BOCATS Cruise Report

17 June – 31 July 2016

BIO Sarmiento de Gamboa

Expocode: 29AH20160617

SUMMARY

The objectives of the BOCATS cruise are fulfilled in spite of the problems derived from the installation of the new signal transmission cable. This operation delayed the departure by one week. However, this delay was recovered thanks to the speed of the ship, the constant adaptation of the cruise planning to the weather forecasts and the excellent reliability of the CTD and box-corer operations. A total of 138 CTD stations and 66 sediment sampling were done. In addition, the recovery and new deployment of two ASFAR-ARGO systems were done, as well as the deployment of five meteorological floats and nine ARGO floats.

Project funded by MINECO, Ref. CTM2013-41048-P

1. INTRODUCTION

Recent evaluations of the CO_2 uptake in the North Atlantic showed that the natural component of the carbon cycle has been affected by the variability of the Meridional Overturning Circulation (MOC). The first goal of BOCATS is to extend the time series of MOC and water ventilation observations to better quantify their effects on the carbon cycle in the North Atlantic on decadal time scales. The estimation of this variability is essential to evaluate the future scenarios of climate change. The second goal of BOCATS is to evaluate the effect of present atmospheric CO_2 increase in the $CaCO_3$ production and dissolution. Recent estimates of acidification in the North Atlantic show a significant effect in deep waters that have a potential impact on calcareous organisms and call into question the generally accepted hypothesis of steady-state $CaCO_3$ cycle. The objectives of BOCATS are addressed through two main activities: i) continuation of the decadal monitoring of the circulation and carbon cycle in the subpolar North Atlantic with the 9th occupation of the A25 hydrography/geochemistry section from Portugal to Greenland (BOCATS cruise) that was first occupied in 1997, and ii) evaluation of the variability of the carbon cycle in the subpolar gyre by separating between natural and anthropogenic components and including organic matter, sediments and other biogenic elements. A major observational contribution of BOCATS is the BOCATS cruise. The planned high quality observations in the subpolar gyre will contribute to the early detection of the alteration of the carbon cycle and will allow the accurate estimation of the rates of CO_2 storage and acidification, relating these changes to the variability of the MOC.

The BOCATS cruise aims to assess the transport of water, salt, heat, natural and anthropogenic CO_2, and other biogeochemical tracers (Chlorofluorocarbons –CFC–, methane –CH_4– and dinitrogen oxide –N_2O– and determining CO_2 the flux between the water column and sediment along a section that has been repeated from 2002 (www.umr-**lops**.fr/Projets/Projets-actifs/**OVIDE**) and is part of international programs GOSHIP (http://www.go-ship.org/RefSecs/goship_ref_secs.html) and CLIVAR / IOPCC (see Fig. 1). These programs allow coordinating the different actions in the Atlantic and manage the databases of CLIVAR, IOPCC and GLODAP. The main line of the BOCATS cruise, the OVIDE section, has been the subject of study in European projects CARBOOCEAN and CARBOCHANGE (http://carbochange.b.uib.no/) and the earlier project National Plan CATARINA. In April 2014 the H2020 AtlantOS project **"Optimizing and Enhancing the Integrated Atlantic Ocean Observing Systems Research"** began coordinating the European activities related with GOSHIP and also supporting the OVIDE section. In fact, part of the chemical group in BOCATS cruise was supported by AtlantOS.

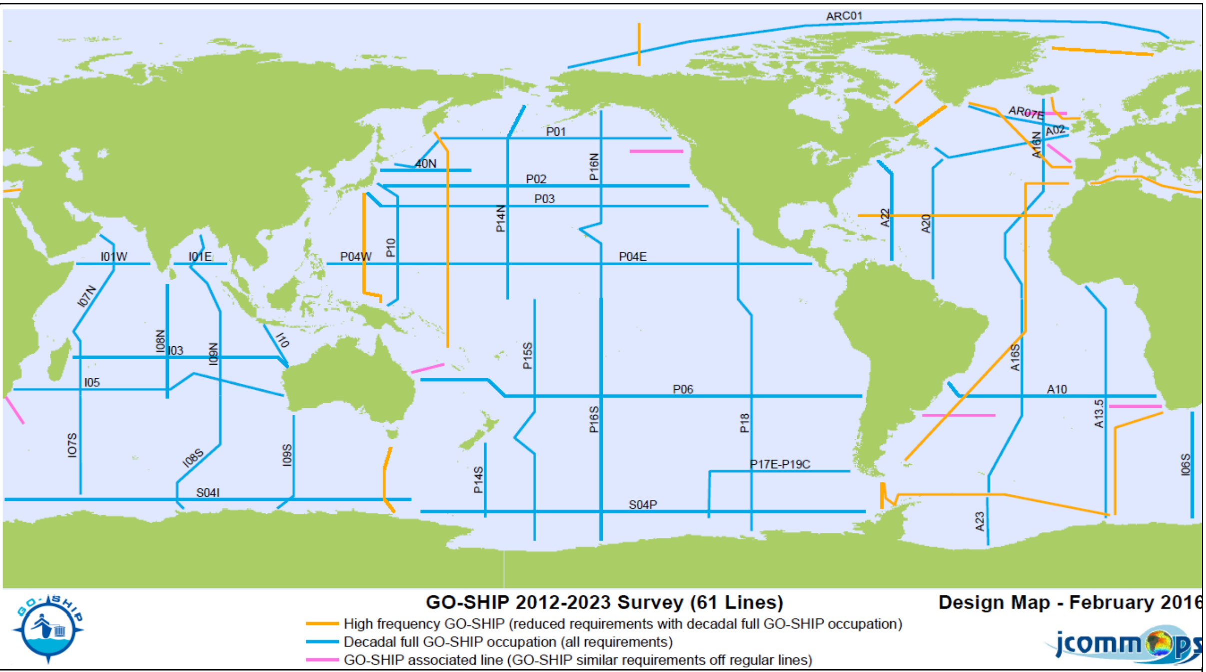


Figure 1: *Hydrographic sections of the GO-SHIP 2012-2023 survey*

Table 1.- Participant list

Nom	Sex	Nationalit	Organism	Task
Fernández Pérez, Fiz	M	Spanish	CSIC-IIM	Chief Scientists
Lherminier, Pascale	F	French	LOPS-IFREMER	CTD, ADCP
Branellec, Pierre	M	French	LOPS-IFREMER	Data processing &calibration
Leizour, Stephane	M	French	LOPS-IFREMER	Buoys & CTD casts
Hamon Michel	M	French	LOPS-IFREMER	Salinity & LADCP
Le Bot Philippe	M	French	LOPS-IFREMER	Winkler analysis (O_2)
Zunino Rodriguez, Patricia	F	Spanish	LOPS-IFREMER	CTD casts
Lagadec, Catherine	M	French	LOPS-IFREMER	CTD casts
Francés Pedraz, Guillermo	M	Spanish	Dpto Geologia U. Vigo	Box-Corer and sediments
Alejo Flores, Irene	M	Spanish	Dpto Geologia U. Vigo	Box-Corer and sediments
Alonso Pérez, Fernando	M	Spanish	CSIC-IIM	Nutrients
de la Paz Arándiga, Mercedes	F	Spanish	CSIC-IIM	CFC, N_2O & CH_4
Fernández Bastero, Susana	F	Spanish	CSIC-IIM	CFC, N_2O & CH_4
Garcia Ibáñez, Mª Isabel	F	Spanish	CSIC-IIM	pH, alkalinity & DIC
Fernández Guallart, Elisa	F	Spanish	CSIC-IIM	pH, alkalinity & DIC
Padín Alvarez, José Antonio	M	Spanish	CSIC-IIM	Underway, pH & alkalinity
Morente Fontela, Marcos	M	Spanish	CSIC-IIM	Water and sediment sampling
Pelayo Espinosa, Victor	M	Spanish	Dpto Geologia U. Vigo	Water and sediment sampling
Álvarez Fernández, Mª Jesús	F	Spanish	Dpto Geologia U. Vigo	Water and sediment sampling
Alcoverro Franquet, Daniel	M	Spanish	CSIC-UTM	Chief Technicians
Redondo Caride, Waldo	M	Spanish	CSIC-UTM	CTD Technician
Giraldez Sotelo, Andres	M	Spanish	CSIC-UTM	CTD Technician
Agudo González, Gustavo	M	Spanish	CSIC-UTM	CTD Technician
Casal Barreiro, Ivan	M	Spanish	CSIC-UTM	Corer Technician
Sanchez Mosquera, Mario	M	Spanish	CSIC-UTM	Corer Technician
Hernández Giménez, Alberto	M	Spanish	CSIC-UTM	Computer Technician

The work on board was developed in three main types of operations: i) CTD hydrographic stations and sampling and chemical work linked to them; ii) sediment sampling using box-corer and Shipek and iii) deployments of meteorological and hydrographical buoys (SVP, PROVOR). In addition, the automatic systems of data acquisition of the ship – positioning, aptitude, meteorological station, thermosalinograph, fluorimeter, Sound EA600 and pCO2-GO system, and two ADCP (Acoustic Doppler Current Profiler) were continuously working and the recording was checked and calibrated.

During this cruise, 19 scientists (4 from Universidad de Vigo, 7 from IFREMER and 8 from Instituto de Investigaciones Marinas de Vigo of CSIC), and 7 technicians from UTM have participated. Table 1describes the team with the main tasks developed by each participant.

The expocode of the cruise is 29SG20160617.

Metadata information can be found by querying for "BOCATS" in Free Search box of SEADATANET download portal: http://seadata.bsh.de/Cgi-csr/retrieve_sdn2/start_sdn2.pl Alternatively, the CSR report in XML format can be downloaded from: http://seadata2.bsh.de/Cgi-csr/XML/xmlDownload_V2.pl?csrref=20165910).

The scientific work presented in this report is organized in following sections:

2.- HYDROGRAPHYC STATIONS

3.- CTD RESULTS

4.- DEPLOYMENTS OF BUOYS

5.- SAMPLING AND CHEMICAL ANALYSIS

6.- UNDERWAY MEASUREMENTS

7.- SEDIMENTS SAMPLING

8.- OUTREACH

9.- INCIDENCES OF THE CRUISE

10.- ACKNOWLEDGEMENTS

11.- REFERNCES

12.- ANNEX I: Bottle sampling

13.- ANNEX II: Press report

2.- HYDROGRAPHYC STATIONS

The geographical distribution of the stations is shown in Figure 2. They are divided in two sections: OVIDE and RREX. The positions, dates and depths of the stations are given in Tables 2 and 3. Three additional sediment stations (202, 204 and 206) are also included in Figure 2 (Table 12).

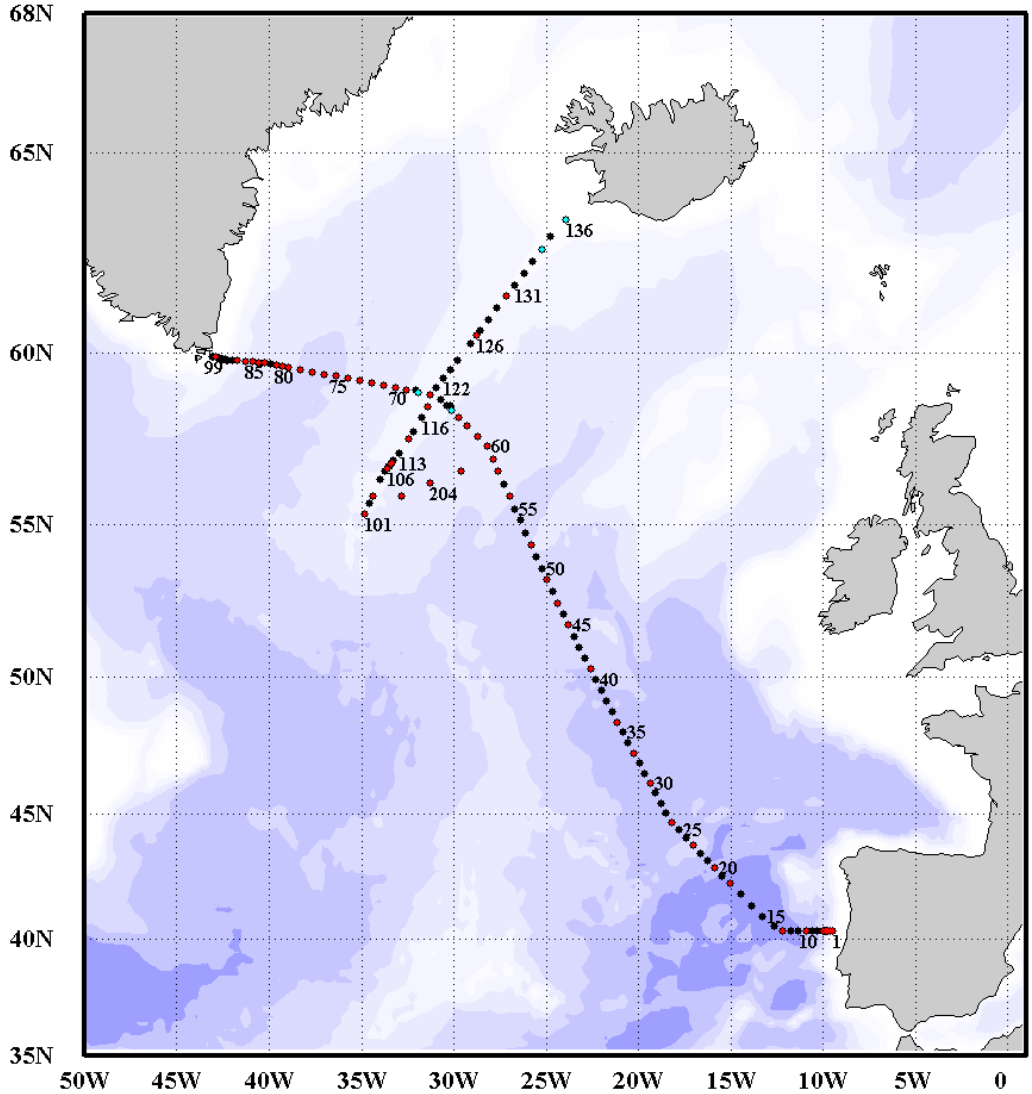


Figure 2: *Hydrographic (CTD) and sediment stations during BOCATS cruise. Positions of Box-corer samples are in red and Shipek samples in green. CTD casts were carried out at all stations except 202, 204 and 206.*

Table 2.- Position, date and depth of the station along the OVIDE section

St.	DATE	LATITUDE N	LONGITUDE W	BOTTOM DEPTH (m)
0	22-Jun-16	40.3342	-10.9050	4854
1	22-Jun-16	40.3331	-9.4642	157
2	22-Jun-16	40.3345	-9.6432	385
3	22-Jun-16	40.3341	-9.7679	821
4	23-Jun-16	40.3340	-9.8051	1440
5	23-Jun-16	40.3345	-9.8794	2772
6	23-Jun-16	40.3343	-9.9420	3395
7	23-Jun-16	40.3341	-10.0341	3542
8	23-Jun-16	40.3342	-10.3001	3901
9	24-Jun-16	40.3341	-10.5720	4340
10	24-Jun-16	40.3342	-10.9059	4853
11	24-Jun-16	40.3342	-11.3390	5098
12	24-Jun-16	40.3339	-11.7743	5216
13	25-Jun-16	40.3341	-12.2210	5260
14	25-Jun-16	40.5523	-12.6555	5307
15	25-Jun-16	40.9362	-13.2952	5346
16	26-Jun-16	41.3824	-13.8903	5346
17	26-Jun-16	41.8360	-14.4771	5336
18	26-Jun-16	42.2804	-15.0625	5308
19	27-Jun-16	42.5791	-15.4595	5070
20	27-Jun-16	42.8850	-15.8517	4192
21	27-Jun-16	43.1830	-16.2447	5126
22	28-Jun-16	43.4780	-16.6356	4173
23	28-Jun-16	43.7744	-17.0291	4011
24	28-Jun-16	44.0758	-17.4253	3801
25	28-Jun-16	44.3783	-17.8177	4952
26	29-Jun-16	44.6738	-18.2107	4824
27	29-Jun-16	45.0520	-18.5032	4611
28	29-Jun-16	45.4191	-18.7947	4571
29	30-Jun-16	45.7939	-19.0861	4523
30	30-Jun-16	46.1691	-19.3765	4606
31	30-Jun-16	46.5418	-19.6745	4561
32	01-Jul-16	46.9177	-19.9683	4505
33	01-Jul-16	47.2912	-20.2637	4516
34	01-Jul-16	47.6625	-20.5599	4349
35	01-Jul-16	48.0367	-20.8520	4457
36	02-Jul-16	48.4099	-21.1409	4338
37	03-Jul-16	48.7872	-21.4329	4090
38	03-Jul-16	49.1579	-21.7265	4343
39	03-Jul-16	49.5344	-22.0182	4231
40	03-Jul-16	49.9040	-22.3127	4001
41	04-Jul-16	50.2823	-22.6085	4133
42	04-Jul-16	50.6459	-22.8997	3735
43	04-Jul-16	51.0280	-23.2017	3918
44	04-Jul-16	51.4021	-23.4853	3247
45	05-Jul-16	51.7705	-23.7849	3850
46	05-Jul-16	52.1480	-24.0734	3907
47	05-Jul-16	52.5189	-24.3585	3597
48	06-Jul-16	52.8895	-24.6591	3613
49	06-Jul-16	53.2652	-24.9480	3527

St	DATE	LATITUDE N	LONGITUDE W	BOTTOM DEPTH (m)
50	06-Jul-16	53.6393	-25.2400	3580
51	06-Jul-16	54.0180	-25.5301	3044
52	06-Jul-16	54.3879	-25.8309	3056
53	07-Jul-16	54.7620	-26.1203	3613
54	07-Jul-16	55.1491	-26.4111	3379
55	07-Jul-16	55.5061	-26.7076	3235
56	07-Jul-16	55.8829	-26.9983	2882
57	08-Jul-16	56.2555	-27.2984	2738
58	08-Jul-16	56.6310	-27.5883	2726
59	08-Jul-16	57.0130	-27.8825	2753
60	08-Jul-16	57.3806	-28.1726	2607
61	09-Jul-16	57.6737	-28.7238	2457
62	09-Jul-16	57.9695	-29.2802	2141
63	09-Jul-16	58.2102	-29.7298	2237
64	09-Jul-16	58.4108	-30.1042	2178
65	09-Jul-16	58.5493	-30.3665	1615
66	09-Jul-16	58.7264	-30.6994	1451
67	10-Jul-16	58.8463	-31.2697	1483
68	10-Jul-16	58.9104	-31.9120	1695
69	10-Jul-16	58.9752	-32.5549	1881
70	10-Jul-16	59.0410	-33.1924	2284
71	10-Jul-16	59.1011	-33.8338	2290
72	10-Jul-16	59.1664	-34.4763	2519
73	11-Jul-16	59.2336	-35.1140	2991
74	11-Jul-16	59.2994	-35.7623	3100
75	11-Jul-16	59.3635	-36.3980	3095
76	11-Jul-16	59.4276	-37.0386	3117
77	11-Jul-16	59.4922	-37.6779	3112
78	12-Jul-16	59.5596	-38.3187	3041
79	12-Jul-16	59.6247	-38.9582	2926
80	12-Jul-16	59.6542	-39.2773	2860
81	12-Jul-16	59.6856	-39.6001	2795
82	12-Jul-16	59.7049	-39.9187	2734
83	12-Jul-16	59.7242	-40.2532	2656
84	12-Jul-16	59.7399	-40.5808	2630
85	12-Jul-16	59.7576	-40.9072	2269
86	13-Jul-16	59.7718	-41.2951	2041
87	13-Jul-16	59.7978	-41.7281	1846
88	13-Jul-16	59.7972	-42.0032	1724
89	13-Jul-16	59.8084	-42.2341	1218
90	13-Jul-16	59.8160	-42.2751	899
91	13-Jul-16	59.8182	-42.3131	549
92	13-Jul-16	59.8215	-42.3979	307
93	13-Jul-16	59.8308	-42.5201	228
94	13-Jul-16	59.8458	-42.6006	201
95	13-Jul-16	59.8595	-42.7012	184
96	13-Jul-16	59.8758	-42.7955	184
97	13-Jul-16	59.8913	-42.9058	184
98	13-Jul-16	59.9038	-43.0041	170
99	13-Jul-16	59.9130	-43.0754	161

Table 3.- Position, date and depth of the station along the RREX section.

St	DATE	LATITUDE N	LONGITUDE W	BOTTOM DEPTH (m)
100	18-Jul-16	58.5470	-30.1831	1707
101	21-Jul-16	55.3491	-34.8138	2212
102	21-Jul-16	55.6714	-34.5708	1460
103	21-Jul-16	55.9076	-34.3939	1834
104	21-Jul-16	56.3988	-34.0208	1709
105	21-Jul-16	56.6353	-33.7130	1299
106	21-Jul-16	56.7021	-33.6260	1833
107	21-Jul-16	56.7249	-33.5939	2424
108	22-Jul-16	56.7811	-33.5242	1691
109	22-Jul-16	56.7998	-33.4845	1097
110	22-Jul-16	56.8502	-33.4331	1896
111	22-Jul-16	56.9098	-33.3543	1925
112	22-Jul-16	56.9499	-33.3035	1645
113	22-Jul-16	57.1753	-33.0018	1071
114	22-Jul-16	57.5776	-32.4779	1731
115	23-Jul-16	57.8003	-32.2167	1433
116	23-Jul-16	58.2003	-31.7504	1592
117	23-Jul-16	58.5303	-31.4223	1663
118	23-Jul-16	58.8452	-31.2696	1464

St.	DATE	LATITUDE N	LONGITUDE W	BOTTOM DEPTH (m)
119	23-Jul-16	58.9706	-32.0975	1699
120	24-Jul-16	58.8451	-31.2687	1454
121	24-Jul-16	59.0500	-30.9527	1303
122	24-Jul-16	59.3003	-30.5696	1321
123	24-Jul-16	59.5496	-30.1883	1240
124	24-Jul-16	59.8000	-29.8062	998
125	24-Jul-16	60.2400	-29.1293	704
126	24-Jul-16	60.4699	-28.7782	1275
127	25-Jul-16	60.5992	-28.5793	792
128	25-Jul-16	60.9028	-28.1180	662
129	25-Jul-16	61.2014	-27.6590	680
130	25-Jul-16	61.4989	-27.1756	714
131	25-Jul-16	61.7998	-26.6917	1047
132	25-Jul-16	62.1001	-26.2056	775
133	26-Jul-16	62.4000	-25.7221	682
134	26-Jul-16	62.7000	-25.2371	613
135	26-Jul-16	63.0002	-24.7521	257
136	26-Jul-16	63.4166	-23.9172	142

3.- CTD RESULTS

Equipment

For the hydrology acquisition, we used the Seabird 911+ CTD probe (s/n. 813) of the LOPS on a 2-floor rosette equipped with 28 bottles of 8 liters. Two high-precision thermometers and pressiometers were used on the first and third bottle to monitor the drift of temperature and pressure of the probe. We systematically used two sets of temperature, conductivity and dissolved oxygen sensors.

We had neither failure nor noise on the signal during the whole cruise. The bottles were closed at different depths for sampling in order to measure different parameters, including salinity and oxygen. Those two variables were measured in the LOPS laboratory container in order to calibrate the CTD data. Closing the bottles with stainless steel springs provided both excellent isolation of the sampled water (there were very few leaks) and no pollution of the CFC sampling. We borrowed 28 Seabird taps from the UTM team since the installed ones were not compatible with the CFC sampling system.

*Calibration of salinity and oxygen (***M. Hamon, P. Le Bot, P. Branellec***).*

During the 137 hydrological stations, 2579 bottles were closed. From those bottles, 2501 salinity samples were taken and analyzed with a Guildline Portasal salinometer. Besides, 2472 dissolved oxygen samples were taken and analyzed with a Metrohm 798 titrinos. The position of the samples in the water column is shown in the Figure 3.

A pre-calibration led to a very good consistency between the CTD probe and the chemical data: the standard deviation of the difference is 0.001 for salinity and 0.03ml/l for dissolved oxygen, i.e. compatible with the international GO-SHIP standards (Fig. 4). The sections of potential temperature, salinity, dissolved oxygen and Apparent Oxygen Utilization, after pre-calibration are shown in Figures 5 and 6.

Along the OVIDE section, we confirm the extension of the subpolar gyre towards the south-east, as already observed in 2014 during the GEOVIDE cruise. Two new features appear, that can be potentially very important for the future: i) the presence of low-salinity layer at the surface of the subpolar gyre, that will be better understood by the measurements of $\delta^{18}O$ taken at the surface for Gilles Reverdin (LOCEAN, Paris), and ii) the deepening of the ventilated layer down to 1500m in the Irminger Gyre. The latter is consistent with the depth of the deep convection observed by ARGO floats during the three previous winters.

