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**GOBEX Report**  
**Hydrographic Data at IOW**

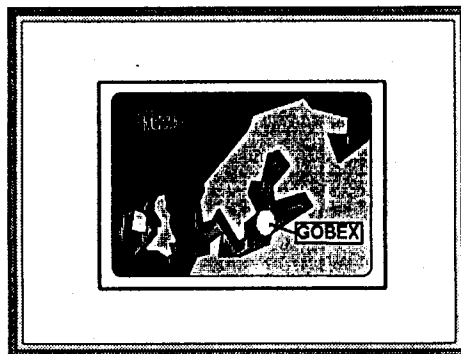
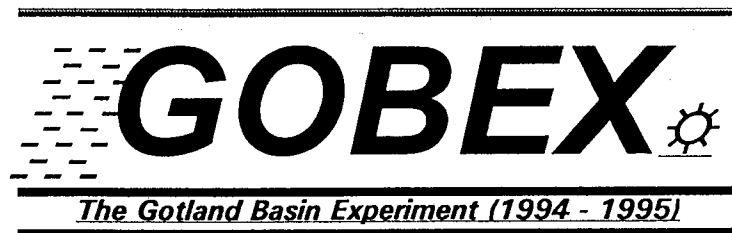
by

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**Warnemünde**  
**1997**

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## **Summary**

One key component of the GOBEX project were hydrographic studies. In this volume we present a quicklook of those data acquired by the Institute for Baltic Sea Research. This comprises cruise information as well as some CTD data for selected stations and sections. The aim is to give a coarse overview on the performed work to encompass further discussion between interested scientists.

## **Zusammenfassung**

Eine Schlüsselkomponente des GOBEX-Projekts waren hydrographische Untersuchungen. In diesem Band präsentieren wir einen Überblick über diejenigen Daten, die am Institut für Ostseeforschung Warnemünde gesammelt wurden. Das beinhaltet sowohl Informationen über die Fahrten als auch einige CTD-Daten für ausgewählte Stationen und Schnitte. Der Zweck ist, einen groben Überblick über die getane Arbeit zu geben, um die weitergehende Diskussion zwischen den Wissenschaftlern zu begünstigen.

## 1. Introduction

The Gotland Basin Experiment (GOBEX) was an international, multidisciplinary study of all riparian countries of the Baltic Sea during 1994 - 1995. The planning phase was initiated by the European Committee on Ocean and Polar Sciences (ECOPS) and funded by the European Science Foundation (ESF) and the Commission of the European Community (CEC). The GOBEX activities were considered as a preparation for the investigations planned for the MAST-III period (1996 - 1999). The German contributions were supported by the "Kultusministerium des Landes Mecklenburg-Vorpommern" under the contract no. 0710, MG 04, 68101-05.

Several workshops elucidated the main objectives for joint efforts. Scheduled field studies were to be concentrated in deep Baltic basins, especially in the eastern Gotland Basin. It was recommended that the positions of most hydrographic stations should coincide with those of the Baltic Year (BY) programme, which was carried out in 1969 - 1970 [ANONYMOUS, 1968].

The principal aim of the project was a better understanding of the water exchange processes between coastal areas and the Eastern Gotland Basin and their consequences for the ecosystem of the "Baltic Proper". These efforts included, inter alia, the quantification of various past and present fluxes between different no-living and living compartments, different ecological zonation and food webs. All this required the coordination of national research activities.

Some interdisciplinary results are published in the GOBEX Summary Report edited by (HAGEN 1996). Here, we present a quicklook of hydrographic data acquired by the Institute for Baltic Sea Research Warnemuende (IOW). This comprises cruise information (scientist in charge, region, time, data label), related station maps, sampling frequency at BY- stations, and selected time series of temperature ( $^{\circ}\text{C}$ ), salinity (PSU), dissolved oxygen (ml/l), and potential density ( $\text{kg}/\text{m}^3$ ) with respect to the reference level at the sea surface. These parameters are also plotted along those Baltic Year stations (BY), which roughly follow the south-north direction through the Bornholm Basin, the Stolpe Furrow, and the eastern Bornholm Basin.

The aim is to provide a coarse overview on the hydrographic data available from the IOW- data bank. All data have been transformed into binary (BIN) and blueprint (BLP) format. Further numerical and graphical processing was done with the GEOS program version 4.3 via QBX 7.1 (c) Microsoft - Quick Basic Extended, which was written by Rainer Feistel. We also used IDL 4.0 (c) RSI - Interactive Display Language.

We hope this technical report encompasses further discussions between interested scientists of different disciplines, who are involved in the still running Baltic Sea System Study (BASYS) project (1996-1999). A data report about geological data sets is also in preparation.

## 2. Overview

### 2.1 Baltic Year Stations

The positions of used BY- stations are mapped in Fig.1.

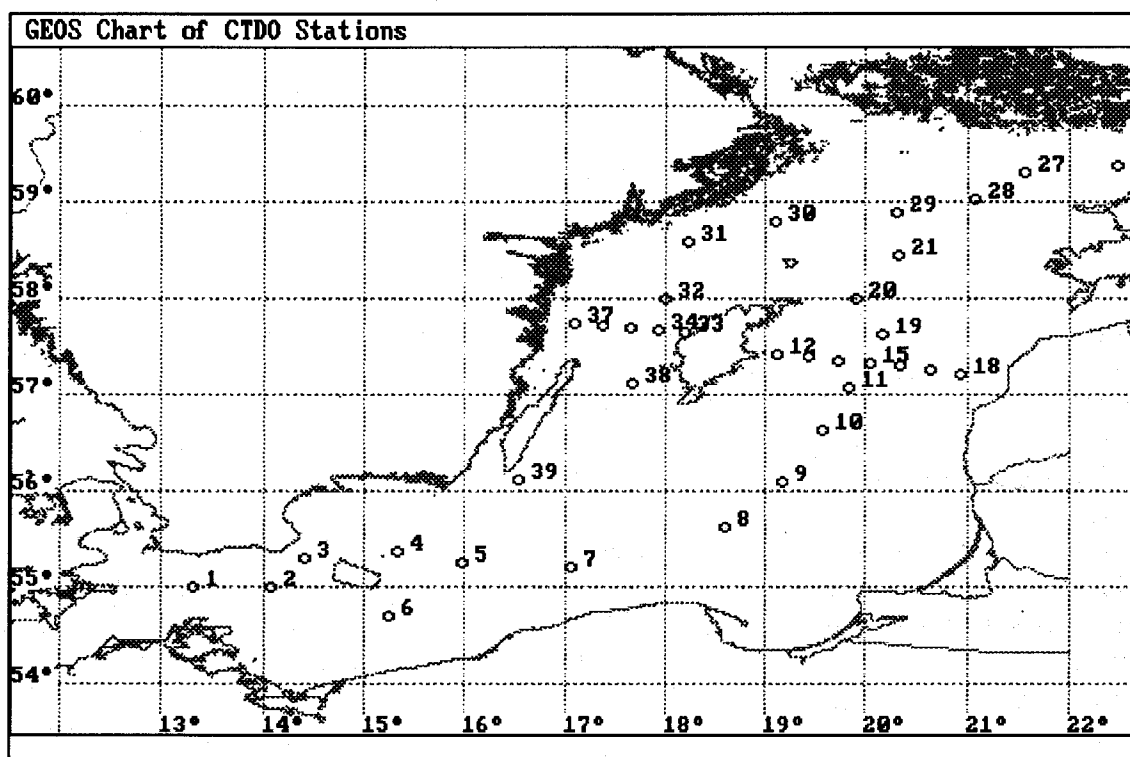


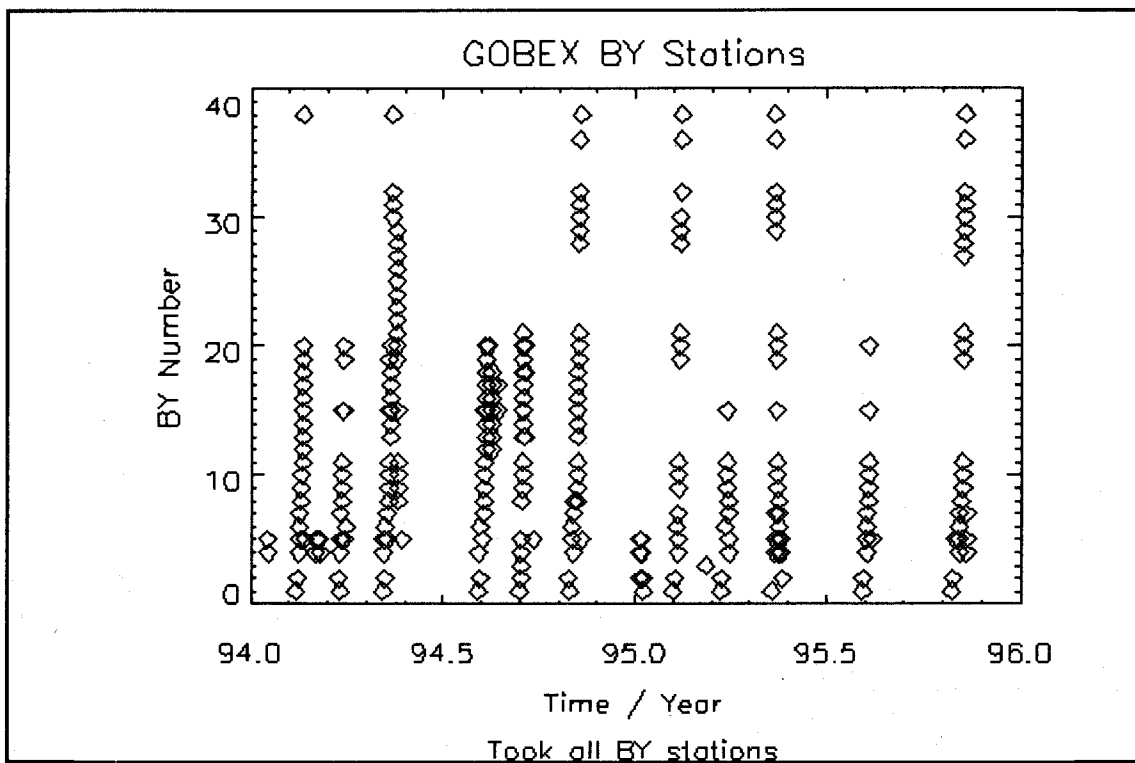
Fig. 1: Position of BY stations

Table 1 provides the corresponding station list from the Baltic Year 1969-70 Program Manual, (Göteborg, December 1968). The last column contents the IOW sampling frequency during GOBEX. Table 1 contains stations 1-21 of the GOBEX target area while stations 22-39 were mainly sampled during IOW-monitoring cruises. The annual frequency of all cruises indicates a sufficient resolution and is depicted in Fig. 2. Station numbers are plotted versus the year. A total of 14 cruises covers the target area of GOBEX (stations 1- 21) during the two year GOBEX-period. Station 21 lies in the North of the eastern Gotland Basin. Five monitoring cruises gathered data from stations with numbers larger 21, which are placed in the area of the entrance of the Gulf of Finland as well as in the western Gotland Basin as shown in Fig.1. The sampling frequency at each standard station is plotted in Fig.3. In the GOBEX area, related values vary between 3 and 39 with a mean value of about 12 measurements per station.

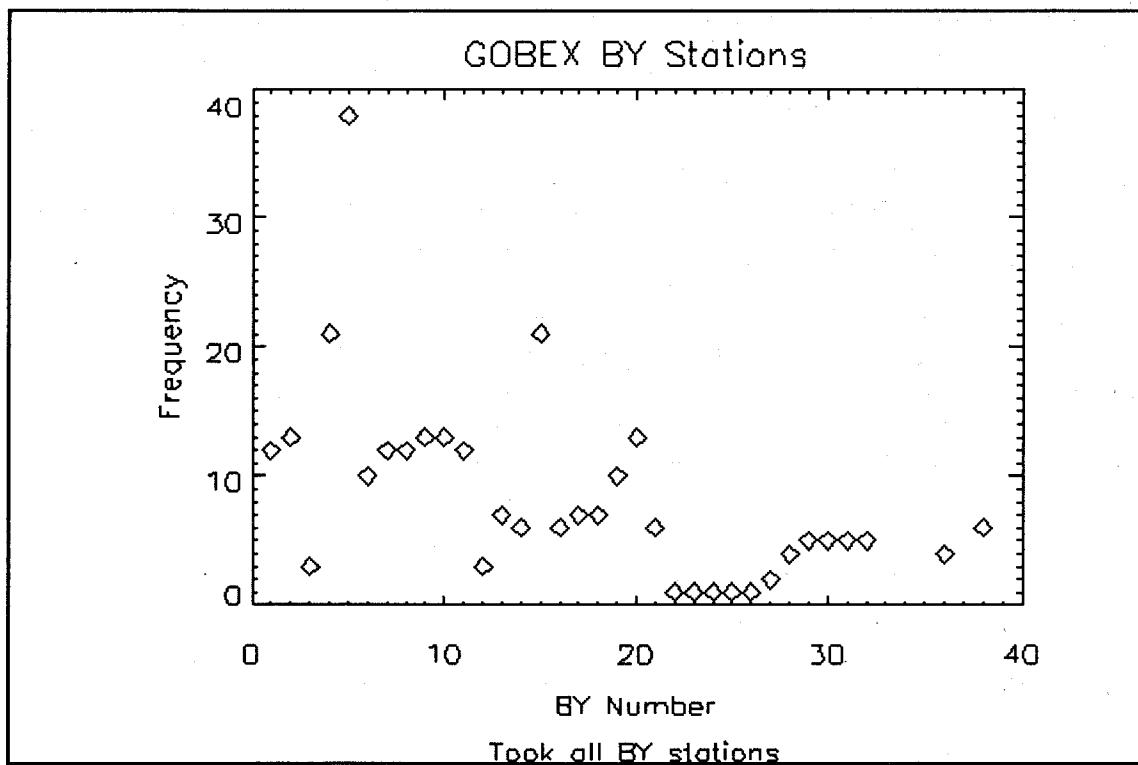
Those stations of Tab.1, which are marked with bold letters, form a South-North transect connecting the main basins from the Arkona Basin (stations 1-2), the Bornholm Basin (stations 4-5), the Stolpe Furrow (station 7), and the eastern Gotland Basin (stations 10-21). These positions have been visited more than five times. Using these data we constructed time-depths plots for selected stations, which are compiled in chapter 3.1. Resulting data sets are used for vertical plots of selected parameters along the South-North transect in chapter 3.2.

BY Station Flag	Latitude / Deg:Min N	Longitude / Deg:Min E	Depth / m	Observations count
01B	55:00	13:18	47	13
02A	55:00	14:05	48	14
03B	55:17.5	14:24	48	3
04B	55:23	15:20	90	21
05A	55:15	15:59	91	39
06B	54:42	15:15	64	10
07A	55:13	17:04	83	12
08A	55:38	18:36	109	12
09A	56:05	19:10	127	13
10B	56:38	19:35	146	13
11B	57:04	19:50	213	12
12B	57:25.5	19:07.5	50	3
13B	57:23.5	19:26	122	7
14B	57:21.5	19:44	175	6
15A	57:20	20:03	249	21
16B	57:17.5	20:21	188	6
17B	57:15.5	20:38.5	100	7
18B	57:13.2	20:56	34	7
19B	57:37	20:10	160	10
20A	58:00	19:54	203	13
21B	58:26.5	20:20	122	6
22A	59:55	25:36	73	1
23B	59:51	24:50	80	1
24B	59:41	24:00	73	1
25A	59:35	23:18	73	1
26B	59:22	22:28	113	1
27A	59:17.8	21:34	176	2
28B	59:02	21:05	178	4
29A	58:53	20:19	170	5
38A	57:07	17:40	112	6
39B	56:07	16:32	50	0

Tab. 1: BY stations



**Fig. 2:** Cruises covering BY stations listed in Tab. 1 versus the time in years (1994-96); each vertical line corresponds to a cruise.



**Fig. 3:** As in Fig. 2 but for the sampling frequency at each BY station according to Tab. 1.

## 2.2. Cruise Inventory

In the following table a coarse inventory of the cruises can be found. The different items are explained below. The inventory is followed by the station maps. These have been produced for the geographic region, which locates between (53.5-60.5) ° N latitude and (11.5-22.5) ° E longitude.

### Content of inventory

<b>LABEL:</b>	Cruise acronym in the form GXyymmdd.sss. It comprises the start date of the cruise (year(yy)-month(mm)-day(dd)) and the ship name (sss) according to
	sss Ship name
	AVH R/V "Alexander von Humboldt"
	PAP R/V "Professor Albrecht Penck"
<b>TIME:</b>	Duration of the cruise indicating the starting and ending date by (yymmdd-yymmdd)
<b>REGION:</b>	basin-wise
	KG Kattegat
	BS Belt Sea
	AB Arkona Basin
	BB Bornholm Basin
	GB Gotland Basin
	GF Gulf of Finland
	GR Rulf of Riga
	BoS Bothnian Sea
	BoB Bothnian Bay
<b>CHIEF:</b>	Chief Scientist. The email addresses for further communication are given below
	Alheit juergen.alheit@io-warnemuende.de
	Breuel (at present not in the IOW)
	Emeis kay.emeis@io-warnemuende.de
	Hagen eberhard.hagen@io-warnemuende.de
	Lass uli.lass@io-warnemuende.de
	Mattheus wolfgang.matthaeus@io-warnemuende.de
	Nausch guenther.nausch@io-warnemuende.de
	Nehring (not in the IOW after January, 1997)
	Nagel klaus.nagel@io-warnemuende.de
	Schmidt, M. martin.schmidt@io-warnemuende.de
	Siegel herbert.siegel@io-warnemuende.de
<b>DATA: IOW Name:</b>	Name of the cruise in IOW Oceanographic Data Archive of the form (yy/xxx)
<b>Kind of Data:</b>	
	CTD CTD Probe (Type- cf. Tab. 2) (Hydrography)
	RCM Recording Current Meters (Current velocity)
	AWS Automatic Weather Station (Meteorology)
	EDP Enhanced Dissipation Profiler (Surface Mixing)



RAD	Radiometers (Atmospheric Radiation)
MCN	Towed Multiple-Opening-Closing Plankton Net (Plankton)
Quality Flag follows the codes:	
0	no data
1	raw data
2	raw data stored @ IOW Information Drive (contact: Chief Scientist)
3	validated data archived @ IOW Oceanographic Data Archive (contact: Chief scientist / claus.wulff@io-warnemuende.de)
4	validated data banked @ IOW Data Bank (contact: Chief Scientist / claus.wulff@io-warnemuende.de)
5	validated data banked @ ICES Data Bank (contact: harry.dooley@ices.dk)

CTD type / Absolute Accuracy	OM: CTD OM87	SB: CTD SeaBird 911+
pressure / dbar	$\pm 1.0$	$\pm 0.5$
temperature / °C	$\pm 0.015$	$\pm 0.004$
conductivity / mS/cm	$\pm 0.015$	$\pm 0.003$
dissolved oxygen / ml/l	$\pm 0.2$	$\pm 0.2$

**Tab. 2:** Accuracy of validated CTD data (Quality Flag  $\geq 3$ )

LABEL	TIME	REGION	CHIEF	DATA				
				IOW Cruise Title	IOW Cruise Number	CTD Quality/Type	Special Parameters	
GX940108.AVH	940108-940121	KG,BS,AB, BB	Matthaeus	SWE94/01	944406	4	OM	MET
GX940210.AVH	940210-940223	BS,AB,BB,GB	Nagel	TF94/02	944401	4	OM	MET
GX940301.AVH	940301-940310	AB,BB	Hagen	GOBEX94/03	944407	3	OM	MET,RAD
GX940321.PAP	940321-940401	AB,BB,GB	Nagel	TF94/03	944002	3	OM	MET
GX940503.AVH	940503-940527	AB,BB,GB	Matthaeus	TF94/05	944403	3	OM	MET
GX940802.PAP	940802-940815	AB,BB,GB	Siegel	TF94/08	944004	3	OM	MET
GX940809.AVH	940809-940821	GB	Lass	GOBEX94/08-1	944413.1	3	OM	MET
GX940822.AVH	940822-940902	GB	Emeis	GOBEX94/08-2	944413.2	3	OM	MET
GX940914.AVH	940914-940927	AB,BB,GB	Hagen	GOBEX94/09	944414	4	OM	MET,RCM,RAD
GX941026.AVH	941026-941114	AB,BB,GB	Breuel	TF94/10	944405	3	OM	MET
GX950104.AVH	950104-950111	AB,BB	Matthaeus	SWE95/01	954401	3	OM	MET
GX950202.AVH	950202-950221	AB,BB,GB	Nehring	TF95/02	954403	3	SB	MET
GX950307.PAP	950307-950317	AB	Hagen	GOBEX95/03	954005	3	OM	MET,RCM,EDP
GX950323.PAP	950323-950405	AB,BB,GB	Nausch, G.	TF95/03	954006	3	OM	MET
GX950509.PAP	950509-950524	AB,BB,GB	Nehring	TF95/05	954010	3	SB	MET
GX950510.AVH	950510-950523	BB	Alheit	PLANKTON95/05	954406	3	SB	MET,MCN
GX950803.PAP	950803-950817	AB,BB,GB	Breuel	TF95/08	954016	3	SB	MET
GX951026.AVH	951026-951116	AB,BB,GB	Schmidt, M.	TF95/11	954412	3	SB	MET

Tab. 3: Inventory of GOBEX Hydrographic Data at IOW

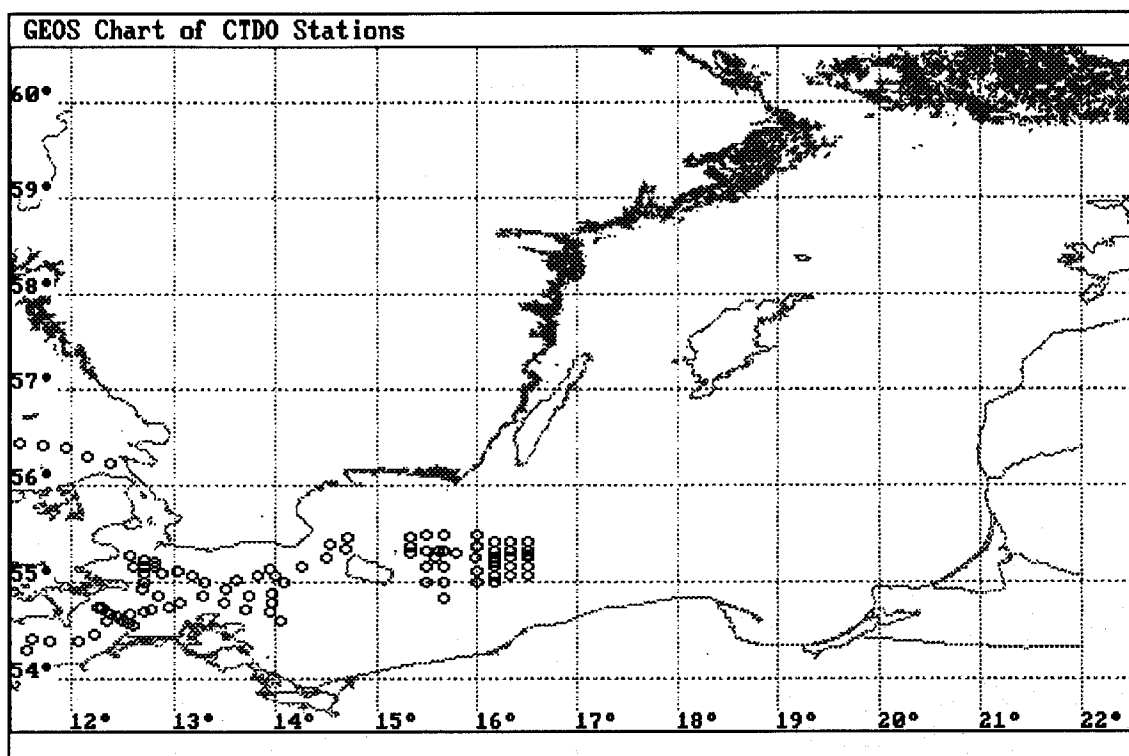


Fig. 4: Station map GX940108.AVH (940108-940121; Matthaeus)

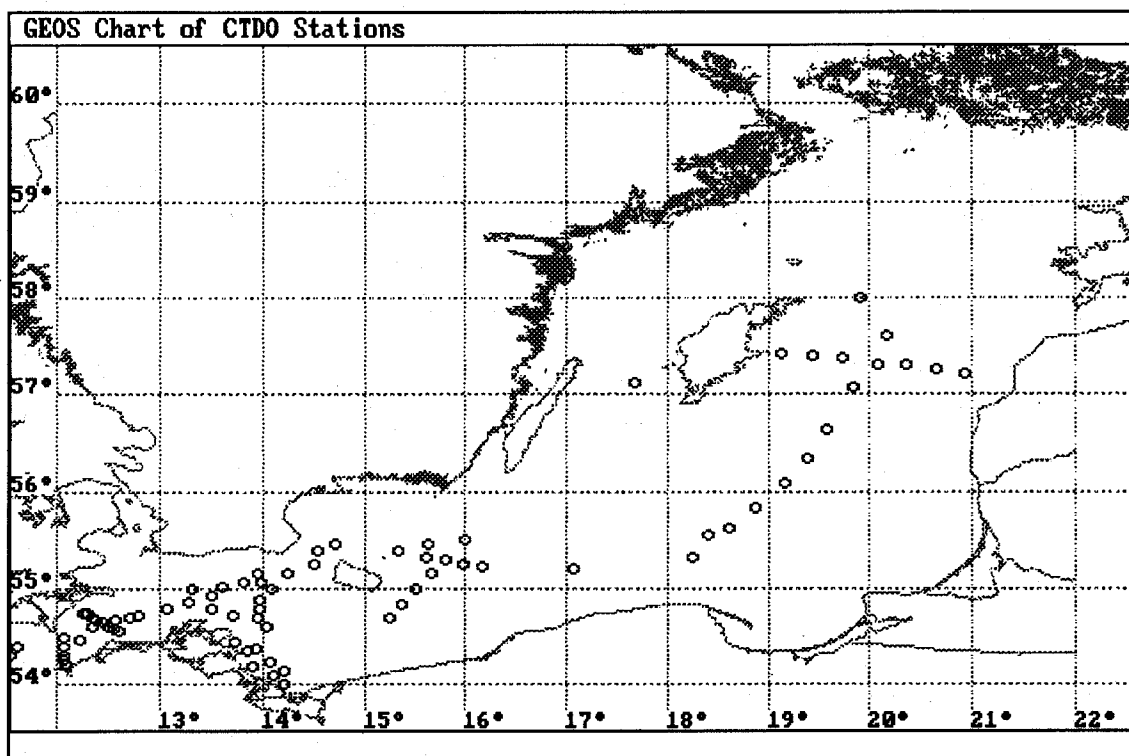


Fig. 5: Station map GX940210.AVH (940210-940223; Nagel)

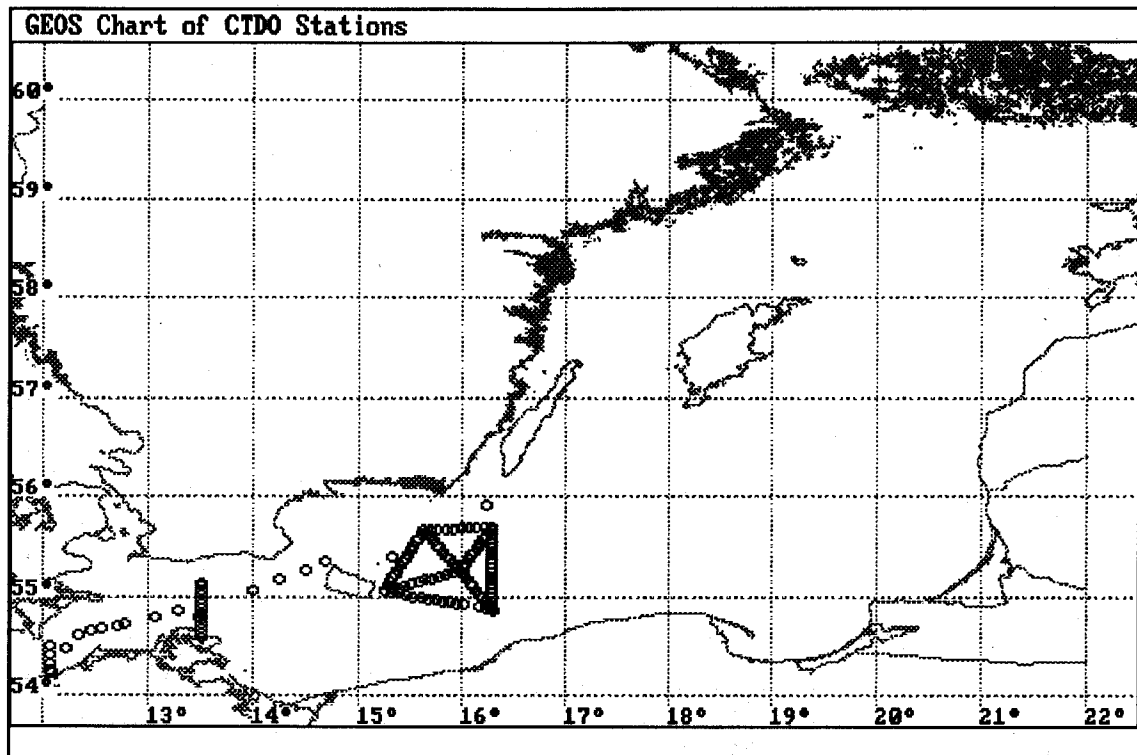


Fig. 6: Station map GX940301.AVH (940301-940310; Hagen)

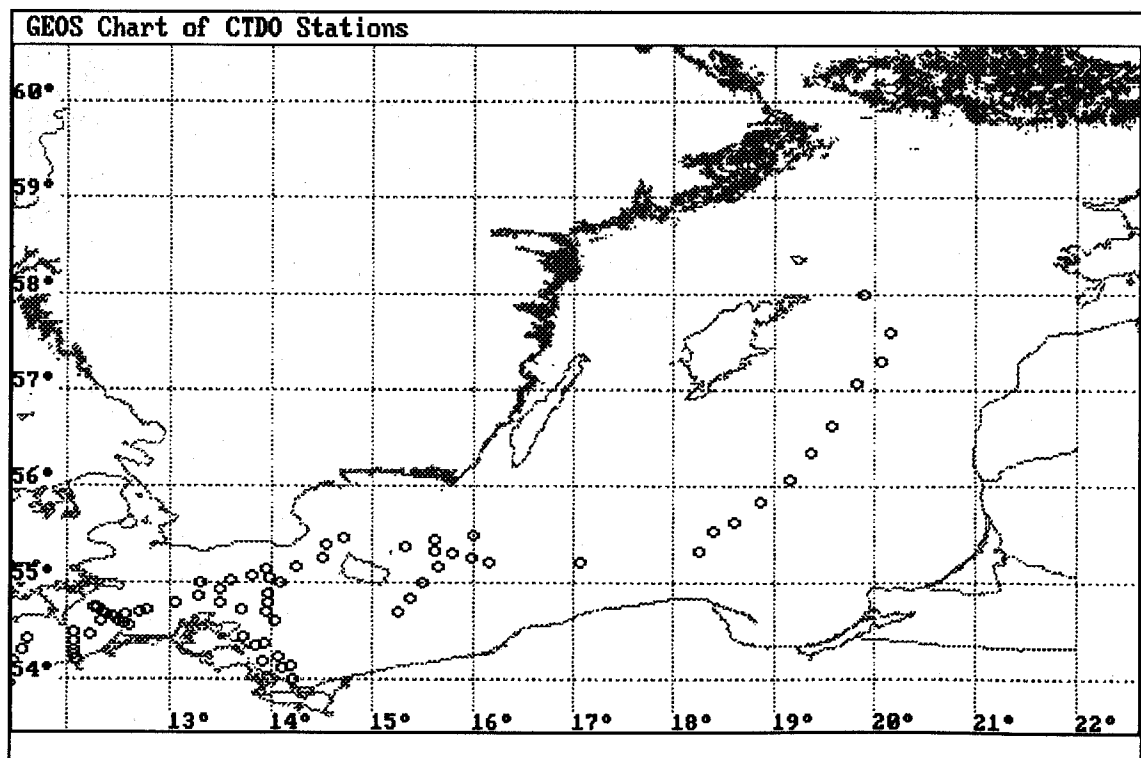


Fig. 7: Station map GX940321.PAP (940321-940401; Nagel)

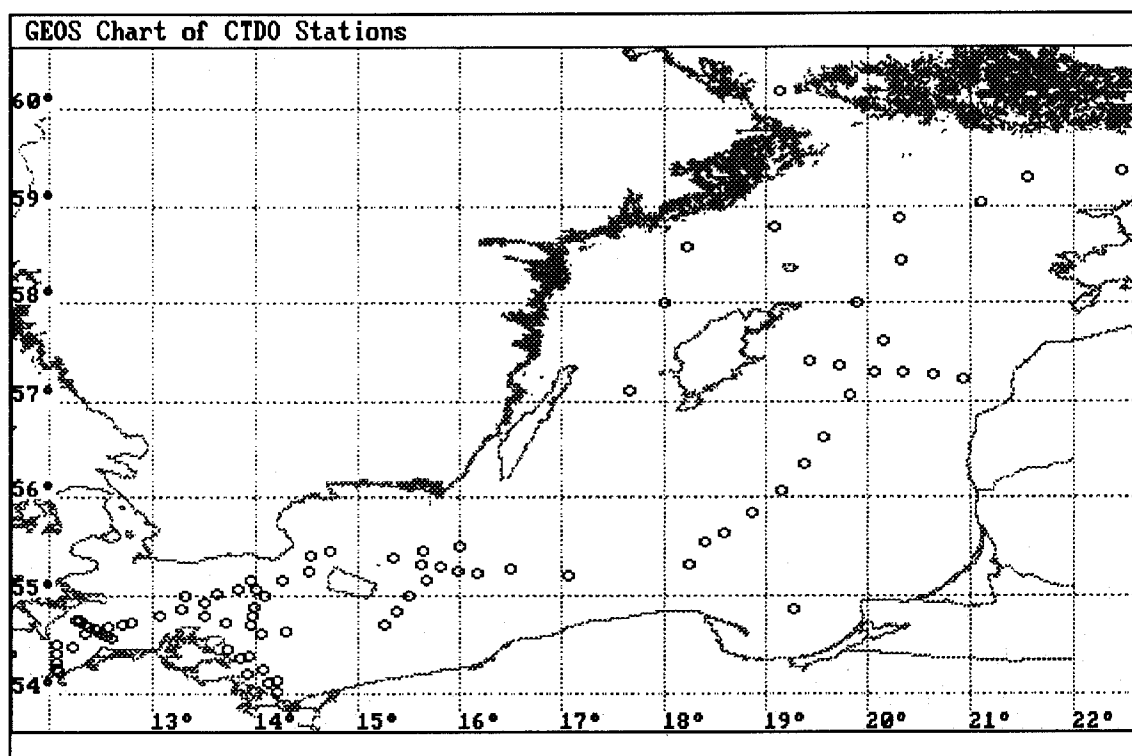


Fig. 8: Station map GX940503.AVH (940503-940527; Matthaeus)

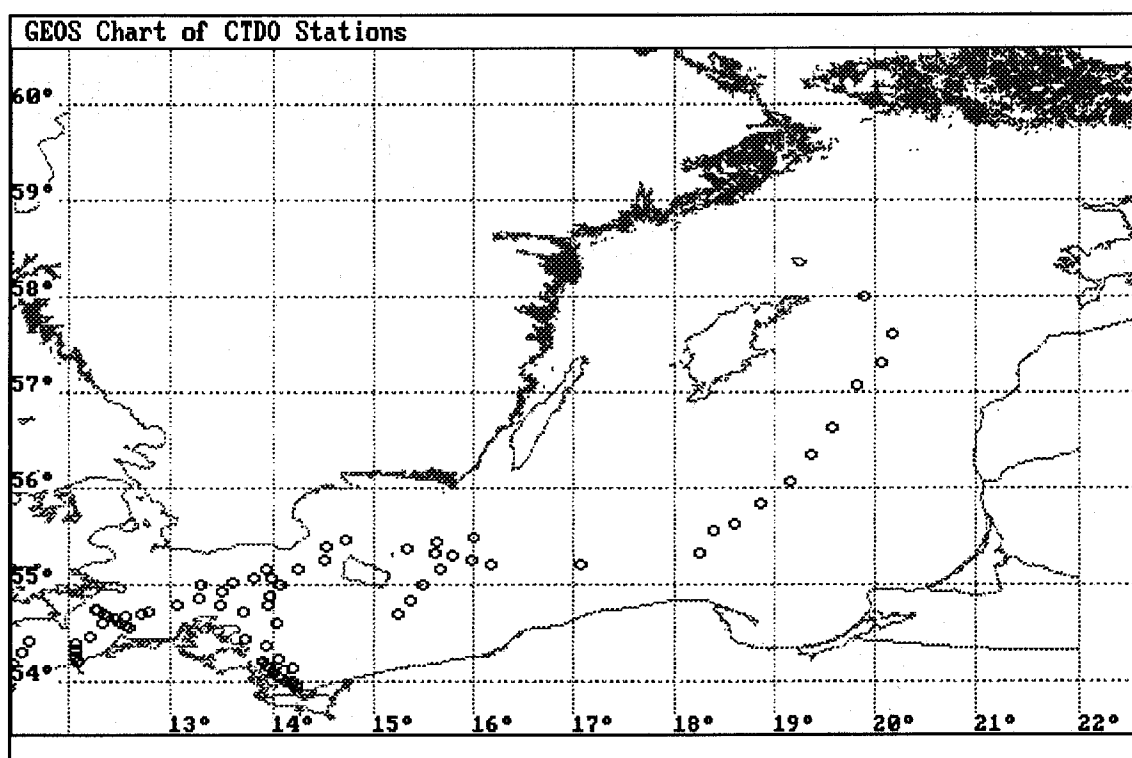


Fig. 9: Station map GX940802.PAP (940802-940815; Siegel)

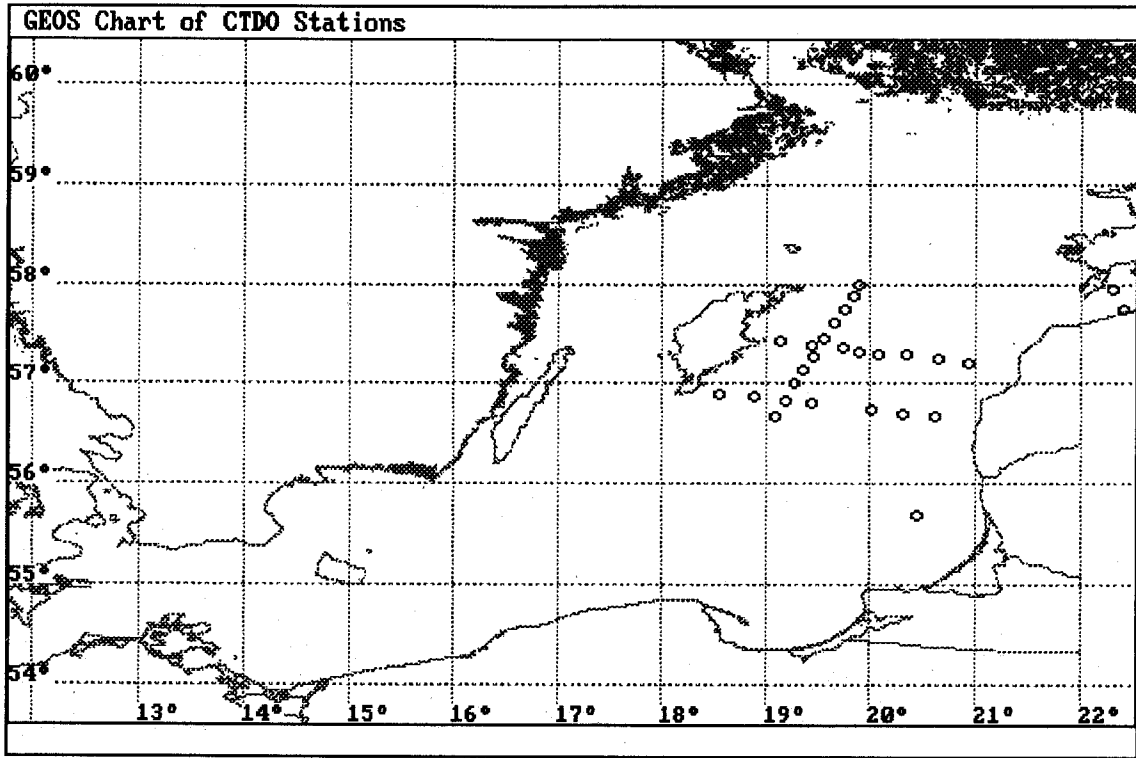


Fig. 10: Station map GX940809.AVH (940809-940321; Lass)

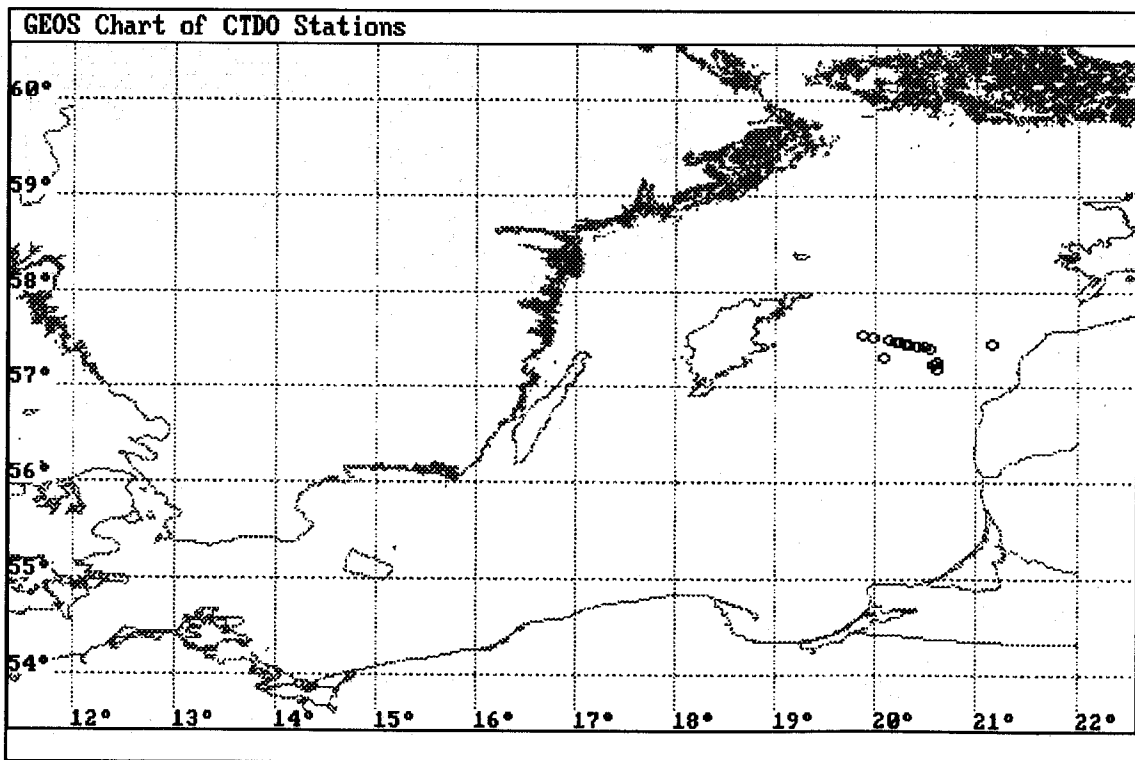


Fig. 11: Station map GX940822.AVH (940822-940902; Emeis)

