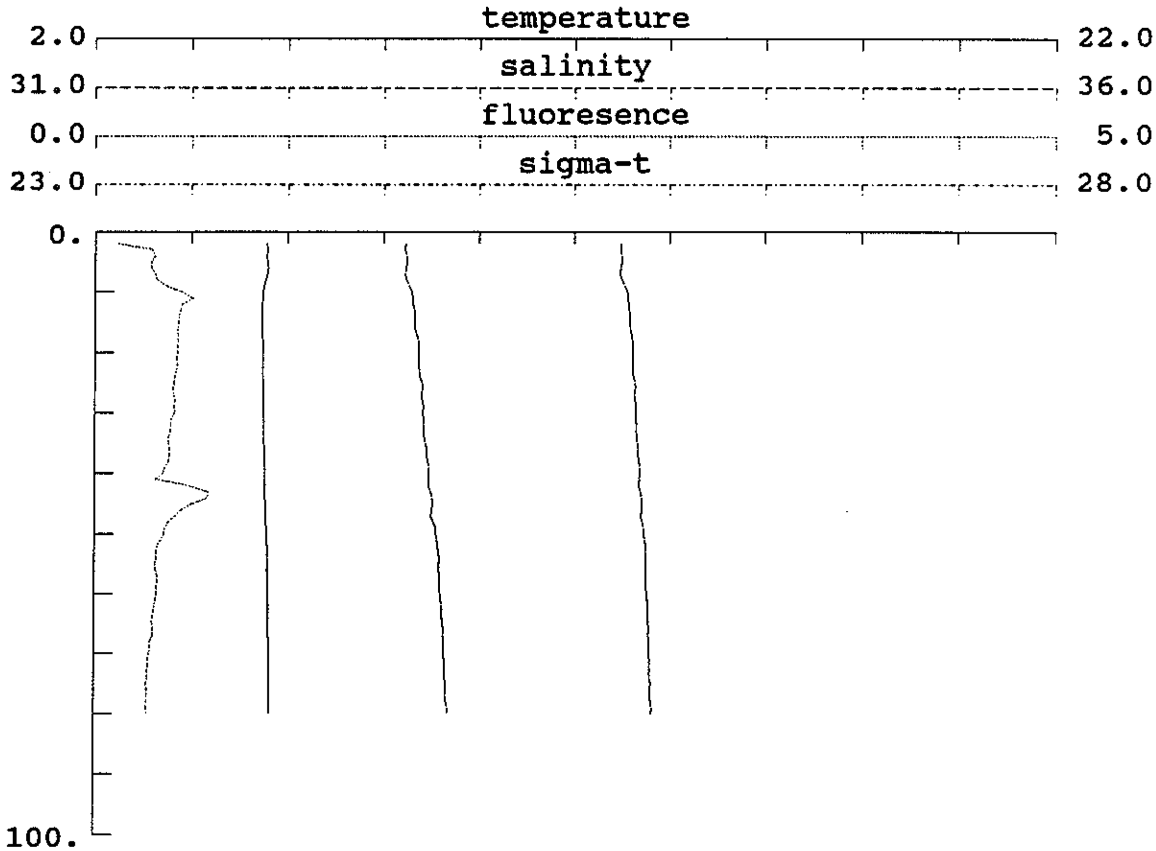


Depth	Temp	Salt	Flur	Sigma-t
2.00	3.32	32.02	0.37	25.51
5.00	3.32	32.02	0.59	25.51
10.00	3.33	32.05	0.58	25.53
15.00	3.26	32.11	0.52	25.58
20.00	3.13	32.20	0.41	25.66
25.00	3.09	32.26	0.37	25.72
30.00	2.85	32.32	0.36	25.79
40.00	2.86	32.41	0.32	25.85
50.00	4.48	32.77	0.49	25.99
75.00	6.03	33.25	0.41	26.19
100.00	9.10	34.37	0.23	26.63
113.00	10.43	34.91	0.15	26.83

[** Note: this is uncorrected data **]

Cast: 026
Lat: 42 4.7 N
Lon: 66 25.2 W

Date(y\m\d): 95\5\14
Hour (GMT): 14.6
Bottom depth: 86

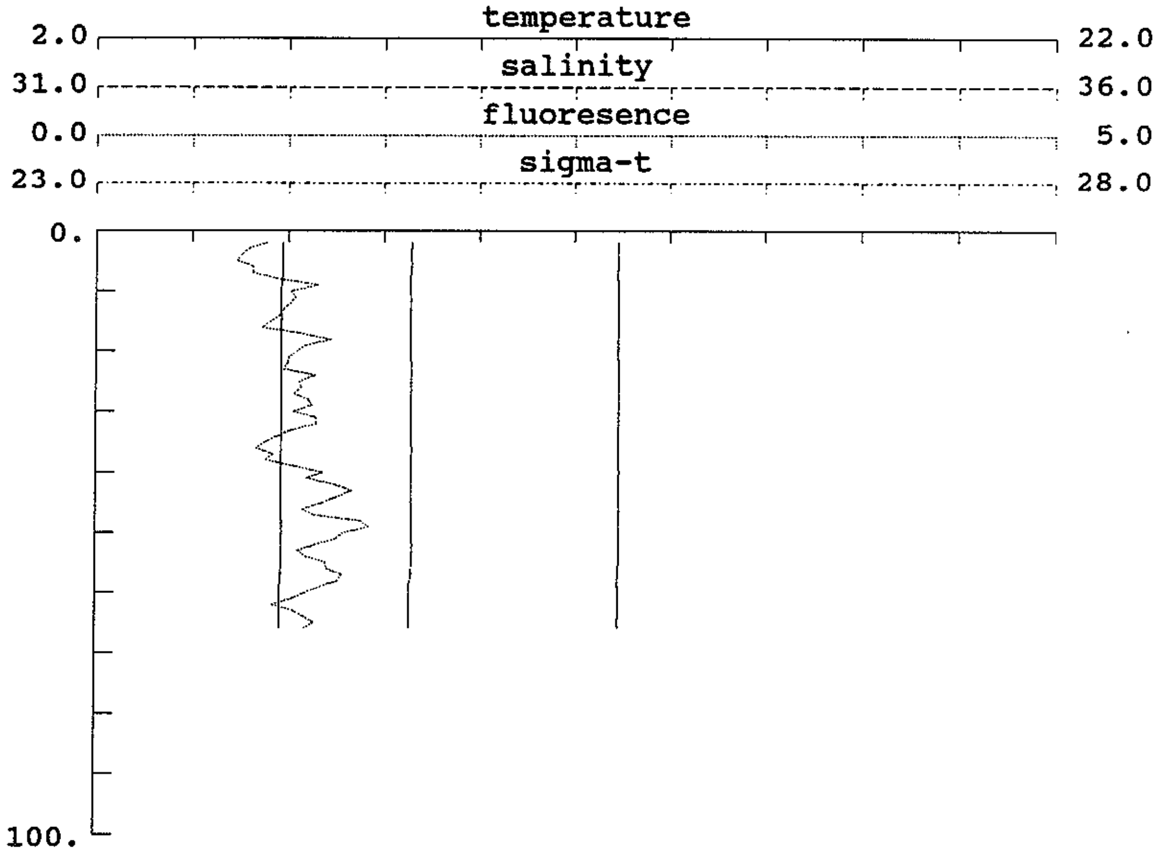


Depth	Temp	Salt	Flur	Sigma-t
2.00	5.56	32.61	0.12	25.74
5.00	5.57	32.62	0.29	25.75
10.00	5.48	32.65	0.45	25.78
15.00	5.47	32.66	0.43	25.79
20.00	5.48	32.68	0.43	25.81
25.00	5.49	32.70	0.41	25.82
30.00	5.49	32.71	0.41	25.83
40.00	5.53	32.74	0.35	25.85
50.00	5.57	32.78	0.36	25.87
75.00	5.64	32.83	0.27	25.91
80.00	5.64	32.84	0.27	25.91