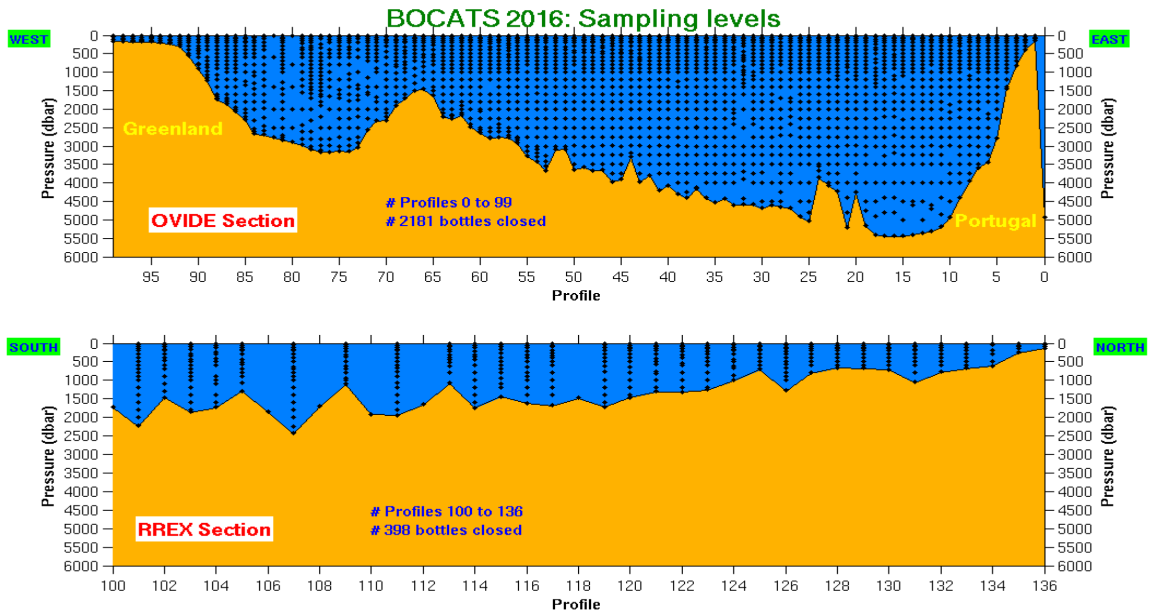


Figure 3: *OVIDE and RREX sections showing the position of the water samples.*

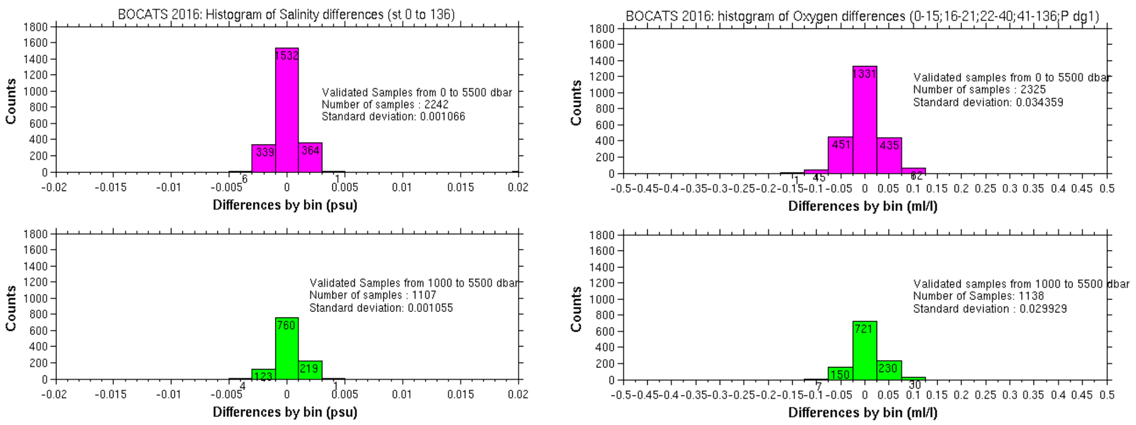


Figure 4: *Histograms of differences between the CTD probe and the chemical analysis for salinity (left) and dissolved oxygen (right) after precalibration*

*OVIDE sections (**C. Lagadec & P. Lherminier**).*

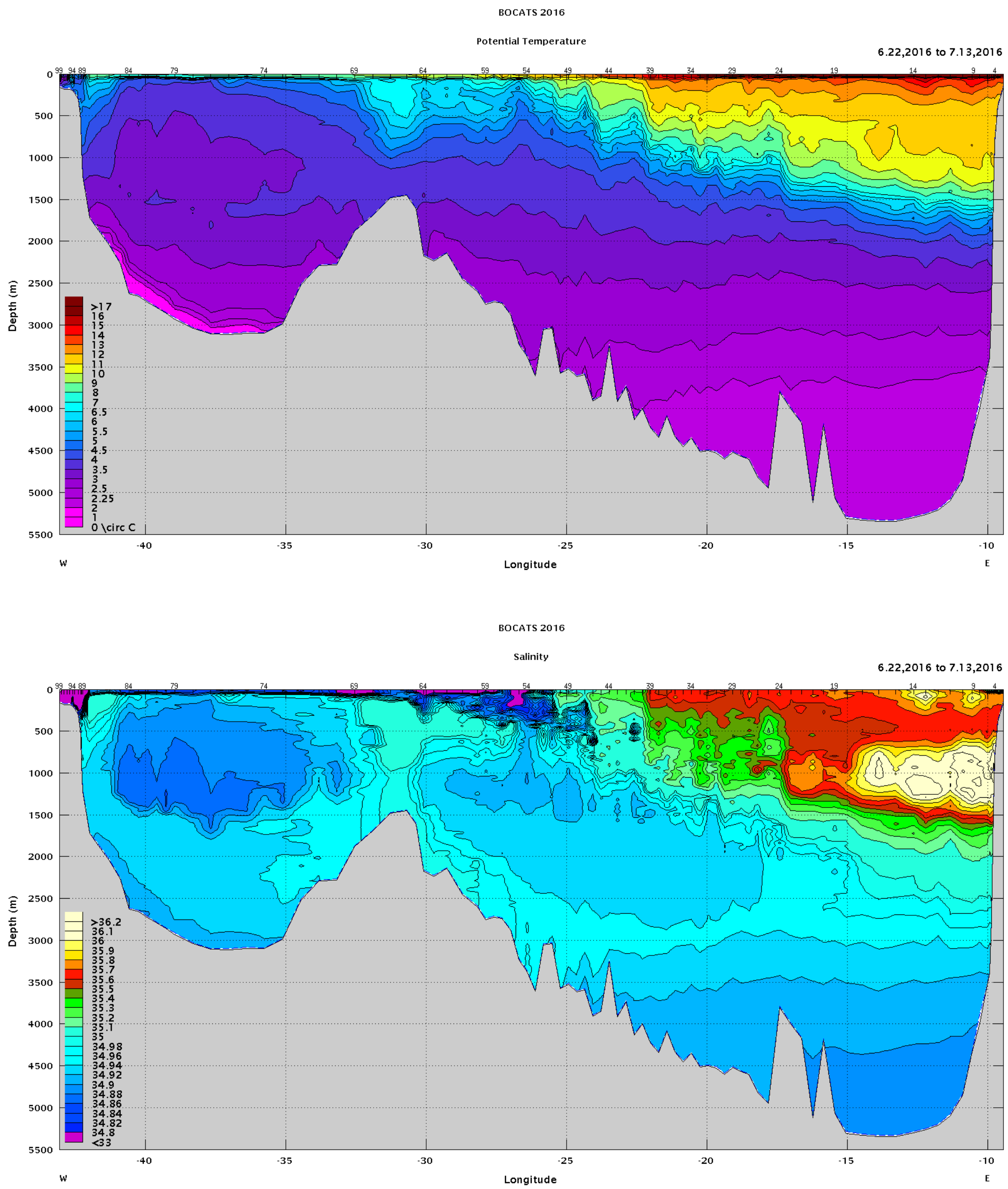


***Figure 5:** BOCATS-OVIDE section in 2016: temperature and salinity after pre-calibration*

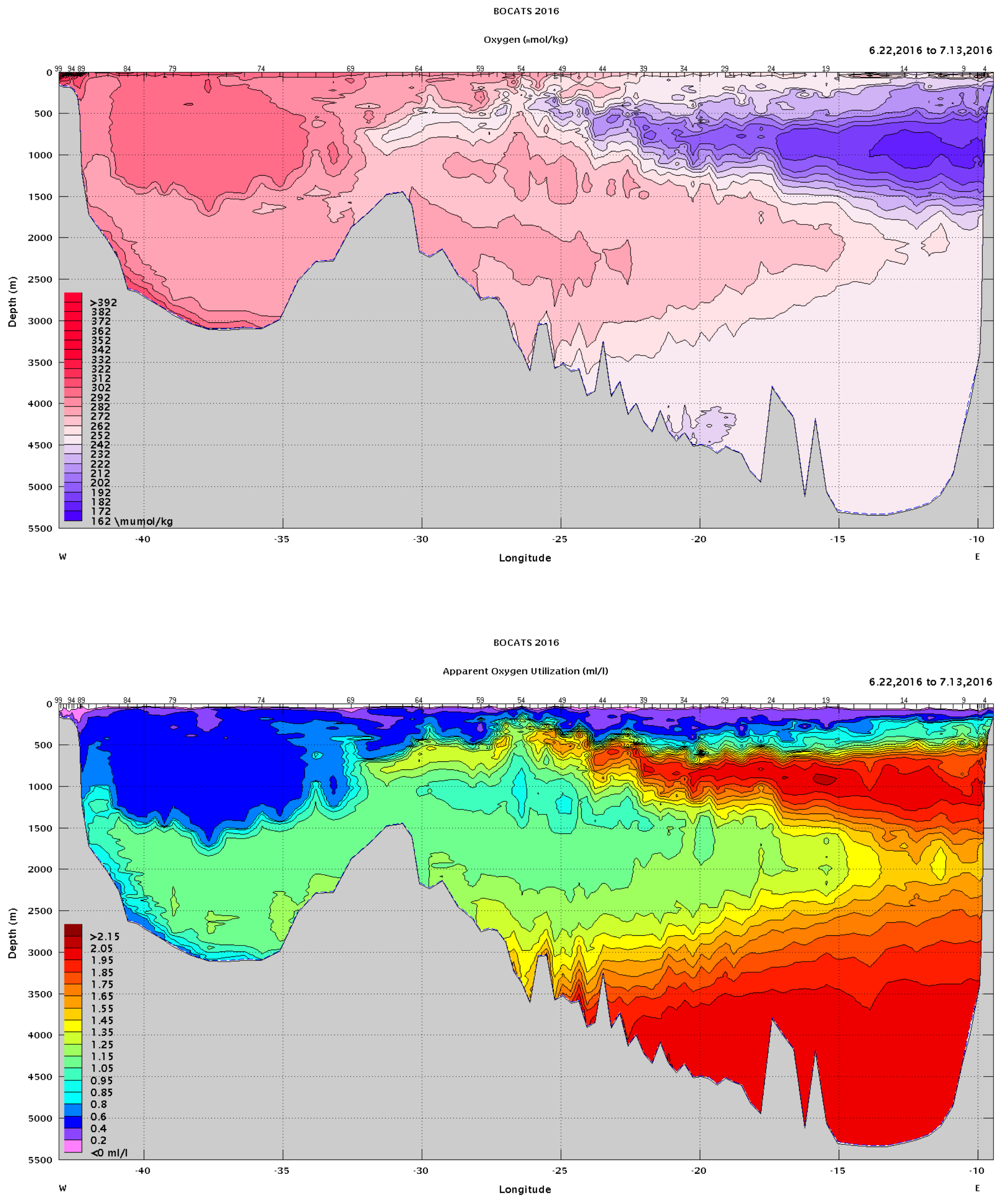


***Figure 6:** BOCATS-OVIDE section in 2016: Dissolved oxygen and Apparent Oxygen Utilization, after pre-calibration.*

*LADCPs: Lowered Acoustic Doppler Current Profilers (**P. Lherminier & M. Hamon**)*

Two yellow LADCPs can be seen on the picture of the rosette: a WH150kHz looking down and a WH300 looking up. They were both tested on a previous cruise without the CTD. Despite the unexpected importance of the interferences between the WH150 and the 200kHz altimeter of the rosette, we could obtain reasonable profiles of velocities for all the stations (note that on the shelves, the LADCPs were not turned on). We had to change the star-cable (connecting the LADCPs between them and with the batteries and the external PCs) in the middle of the cruise, before station 85. As usual, the signal to noise ratio is much better in the subpolar gyre, where water is richer in particles that reflect the acoustic signal.

All the profiles were processed by P. Lherminier with the LDEO software (version 10.16) written by M. Visbeck and G. Krahmann. The bottom velocities were immediately given to the sediment team to interpret their data.

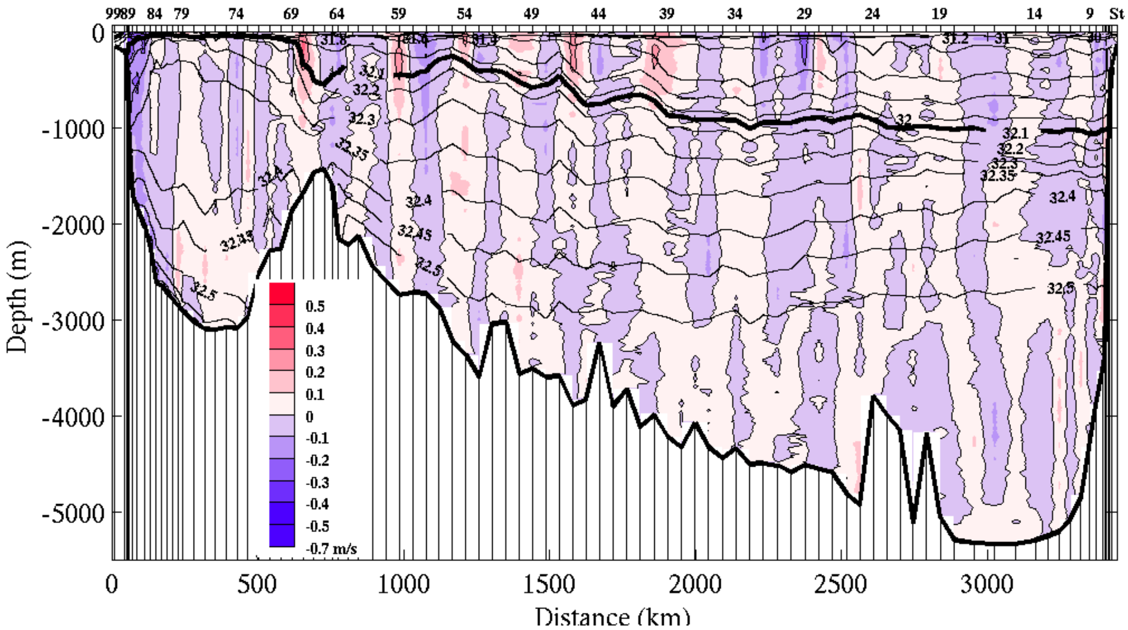


***Figure 7:** BOCATS-OVIDE section of currents as measured by the LADCPs (interpolated from stations).*

*SADCPs: Ship Acoustic Doppler Current Profilers (**P. Lherminier**)*

Two SADCPs (Ocean Surveyor model of RDInstruments) are installed on the Sarmiento de Gamboa in a "quilla" that can be lowered at 10m below the surface: one at 75kHz and one at 150kHz (called OS75 and OS150 respectively). Both were connected with a cable to ensure synchronization, the OS75 being the master. After some difficulties with the NMEA input that did not include the $PASHR lines required by the software, we finally manage to make them work as soon as the survey began. The OS75 was tuned in Narrow Band to get the maximum range possible (about 820m), and the OS150 in broad band to have more precision in the surface layers (down to about 250m, but sometimes less). The OS75 worked perfectly, giving excellent continuous data along the whole cruise without a single failure. The range of the OS150 was a little disappointing, but the data could be used to validate the OS75 data as expected.

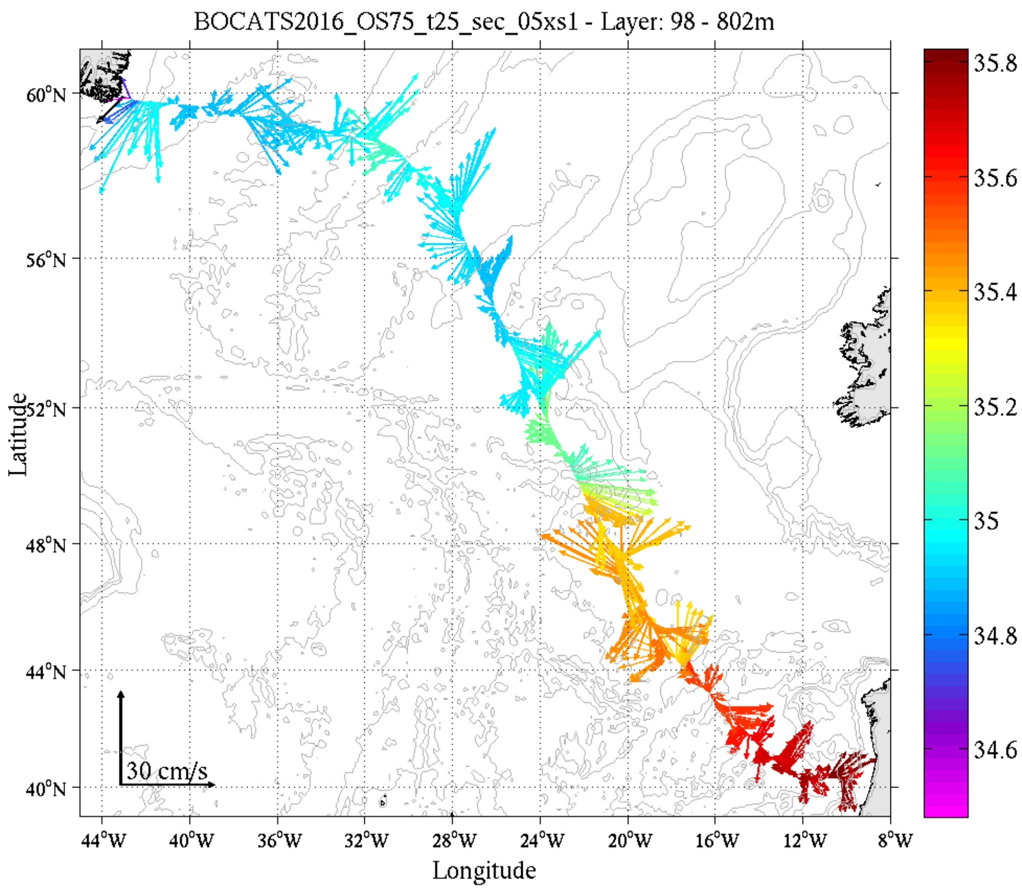


***Figure 8**: Currents averaged between 100m and 800m along the BOCATS-OVIDE section, measured by the OS75*

The data were all processed by P. Lherminier with the Matlab software CASCADE V7.0 created and maintained at the laboratory. The alignment (45.13°) and amplitude of the OS75 were good and not corrected. To improve the estimate of the vertical velocities, the pitch was corrected by 2.5°. The alignment already implemented in VmDAS for the OS150 was obviously wrong. The correct value is most likely 45.78°. The amplitude correction has different estimates depending on the way to estimate it (bottom track or correlation method). This is why we ended the cruise with a cross on the Iceland Shelf to estimate it more precisely, along with the alignment; those data will be analyzed on shore. However, with unchanged amplitude, an alignment corrected to 45.78° and a pitch corrected by 2.5°, we obtained a mean difference between both OS of 0.03 and 0.56 cm/s for the zonal and meridional velocities respectively in the 80-180m layer, with a standard deviation of 1.7 cm/s. This is better than the precision of the instruments given by the manufacturer (RDI) in the chosen configuration, i.e. 2.5 cm/s for the OS75 and 1.25 cm/s for the OS150.

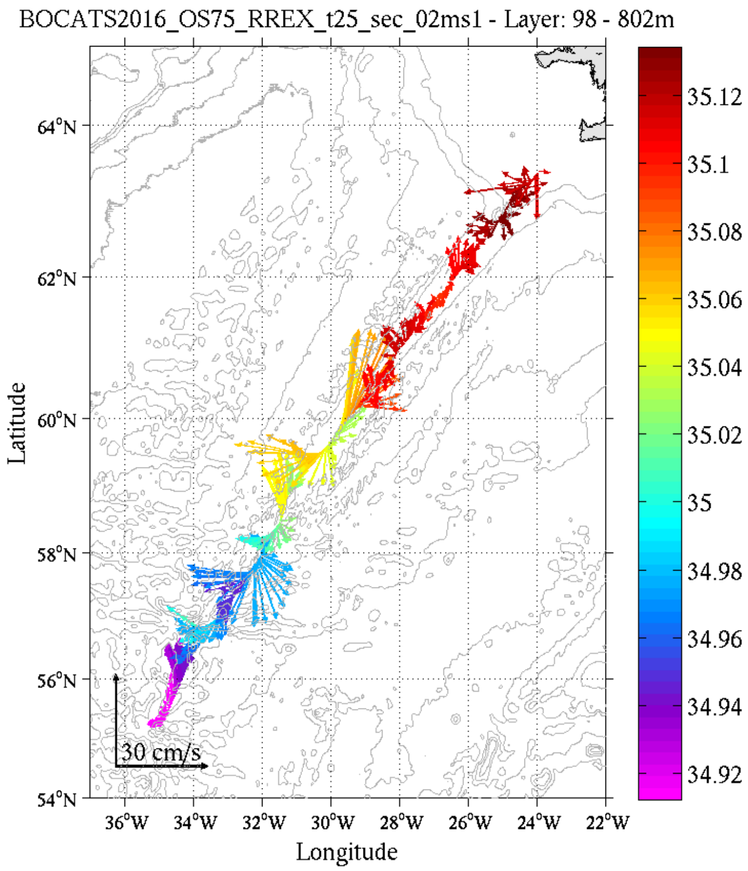


Figure 9: *Currents averaged between 100m and 800m along the Reykjanes Ridge section, measured by the OS75*

On the OVIDE section (figure 8), the SubArctic Front that delimits the eastern rim of the Subpolar Gyre stands out at 49.5°N by its gradient of salinity (from 35.4 to 35.1) and the strong northwestward current. Further north, the circulation around Reykjanes Ridge and the Western Boundary Current (WBC) were found apparently similar to previous observations, although the WBC appeared stronger when we reran the section backwards 2 days later. As usual, the North Atlantic Current between 44°N and 55°N is very meandering.

Along the Reykjanes Ridge, the currents were significantly influenced be the tide. Once de-tided (Fig. 9), the flux was mainly westward, except for an eddy at 58°N. The positive gradient of mean salinity reveals the increased importance of Atlantic Central Water on the ridge when going north.

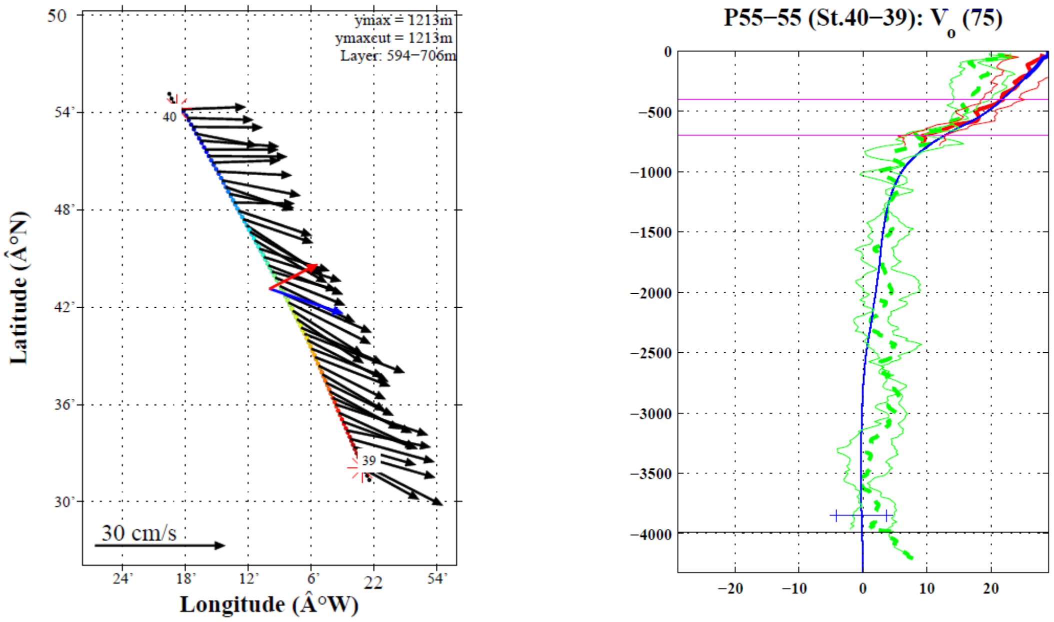


Figure 10: *(a) Currents in the 600-700m deep layer between stations 39 and 40, average in blue and projection in red. (b) Comparison of geostrophic profile (blue), LADCP profiles and their average (green) and SADCP mean velocity profile (red).*

*First transport and MOC estimates (**P. Lherminier**)*

The high quality of the OS75 and hydrological data allows the synthesis of those data with an inverse model to estimate the transports across the OVIDE section. The OS75 velocities are averaged between stations and projected perpendicularly to the section (Fig. 10, left). An error is set based of the standard deviations of the velocity profiles. This mean profile of velocity is compared with the geostrophic velocity profile calculated from the horizontal density gradient of the CTD data (Fig. 10, right). The example shown on Figure 10 is a pair of stations in the SubArctic Front. The OS75 data helps to determine the velocity at the reference level in the model (chosen at 3800m in the example below).

The depths and the a priori velocities at the reference levels were chosen as for the previous OVIDE cruises. The inverse model is also constrained by an overall transport of 1 ± 3Sv northward across the section (corresponding to the Arctic mass balance). The transport of silicates was computed but not used as a constraint. The preliminary inversion gives results that are very consistent. The amplitude of the MOC_σ is found at 18.2 Sv with an error of about 2 Sv. The final net transport across the section has the same value than the constraint: 1 ± 3 Sv. The heat flux across the section is found at 0.53 ±0.07 PW, and the silicate transport at 38 kmol/s to the north (a little high but very reasonable for preliminary data). The baroclinic transport profiles (Fig. 11) shows that BOCATS sampled the strongest MOC of the last 14 years.

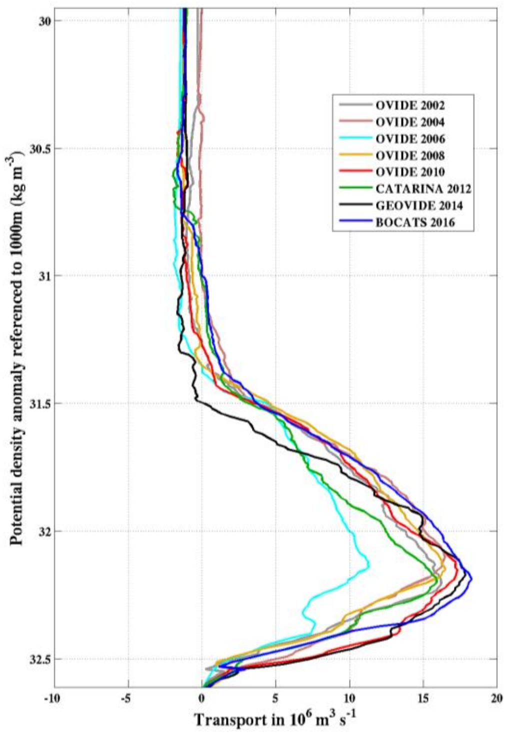
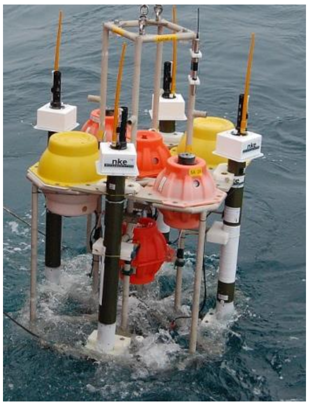


Figure 11: *Transports across all OVIDE sections integrated in sigma layers and accumulated from the bottom after a sign change; the amplitude of the MOC_σ is at the maximum of each curve.*

4. DEPLOYMENTS OF BUOYS AND ASFAR *(S. Leizour, M. Hamon, P. Le Bot & P. Branellec)*

The PROVOR floats are part of the international ARGO network. Each float drifts during ten days at around 1000 m, then dives down to 2000 m and comes up to the surface and collects vertical profiles of data. The data are transmitted (Argos/Iridium) to satellites when the float is at the surface. After transmission, the float starts a new cycle and dives to its parking depth at 1000 m for the next 10 days. The floats called PROVOR-DEEP have a deeper parking depth (2100m) and profile down to 3500m. All floats are equipped to measure temperature and salinity. Some of them, called "DO", also have dissolved oxygen sensors.



A launching platform, called ASFAR (Autonomous System For ARGO float Release), was developed at LOPS (above on the left). It is a structure equipped with 4 ARGO floats of ARVOR type that are released one by one every 3 months after the deployment of the platform on the ocean floor. It aims at sampling specific areas where we need more information on the seasonal variability of the water masses.