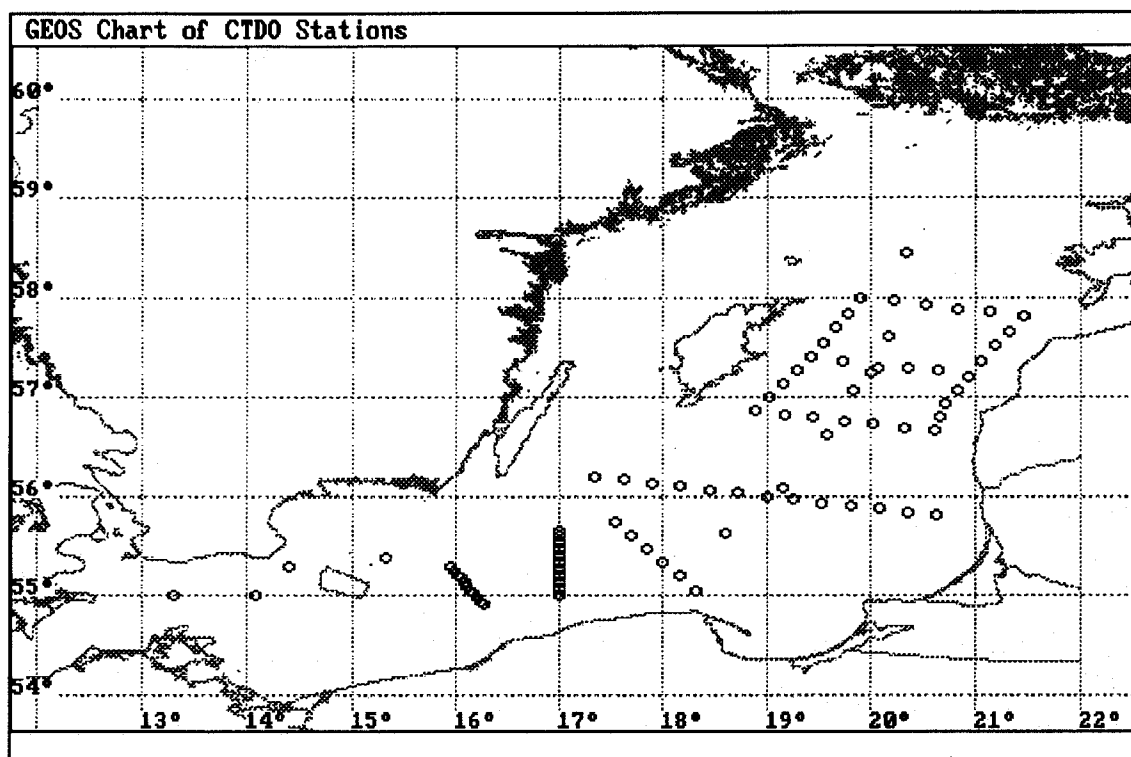


Fig. 12: Station map GX940914.AVH (940914-940927; Hagen)

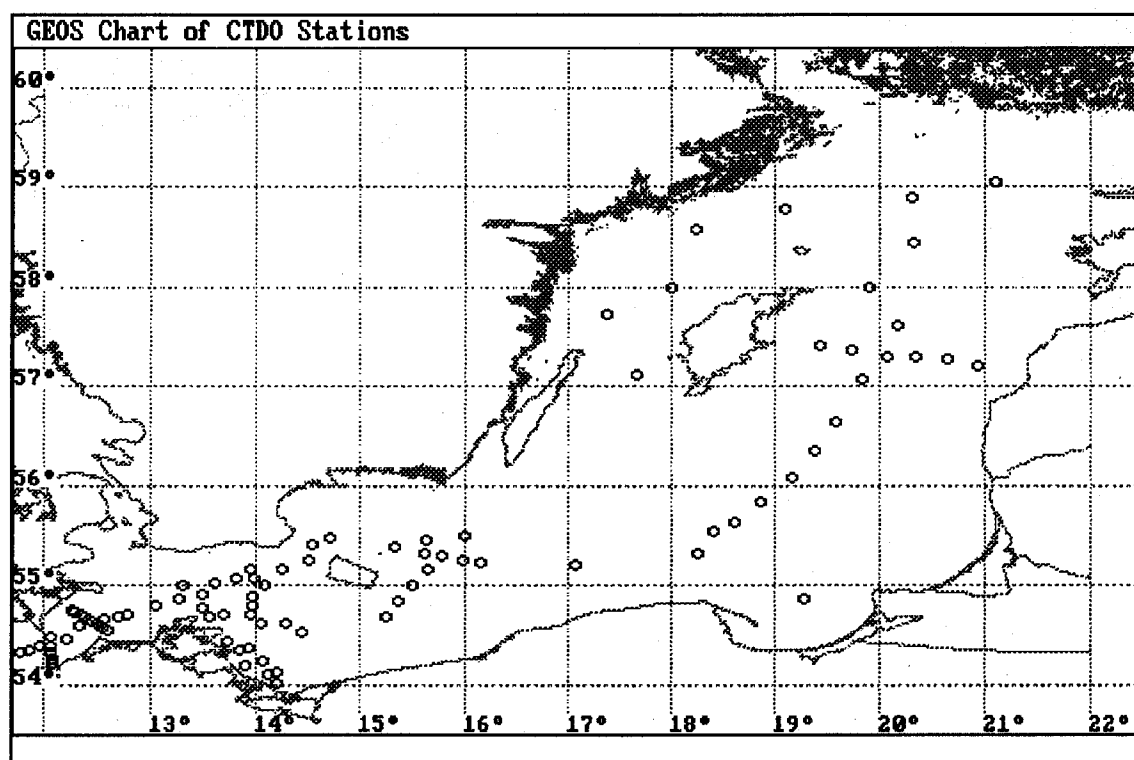


Fig. 13: Station map GX941026.AVH (941026-941114; Breuel)

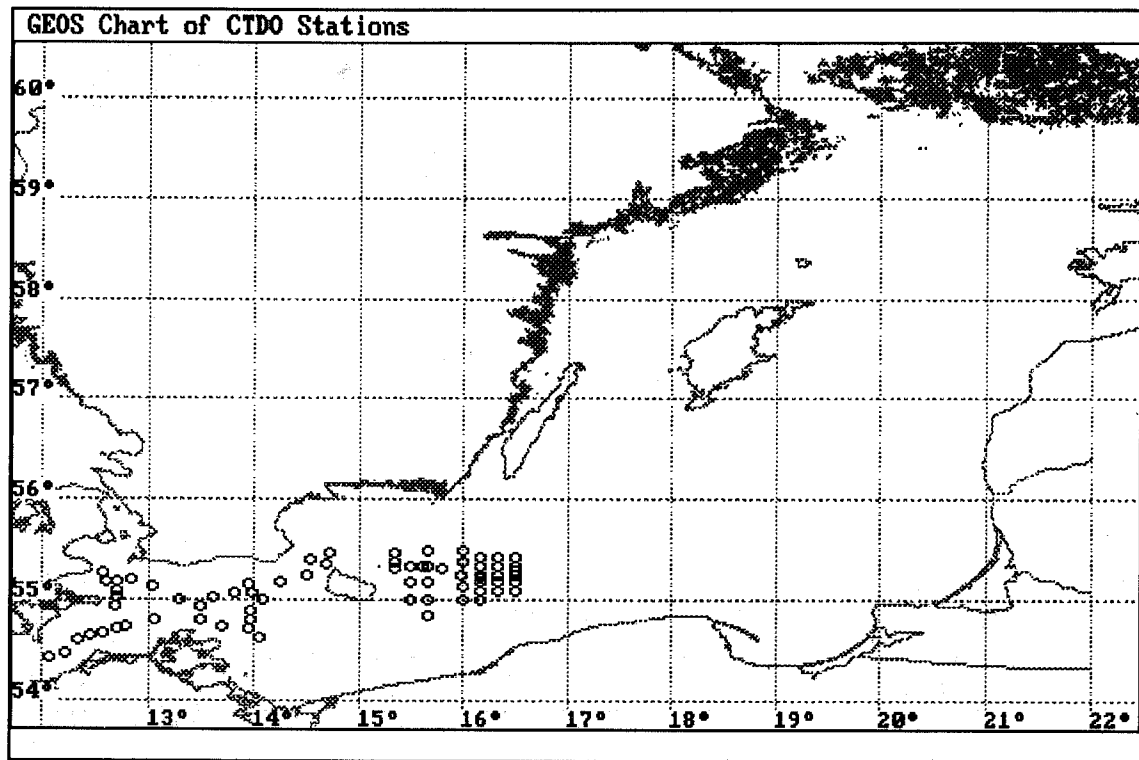


Fig. 14: Station map GX950104.AVH (950104-950111; Matthaeus)

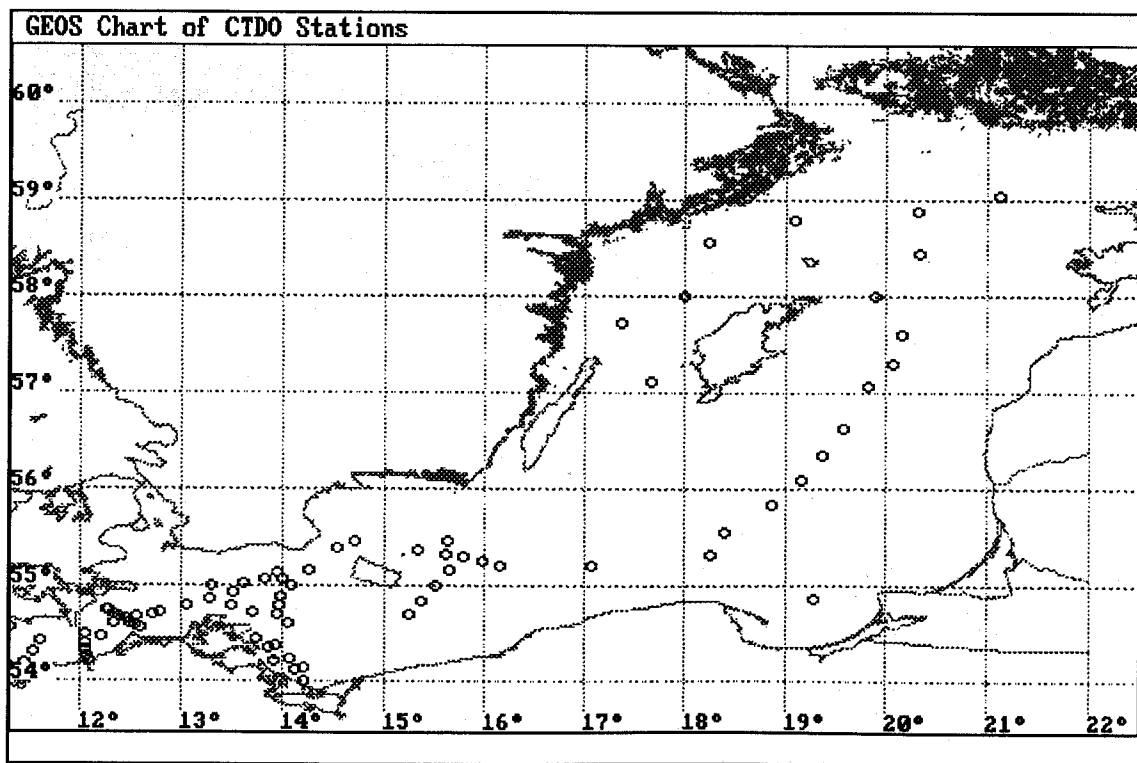


Fig. 15: Station map GX950202.AVH (950202-950221; Nehring)



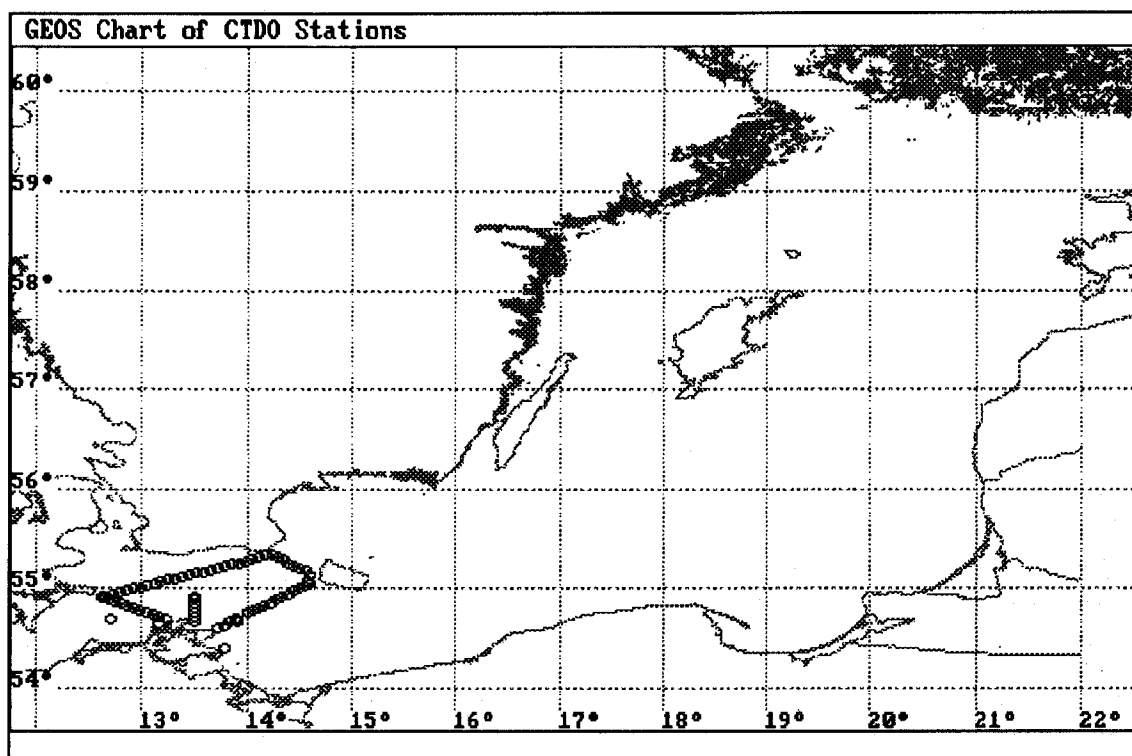


Fig. 16: Station map GX950307.PAP (950307-950317; Hagen)

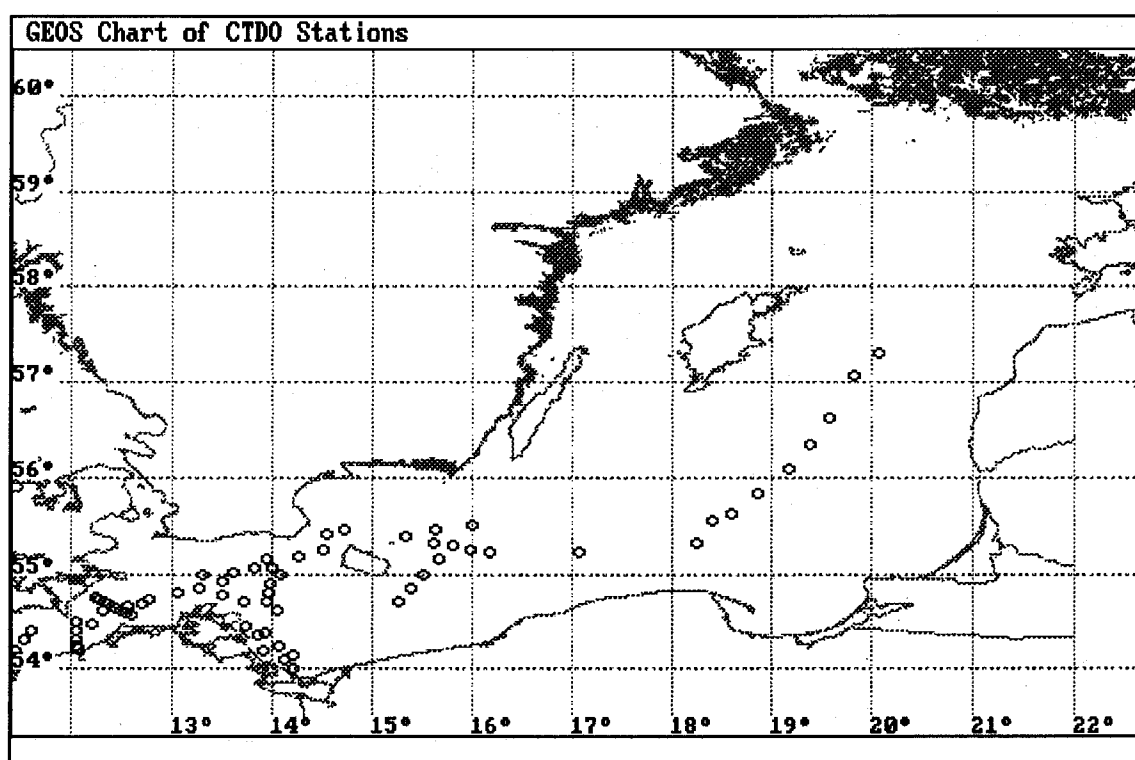


Fig. 17: Station map GX950323.PAP (950323-950405; G.Nausch)

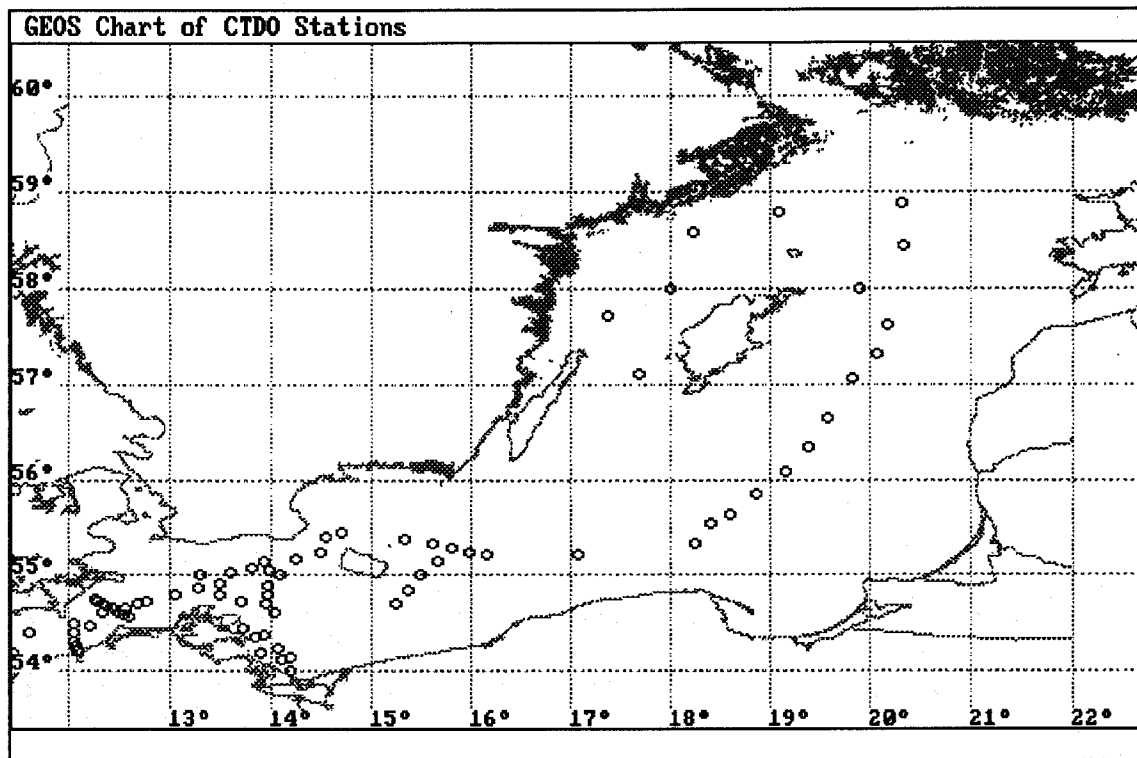


Fig. 18: Station map GX950509.PAP (950509-950524; Nehring)

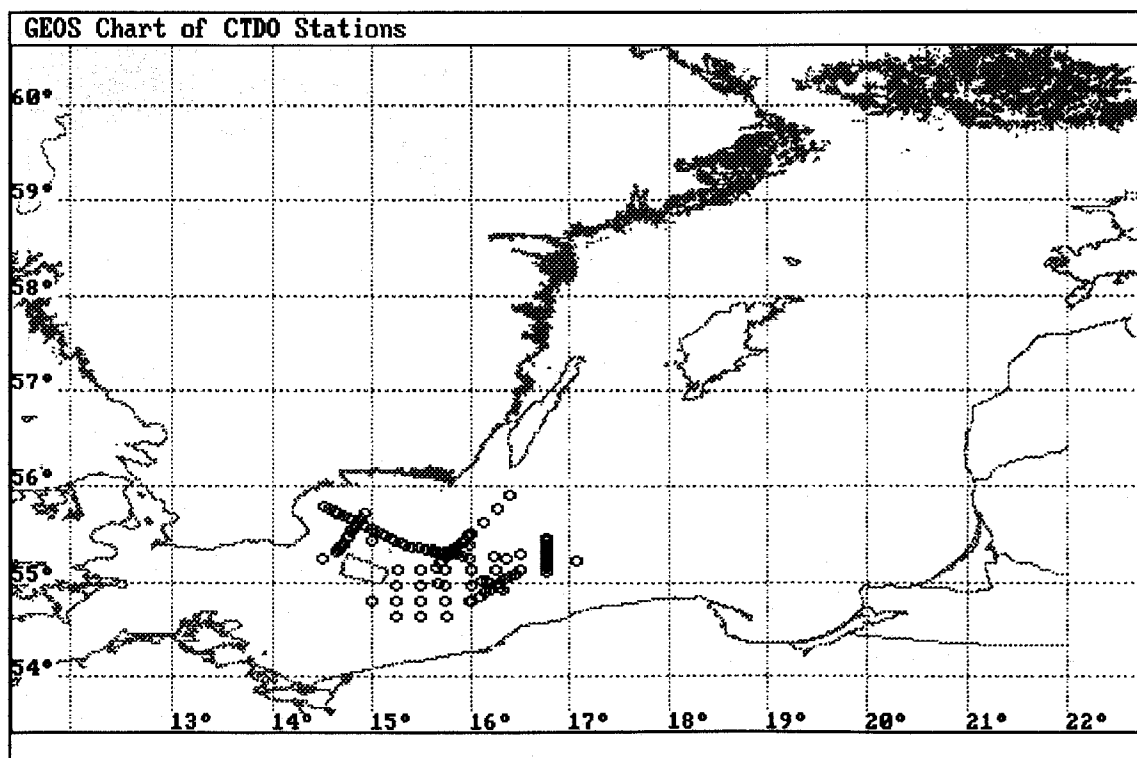


Fig. 19: Station map GX950510.AVH (950510-950523; Alheit)

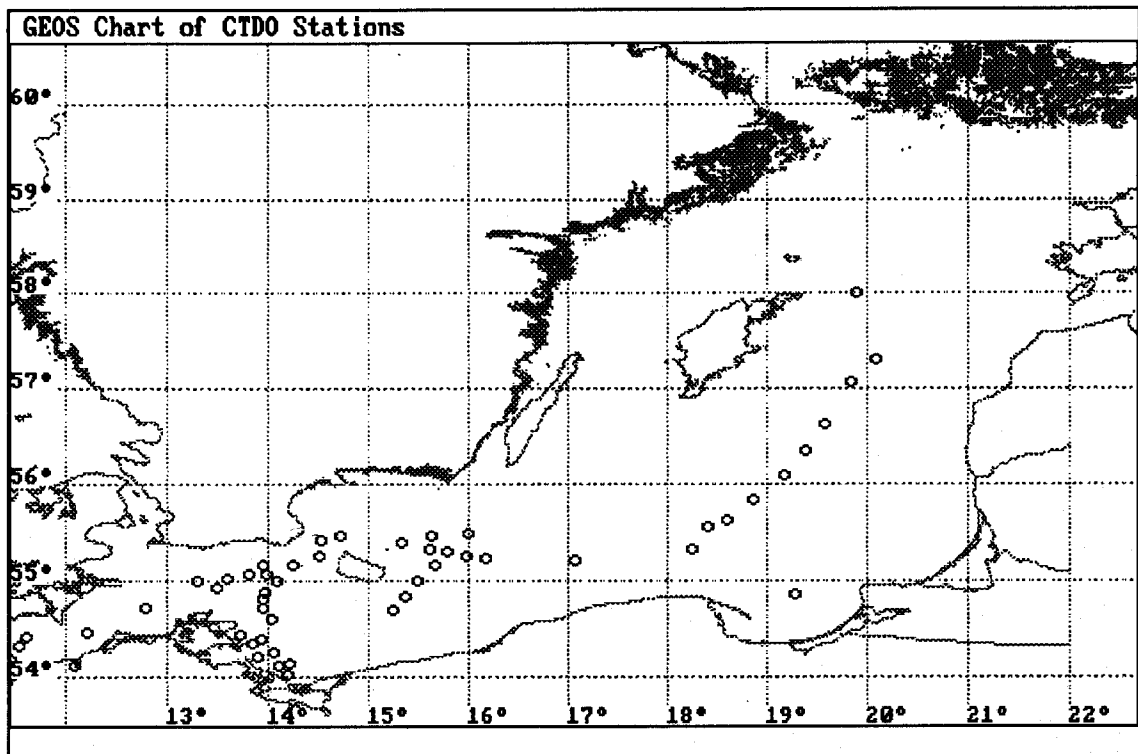


Fig. 20: Station map GX950803.PAP (950803-950817; Breuel)

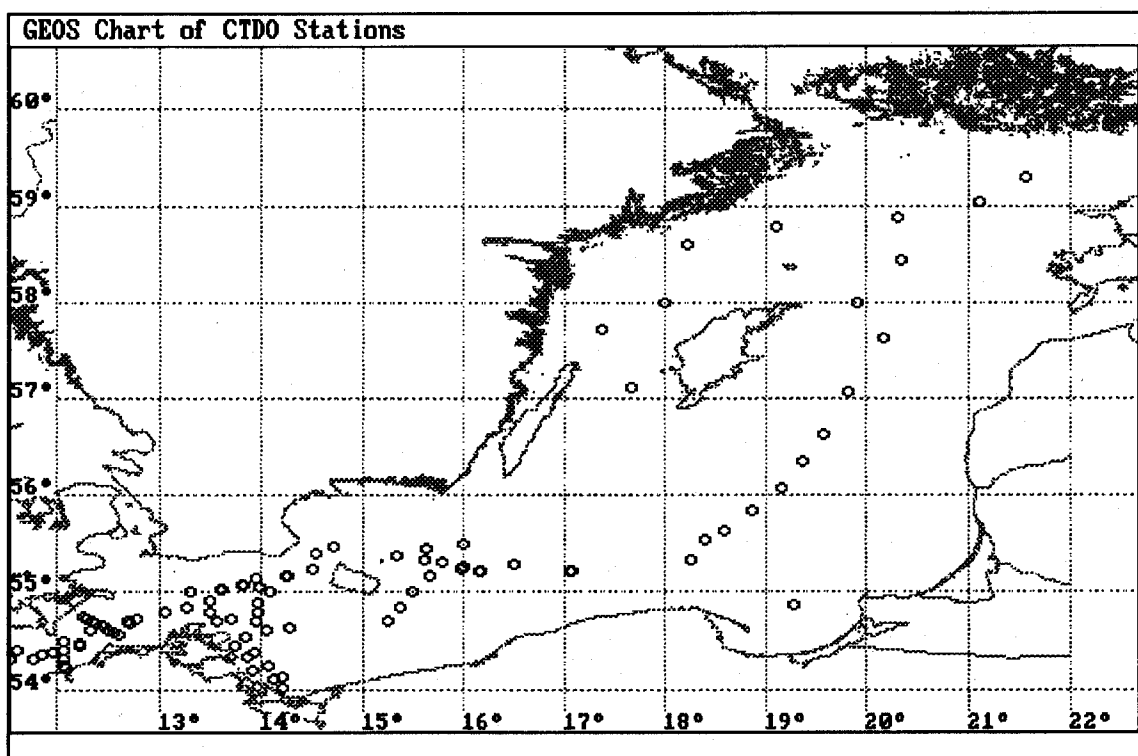


Fig. 21: Station map GX951026.AVH (951026-951116; M.Schmidt)

### 3. South-North Transect

In this section time series of selected BY stations are presented. They have been chosen along a line connecting the main basins from the Belt Sea to the Gotland Deep (practically a South-North transect through the Baltic Proper). Further they should have been visited more than five times. These 13 stations are marked with bold letter in Tab. 1 and are depicted in Fig. 23 below; in particular BY 01B, 02A, 04B, 05A, 07A, 08A, 10B, 11B, 15A, 19B, 20A, and 21B. In the figures 24 and 25 is visualised the time and frequency of observations.

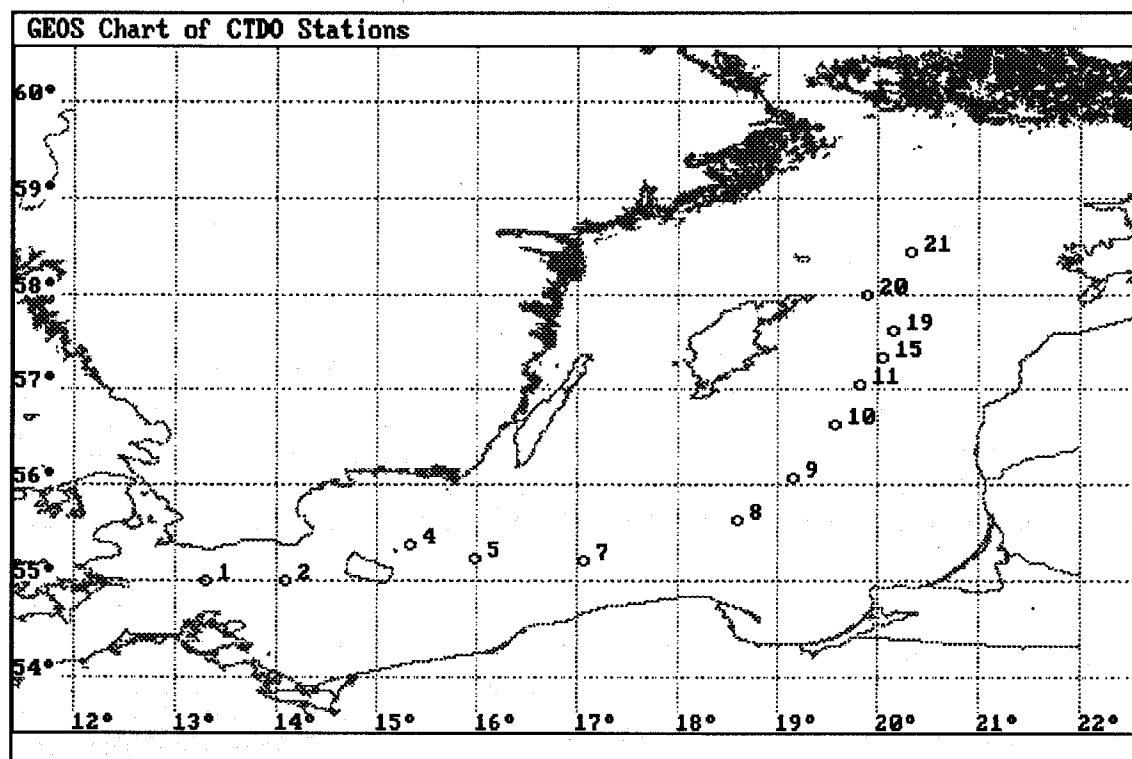


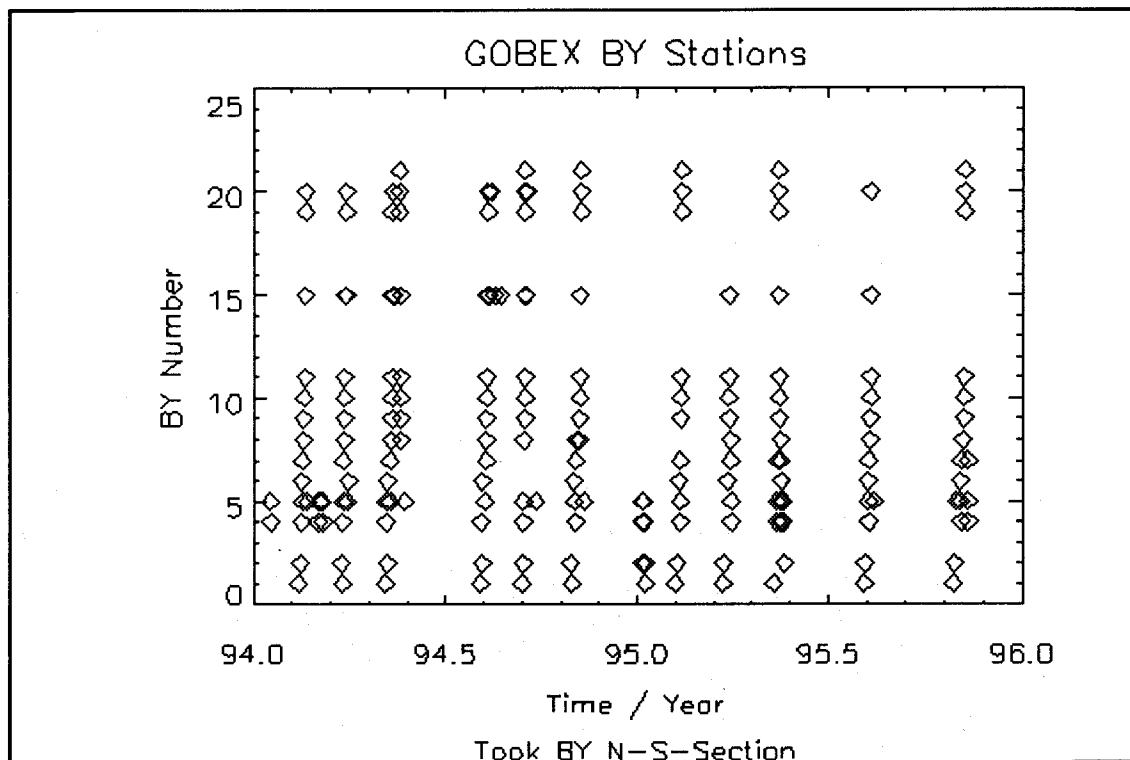
Fig. 22: Positions of selected BY stations along the South-North transect

The quicklook part contains a collection of time series of hydrographic profiles. Oriented on the deepest point of observation (the Gotland Deep with ca. 249 m) we choose the abscissa from 0 down to 250 dbar (corresponding to 250 m).

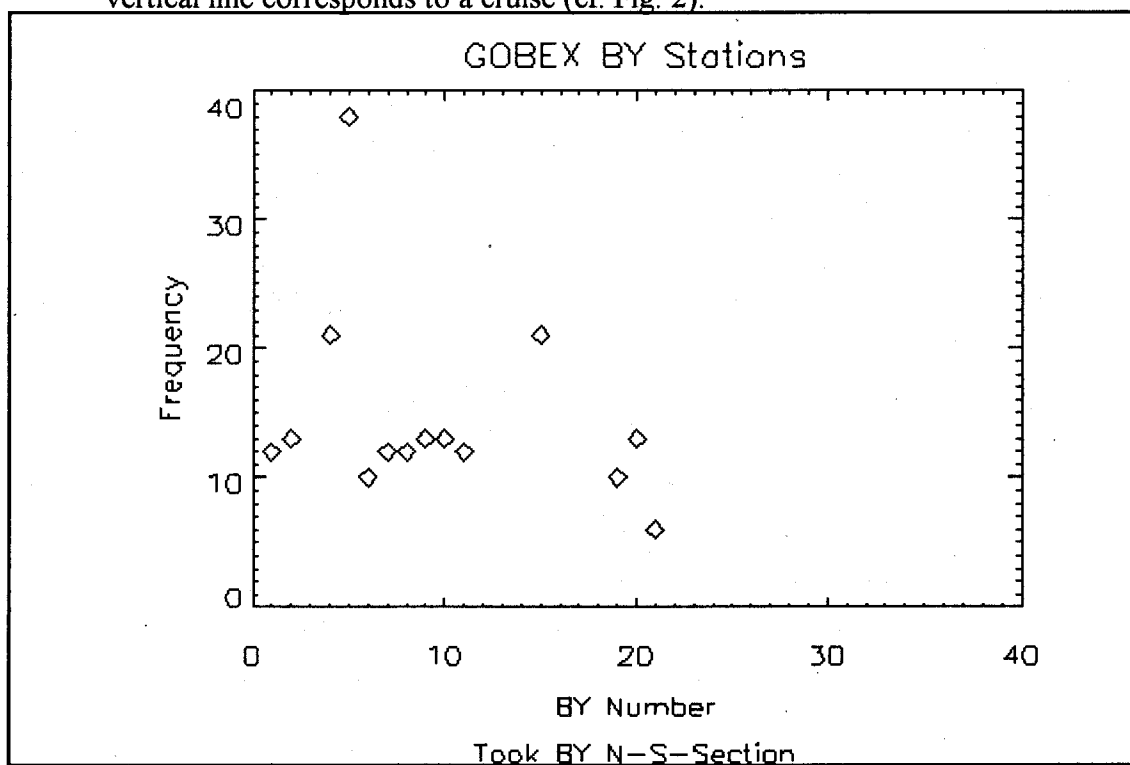
Parameter / Unit	Minimum	Contour interval	Maximum
Time / years	94.0		96.0
Depth / dbar	0.0		250.0
Temperature / Deg C	0.0	1.0	30.0
Salinity / PSU	0.0	1.0	30.0
Oxygen / ml/l	0.0	1.0	20.0
Potential Density / kg/m <sup>3</sup> (according to FEISTEL, 1993)	1000.0	1.0	1030.0

Tab. 4: Presented hydrographic parameters. range of values and contour intervals.

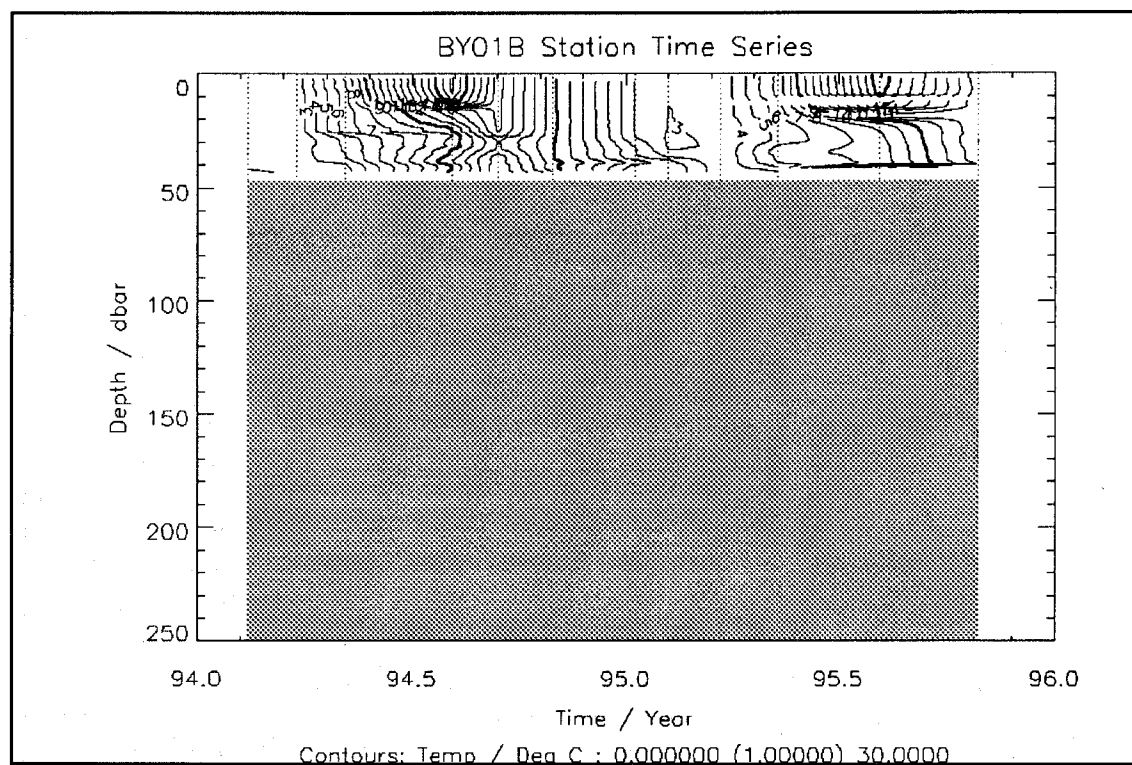
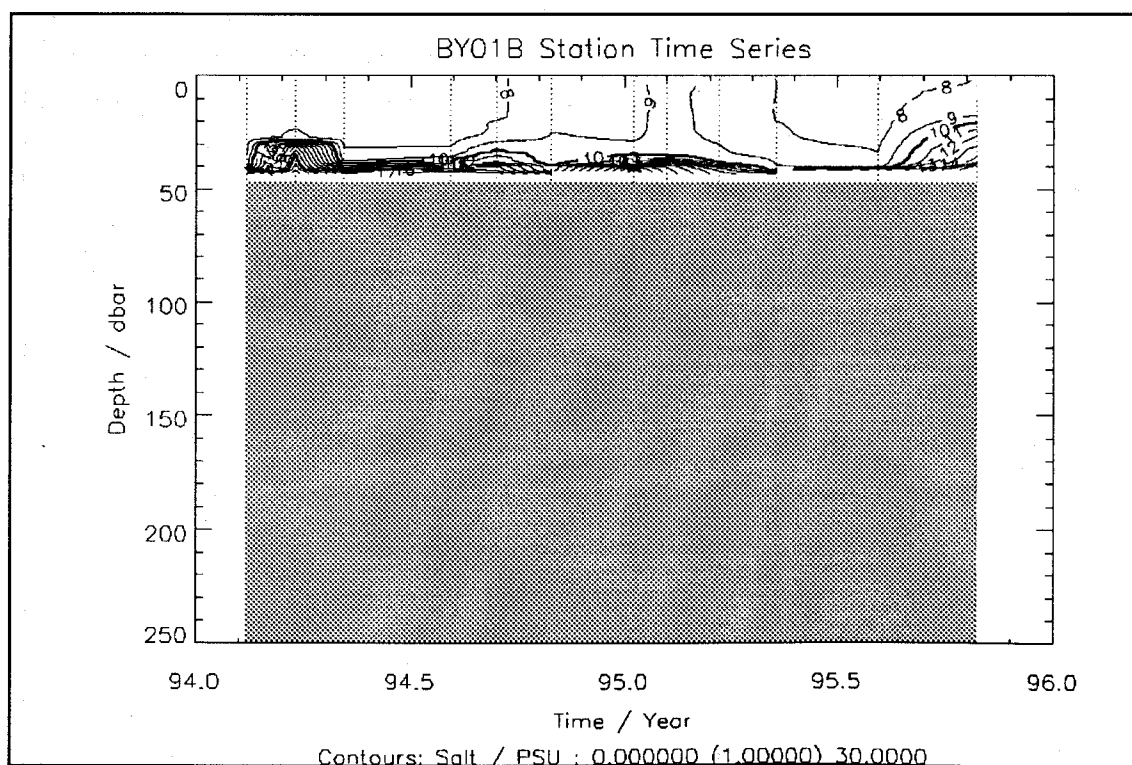
### 3.1. Station Time Series

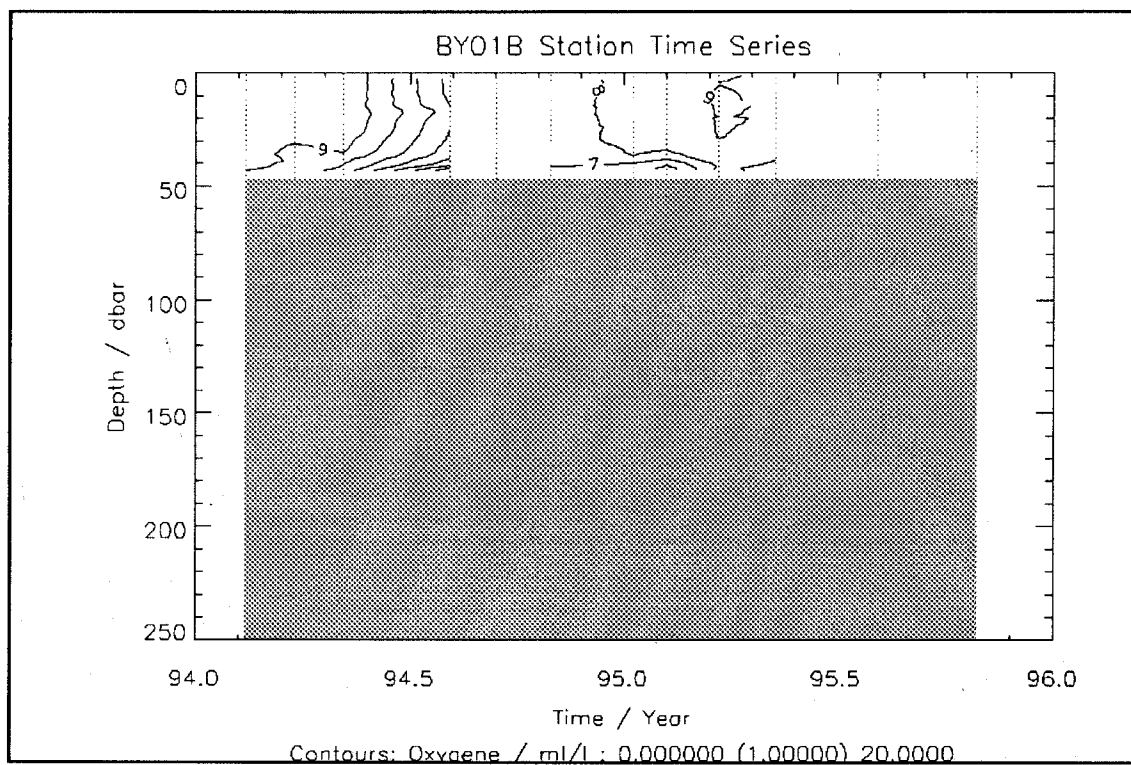


**Fig. 23:** Cruises covering the S-N transect versus the time in years (1994-96); each vertical line corresponds to a cruise (cf. Fig. 2).