[** Note: this is uncorrected data **]

Cast: 027
Lat: 41 57.1 N
Lon: 66 40.1 W

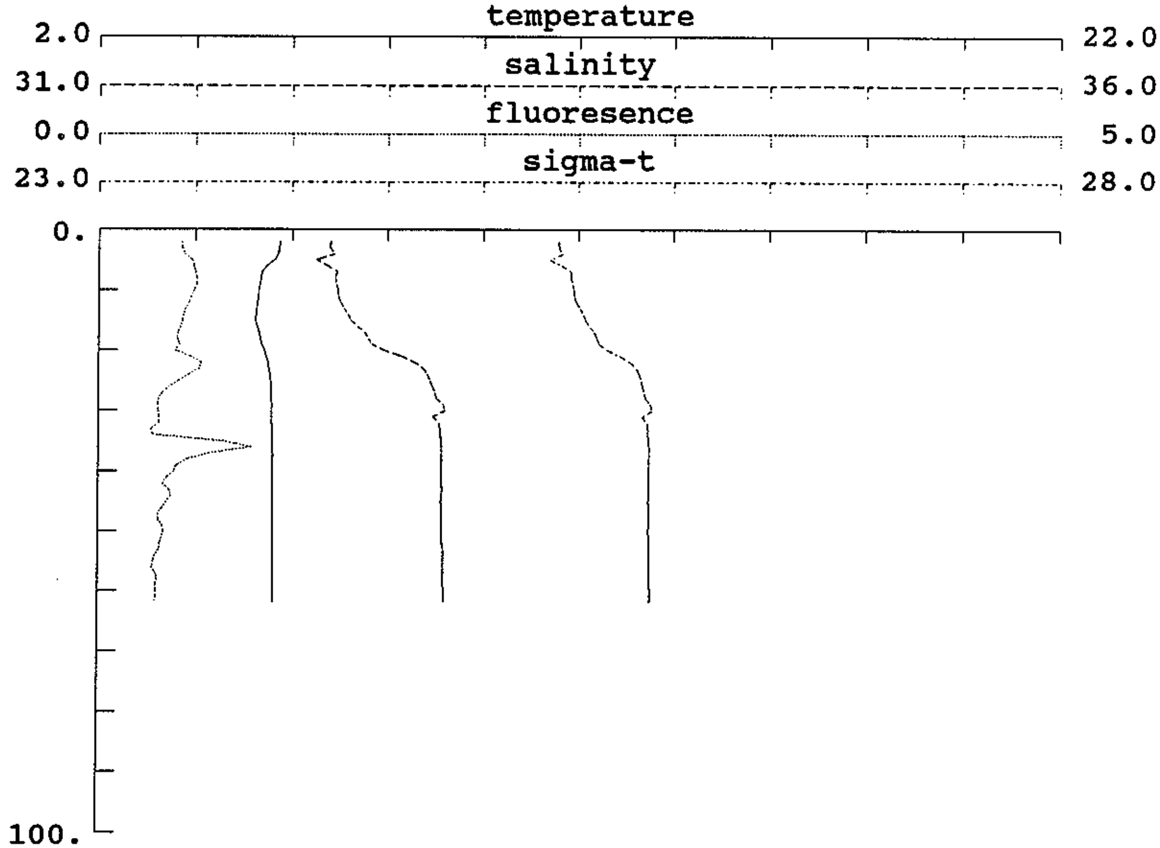
Date(y\m\d): 95\5\14
Hour (GMT): 17.3
Bottom depth: 70



Depth	Temp	Salt	Flur	Sigma-t
1.00	5.90	32.64	1.03	25.72
5.00	5.88	32.64	0.73	25.73
10.00	5.84	32.64	1.01	25.73
15.00	5.85	32.64	0.91	25.73
20.00	5.85	32.64	1.05	25.73
25.00	5.85	32.64	1.06	25.73
30.00	5.85	32.64	1.03	25.73
40.00	5.85	32.65	1.18	25.74
50.00	5.86	32.65	1.29	25.74
66.00	5.82	32.64	1.08	25.73

[** Note: this is uncorrected data **]

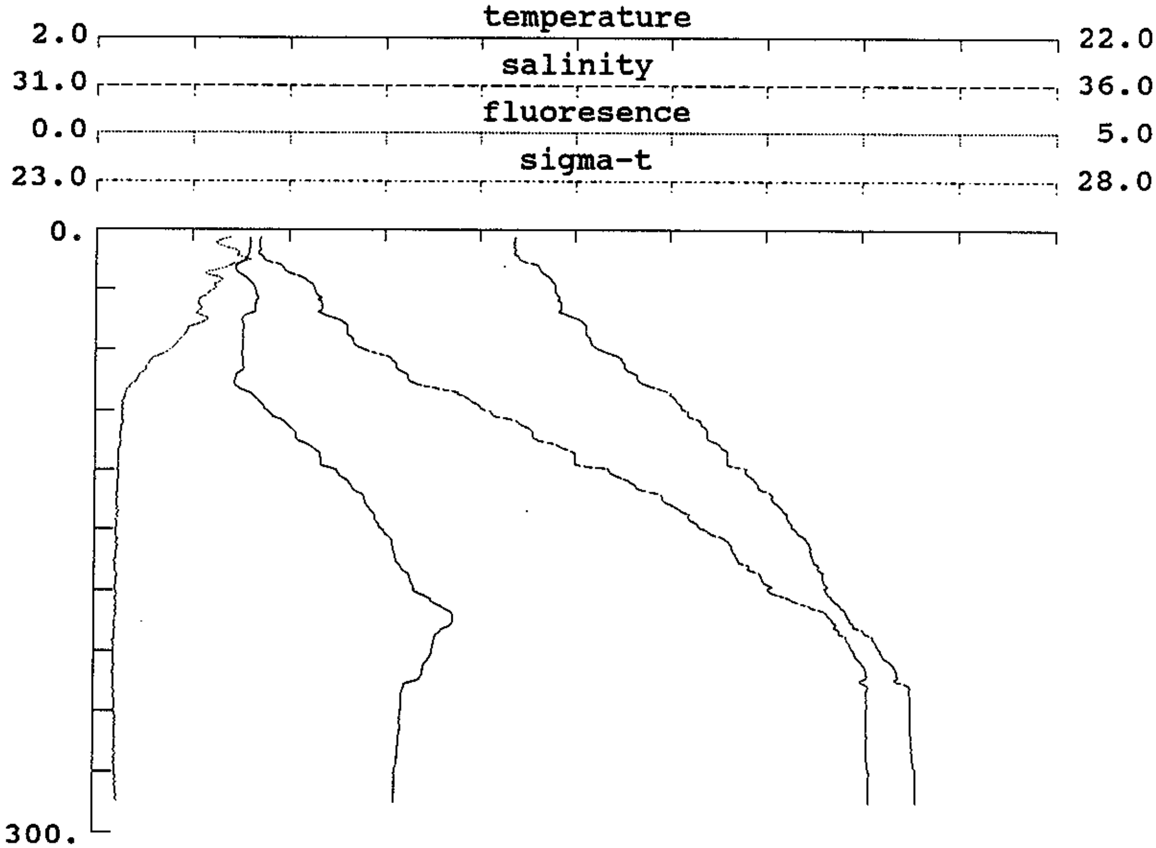
Cast: 028 Date(y\m\d): 95\5\14
Lat: 42 6.2 N Hour (GMT): 22.4
Lon: 66 53.7 W Bottom depth: 67