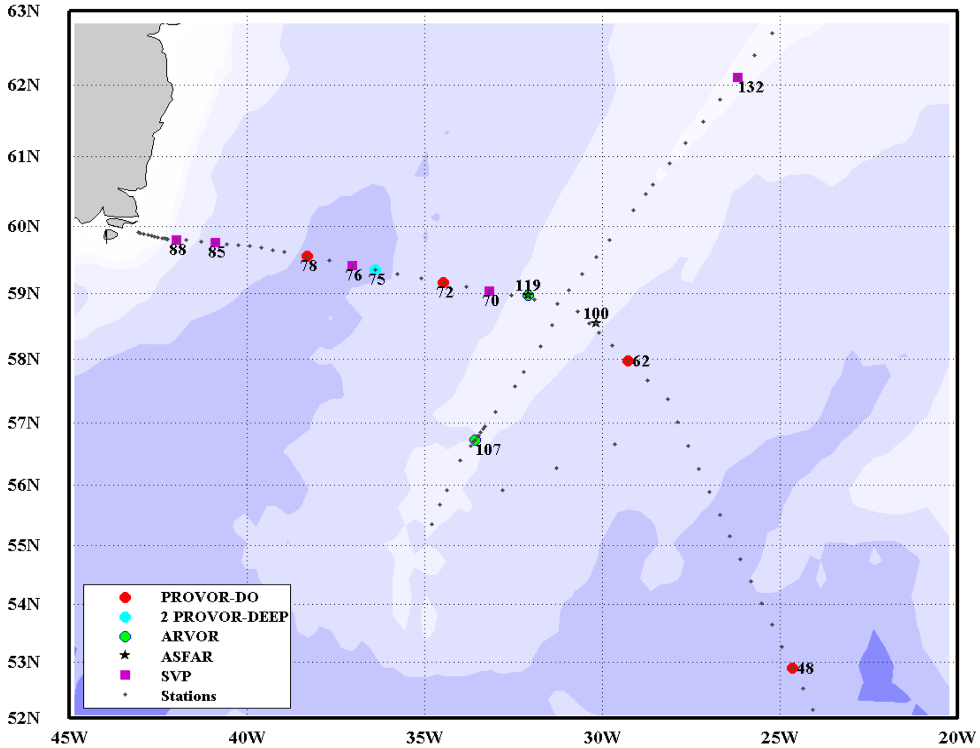


Figure 12: *Position of the float and ASFAR deployments with station numbers. At station 107, in Bight Fracture Zone, 2 ARVOR were deployed.*

At the beginning of the cruise, a total of 14 floats (4 PROVOR-CTS3-DO with oxygen sensor, 8 ARVOR for the ASFAR, 2 PROVOR-DEEP) and one new ASFAR were embarked. We also recovered 2 ASFAR and 3 ARVOR floats.

During the cruise, the 4 PROVOR-CTS3-DO floats and the 2 PROVOR-DEEP were deployed in the Subpolar Gyre (see Fig. 12 and Fig. 4). We also recovered 2 ASFAR (stations 100 and 119) and refit the second one after correcting a problem of burn-wire in the release system. Then we re-deployed 2 ASFAR (one new and one refit) equipped with the 8 new ARVOR at the same position (table 5). The 3 ARVOR floats that could be recovered from the old ASFAR were re-programmed and deployed (Fig. 12, Table 4).

Table 4 .- Position of the ARGO float deployments

	SERIAL NUMBER	WMO NUMBER	St.	TIME	LATITUDE	LONGITUDE	SEA STATE	BATHYM.
CTS3 DO	OIN-12-DO-S31-01	6901457	48	05/07/2016 23:54	52°52,54 N	24°38,72 W	moderate	3646m
CTS3 DO	OIN-14-DO-S31-04	6901753	78	12/07/2016 01.30	59°33,64 N	38°18,99W	moderate	3042m
CTS3 DO	OIN-14-DO-S31-05	6901754	72	10/07/2016 23:20	59°09,98 N	34°28,47 W	moderate	2505m
CTS3 DO	OIN-14-DO-S31-06	6901755	62	09/07/2016 3:45	57°57,86 N	29°16,08 W	very rough	2144m
DEEP	OIN-015-ARDP-09	6901760	75	11/07/2016 12:00	59°22,90 N	36°23,64 W	calm	3097m
DEEP	OIN-015-ARDP-11	6901762	75	11/07/2016 12:00	59°22,09 N	36°23,61 W	calm	3097m
ARVOR	OIN-AR14-058	6901719	107	22/07/2016 2:42	56º 43,47 N	33º 35,56 W	rough	2377m
ARVOR	OIN-AR14-059	6901720	107	22/07/2016 2:42	56º 43,47 N	33º 35,56 W	rough	2377m
ARVOR	OIN-AR14-065	6901726	119	23/07/2016 19:50	58º 58,40 N	32º 05,82 W	calm	1710m

Table 5 .- Position of the ASFAR deployments after triangulation.

	St.	DEPLOY TIME	LATITUDE	LONGITUDE	BATHYMETRY
ASFAR 03	100	18/07/2016 19:00	58°32,674 N	30°11,235 W	1848m
ASFAR 04	119	23/07/2016 19:30	58°58,269 N	32°05,775W	1707m

Table 6 .- Position of the drifting buoys of MetOcean Surface Velocity Program –SVP.

	S/N	IMEI	Latitude	Longitude	Depth	Station	OMM
SVP 1	J07AHZ	300234063738740	59°02,54 N	33°11,52 W	2291m	CTD 70	6401552
SVP 2	J079OB	300234063730820	59°25,65 N	37°02,31 W	3111m	CTD 76	6501557
SVP 3	J07AHV	300234063739800	59°45,45 N	40°54,40 W	2285m	CTD 85	6501556
SVP 4	J07A24	300234063737900	59°48,02 N	42°00,10 W	1734m	CTD 88	6501558
SVP 5	121390	300234063121390	62°06,06 N	26°12,41 W	760m	CTD 132	6401500

The French meteorological office gave us 5 drifting buoys that we deployed in the Subpolar Gyre (Fig. 12, Table 6). The MetOcean Surface Velocity Program (SVP, iSVP) drifting buoy is a Lagrangian current-following drifter, designed to track water currents (15 m depth) beneath the ocean surface. It is equipped with a sea surface temperature sensor and a barometric pressure sensor.

5. SAMPLING AND CHEMICAL ANALYSIS

Seawater sampling

A total of 13098 samples were collected during BOCATS cruise from the 28 Niskin bottles attached to the CTD-rosette. The sampling of the different variables followed the strict order given in Table 1. The detailed samples collected by variable in each station and depth are listed in the Table of the Annex I.

Table 7: *Number of samples collected during BOCATS cruise*

Variable	**Number of**
CFC	504
Oxygen	2472
N_2O/CH_4	709
pH	2476
C_T	307
DOC	329
Alkalinity	1010
Nutrients	2502
Salinity	2501
^{18}O and ^{13}C	288

*CFCs (**M de la Paz & S. Fdez Bastero)**.*

CFC samples were taken every other station. The analyses of these samples with respect to the components CFC-11 and CFC-12 will be performed at the gas chromatography lab at the Institute of Environmental Physics, ***University of Bremen***, after the cruise. These sea water samples were collected in so called through-flow containers, which consist of a glass ampoule (volume ~ 100 mL) connected to a head carrying a movable central and a fixed side tubing, both made of stainless steel. After flushing with water from the Niskin bottles, the side tubing was closed with a plug. Later on, purified nitrogen was inserted into the side tubing, thereby creating a headspace in the neck-part of the ampoule. This neck part was then flame sealed, and the remaining molten glass pieces were stuck to the ampoules after cooling. In order to determine the CFC concentration, the total weight of the flame sealed ampoules has to be known in addition to their net weight, which has been determined prior to the cruise at the Bremen lab.

Altogether, 504 CFC samples have been taken during the cruise, out of these 17 are double samples. Due to their time dependent input into the ocean, CFCs carry information on the age and the ventilation of water masses. It is also possible to infer the concentration of anthropogenic carbon from the CFC/age data. Special focus of the analyses will be on the different components of North Atlantic Deep Water and Labrador Sea Water and their variability compared to previous cruises.

*Oxygen (**P. Le Bot & P. Branellec))**.*

With the main purpose to know the oceanic ventilation and also to estimate the anthropogenic CO_2, and additionally for calibrating the O_2 sensor of CTD, samples of O_2 were taken in most of the stations at 28 depths. The O_2 samples were analyzed following the widely applied Winkler method. The O_2 samples were always the first in being taken from the Niskin bottles of the rosette or after CFC samples when they were sampled. Samples were collected in calibrated flasks (~120 mL) with a PVC pipe avoiding the bubble formation. Sample fixation (precipitation) were done by adding 0.6 mL of manganous salt ($MnCl_2 \cdot 4H_2O$) and 0.6 mL of alkali-iodide solution (NaOH + NaI). These samples were stored at darkness at least 12 hours before being measured. Then, 1 mL of sulphuric acid is added to dissolve the precipitate and to titrate the O_2 sample with thiosulfate 0.01N using an automatic 5 mL burette "Titrando Metrohm". Taking into account the stoichiometry and the volume of thiosulfate used, O_2 concentration is obtained in µmol kg^{-1}.

O_2 concentration distribution of OVIDE section is represented using the Ocean Data View program (ODV) (Schlitzer, 2011) in figure 13. This figure is made using the Winkler measurement being different to the Figure 6 that used the data of the O_2 sensor of the CTD

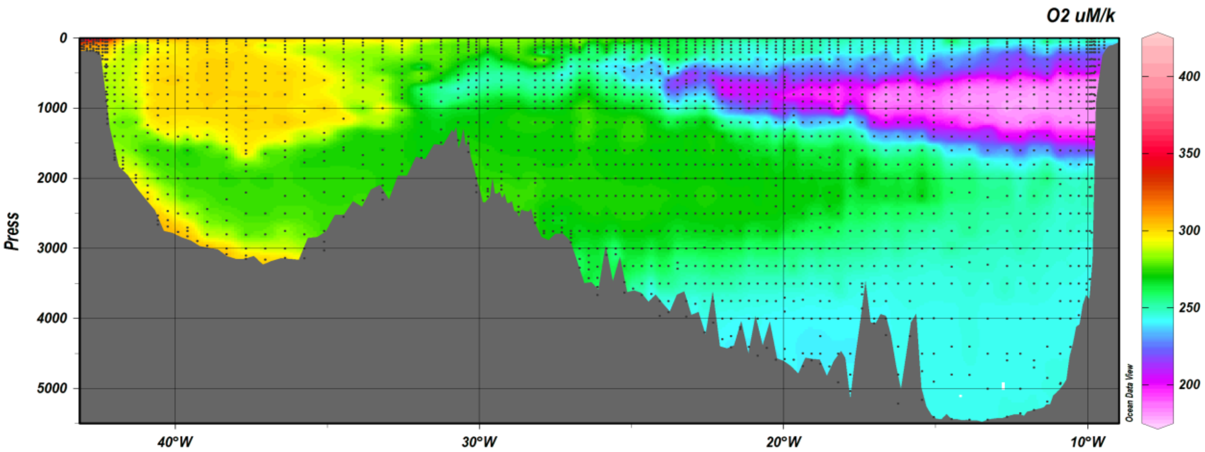


Figure 13: *O_2 distribution along the OVIDE section using the Winkler measurements.*

*N_2O and CH_4. (**M de la Paz & S. Fdez Bastero**)*.

During the BOCATS cruise discrete samples were taken every other station. For each water depth, two replicates were taken from the Niskin bottles after arrival to the deck. Altogether, 709 duplicated samples have been taken during the cruise for N_2O and CH_4 analysis. The right sampling order (according to solubility of the different gases), should be after the CFC´s and oxygen sampling. Samples were taken in 100 mL vials for the simultaneous analysis of N_2O and CH_4. Vials are filled using a silicon tube squeezing air bubbles to assure air bubble free sampling. The silicon tube is placed to the bottom of the vial, then leave overflow seawater at least 2 volume and finally close vial with a rubber plug under running water. Close attention is paid when closing the vials avoiding air bubbles trapped in the sample. When all samples for one station are collected, the vials are close with an aluminum capsule using a crimping tool. The samples were poisoned right after sampling one station using saturated $HgCl_2$, and stored upside down for the later analysis after the cruise. The N_2O and CH_4 concentration will be determined by gas chromatography in the laboratories of the IIM-CSIC following the procedure described in *de la Paz et al.* (2015). Samples will be analyzed with a static equilibration method: A headspace of 20 mL compressed a secondary standard was added to the sample vial and left to equilibrate with the liquid phase for at least 8 hours. Afterwards subsamples were taken from the headspace and injected automatically into the gas chromatographic system. N_2O and CH_4 are determined simultaneously ECD and FID detector respectively.

*pH. (**M. García-Ibáñez, E. F. Guallard & X. A. Padín**).*

Seawater pH samples were taken at 28 levels in all the stations along the cruise section. pH samples were taken directly from the Niskin bottles into special optical glass spectrophotometric cells of 28 mL and 100 mm of path length. These cells were carefully stored in a thermostatic bath at 25.0ºC approximately one hour before the analysis. pH measurements were performed using the spectrophotometric method described in Clayton and Byrne (1993). This method consists of adding 75 µL of m-cresol purple to the seawater sample and measuring its absorbance at 3 wavelengths, i.e., λ_{HI} =434 nm; λ_I =578 nm and $\lambda_{non\text{-}abs}$=730 nm. The reaction of interest at seawater pH is the second dissociation $HI^-_{(aq)}=H^+_{(aq)}+I^{2-}_{(aq)}$ in which I is the indicator. Then, the total hydrogen ion concentration can be determined by $pH=pK_2+\log_{10}[I^{2-}]/[HI^-]$. Absorbance measurements were performed with a Perkin Elmer Lambda 859 UV/VIS spectrometer. pH values were calculated following the equations described in Dickson *et al*. (2007), who include a correction due to the difference between seawater and the indicator acidity (ΔR).

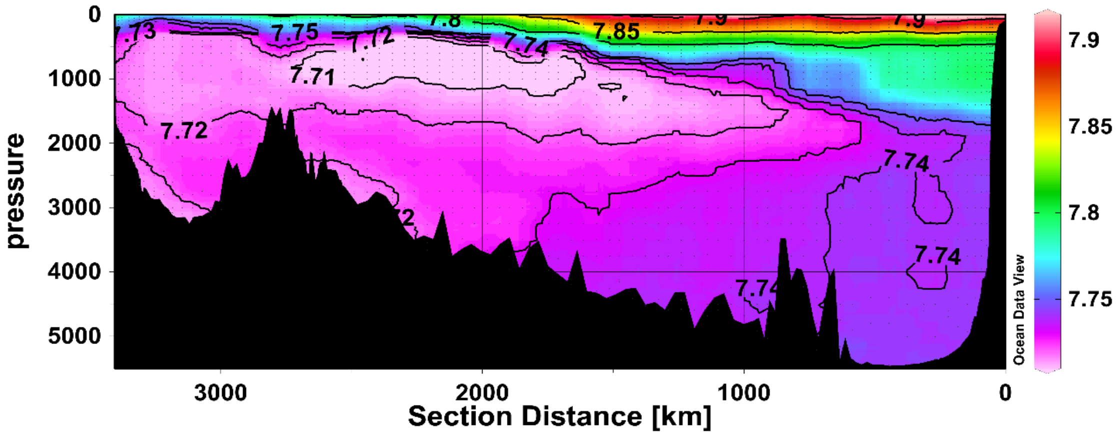


***Figure 14:** Vertical distribution of pH_{T25} along the BOCATS section.*

The preliminary pH results of the BOCATS section on the total scale and 25ºC (pH_{T25}) were plotted using ODV (Schlitzer, 2011), as it is shown in figure.14. The minimum of pH_{T25} is associated to the layer of low oxygen. The upper layer has higher pH because of the biological CO_2 fixation. The Mediterranean Water also shows a relative pH maximum at 1000 dbar close to Iberian Peninsula. In the Irminger Sea, the low pH of Denmark Strait Overflow Water is associated with the high content of anthropogenic CO_2.

*Total alkalinity (A_T) (**M. García-Ibáñez, E. F. Guallard & X. A. Padín**).*

Samples of A_T were taken in 64 stations along the cruise section, almost half of the total stations. Clean borosilicate glass bottles (600 mL) were rinsed and filled from the bottom using a silicon tube, overflowing half a volume. Samples were stored before the on board analyses. Measurements of A_T were done by a one endpoint method using an automatic potentiometric titrator (Dosino 800 Metrohm) with a combined glass electrode (Perez and Fraga, 1987). A Knudsen pipette (~185 mL) was used to transfer the samples into an open Erlenmeyer flask in which the potentiometric titration was carried out with HCl (0.1 M). The final volume of titration was determined by means of two pH reading after the endpoint of 4.45 is reached (Mintrop et al., 2000). These A_T measurements were done in 13 sets of analysis. In order to estimate the accuracy of the A_T method, measurements of certified reference material (CRM) of CO_2 from batches 135 and 155 provided by Dr. Andrew Dickson were analyzed. In addition, an extra calibration (substandard) was made by using a closed container of 75 L filled with open ocean surface water.

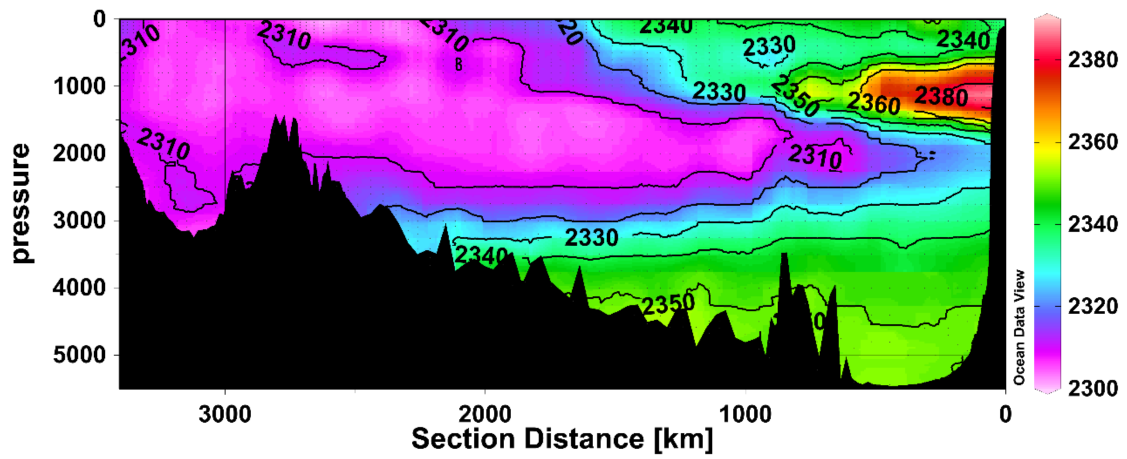


***Figure 15:** Vertical distribution of A_T distribution along the BOCATS section*

The distribution of A_T concentrations in $\mu mol \cdot kg^{-1}$ along the BOCATS cruise is shown in the Figure 15. Note that the plot accounts for measured and interpolated data (30%). The maximums at the upper layer toward the east and at 1000 close to the Iberian Peninsula are associated to the high saline waters. However, the maximum in deep waters is due to the advection of Antarctic waters with high A_T concentrations. The water formed in the subpolar gyre has low and very homogenous A_T concentrations (2310-2315 $\mu mol \cdot kg^{-1}$).

*Total inorganic carbon (C_T) (**M. García-Ibáñez, E. F. Guallard & X. A. Padín**)*.

During the cruise a total of 307 samples of C_T were taken (*Figure 16*). Samples of C_T were collected in 5-15 levels in 29 stations in order to check C_T computed from pH and A_T measurements. Usually, fifteen levels were sampled each four stations. Amber vials (100 ml) were rinsed and filled from the bottom using a silicon tube, overflowing half a volume. avoiding bubble generation directly from the Niskin bottles. Samples had been poisoned with mercury ($HgCl_2$) and storage at a cool dark-isolated place. A headspace of 1% of the bottle volume is left. Then, a saturated aqueous solution of mercuric chloride (75 µL) was added to the samples as a preservative of fouling formation. Afterwards the bottles were closed with an aluminum capsule using a crimping tool, and stored in a cool dark-isolated place. These samples will be analyzed in the laboratories of IIM-CSIC in Vigo (Spain) using an AIRICA equipment. The analysis consists on acidifying an aliquot of 2 mL with H_3PO_4 in a glass stripping chamber. Then, the resulting CO_2 gas is carried in the equipment by a free-CO_2 gas (N_2) into a non-dispersive infrared gas analyzer (LICOR 6262). Certified Reference Material of CO_2 analyses were performed in order to control the accuracy of C_T measurements.

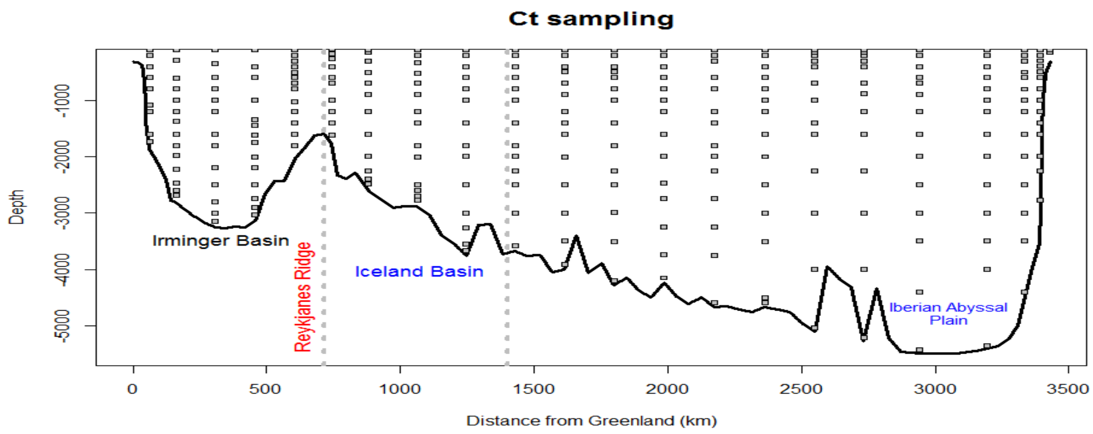


Figure 16: *Total inorganic carbon (C_T) sampling: relative positions of the samples in the water column. Main basins are indicated.*

The C_T was also computed from pH and A_T using the thermodynamic constants determined by Mehrbach et al. (1973) and refitted by Dickson and Millero (1987). The C_T distribution along the BOCATS section is show in the Figure 17. The C_T distribution follows the same pattern than the A_T distribution, except in the upper layer where the biological CO_2 fixation decreases the C_T concentrations.

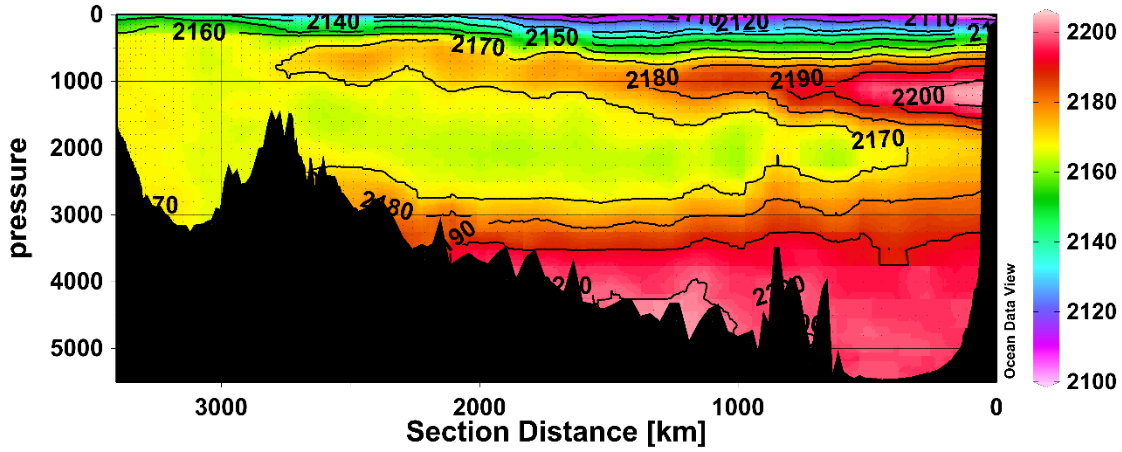


Figure 17: *Vertical distribution of C_T distribution along the BOCATS section*

The first estimation of anthropogenic CO_2 (C_{ant}) was performed using the phi-method (Vazquez-Rodríguez et al., 2009, Perez et al. 2008; Rios et al. 2010), which is a back-calculation technique. The distribution of C_{ant} along the main section is shown in Figure 18. High values of C_{ant} are detected in the thermocline showing a general decrease toward the bottom. Deep waters in the Iberian Basin show very low values. In the Irminger Sea, the thick layer of Labrador Sea Water contains high values of C_{ant}, as well as the thin layer of Denmark Strait Overflow Water just in the bottom.

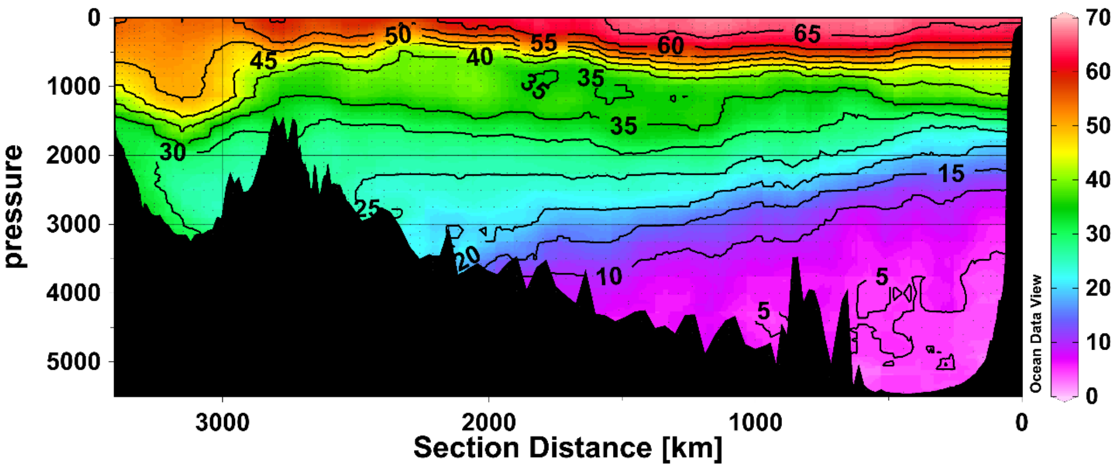


Figure 18: *Vertical distribution of C_{ant} distribution along the BOCATS section.*

*Nutrients (**F. Alonso-Pérez & M. Fontela**)*

Dissolved nutrients were sampled after tracer gases, dissolved oxygen, total inorganic carbon, pH and alkalinity. Samples were withdrawn to 30 mL solid-polyetilene containers after rinsing twice with the same water. Samples were preserved in the dark at 4ºC when analyses started more than one hour after collection, and they were analyzed no more than 12 hours after collection. Nutrient analyses were performed with a SKALAR segmented flow auto-analyzer.

Nitrate+nitrite, phosphate and silicate were simultaneously determined. Determination procedure was settled as a pumping cycle of 120 seconds sucking the sample and 80 seconds sucking from a milli Q water reservoir. Every analysis spent ~8 mL of sample. Determinations of nitrate, phosphate and silicate were carried out following methods described by Hansen and Grassoff (1983) with some improvements (Mouriño and Fraga, 1985).