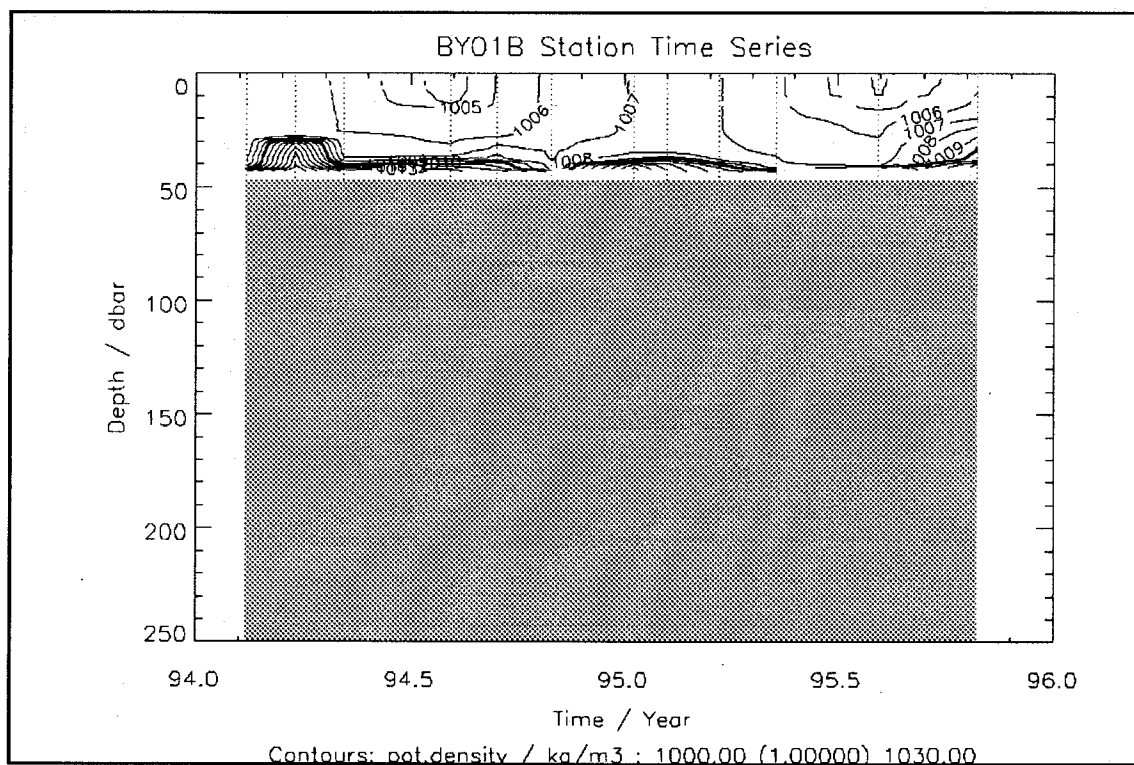


**Fig. 24:** As in Fig. 23 but for the sampling frequency at each station along the S-N transect (cf. Fig. 3).

**BY01B****Fig. 25: BY01B Station Time Series - Temperature****Fig. 26: BY01B Station Time Series - Salinity**

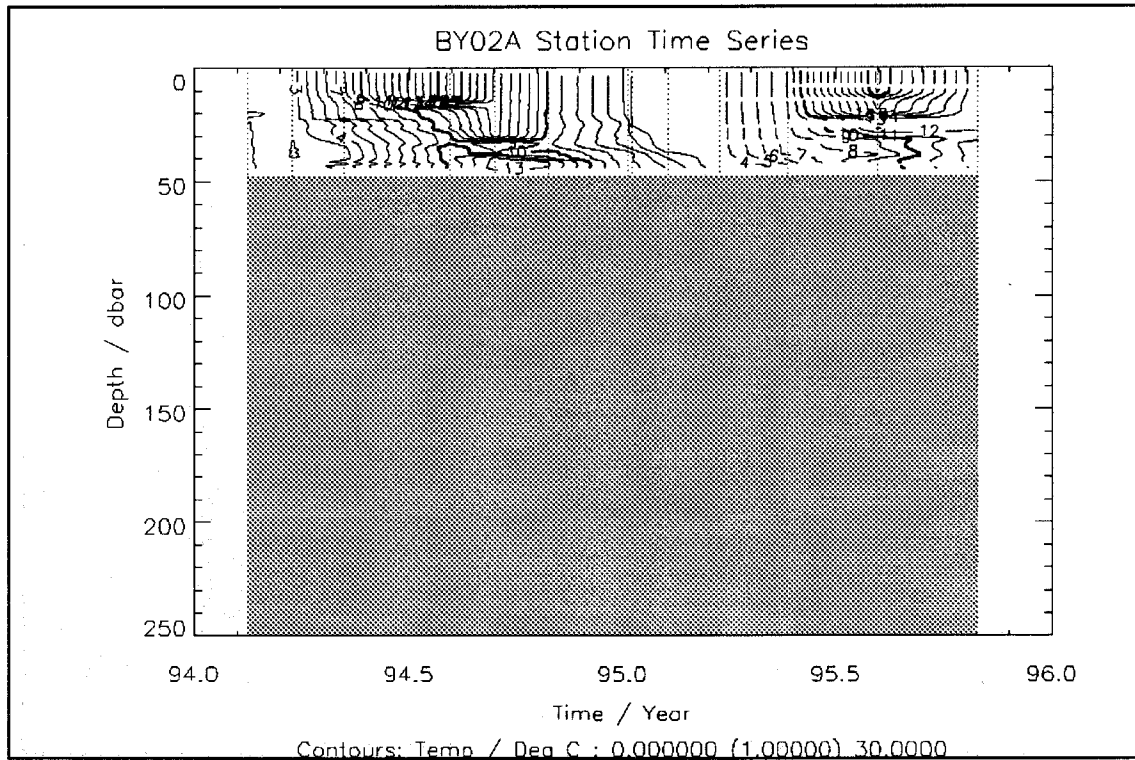


**Fig. 27: BY01B Station Time Series - Dissolved Oxygen**

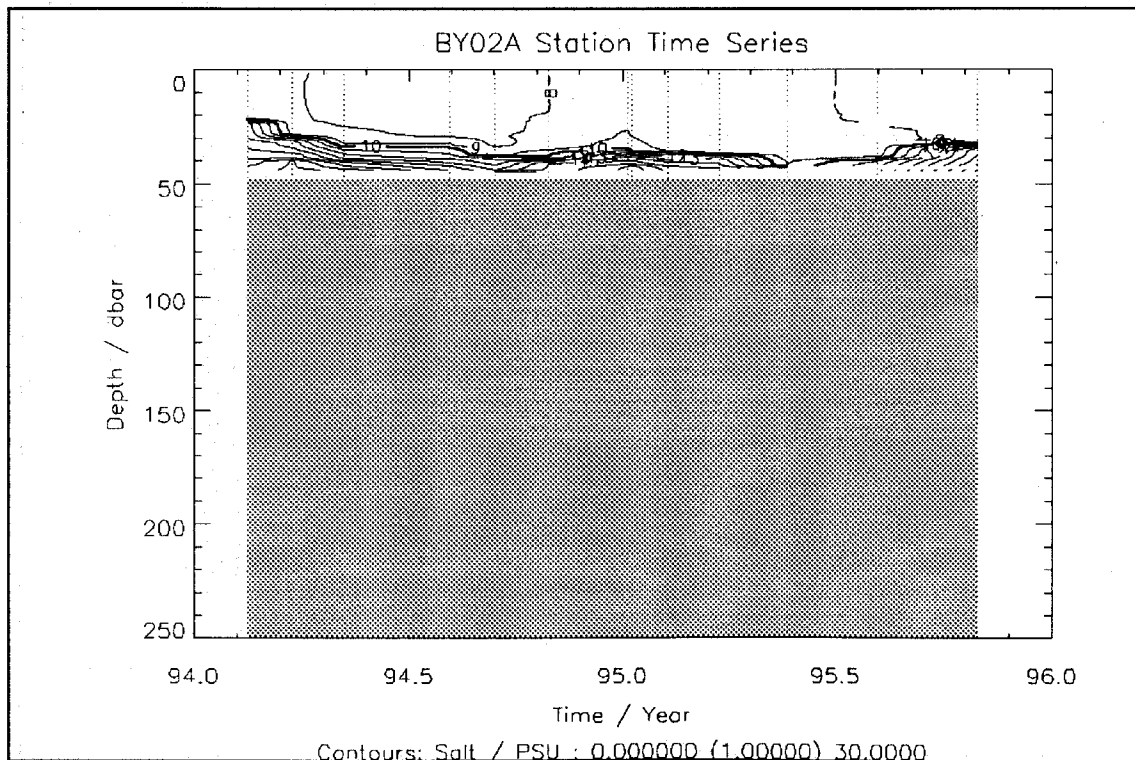


**Fig. 28: BY01B Station Time Series - Potential Density**

**BY02A**



**Fig. 29:** BY02A Station Time Series - Temperature



**Fig. 30:** BY01B Station Time Series - Salinity



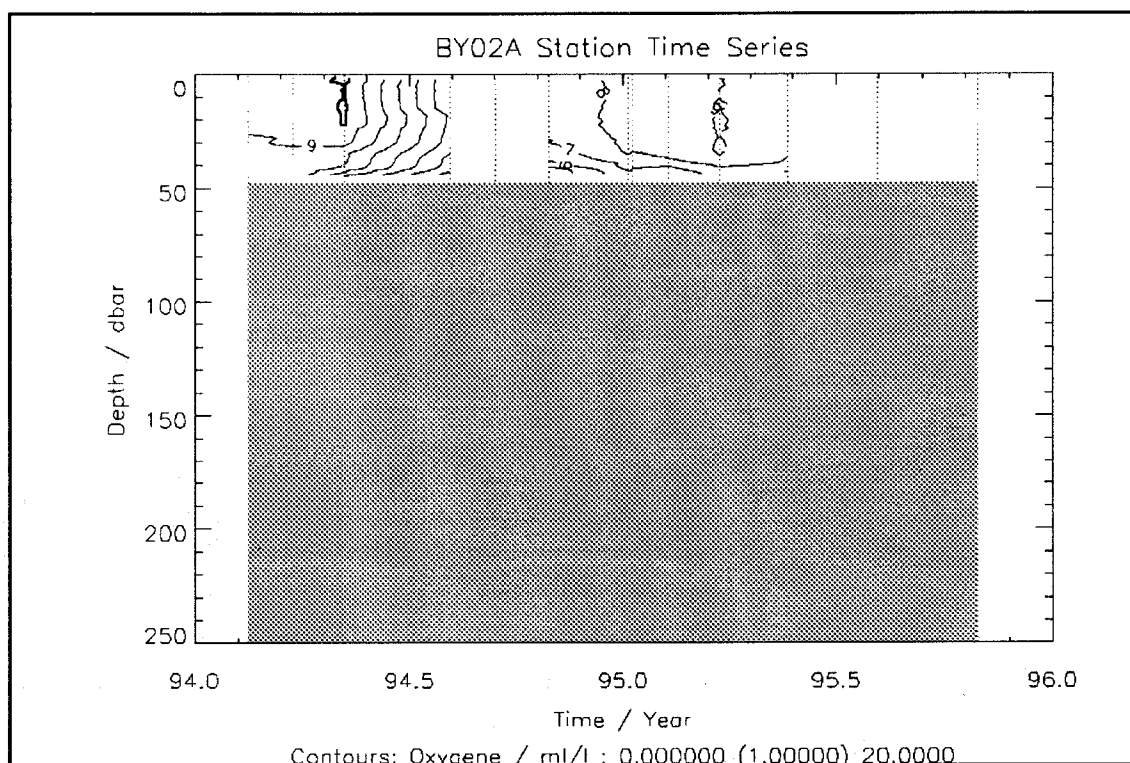


Fig. 31: BY02A Station Time Series - Dissolved Oxygen

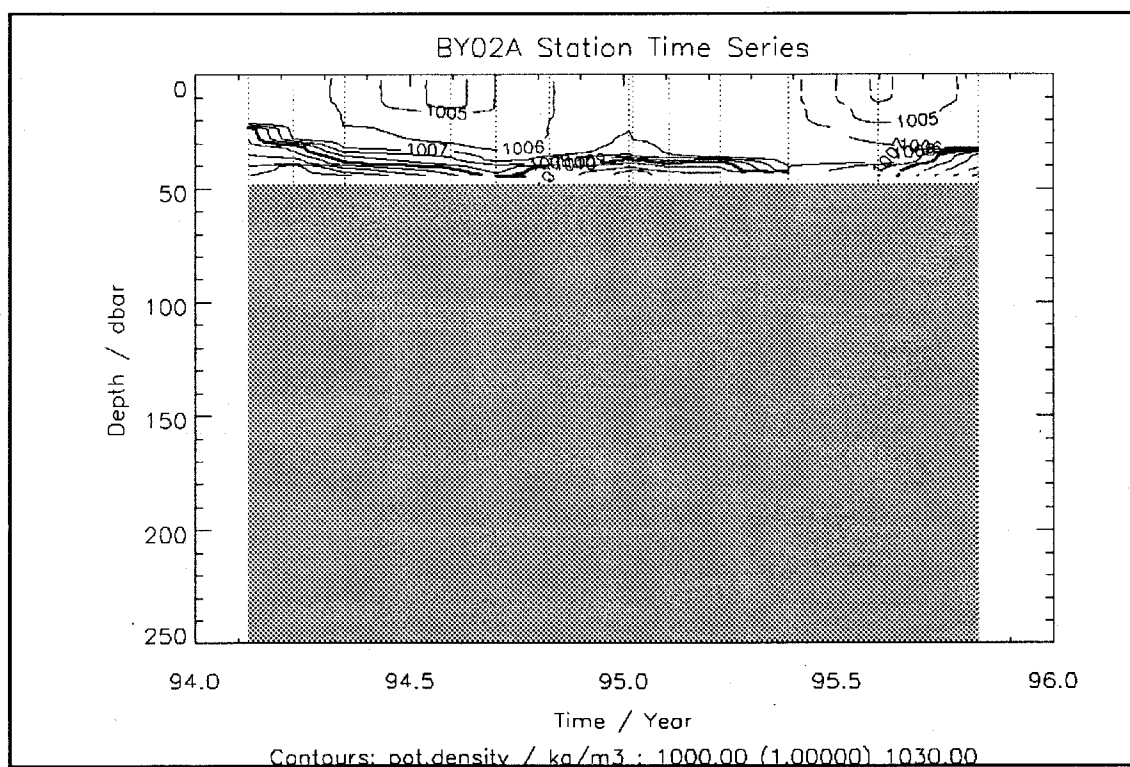
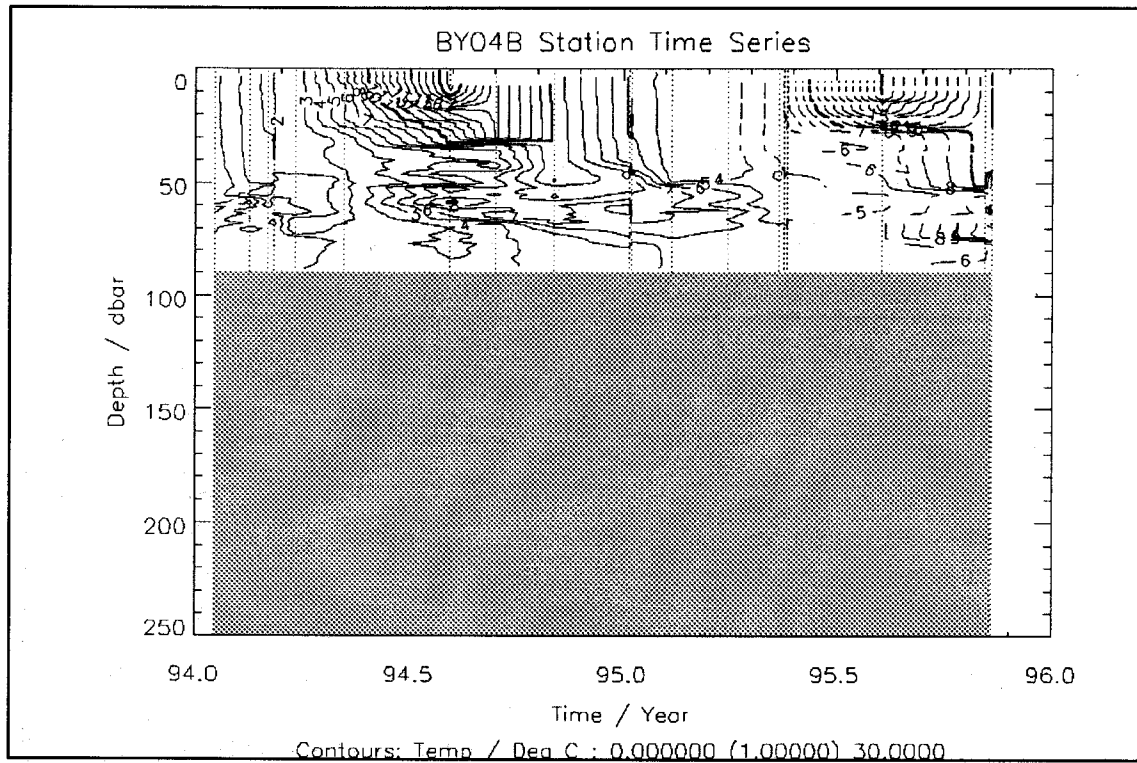
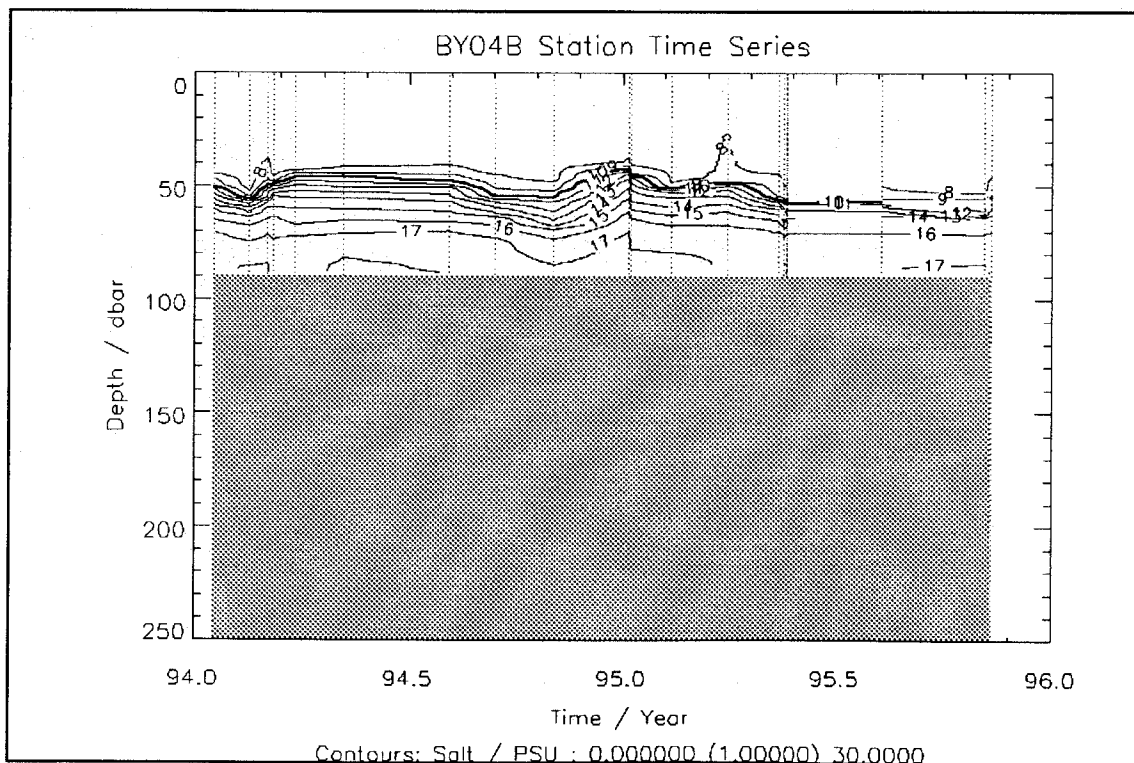


Fig. 32: BY02A Station Time Series - Potential Density

**BY04B**



**Fig. 33: BY04B Station Time Series - Temperature**



**Fig. 34: BY04B Station Time Series - Salinity**

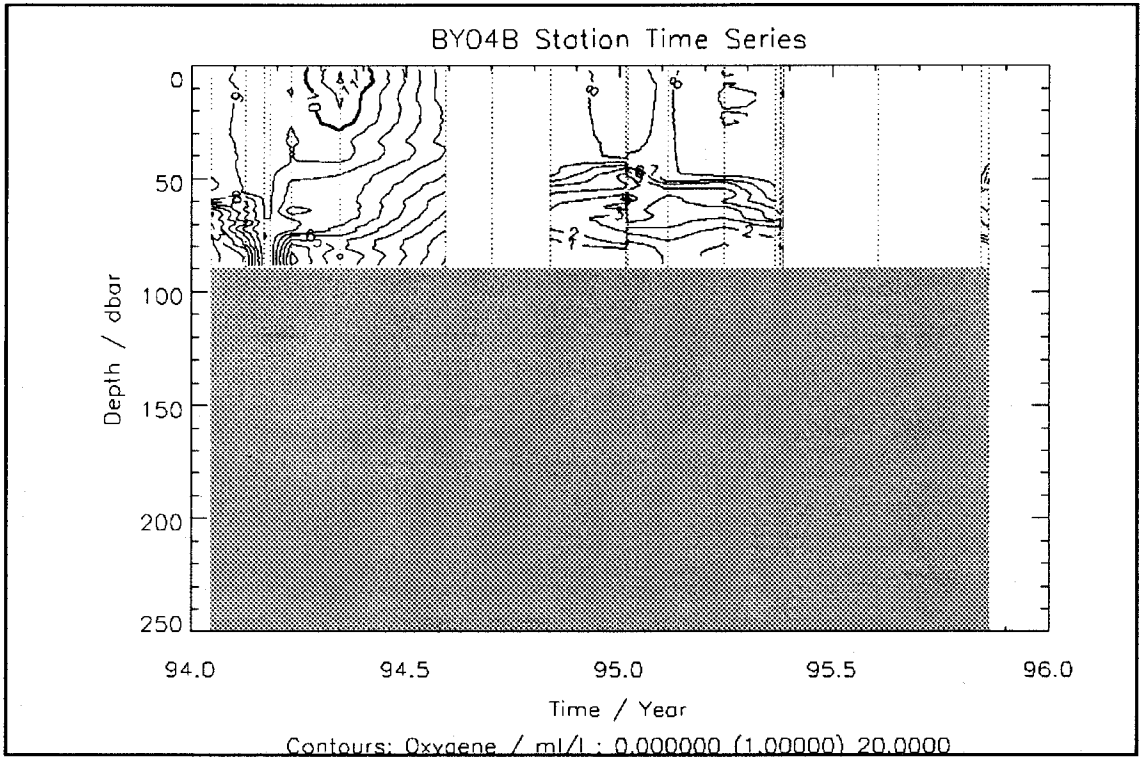


Fig. 35: BY04B Station Time Series - Dissolved Oxygen

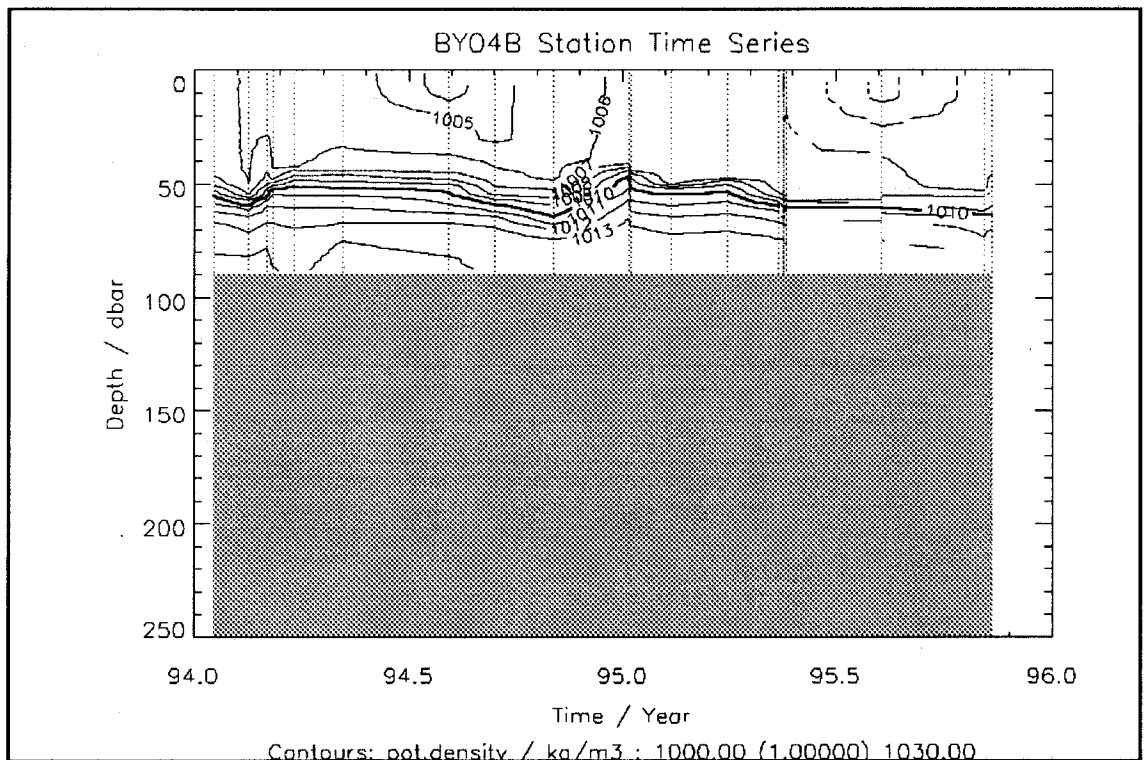
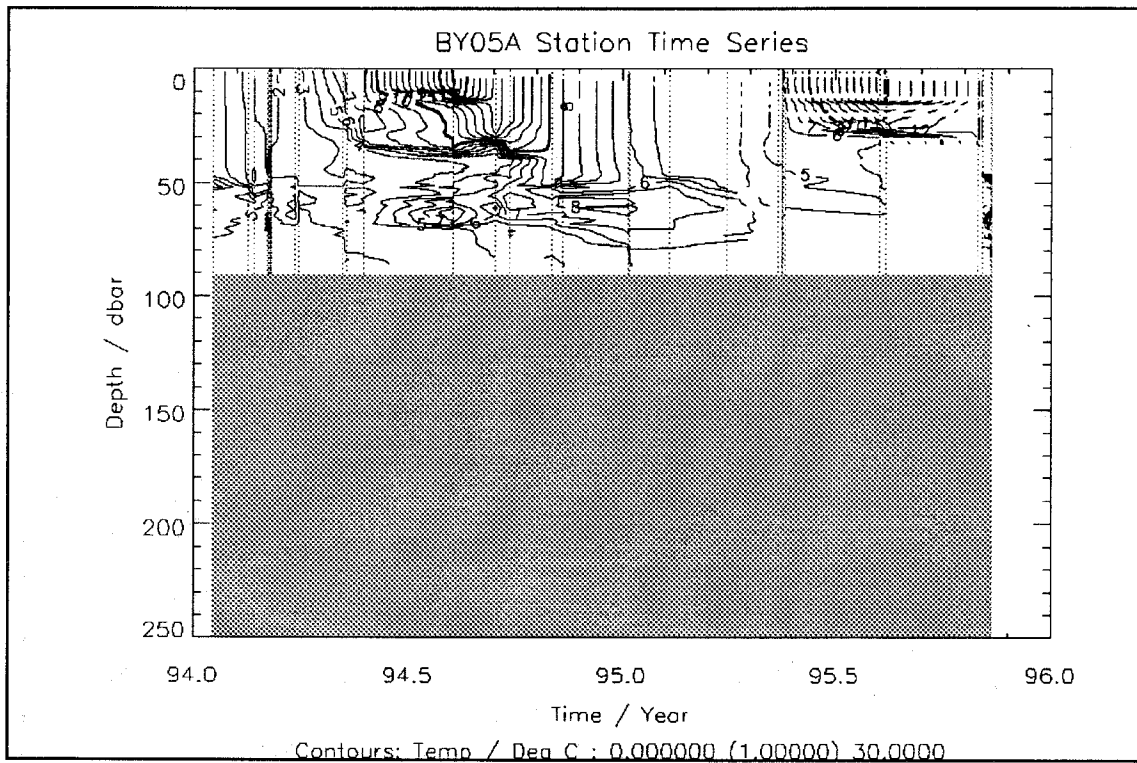
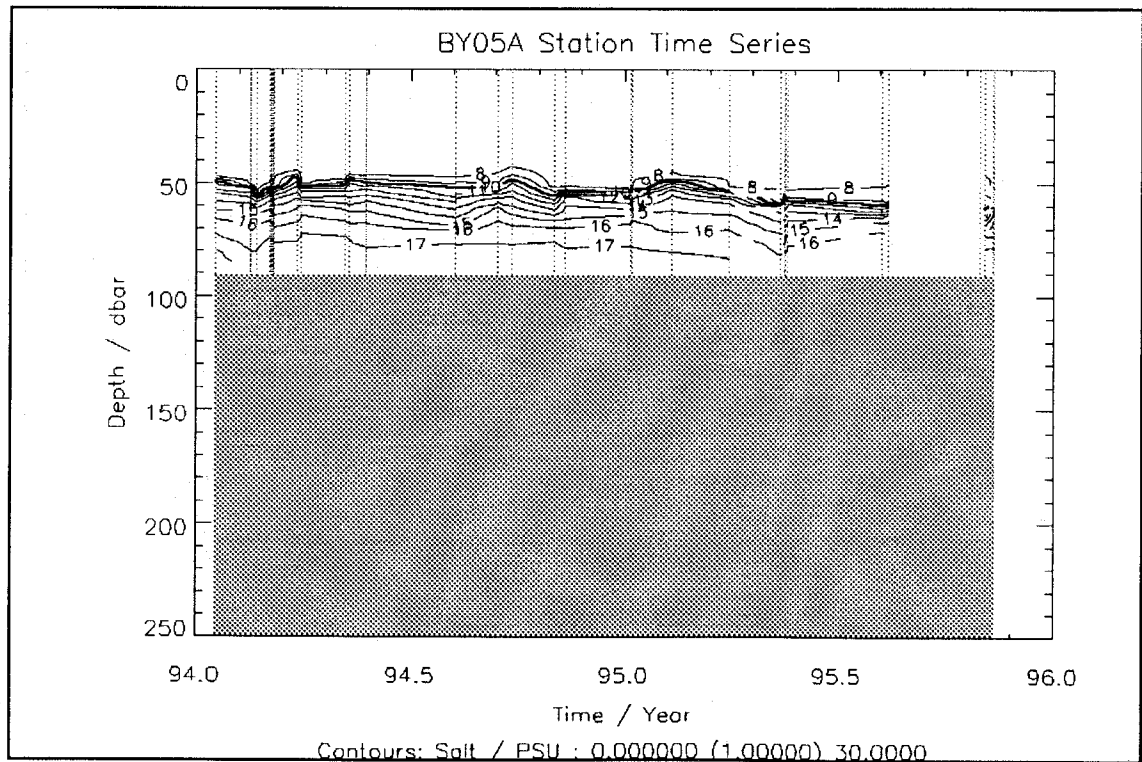


Fig. 36: BY04B Station Time Series - Potential Density

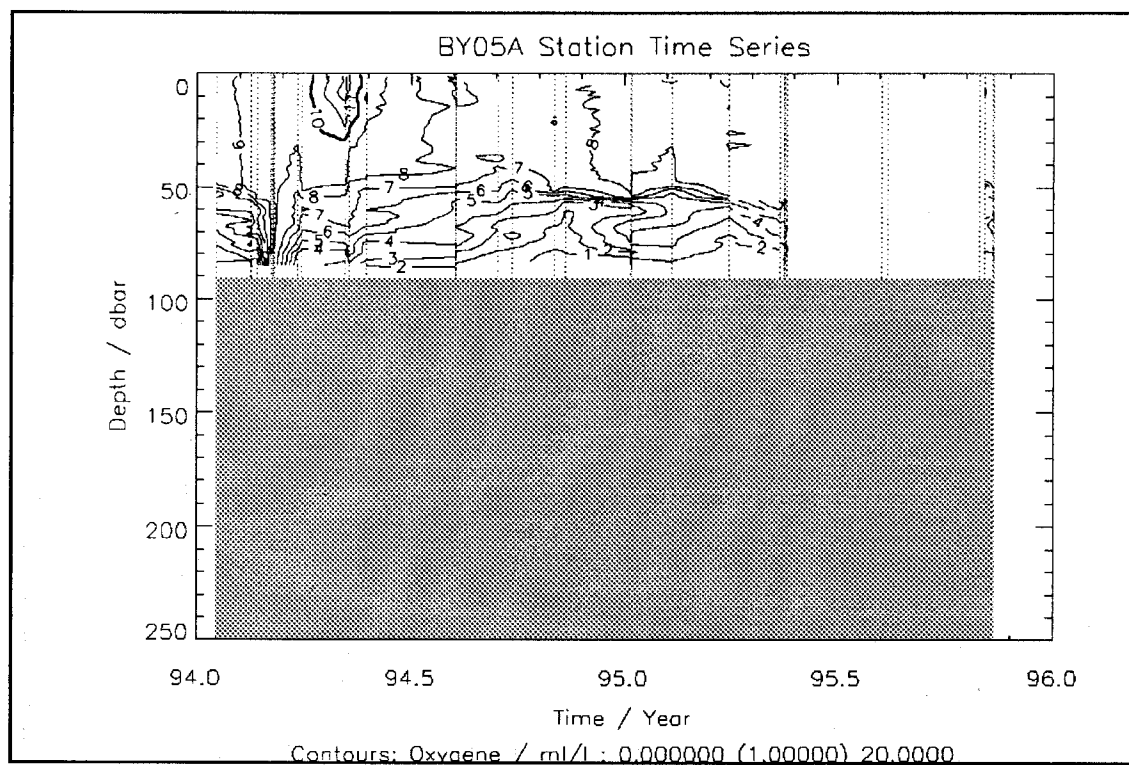
**BY05A**



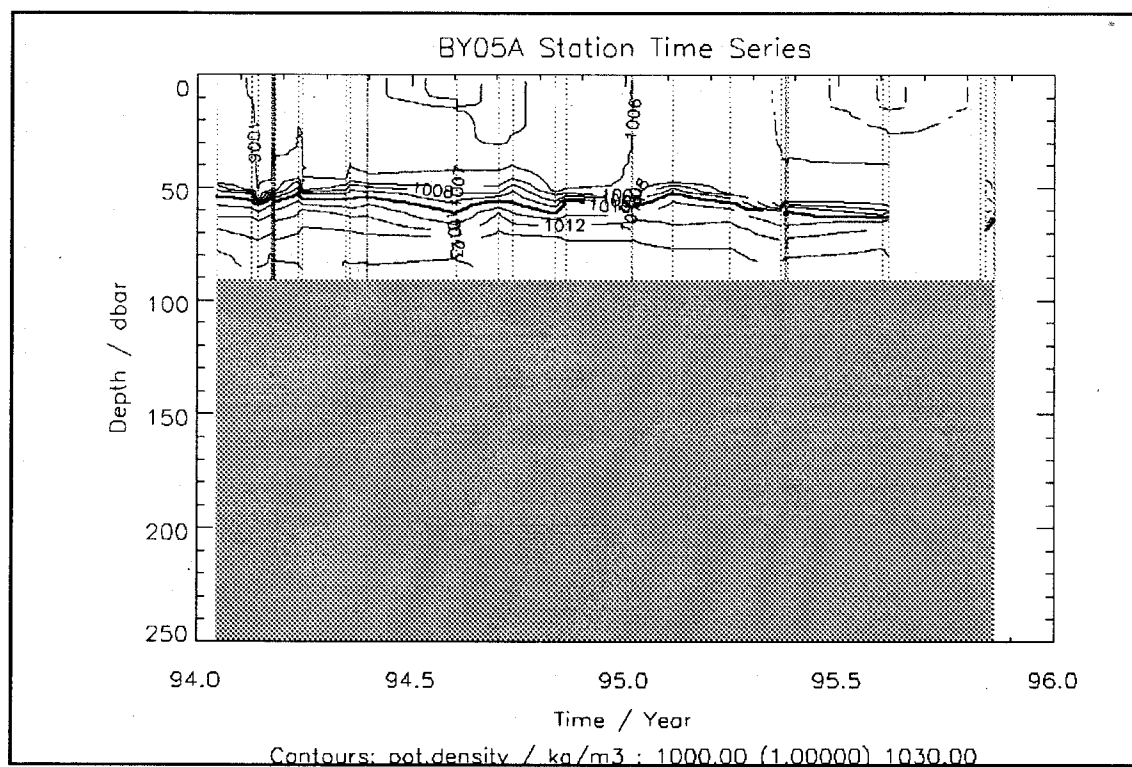
**Fig. 37: BY05A Station Time Series - Temperature**