Depth	Temp	Salt	Flur	Sigma-t
1.00	5.78	32.18	0.41	25.38
5.00	5.64	32.13	0.48	25.35
10.00	5.31	32.24	0.49	25.48
15.00	5.24	32.31	0.43	25.54
20.00	5.42	32.48	0.40	25.66
25.00	5.55	32.72	0.41	25.83
30.00	5.59	32.80	0.31	25.89
40.00	5.61	32.79	0.39	25.88
50.00	5.62	32.79	0.34	25.87
62.00	5.63	32.80	0.29	25.88

[** Note: this is uncorrected data **]

Cast: 029 Date(y\m\d): 95\5\15
Lat: 42 17.1 N Hour (GMT): .9
Lon: 66 53.8 W Bottom depth: 291

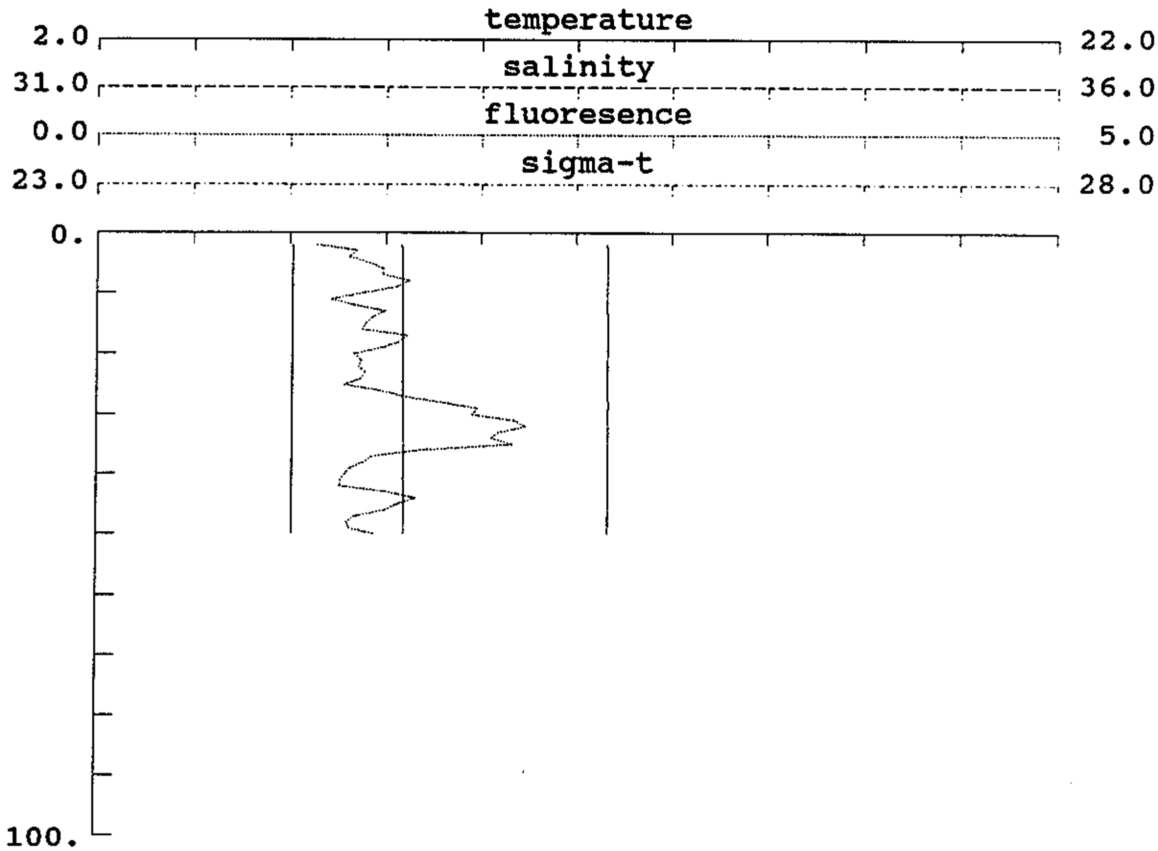


Depth	Temp	Salt	Flur	Sigma-t
1.00	5.21	31.84	0.60	25.18
5.00	5.19	31.85	0.64	25.18
10.00	5.16	31.85	0.72	25.19
15.00	5.11	31.87	0.80	25.21
20.00	4.89	31.98	0.62	25.32
25.00	5.15	32.08	0.65	25.37
30.00	5.30	32.14	0.61	25.40
40.00	5.31	32.17	0.54	25.43
50.00	5.06	32.30	0.48	25.56
75.00	4.89	32.63	0.21	25.83
100.00	6.13	33.28	0.13	26.20
150.00	8.00	34.20	0.11	26.66
200.00	9.23	34.90	0.10	27.02
250.00	8.37	35.04	0.11	27.27
285.00	8.26	35.06	0.13	27.30

[** Note: this is uncorrected data **]