Calibration. Primary standards for nitrate+nitrite, phosphate and silicate were performed from nutrient salt materials (KNO_3, KH_2PO_4 and Na_2SiF_6, respectively) dried 24 hours over silica gel prior to weigh. Primary solutions were performed with milli Q in calibrated volumetric flasks. A stock standard solution was prepared by mixing the three primary standards and preserved in the dark at 4 ºC. Daily working standard solutions were produced dissolving different volumes of stock standard solution in low nutrient seawater (LNSW), filtered through 0.2 µm. These solutions were prepared every two days and preserved in the dark at 4 ºC. Concentrations of each nutrient in the working standard solution are showed in Table 8.

Table 8.-. Working calibration standards

	Volume (mL)		Concentration (µmol l^{-1})			
STD	**Stock STD**	**Final Volume**	**NO_3^-**	**NO_2^-**	**HPO_4^{2-}**	**SiO_2**
1	1	500	7.960		0.532	16.307
2	2	500	15.920		1.065	32.613
3	3	500	23.880		1.597	48.920
4	3	500		23.895		

Table 9: Nutrient concentrations ± standard deviation for Low Nutrient Sea Waters and North East Atlantic Deep Water Lower.

	Concentration (µmol l^{-1})		
	NO_3^-	**HPO_4^{2-}**	**SiO_2**
LNSW	0.02 ± 0.08	0.00 ± 0.03	0.57 ± 0.05
NEADWL	22.58 ± 0.22	1.44 ± 0.02	46.77 ± 1.20

A LNSW set was used for the whole the cruise. Nutrient concentrations of these LNSWs are showed in table 9. At station 12, water deeper than 4000 m, corresponding to North East Atlantic Deep Water Lower waters (NEADWL) was collected and filtered through 0.2 µm in order to have a high nutrient standard. NEADWL standard was since then measured every day of analysis; its nutrient concentration is showed in table 8. Regarding linearity, the analytical system of nitrate showed a linear response over the working range.

Precision. The WOCE requirements for precision (Joyce et al., 1991) are silicate 0.2 % full scale (150 µmol kg^{-1}) nitrate 0.2 % full scale (40 µmol kg^{-1}) and phosphate 0.4% full scale (2.5 µmol kg^{-1}).

Sampling error and duplicate samples. In order to test sampling error, 32 pairs of bottles were fired at the same depth at different stations. Absolute differences average between samples pairs are showed in table 10. Silicate and phosphate errors are within the WOCE requirements. However, these errors are slightly higher in the case of nitrate.

Table 10.- Summary of differences between samples fired at the same depth

	Nitrate	**Phosphate**	**Silicate**
Absolute differences	0.12	0.006	0.12
C.V.fs (%)	0.29	0.23	0.08
WOCE requirements	0.20	0.40	0.20

Consistency of measurements. Quality control. At station 0, the 28 oceanographic Niskin bottles were fired at the same depth, 4854 m. Results are showed in table 11, standard deviation was 0.23 for nitrate, 0.01 for phosphate and 0.26 for silicate. Standard deviations referred to full scale were lower than WOCE requirements in the case of silicate and phosphate and 0.25 % higher for nitrate.

Table 11.- Summary of differences between quality control measurements

	Average	**S.D.**	**C.V. fs (%)**
Nitrate	23.06	0.23	0.45
Phosphate	1.30	0.01	0.24
Silicate	47.77	0.26	0.17

Preliminary results. The vertical distributions in the concentrations of nitrate, phosphate and silicate for the Ovide section are showed in Figure 19.

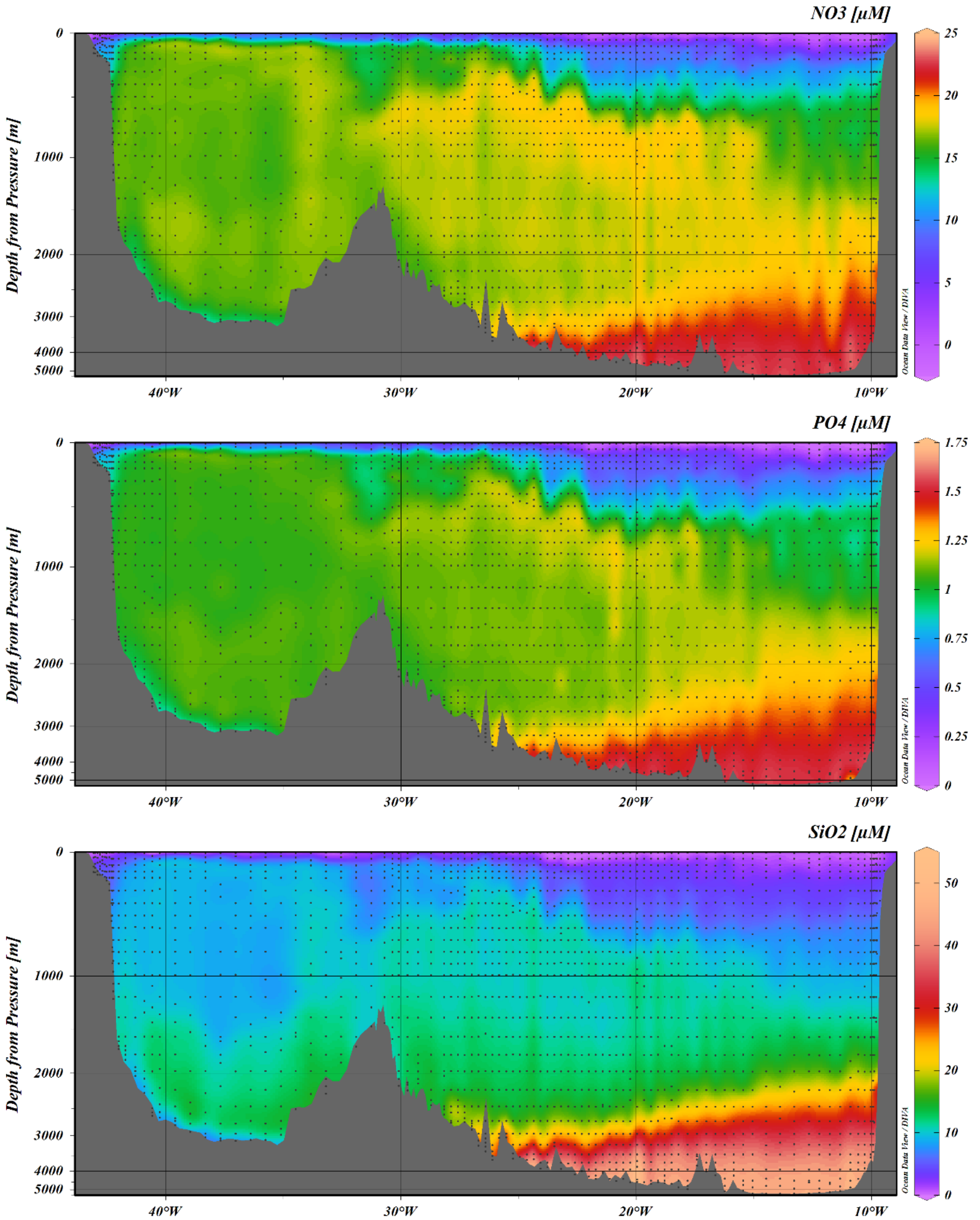


Figure 19: *Vertical distribution of nitrate, phosphate and silicate (µmol kg^{-1}) along the section OVIDE.*

*Dissolved Organic Carbon sampling (**M.J. Álvarez, V. Pelayo & M. Fontela**)*

Sampling planning for dissolved organic carbon (*DOC*) was similar to total inorganic carbon (C_T). A station each four was sampled at fifteen levels approx. The sample distribution is surface-intensified (Fig. 20). At some points extra bottoms samples were taken to characterize specific watermasses. Previously clean amber vials (20 mL) with polypropylene caps were rinsed and filled with the sample. Immediately, has been acid-leached with phosphoric acid (H_3PO_4) and stored in a fridge (3-4ºC). There are replicates for all the points, to compensate possible contamination events. A total of 329 samples are going to be measured on land during August-September 2016 using an IRGA Shimadzu TOC5000 analyzer. The measurement accuracy will be tested with certified reference materials provided by Dr. Hansell (University of Miami).

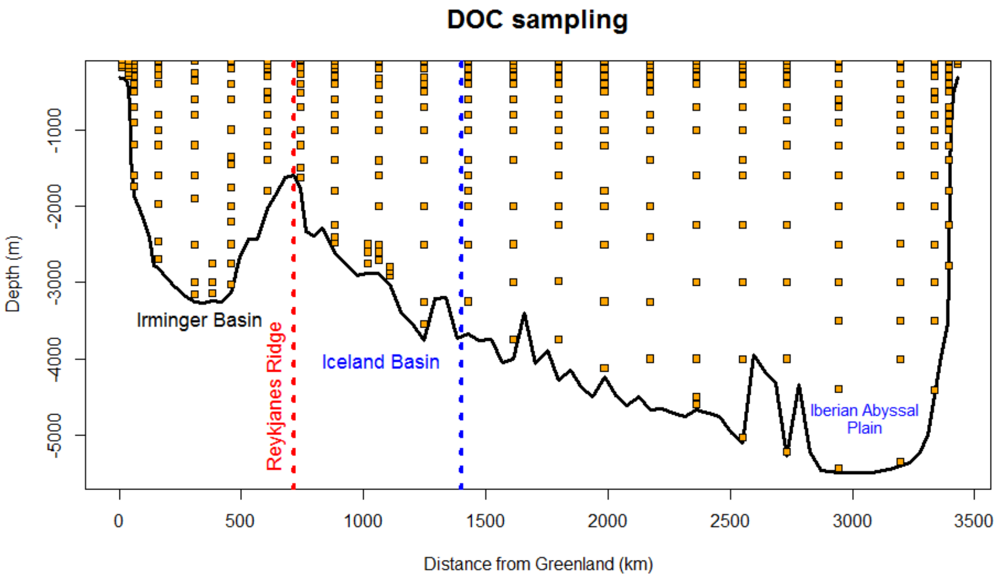


Figure 20: *DOC sampling. Relative positions of the samples in the water column. Main basins are indicated.*

*Isotopes $\delta^{18}O/\delta D$ sampling (**M.J. Álvarez, V. Pelayo, M. Fontela**)*

At some discrete points, isotopes samples were collected. It is an international collaboration with Dr. Voelker of Instituto Português do Mar e da Atmosfera (IPMA- Divisão de Geologia e Georecursos Marinhos) and Dr. Reverdin of Laboratoire d'OCeanographie et du Climat of Institut Pierre-Simon-Laplace (LOCEAN-IPSL). Although slightly similar, methodologies differ: 10 mL glass transparent flasks closed by crimped for the IPMA; and amber vials with cap for LOCEAN. Both were first rinsed and then filled with the sample avoiding bubble formation. A total of 208 samples were taken (see sampling table in Annex I).

6.- UNDERWAY MEASUREMENTS *(A. Padín)*

The underway measurements of sea-surface and atmospheric molar fractions of CO_2 (xCO_2sw and xCO_2atm, respectively) along the BOCATS track were performed with model 8050 pCO2 measuring system of General Oceanics whose design and mode of operation was designed pCO2 experts. The analytical principle is based on the equilibration of atmospheric air with the seawater sample under analysis. The system is compact and operates by directing seawater flow through a chamber (the equilibrator) at a rate of 2 L min-1 where the CO_2 contained in the water equilibrates with the gas present in the chamber (the headspace gas).

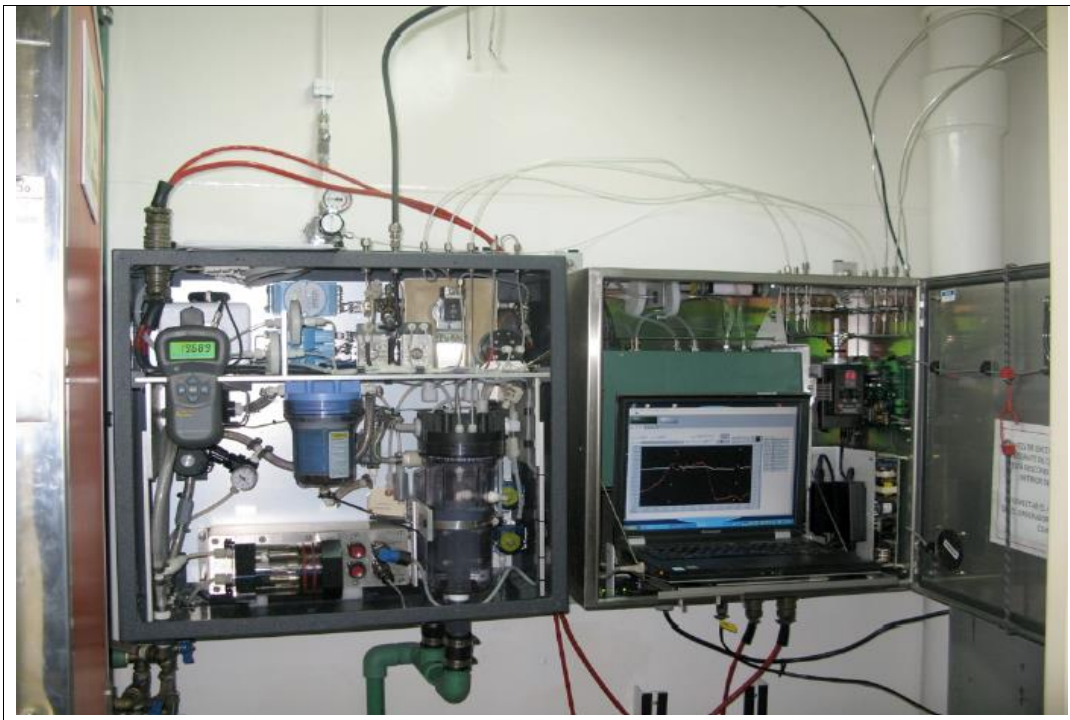
The analyzer used to measure the CO_2 in the sample gas stream is the non-dispersive infrared analyzer LI-7000 built by LICOR. The CO_2 measurements are corrected for the dilution by water vapor and band-broadening pressure effect by the firmware internal to the analyzer such that they report a dry mole fraction. The LICOR was calibrated regularly by measuring a set of four standards at regular intervals with concentrations that covered the range encountered in the working area, namely, 0, 205, 381 and 504 ppm. A typical analytical cycle in which all measurements were taken at a 1-min frequency consisted of a calibration phase, which involved three measurements of each of the four gas standards. Immediately after calibration, atmospheric air measurements were made as a set of 5 analyses following 100 seawater equilibrated sample measurements. Moreover, other sensors are included in the system for analytical and control quality purposes as a stable Harts digital thermometer with a thermistor probe to measure the temperature of the seawater in the equilibrator and several barometers to monitor pressure inside the equilibrator Pressure is also monitored inside the equilibrator and inside the analyzer.

A thermosalinograph (Sea-Bird SEACAT SBE21) was connected to the same uncontaminated seawater supply. This apparatus recorded underway surface temperature (SST) and salinity (SSS) during the BOCATS cruises.

The air-sea CO2 flux (FCO_2; mol m^{-2} yr^{-1}) was calculated according to:

$$FCO_2 = S\ k\ \Delta fCO_2$$

where “S” stands for the solubility of CO_2 in seawater (Weiss et al., 1974), “k” is the CO_2 transfer velocity (Wanninkhof, 1992) computed using 6-hour wind speed (WS) data obtained from the the cross-calibrated multiplatform (CCMP) winds (Atlas et al., 2011) provided at 6 h time intervals and 0.25º resolution. The calculation of fCO_2sw and fCO_2atm from the raw xCO_2 data were computed following the methods and equations described by Pierrot et al. (2009).



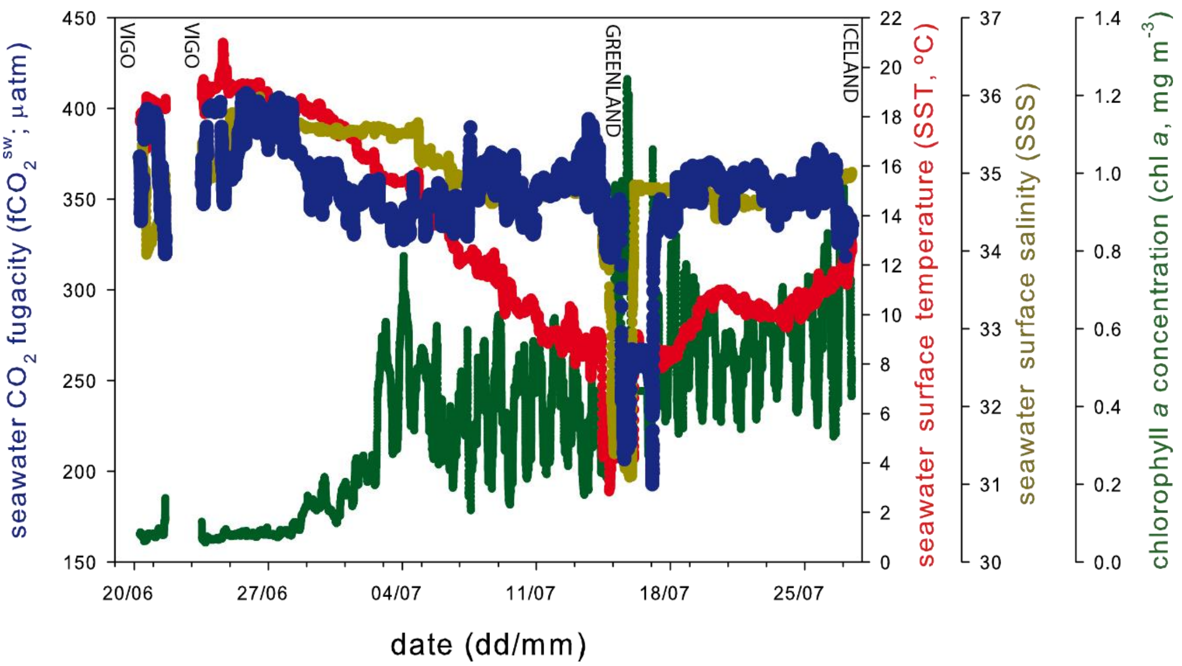


Figure 21: ***(a)*** GO pcO2 system and pCO2 observation along the cruise track or OVIDE line ***(b)*** Values of seawater CO2 fugacity, temperature, salinity and chlorophyll concentration at surface seawater as measured along BOCATS cruise.

A buoy MLI for Sea Surface Temperature measurements was deployed during the test station for checking purposes.

7.- SEDIMENTS SAMPLING *(G. Francés, I. Alejo, Mª J. Álvarez & V. Pelayo)*

Analyses of the recent sedimentary record are mainly addressed to quantify the $CaCO_3$ (as the result of biogenic production and preservation) and the TOC (total organic carbon) content, as well the grain-size of sediments during the last centuries. These data will be correlated with chemical data of the water column and bottom currents velocities measured during the cruise in the same stations with the LADCP. Establishing fluctuations of aforementioned variables along the preindustrial and industrial times enables to detect changes related with natural and anthropogenic CO_2 concentrations and the AMOC (Atlantic Meridional Overturning Circulation) at centennial time scales and their effects on the production and preservation of $CaCO_3$ in the North Atlantic.

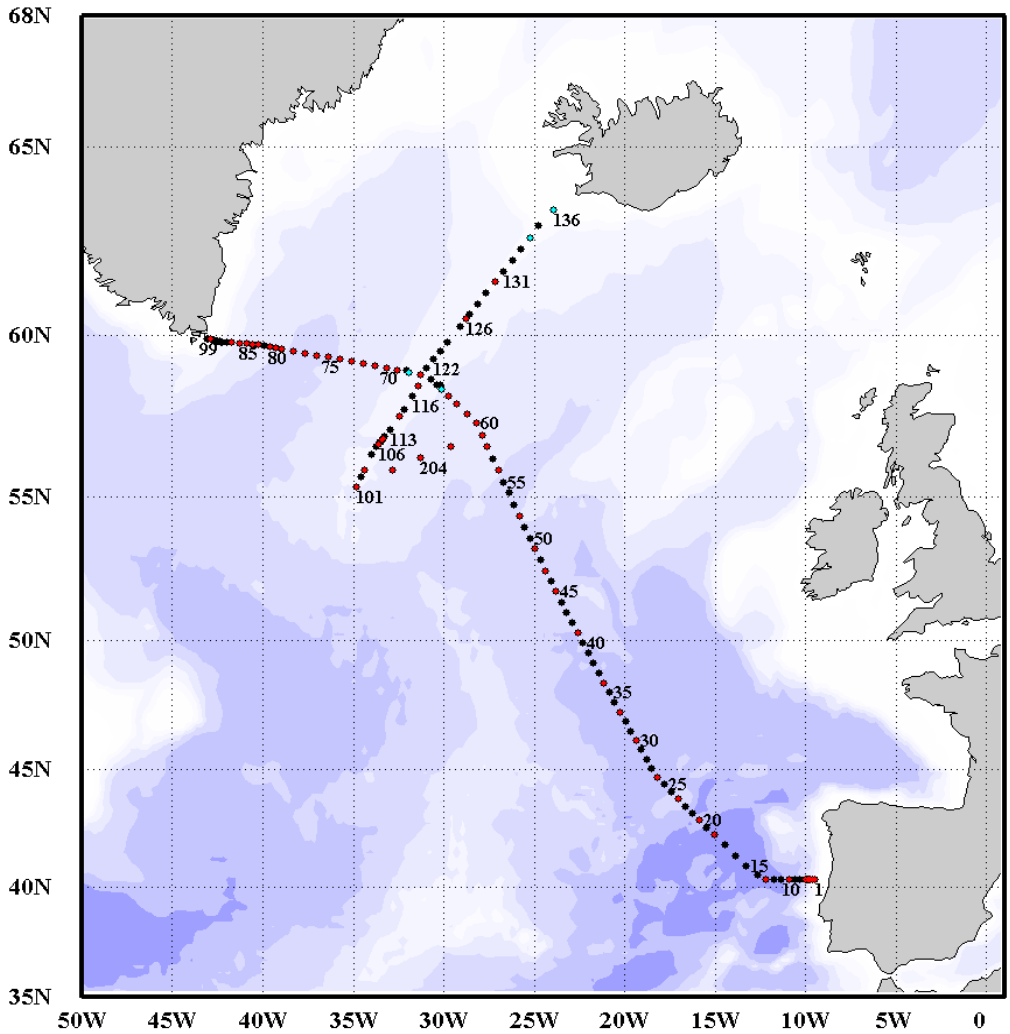


Figure 22: *Map of stations: Red dots: Box-corer samples; Green dots: Shipek samples.*

Objectives

Sediments recovery during BOCATS cruise aims to retrieve surface sedimentary samples from the bottom of the North Atlantic from the Iberian Margin to the Irminger Basin and along the Reykjanes Ridge (from 55ºN to Iceland continental shelf). The shallowest sample has been retrieved at 142 m depth (Iceland continental shelf) and the deepest sample at 5267 m depth (Iberian Abyssal Plain). Most of the samples were obtained at around 2000-4000 m depth in basins currently bathed by different components of the North Atlantic Deep Water (NADW), as the Labrador Sea Water (LSW), Denmark Strait Overflow Water (DSOW) Iceland-Scotland Overflow Water (ISOW) and North-East Atlantic Deep Water (NEADW). The map of box corer and Shipped sampling is given in Fig. 22. More details about bathymetry are given in Fig. 23.

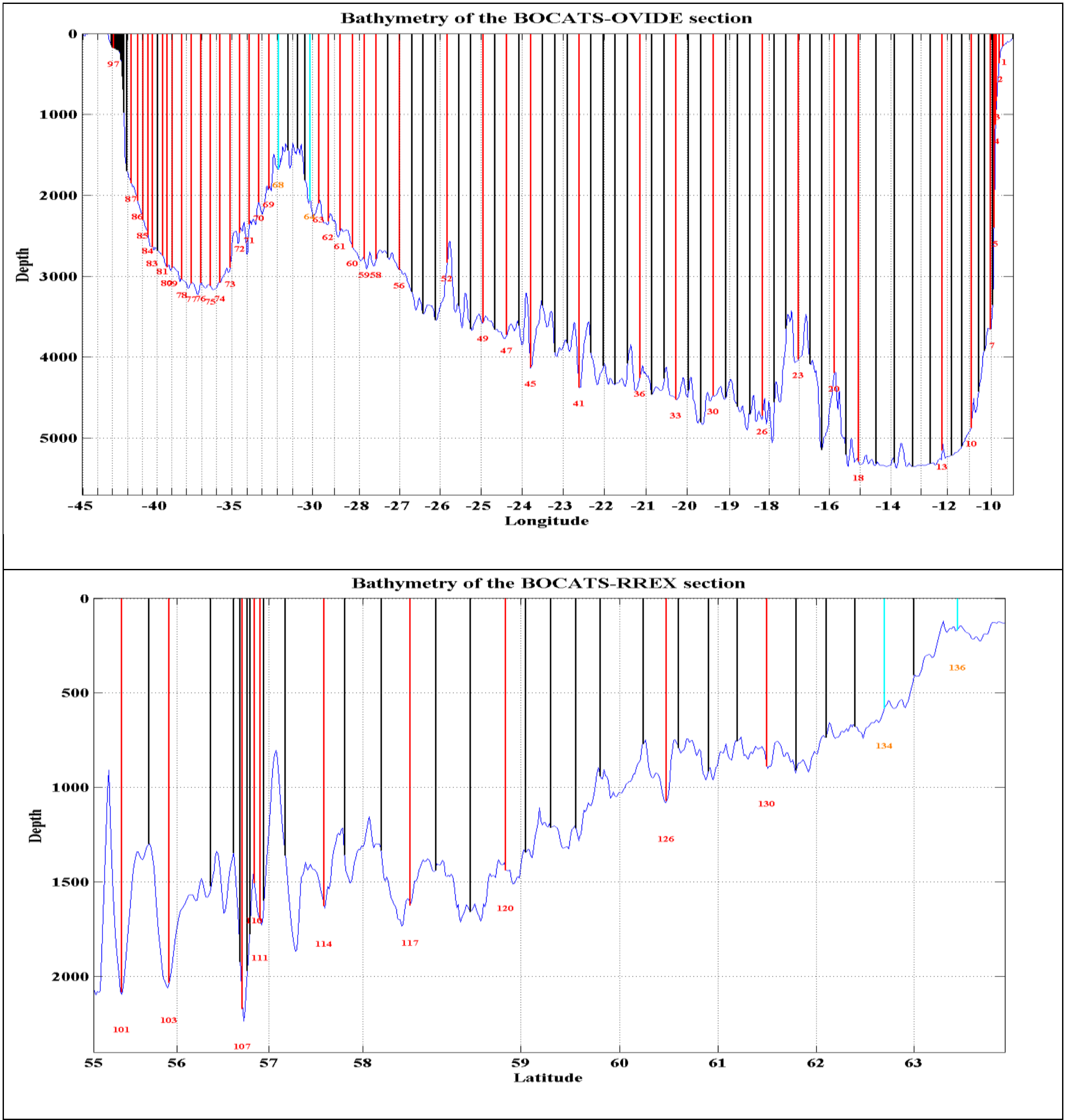


Figure 23: *Profile of OVIDE section (above) and Reykjanes Ridge section (below) (Longitude axis is not at the same scale): Red lines indicate the position of box-corer samples and cyan lines, Shipek samples.*

A list of prospected stations appears in the Table 12.