**Fig. 38: BY05A Station Time Series - Salinity**

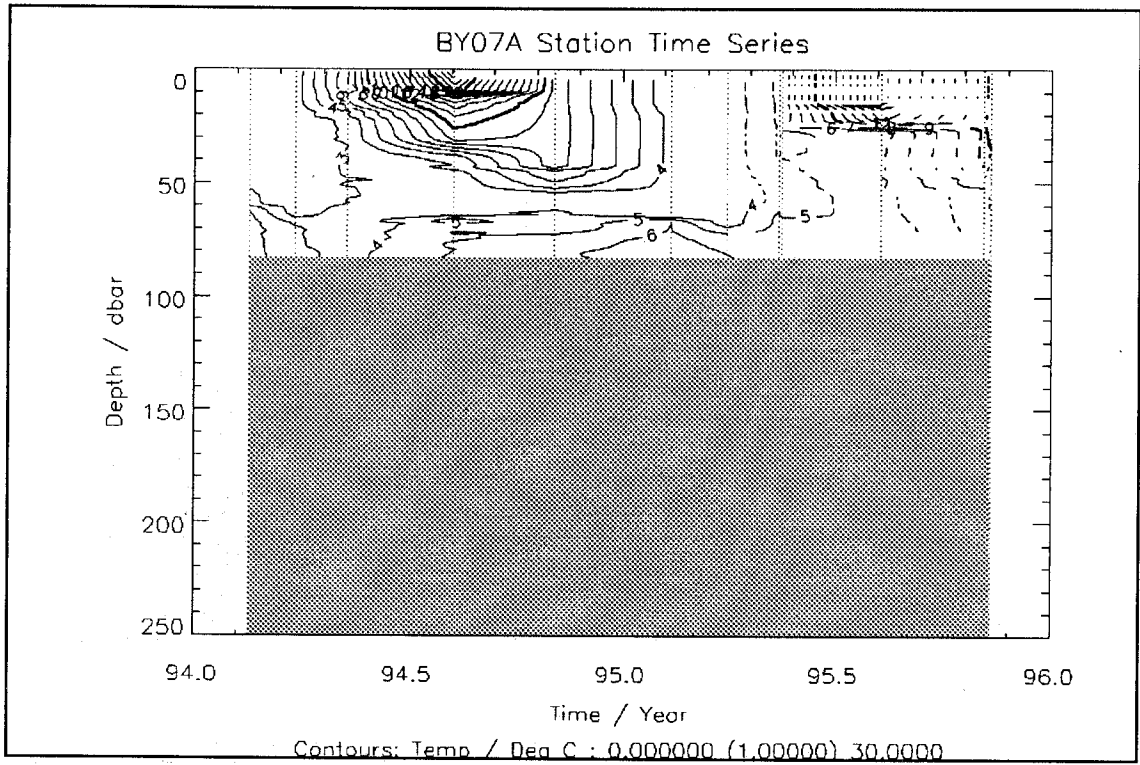


**Fig. 39:** BY05A Station Time Series - Dissolved Oxygen

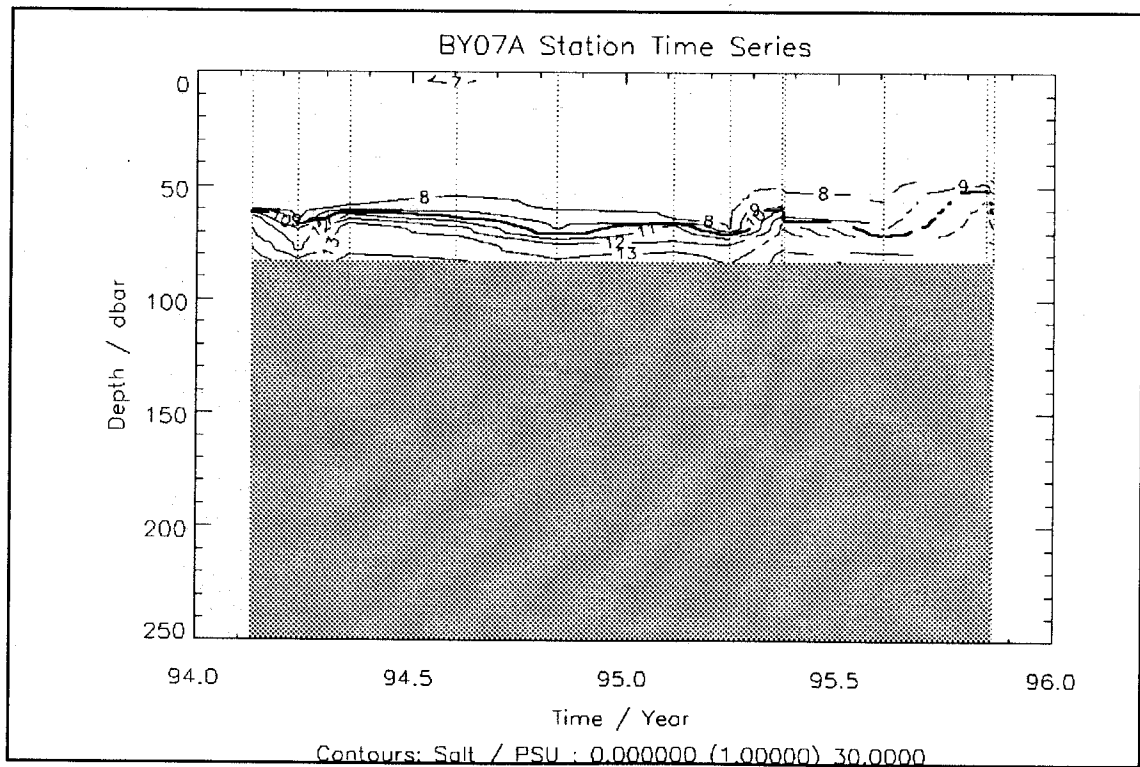


**Fig. 40:** BY05A Station Time Series - Potential Density

**BY07A**

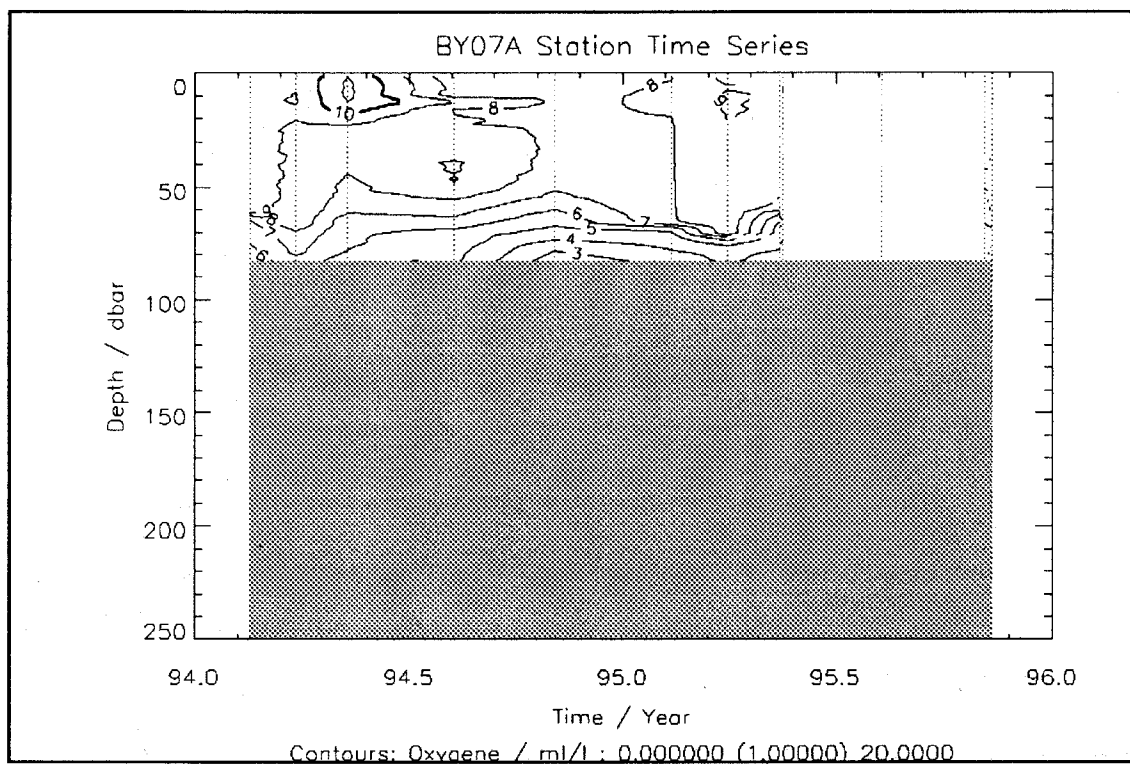


**Fig. 41: BY07A Station Time Series - Temperature**

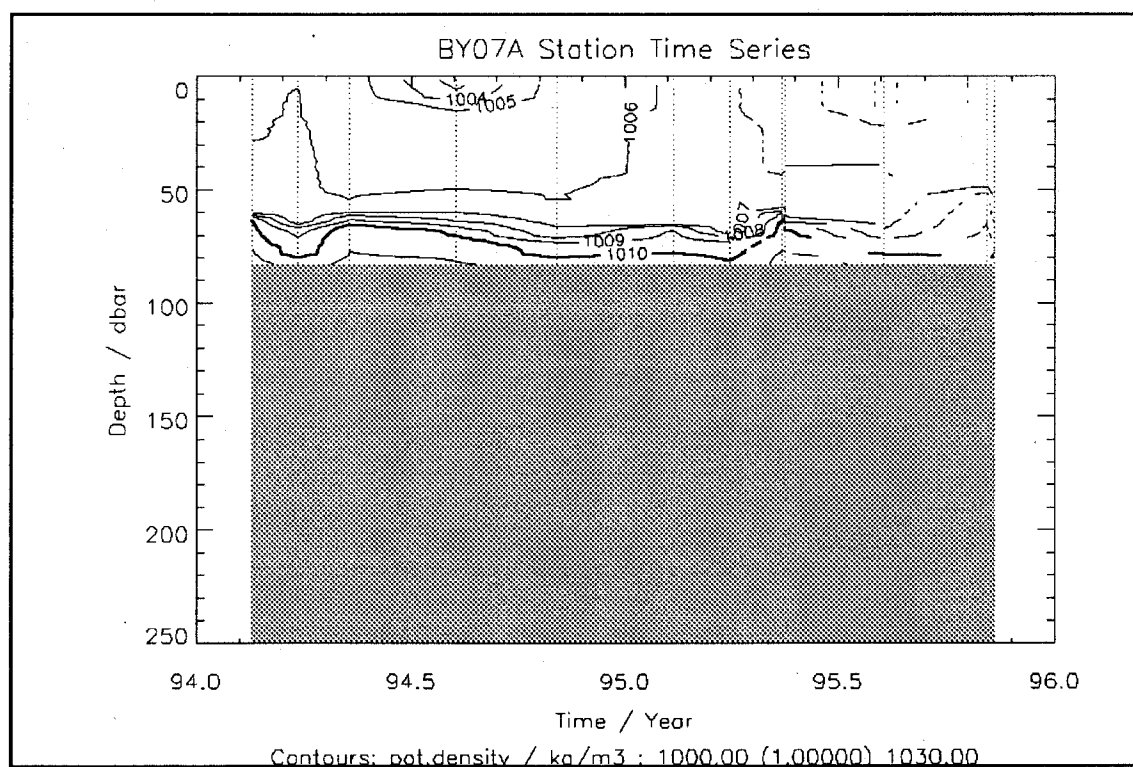


**Fig. 42: BY07A Station Time Series - Salinity**



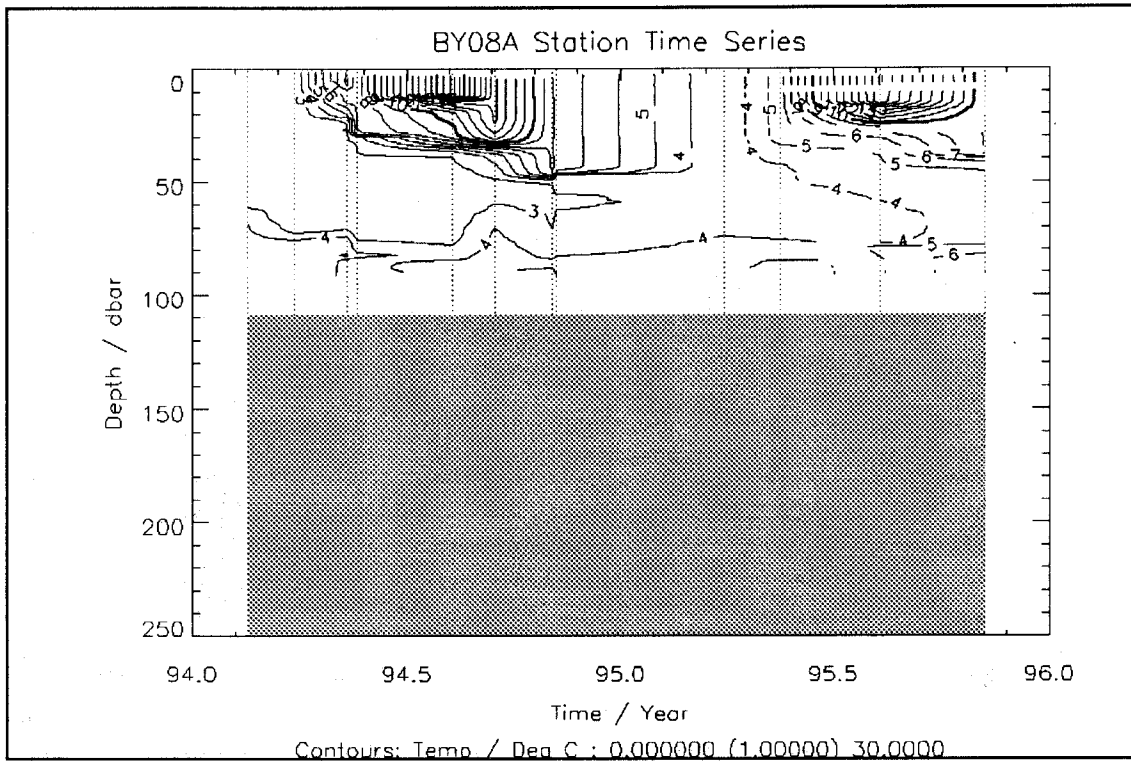


**Fig. 43: BY07A Station Time Series - Dissolved Oxygen**

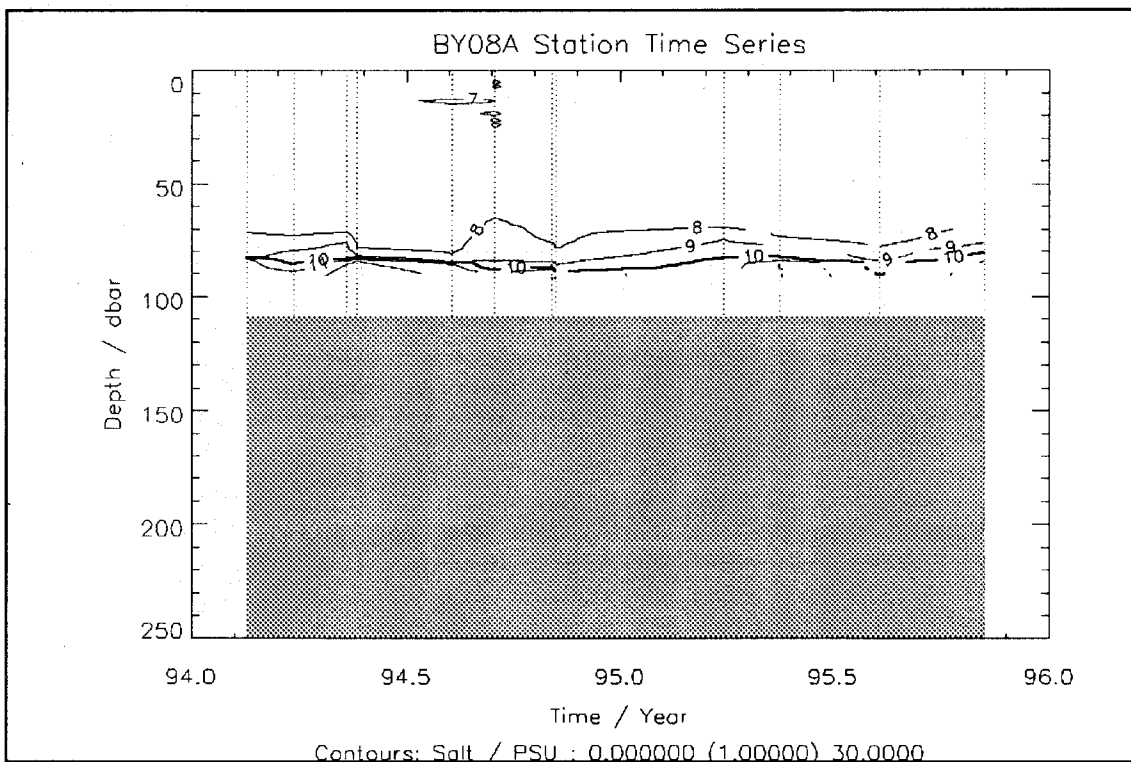


**Fig. 44: BY07A Station Time Series - Potential Density**

**BY08A**

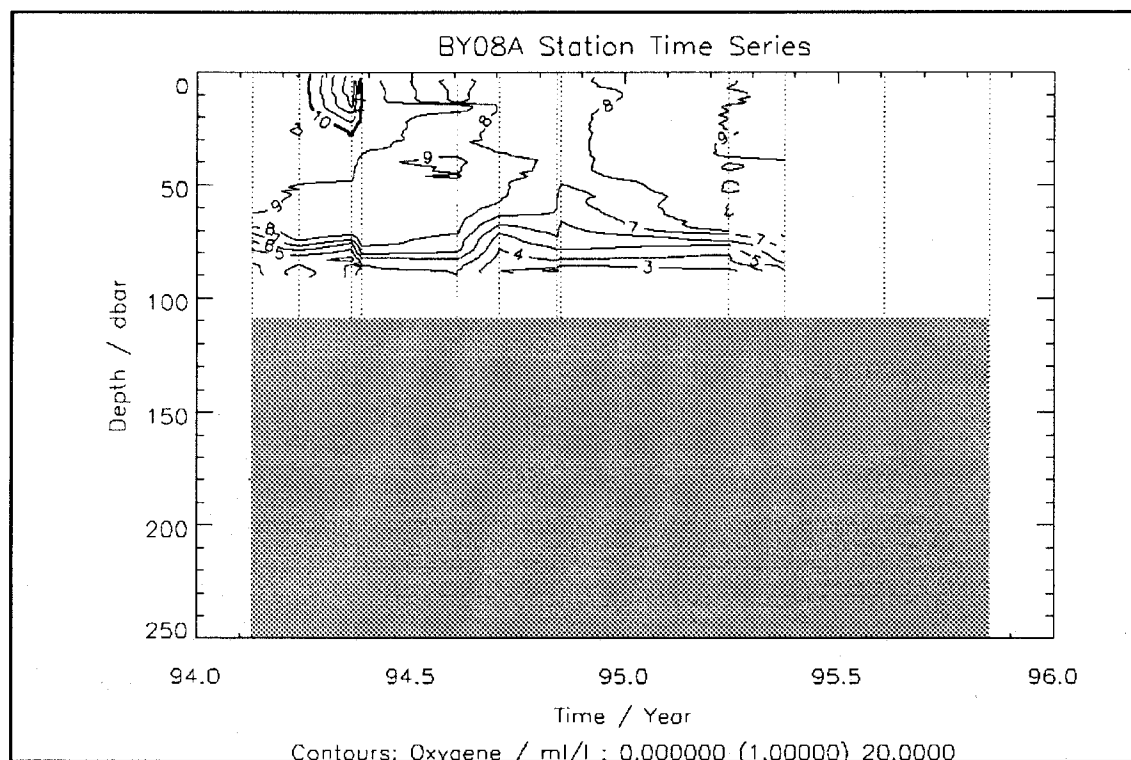


**Fig. 45: BY08A Station Time Series - Temperature**

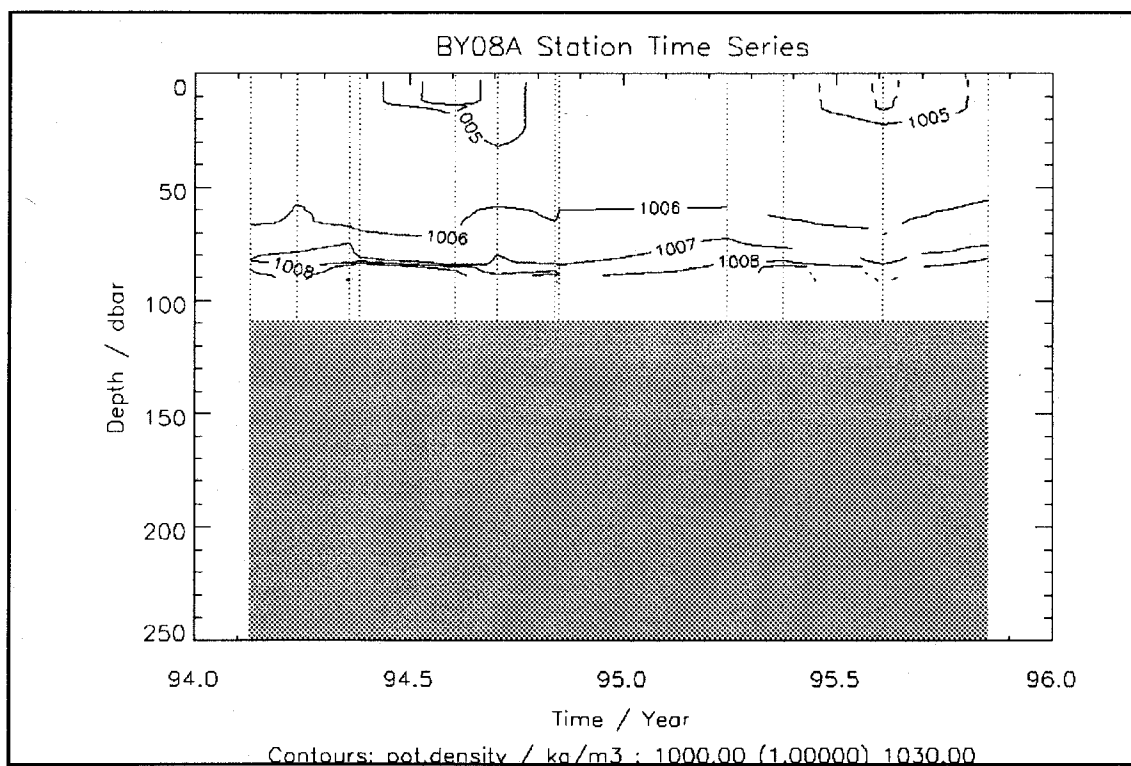


**Fig. 46: BY08A Station Time Series - Salinity**





**Fig. 47: BY08A Station Time Series - Dissolved Oxygen**



**Fig. 48: BY08A Station Time Series - Potential Density**

BY09A

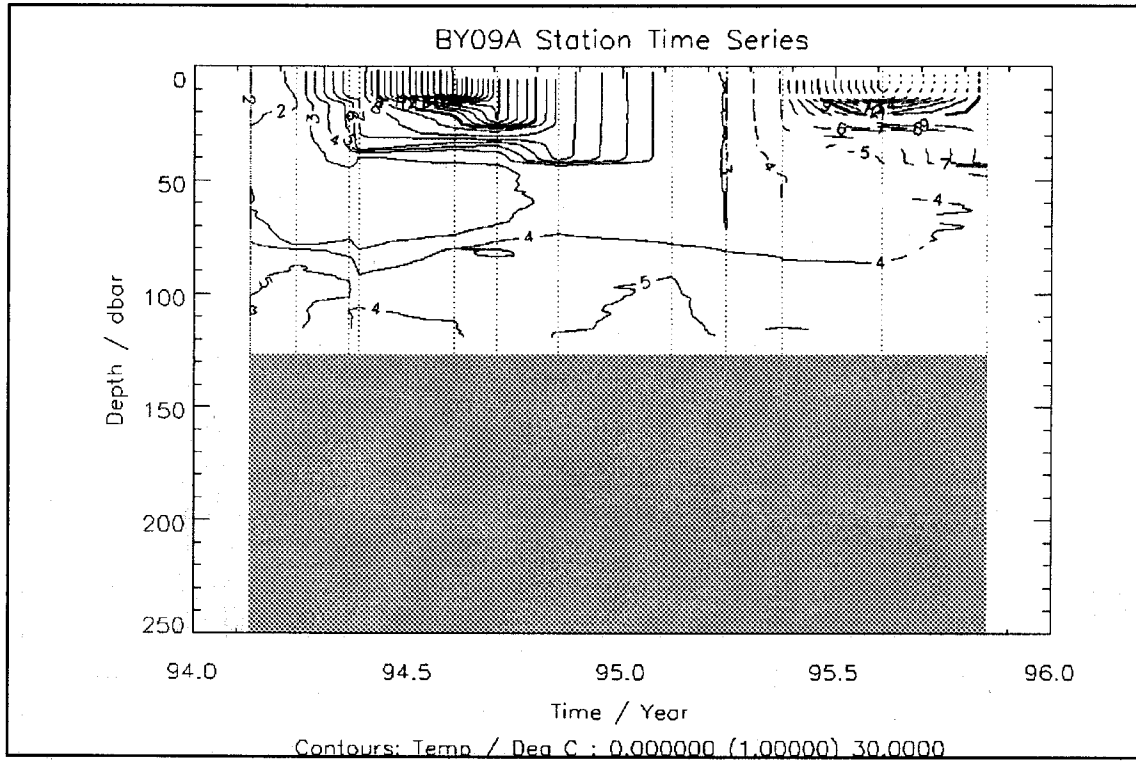


Fig. 49: BY09A Station Time Series - Temperature

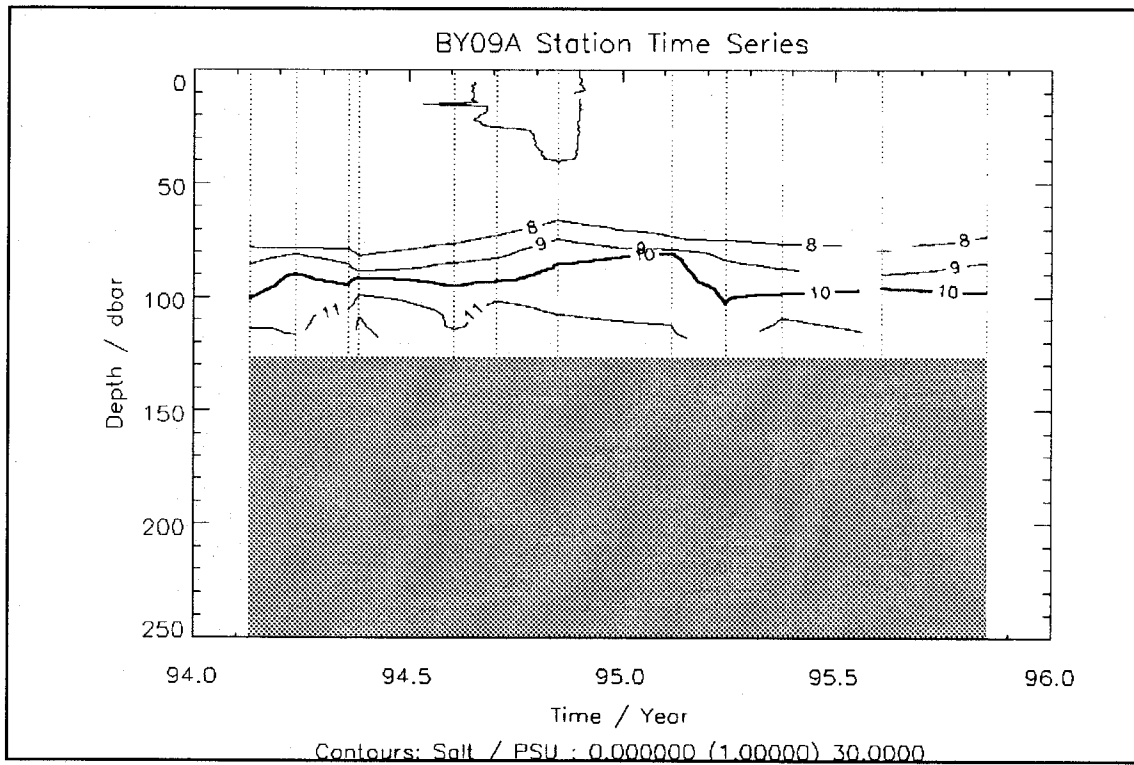
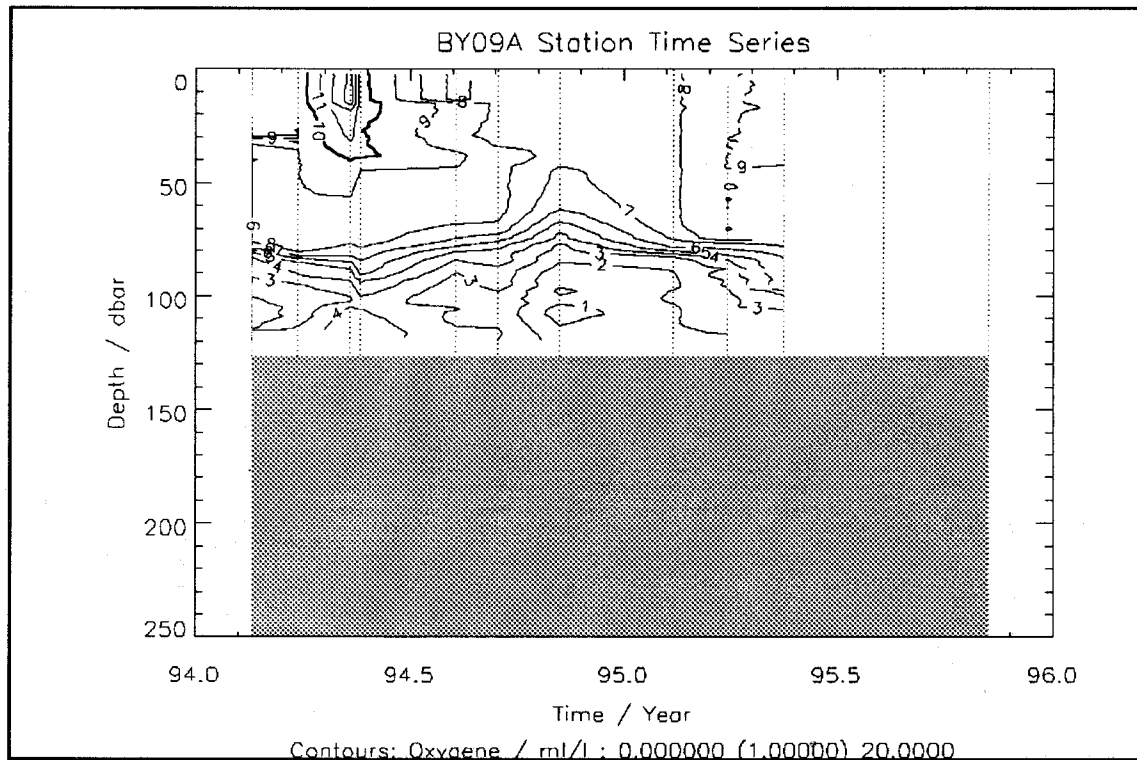
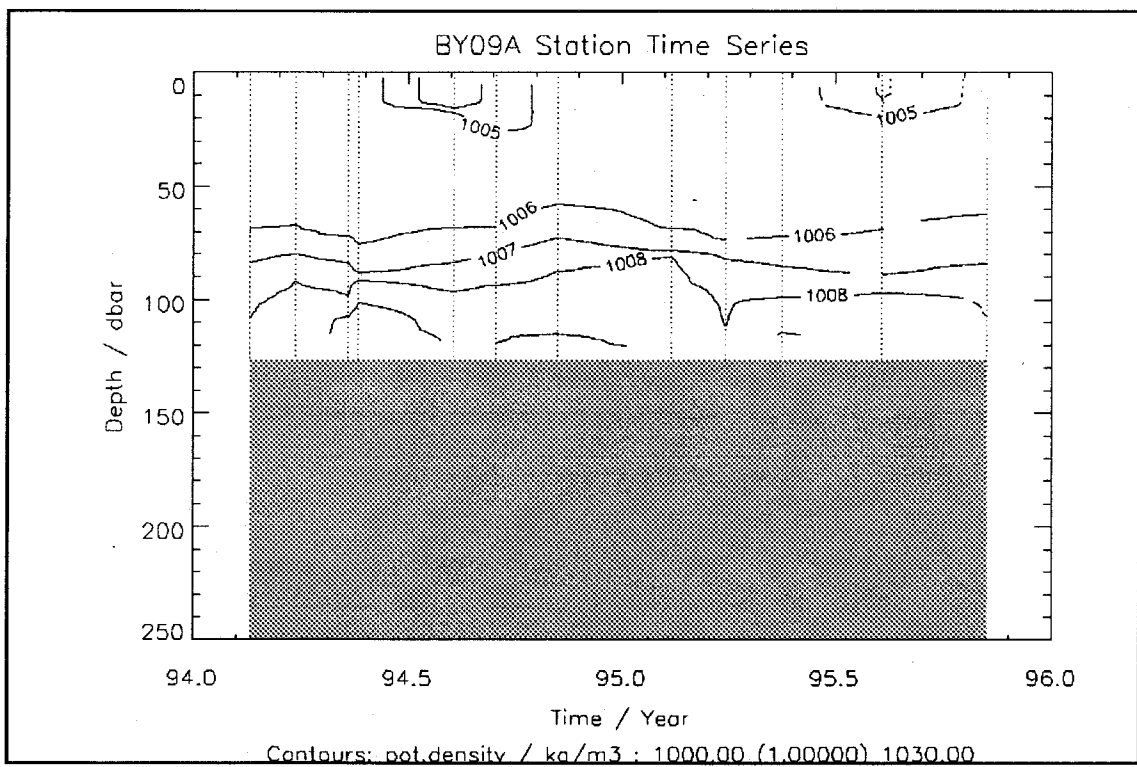