Cast: 030
Lat: 41 56.6 N
Lon: 67 12.3 W

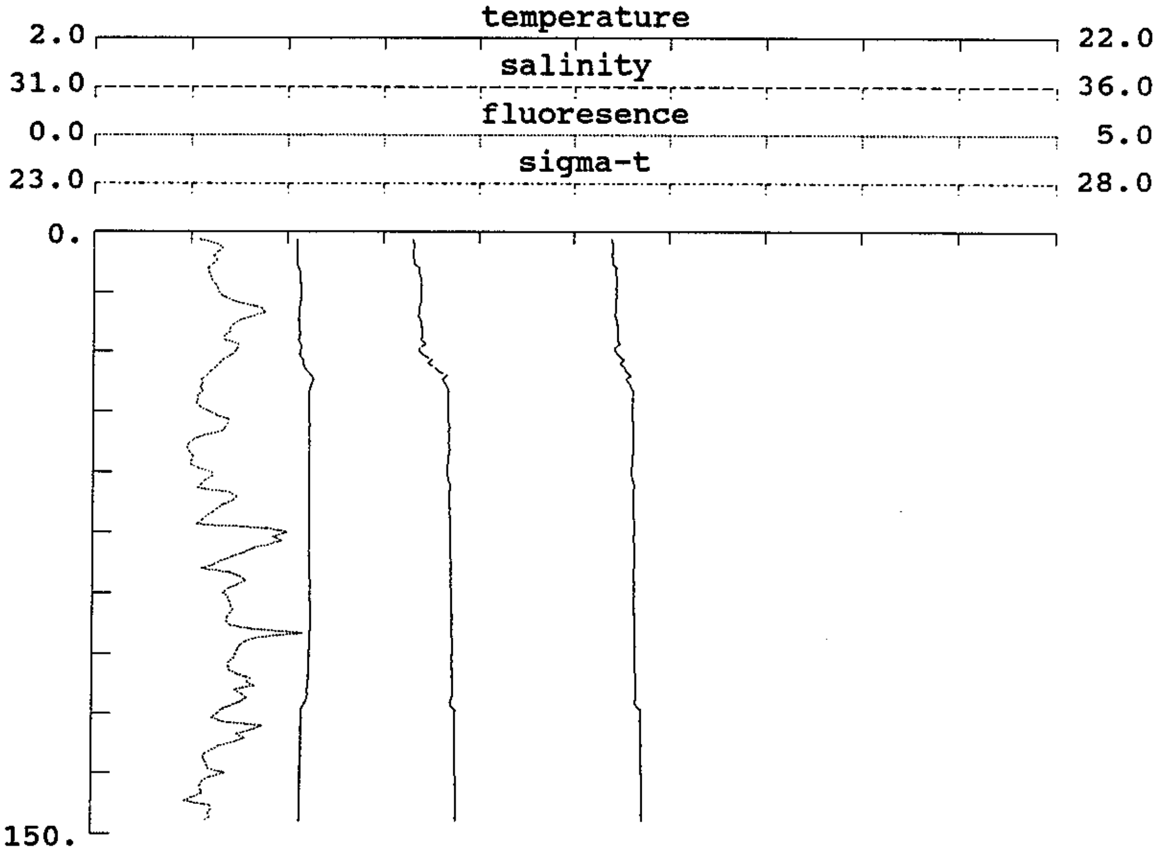
Date(y\m\d): 95\5\15
Hour (GMT): 8.
Bottom depth: 55



Depth	Temp	Salt	Flur	Sigma-t
2.00	6.06	32.58	1.14	25.66
5.00	6.06	32.59	1.41	25.66
10.00	6.05	32.59	1.38	25.66
15.00	6.06	32.59	1.40	25.67
20.00	6.06	32.59	1.33	25.67
25.00	6.06	32.59	1.28	25.67
30.00	6.06	32.59	1.95	25.67
40.00	6.06	32.60	1.29	25.67
50.00	6.06	32.60	1.45	25.67
50.00	6.06	32.60	1.45	25.67

[** Note: this is uncorrected data **]

Cast:	031	Date(y\m\d):	95\5\15
Lat:	42 3.1 N	Hour (GMT):	12.5
Lon:	67 40.2 W	Bottom depth:	152

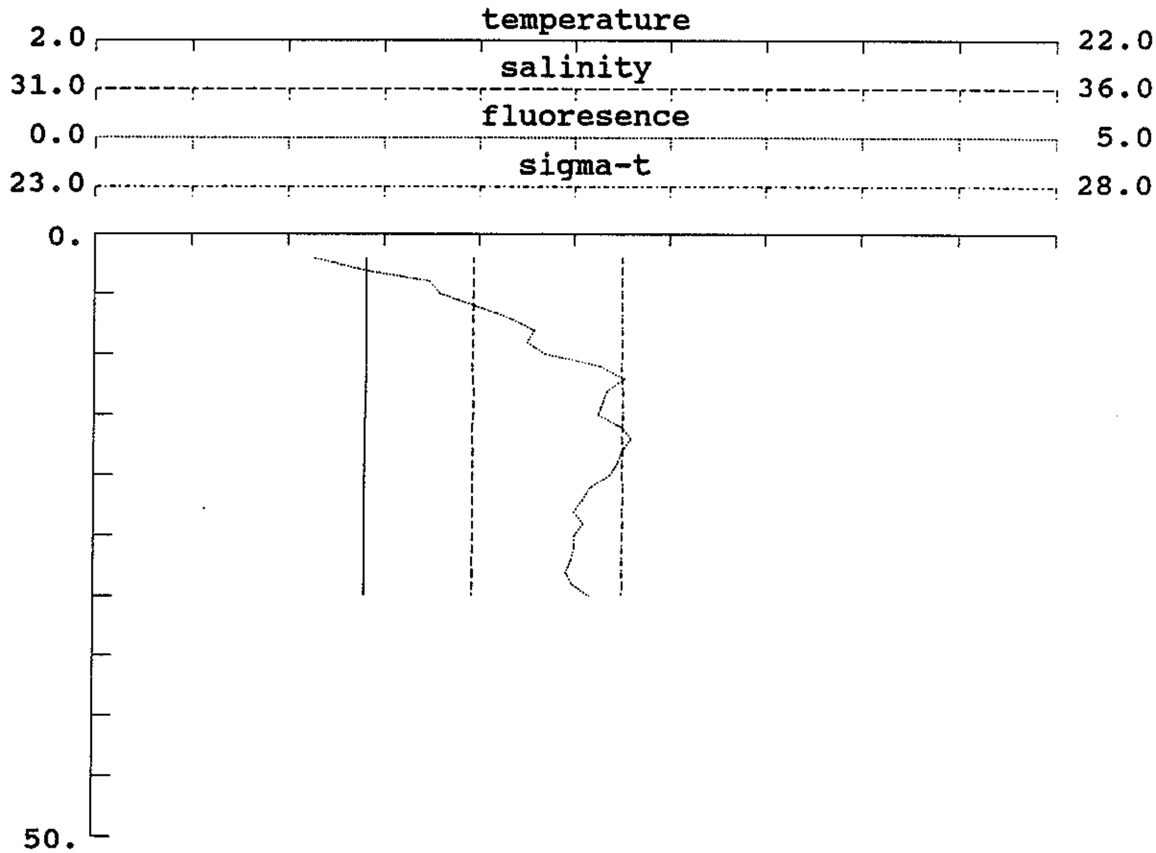


Depth	Temp	Salt	Flur	Sigma-t
1.00	6.20	32.65	0.50	25.69
5.00	6.20	32.66	0.64	25.70
10.00	6.26	32.69	0.59	25.72
15.00	6.28	32.70	0.64	25.72
20.00	6.25	32.69	0.88	25.72
25.00	6.26	32.71	0.70	25.73
30.00	6.26	32.69	0.73	25.72
40.00	6.47	32.85	0.56	25.82
50.00	6.47	32.85	0.67	25.82
75.00	6.48	32.86	1.00	25.83
100.00	6.51	32.87	1.09	25.83
147.00	6.31	32.90	0.58	25.88

[** Note: this is uncorrected data **]