Table 12: Summary of prospected sediment station.

BOTTOM SEDIMENT SAMPLES				
IBERIAN MARGIN				
Station	**Sample method**	**latitude**	**longitude**	**Depth (m)**
01	BOX-CORER	40.3332	-9.4642	154.7
02	BOX-CORER	40.3345	-9.6432	383.1
03	BOX-CORER	40.3341	-9.7680	814.4
04	BOX-CORER	40.3341	-9.8051	1359.0
05	BOX-CORER	40.3345	-9.8785	2648.9
07	BOX-CORER	40.3340	-10.0340	3524.0
IBERIAN ABISAL PLAIN				
Station	**Sample method**	**latitude**	**longitude**	**Depth (m)**
10	BOX-CORER	40.3343	-10.9050	4817.0
13	BOX-CORER	40.3340	-12.2210	5217.0
18	BOX-CORER	42.2803	-15.0626	5266.9
20	BOX-CORER	42.8849	-15.8517	4179.9
23	BOX-CORER	43.7744	-17.0290	4005.6
WEST EUROPE BASIN				
Station	**Sample method**	**latitude**	**longitude**	**Depth (m)**
26	BOX-CORER	44.6738	-18.2106	4823.0
30	BOX-CORER	46.1691	-19.3763	4607.8
33	BOX-CORER	47.2911	-20.2635	4517.0
36	BOX-CORER	48.4099	-21.1408	4339.0
41	BOX-CORER	50.2823	-22.6084	4141.0
45	BOX-CORER	51.7706	-23.7849	3857.9
ICELAND BASIN				
Station	**Sample method**	**latitude**	**longitude**	**Depth (m)**
47	BOX-CORER	52.5189	-24.3584	3616.9
49	BOX-CORER	53.2653	-24.9480	3543.0
52	BOX-CORER	54.3880	-25.8308	3078.0
56	BOX-CORER	55.8830	-26.9983	2921.3
58	BOX-CORER	56.6310	-27.5884	2748.5
59	BOX-CORER	57.0126	-27.8810	2789.0
60	BOX-CORER	57.3798	-28.1710	2637.6
61	BOX-CORER	57.6740	-28.7225	2487.0
62	BOX-CORER	57.9690	-29.2797	2151.0
63	BOX-CORER	58.2085	-29.7264	2255.7
64	SHIPEK	58.4105	-30.1040	2179.9
64	BOX-CORER	58.4110	-30.1028	2164.8
202	BOX-CORER	56.6565	-29.6427	2770.5
204	BOX-CORER	56.2755	-31.2935	2434.5
206	BOX-CORER	55.9125	-32.8110	2222.5

Table 12: Continuation.

IRMINGER BASIN				
Station	**Sample method**	**latitude**	**longitude**	**Depth (m)**
68	BOX-CORER	58.9097	-31.9117	1698.7
68X	SHIPEK	58.9726	-32.1771	1455.0
69	BOX-CORER	58.9749	-32.5560	1888.5
70	BOX-CORER	59.0412	-33.1928	2294.3
71	BOX-CORER	59.1010	-33.8341	2298.0
72	BOX-CORER	59.1662	-34.4763	2508.2
73	BOX-CORER	59.2330	-35.1142	3000.0
74	BOX-CORER	59.2991	-35.7629	3104.0
75	BOX-CORER	59.3628	-36.3990	3101.0
76	BOX-CORER	59.4275	-37.0401	3122.0
77	BOX-CORER	59.4911	-37.6859	3118.5
78	BOX-CORER	59.5584	-38.3167	3048.3
79	BOX-CORER	59.6246	-38.9599	2935.0
80	BOX-CORER	59.6548	-39.2794	2869.5
81	BOX-CORER	59.6849	-39.6000	2789.0
83	BOX-CORER	59.7245	-40.2527	2667.5
84	BOX-CORER	59.7395	-40.5783	2629.0
85	BOX-CORER	59.7563	-40.9074	2286.7
86	BOX-CORER	59.7730	-41.2932	2053.1
87	BOX-CORER	59.7979	-41.7261	1861.6
97	SHIPEK	59.8912	-42.9078	186.0
REYKJANES RIDGE				
Station	**Sample method**	**latitude**	**longitude**	**Depth (m)**
101	BOX-CORER	55.3489	-34.8138	2180.4
103	BOX-CORER	55.9075	-34.3939	1856.5
107	BOX-CORER	55.7250	-33.5941	2395.0
110	BOX-CORER	56.8505	-33.4335	1916.4
111	BOX-CORER	56.9098	-33.3547	1945.0
114	BOX-CORER	57.5777	-32.4777	1737.0
117	BOX-CORER	58.5304	-31.4223	1655.8
120	SHIPEK	58.8454	-31.2689	1394.4
120b	BOX-CORER	58.8454	-31.2689	1400.0
126	BOX-CORER	60.4698	-28.7782	1265.3
130	SHIPEK	61.4988	-27.1755	716.6
134	SHIPEK	62.6999	-25.2371	618.2
136	SHIPEK	63.4165	-23.9171	142.6

Fieldwork

Most of sedimentary samples have been obtained by means of a box-corer. Only when topographical and/or tectonic and sedimentary context of the sites suggested the presence of rocks, a Shipek dredge has been employed. In these cases, when the Shipek recovered sediments, the box-corer was also used. Recovered box core was sub-sampled using 4 PVC tubes (foraminifera, sedimentology, geochemistry and chronology). Two tubes were sampled every 1 cm. Foraminifera samples (first tube) was stained with Rose of Bengal to distinguish alive and dead specimens. 1-cm samples from second tube were stored in plastic bags properly labelled (see later, samples nomenclature).

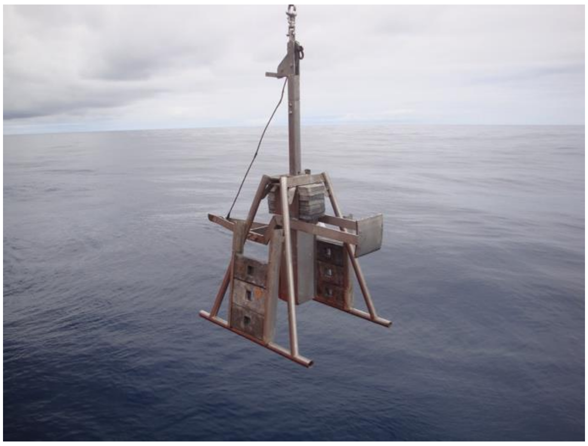


Figure 24a: *Box-corer dredge*

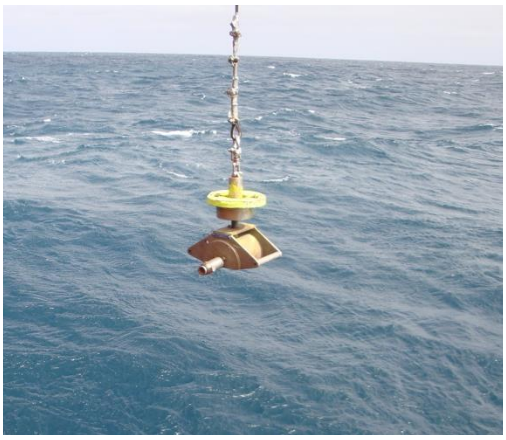


Figure 24b: *Shipek dredge*

Figure 25a: *Obtaining PVC tubes*

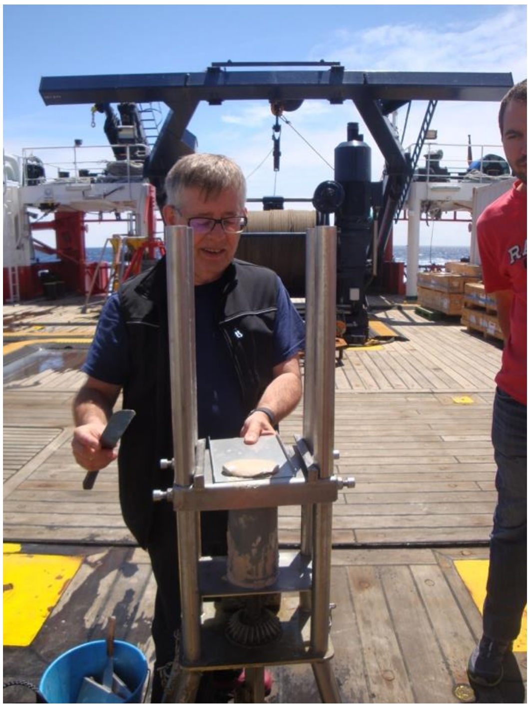


Figure 25b: *Tube subsampling*

Figure 25c: *1 cm thick subsample*

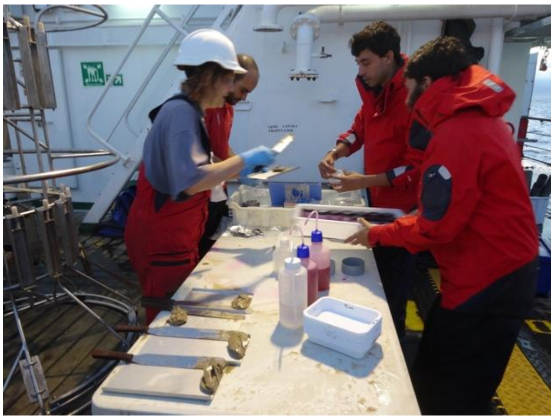


Figure 25d: *Sample stain, stored and labelled*

The third tube of selected samples representative from each prospected basin (Iberia Abyssal Plain, West Europe Basin, Iceland Basin and Irminger Basin) has been subsampled every 0,5 cm from 0 to 10 cm, and every 1 cm from 11 cm to the bottom for chronological analyses of Pb and Cs. Third tube of non-selected samples and the fourth tube of all the samples were properly labelled and cold stored as archive.

Samples have been labelled according the following protocol:

The abbreviation BOC16 denotes the name of the cruise. The next two letters refer to the used dredge, being BC: Box-corer and SH Shipek. The last two/three numbers designate the Station, from 01 to 97 for the OVIDE section and 101-136 for the Reykjanes Ridge section. Samples numbered as 202, 204 and 206 where retrieved along the section from Station 59 (Iceland Basin) to Station 101 (start of Reykjanes Ridge section).

Subsamples (1 cm thick as general case) from box-cores are identified also by their basal centimeter, counting from the top to the bottom.

Archive tubes include the complete name of the station (e.g. BOC16-BC##) and an arrow which head always point at the core-top.

In every station a form including relevant data has been filled out. An electronic and an analogic copy of all the forms have been stored.

Pictures from bulk sample have been obtained in every station. Also a visual description as well as a short characterization of sand fraction of surface sediment using binocular microscope have been performed.

BOCATS	BC			Día	Mes	Año
			Fecha:			2016
BOX CORER			Hora GMT(llegada a estación)			

NOMBRE ESTACIÓN		Nº ESTACIÓN
BOC16	BC-	

	Grados	Minutos
Latitud		
Longitud		
Prof. (m)		

Anotador	

MUESTREO

Penetración (cm)	

INICIO DE MANIOBRA:	HORA (GMT):	
FONDO:	PROF. (m):	
	HORA (GMT):	
CABLE LARGADO (m):		
Latitud:	º	
Longitud:	º	
DRAGA A BORDO:	HORA (GMT):	

A=TEÑIDO B=MUESTR C=XRF/SCL D= DATAC.

Nombre	Nº Est	cm	A	B	C	D
BOC16-BC-		1				
BOC16-BC-		2				
BOC16-BC-		3				
BOC16-BC-		4				
BOC16-BC-		5				
BOC16-BC-		6				
BOC16-BC-		7				
BOC16-BC-		8				
BOC16-BC-		9				
BOC16-BC-		10				
BOC16-BC-		11				
BOC16-BC-		12				
BOC16-BC-		13				
BOC16-BC-		14				
BOC16-BC-		15				
BOC16-BC-		16				
BOC16-BC-		17				
BOC16-BC-		18				
BOC16-BC-		19				
BOC16-BC-		20				
BOC16-BC-		21				
BOC16-BC-		22				
BOC16-BC-		23				
BOC16-BC-		24				
BOC16-BC-		25				
BOC16-BC-		26				
BOC16-BC-		27				
BOC16-BC-		28				
BOC16-BC-		29				
BOC16-BC-		30				
BOC16-BC-		31				
BOC16-BC-		32				
BOC16-BC-		33				
BOC16-BC-		34				
BOC16-BC-		35				
BOC16-BC-		36				
BOC16-BC-		37				
BOC16-BC-		38				
BOC16-BC-		39				

DESCRIPCIÓN

OBSERVACIONES

Figure 26: *Form for box-corer samples.*

Figure 27: *Picture of the sediment recovered by the box-corer*

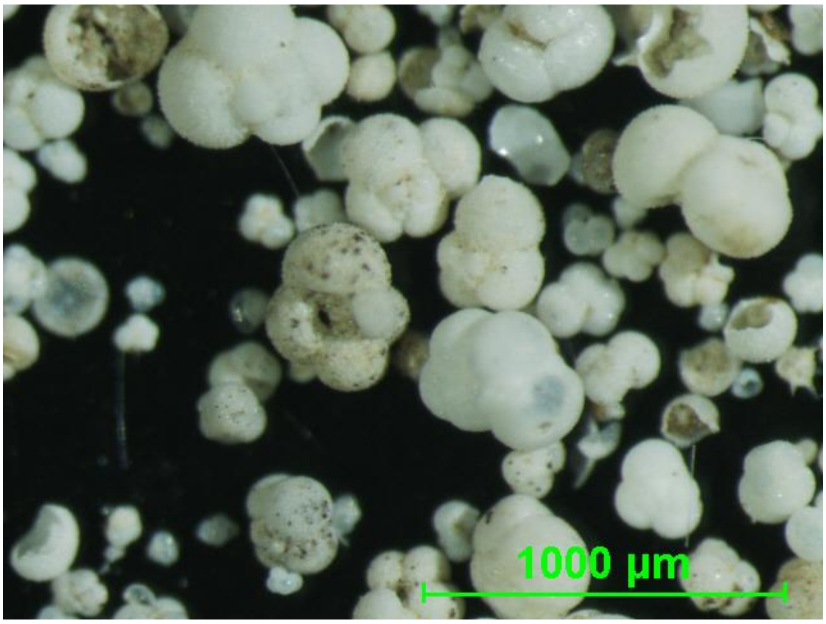


Figure 28: *Picture obtained with binocular microscope of sand fraction.*

8.- OUTREACH

During the cruise an important activity in the media was done. Several appearances in the newspapers and electronic journal was occurred (Faro de Vigo, DUVI…). The same day of departure two reports in the Galician TV and in SER broadcasting station were appeared. In addition, four talks for the crew and the scientific cruise was developed to divulgate the scientific objective of the BOCATS project. Finally a strong work with 13 issues was done using the blog GCIENCIA (http://www.gciencia.com/) in the section "Bitacoras" (http://www.gciencia.com/seccion/bitacoras/sarmiento-gamboa/), with very high repercussion in the social network. In the Annex II a press report of the is collected.

9.- INCIDENCES OF THE CRUISE

The major incidence was the replacement of the new cable of the CTD winch. The operation was done the 17th of June delaying the beginning of the cruise. Before doing the test station with the rosette, a weight of 500 kg was attached to cable and a testing of mechanical system was done. This test showed that the cable was not well installed and many faults and stroke occurred during the recovery of the cable and the weight. Finally, the 19 of June the decision to come back Vigo to repeat the cable installation was taken. During the night from Monday 20th to early Tuesday 21st of June the cable was again installed using a more specific machine keeping the tension of the cable between 500 to 1000 kg-F. Early morning the 21st, a station test was done with the 500-kg-weight to 2000 m depth and later again to 4500 m depth showing a good performance of the winch. A total of 138 stations were done with a total of 710 km of the CTD-rosette traveling along the water column. No fail in the cable was observed during the rest of the cruise. Even in bad weather condition very few times we observed loss the tension in the cable. Thus, the weight of the rosette, about 750 kg, was very appropriate. We observed negative velocity in the CTD rosette only very rarely, and the cable velocity was kept constant at 60 meter per min (except near the surface and the bottom).

The previous facts and the very good behavior of the speed of the ship made us recover most of the time lost with the cable replacement. During the BOCATS cruise, we performed the 99 stations of OVIDE section in a time record of 22 days including 29 sediment stations.

We removed a couple of stations during the second week to avoid bad weather in the Portugal-Azores area (the distance between stations was increased homogeneously to 37.5 Nm instead of 25 Nm between stations 14 and 18). The ship was able to work with 35 knots of wind for several hours. However, in the stations with BOX-CORER, the length of the station reached about 5-6 hour putting the Dynamic Position system in risk because overheating. For this reason, and because of an unfavorable weather forecast in the Irminger Sea, the last part of the OVIDE section only CTD-rosette station was done in the way to Greenland doing the BOX-CORER station in the way-back to RREX section.

Other incidence is related to the functionality of the starboard cable used to sediment sampling (corer, box-corer, etc.). A second-hand cable 8000 m long has been acquired recently, but it can be used only up to 4000 m depth because a torsion was detected some meters after. This fail avoids operating safely below that depth. This fact compelled to change the operation and to use the multipurpose crane (by the stern) to retrieve box-core samples. For this kind of sampling it is not a major problem, but make impossible the recovering of gravity and piston cores in sites deeper of 4000 m, restricting the functionality of the vessel.

10.- ACKNOWLEDGEMENTS

We want to express a great satisfaction concerning the progress of the cruise. No major problem was encountered except a number of stations that had to be removed due to bad sea conditions. Crew, technician and scientific teams were very competent, and then we were able to enjoy a very good atmosphere on board. The work done together within this good atmosphere has resulted in very good quality data. Thank you all!

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12.- ANNEX I: Bottle sampling