Fig. 50: BY09A Station Time Series - Salinity



**Fig. 51:** BY09A Station Time Series - Dissolved Oxygen



**Fig. 52:** BY09A Station Time Series - Potential Density

BY10B

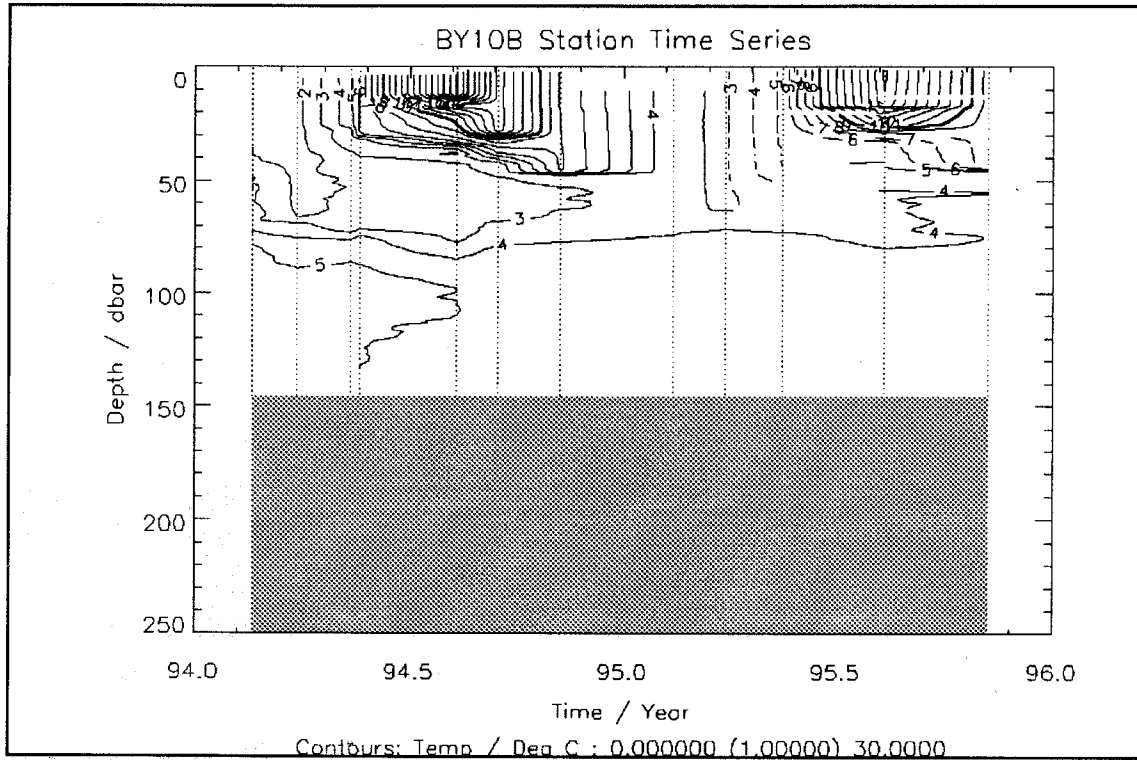


Fig. 53: BY10B Station Time Series - Temperature

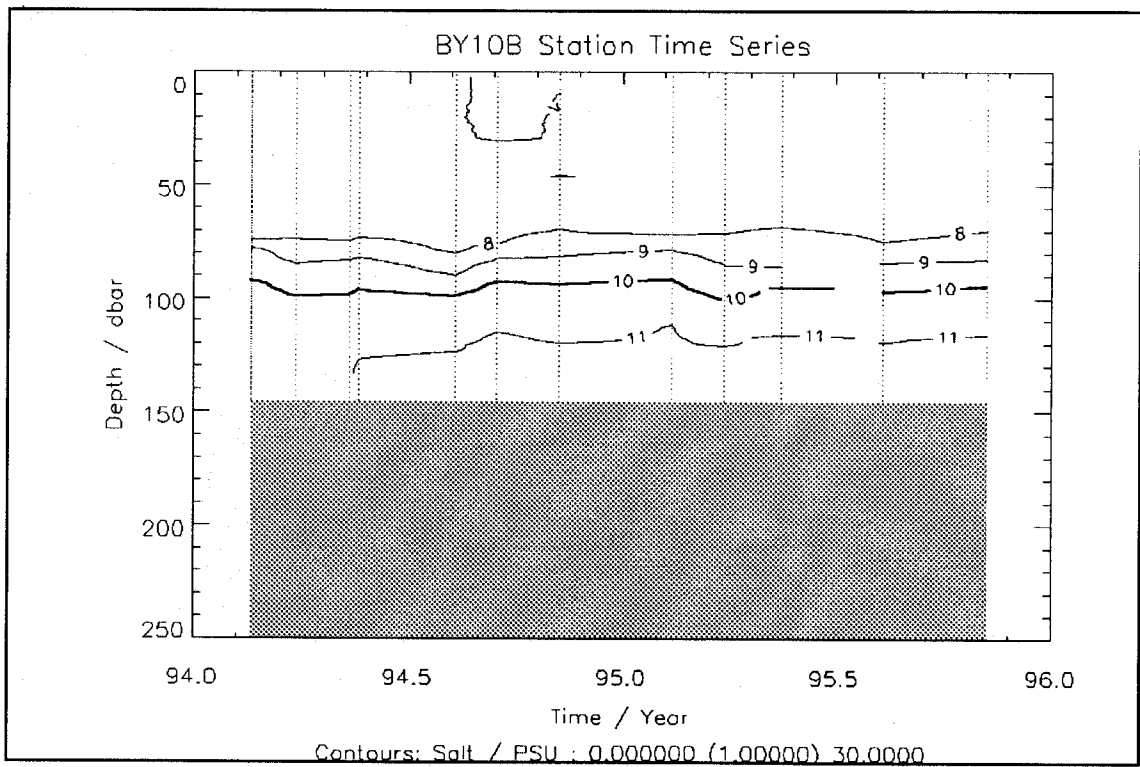


Fig. 54: BY10B Station Time Series - Salinity

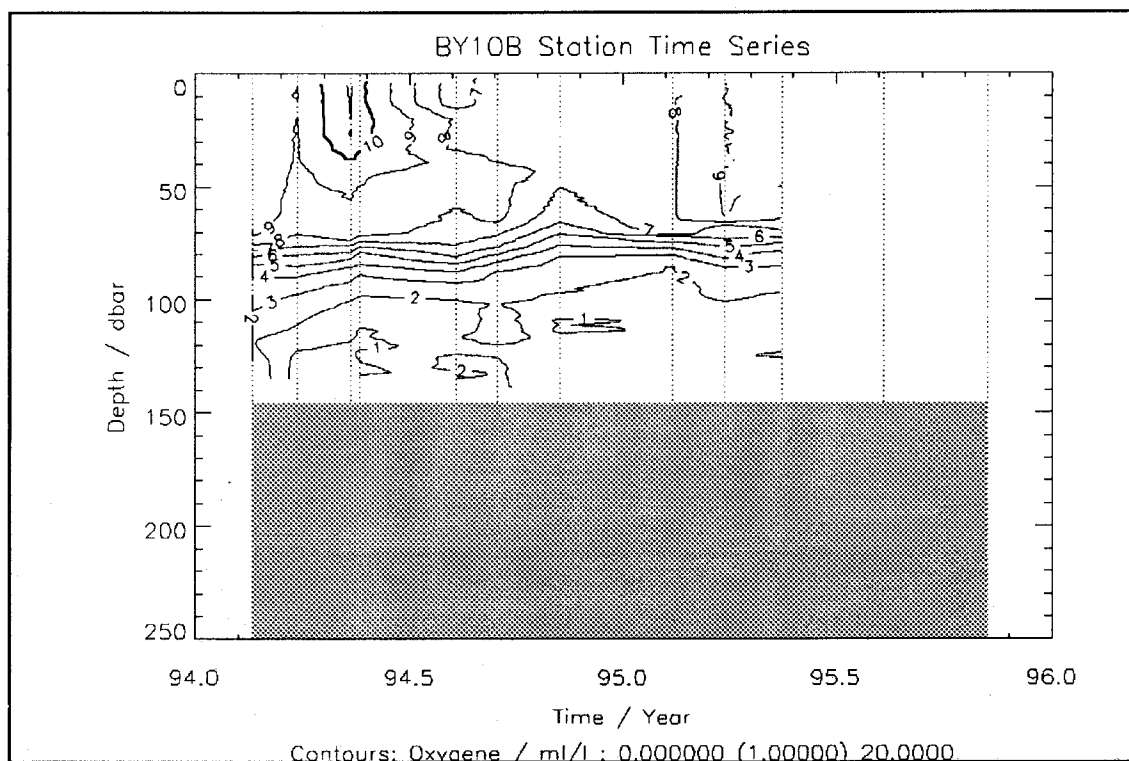


Fig. 55: BY10B Station Time Series - Dissolved Oxygen

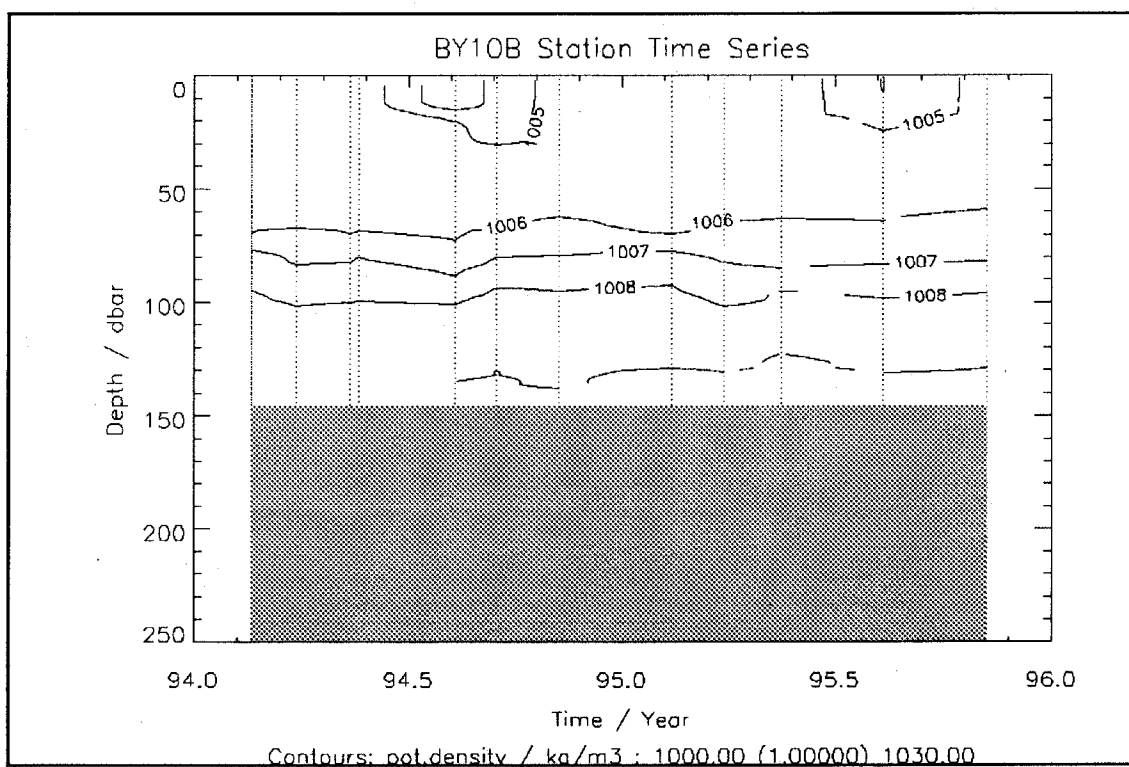


Fig. 56: BY10B Station Time Series - Potential Density

BY11B

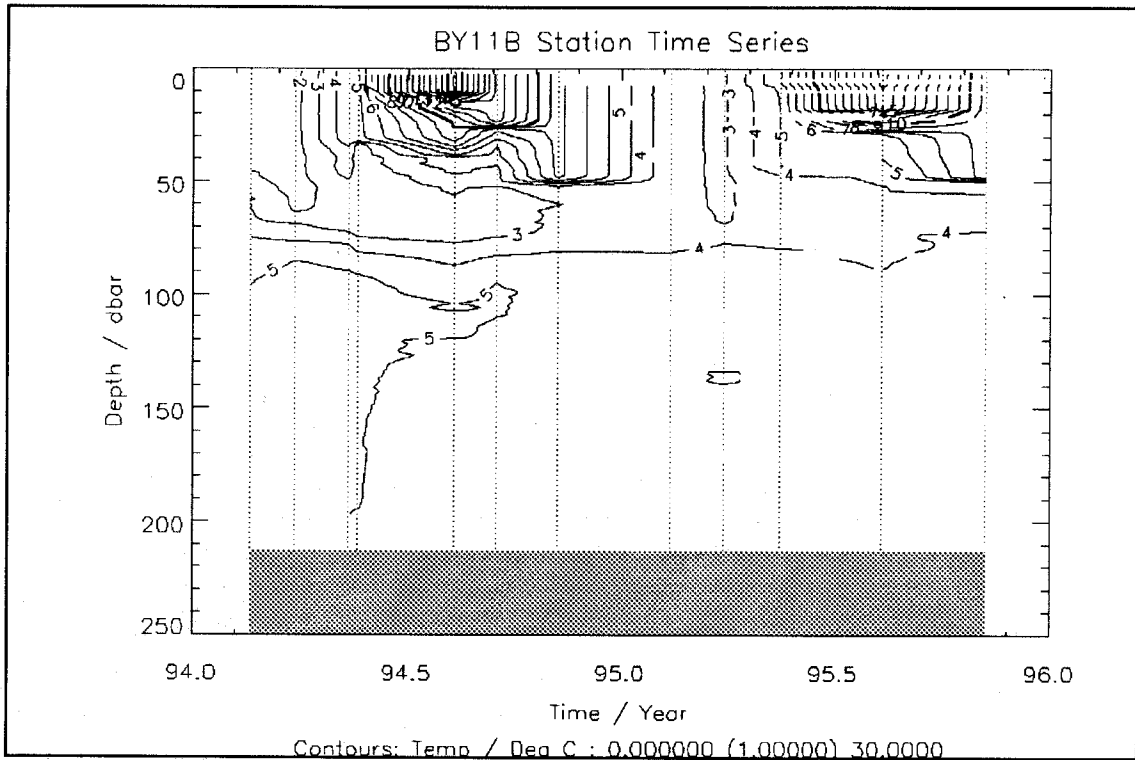


Fig. 57: BY11B Station Time Series - Temperature

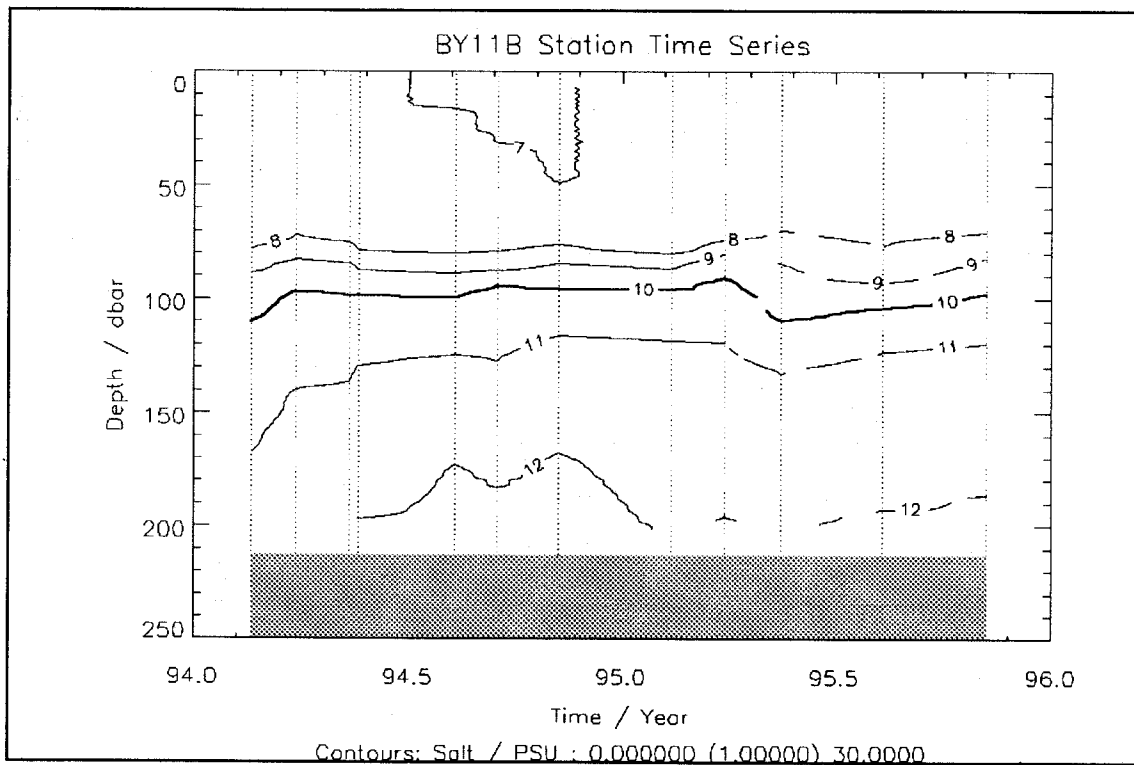


Fig. 58: BY11B Station Time Series - Salinity

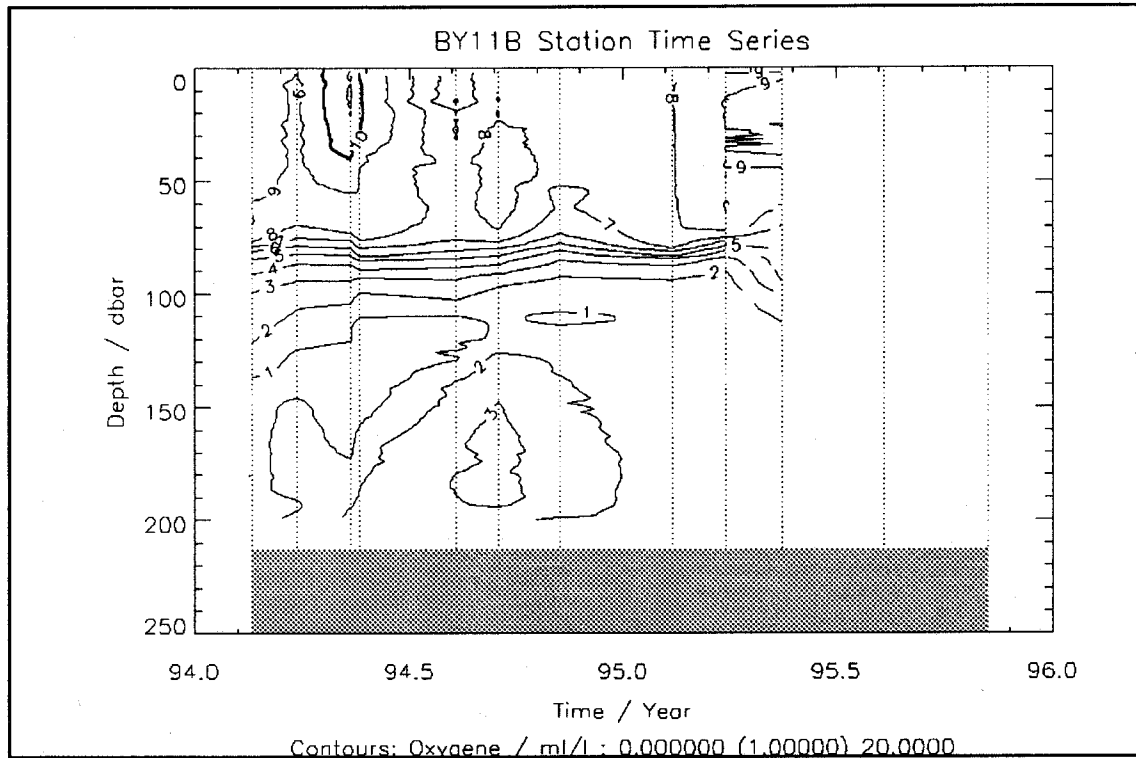


Fig. 59: BY11B Station Time Series - Dissolved Oxygen

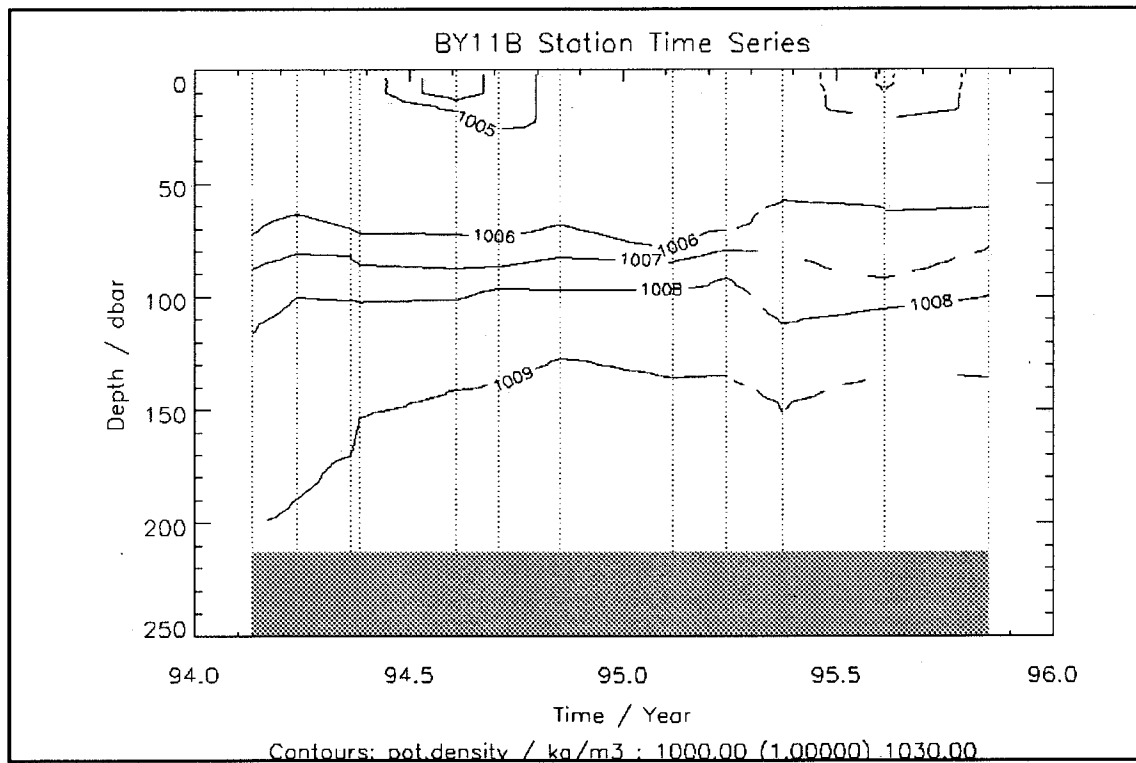
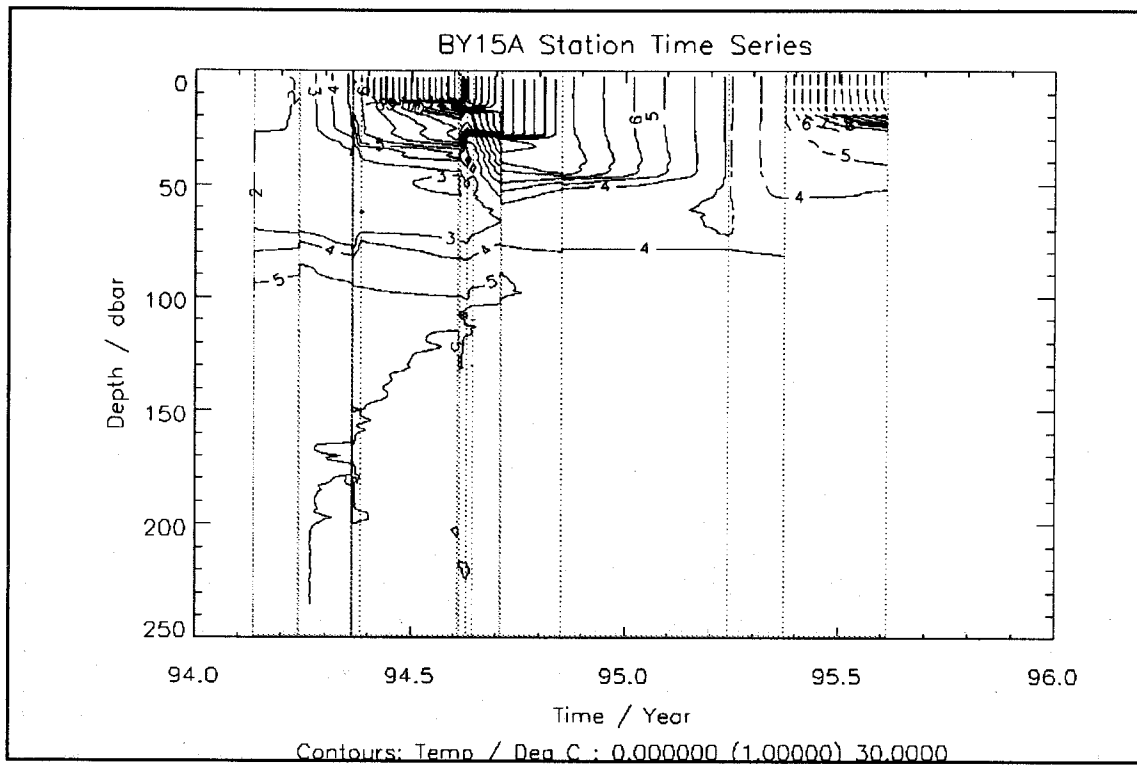
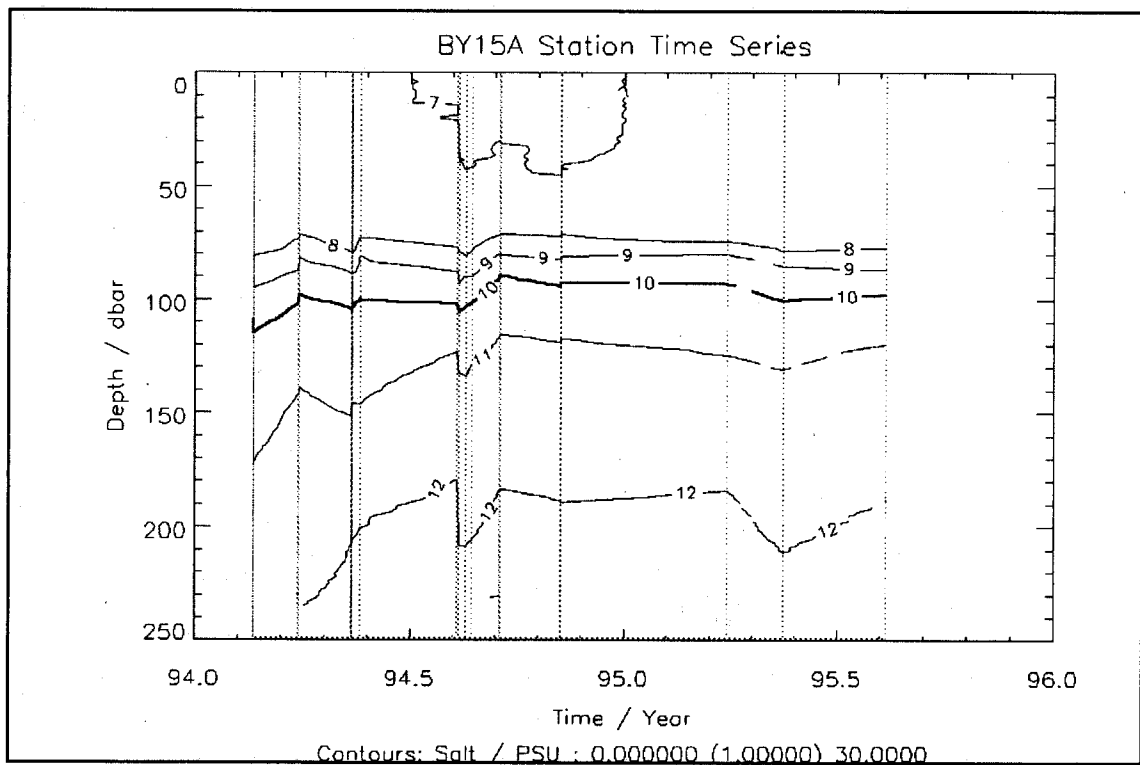


Fig. 60: BY11B Station Time Series - Potential Density

**BY15B**



**Fig. 61: BY15B Station Time Series - Temperature**



**Fig. 62: BY15B Station Time Series - Salinity**



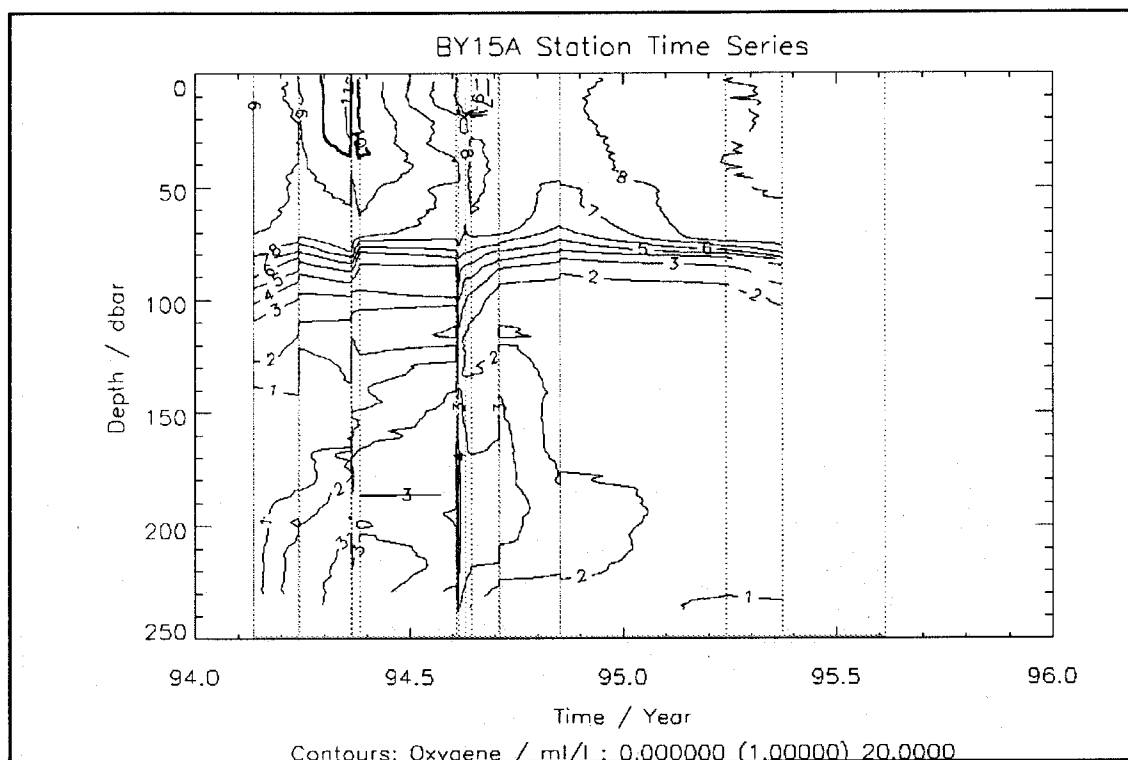


Fig. 63: BY15B Station Time Series - Dissolved Oxygen

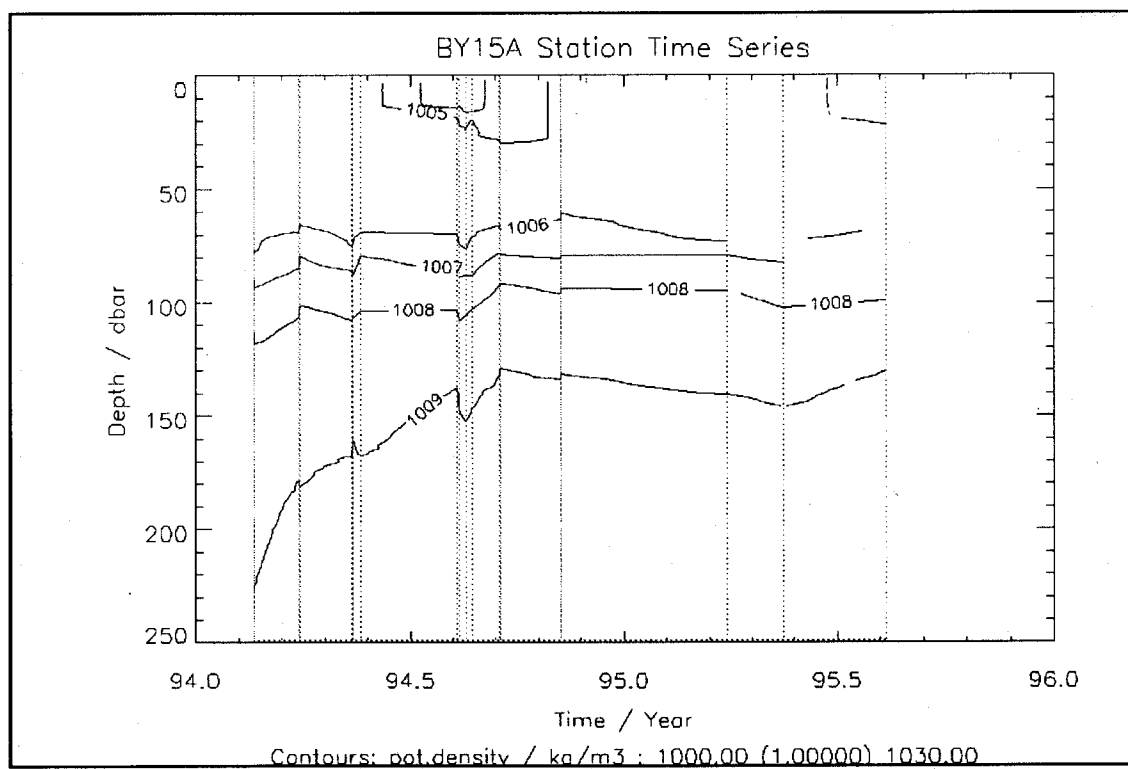
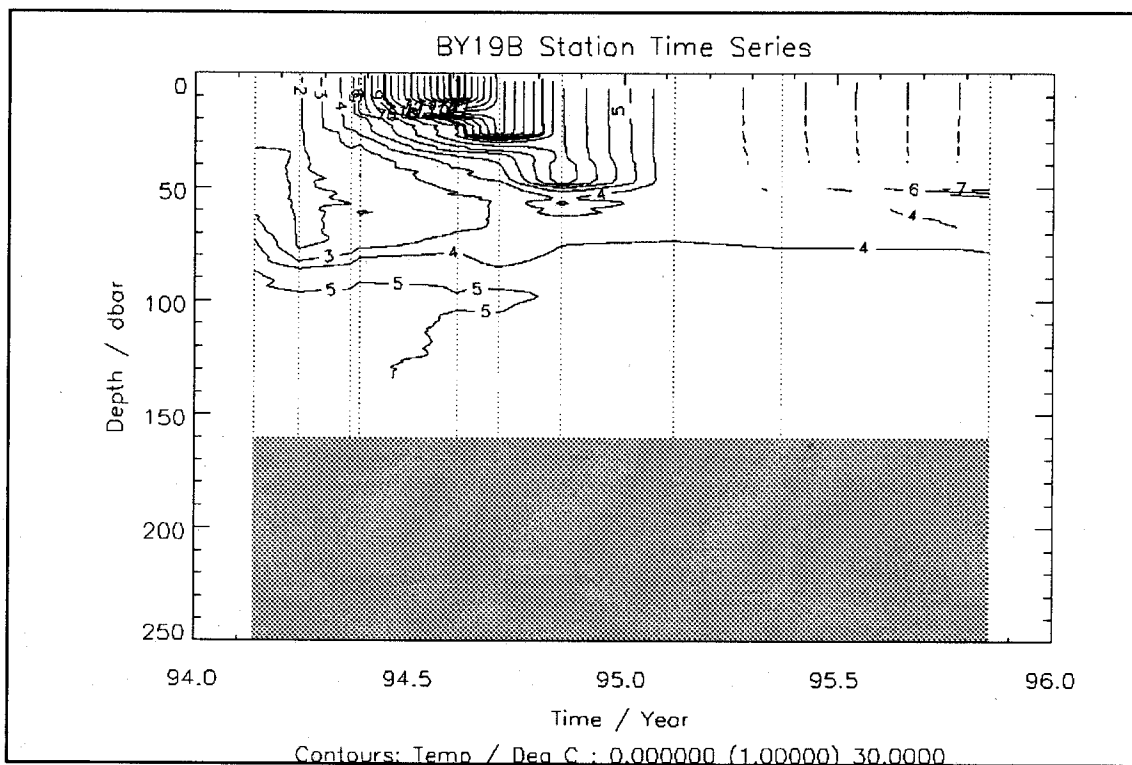
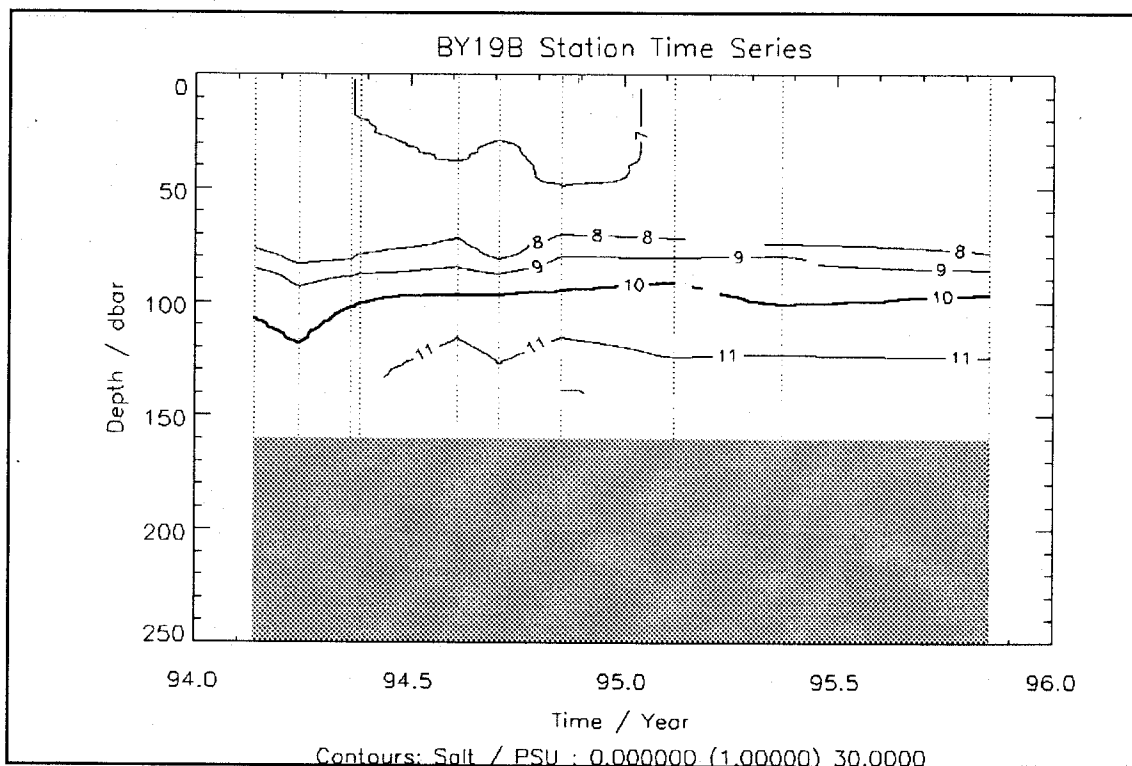


Fig. 64: BY15B Station Time Series - Potential Density

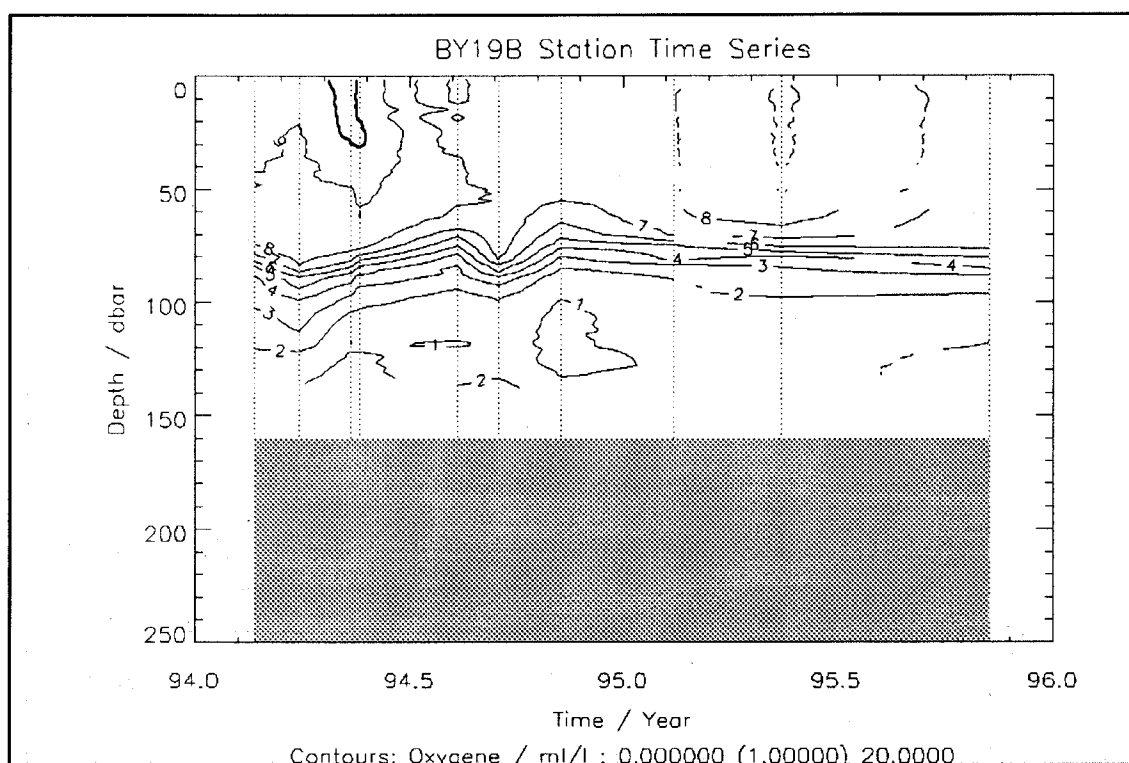
**BY19B**



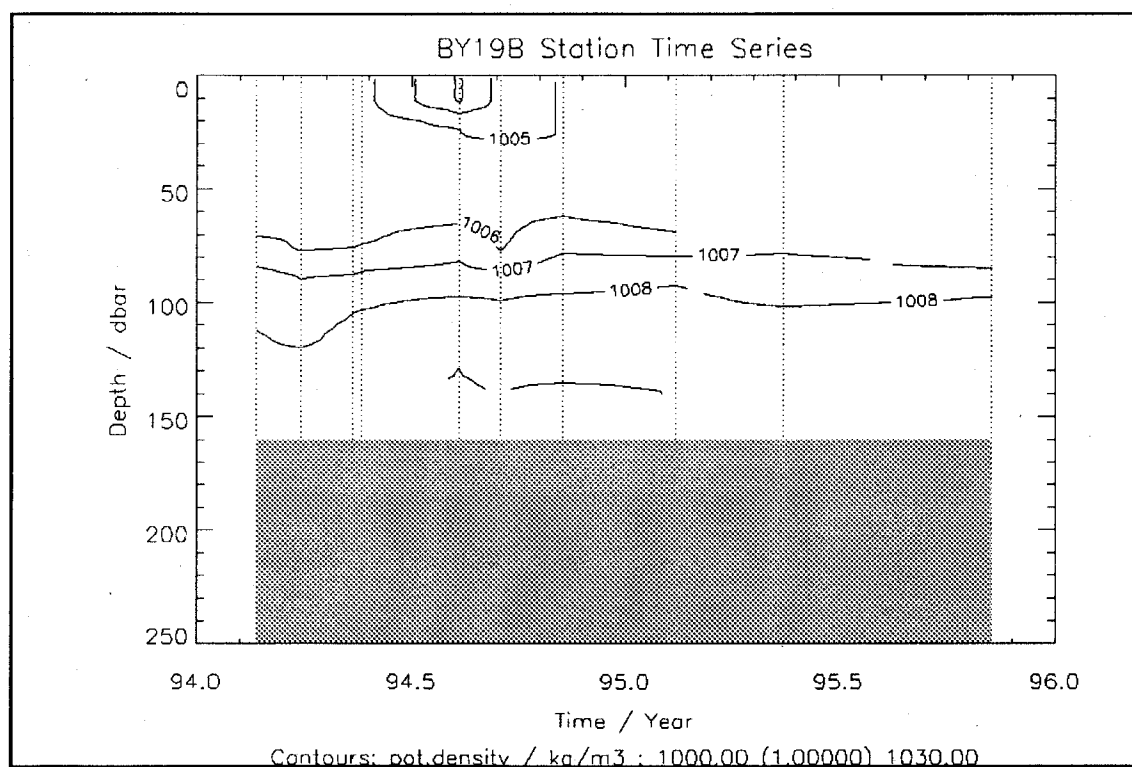
**Fig. 65: BY19B Station Time Series - Temperature**



**Fig. 66: BY19B Station Time Series - Salinity**

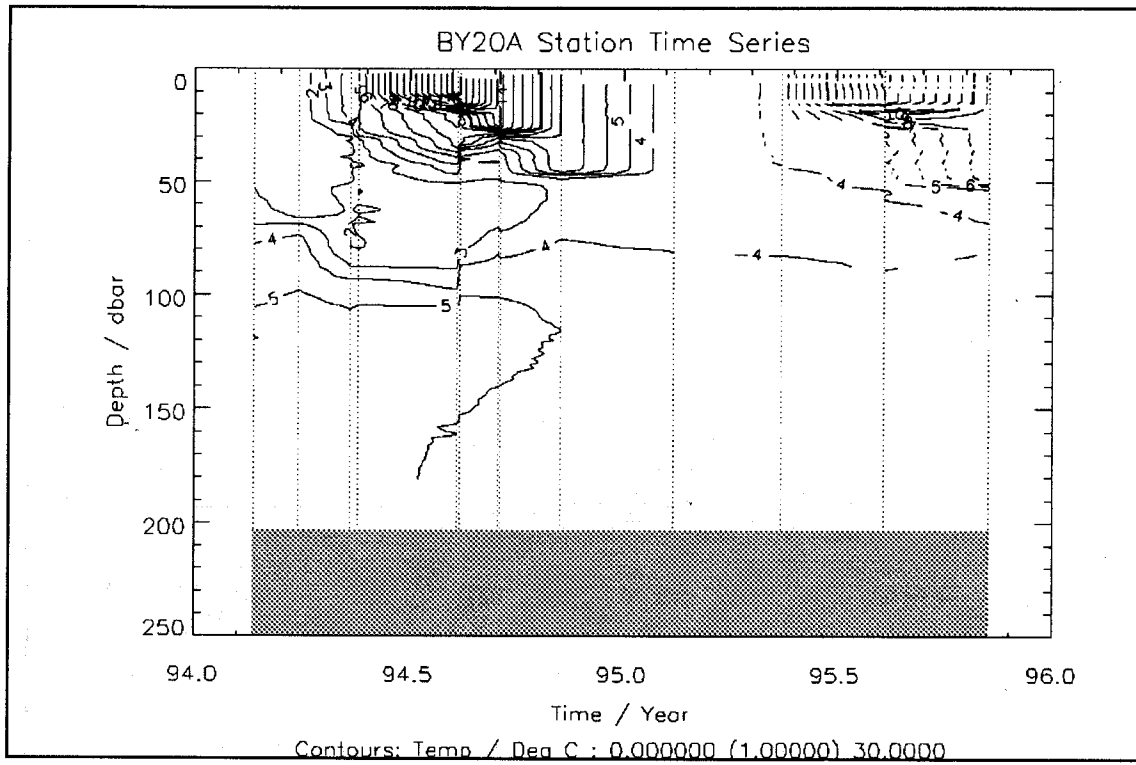


**Fig. 67:** BY19B Station Time Series - Dissolved Oxygen

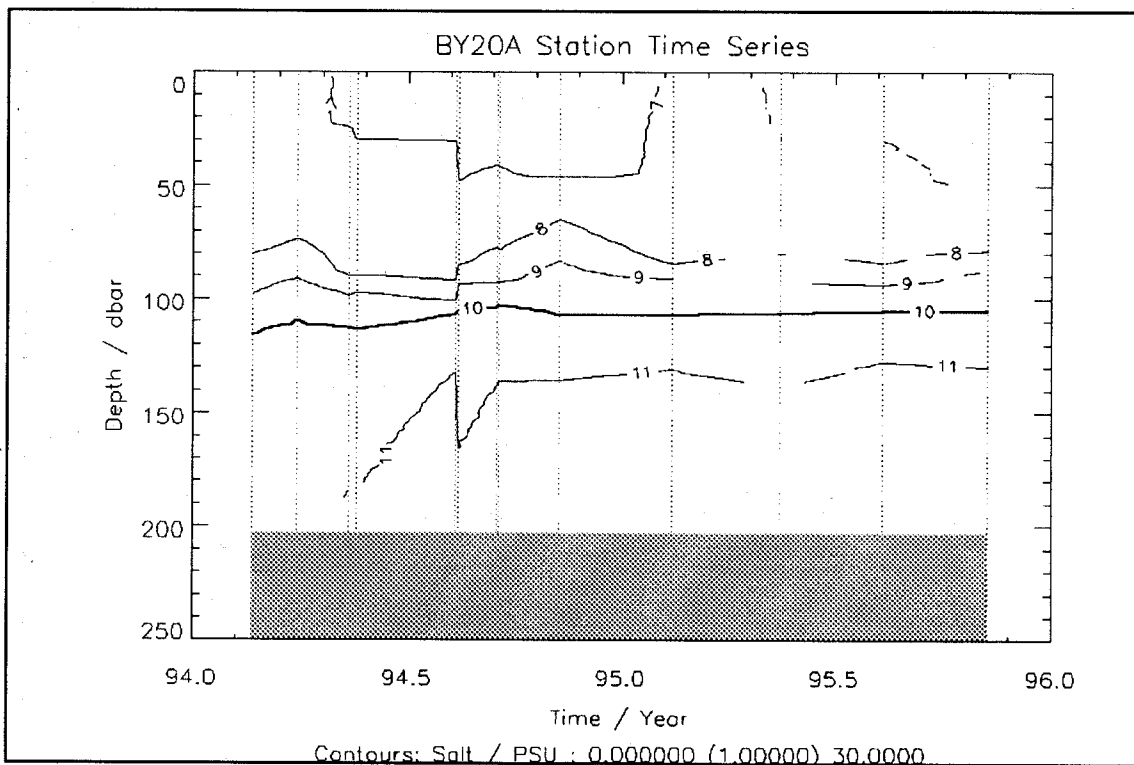


**Fig. 68:** BY19B Station Time Series - Potential Density

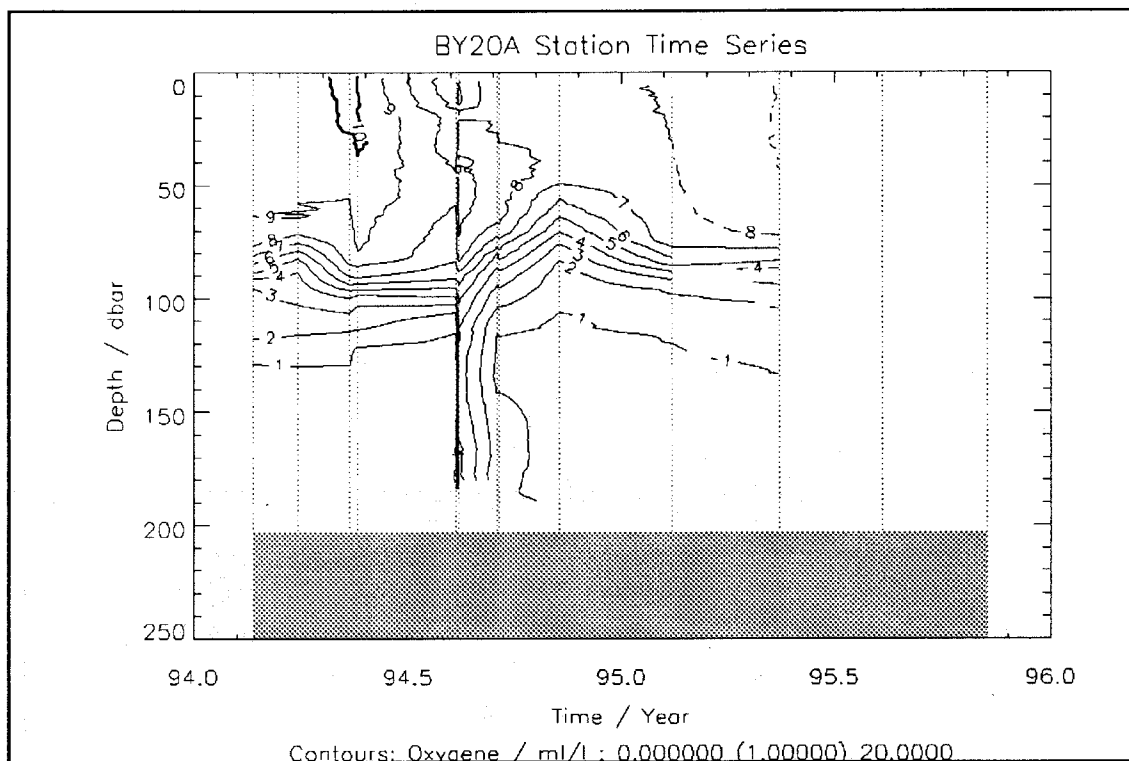
**BY20A**



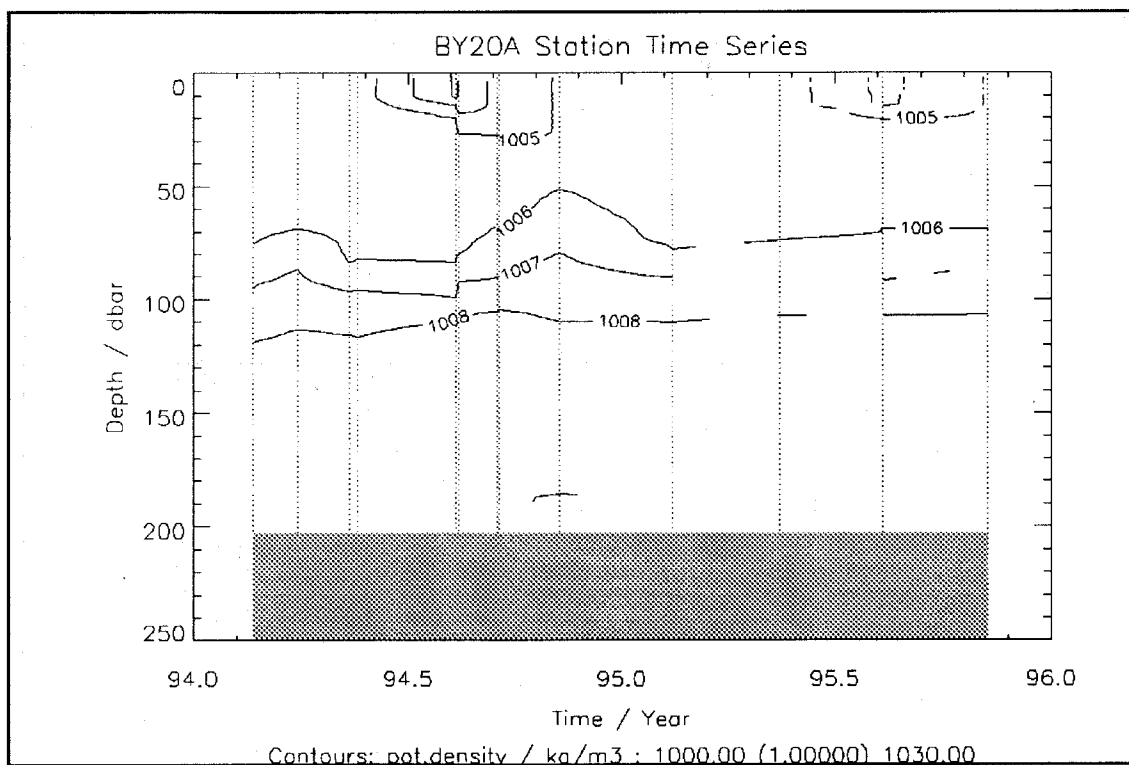
**Fig. 69: BY20A Station Time Series - Temperature**