Cast: 032
Lat: 41 44.3 N
Lon: 67 49.7 W

Date(y\m\d): 95\5\15
Hour (GMT): 16.
Bottom depth: 35

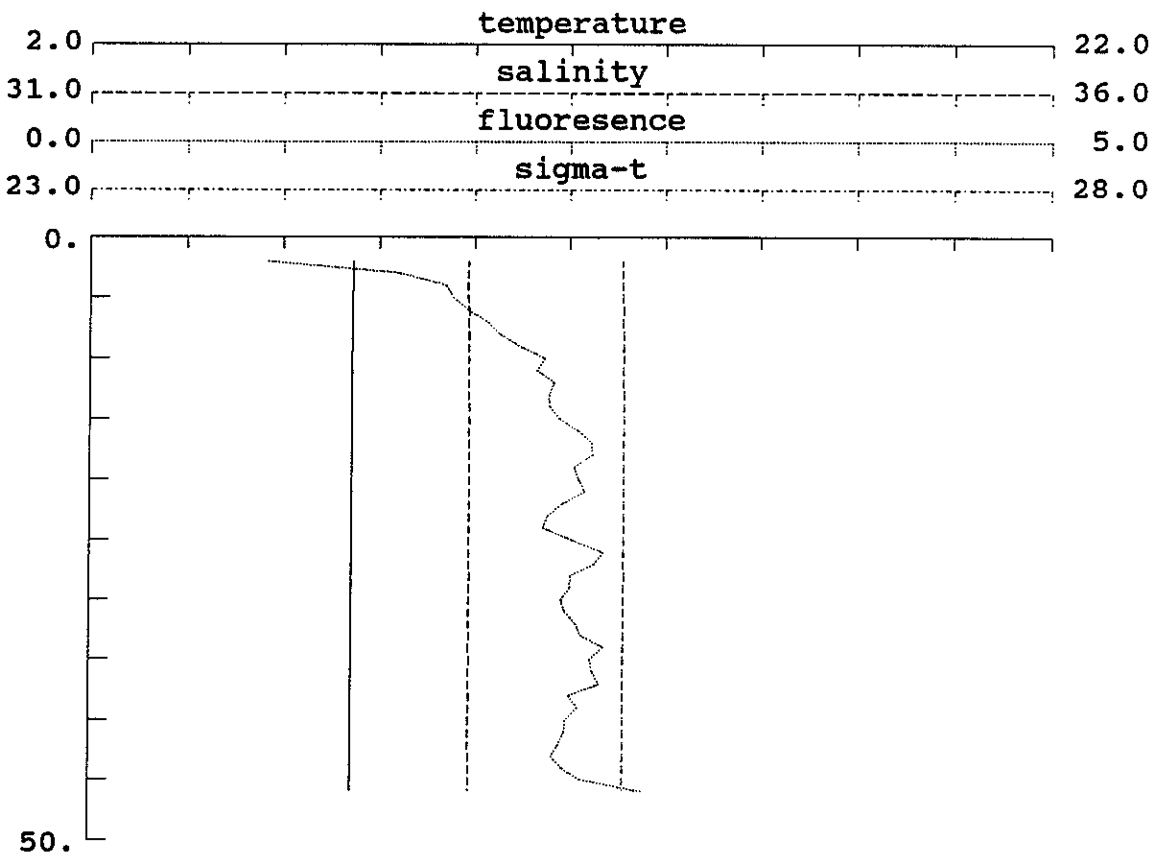


Depth	Temp	Salt	Flur	Sigma-t
2.00	7.64	32.97	1.14	25.75
5.00	7.64	32.97	1.79	25.75
10.00	7.63	32.97	2.35	25.76
15.00	7.63	32.97	2.63	25.76
20.00	7.61	32.97	2.69	25.76
25.00	7.61	32.97	2.51	25.76
30.00	7.61	32.97	2.59	25.76
30.00	7.61	32.97	2.59	25.76

[** Note: this is uncorrected data **]

Cast: 033
Lat: 41 48.8 N
Lon: 67 58.8 W

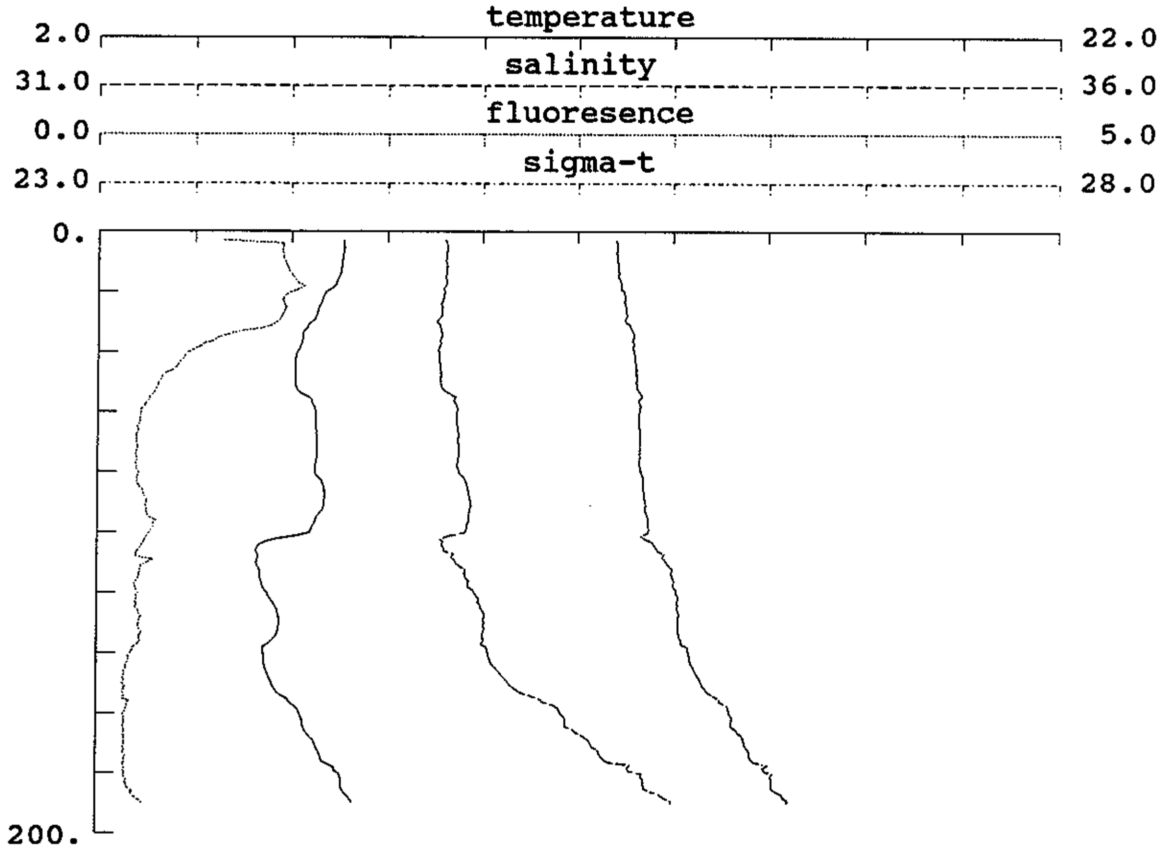
Date(y\m\d): 95\5\15
Hour (GMT): 18.
Bottom depth: 52