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
0	3	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	4	4919	2.508	34.8924	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	5	4919	2.508	34.8926	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	6	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	7	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	8	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	9	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	10	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	11	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	12	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	13	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	14	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	15	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	16	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	17	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	18	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	19	4919	2.508	34.8926	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	20	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	21	4919	2.508	34.8926	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	22	4919	2.508	34.8925	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	23	4919	2.508	34.8924	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	24	4919	2.508	34.8926	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	25	4919	2.508	34.8926	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	26	4919	2.508	34.8925	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	27	4919	2.508	34.8925	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	28	4919	2.508	34.8926	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	29	4919	2.508	34.8924	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
0	30	4919	2.508	34.8926	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
1	3	144.1	12.74	35.7048	√	√	√	√	√	√	√	1	ns	ns	ns	ns	ns
1	4	144	12.74	35.7042	√	√	√	√	√	√	√	ns	ns	1-1	1	ns	ns
1	5	100.7	13.11	35.7141	√	√	√	√	√	√	√	2	ns	ns	ns	ns	ns
1	6	100.6	13.11	35.7142	√	√	√	√	√	√	√	ns	ns	1-2	2	ns	ns
1	7	51	13.63	35.709	√	√	√	√	ns	ns	ns	3	ns	ns	ns	ns	ns
1	8	51	13.63	35.7091	√	√	√	√	√	√	√	ns	ns	1-3	3	ns	ns
1	9	5.1	17.85	34.8879	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
1	10	5	17.83	34.8914	√	√	√	√	√	√	√	ns	ns	1-4	4	ns	ns
2	3	380.8	11.53	35.6713	√	√	√	√	√	√	√	1	ns	ns	ns	ns	ns
2	4	380.8	11.53	35.6723	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
2	5	300.8	11.75	35.6409	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
2	6	201.6	12.38	35.6826	√	√	√	√	√	√	√	2	ns	ns	ns	ns	ns
2	7	150.3	12.74	35.7022	√	√	√	√	√	√	√	3	ns	ns	ns	ns	ns
2	8	101	13.02	35.7089	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
2	9	50.3	13.83	35.6738	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
2	10	4.5	18.71	34.9983	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns
3	3	814.4	11.84	36.1317	√	√	√	√	√	√	√	1	1297	ns	ns	ns	ns
3	5	700.5	11.85	36.064	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
3	6	700.4	11.85	36.0636	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
3	7	599.8	11.66	35.9197	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
3	9	479.7	11.38	35.6522	√	√	√	√	√	√	√	2	1298	ns	ns	ns	ns
3	11	401	11.52	35.6156	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
3	13	300.9	12.01	35.6617	√	√	√	√	√	√	√	3	ns	ns	ns	ns	ns
3	15	200.8	12.49	35.6951	√	√	√	√	√	√	√	4	1299	ns	ns	ns	ns
3	17	150.4	12.99	35.7424	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns
3	19	100.6	13.34	35.7531	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
3	21	50.5	13.81	35.72	√	√	√	√	√	√	√	7	ns	ns	ns	ns	ns
3	23	3.5	18.83	34.9965	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
4	3	1441	8.947	35.8708	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
4	4	1403	9.011	35.8831	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	5	1201	10.72	36.1583	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	6	999.5	11.4	36.2099	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	7	898.9	11.7	36.2133	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	8	799.5	11.78	36.1612	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	9	700.5	11.85	36.0707	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	10	600.2	11.51	35.871	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	11	499.2	11.42	35.7182	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	12	399.1	11.43	35.6046	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	13	301	11.98	35.6679	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	14	199.4	12.53	35.6999	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	15	150.2	13.02	35.747	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	16	91.3	13.58	35.7719	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	17	47.6	15.28	35.6898	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
4	18	4.5	18.86	35.0059	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
5	3	2774	3.045	34.9677	√	√	√	√	ns	ns	ns	1	2301	ns	ns	ns	ns
5	4	2774	3.046	34.9677	√	√	√	√	√	√	√	ns	ns	5-1	5	5-1	ns
5	5	2250	3.811	35.0416	√	√	√	√	ns	ns	ns	ns	ns	5-2	6	5-2	ns
5	6	2001	4.384	35.1022	√	√	√	√	√	√	√	2	1302	5-3	ns	5-3	ns
5	7	2001	4.387	35.1026	√	√	√	√	√	√	√	ns	ns	5-4	ns	5-4	ns
5	8	1800	4.896	35.1598	√	√	√	√	√	√	√	ns	ns	ns	7	5-5	ns
5	9	1602	7.473	35.6104	√	√	√	√	√	√	√	3	1303	5-5	ns	5-6	ns
5	10	1401	9.491	35.9703	√	√	√	√	√	√	√	4	1306	5-6	8	5-7	ns
5	11	1401	9.492	35.9706	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
5	12	1201	10.99	36.21	√	√	√	√	√	√	√	5	1304	5-7	9	5-8	ns
5	13	1002	11.34	36.1823	√	√	√	√	√	√	√	ns	1307	5-8	10	5-9	ns
5	14	1002	11.33	36.1787	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
5	15	900.7	11.08	36.0253	√	√	√	√	√	√	√	6	1308	ns	11	ns	ns
5	16	798.7	11.72	36.0965	√	ns	√	√	√	√	√	ns	ns	5-9	12	5-10	ns
5	17	700.6	11.46	35.9079	√	√	√	√	√	√	√	7	ns	ns	13	ns	ns
5	18	700.6	11.46	35.9104	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	5-11	ns
5	19	601	11.71	35.8433	√	√	√	√	√	√	√	ns	ns	5-10	ns	5-12	ns
5	20	499	11.29	35.6215	√	√	√	√	√	√	√	8	1309	5-11	14	5-13	ns
5	21	499.1	11.29	35.6218	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
5	22	397.6	11.63	35.6284	√	√	√	√	√	√	√	9	ns	5-12	15	5-14	ns
5	23	298.2	12.05	35.654	√	√	√	√	√	√	√	ns	ns	5-13	16	5-15	ns
5	24	200.1	12.78	35.7167	√	√	√	√	√	√	√	10	1310	5-14	17	5-16	ns
5	25	200.1	12.79	35.7176	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
5	26	149.2	13.09	35.7109	√	√	√	√	√	√	√	11	ns	ns	ns	5-17	ns
5	27	100.7	13.55	35.765	√	√	√	√	√	√	√	12	ns	5-15	18	5-18	ns
5	28	100.7	13.55	35.7646	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
5	29	51.3	14.86	35.7292	ns	√	√	√	√	√	√	13	ns	ns	19	5.19	ns
5	30	5	18.93	35.0506	√	√	√	√	√	√	√	14	1311	5-16	20	ns	ns
6	3	3436	2.613	34.9209	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	4	3250	2.685	34.9298	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	5	3001	2.804	34.9433	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	6	2751	3.053	34.9671	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	7	2501	3.37	34.9981	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	8	2252	3.806	35.0456	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	9	2122	3.945	35.0495	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	10	1801	4.726	35.1347	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	11	1601	6.782	35.4859	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	12	1401	9.201	35.9056	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	13	1201	10.73	36.1532	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	14	1002	10.87	36.0396	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	15	900.8	11.49	36.1207	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	16	800.6	11.59	36.0715	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
6	17	700.9	11.63	35.9709	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	18	600.7	11.32	35.7744	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	19	501.2	11.33	35.6423	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	20	401.2	11.54	35.6225	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	21	301.1	11.9	35.6424	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	22	201.6	12.7	35.7204	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	23	150.8	13.12	35.7446	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	24	100.6	13.6	35.7717	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	25	51.4	14.56	35.7456	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
6	26	4.2	19.03	35.2168	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	3	3586	2.571	34.9155	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	4	3586	2.571	34.9155	√	√	√	√	√	√	√	1	1312	ns	ns	ns	ns
7	5	3500	2.585	34.9179	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	6	3250	2.717	34.9332	√	√	√	√	√	√	√	2	1313	ns	ns	ns	ns
7	7	3001	2.878	34.9502	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	8	2751	3.089	34.9723	√	√	√	√	√	√	√	3	1314	ns	ns	ns	ns
7	9	2501	3.377	35.0007	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	10	2251	3.676	35.0257	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	11	2002	4.309	35.1	√	√	√	√	√	√	√	4	1315	ns	ns	ns	ns
7	12	1800	5.276	35.2389	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	13	1601	6.696	35.4756	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	14	1401	8.891	35.8578	√	√	√	√	√	√	√	5	1316	ns	ns	ns	ns
7	15	1201	10.76	36.1683	√	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
7	16	1201	10.77	36.1697	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	17	1002	10.81	36.0377	√	√	√	√	√	√	√	6	1318	ns	ns	ns	ns
7	18	900.7	11.21	36.0491	√	√	√	√	√	√	√	7	1319	ns	ns	ns	ns
7	19	801.3	11.55	36.0572	ns	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	20	700.7	11.58	35.9473	ns	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
7	21	601.3	11.34	35.7616	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	22	501.4	11.24	35.5997	√	√	√	√	√	√	√	9	1320	ns	ns	ns	ns
7	23	401.4	11.52	35.6099	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	24	401.4	11.52	35.6099	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	25	301.7	11.87	35.6339	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	26	201.3	12.43	35.6842	√	√	√	√	√	√	√	10	1321	ns	ns	ns	ns
7	27	149.5	13	35.7398	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
7	28	100.8	13.5	35.7604	√	√	√	√	√	√	√	11	ns	ns	ns	ns	ns
7	29	50.9	14.74	35.7386	√	√	√	√	√	√	√	12	ns	ns	ns	ns	ns
7	30	4	19.54	35.2736	√	√	√	√	√	√	√	13	1322	ns	ns	ns	ns
8	3	3953	2.468	34.9017	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	4	3749	2.493	34.9066	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	5	3502	2.578	34.9175	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	6	3250	2.695	34.931	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	7	3250	2.696	34.931	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
8	8	2998	2.85	34.9478	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	9	2753	3.13	34.9749	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	10	2502	3.426	35.0035	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	11	2251	3.895	35.0581	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	12	2002	4.453	35.1224	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	13	1801	5.319	35.2518	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	14	1603	6.97	35.516	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	15	1401	9.152	35.8929	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	16	1203	10.7	36.152	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	17	1102	11.25	36.2134	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	18	901.9	11.45	36.0867	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	19	801.6	11.85	36.0777	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	20	699.7	11.89	35.9788	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	21	601.3	11.69	35.7954	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
8	22	501.8	11.72	35.717	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	23	400.5	11.67	35.6197	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	24	302	12.19	35.6712	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	25	199.8	13.14	35.7921	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	26	152.7	13.57	35.8119	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	27	101.8	14.22	35.9205	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	28	53.5	14.75	35.9026	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	29	4.2	18.8	35.628	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
8	30	4.4	18.8	35.628	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
9	3	4406	2.471	34.8968	√	√	√	√	√	√	√	1	1323	9-1	25	ns	ns
9	4	4002	2.471	34.9018	√	√	√	√	√	√	√	ns	1324	ns	ns	ns	ns
9	5	3749	2.513	34.9088	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
9	6	3749	2.514	34.9089	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
9	7	3500	2.59	34.9189	√	√	√	√	√	√	√	ns	ns	9-2	26	ns	ns
9	8	3250	2.701	34.9316	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
9	9	3001	2.874	34.9496	√	√	√	√	√	√	√	2	1325	9-3	27	ns	ns
9	10	2750	3.135	34.9783	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
9	11	2500	3.455	35.0143	√	√	√	√	√	√	√	ns	ns	9-4	28	ns	ns
9	12	2244	3.829	35.0507	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
9	13	2001	4.4	35.1174	√	√	√	√	√	√	√	3	1326	9-5	29	ns	ns
9	14	1796	5.251	35.2449	√	√	√	√	√	√	√	4	1327	ns	ns	ns	ns
9	15	1603	6.766	35.4909	√	√	√	√	√	√	√	ns	ns	9-6	30	ns	ns
9	16	1399	9.444	35.9629	√	√	√	√	√	√	√	5	1328	ns	ns	ns	ns
9	17	1201	10.97	36.1997	√	√	√	√	√	√	√	6	1329	9-7	31	ns	ns
9	18	999.5	11.49	36.1914	√	√	√	√	√	√	√	7	1330	9-8	32	ns	ns
9	19	897.9	11.88	36.1962	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
9	20	803.3	11.96	36.121	√	√	√	√	√	√	√	8	1331	9-9	33	ns	ns
9	21	700.4	11.92	35.9863	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
9	22	601	11.75	35.8231	√	√	√	√	√	√	√	9	ns	9-10	34	ns	ns
9	23	500.4	11.6	35.6633	√	√	√	√	√	√	√	10	1333	9-11	35	ns	ns
9	24	403.5	11.93	35.6666	√	√	√	√	√	√	√	11	ns	ns	ns	ns	ns
9	25	302.3	12.52	35.7196	√	√	√	√	√	√	√	ns	ns	9-12	36	ns	ns
9	26	203	13.45	35.8458	ns	√	√	√	√	√	√	12	1334	9-13	37	ns	ns
9	27	150	14.03	35.9221	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
9	28	99.7	14.55	36.013	√	√	√	√	√	√	√	13	ns	9-14	38	ns	ns
9	29	52	15.11	35.8668	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
9	30	4.6	18.91	35.8387	√	√	√	√	√	√	√	15	541	9-15	39	ns	ns
10	3	4932	2.505	34.8936	√	√	√	√	√	√	√	ns	ns	ns	ns	10-1	ns
10	4	4500	2.475	34.8964	√	√	√	√	√	√	√	ns	ns	ns	ns	10-2	ns
10	5	4001	2.487	34.9035	√	√	√	√	√	√	√	ns	ns	ns	ns	10-3	ns
10	6	3749	2.524	34.91	√	√	√	√	√	√	√	ns	ns	ns	ns	10-4	ns
10	7	3501	2.591	34.9189	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
10	8	3502	2.591	34.9189	√	√	√	√	√	√	√	ns	ns	ns	ns	10-5	ns
10	9	3000	2.857	34.9486	√	√	√	√	√	√	√	ns	ns	ns	ns	10-6	ns
10	10	2751	3.103	34.9748	√	√	√	√	√	√	√	ns	ns	ns	ns	10-7	ns
10	11	2503	3.439	35.0117	√	√	√	√	√	√	√	ns	ns	ns	ns	10-8	ns
10	12	2250	3.866	35.0569	√	√	√	√	√	√	√	ns	ns	ns	ns	10-9	ns
10	13	2081	4.078	35.0694	√	√	√	√	√	√	√	ns	ns	ns	ns	10-10	ns
10	14	1874	4.657	35.1419	√	√	√	√	√	√	√	ns	ns	ns	ns	10-11	ns
10	15	1600	6.984	35.5348	√	√	√	√	√	√	√	ns	ns	ns	ns	10-12	ns
10	16	1400	9.167	35.9096	√	√	√	√	√	√	√	ns	ns	ns	ns	10-13	ns
10	17	1202	10.95	36.219	√	√	√	√	√	√	√	ns	ns	ns	ns	10-14	ns
10	18	1001	11.41	36.1966	√	√	√	√	√	√	√	ns	ns	ns	ns	10-15	ns
10	19	900.7	11.67	36.1764	√	√	√	√	√	√	√	ns	ns	ns	ns	10-16	ns
10	20	799.8	12.06	36.1687	√	√	√	√	√	√	√	ns	ns	ns	ns	10-17	ns
10	21	699.9	11.93	36.0203	√	√	√	√	√	√	√	ns	ns	ns	ns	10-18	ns
10	22	600.4	11.67	35.8321	√	√	√	√	√	√	√	ns	ns	ns	ns	10-19	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
10	23	499.9	11.71	35.7207	√	√	√	√	√	√	√	ns	ns	ns	ns	10-20	ns
10	24	400.9	11.81	35.6548	√	√	√	√	√	√	√	ns	ns	ns	ns	10-21	ns
10	25	300.3	12.18	35.6736	√	√	√	√	√	√	√	ns	ns	ns	ns	10-22	ns
10	26	200.9	13.17	35.8025	√	√	√	√	√	√	√	ns	ns	ns	ns	10-23	ns
10	27	151	13.38	35.781	√	√	√	√	√	√	√	ns	ns	ns	ns	10-24	ns
10	28	101.2	13.6	35.7767	√	√	√	√	√	√	√	ns	ns	ns	ns	10-25	ns
10	29	49.9	14.62	35.7622	√	√	√	√	√	√	√	ns	ns	ns	ns	10-26	ns
10	30	4.1	18.97	35.8054	√	√	√	√	√	√	√	ns	ns	ns	ns	10-27	10-27B
11	3	5185	2.539	34.8938	√	√	√	√	√	√	√	1	530	ns	ns	ns	ns
11	4	4849	2.5	34.8946	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	5	4402	2.474	34.8978	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	6	4000	2.495	34.9046	√	√	√	√	√	√	√	2	531	ns	ns	ns	ns
11	7	3501	2.6	34.9199	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	8	3248	2.7	34.9312	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	9	3000	2.856	34.9477	√	√	√	√	√	√	√	3	532	ns	ns	ns	ns
11	10	2750	3.089	34.9723	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	11	2501	3.373	34.9987	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	12	2250	3.68	35.0189	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	13	2000	3.992	35.0269	√	√	√	√	√	√	√	4	533	ns	ns	ns	ns
11	14	1800	4.626	35.105	√	√	√	√	√	√	√	ns	534	ns	ns	ns	ns
11	15	1600	6.094	35.3494	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	16	1390	8.453	35.7573	√	√	√	√	√	√	√	5	535	ns	ns	ns	ns
11	17	1199	10.02	35.9955	√	√	√	√	√	√	√	6	536	ns	ns	ns	ns
11	18	999.5	10.75	36.0044	√	√	√	√	√	√	√	7	537	ns	ns	ns	ns
11	19	901	11.41	36.0792	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	20	800.8	11.8	36.0642	√	√	√	√	√	√	√	8	538	ns	ns	ns	ns
11	21	699.6	11.45	35.8342	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	22	599.4	11.26	35.6472	√	√	√	√	√	√	√	9	539	ns	ns	ns	ns
11	23	501.4	11.35	35.5954	√	√	√	√	√	√	√	10	540	ns	ns	ns	ns
11	24	401.1	11.68	35.6153	√	√	√	√	√	√	√	11	ns	ns	ns	ns	ns
11	25	301.2	12.1	35.656	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	26	199.7	12.5	35.6508	√	√	√	√	√	√	√	12	542	ns	ns	ns	ns
11	27	150.2	12.96	35.7145	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
11	28	100.5	13.47	35.771	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
11	29	50	15.2	35.7667	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
11	30	4.8	19.04	35.8072	√	√	√	√	√	√	√	15	543	ns	ns	ns	ns
12	3	5306	2.551	34.8934	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	4	4699	2.488	34.8956	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	5	4600	2.481	34.8962	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	6	4000	2.518	34.907	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	7	3501	2.615	34.9212	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	8	3245	2.714	34.932	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	9	3000	2.803	34.9412	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	10	2749	3.026	34.9616	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	11	2503	3.294	34.9846	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	12	2251	3.637	35.0126	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	13	2000	4.195	35.0677	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	14	1801	4.99	35.1769	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	15	1602	6.051	35.3415	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	16	1402	7.752	35.6211	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	17	1200	10.51	36.1311	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	18	1200	10.51	36.1313	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	19	1001	10.86	36.055	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	20	800.3	11.23	35.9389	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	21	701.6	11.29	35.8224	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	22	601.1	11.24	35.6629	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	23	500.6	11.44	35.6074	√	√	√	√	√	√	√	ns	ns	ns	ns	12-1	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
12	24	400.8	11.79	35.6211	√	√	√	√	√	√	√	ns	ns	ns	ns	12-2	ns
12	25	300.2	12.23	35.662	√	√	√	√	√	√	√	ns	ns	ns	ns	12-3	ns
12	26	200.1	12.86	35.7101	√	√	√	√	√	√	√	ns	ns	ns	ns	12-4	ns
12	27	151.2	13.25	35.7522	√	√	√	√	√	√	√	ns	ns	ns	ns	12-5	ns
12	28	101.1	13.77	35.8125	√	√	√	√	√	√	√	ns	ns	ns	ns	12-6	ns
12	29	50.4	14.46	35.8949	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
12	30	4.7	18.92	35.6847	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	3	5354	2.554	34.8932	√	√	√	√	√	√	√	1	544	13-1	40	ns	ns
13	4	5001	2.512	34.894	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	5	4502	2.477	34.8971	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	6	4001	2.516	34.9068	√	√	√	√	√	√	√	2	545	13-2	41	ns	ns
13	7	3502	2.62	34.9216	√	√	√	√	√	√	√	ns	ns	13-3	42	ns	ns
13	8	3250	2.72	34.9327	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	9	3000	2.847	34.9445	√	√	√	√	√	√	√	3	546	13-4	43	ns	ns
13	10	2749	3.013	34.9585	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	11	2498	3.298	34.9841	√	√	√	√	√	√	√	ns	ns	13-5	44	ns	ns
13	12	2250	3.819	35.0451	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	13	1998	4.357	35.0985	√	√	√	√	√	√	√	4	518	13-6	45	ns	ns
13	14	1805	5.314	35.2428	√	√	√	√	√	√	√	ns	519	ns	ns	ns	ns
13	15	1598	6.889	35.5045	√	√	√	√	√	√	√	ns	ns	13-7	46	ns	ns
13	16	1402	8.941	35.8513	√	√	√	√	√	√	√	5	520	ns	ns	ns	ns
13	17	1202	10.83	36.1704	√	√	√	√	√	√	√	6	521	13-8	47	ns	ns
13	18	1001	11.05	36.0868	√	√	√	√	√	√	√	7	522	13-9	48	ns	ns
13	19	901.3	11.31	36.0498	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	20	801.1	11.64	36.0112	√	√	√	√	√	√	√	8	523	13-10	49	ns	ns
13	21	685.2	11.34	35.7725	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	22	600.8	11.42	35.6962	√	√	√	√	√	√	√	9	525	13-11	50	ns	ns
13	23	501	11.71	35.6605	√	√	√	√	√	√	√	10	526	ns	ns	ns	ns
13	24	402.1	11.99	35.6498	√	√	√	√	√	√	√	11	ns	13-12	51	ns	ns
13	25	300.2	12.7	35.7377	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	26	201.1	13.74	35.9036	√	√	√	√	√	√	√	12	527	13-13	52	ns	ns
13	27	149.2	14.53	36.0223	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
13	28	98.5	15.15	36.1196	√	√	√	√	√	√	√	13	ns	13-14	53	ns	ns
13	29	52.5	16.22	36.0236	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
13	30	4.9	19.05	35.9654	√	√	√	√	√	√	√	15	528	13-15	54	ns	ns
14	3	5403	2.56	34.8931	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	4	4600	2.478	34.8959	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	5	4499	2.477	34.8971	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	6	3999	2.516	34.9068	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	7	3500	2.608	34.9204	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	8	3249	2.694	34.9302	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	9	3000	2.804	34.9415	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	10	2750	2.964	34.9559	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	11	2501	3.227	34.9763	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	12	2250	3.537	34.996	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	13	2001	4.142	35.0625	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	14	1800	4.907	35.1703	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	15	1602	6.045	35.3357	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	16	1401	8.683	35.812	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	17	1202	10.5	36.1291	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	18	1000	11.05	36.0896	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	19	900.2	11.29	36.0383	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	20	800.7	11.61	35.9902	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	21	700.1	11.29	35.802	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	22	600.4	11.32	35.6485	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	23	501.1	11.55	35.6118	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	24	400.3	11.87	35.631	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salin ity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
14	25	300.5	12.34	35.6826	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	26	201.2	13.1	35.77	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	27	120.4	14.05	35.8633	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	28	81.5	14.46	35.9278	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	29	50.9	15.06	35.9229	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
14	30	3.8	19.1	36.0452	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	3	5444	2.565	34.8931	√	√	√	√	√	√	√	1	505	ns	ns	ns	ns
15	4	5002	2.517	34.8947	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	5	4501	2.485	34.898	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	6	4001	2.532	34.9084	√	√	√	√	√	√	√	2	506	ns	ns	ns	ns
15	7	3502	2.635	34.9227	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	8	3230	2.736	34.9336	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	9	3003	2.83	34.9431	√	√	√	√	√	√	√	3	507	ns	ns	ns	ns
15	10	2750	2.994	34.9576	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	11	2501	3.241	34.9775	√	√	√	√	√	√	√	4	508	ns	ns	ns	ns
15	12	2270	3.547	35.0011	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	13	2001	4.114	35.0602	√	√	√	√	√	√	√	5	509	ns	ns	ns	ns
15	14	1800	4.822	35.1579	√	√	√	√	√	√	√	ns	510	ns	ns	ns	ns
15	15	1601	6.419	35.4279	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	16	1400	7.698	35.6116	√	√	√	√	√	√	√	6	511	ns	ns	ns	ns
15	17	1101	10.33	36.0114	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	18	999.7	10.62	35.9815	√	√	√	√	√	√	√	7	512	ns	ns	ns	ns
15	19	900.8	10.87	35.9679	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	20	801.8	10.95	35.8944	√	√	√	√	√	√	√	8	513	ns	ns	ns	ns
15	21	702.1	11.07	35.8102	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	22	600.4	11.08	35.6826	√	√	√	√	√	√	√	9	514	ns	ns	ns	ns
15	23	501.4	11.15	35.6082	√	√	√	√	√	√	√	10	515	ns	ns	ns	ns
15	24	400	11.45	35.5992	√	√	√	√	√	√	√	11	ns	ns	ns	ns	ns
15	25	300.1	11.79	35.6241	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	26	200.5	12.34	35.6768	√	√	√	√	√	√	√	12	516	ns	ns	ns	ns
15	27	149.8	12.7	35.689	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
15	28	99.8	13.09	35.7123	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
15	29	51	13.72	35.7323	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
15	30	8.2	18.7	35.7563	√	√	√	√	√	√	√	15	517	ns	ns	ns	ns
16	3	5444	2.568	34.8936	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	4	4803	2.499	34.8956	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	5	4402	2.488	34.8995	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	6	4000	2.53	34.9082	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	7	3503	2.644	34.9239	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	8	3199	2.767	34.9367	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	9	3001	2.864	34.9459	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	10	2700	3.082	34.9644	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	11	2501	3.308	34.9812	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	12	2203	3.657	35.0004	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	13	2000	4.013	35.0286	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	14	1802	4.693	35.1155	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	15	1587	5.852	35.2833	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	16	1401	7.896	35.6217	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	17	1202	9.908	35.9567	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	18	1094	10.74	36.0874	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	19	902.1	11.57	36.1449	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	20	801.2	11.74	36.102	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	21	701.9	11.42	35.9075	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	22	602	11.15	35.7106	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	23	504.5	11.16	35.5974	√	√	√	√	√	√	√	ns	ns	ns	ns	16-1	ns
16	24	400.2	11.46	35.5924	√	√	√	√	√	√	√	ns	ns	ns	ns	16-2	ns
16	25	301.8	11.82	35.6242	√	√	√	√	√	√	√	ns	ns	ns	ns	16-3	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
16	26	201.2	12.48	35.6712	√	√	√	√	√	√	√	ns	ns	ns	ns	16-4	ns
16	27	150.3	12.66	35.6561	√	√	√	√	√	√	√	ns	ns	ns	ns	16-5	ns
16	28	100.3	12.95	35.6923	√	√	√	√	√	√	√	ns	ns	ns	ns	16-6	ns
16	29	51.4	13.39	35.7131	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
16	30	3.7	18.35	35.7748	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
17	3	5433	2.568	34.8936	√	√	√	√	√	√	√	1	1336	17-1	56	ns	ns
17	4	4799	2.503	34.8962	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
17	5	4400	2.495	34.9004	√	√	√	√	√	√	√	ns	ns	17-2	57	ns	ns
17	6	4001	2.532	34.9086	√	√	√	√	√	√	√	2	1337	ns	ns	ns	ns
17	7	3501	2.63	34.9227	√	√	√	√	√	√	√	ns	ns	17-3	58	ns	ns
17	8	3260	2.715	34.9321	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
17	9	3000	2.849	34.9448	√	√	√	√	√	√	√	3	1338	17-4	59	ns	ns
17	10	2750	3.034	34.96	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
17	11	2500	3.279	34.9754	√	√	√	√	√	√	√	ns	ns	17-5	60	ns	ns
17	12	2201	3.61	34.9882	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
17	13	2000	3.958	35.0156	√	√	√	√	√	√	√	4	1340	17-6	61	ns	ns
17	14	1801	4.607	35.0984	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
17	15	1601	5.627	35.2474	√	√	√	√	√	√	√	ns	ns	17-7	55	ns	ns
17	16	1401	7.589	35.5727	√	√	√	√	√	√	√	5	1342	ns	ns	ns	ns
17	17	1202	9.502	35.8889	√	√	√	√	√	√	√	6	1346	17-8	62	ns	ns
17	18	1001	10.46	35.9608	√	√	√	√	√	√	√	7	1347	ns	ns	ns	ns
17	19	900.4	10.68	35.9021	√	√	√	√	√	√	√	ns	ns	17-9	63	ns	ns
17	20	800.4	10.92	35.8427	√	√	√	√	√	√	√	8	1348	ns	ns	ns	ns
17	21	700.9	10.83	35.6894	√	√	√	√	√	√	√	ns	ns	17-10	64	ns	ns
17	22	600.6	10.99	35.6092	√	√	√	√	√	√	√	9	1349	17-11	65	ns	ns
17	23	501.1	11.32	35.6022	√	√	√	√	√	√	√	10	1350	ns	ns	ns	ns
17	24	400	11.48	35.5792	√	√	√	√	√	√	√	11	1352	17-12	66	ns	ns
17	25	302.1	11.81	35.6047	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
17	26	200	12.36	35.6442	√	√	√	√	√	√	√	12	577	17-13	67	ns	ns
17	27	150.4	12.57	35.6501	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
17	28	99.6	13	35.6967	√	√	√	√	√	√	√	13	ns	17-14	68	ns	ns
17	29	50.4	14.04	35.6883	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
17	30	4.3	18.18	35.7271	√	√	√	√	√	√	√	15	1341	17-15	69	ns	ns