**Fig. 70: BY20A Station Time Series - Salinity**

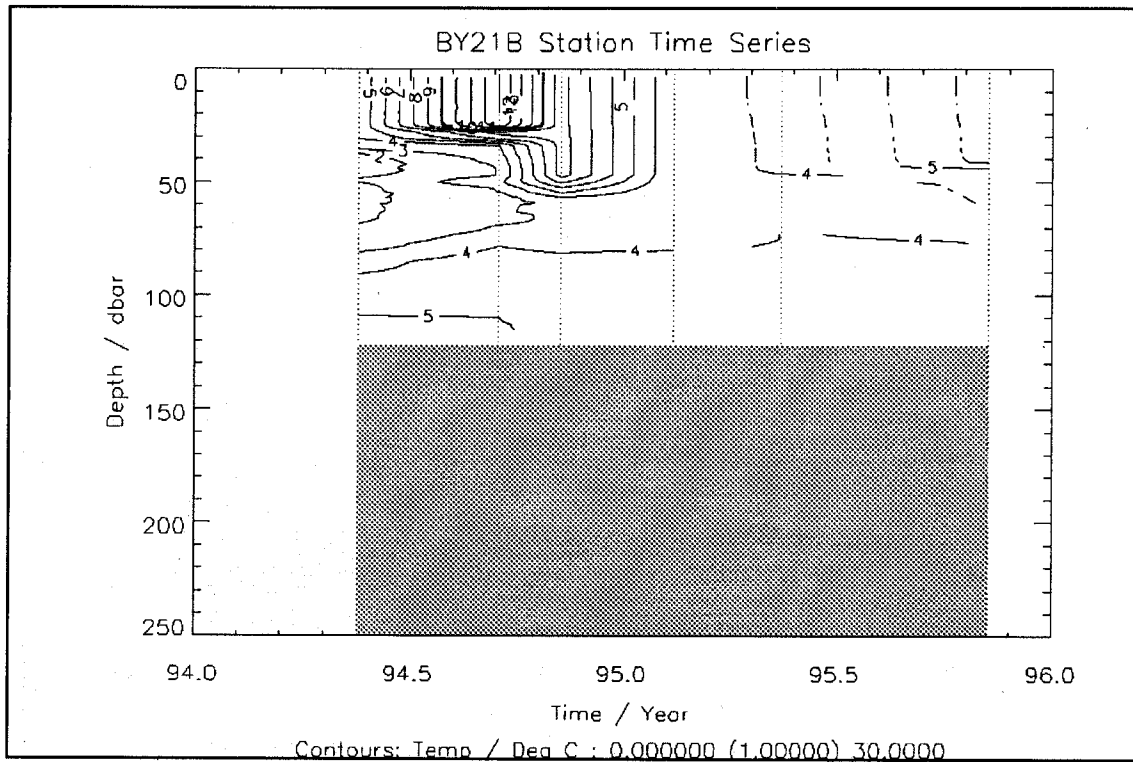


**Fig. 71: BY20A Station Time Series - Dissolved Oxygen**

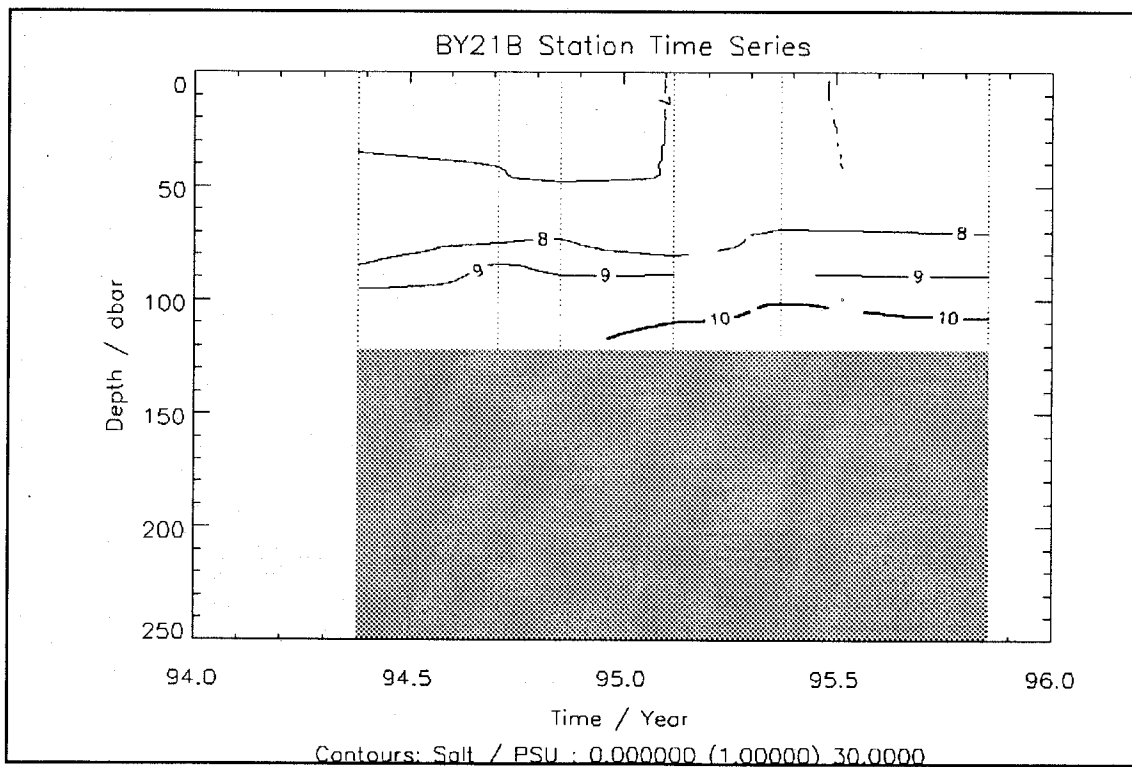


**Fig. 72: BY20A Station Time Series - Potential Density**

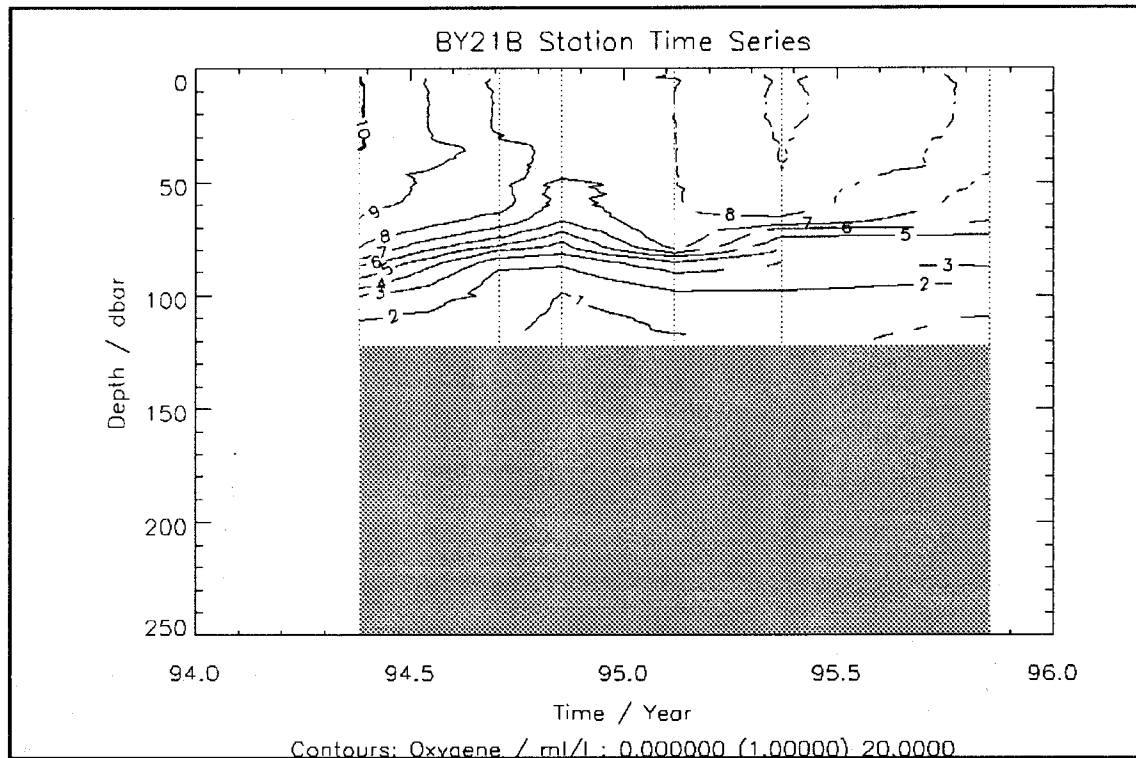
**BY21B**



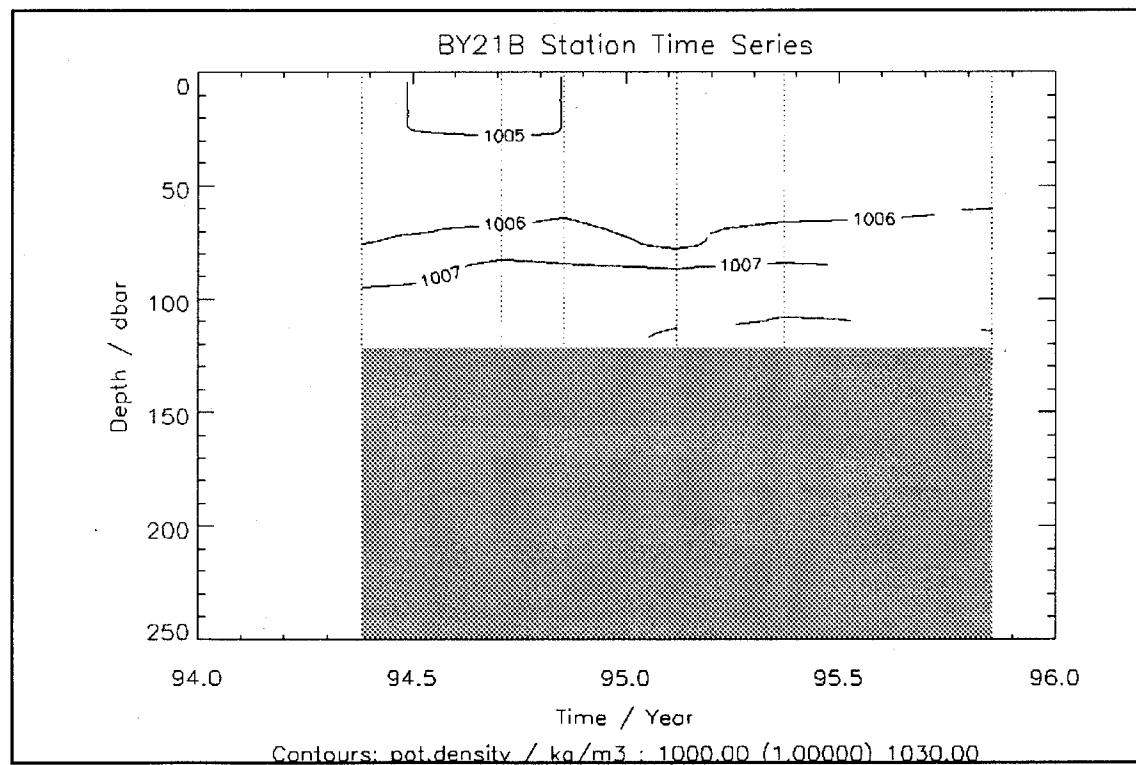
**Fig. 73: BY21B Station Time Series - Temperature**



**Fig. 74: BY21B Station Time Series - Salinity**



**Fig. 75: BY21B Station Time Series - Dissolved Oxygen**



**Fig. 76: BY21B Station Time Series - Potential Density**

### 3.2. Series of South-North Transects

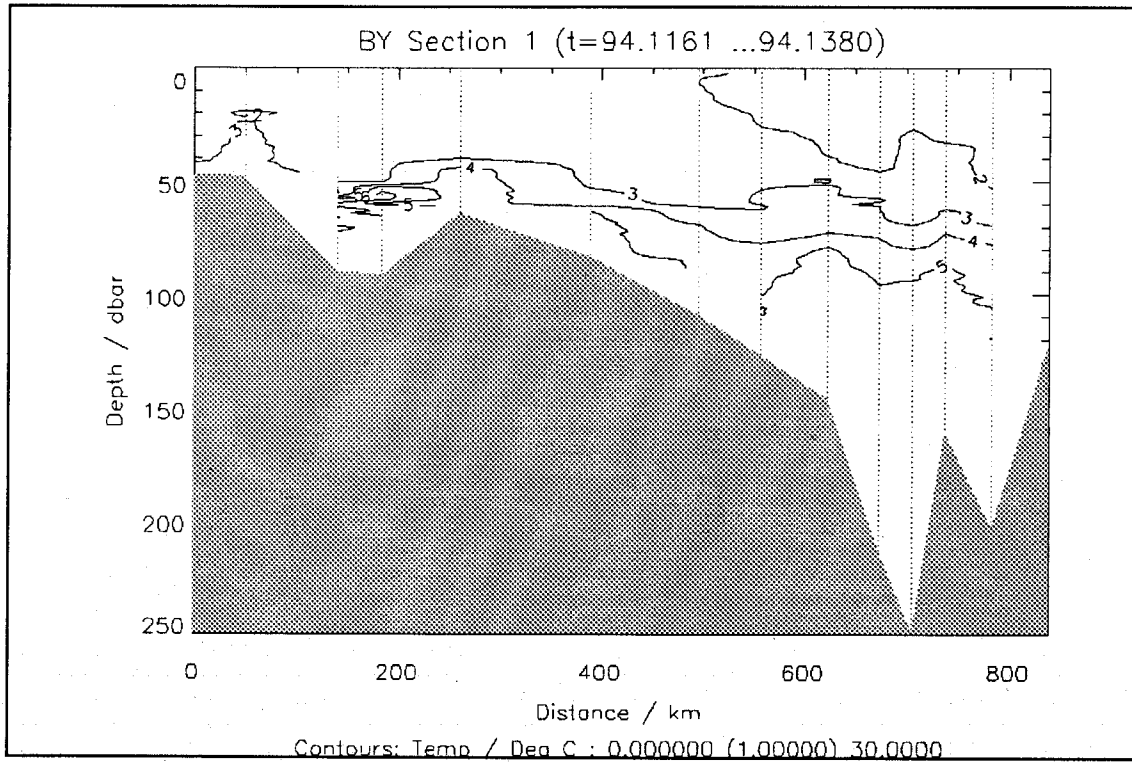
Here a series of N-S transects of selected BY stations is presented. The selection criterion is that at least 8 stations were sampled within of 15 days. This allows for quasi-synoptic observations. In Tab. 5 can be found an overview. The first column contains the acronym of the actual section, which is used for the quicklook presentations. The following two columns express the duration of the cruises in years and alternatively in days of the year. The next column contains the duration of the cruises, which should be no longer then 15 days. Further the GOBEX-acronym of the actual cruise is given and, last, the number of sampled stations of the 13 selected BY positions is given.

Section Acronym	Time of survey / years	Time of survey / year / day of year	Duration / days	Cruise acronym	Nr. of stat.
BYSCT1	94.116 - 94.138	94 / 42.5 - 50.5	8.0	GX940210.AVH	13
BYSCT2	94.228 - 94.242	94 / 83.5 - 88.5	5.0	GX940301.AVH	12
BYSCT3	94.343 - 94.384	94 / 125.2 - 139.6	14.4	GX940321.PAP	13
BYSCT4	94.381 - 94.395	94 / 139.6 - 144.5	4.9	GX940503.AVH	8
BYSCT5	94.591 - 94.619	94 / 216.5 - 226.5	10.0	GX940802.PAP	13
BYSCT6	94.701 - 94.736	94 / 256.5 - 269.5	13.0	GX940914.AVH	12
BYSCT7	94.825 - 94.855	94 / 302.0 - 313.0	11.0	GX941026.AVH	13
BYSCT8	95.100 - 95.119	95 / 36.5 - 43.6	7.1	GX950202.AVH	12
BYSCT9	95.357 - 95.388	95 / 130.5 - 142.0	11.5	GX950509.PAP	13
BYSCT10	95.594 - 95.620	95 / 217.5 - 227.0	9.5	GX950803.PAP	12
BYSCT11	95.822 - 95.863	95 / 301.0 - 316.0	15.0	GX951026.AVH	13

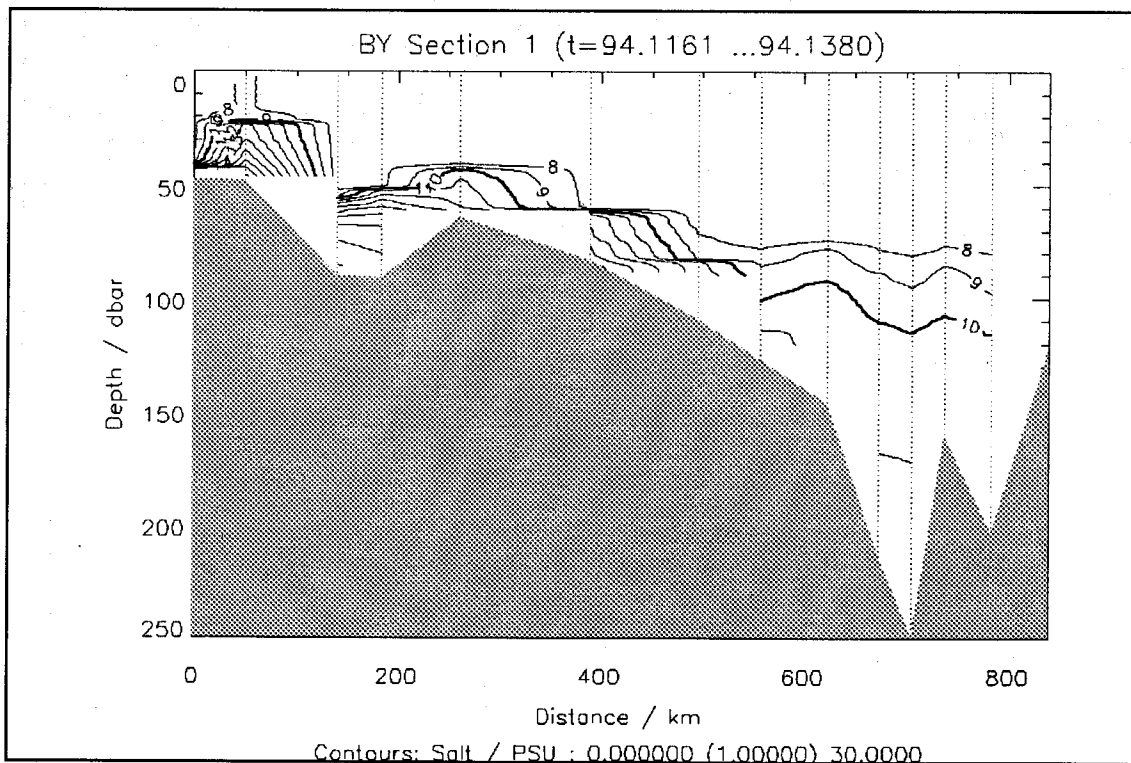
**Tab. 5:** Data of S-N sections based on GOBEX data at IOW