Depth	Temp	Salt	Flur	Sigma-t
2.00	7.45	32.97	0.92	25.78
5.00	7.44	32.96	1.89	25.78
10.00	7.43	32.97	2.37	25.79
15.00	7.43	32.97	2.45	25.79
20.00	7.43	32.97	2.55	25.79
25.00	7.43	32.97	2.52	25.79
30.00	7.44	32.97	2.46	25.79
40.00	7.44	32.97	2.49	25.79
46.00	7.44	32.98	2.90	25.79

[** Note: this is uncorrected data **]

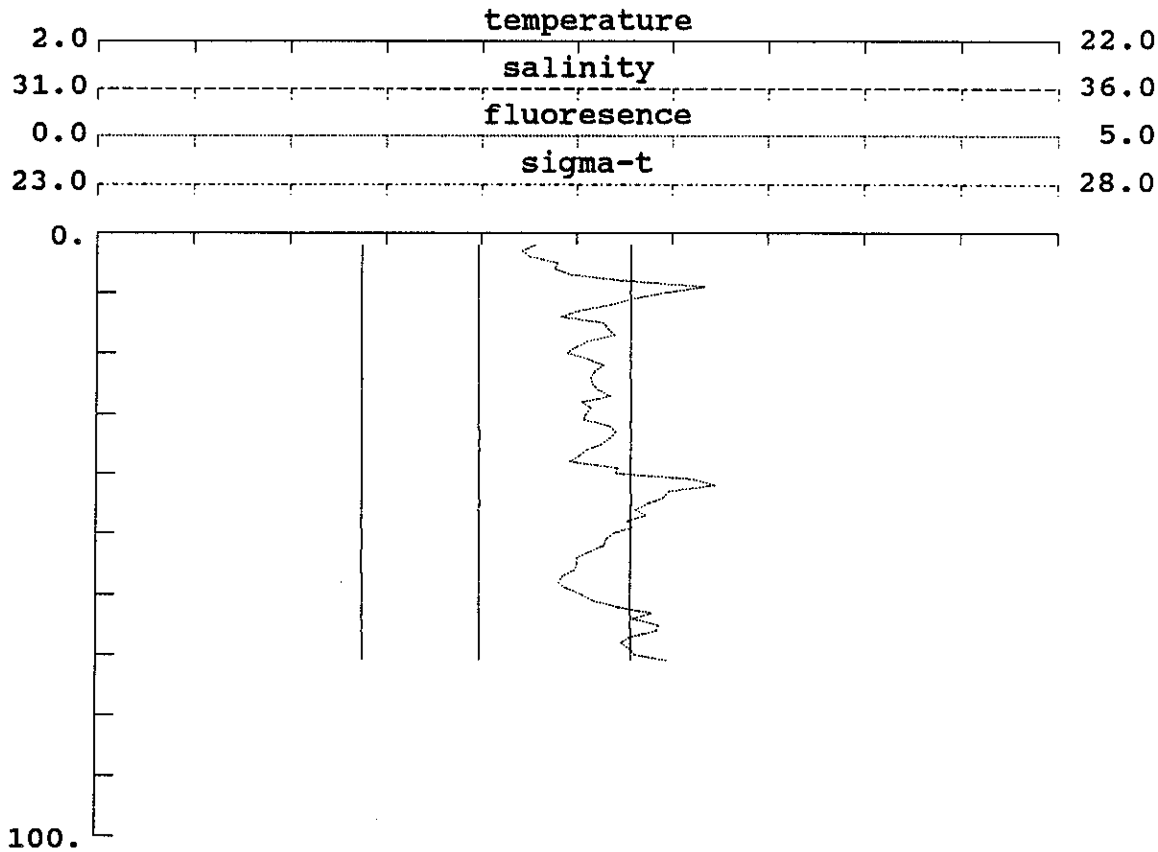
Cast: 034 Date(y\m\d): 95\5\15
Lat: 41 50.2 N Hour (GMT): 20.9
Lon: 68 17.5 W Bottom depth: 197



Depth	Temp	Salt	Flur	Sigma-t
3.00	7.08	32.80	0.65	25.70
5.00	7.09	32.81	0.96	25.71
10.00	7.06	32.80	0.97	25.71
15.00	6.99	32.80	1.01	25.71
20.00	6.72	32.80	1.00	25.75
25.00	6.57	32.79	0.97	25.76
30.00	6.43	32.76	0.93	25.75
40.00	6.12	32.77	0.46	25.80
50.00	6.09	32.78	0.31	25.81
75.00	6.55	32.88	0.20	25.83
100.00	6.40	32.91	0.27	25.88
150.00	5.63	33.15	0.14	26.16
190.00	7.33	34.01	0.24	26.61

[** Note: this is uncorrected data **]

Cast: 035 Date(y\m\d): 95\5\16
Lat: 41 36.2 N Hour (GMT): 2.6
Lon: 68 27.2 W Bottom depth: 75