18	3	5404	2.569	34.8943	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	4	4900	2.512	34.8957	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	5	4500	2.493	34.8989	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	6	3999	2.52	34.9075	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	7	3501	2.628	34.9225	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	8	3002	2.861	34.9452	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	9	2751	3.062	34.9607	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	10	2501	3.257	34.9634	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	11	2250	3.445	34.9557	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	12	2002	3.844	34.9817	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	13	1801	4.24	35.0146	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	14	1601	4.92	35.1062	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	15	1402	7.138	35.4733	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	16	1300	8.007	35.5991	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	17	1201	8.839	35.7246	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	18	1100	9.252	35.7419	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	19	1002	9.458	35.7131	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	20	900.5	9.484	35.5742	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	21	749.8	10.41	35.5574	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	22	650.5	10.76	35.5339	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	23	500.1	11.34	35.5497	√	√	√	√	√	√	√	ns	ns	ns	ns	18-1	ns
18	24	401.4	11.8	35.6009	√	√	√	√	√	√	√	ns	ns	ns	ns	18-2	ns
18	25	350.7	12.01	35.6261	√	√	√	√	√	√	√	ns	ns	ns	ns	18-3	ns
18	26	250.5	12.34	35.6283	√	√	√	√	√	√	√	ns	ns	ns	ns	18-4	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
18	27	151.7	12.76	35.6568	√	√	√	√	√	√	√	ns	ns	ns	ns	18-5	ns
18	28	101.2	13.12	35.6942	√	√	√	√	√	√	√	ns	ns	ns	ns	18-6	ns
18	29	50	13.77	35.6907	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
18	30	5.7	18.05	35.7383	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	3	5160	2.54	34.8946	√	√	√	√	√	√	√	1	563	ns	ns	ns	ns
19	4	4750	2.493	34.8957	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	5	4500	2.482	34.8977	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	6	4002	2.507	34.9062	√	√	√	√	√	√	√	2	564	ns	ns	ns	ns
19	7	3502	2.608	34.9207	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	8	3249	2.695	34.9306	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	9	3001	2.833	34.9435	√	√	√	√	√	√	√	3	565	ns	ns	ns	ns
19	10	2750	3.005	34.954	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	11	2500	3.216	34.9595	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	12	2250	3.378	34.9374	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	13	2000	3.671	34.9501	√	√	√	√	√	√	√	4	566	ns	ns	ns	ns
19	14	1800	4.079	34.9974	√	√	√	√	√	√	√	5	567	ns	ns	ns	ns
19	15	1600	4.561	35.0446	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	16	1400	6.204	35.3058	√	√	√	√	√	√	√	6	568	ns	ns	ns	ns
19	17	1201	8.32	35.6265	√	√	√	√	√	√	√	7	569	ns	ns	ns	ns
19	18	999.6	9.479	35.7221	√	√	√	√	√	√	√	8	570	ns	ns	ns	ns
19	19	900.5	9.546	35.594	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	20	800.1	10.05	35.5552	√	√	√	√	√	√	√	9	571	ns	ns	ns	ns
19	21	700	10.64	35.5617	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	22	600.9	10.97	35.5439	√	√	√	√	√	√	√	10	573	ns	ns	ns	ns
19	23	500.1	11.33	35.5538	√	√	√	√	√	√	√	11	574	ns	ns	ns	ns
19	24	400	11.73	35.5797	√	√	√	√	√	√	√	12	ns	ns	ns	ns	ns
19	25	300.8	11.97	35.5445	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	26	199.6	12.77	35.6666	√	√	√	√	√	√	√	13	575	ns	ns	ns	ns
19	27	149.1	13.17	35.7106	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
19	28	100	13.42	35.7344	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
19	29	50.6	13.86	35.7607	√	√	√	√	√	√	√	15	ns	ns	ns	ns	ns
19	30	5.2	17.57	35.6895	√	√	√	√	√	√	√	16	576	ns	ns	ns	ns
20	3	4253	2.493	34.9016	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	4	4000	2.507	34.9062	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	5	3749	2.569	34.915	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	6	3500	2.623	34.9222	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	7	3249	2.724	34.9328	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	8	3000	2.843	34.9434	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	9	2752	3.019	34.9556	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	10	2500	3.188	34.9566	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	11	2252	3.422	34.9523	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	12	2001	3.847	34.9873	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	13	1801	4.05	34.9929	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	14	1601	4.744	35.0899	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	15	1400	6.34	35.3432	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	16	1201	8.204	35.6332	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	17	1102	8.885	35.7055	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	18	1001	9.225	35.6878	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	19	899.7	9.759	35.7019	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	20	801.4	9.738	35.5814	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	21	700.1	10.28	35.5614	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	22	600.9	10.65	35.5304	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	23	500.2	11.07	35.5371	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	24	400.2	11.37	35.5456	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	25	300.6	11.88	35.6063	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	26	200	12.1	35.5881	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	27	150	12.35	35.6148	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
20	28	100.3	12.66	35.6481	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	29	50.2	13.7	35.6682	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
20	30	4	18.15	35.7056	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
21	3	5216	2.557	34.8959	√	√	√	√	√	√	√	1	549	21-1	70	ns	ns
21	4	4800	2.517	34.8975	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
21	5	4401	2.502	34.9012	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
21	6	4000	2.538	34.9093	√	√	√	√	√	√	√	2	551	21-2	76	ns	ns
21	7	3502	2.633	34.9227	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
21	8	3250	2.731	34.9328	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
21	9	3000	2.855	34.9417	√	√	√	√	√	√	√	3	552	21-3	80	ns	ns
21	10	2751	3.016	34.9513	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
21	11	2499	3.22	34.9554	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
21	12	2250	3.453	34.9518	√	√	√	√	√	√	√	ns	ns	21-4	71	ns	ns
21	13	2001	3.772	34.9667	√	√	√	√	√	√	√	4	553	ns	ns	ns	ns
21	14	1800	4.204	35.0122	√	√	√	√	√	√	√	5	554	ns	ns	ns	ns
21	15	1601	4.85	35.0911	√	√	√	√	√	√	√	ns	ns	21-5	82	ns	ns
21	16	1402	6.046	35.2747	√	√	√	√	√	√	√	6	555	ns	ns	ns	ns
21	17	1200	8.548	35.6932	√	√	√	√	√	√	√	7	556	21-6	72	ns	ns
21	18	1001	9.718	35.7889	√	√	√	√	√	√	√	8	557	ns	ns	ns	ns
21	19	878.1	10.38	35.8124	√	√	√	√	√	√	√	ns	ns	21-7	77	ns	ns
21	20	801.8	10.48	35.7324	√	√	√	√	√	√	√	9	558	ns	ns	ns	ns
21	21	700	10.47	35.575	√	√	√	√	√	√	√	ns	ns	21-8	83	ns	ns
21	22	600.9	10.84	35.5449	√	√	√	√	√	√	√	10	559	ns	ns	ns	ns
21	23	500.6	11.18	35.5428	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
21	24	400.2	11.49	35.552	√	ns	√	√	√	√	√	11	560	21-9	73	ns	ns
21	25	301.5	11.65	35.5136	√	√	√	√	√	√	√	ns	ns	21-10	78	ns	ns
21	26	200.4	12.08	35.5525	√	√	√	√	√	√	√	12	561	21-11	84	ns	ns
21	27	150.6	12.55	35.6289	√	√	√	√	√	√	√	ns	ns	21-12	74	ns	ns
21	28	99.9	12.97	35.7031	√	√	√	√	√	√	√	13	ns	21-13	75	ns	ns
21	29	51.2	13.5	35.7446	√	√	√	√	√	√	√	14	ns	21-14	79	ns	ns
21	30	5.2	17.92	35.6606	√	√	√	√	√	√	√	15	ns	21-15	85	ns	ns
22	3	4235	2.495	34.9018	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	4	4003	2.535	34.9086	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	5	3750	2.57	34.9145	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	6	3502	2.604	34.9198	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	7	3250	2.667	34.9271	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	8	3002	2.808	34.9405	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	9	2751	2.984	34.9507	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	10	2502	3.173	34.9565	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	11	2252	3.416	34.9454	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	12	2002	3.75	34.9651	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	13	1804	4.217	35.0116	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	14	1601	4.977	35.1128	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	15	1401	6.128	35.2868	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	16	1200	8.627	35.7094	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	17	1099	9.171	35.7506	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	18	1002	9.639	35.7729	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	19	900	9.919	35.737	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	20	800.1	10.14	35.6766	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	21	701	10.29	35.559	ns	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	22	600.3	10.85	35.5632	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	23	499.2	11.01	35.5191	√	√	√	√	√	√	√	ns	ns	ns	ns	22-1	ns
22	24	394.7	11.34	35.5403	√	√	√	√	√	√	√	ns	ns	ns	ns	22-2	ns
22	25	302	11.75	35.5853	√	√	√	√	√	√	√	ns	ns	ns	ns	22-3	ns
22	26	200.4	12.12	35.6109	√	√	√	√	√	√	√	ns	ns	ns	ns	22-4	ns
22	27	151.2	12.19	35.5973	√	√	√	√	√	√	√	ns	ns	ns	ns	22-5	ns
22	28	103.6	12.38	35.6201	√	√	√	√	√	√	√	ns	ns	ns	ns	22-6	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
22	29	51.3	12.9	35.6136	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
22	30	4.3	18.12	35.6463	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	3	4067	2.575	34.911	√	√	√	√	√	√	√	1	494	ns	ns	ns	ns
23	4	3999	2.579	34.9121	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	5	3749	2.588	34.9159	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	6	3500	2.62	34.921	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	7	3249	2.694	34.929	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	8	3000	2.827	34.9398	√	√	√	√	√	√	√	2	495	ns	ns	ns	ns
23	9	3000	2.828	34.9399	√	√	√	√	√	√	√	ns	496	ns	ns	ns	ns
23	10	2750	2.969	34.9458	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	11	2501	3.13	34.9455	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	12	2251	3.334	34.9414	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	13	2001	3.661	34.9529	√	√	√	√	√	√	√	3	497	ns	ns	ns	ns
23	14	1801	3.943	34.9711	√	√	√	√	√	√	√	4	498	ns	ns	ns	ns
23	15	1600	4.593	35.0526	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	16	1400	6.017	35.2747	√	√	√	√	√	√	√	5	499	ns	ns	ns	ns
23	17	1200	8.366	35.6502	√	√	√	√	√	√	√	6	500	ns	ns	ns	ns
23	18	1000	9.703	35.7753	√	√	√	√	√	√	√	7	501	ns	ns	ns	ns
23	19	899.7	9.897	35.6965	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
23	20	800.9	10.3	35.6778	√	√	√	√	√	√	√	ns	502	ns	ns	ns	ns
23	21	700.2	10.1	35.4763	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	22	601	10.76	35.5232	√	√	√	√	√	√	√	9	503	ns	ns	ns	ns
23	23	500.3	11.14	35.5453	√	√	√	√	√	√	√	10	504	ns	ns	ns	ns
23	24	400.6	11.47	35.5751	√	√	√	√	√	√	√	11	ns	ns	ns	ns	ns
23	25	300.7	11.84	35.6043	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	26	199.8	12.08	35.5987	√	√	√	√	√	√	√	12	547	ns	ns	ns	ns
23	27	150.4	12.15	35.5879	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
23	28	100.8	12.39	35.6209	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
23	29	50.6	12.84	35.6419	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
23	30	4.3	17.89	35.6456	√	√	√	√	√	√	√	15	562	ns	ns	ns	ns
24	3	3855	2.557	34.9117	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	4	3657	2.565	34.9147	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	5	3551	2.588	34.9178	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	6	3501	2.6	34.9192	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	7	3250	2.678	34.9279	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	8	3001	2.794	34.9369	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	9	2751	2.949	34.9456	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	10	2500	3.127	34.9437	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	11	2251	3.398	34.9474	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	12	2001	3.572	34.9324	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	13	2001	3.572	34.9324	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	14	1802	3.787	34.9295	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	15	1599	4.311	34.9891	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	16	1400	5.056	35.0863	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	17	1200	6.22	35.2396	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	18	1001	7.864	35.4163	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	19	901.6	8.369	35.4054	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	20	801.5	8.483	35.2833	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	21	700.5	9.244	35.2935	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	22	596.7	10.24	35.3714	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	23	501.8	10.93	35.4654	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	24	400.3	11.24	35.4543	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	25	301	11.83	35.5188	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	26	200.1	12.5	35.618	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	27	149.7	12.77	35.6583	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	28	99.8	13.05	35.6963	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
24	29	51.1	13.52	35.7079	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
24	30	4.6	18.15	35.602	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	3	5035	2.649	34.9069	√	√	√	√	√	√	√	1	481	25-1	86	ns	ns
25	4	4801	2.618	34.907	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	5	4500	2.592	34.9081	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	6	4000	2.559	34.9109	√	√	√	√	√	√	√	2	482	25-2	87	ns	ns
25	7	3502	2.621	34.9213	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	8	3250	2.703	34.9298	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	9	3001	2.827	34.9392	√	√	√	√	√	√	√	3	483	25-3	88	ns	ns
25	10	2749	2.976	34.9452	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	11	2500	3.229	34.9519	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	12	2252	3.45	34.956	√	√	√	√	√	√	√	ns	ns	25-4	89	ns	ns
25	13	2001	3.772	34.9641	√	√	√	√	√	√	√	4	484	ns	ns	ns	ns
25	14	1799	4.105	34.9924	√	√	√	√	√	√	√	5	485	ns	ns	ns	ns
25	15	1600	4.18	34.9757	√	√	√	√	√	√	√	ns	ns	25-5	90	ns	ns
25	16	1401	4.707	35.0358	√	√	√	√	√	√	√	6	486	25-6	91	ns	ns
25	17	1202	5.6	35.1547	√	√	√	√	√	√	√	7	487	ns	ns	ns	ns
25	18	1004	6.364	35.1946	√	√	√	√	√	√	√	8	488	25-7	92	ns	ns
25	19	901.2	8.561	35.5641	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	20	800.7	8.341	35.4053	√	√	√	√	√	√	√	9	489	ns	ns	ns	ns
25	21	700.5	8.031	35.1823	√	√	√	√	√	√	√	ns	ns	25-8	93	ns	ns
25	22	601.7	9.023	35.223	√	√	√	√	√	√	√	10	490	ns	ns	ns	ns
25	23	499.5	9.585	35.2135	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
25	24	402.2	10.14	35.2614	√	√	√	√	√	√	√	11	491	25-9	94	ns	ns
25	25	299.5	11.02	35.3914	√	√	√	√	√	√	√	ns	ns	25-10	95	ns	ns
25	26	200.8	11.64	35.4796	√	√	√	√	√	√	√	12	493	25-11	96	ns	ns
25	27	151.1	12.11	35.5536	√	√	√	√	√	√	√	ns	ns	25-12	97	ns	ns
25	28	101.4	12.58	35.6056	√	√	√	√	√	√	√	13	ns	25-13	98	ns	ns
25	29	52.6	14.74	35.6703	√	√	√	√	√	√	√	14	ns	25-14	99	ns	ns
25	30	4.7	17.75	35.6246	√	√	√	√	√	√	√	15	492	25-15	100	ns	ns
26	3	4908	2.639	34.9073	√	√	√	√	√	√	√	ns	ns	ns	ns	26-1	26-1
26	4	4500	2.591	34.908	√	√	√	√	√	√	√	ns	ns	ns	ns	26-2	26-2
26	5	3999	2.56	34.9109	√	√	√	√	√	√	√	ns	ns	ns	ns	26-3	26-3
26	6	3500	2.617	34.9209	√	√	√	√	√	√	√	ns	ns	ns	ns	26-4	26-4
26	7	3247	2.718	34.931	√	√	√	√	√	√	√	ns	ns	ns	ns	26-5	26-5
26	8	3001	2.845	34.9401	√	√	√	√	√	√	√	ns	ns	ns	ns	26-6	26-6
26	9	2753	2.996	34.9447	√	√	√	√	√	√	√	ns	ns	ns	ns	26-7	26-7
26	10	2500	3.158	34.9351	√	√	√	√	√	√	√	ns	ns	ns	ns	26-8	26-8
26	11	2250	3.329	34.9257	√	√	√	√	√	√	√	ns	ns	ns	ns	26-9	26-9
26	12	2001	3.608	34.931	√	√	√	√	√	√	√	ns	ns	ns	ns	26-10	26-10
26	13	1802	3.829	34.9375	√	√	√	√	√	√	√	ns	ns	ns	ns	26-11	26-11
26	14	1600	4.09	34.9501	√	√	√	√	√	√	√	ns	ns	ns	ns	26-12	26-12
26	15	1403	4.534	34.993	√	√	√	√	√	√	√	ns	ns	ns	ns	26-13	ns
26	16	1200	5.998	35.1936	√	ns	√	√	√	√	√	ns	ns	ns	ns	26-14	ns
26	17	1001	9.085	35.7276	√	√	√	√	√	√	√	ns	ns	ns	ns	26-15	ns
26	18	1001	9.087	35.7275	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
26	19	899	8.724	35.5129	√	√	√	√	√	√	√	ns	ns	ns	ns	26-16	ns
26	20	802.2	8.616	35.3739	√	√	√	√	√	√	√	ns	ns	ns	ns	26-17	ns
26	21	701	9.927	35.4976	√	√	√	√	√	√	√	ns	ns	ns	ns	26-18	ns
26	22	600	10.1	35.4157	√	√	√	√	√	√	√	ns	ns	ns	ns	26-19	ns
26	23	501.8	10.66	35.464	√	√	√	√	√	√	√	ns	ns	ns	ns	26-20	ns
26	24	399	11.32	35.5518	√	√	√	√	√	√	√	ns	ns	ns	ns	26-21	ns
26	25	302	11.51	35.542	√	√	√	√	√	√	√	ns	ns	ns	ns	26-22	ns
26	26	199.2	11.92	35.5607	√	√	√	√	√	√	√	ns	ns	ns	ns	26-23	ns
26	27	149.6	12.06	35.5627	√	√	√	√	√	√	√	ns	ns	ns	ns	26-24	ns
26	28	100.7	12.4	35.5925	√	√	√	√	√	√	√	ns	ns	ns	ns	26-25	ns
26	29	52.3	13.19	35.5909	√	√	√	√	√	√	√	ns	ns	ns	ns	26-26	ns
26	30	5.7	17.7	35.6078	√	√	√	√	√	√	√	ns	ns	ns	ns	26-27	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
27	3	4684	2.611	34.9076	√	√	√	√	√	√	√	1	468	ns	ns	ns	ns
27	4	4000	2.566	34.9115	√	√	√	√	√	√	√	2	469	ns	ns	ns	ns
27	5	3749	2.582	34.9156	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	6	3502	2.627	34.9217	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	7	3248	2.717	34.931	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	8	3001	2.834	34.9389	√	√	√	√	√	√	√	3	470	ns	ns	ns	ns
27	9	2702	3.007	34.9406	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	10	2399	3.237	34.9335	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	11	2200	3.386	34.926	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	12	2001	3.655	34.9358	√	√	√	√	√	√	√	4	471	ns	ns	ns	ns
27	13	2001	3.655	34.9358	√	√	√	√	√	√	√	ns	472	ns	ns	ns	ns
27	14	1799	3.976	34.9581	√	√	√	√	√	√	√	5	473	ns	ns	ns	ns
27	15	1701	4.113	34.964	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	16	1398	4.823	35.0329	√	√	√	√	√	√	√	6	474	ns	ns	ns	ns
27	17	1202	5.733	35.1295	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	18	1000	7.479	35.3457	√	√	√	√	√	√	√	7	475	ns	ns	ns	ns
27	19	900.1	8.464	35.4338	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	20	798.7	9.058	35.4313	√	√	√	√	√	√	√	8	476	ns	ns	ns	ns
27	21	699.6	9.552	35.3831	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	22	600.3	9.91	35.3443	√	√	√	√	√	√	√	9	477	ns	ns	ns	ns
27	23	500.2	10.82	35.4517	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	24	399.6	11.37	35.4919	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
27	25	299.5	11.72	35.5149	√	√	√	√	√	√	√	11	478	ns	ns	ns	ns
27	26	200	12.41	35.6137	√	√	√	√	√	√	√	12	479	ns	ns	ns	ns
27	27	150.4	12.86	35.6782	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
27	28	100.8	13.11	35.7089	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
27	29	49.9	13.76	35.7398	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
27	30	6.3	17.05	35.637	√	√	√	√	√	√	√	15	480	ns	ns	ns	ns
28	3	4646	2.567	34.9038	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	4	4500	2.575	34.9064	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	5	4250	2.564	34.9083	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	6	4000	2.555	34.9103	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	7	3751	2.566	34.9141	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	8	3500	2.629	34.9221	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	9	3249	2.725	34.9314	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	10	3001	2.837	34.9385	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	11	2700	3.017	34.942	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	12	2500	3.151	34.9376	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	13	2249	3.376	34.9324	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	14	2002	3.628	34.9323	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	15	1700	4.022	34.9532	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	16	1400	4.696	35.0216	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	17	1199	5.903	35.1908	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	18	1000	7.443	35.3612	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	19	800.4	8.755	35.4199	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	20	800.5	8.756	35.4197	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	21	700.4	9.183	35.3418	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	22	601.4	9.849	35.3722	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	23	499.8	10.56	35.4466	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	24	400	10.91	35.4688	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	25	301.4	11.31	35.5004	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	26	198.3	11.62	35.5116	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	27	99.4	11.88	35.538	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	28	50.3	13.4	35.5697	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	29	4.9	17.33	35.5579	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
28	30	4.9	17.33	35.5581	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
29	3	4595	2.588	34.9063	√	√	√	√	√	√	√	1	247	29-1	101	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
29	4	4595	2.587	34.9062	√	√	√	√	√	√	√	ns	248	ns	ns	ns	ns
29	5	4500	2.578	34.9067	√	√	√	√	√	√	√	ns	ns	29-2	102	ns	ns
29	6	4000	2.55	34.9098	√	√	√	√	√	√	√	ns	ns	ns	103	ns	ns
29	7	3502	2.609	34.9202	√	√	√	√	√	√	√	ns	ns	29-3	ns	ns	ns
29	8	3251	2.711	34.9305	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
29	9	3003	2.861	34.9398	√	√	√	√	√	√	√	2	249	29-4	104	ns	ns
29	10	2748	3.016	34.9425	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
29	11	2502	3.184	34.9378	√	√	√	√	√	√	√	ns	ns	29-5	ns	ns	ns
29	12	2250	3.392	34.9316	√	√	√	√	√	√	√	ns	ns	ns	105	ns	ns
29	13	2001	3.613	34.9294	√	√	√	√	√	√	√	3	250	29-6	ns	ns	ns
29	14	1801	3.869	34.9396	√	√	√	√	√	√	√	4	251	ns	ns	ns	ns
29	15	1600	4.195	34.9665	√	√	√	√	√	√	√	ns	ns	29-7	106	ns	ns
29	16	1400	4.997	35.0757	√	√	√	√	√	√	√	5	252	ns	ns	ns	ns
29	17	1203	6.075	35.2139	√	√	√	√	√	√	√	6	463	29-8	ns	ns	ns
29	18	999.4	7.392	35.355	√	√	√	√	√	√	√	7	464	29-9	107	ns	ns
29	19	899.9	8.051	35.3993	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
29	20	801.5	8.514	35.3658	√	√	√	√	√	√	√	9	465	29-10	ns	ns	ns
29	21	700.3	9.156	35.3663	√	√	√	√	√	√	√	ns	ns	ns	108	ns	ns
29	22	600.9	10.03	35.4144	√	√	√	√	√	√	√	10	466	29-11	ns	ns	ns
29	23	502.2	10.56	35.4419	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
29	24	401.6	11.08	35.4973	√	√	√	√	√	√	√	11	467	29-12	109	ns	ns
29	25	300.4	11.31	35.4866	√	√	√	√	√	√	√	ns	ns	ns	110	ns	ns
29	26	201.2	11.68	35.5198	√	√	√	√	√	√	√	12	1339	29-13	111	ns	ns
29	27	150	11.79	35.5271	√	√	√	√	√	√	√	ns	ns	ns	112	ns	ns
29	28	101.9	11.99	35.5448	√	√	√	√	√	√	√	13	ns	29-14	113	ns	ns
29	29	50.7	13.82	35.5683	√	√	√	√	√	√	√	14	ns	ns	114	ns	ns
29	30	4.3	17.06	35.5853	√	√	√	√	√	√	√	15	1344	29-15	115	ns	ns
30	3	4681	2.583	34.905	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	4	4498	2.576	34.9065	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	5	3998	2.555	34.9104	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	6	3730	2.583	34.9158	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	7	3500	2.65	34.9237	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	8	3250	2.756	34.9335	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	9	3001	2.892	34.9409	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	10	2750	3.066	34.9412	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	11	2500	3.23	34.9301	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	12	2250	3.414	34.9224	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	13	2002	3.726	34.9377	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	14	1802	3.948	34.9453	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	15	1602	4.306	34.977	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	16	1401	4.896	35.0445	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	17	1201	6.233	35.228	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	18	1001	7.776	35.3917	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	19	901.2	8.279	35.3852	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	20	800.3	8.921	35.3771	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	21	700.7	9.499	35.3577	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	22	599.9	10.44	35.449	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	23	500.7	10.85	35.4758	√	√	√	√	√	√	√	ns	ns	ns	ns	30-1	ns
30	24	400.5	11.35	35.534	√	√	√	√	√	√	√	ns	ns	ns	ns	30-2	ns
30	25	300	11.54	35.5093	√	√	√	√	√	√	√	ns	ns	ns	ns	30-3	ns
30	26	199.4	11.78	35.5235	√	√	√	√	√	√	√	ns	ns	ns	ns	30-4	ns
30	27	150.1	11.94	35.5405	√	√	√	√	√	√	√	ns	ns	ns	ns	30-5	ns
30	28	100.6	12.3	35.5838	√	√	√	√	√	√	√	ns	ns	ns	ns	30-6	ns
30	29	51.1	13.08	35.5985	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
30	30	4.8	16.86	35.6124	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	3	4587	2.581	34.9059	√	√	√	√	√	√	√	1	232	ns	ns	ns	ns
31	4	4000	2.567	34.9116	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
31	5	3749	2.594	34.9167	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	6	3499	2.657	34.9244	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	7	3251	2.784	34.9352	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	8	3001	2.93	34.9418	√	√	√	√	√	√	√	2	233	ns	ns	ns	ns
31	9	2750	3.075	34.9382	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	10	2400	3.327	34.9274	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	11	2250	3.462	34.9268	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	12	1999	3.691	34.9252	√	√	√	√	√	√	√	3	236	ns	ns	ns	ns
31	13	1999	3.693	34.9251	√	√	√	√	√	√	√	ns	237	ns	ns	ns	ns
31	14	1801	3.863	34.925	√	√	√	√	√	√	√	4	238	ns	ns	ns	ns
31	15	1600	4.076	34.9313	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	16	1399	4.397	34.9553	√	√	√	√	√	√	√	5	239	ns	ns	ns	ns
31	17	1201	5.035	35.0133	√	√	√	√	√	√	√	6	240	ns	ns	ns	ns
31	18	1100	6.093	35.1553	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	19	1000	6.798	35.2097	√	√	√	√	√	√	√	7	241	ns	ns	ns	ns
31	20	799.4	9.184	35.4423	√	√	√	√	√	√	√	8	242	ns	ns	ns	ns
31	21	699.6	9.826	35.4168	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	22	599.1	10.35	35.437	√	√	√	√	√	√	√	9	243	ns	ns	ns	ns
31	23	500.5	10.94	35.4877	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
31	24	401.2	11.26	35.5039	√	√	√	√	√	√	√	11	244	ns	ns	ns	ns
31	25	299.8	11.64	35.5187	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	26	200.5	11.82	35.5257	√	√	√	√	√	√	√	12	245	ns	ns	ns	ns
31	27	150.6	12.03	35.5536	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
31	28	101	12.43	35.6088	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
31	29	50.8	12.73	35.622	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
31	30	4.7	16.27	35.593	√	√	√	√	√	√	√	15	246	ns	ns	ns	ns
32	3	4578	2.577	34.9056	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	4	4436	2.564	34.906	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	5	3901	2.568	34.9126	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	6	3701	2.6	34.9175	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	7	3502	2.684	34.9265	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	8	3249	2.794	34.9359	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	9	3003	2.938	34.9422	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	10	2501	3.335	34.9312	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	11	2000	3.756	34.9242	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	12	1600	4.143	34.9323	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	13	1400	4.449	34.949	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	14	1300	4.867	34.995	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	15	1200	6.108	35.1935	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	16	1072	7.343	35.3437	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	17	1003	6.814	35.1737	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	18	949.7	6.913	35.1333	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	19	850.5	8.88	35.3937	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	20	698.9	9.422	35.2819	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	21	652.1	9.911	35.3448	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	22	601.8	10.3	35.3799	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	23	551	10.44	35.3629	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	24	448.8	10.97	35.4159	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	25	300.7	11.57	35.4722	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	26	203.1	11.87	35.5139	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	27	150.1	12.2	35.5558	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	28	97.3	12.76	35.653	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	29	51.7	14.4	35.5504	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
32	30	5.4	16.09	35.636	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
33	3	4589	2.56	34.9037	√	√	√	√	√	√	√	1	231	33-1	ns	ns	ns
33	4	4000	2.579	34.9126	√	√	√	√	√	√	√	ns	ns	ns	116	ns	ns
33	5	3749	2.602	34.9173	√	√	√	√	√	√	√	ns	ns	33-2	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
33	6	3500	2.71	34.9286	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
33	7	3250	2.83	34.9379	√	√	√	√	√	√	√	ns	ns	33-3	117	ns	ns
33	8	3000	3	34.9418	√	√	√	√	√	√	√	2	219	ns	ns	ns	ns
33	9	2750	3.136	34.934	√	√	√	√	√	√	√	ns	ns	33-4	ns	ns	ns
33	10	2400	3.355	34.922	√	√	√	√	√	√	√	ns	ns	ns	118	ns	ns
33	11	2250	3.492	34.9224	√	√	√	√	√	√	√	ns	ns	33-5	ns	ns	ns
33	12	2100	3.633	34.923	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
33	13	2001	3.733	34.9262	√	√	√	√	√	√	√	3	220	33-6	119	ns	ns
33	14	1800	3.97	34.9383	√	√	√	√	√	√	√	4	221	33-7	ns	ns	ns
33	15	1800	3.971	34.9386	√	√	√	√	√	√	√	ns	222	ns	ns	ns	ns
33	16	1601	4.349	34.9725	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
33	17	1399	4.915	35.028	√	√	√	√	√	√	√	5	226	33-8	120	ns	ns
33	18	1201	5.704	35.0881	√	√	√	√	√	√	√	6	223	33-9	ns	ns	ns
33	19	1002	8.152	35.4062	√	√	√	√	√	√	√	7	224	ns	121	ns	ns
33	20	801.8	9.382	35.3507	√	√	√	√	√	√	√	8	225	33-10	122	ns	ns
33	21	700.8	10.23	35.4095	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
33	22	600.7	10.66	35.4177	√	√	√	√	√	√	√	9	227	33-11	ns	ns	ns
33	23	501.8	11.38	35.5311	√	√	√	√	√	√	√	10	ns	ns	123	ns	ns
33	24	401.1	11.5	35.4981	√	√	√	√	√	√	√	11	228	ns	124	ns	ns