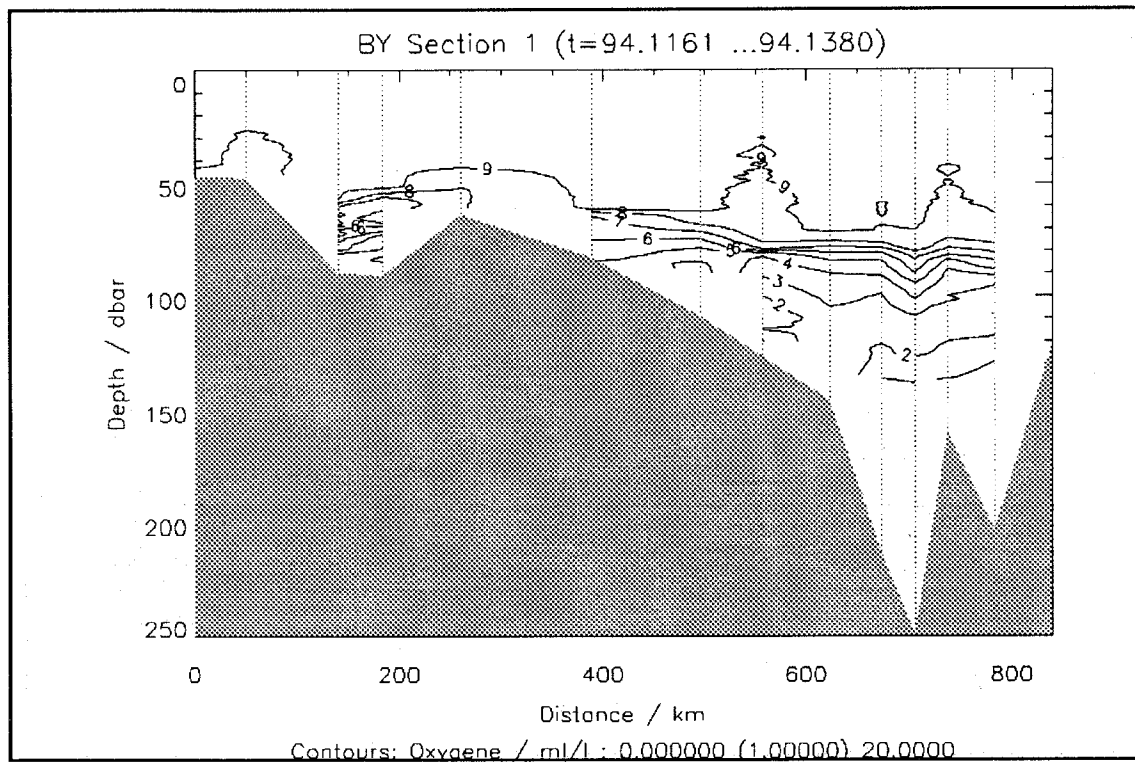
**BYSCT1**



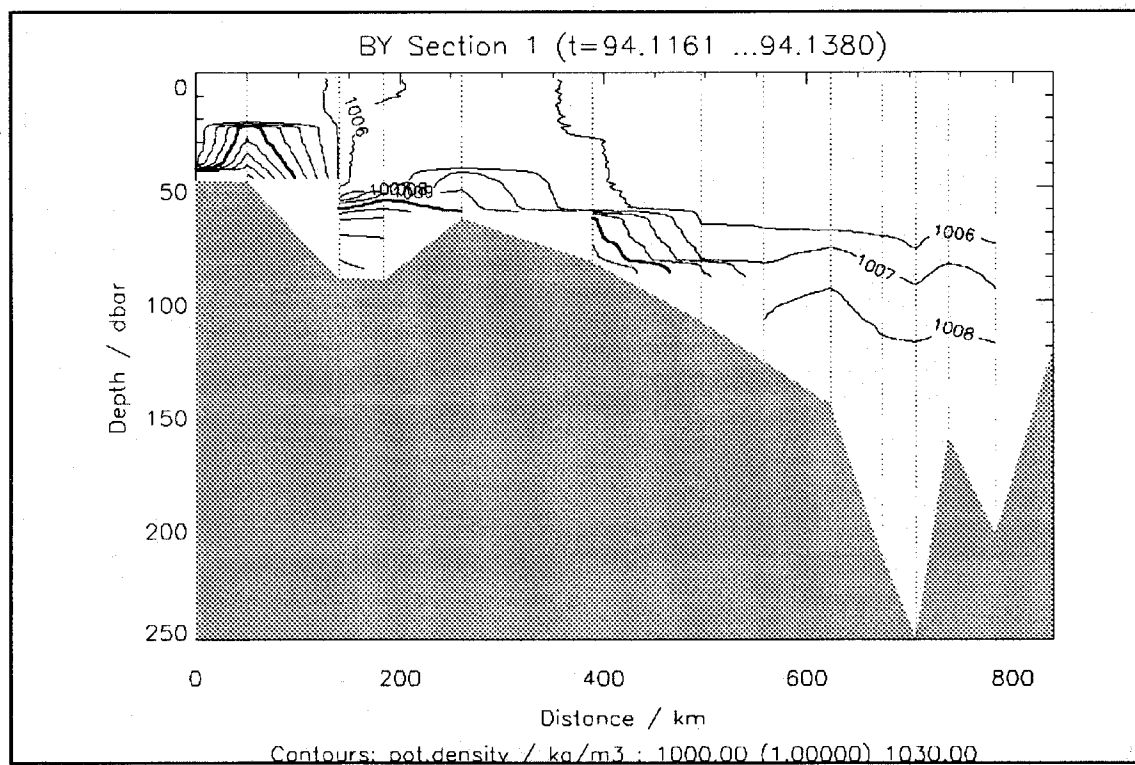
**Fig. 77: BY Section 1 - Temperature**



**Fig. 78: BY Section 1 - Salinity**

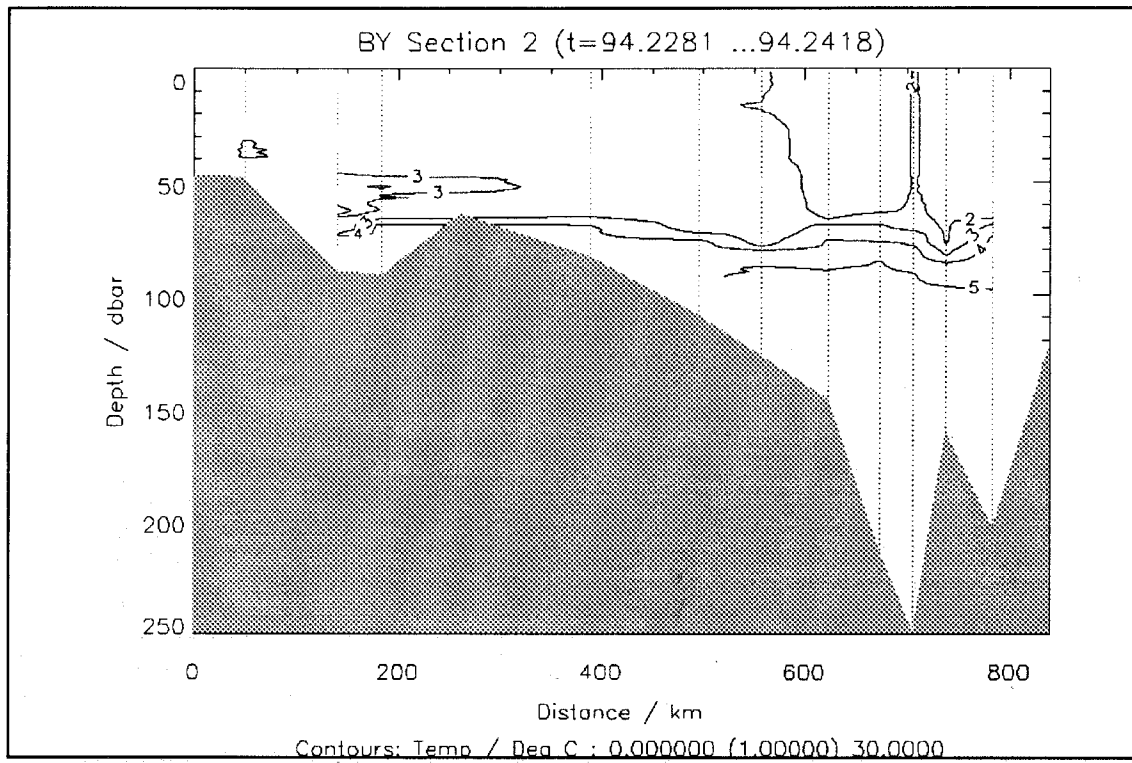


**Fig. 79:** BY Section 1 - Dissolved Oxygen

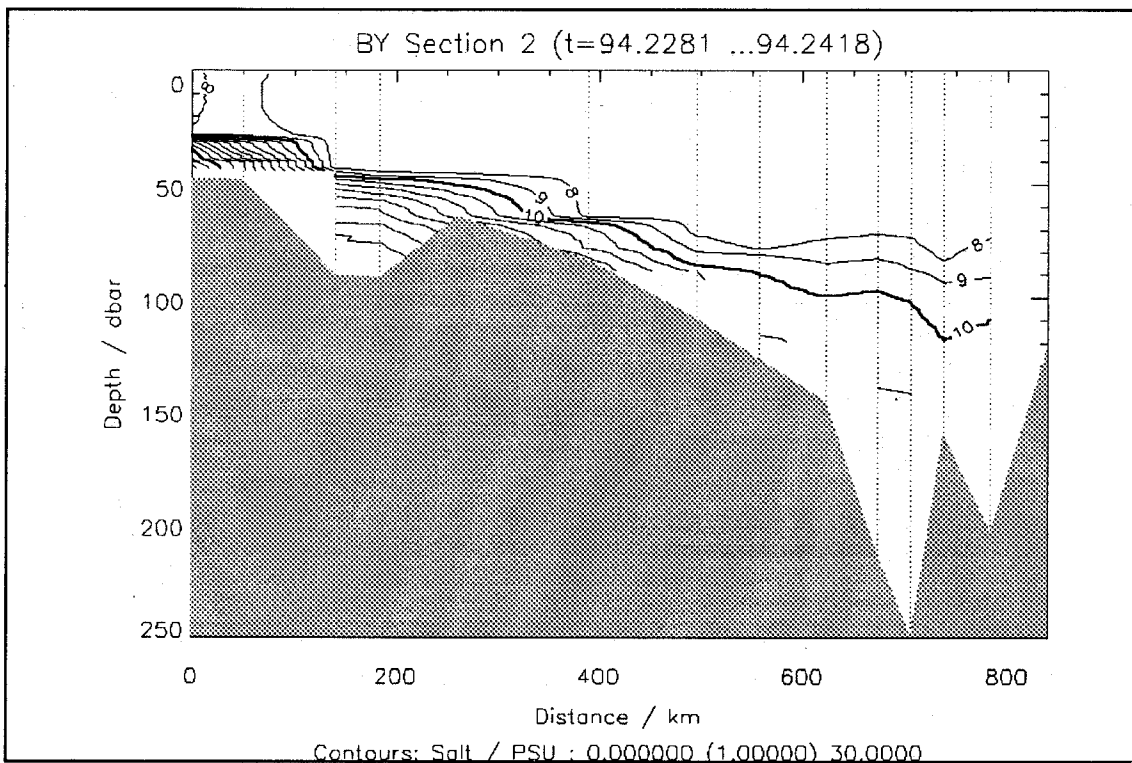


**Fig. 80:** BY Section 1 - Potential Density

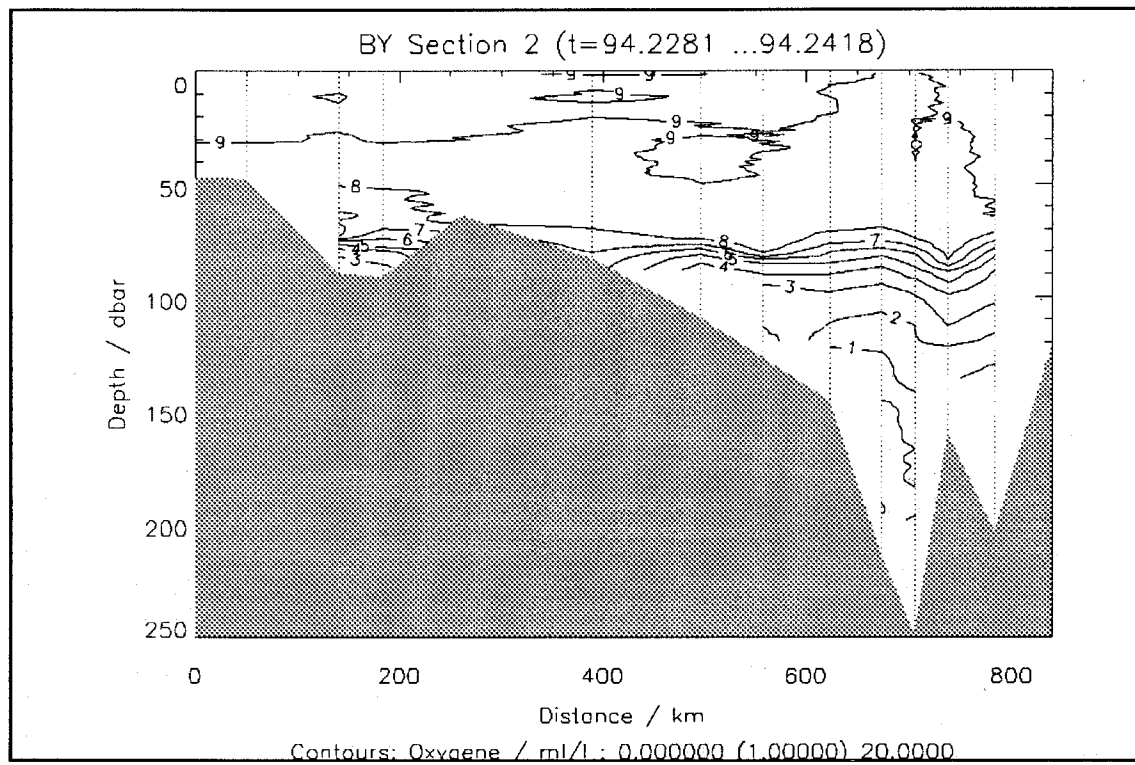
**BYSCT2**



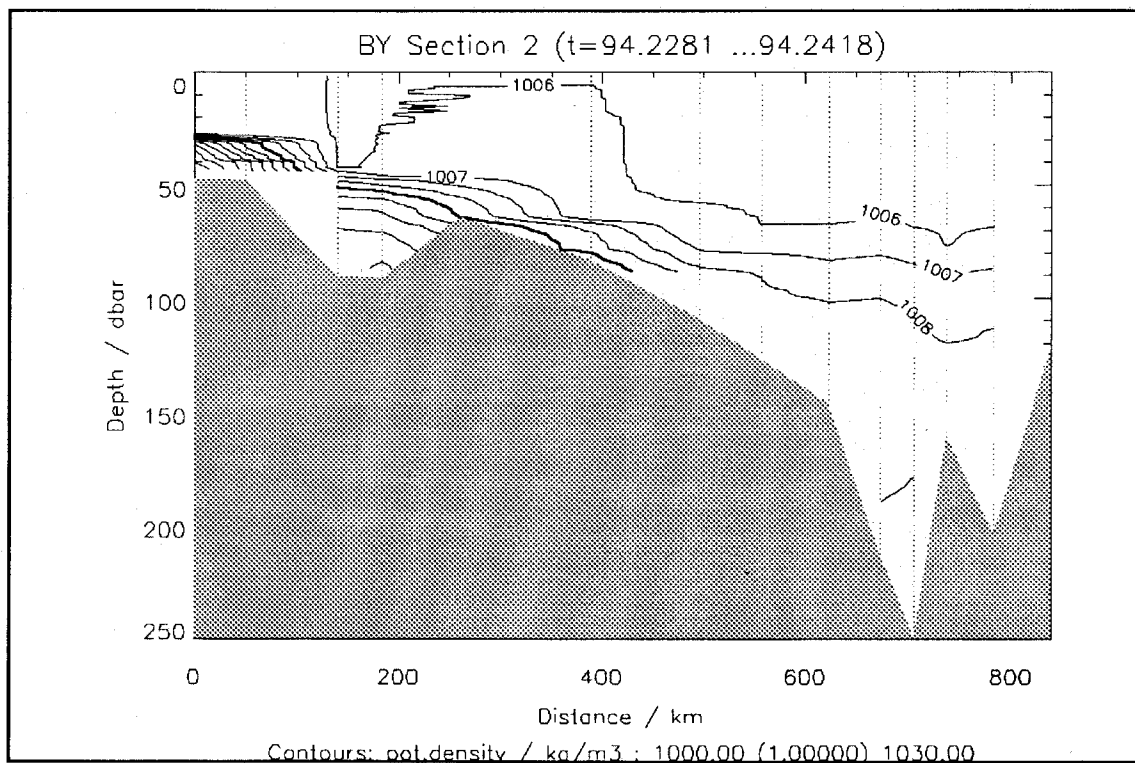
**Fig. 81: BY Section 2 - Temperature**



**Fig. 82: BY Section 2 - Salinity**

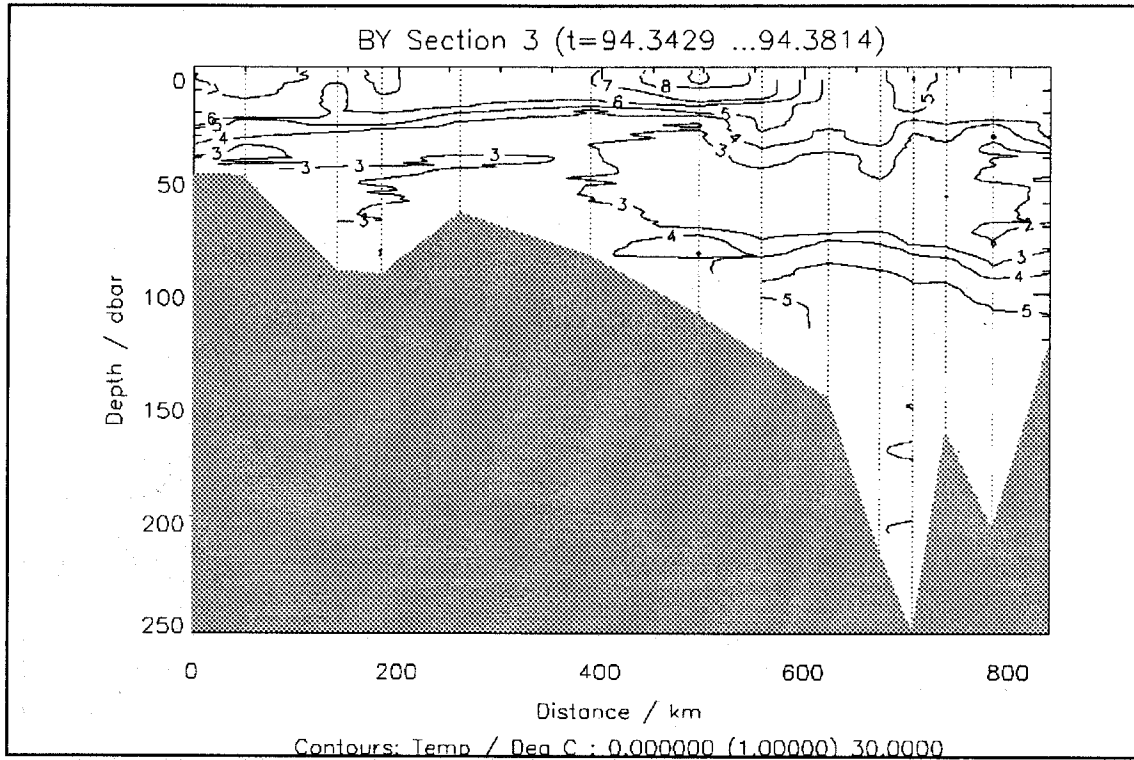


**Fig. 83:** BY Section 2 - Dissolved Oxygen

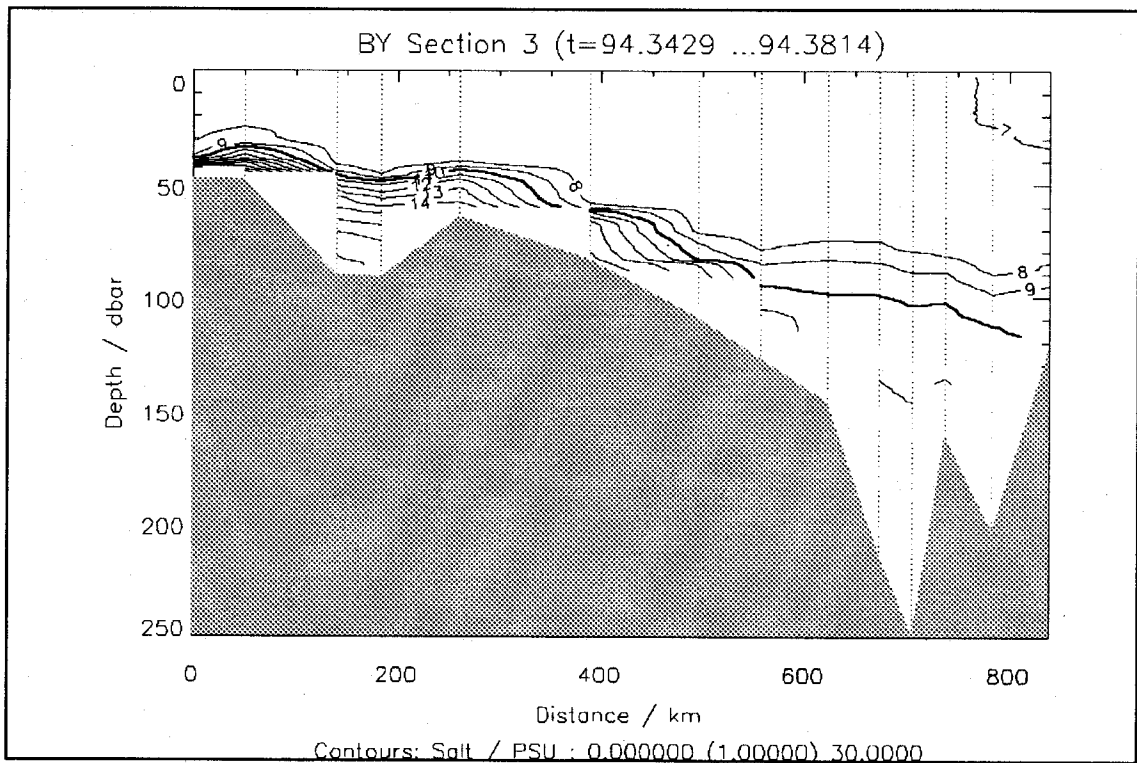


**Fig. 84:** BY Section 2 - Potential Density

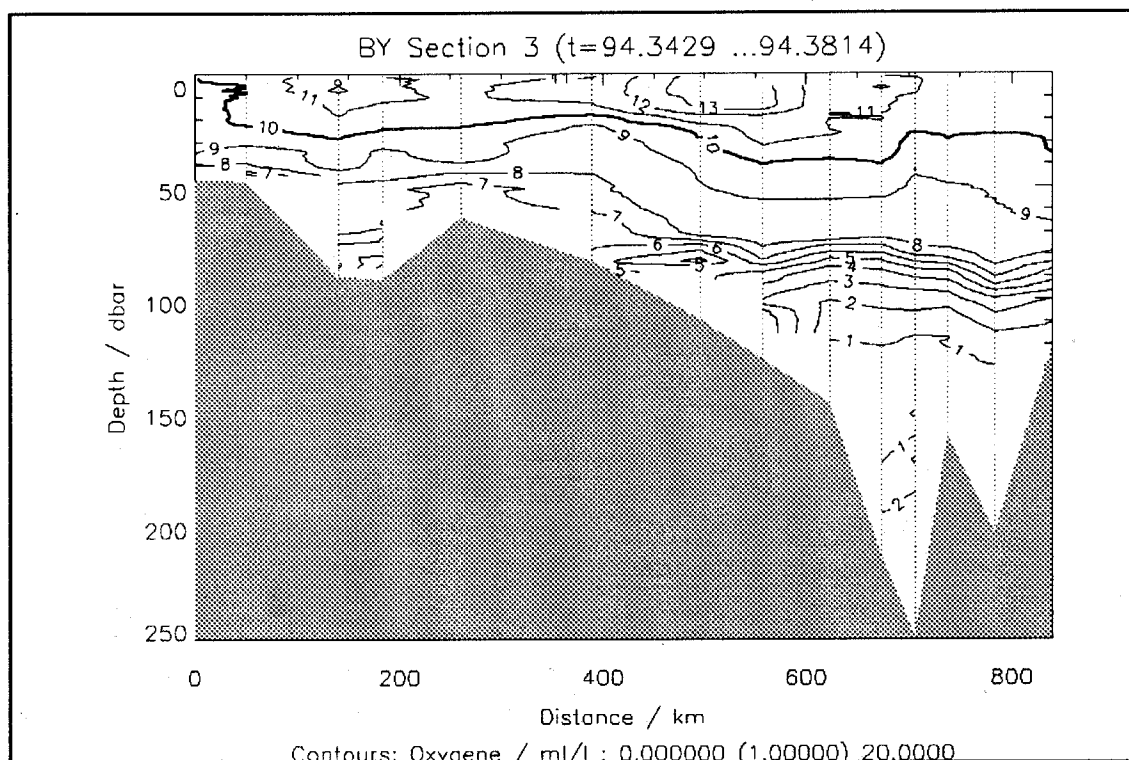
**BYSCT3**



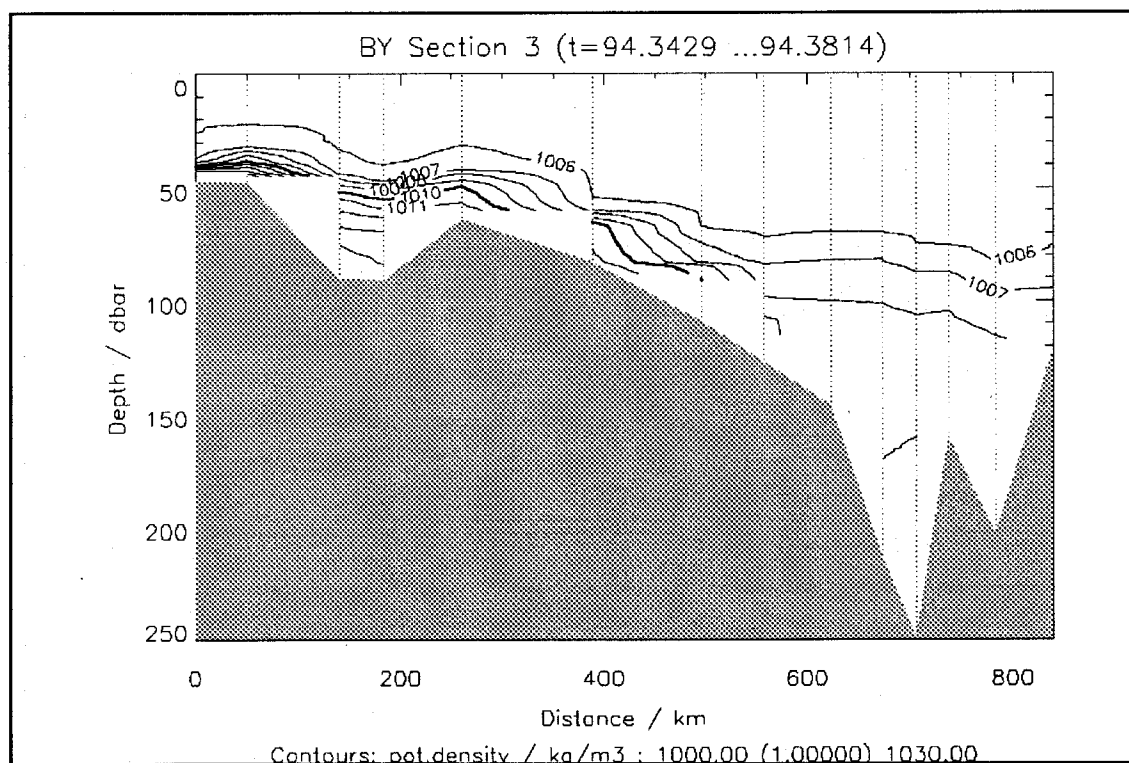
**Fig. 85: BY Section 3 - Temperature**



**Fig. 86: BY Section 3 - Salinity**



**Fig. 87:** BY Section 3 - Dissolved Oxygen



**Fig. 88:** BY Section 3 - Potential Density

## BYSCT4

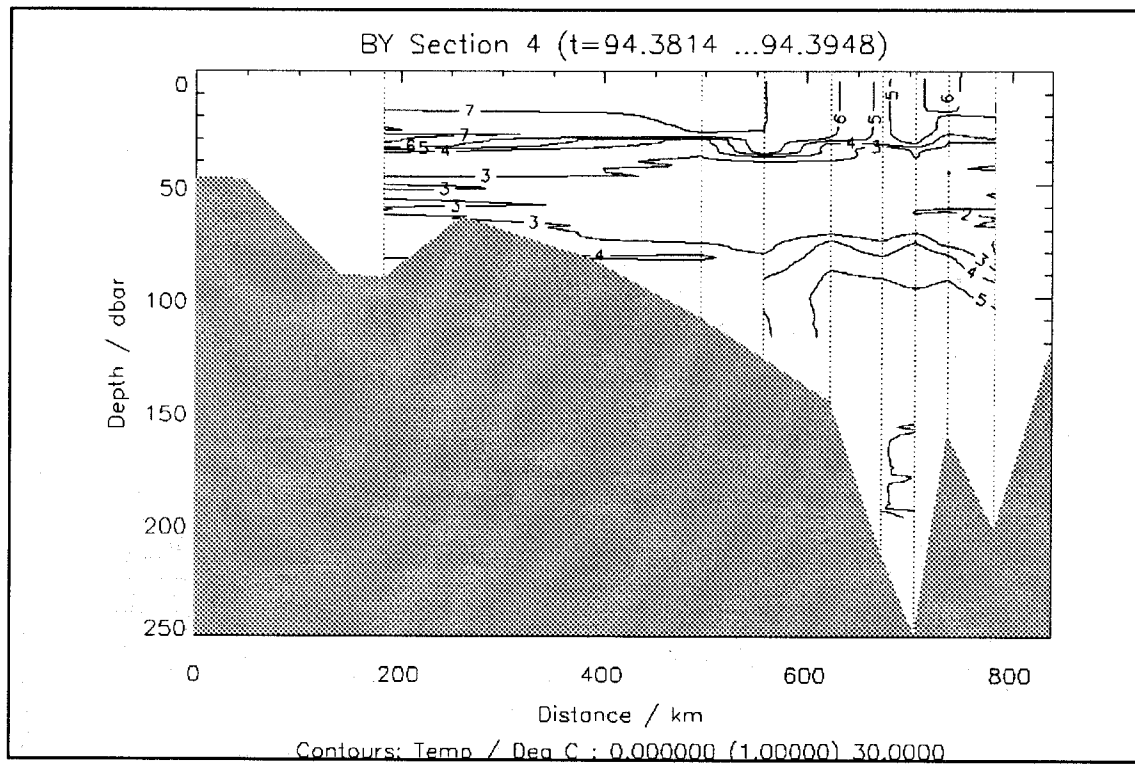


Fig. 89: BY Section 4 - Temperature

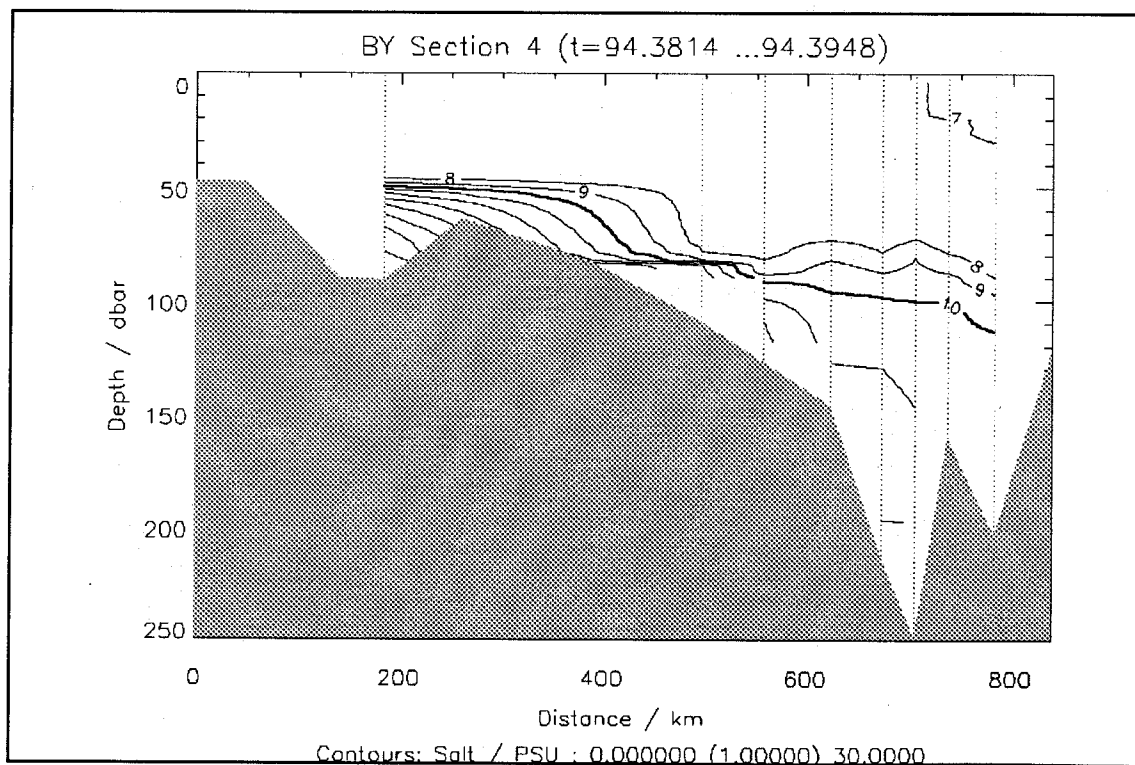
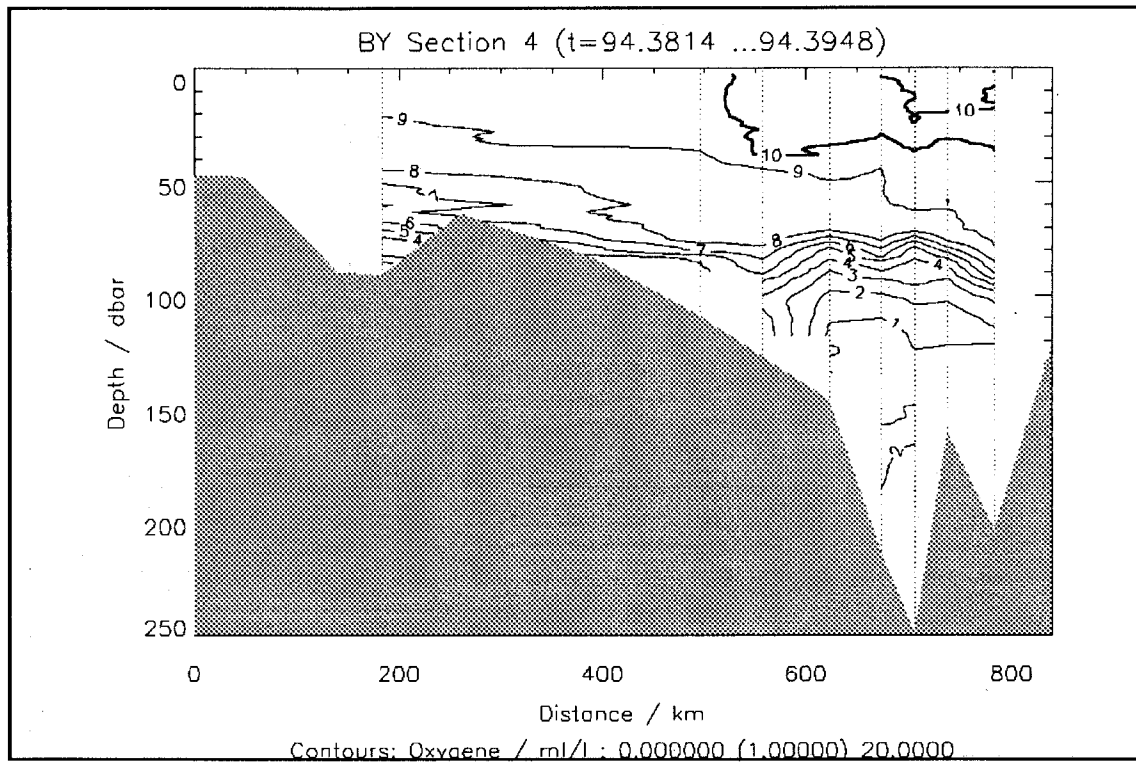
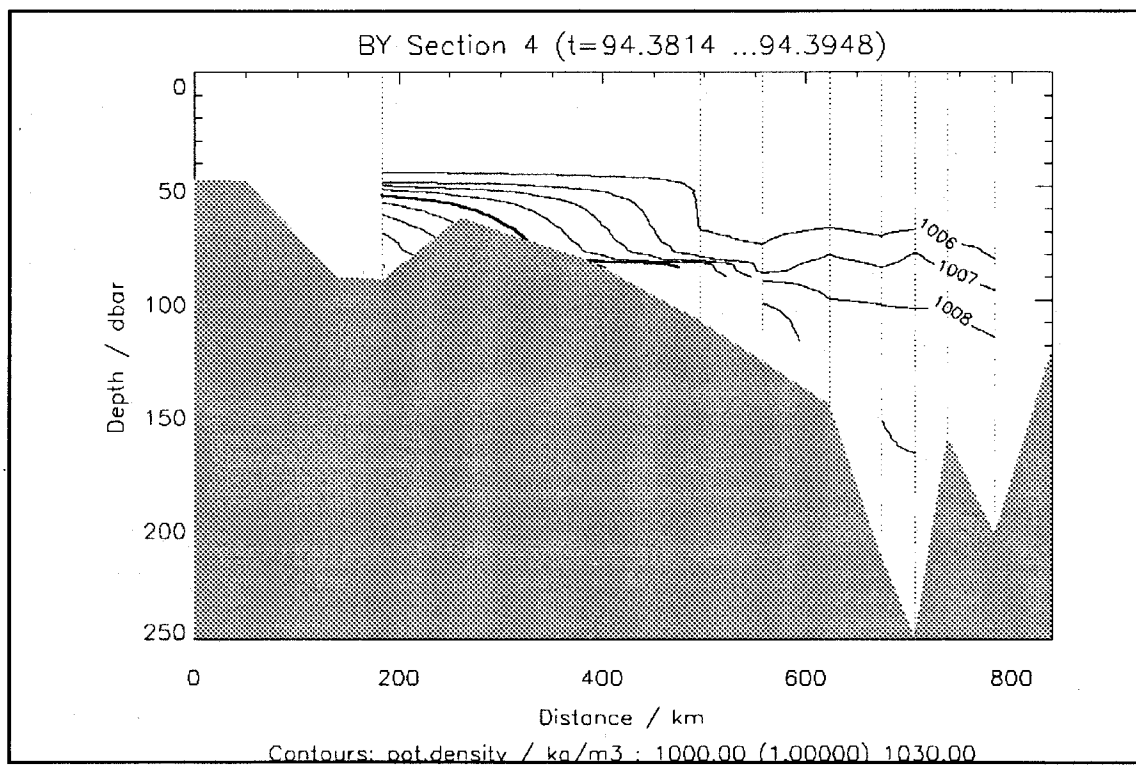


Fig. 90: BY Section 4 - Salinity





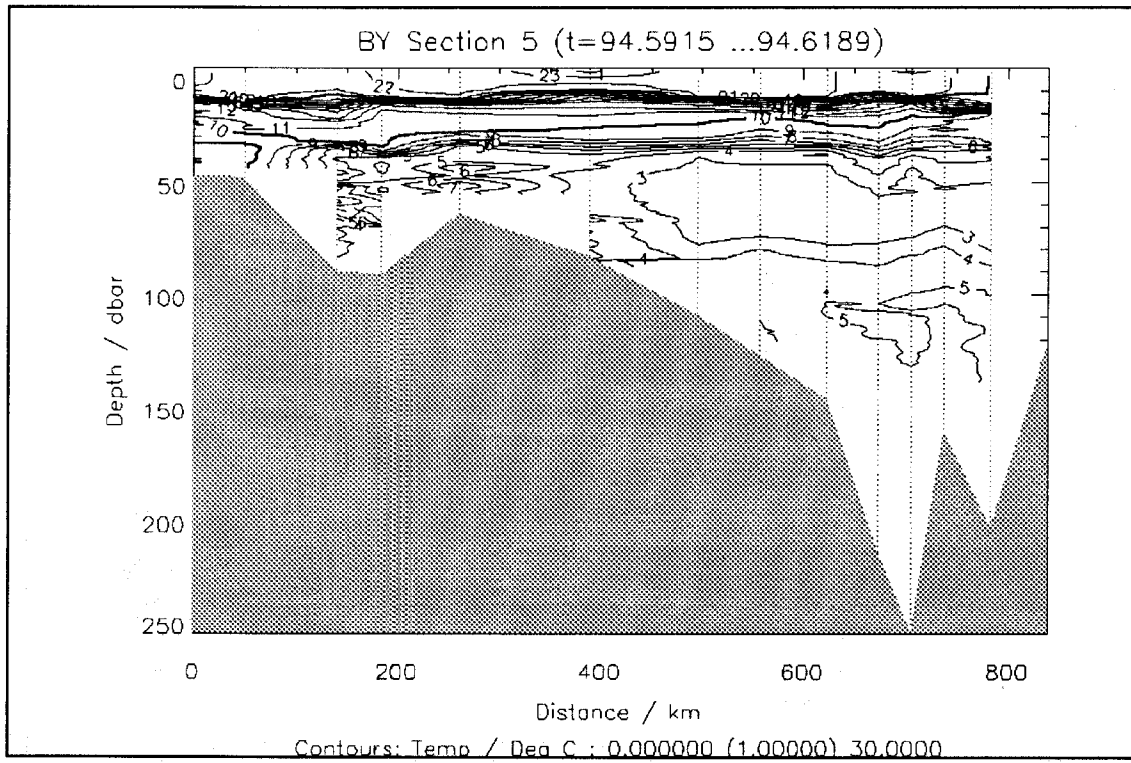
**Fig. 91:** BY Section 4 - Dissolved Oxygen



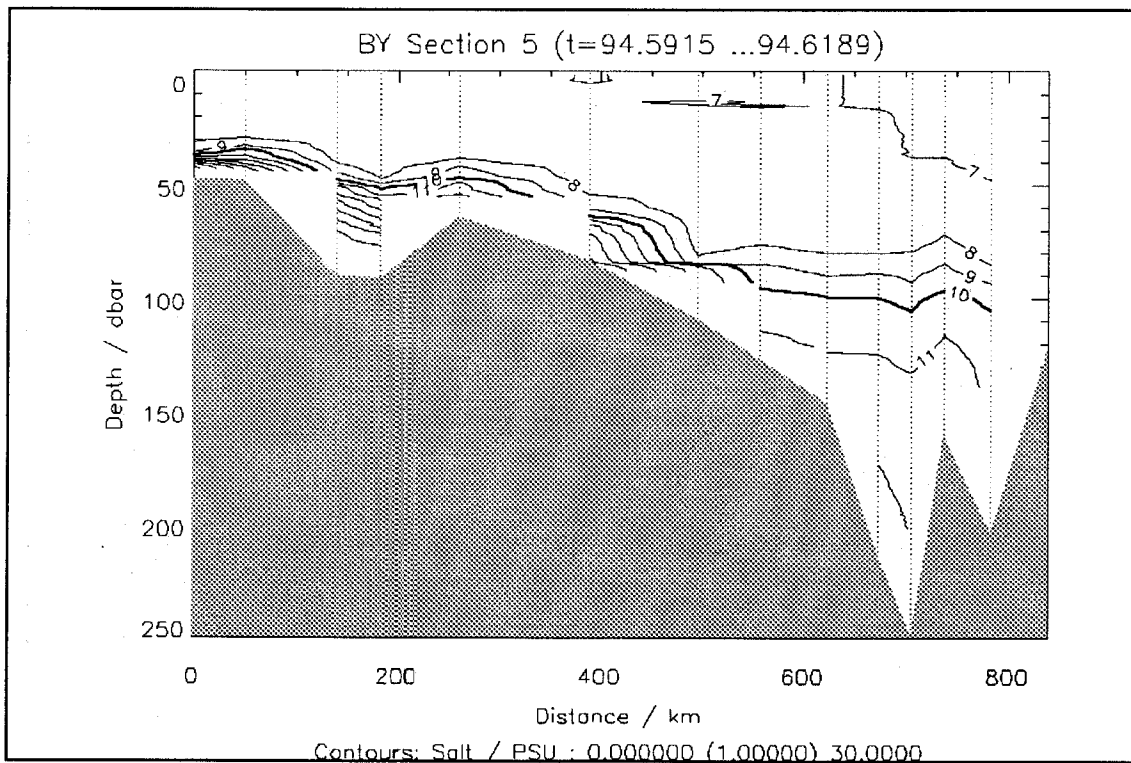
**Fig. 92:** BY Section 4 - Potential Density



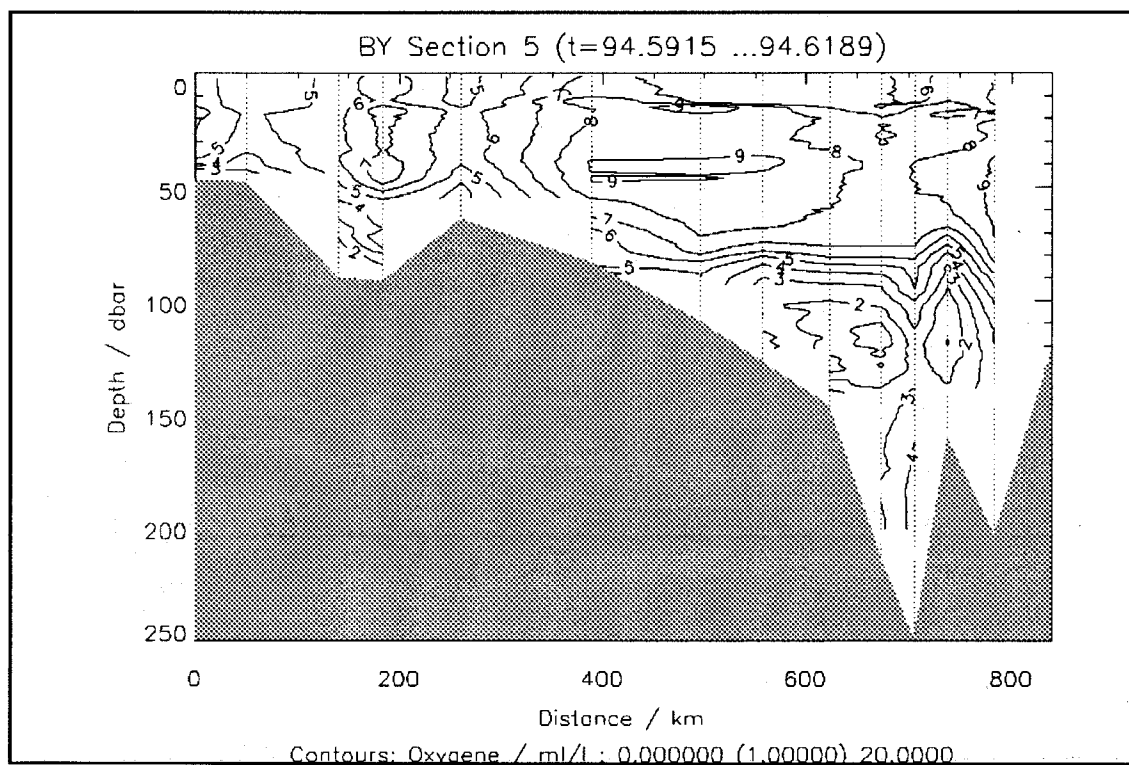
**BYSCT5**



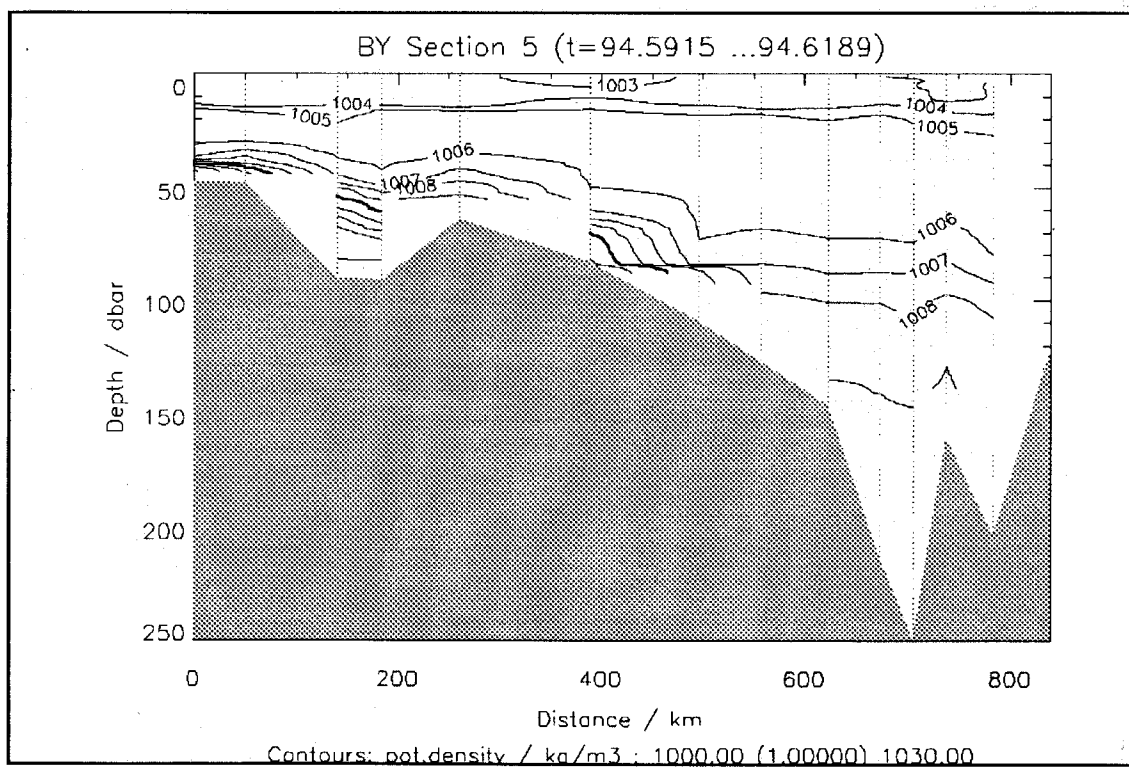
**Fig. 93: BY Section 5 - Temperature**



**Fig. 94: BY Section 5 - Salinity**

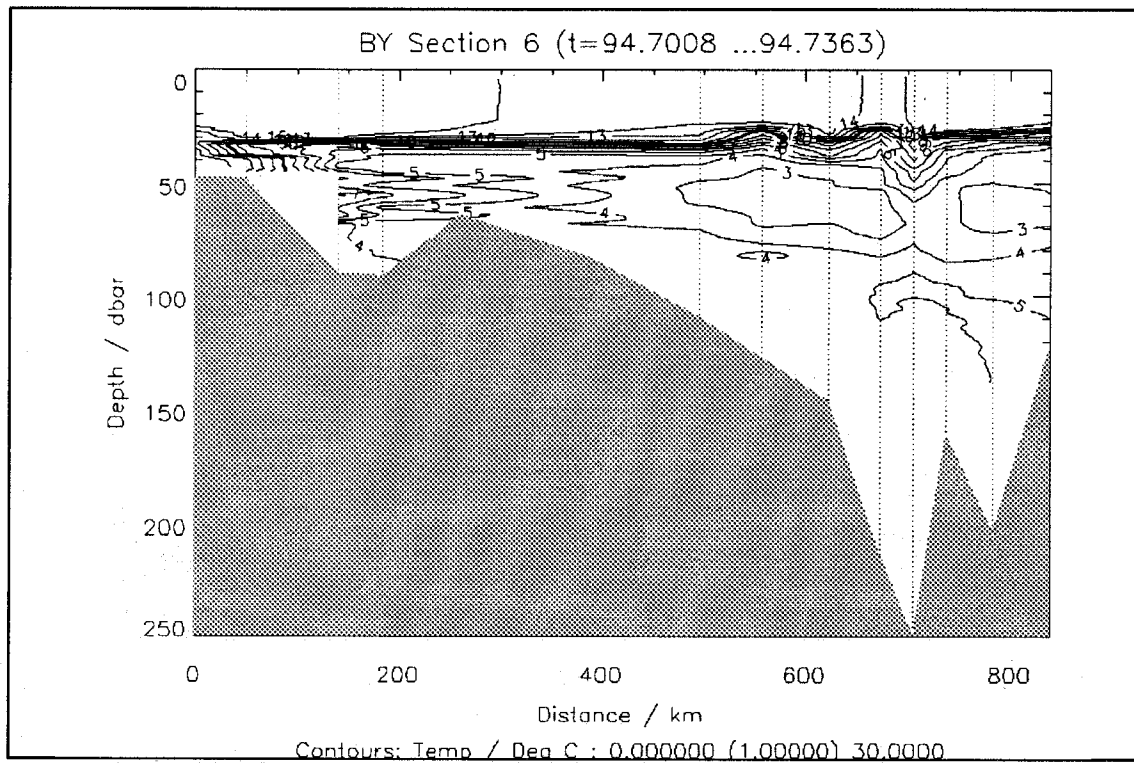


**Fig. 95:** BY Section 5 - Dissolved Oxygen

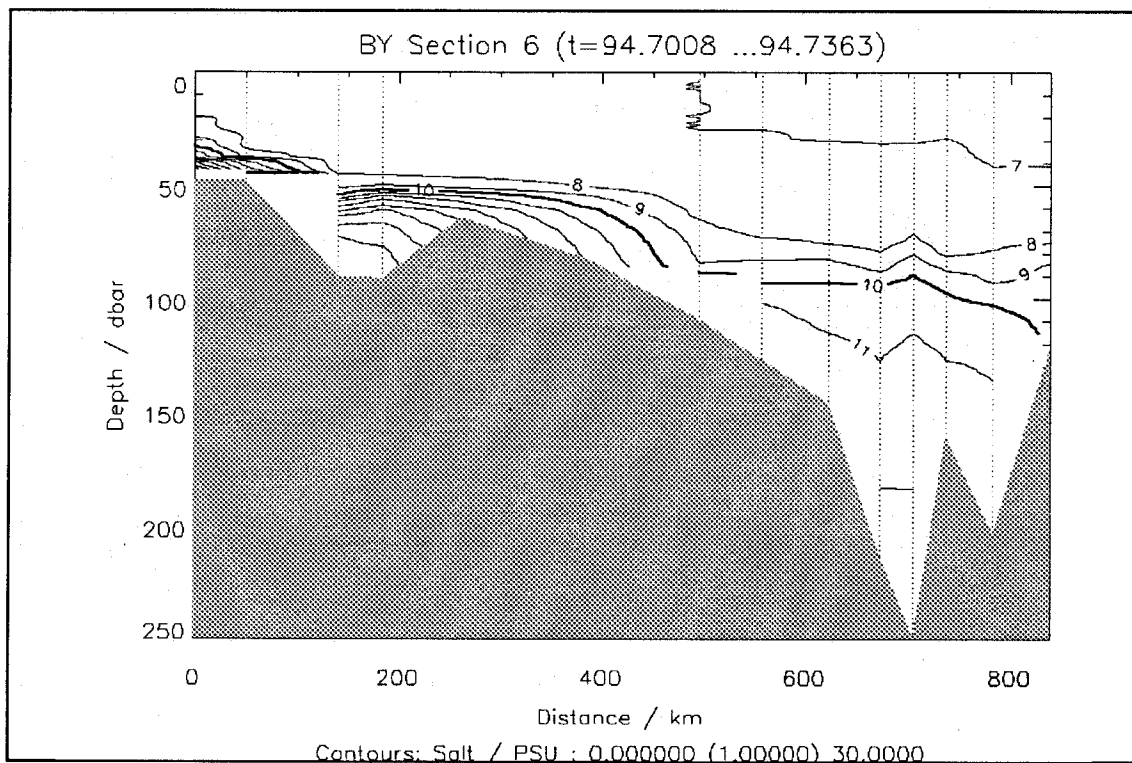


**Fig. 96:** BY Section 5 - Potential Density

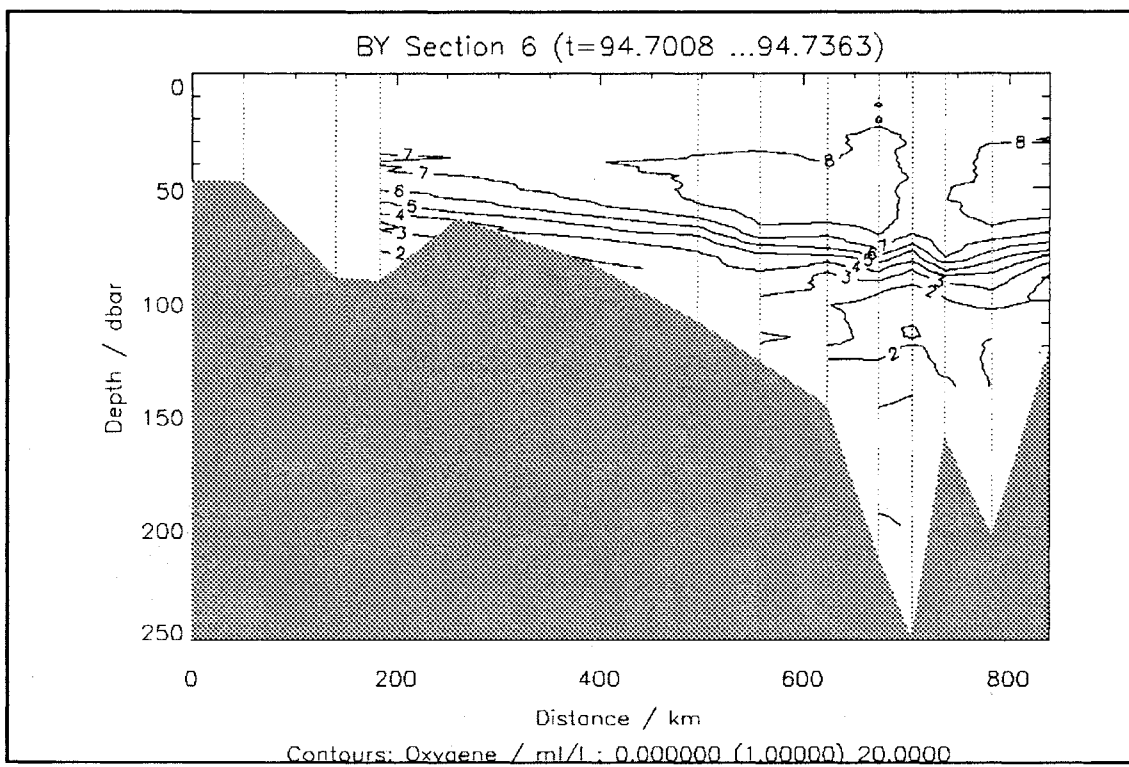
**BYSCT6**



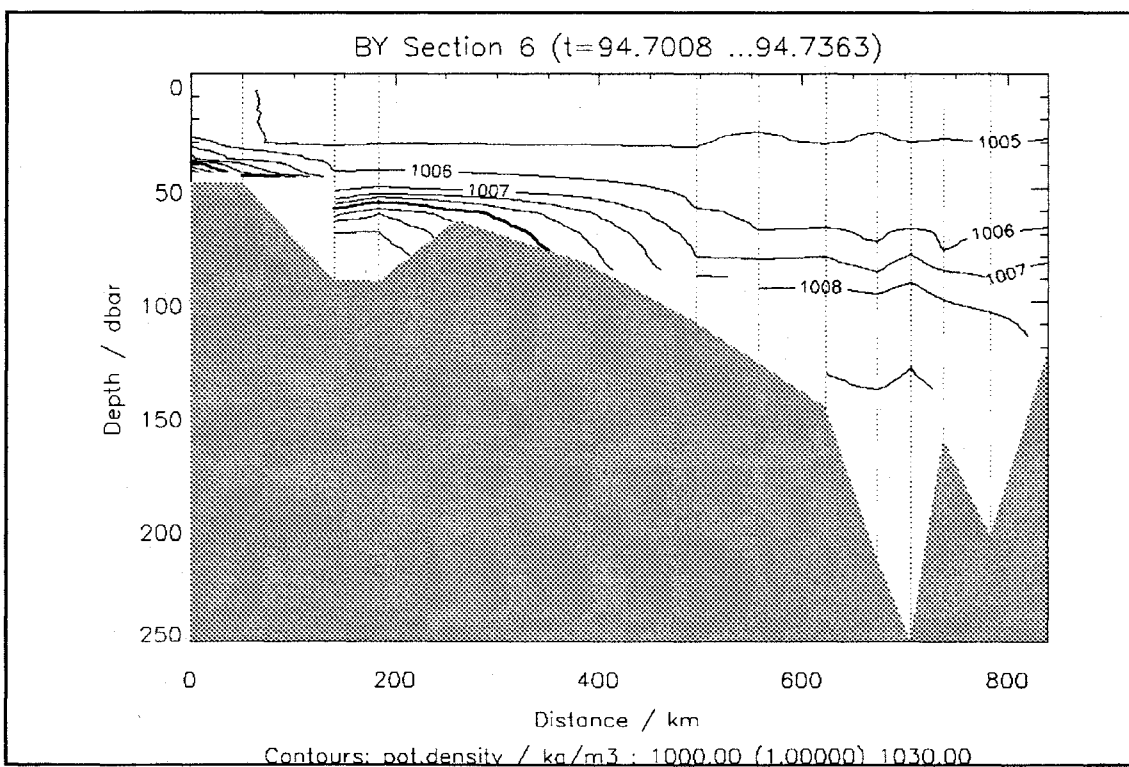
**Fig. 97: BY Section 6 - Temperature**



**Fig. 98: BY Section 6 - Salinity**

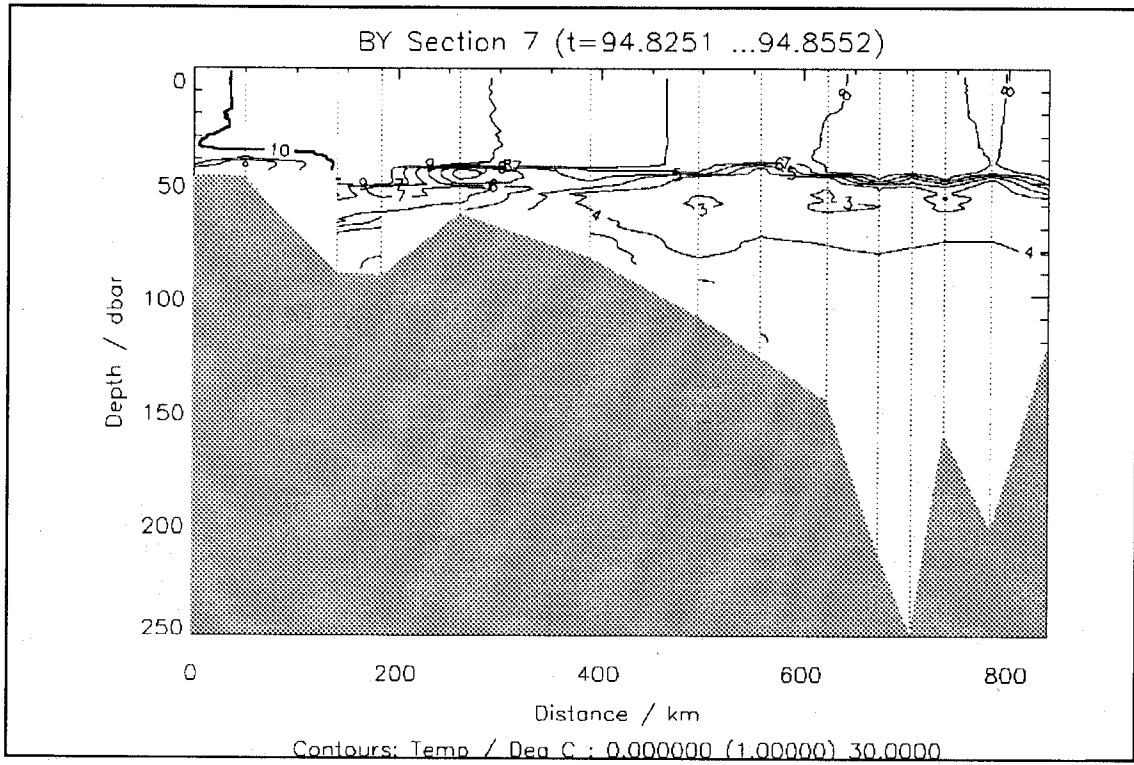


**Fig. 99:** BY Section 6 - Dissolved Oxygen

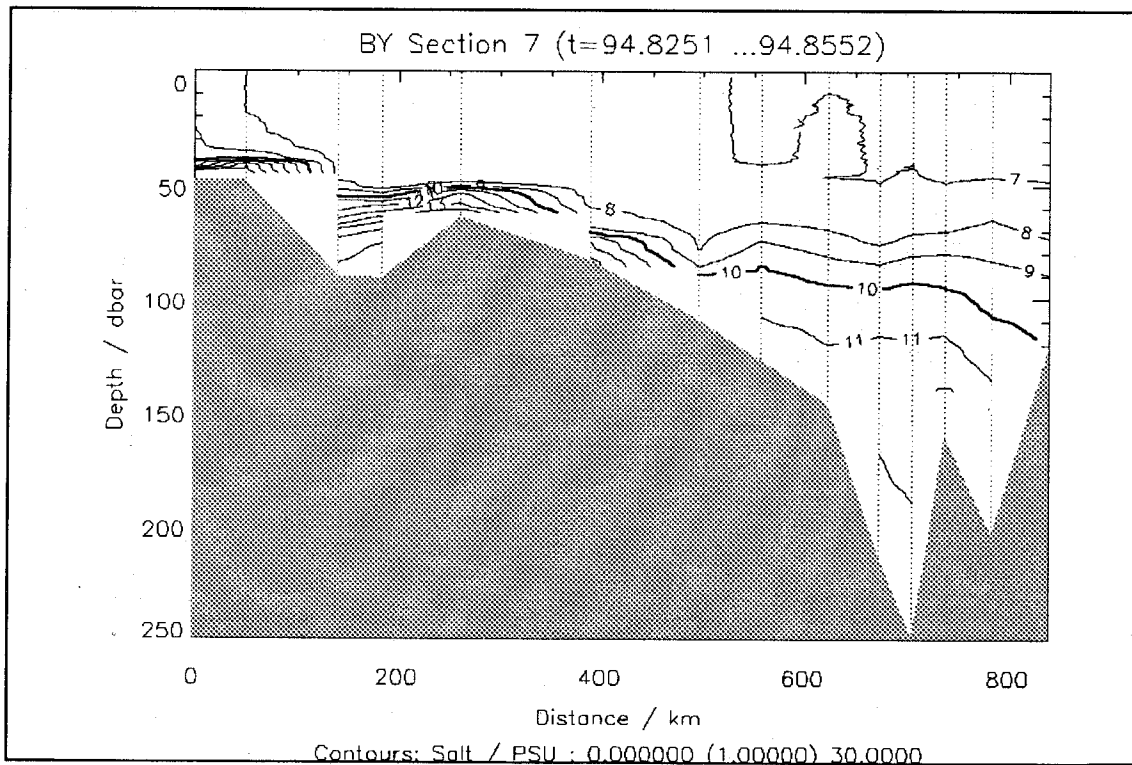


**Fig. 100:** BY Section 6 - Potential Density

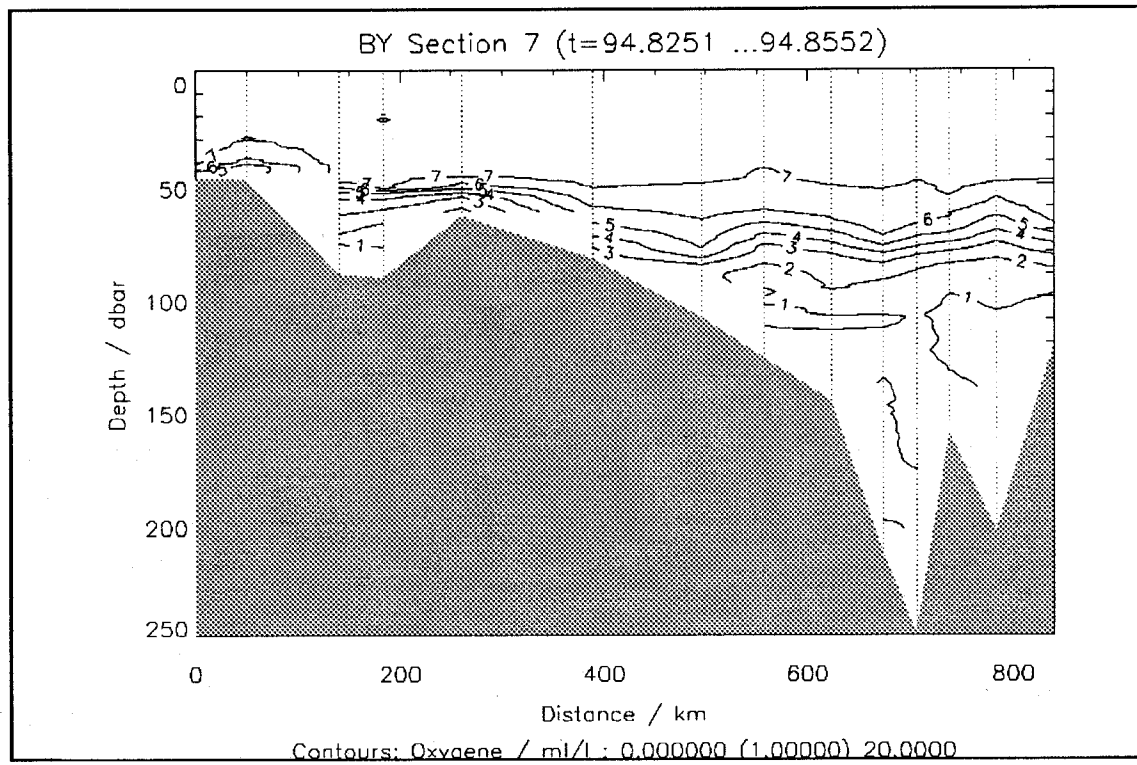
**BYSCT7**



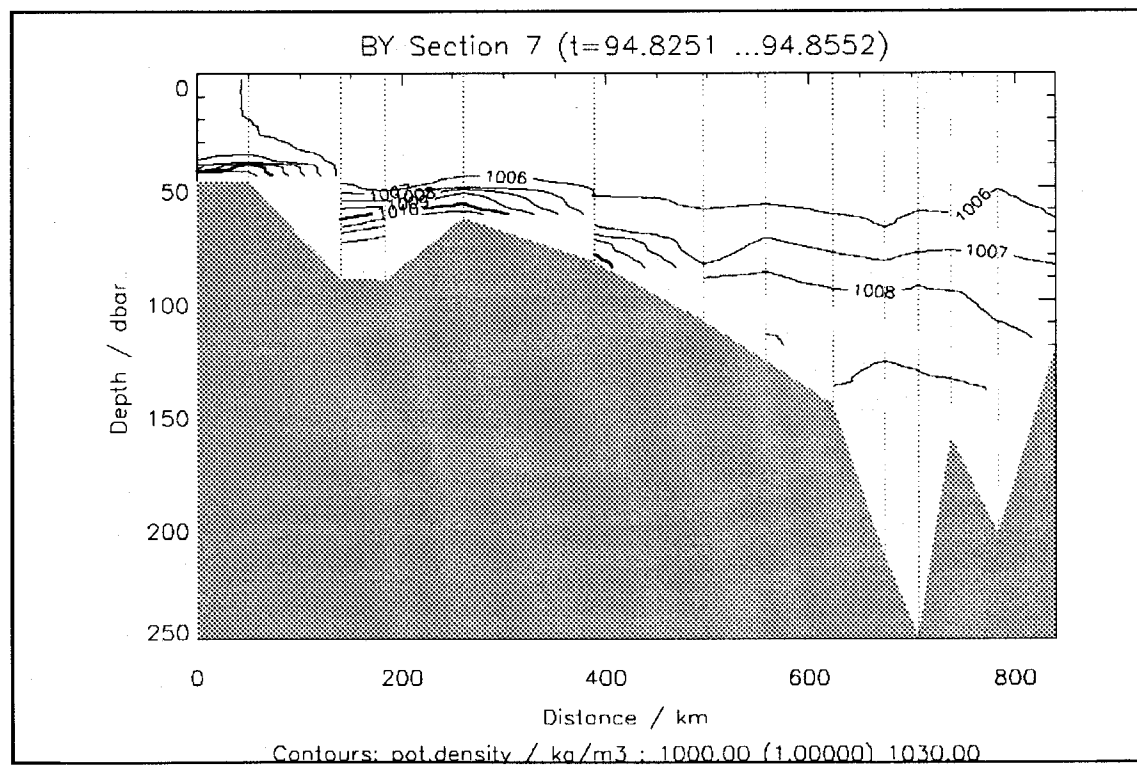
**Fig. 101: BY Section 7 - Temperature**