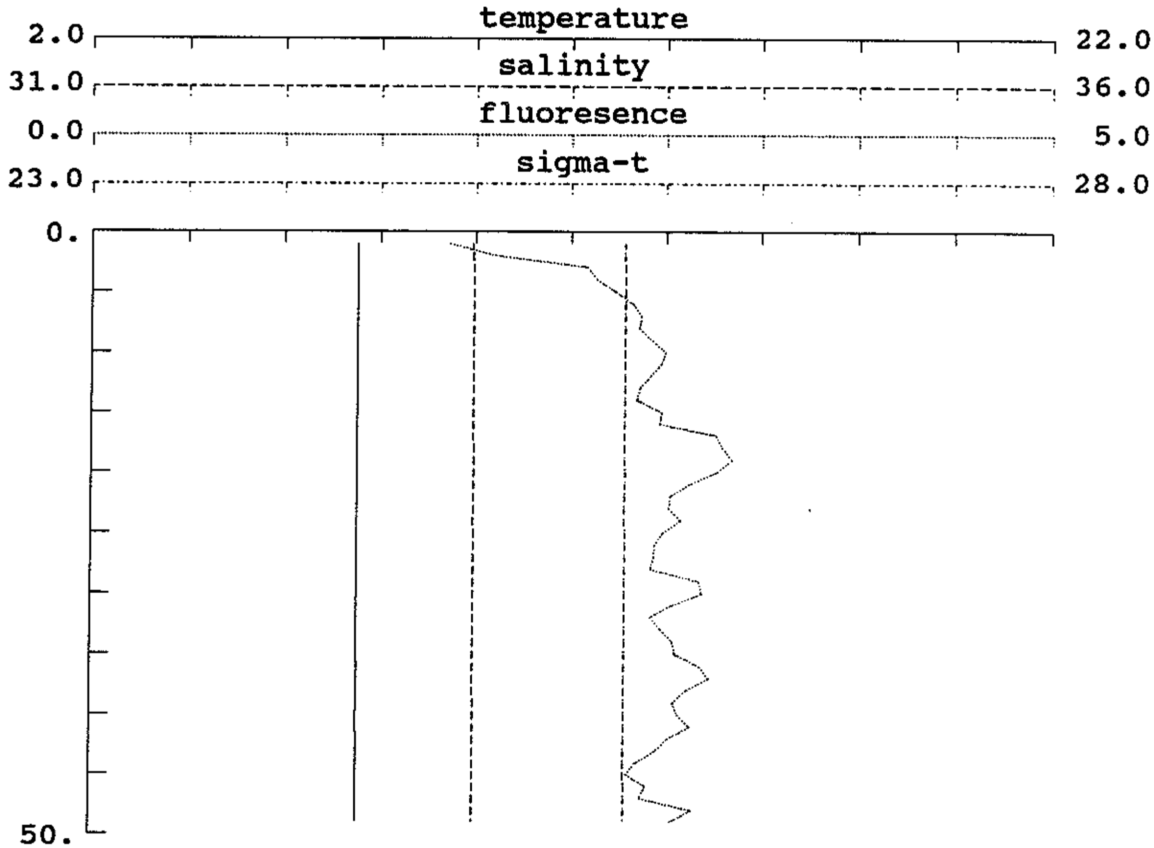


Depth	Temp	Salt	Flur	Sigma-t
1.00	7.50	32.99	2.29	25.79
5.00	7.49	32.98	2.40	25.79
10.00	7.49	32.98	2.97	25.78
15.00	7.49	32.99	2.64	25.79
20.00	7.50	32.99	2.45	25.79
25.00	7.50	32.99	2.59	25.79
30.00	7.51	32.99	2.55	25.79
40.00	7.51	32.99	2.71	25.79
50.00	7.51	32.99	2.70	25.79
71.00	7.53	33.00	2.99	25.79

[** Note: this is uncorrected data **]

Cast: 036
Lat: 41 24. N
Lon: 68 18.7 W

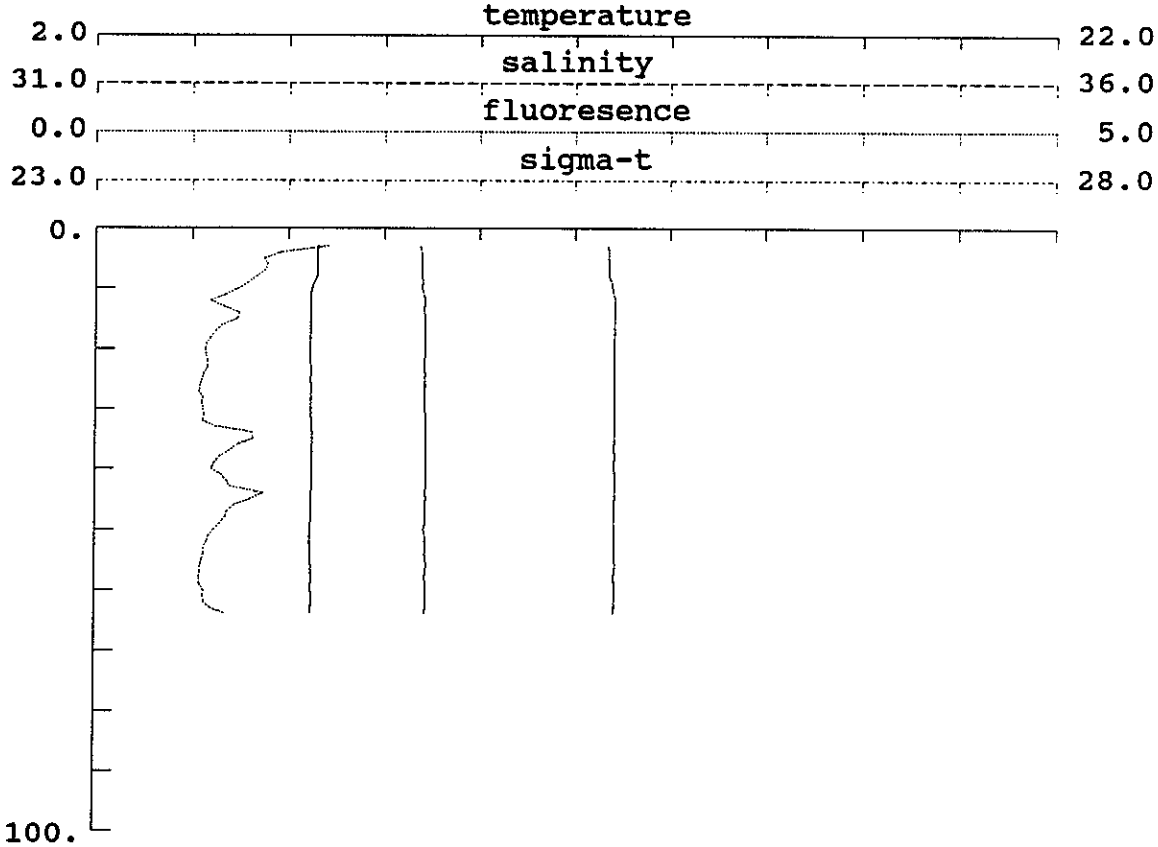
Date(y\m\d): 95\5\16
Hour (GMT): 5.2
Bottom depth: 54



Depth	Temp	Salt	Flur	Sigma-t
1.00	7.52	32.98	1.86	25.78
5.00	7.52	32.99	2.73	25.79
10.00	7.52	32.99	3.00	25.79
15.00	7.52	32.99	2.98	25.79
20.00	7.53	32.99	3.27	25.79
25.00	7.53	32.99	2.99	25.79
30.00	7.53	32.99	3.20	25.79
40.00	7.53	33.00	3.07	25.79
49.00	7.53	33.00	3.03	25.79

[** Note: this is uncorrected data **]

Cast: 037 Date(y\m\d): 95\5\16
Lat: 41 18.1 N Hour (GMT): 9.9
Lon: 68 35.6 W Bottom depth: 70