**Fig. 102: BY Section 7 - Salinity**

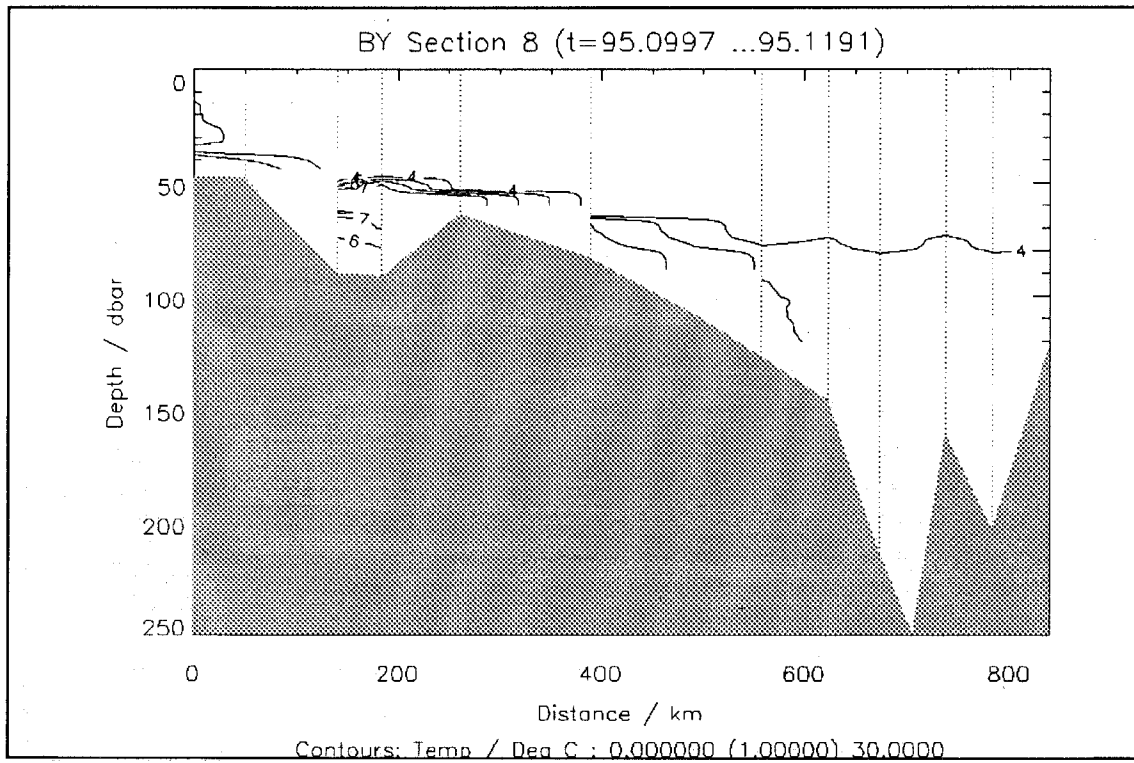


**Fig. 103:** BY Section 7 - Dissolved Oxygen

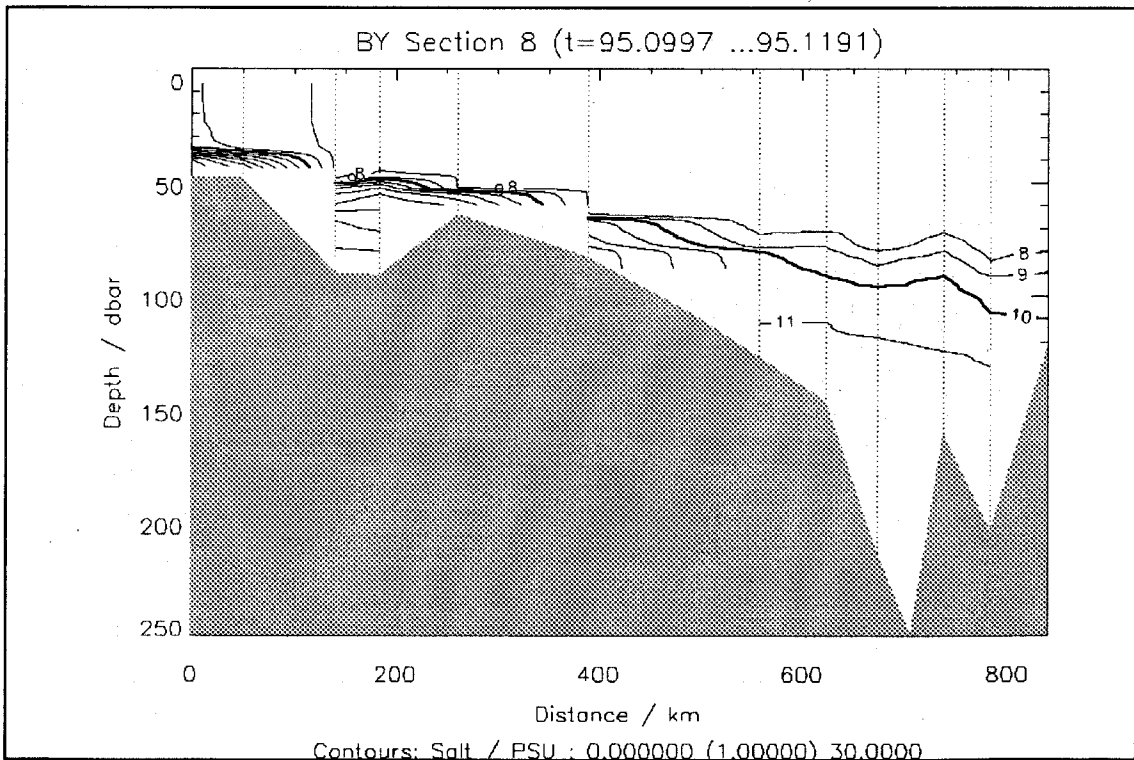


**Fig. 104:** BY Section 7 - Potential Density

**BYSCT8**

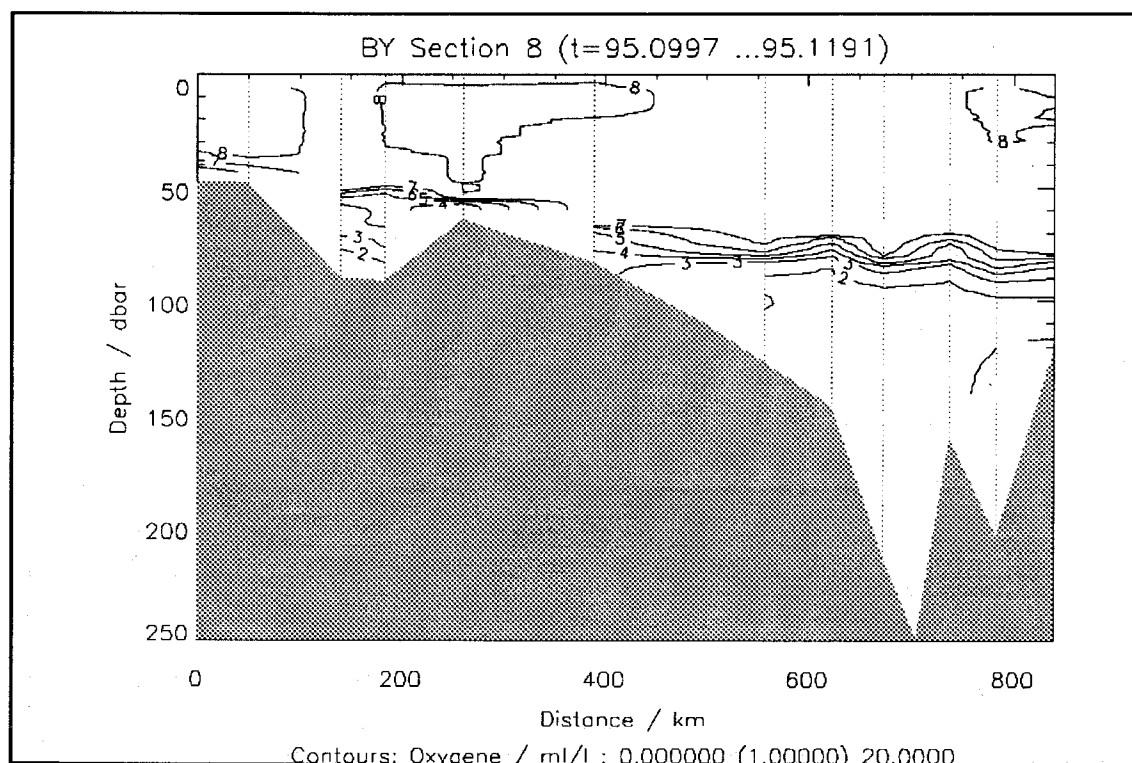


**Fig. 105: BY Section 8 - Temperature**

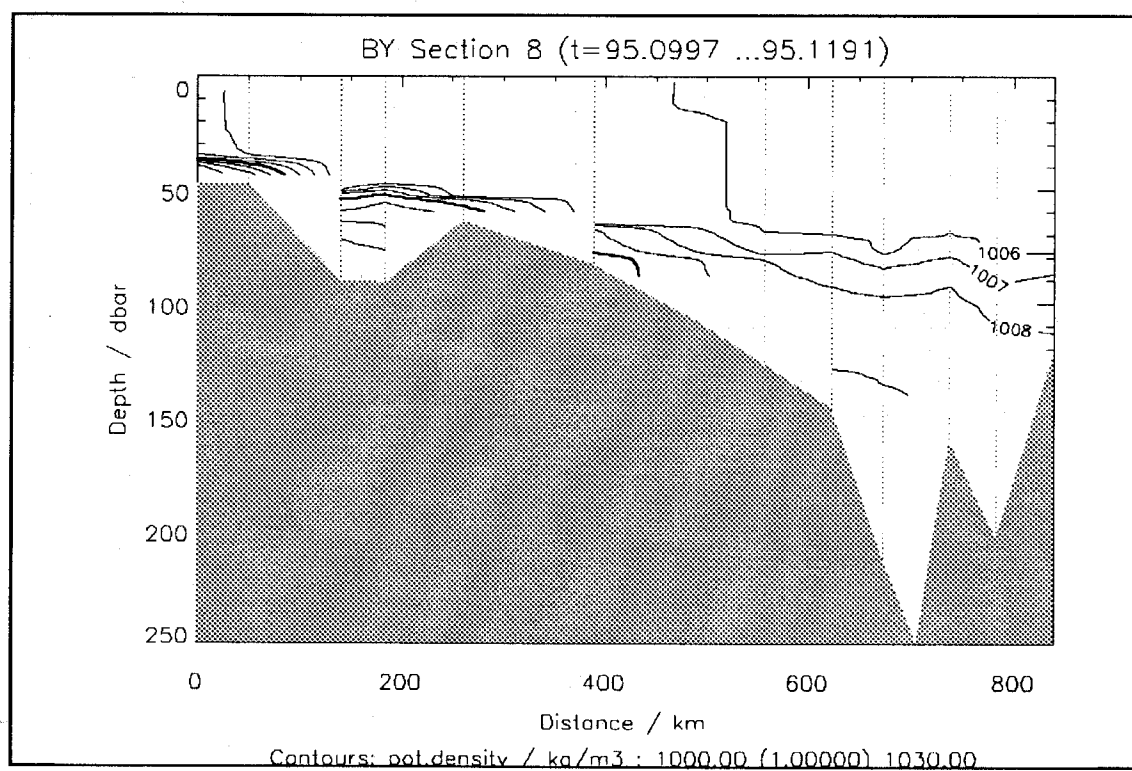


**Fig. 106: BY Section 8 - Salinity**





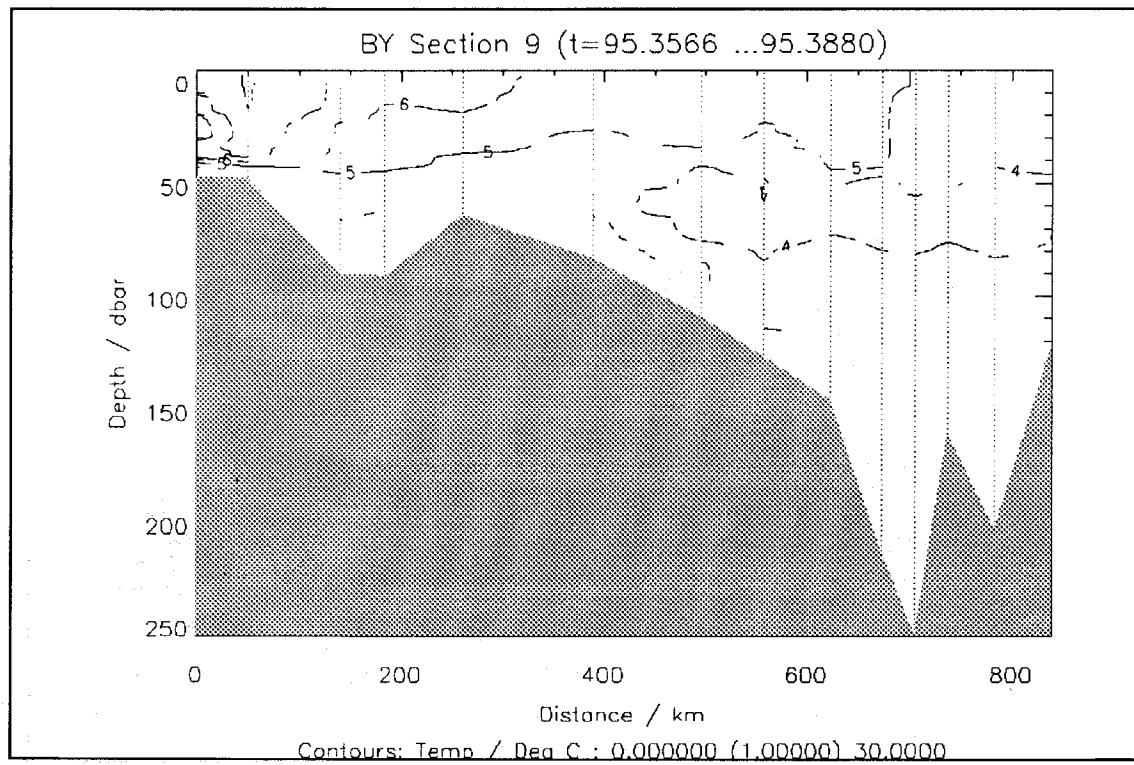
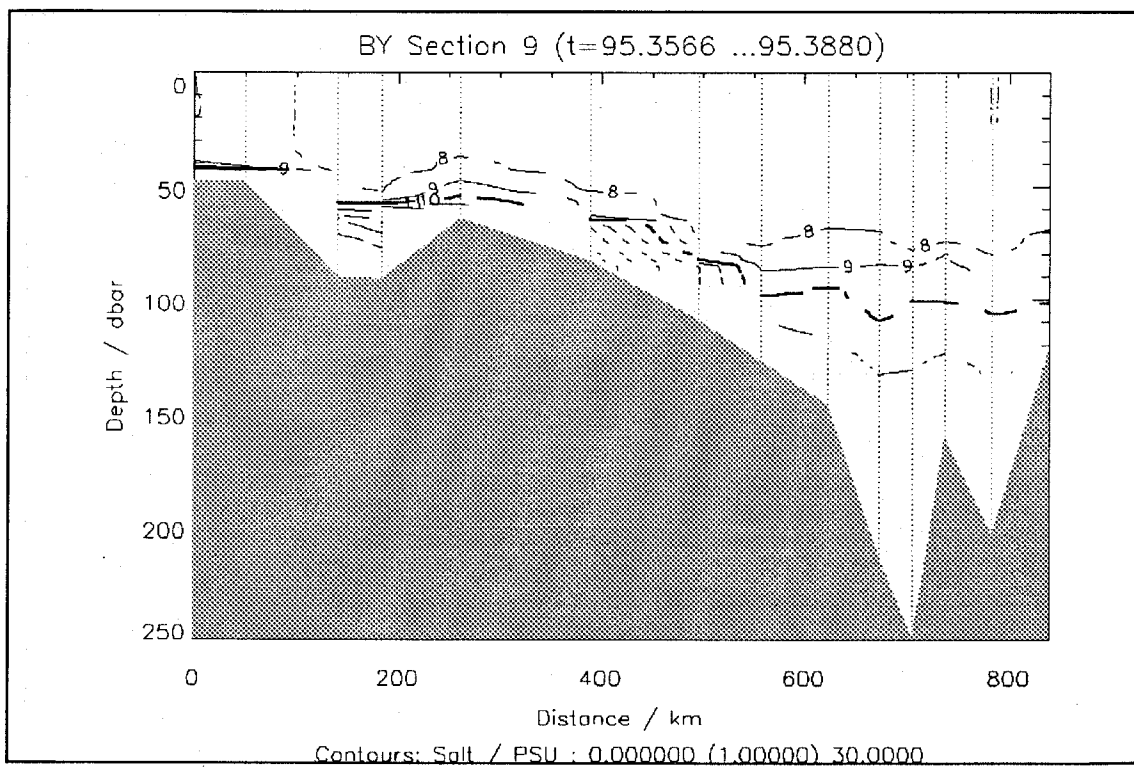
**Fig. 107:** BY Section 8 - Dissolved Oxygen



**Fig. 108:** BY Section 8 - Potential Density



## BYSCT9

**Fig. 109: BY Section 10 - Temperature****Fig. 110: BY Section 10 - Salinity**

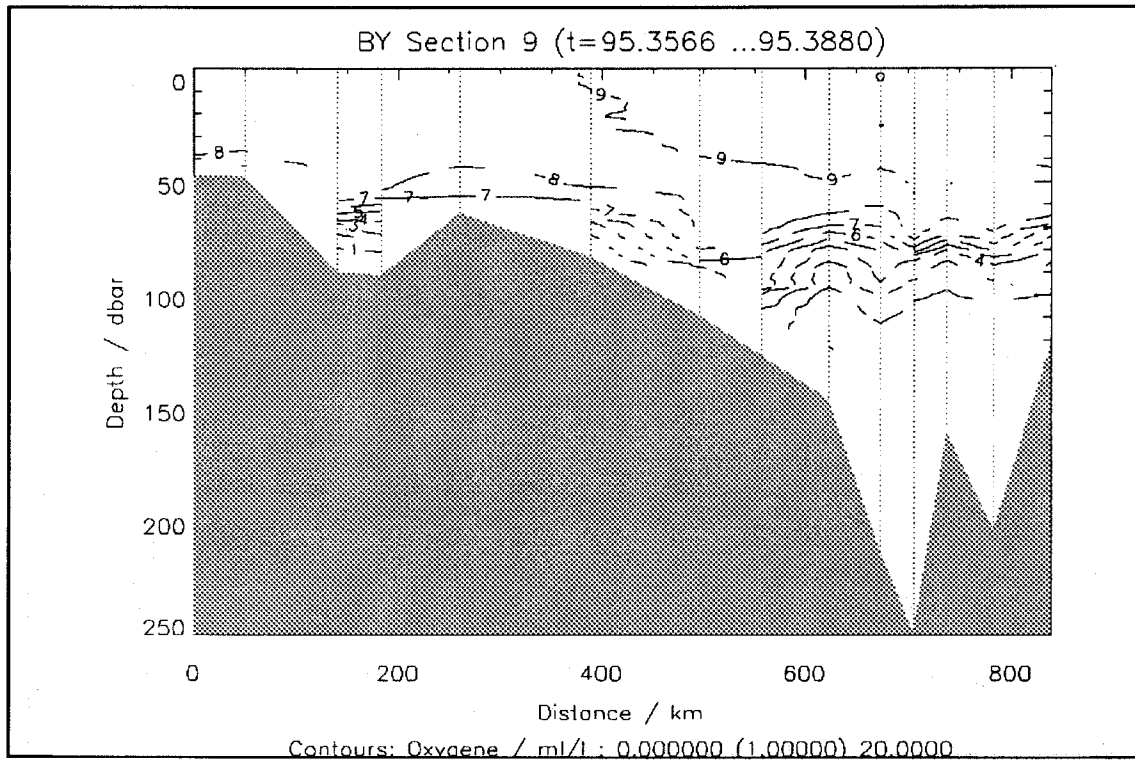


Fig. 111: BY Section 10 - Dissolved Oxygen

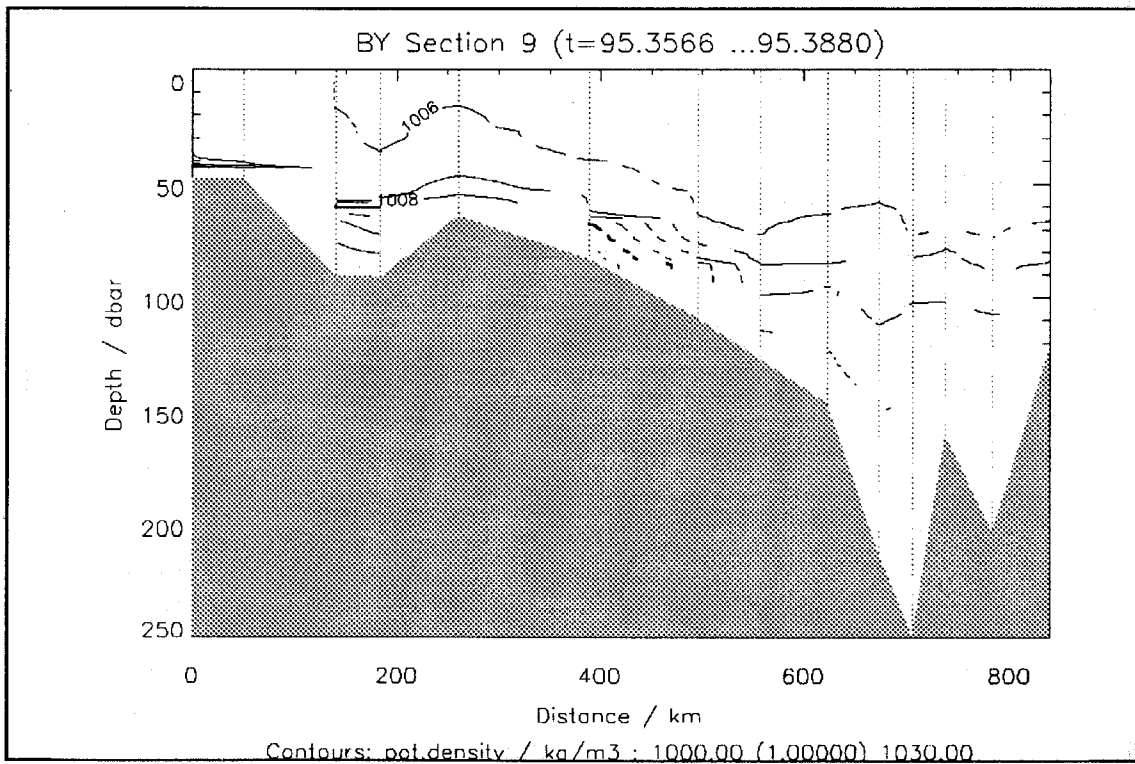
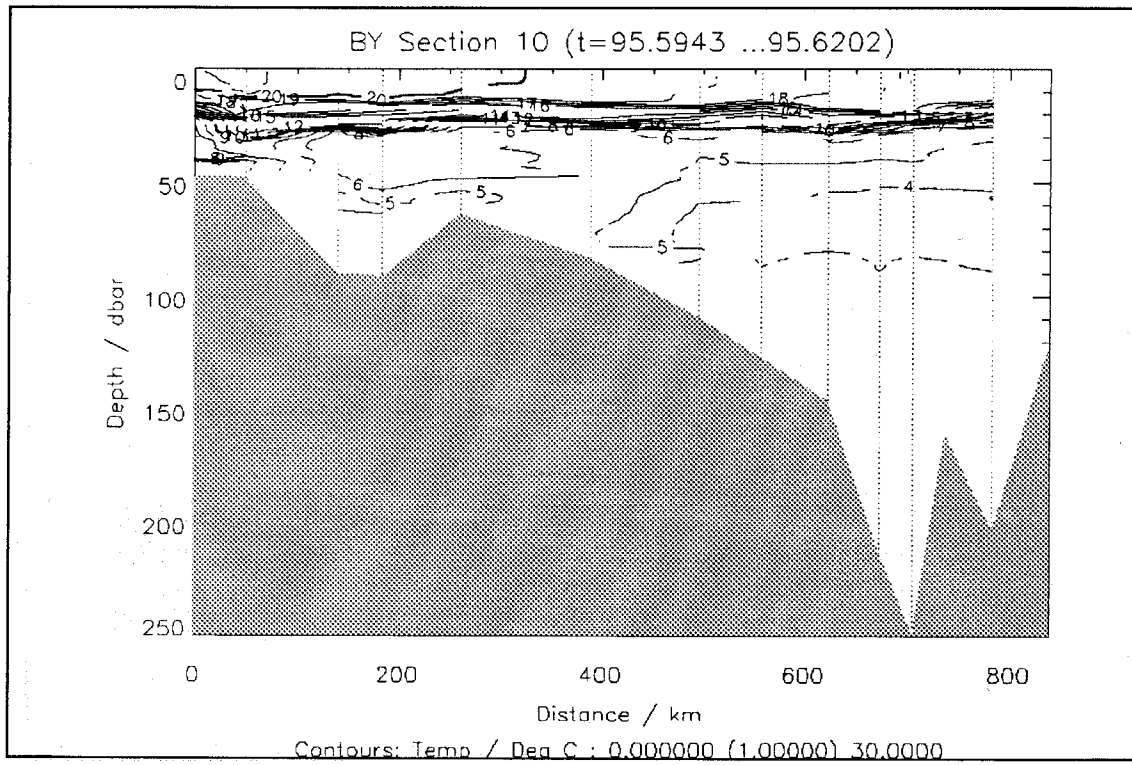
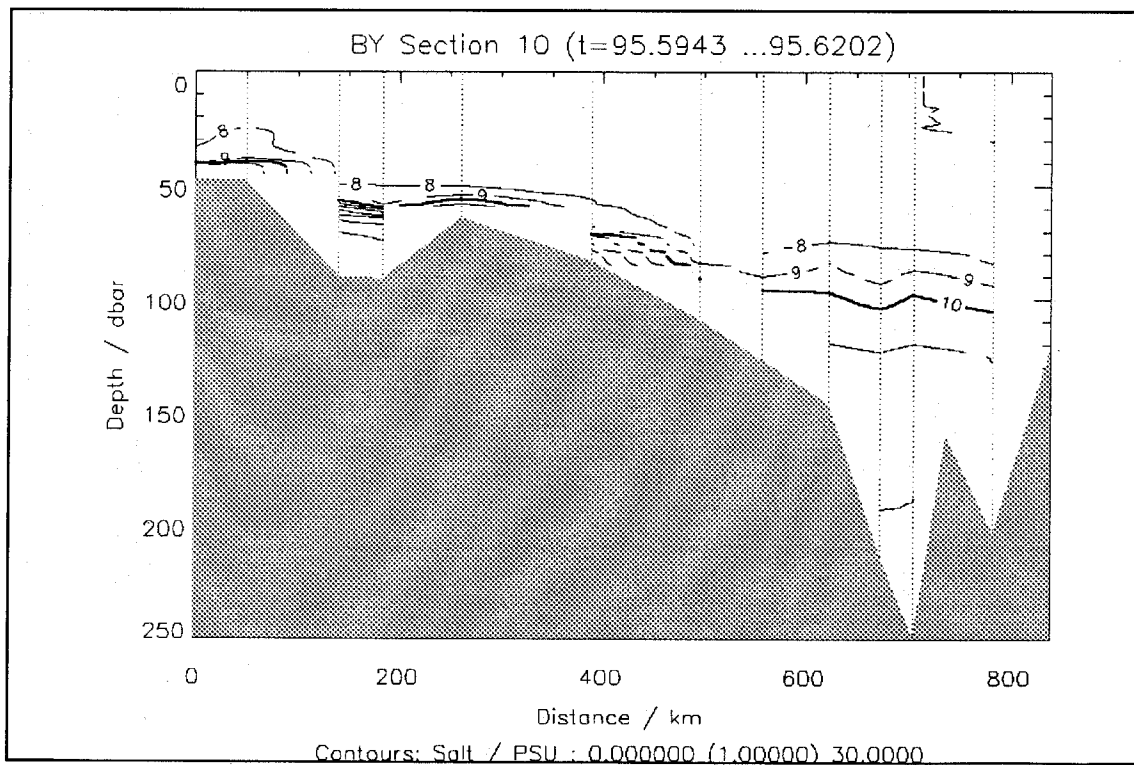


Fig. 112: BY Section 10 - Potential Density

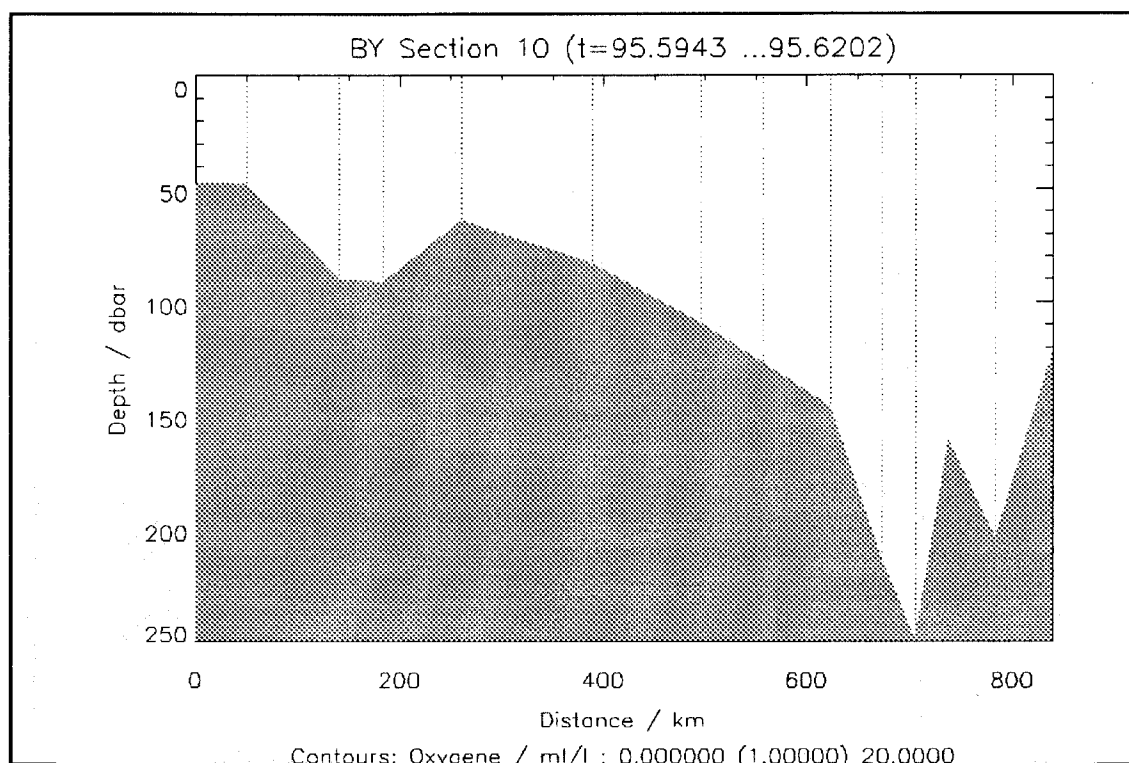
**BYSCT10**



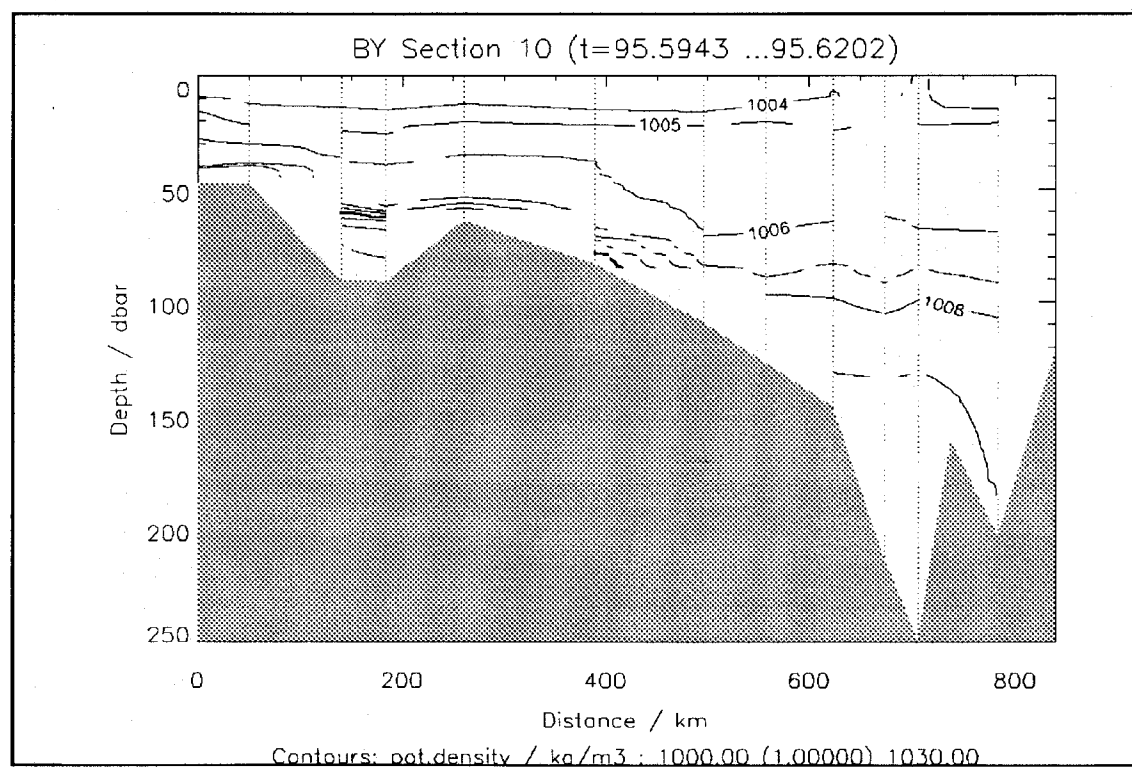
**Fig. 113: BY Section 10 - Temperature**



**Fig. 114: BY Section 10 - Salinity**

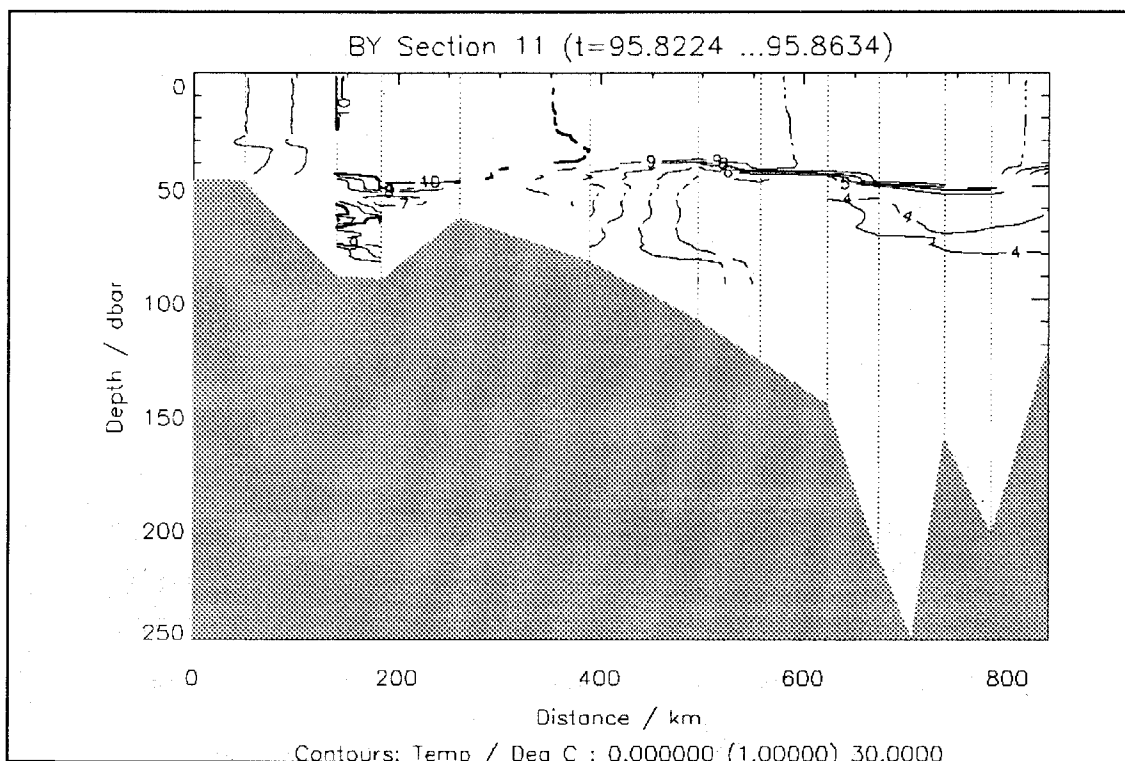


**Fig. 115:** BY Section 10 - Dissolved Oxygen

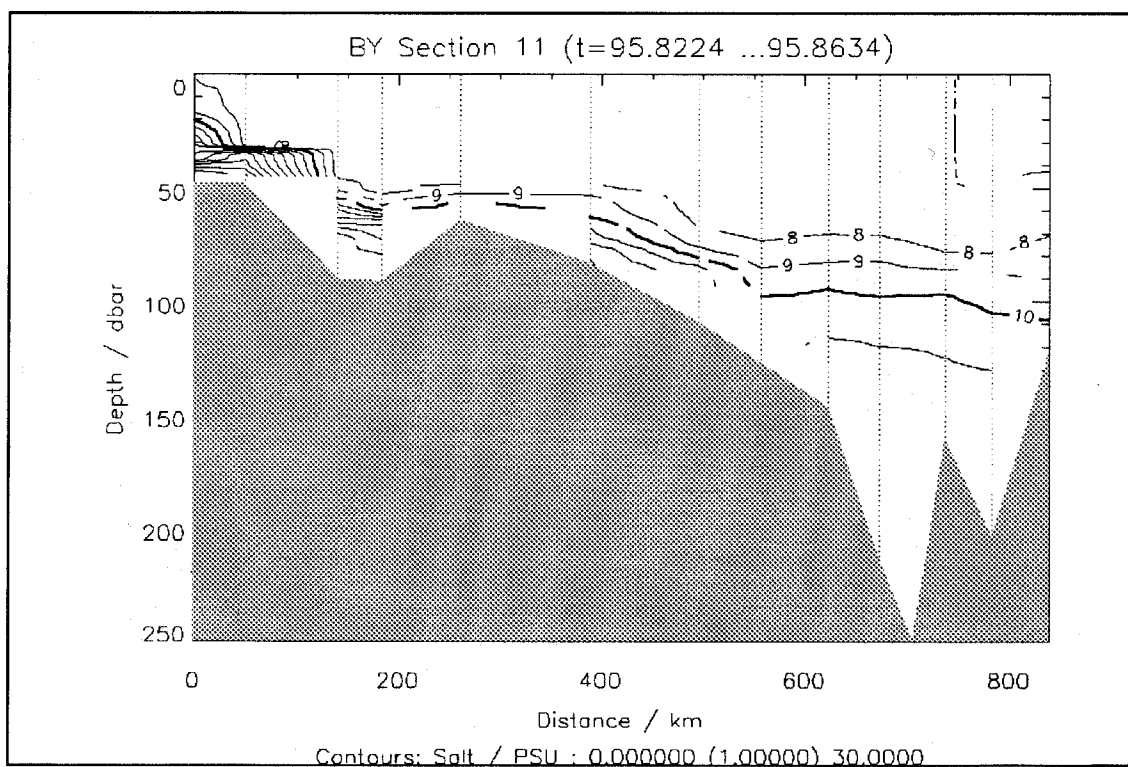


**Fig. 116:** BY Section 10 - Potential Density

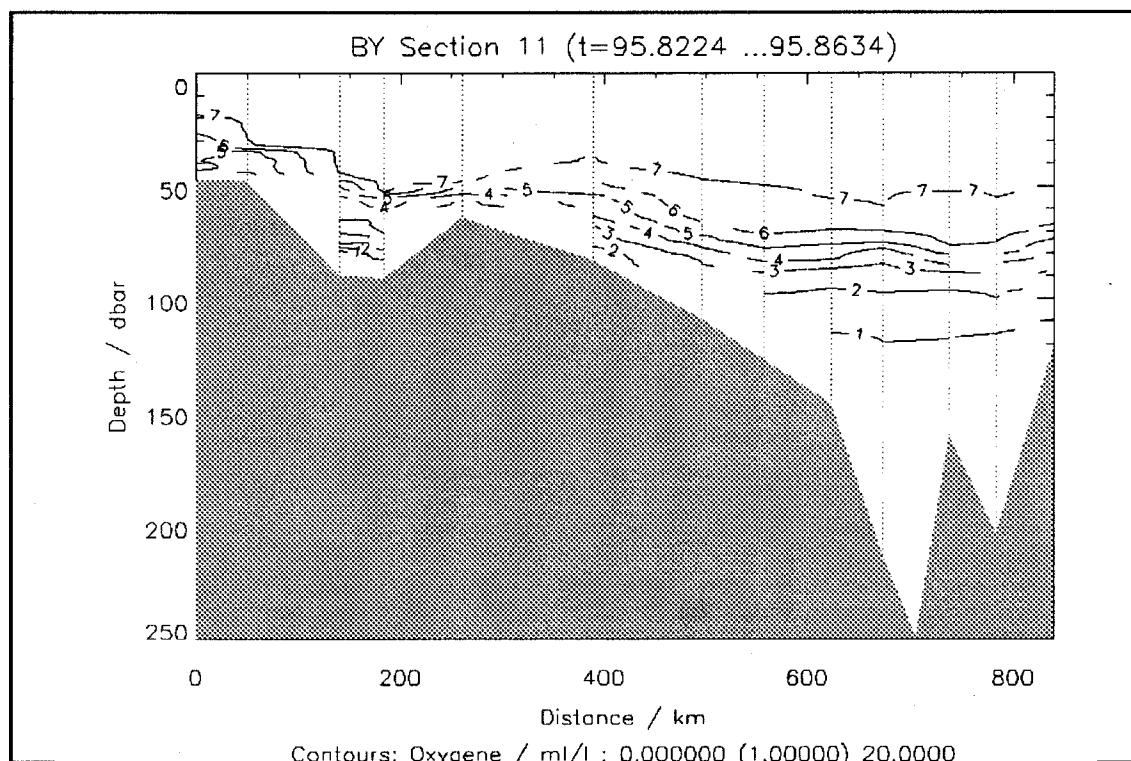
**BYSCT11**



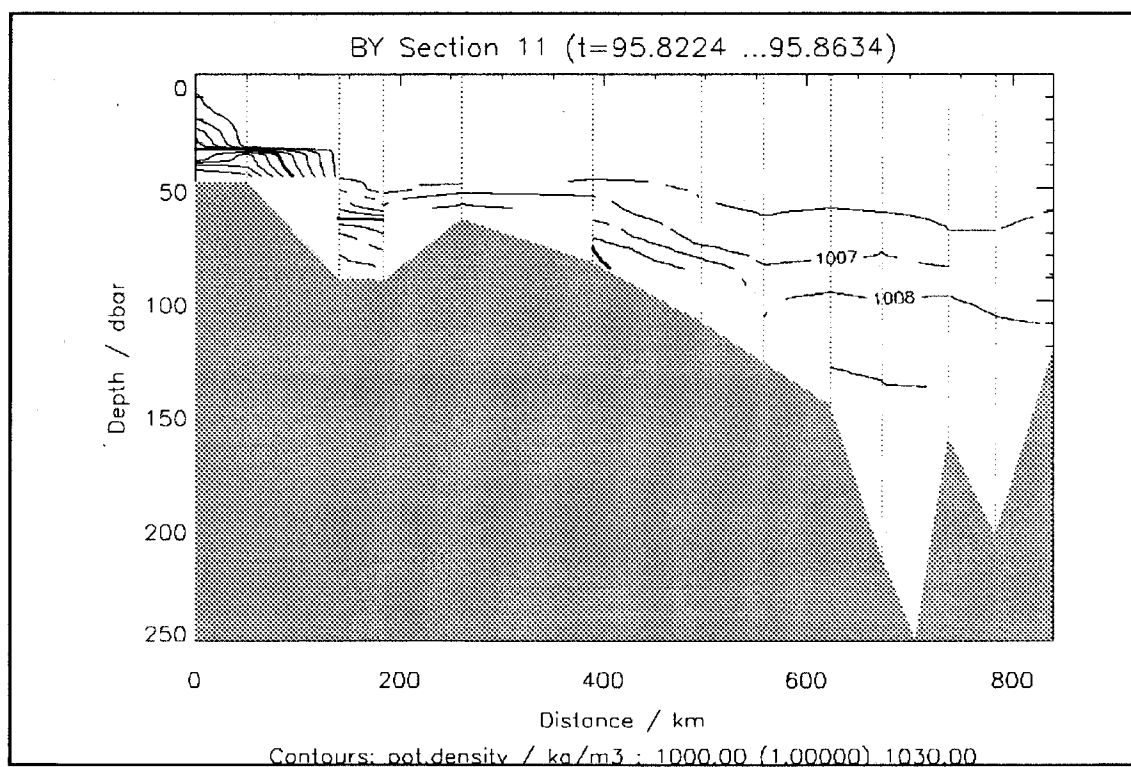
**Fig. 117: BY Section 11 - Temperature**



**Fig. 118: BY Section 11 - Salinity**



**Fig. 119:** BY Section 11 - Dissolved Oxygen



**Fig. 120:** BY Section 11 - Potential Density

#### 4. Acknowledgement

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