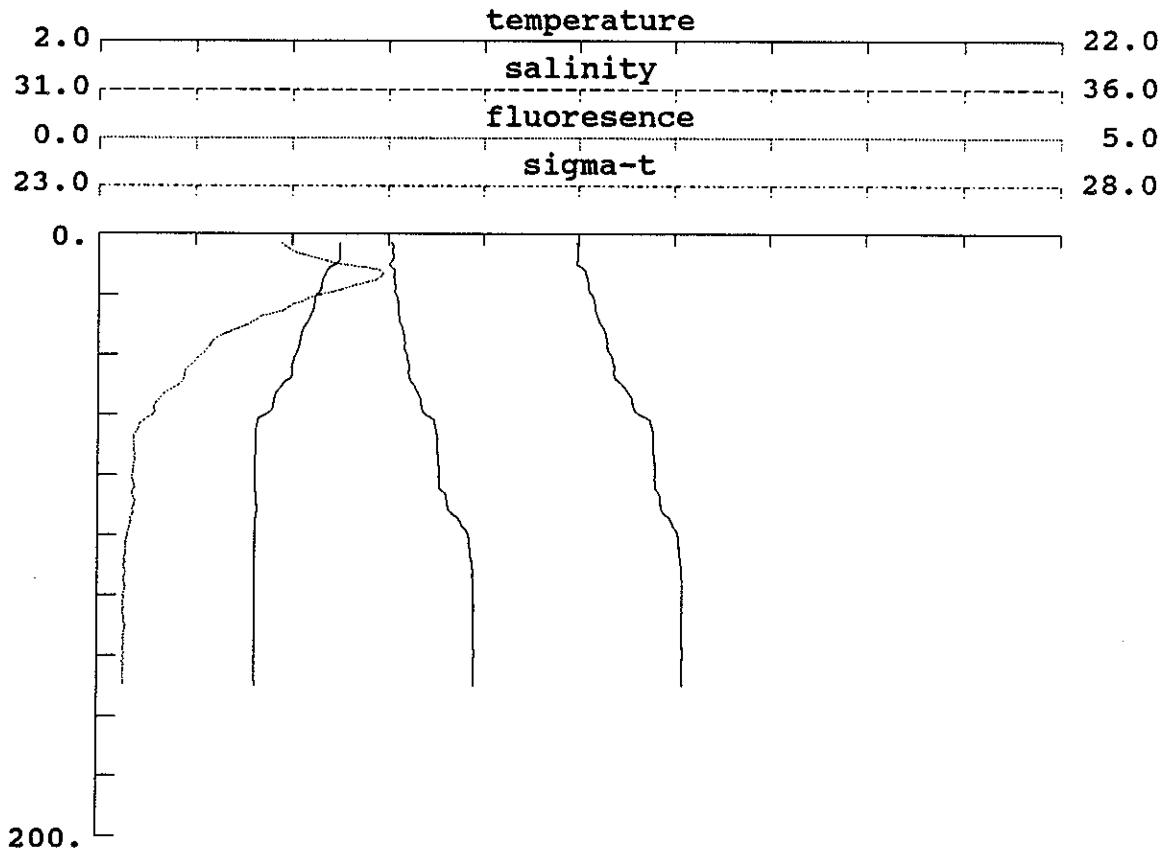


Depth	Temp	Salt	Flur	Sigma-t
3.00	6.61	32.69	1.21	25.67
5.00	6.61	32.69	0.87	25.68
10.00	6.49	32.70	0.74	25.70
15.00	6.47	32.71	0.74	25.71
20.00	6.47	32.71	0.57	25.71
25.00	6.47	32.71	0.55	25.71
30.00	6.47	32.71	0.56	25.71
40.00	6.51	32.72	0.60	25.71
50.00	6.48	32.71	0.62	25.71
64.00	6.50	32.72	0.68	25.71

[** Note: this is uncorrected data **]

Cast: 038
Lat: 41 29.8 N
Lon: 68 56.2 W

Date(y\m\d): 95\5\16
Hour (GMT): 12.9
Bottom depth: 155

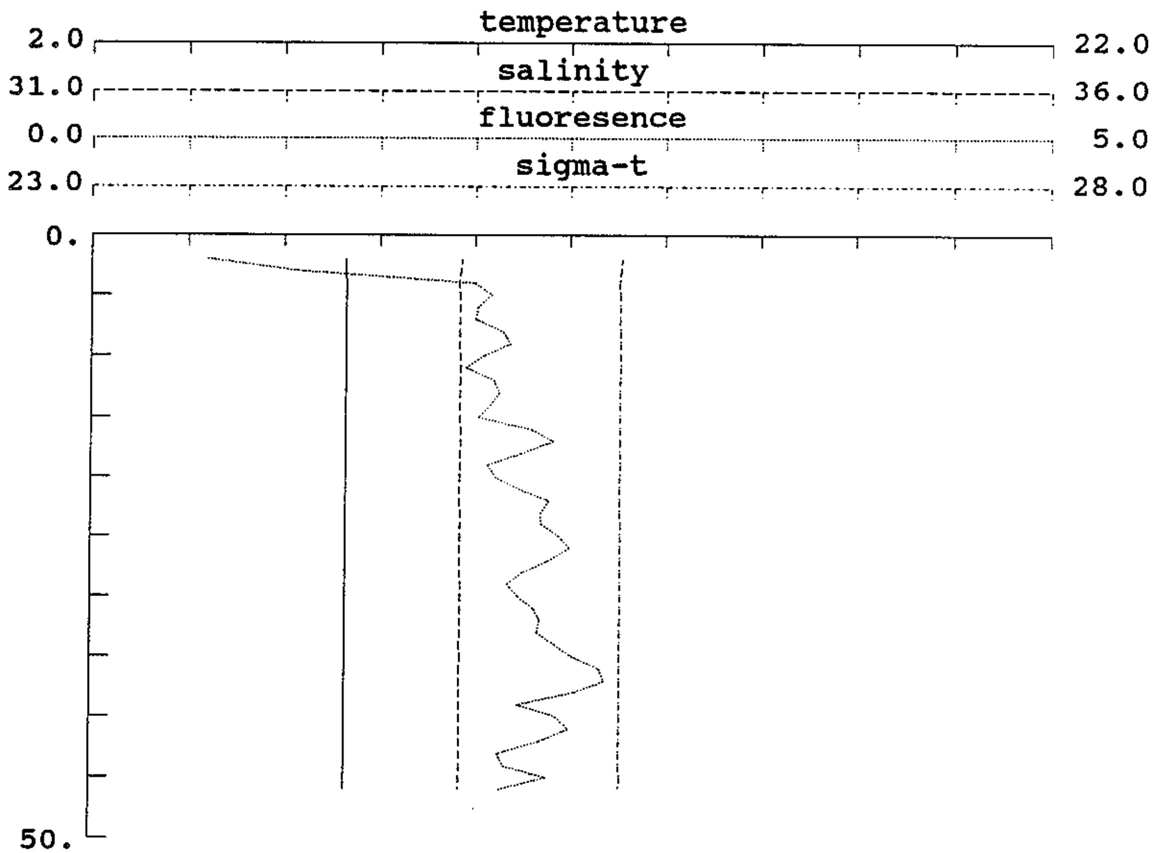


Depth	Temp	Salt	Flur	Sigma-t
2.00	6.99	32.52	0.95	25.49
5.00	6.98	32.52	0.98	25.49
10.00	6.91	32.50	1.25	25.49
15.00	6.64	32.53	1.44	25.55
20.00	6.51	32.54	1.14	25.57
25.00	6.44	32.55	0.96	25.59
30.00	6.28	32.57	0.76	25.62
40.00	6.08	32.60	0.53	25.67
50.00	5.80	32.64	0.41	25.73
75.00	5.25	32.77	0.19	25.90
100.00	5.25	32.93	0.15	26.03
150.00	5.26	32.96	0.14	26.05
150.00	5.26	32.96	0.14	26.05

[** Note: this is uncorrected data **]

Cast: 039
Lat: 40 59.7 N
Lon: 68 . W

Date(y\m\d): 95\5\16
Hour (GMT): 21.9
Bottom depth: 53



Depth	Temp	Salt	Flur	Sigma-t
2.00	7.29	32.93	0.60	25.77
5.00	7.29	32.92	2.09	25.76
10.00	7.29	32.92	2.05	25.77
15.00	7.29	32.92	2.02	25.77
20.00	7.29	32.92	2.11	25.77
25.00	7.29	32.93	2.44	25.77
30.00	7.30	32.93	2.23	25.77
40.00	7.30	32.93	2.44	25.77
46.00	7.30	32.93	2.13	25.77

[** Note: this is uncorrected data **]