33	25	303	11.76	35.5152	√	√	√	√	√	√	√	ns	ns	33-12	125	ns	ns
33	26	200.8	12.04	35.5475	√	√	√	√	√	√	√	12	229	33-13	126	ns	ns
33	27	150.8	12.48	35.6105	√	√	√	√	√	√	√	ns	ns	ns	127	ns	ns
33	28	101.7	12.79	35.6621	√	√	√	√	√	√	√	13	ns	33-14	128	ns	ns
33	29	51.2	13.37	35.6325	√	√	√	√	√	√	√	14	ns	ns	129	ns	ns
33	30	4.6	16.1	35.6431	√	√	√	√	√	√	√	15	230	33-15	130	ns	ns
34	3	4420	2.545	34.9044	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	4	4000	2.556	34.9105	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	5	3750	2.579	34.9153	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	6	3502	2.639	34.9232	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	7	3249	2.77	34.9352	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	8	3001	2.903	34.9412	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	9	2750	3.065	34.9388	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	10	2501	3.23	34.9306	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	11	2251	3.422	34.9237	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	12	1999	3.679	34.9305	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	13	1800	3.899	34.9346	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	14	1601	4.201	34.9536	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	15	1400	4.488	34.9682	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	16	1199	5.132	35.0261	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	17	999.8	6.474	35.1623	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	18	901.1	6.516	35.0567	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	19	800.7	8.518	35.2954	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	20	698.8	8.979	35.2407	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	21	600.4	9.595	35.2602	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	22	501	10.15	35.2772	√	√	√	√	√	√	√	ns	ns	ns	ns	34-1	ns
34	23	400.7	10.61	35.3139	√	√	√	√	√	√	√	ns	ns	ns	ns	34-2	ns
34	24	299.4	11.44	35.4483	√	√	√	√	√	√	√	ns	ns	ns	ns	34-3	ns
34	25	200.3	12.03	35.5398	√	√	√	√	√	√	√	ns	ns	ns	ns	34-4	ns
34	26	149	12.5	35.6126	√	√	√	√	√	√	√	ns	ns	ns	ns	34-5	ns
34	27	100.1	12.75	35.6439	√	√	√	√	√	√	√	ns	ns	ns	ns	34-6	ns
34	28	49.3	14.63	35.6754	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
34	29	5.9	15.66	35.6186	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	34-1
34	30	5.9	15.66	35.6185	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	3	4528	2.552	34.9037	√	√	√	√	√	√	√	1	1803	ns	ns	ns	ns
35	4	4001	2.588	34.9134	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	5	3748	2.613	34.9183	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	6	3500	2.672	34.9259	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
35	7	3251	2.774	34.9353	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	8	3002	2.913	34.9418	√	√	√	√	√	√	√	2	1805	ns	ns	ns	ns
35	9	2750	3.056	34.9384	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	10	2501	3.197	34.9314	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	11	2250	3.439	34.9309	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	12	2001	3.677	34.9289	√	√	√	√	√	√	√	3	1806	ns	ns	ns	ns
35	13	1802	3.907	34.9296	√	√	√	√	√	√	√	4	1807	ns	ns	ns	ns
35	14	1598	4.191	34.9444	√	√	√	√	√	√	√	5	1808	ns	ns	ns	ns
35	15	1402	4.58	34.9754	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	16	1202	5.584	35.1026	√	√	√	√	√	√	√	6	1809	ns	ns	ns	ns
35	17	1202	5.585	35.1027	√	√	√	√	√	√	√	ns	211	ns	ns	ns	ns
35	18	1003	6.426	35.129	√	√	√	√	√	√	√	7	218	ns	ns	ns	ns
35	19	899.2	7.495	35.2092	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	20	802.2	8.323	35.2385	√	√	√	√	√	√	√	8	213	ns	ns	ns	ns
35	21	700.3	8.939	35.2218	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	22	601.6	9.774	35.2806	√	√	√	√	√	√	√	9	214	ns	ns	ns	ns
35	23	502.4	10.48	35.3505	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
35	24	400.8	11.14	35.4392	√	√	√	√	√	√	√	11	215	ns	ns	ns	ns
35	25	300.7	11.58	35.4845	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	26	199.1	11.92	35.5303	√	√	√	√	√	√	√	12	216	ns	ns	ns	ns
35	27	149.3	12.17	35.5606	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
35	28	101.1	12.45	35.5971	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
35	29	50.7	13.01	35.6025	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
35	30	6.2	15.33	35.6362	√	√	√	√	√	√	√	15	217	ns	ns	ns	ns
36	3	4406	2.527	34.903	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	4	4001	2.56	34.9108	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	5	3747	2.599	34.9169	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	6	3501	2.677	34.9262	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	7	3248	2.793	34.9356	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	8	3001	2.954	34.9423	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	9	2750	3.144	34.938	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	10	2499	3.308	34.9268	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	11	2246	3.453	34.9215	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	12	2000	3.678	34.923	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	13	1802	3.856	34.9231	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	14	1609	4.156	34.9513	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	15	1401	4.303	34.941	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	16	1200	5.074	35.0197	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	17	1000	7.179	35.284	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	18	902.4	7.324	35.1985	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	19	797.9	7.792	35.1555	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	20	700.8	8.826	35.2107	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	21	601.1	9.425	35.2192	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	22	499	10.31	35.3117	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	23	400.3	11.01	35.393	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	24	302.7	11.58	35.4721	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	25	200.2	12.06	35.5488	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	26	149.5	12.51	35.6182	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	27	98.6	13.04	35.7074	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	28	51.3	14.48	35.6708	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	29	5.9	15.22	35.6193	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
36	30	6.3	15.22	35.6192	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
37	3	4151	2.595	34.9121	√	√	√	√	√	√	√	1	1789	37-1	ns	ns	ns
37	4	4120	2.592	34.9122	√	√	√	√	√	√	√	ns	ns	ns	131	ns	ns
37	5	3747	2.638	34.9205	√	√	√	√	√	√	√	ns	ns	37-2	ns	ns	ns
37	6	3502	2.699	34.9282	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
37	7	3250	2.844	34.939	√	√	√	√	√	√	√	ns	ns	37-3	132	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
37	8	3001	2.988	34.9419	√	√	√	√	√	√	√	2	1790	ns	ns	ns	ns
37	9	2751	3.123	34.9353	√	√	√	√	√	√	√	ns	ns	37-4	ns	ns	ns
37	10	2501	3.254	34.927	√	√	√	√	√	√	√	ns	ns	ns	133	ns	ns
37	11	2475	3.277	34.9257	√	√	√	√	√	√	√	ns	ns	37-5	ns	ns	ns
37	12	2250	3.466	34.9222	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
37	13	2000	3.712	34.9267	√	√	√	√	√	√	√	3	1791	37-6	134	ns	ns
37	14	1800	3.901	34.9287	√	√	√	√	√	√	√	4	1794	ns	135	ns	ns
37	15	1600	4.091	34.9327	√	√	√	√	√	√	√	ns	ns	37-7	ns	ns	ns
37	16	1401	4.451	34.9632	√	√	√	√	√	√	√	5	1793	ns	ns	ns	ns
37	17	1201	5.11	35.0297	√	√	√	√	√	√	√	6	1795	37-8	136	ns	ns
37	18	1002	6.262	35.1193	√	√	√	√	√	√	√	7	1796	37-9	137	ns	ns
37	19	902.4	6.697	35.0923	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
37	20	799.3	7.378	35.0705	√	√	√	√	√	√	√	8	1797	37-10	138	ns	ns
37	21	700.7	8.402	35.1315	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
37	22	600.7	9.651	35.2757	√	√	√	√	√	√	√	9	1798	37-11	ns	ns	ns
37	23	499	10.43	35.3391	√	√	√	√	√	√	√	10	ns	ns	139	ns	ns
37	24	400.8	11.04	35.4047	√	√	√	√	√	√	√	11	1799	37-12	140	ns	ns
37	25	301.7	11.46	35.4506	√	√	√	√	√	√	√	ns	ns	ns	141	ns	ns
37	26	200.3	11.77	35.5012	√	√	√	√	√	√	√	12	1800	37-13	142	ns	ns
37	27	150.6	11.96	35.5186	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
37	28	101	12.57	35.5883	√	√	√	√	√	√	√	13	ns	37-14	143	ns	ns
37	29	50.8	14.53	35.6021	√	√	√	√	√	√	√	14	ns	ns	144	ns	ns
37	30	8.4	15.1	35.5714	√	√	√	√	√	√	√	15	1801	37-15	145	ns	ns
38	3	4410	2.557	34.9057	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	4	4251	2.578	34.9097	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	5	4002	2.59	34.9135	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	6	3750	2.643	34.921	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	7	3502	2.732	34.931	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	8	3249	2.838	34.939	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	9	3001	2.976	34.9419	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	10	2750	3.123	34.9362	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	11	2501	3.28	34.9269	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	12	2251	3.478	34.9222	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	13	2002	3.719	34.9269	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	14	1801	3.921	34.9321	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	15	1599	4.065	34.9251	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	16	1398	4.374	34.9456	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	17	1201	5.03	35.0103	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	18	1001	6.229	35.1035	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	19	900.8	6.39	35.0171	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	20	800.2	8.237	35.2539	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	21	701.2	9.043	35.2671	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	22	601.9	10.11	35.3758	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
38	23	499.7	10.54	35.378	√	√	√	√	√	√	√	ns	ns	ns	ns	38-1	ns
38	24	401.9	11.49	35.5356	√	√	√	√	√	√	√	ns	ns	ns	ns	38-2	ns
38	25	302.2	11.51	35.4652	√	√	√	√	√	√	√	ns	ns	ns	ns	38-3	ns
38	26	199.9	11.82	35.5132	√	√	√	√	√	√	√	ns	ns	ns	ns	38-4	ns
38	27	151.1	12.09	35.548	√	√	√	√	√	√	√	ns	ns	ns	ns	38-5	ns
38	28	100.4	12.54	35.6106	√	√	√	√	√	√	√	ns	ns	ns	ns	38-6	38-1B
38	29	49.3	14.69	35.5538	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	3	4296	2.585	34.9097	√	√	√	√	√	√	√	1	1775	ns	ns	ns	ns
39	4	3999	2.593	34.9138	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	5	3748	2.625	34.9195	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	6	3499	2.726	34.9307	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	7	3250	2.833	34.9395	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	8	3000	2.946	34.942	√	√	√	√	√	√	√	2	1776	ns	ns	ns	ns
39	9	2750	3.114	34.9353	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
39	10	2500	3.26	34.9273	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	11	2248	3.458	34.9219	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	12	1999	3.665	34.9222	√	√	√	√	√	√	√	3	1777	ns	ns	ns	ns
39	13	1801	3.801	34.9223	√	√	√	√	√	√	√	4	1778	ns	ns	ns	ns
39	14	1601	3.982	34.9253	√	√	√	√	√	√	√	5	1779	ns	ns	ns	ns
39	15	1401	4.12	34.9198	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	16	1250	4.726	34.9949	√	√	√	√	√	√	√	6	1781	ns	ns	ns	ns
39	17	1001	5.746	35.0701	√	√	√	√	√	√	√	7	1782	ns	ns	ns	ns
39	18	1000	5.747	35.0699	√	√	√	√	√	√	√	ns	1783	ns	ns	ns	ns
39	19	900.4	6.503	35.1248	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	20	800.2	8.097	35.3187	√	√	√	√	√	√	√	8	1784	ns	ns	ns	ns
39	21	700.4	8.143	35.1704	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	22	598.9	9.849	35.3474	√	√	√	√	√	√	√	9	1786	ns	ns	ns	ns
39	23	499.8	10.31	35.3389	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
39	24	401.3	10.83	35.3708	√	√	√	√	√	√	√	11	1787	ns	ns	ns	ns
39	25	300.2	11.25	35.416	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	26	201.3	11.84	35.5156	√	√	√	√	√	√	√	12	1788	ns	ns	ns	ns
39	27	150	12.31	35.583	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
39	28	95.9	12.64	35.5938	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
39	29	49.7	15.21	35.6496	√	√	√	√	√	√	√	14	ns	ns	ns	ns	ns
39	30	7	15.32	35.6374	√	√	√	√	√	√	√	15	1802	ns	ns	ns	ns
40	3	4061	2.612	34.9149	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	4	3751	2.635	34.9204	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	5	3502	2.723	34.9308	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	6	3249	2.829	34.9402	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	7	3002	2.932	34.9435	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	8	2749	3.071	34.9377	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	9	2501	3.199	34.9285	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	10	2249	3.359	34.9229	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	11	2001	3.555	34.9218	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	12	1802	3.713	34.9228	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	13	1600	3.851	34.9193	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	14	1401	3.976	34.9185	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	15	1201	4.302	34.9455	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	16	1003	5.185	35.0472	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	17	900.7	5.391	35.0321	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	18	799.7	5.932	35.0594	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	19	700.3	6.502	35.059	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	20	600.5	7.154	35.0298	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	21	500	8.148	35.0445	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	22	399.3	8.498	35.0222	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	23	302.2	9.472	35.1489	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	24	201.1	10.01	35.2282	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	25	151	10.46	35.2808	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	26	102.1	11.14	35.343	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	27	52.7	12.84	35.382	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
40	28	5	13.87	35.2688	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
41	3	4196	2.602	34.9122	√	√	√	√	√	√	√	1	1769	41-1	ns	ns	ns
41	4	3750	2.636	34.9205	√	√	√	√	√	√	√	ns	ns	ns	146	ns	ns
41	5	3502	2.709	34.9302	√	√	√	√	√	√	√	ns	ns	41-2	ns	ns	ns
41	6	3252	2.789	34.9382	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
41	7	2988	2.916	34.9444	√	√	√	√	√	√	√	2	1770	41-3	147	ns	ns
41	8	2750	3.053	34.9406	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
41	9	2503	3.199	34.9313	√	√	√	√	√	√	√	ns	ns	41-4	ns	ns	ns
41	10	2251	3.357	34.924	√	√	√	√	√	√	√	ns	ns	ns	148	ns	ns
41	11	2251	3.357	34.924	√	√	√	√	√	√	√	ns	ns	41-5	ns	ns	ns
41	12	2000	3.529	34.9224	√	√	√	√	√	√	√	3	1771	ns	149	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
41	13	1802	3.681	34.9228	√	√	√	√	√	√	√	4	1772	41-6	ns	ns	ns
41	14	1601	3.84	34.9205	√	√	√	√	√	√	√	ns	ns	ns	150	ns	ns
41	15	1402	3.953	34.9168	√	√	√	√	√	√	√	5	1773	41-7	ns	ns	ns
41	16	1201	4.157	34.9235	√	√	√	√	√	√	√	6	1774	ns	152	ns	ns
41	17	999.4	4.713	34.9791	√	√	√	√	√	√	√	7	2104	41-8	152	ns	ns
41	18	899.8	5.252	35.0418	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
41	19	800	5.491	35.0276	√	√	√	√	√	√	√	8	2105	41-9	153	ns	ns
41	20	699.9	5.926	35.0197	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
41	21	599.9	6.222	34.9564	√	√	√	√	√	√	√	9	2106	41-10	154	ns	ns
41	22	499.6	6.891	34.917	√	√	√	√	√	√	√	10	ns	41-11	ns	41-1	ns
41	23	400.1	8.111	35.0017	√	√	√	√	√	√	√	11	ns	41-12	155	41-2	ns
41	24	300.1	9.177	35.1066	√	√	√	√	√	√	√	ns	2107	ns	156	41-3	ns
41	25	200.7	9.897	35.2015	√	√	√	√	√	√	√	12	2108	41-13	157	41-4	ns
41	26	149.7	10.54	35.2976	√	√	√	√	√	√	√	ns	ns	ns	ns	41-5	ns
41	27	100.9	11.07	35.3331	√	√	√	√	√	√	√	13	ns	41-14	158	41-6	41-1B
41	28	50.3	13.38	35.3447	√	√	√	√	√	√	√	14	ns	ns	159	ns	ns
41	29	4.7	14.01	35.296	√	√	√	√	√	√	√	15	2109	41-15	160	ns	ns
41	30	4.7	14.01	35.296	√	√	√	√	ns	ns	ns	ns	1768	ns	ns	ns	ns
42	3	3787	2.581	34.9147	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	4	3500	2.681	34.9276	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	5	3249	2.771	34.9372	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	6	3001	2.918	34.9437	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	7	2750	3.05	34.9412	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	8	2500	3.186	34.9309	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	9	2250	3.335	34.9246	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	10	2000	3.528	34.9217	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	11	1800	3.698	34.9231	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	12	1599	3.86	34.9239	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	13	1400	4.027	34.9272	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	14	1201	4.286	34.9414	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	15	1001	4.926	35.0064	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	16	899.7	5.238	35.0307	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	17	800.4	5.798	35.0765	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	18	701.1	6.265	35.0784	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	19	601	6.786	35.0673	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	20	498.8	7.772	35.0904	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	21	400.5	8.504	35.1098	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	22	300.2	8.936	35.1043	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	23	200.8	9.521	35.1627	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	24	150	9.884	35.1998	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	25	99.8	10.22	35.2068	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	26	50.3	11.5	35.224	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
42	27	6.1	13.76	35.229	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	3	3975	2.622	34.9168	√	√	√	√	√	√	√	1	2110	ns	ns	ns	ns
43	4	3750	2.624	34.9195	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	5	3498	2.683	34.9279	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	6	3250	2.767	34.9364	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	7	3000	2.929	34.9432	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	8	2749	3.054	34.9408	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	9	2501	3.206	34.9311	√	√	√	√	√	√	√	2	2111	ns	ns	ns	ns
43	10	2249	3.379	34.9247	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	11	2000	3.567	34.9236	√	√	√	√	√	√	√	3	2112	ns	ns	ns	ns
43	12	2000	3.568	34.9236	√	√	√	√	√	√	√	ns	2113	ns	ns	ns	ns
43	13	1800	3.731	34.9233	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	14	1601	3.887	34.9204	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	15	1400	4.02	34.9203	√	√	√	√	√	√	√	4	2114	ns	ns	ns	ns
43	16	1201	4.31	34.9427	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
43	17	1001	4.905	34.9907	√	√	√	√	√	√	√	6	2115	ns	ns	ns	ns
43	18	892.3	5.232	34.9984	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	19	800.2	5.804	35.0449	√	√	√	√	√	√	√	7	2116	ns	ns	ns	ns
43	20	699.8	6.184	35.0178	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	21	645	7.098	35.1174	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
43	22	599.3	7.331	35.1155	√	√	√	√	√	√	√	8	2117	ns	ns	ns	ns
43	23	501	8	35.0863	√	√	√	√	√	√	√	9	ns	ns	ns	43-1	ns
43	24	400.6	8.635	35.0945	√	√	√	√	√	√	√	10	2118	ns	ns	43-2	ns
43	25	298.9	9.193	35.1276	√	√	√	√	√	√	√	ns	ns	ns	ns	43-3	ns
43	26	201.5	9.513	35.1598	√	√	√	√	√	√	√	11	2119	ns	ns	43-4	ns
43	27	149.1	9.686	35.1786	√	√	√	√	√	√	√	ns	ns	ns	ns	43-5	ns
43	28	100.4	9.986	35.2079	√	√	√	√	√	√	√	12	ns	ns	ns	43-6	43-1B
43	29	50	10.54	35.2327	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
43	30	6.2	13.46	35.2281	√	√	√	√	√	√	√	14	2120	ns	ns	ns	ns
44	3	3289	2.716	34.9319	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	4	3202	2.788	34.9377	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	5	2999	2.898	34.943	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	6	2752	3.046	34.9406	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	7	2502	3.17	34.9333	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	8	2251	3.355	34.9238	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	9	2001	3.602	34.9224	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	10	1799	3.76	34.9234	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	11	1600	3.944	34.9279	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	12	1400	4.112	34.929	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	13	1199	4.378	34.9449	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	14	1002	5.212	35.0279	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	15	899	5.889	35.0974	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	16	800.3	6.278	35.0799	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	17	701.3	7.021	35.0976	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	18	600.9	7.509	35.0673	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	19	498.4	8.512	35.1162	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	20	423.1	8.438	35.0393	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	21	300.3	9.475	35.1668	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	22	200.4	9.661	35.1932	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	23	159	9.612	35.1776	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	24	99.2	10.02	35.197	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	25	49.2	10.99	35.22	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
44	26	4.9	13.46	35.1981	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
45	3	3907	2.552	34.9108	√	√	√	√	√	√	√	1	2121	45-1	ns	ns	ns
45	4	3750	2.626	34.92	√	√	√	√	√	√	√	ns	ns	ns	161	ns	ns
45	5	3500	2.733	34.9346	√	√	√	√	√	√	√	ns	ns	45-2	ns	ns	ns
45	6	3249	2.843	34.9459	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
45	7	3001	2.952	34.949	√	√	√	√	√	√	√	ns	ns	45-3	162	ns	ns
45	8	2750	3.086	34.9392	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
45	9	2499	3.231	34.9301	√	√	√	√	√	√	√	2	2122	45-4	163	ns	ns
45	10	2250	3.432	34.9252	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
45	11	2002	3.614	34.9229	√	√	√	√	√	√	√	ns	ns	45-5	164	ns	ns
45	12	1802	3.774	34.9233	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
45	13	1600	3.938	34.9241	√	√	√	√	√	√	√	3	2123	45-6	ns	ns	ns
45	14	1600	3.938	34.9241	√	√	√	√	√	√	√	ns	2124	ns	ns	ns	ns
45	15	1401	4.091	34.9252	√	√	√	√	√	√	√	ns	2125	45-7	165	ns	ns
45	16	1201	4.55	34.9644	√	√	√	√	√	√	√	4	ns	45-8	ns	ns	ns
45	17	1001	5.285	35.0293	√	√	√	√	√	√	√	5	2126	ns	166	ns	ns
45	18	900.1	5.694	35.0437	√	√	√	√	√	√	√	ns	ns	45-9	ns	ns	ns
45	19	800.6	6.504	35.0986	√	√	√	√	√	√	√	6	2127	ns	167	ns	ns
45	20	701.4	7.227	35.1016	√	√	√	√	√	√	√	ns	ns	45-10	ns	ns	ns
45	21	600.4	7.841	35.0813	√	√	√	√	√	√	√	7	ns	ns	168	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
45	22	498.9	8.627	35.1109	√	√	√	√	√	√	√	ns	ns	45-11	ns	45-1	ns
45	23	470.9	8.559	35.0679	√	√	√	√	√	√	√	8	2128	ns	ns	45-2	ns
45	24	400.7	9.314	35.1795	√	√	√	√	√	√	√	9	ns	45-12	169	45-3	ns
45	25	300.6	9.748	35.2149	√	√	√	√	√	√	√	ns	ns	ns	170	45-4	ns
45	26	199.4	9.685	35.1973	√	√	√	√	√	√	√	10	2129	45-13	171	45-5	ns
45	27	150.3	9.637	35.1821	√	√	√	√	√	√	√	ns	ns	ns	172	45-6	ns
45	28	100.6	10.03	35.2034	√	√	√	√	√	√	√	11	ns	45-14	173	45-7	45-1B
45	29	48.8	10.62	35.1908	√	√	√	√	√	√	√	12	ns	ns	174	ns	ns
45	30	4.1	13.33	35.1884	√	√	√	√	√	√	√	13	2130	45-15	175	ns	ns
46	3	3965	2.59	34.9142	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	4	3750	2.653	34.9233	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	5	3498	2.788	34.94	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	6	3248	2.868	34.9495	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	7	2998	2.96	34.9481	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	8	2749	3.092	34.9426	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	9	2501	3.218	34.9346	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	10	2250	3.353	34.9268	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	11	2000	3.53	34.9259	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	12	1802	3.68	34.9259	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	13	1603	3.811	34.9217	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	14	1401	3.919	34.9157	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	15	1190	4.179	34.9327	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	16	1001	4.529	34.9605	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	17	901.1	4.839	34.9835	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	18	801.3	4.987	34.9638	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	19	701.8	5.469	34.9853	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	20	601.9	5.28	34.8499	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	21	502.1	6.912	34.9847	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	22	400.8	7.916	35.0147	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	23	300.7	8.493	35.0207	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	24	201.9	9.232	35.1122	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	25	150.1	9.61	35.1661	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	26	98.9	10.34	35.251	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	27	52.5	11.23	35.2956	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
46	28	5.9	12.84	35.0621	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	3	3648	2.513	34.9099	√	√	√	√	√	√	√	1	2131	ns	ns	ns	ns
47	4	3499	2.583	34.9188	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	5	3251	2.734	34.9365	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	6	3000	2.85	34.945	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	7	2750	3.01	34.9485	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	8	2501	3.137	34.9382	√	√	√	√	√	√	√	2	2132	ns	ns	ns	ns
47	9	2250	3.261	34.9292	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	10	2001	3.413	34.9239	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	11	1799	3.548	34.9227	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	12	1600	3.714	34.9236	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	13	1400	3.863	34.9235	√	√	√	√	√	√	√	3	2133	ns	ns	ns	ns
47	14	1200	4.017	34.9269	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
47	15	1000	4.349	34.954	√	√	√	√	√	√	√	5	2134	ns	ns	ns	ns
47	16	1000	4.349	34.9542	√	√	√	√	√	√	√	ns	2135	ns	ns	ns	ns
47	17	899.4	4.557	34.9708	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	18	801.5	4.898	35.0022	√	√	√	√	√	√	√	6	2136	ns	ns	ns	ns
47	19	699.4	5.076	35.0013	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
47	20	600	5.759	35.0688	√	√	√	√	√	√	√	7	2137	ns	ns	ns	ns
47	21	498.9	5.385	34.922	√	√	√	√	√	√	√	8	ns	ns	ns	47-1	ns
47	22	447.7	5.519	34.8831	√	√	√	√	√	√	√	9	2138	ns	ns	47-2	ns
47	23	350.6	6.391	34.8966	√	√	√	√	√	√	√	10	ns	ns	ns	47-3	ns
47	24	279.4	6.794	34.8696	√	√	√	√	√	√	√	11	2139	ns	ns	47-4	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
47	25	198.9	7.462	34.9096	√	√	√	√	√	√	√	ns	ns	ns	ns	47-5	ns
47	26	149.5	7.923	34.9459	√	√	√	√	√	√	√	ns	ns	ns	ns	47-6	ns
47	27	101.1	8.713	35.0159	√	√	√	√	√	√	√	12	ns	ns	ns	47-7	47-1B
47	28	49.9	10.06	35.0353	√	√	√	√	√	√	√	13	ns	ns	ns	ns	ns
47	29	5.7	12.47	35.032	√	√	√	√	√	√	√	14	2140	ns	ns	ns	ns
48	3	3665	2.663	34.9263	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	4	3501	2.749	34.9373	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	5	3248	2.875	34.9479	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	6	3000	2.999	34.9488	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	7	2750	3.13	34.9406	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	8	2500	3.25	34.932	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	9	2250	3.381	34.9253	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	10	1998	3.561	34.9235	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	11	1799	3.699	34.9237	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	12	1602	3.824	34.9201	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	13	1399	3.892	34.9113	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	14	1202	4.027	34.9133	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	15	999.5	4.28	34.9285	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	16	891.7	4.457	34.9343	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	17	802.9	4.724	34.9499	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	18	700.2	5.084	34.9556	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	19	600.3	5.511	34.9311	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	20	477.3	6.308	34.9008	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	21	401.3	7.163	34.9576	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	22	294.9	7.816	34.9489	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	23	200.9	8.437	35.008	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	24	151.7	9.07	35.0879	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	25	101.5	9.665	35.1613	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	26	51	10.43	35.2641	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
48	27	5	11.86	35.0185	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
49	3	3575	2.674	34.9279	√	√	√	√	√	√	√	1	163	49-1	ns	ns	ns
49	4	3250	2.817	34.9464	√	√	√	√	√	√	√	ns	ns	ns	176	ns	ns
49	5	3000	2.934	34.9505	√	√	√	√	√	√	√	ns	ns	49-2	ns	ns	ns
49	6	2749	3.055	34.9452	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
49	7	2501	3.181	34.9356	√	√	√	√	√	√	√	2	164	49-3	177	ns	ns
49	8	2250	3.342	34.929	√	√	√	√	√	√	√	ns	ns	49-4	ns	ns	ns
49	9	2001	3.502	34.9244	√	√	√	√	√	√	√	ns	ns	49-5	178	ns	ns
49	10	1801	3.68	34.9238	√	√	√	√	√	√	√	3	ns	49-6	179	ns	ns
49	11	1601	3.797	34.9208	√	√	√	√	√	√	√	ns	ns	ns	180	ns	ns
49	12	1400	3.868	34.9107	√	√	√	√	√	√	√	4	165	49-7	181	ns	ns
49	13	1201	3.984	34.9088	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
49	14	1000	4.223	34.9178	√	√	√	√	√	√	√	5	166	49-8	182	ns	ns
49	15	900.1	4.52	34.9416	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
49	16	800.1	4.776	34.9509	√	√	√	√	√	√	√	6	168	49-9	183	ns	ns
49	17	699.6	5.03	34.9436	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
49	18	600.1	5.807	34.9825	√	√	√	√	√	√	√	7	2141	49-10	ns	ns	ns
49	19	600.3	5.807	34.9826	√	√	√	√	√	√	√	ns	2142	ns	184	ns	ns
49	20	460.3	6.317	34.86	√	√	√	√	√	√	√	ns	ns	ns	ns	49-1	ns
49	21	400.1	6.998	34.8804	√	√	√	√	√	√	√	8	2143	49-11	185	49-2	ns
49	22	299.7	7.657	34.9071	√	√	√	√	√	√	√	9	ns	ns	186	49-3	ns
49	23	201.6	8.434	35.0023	√	√	√	√	√	√	√	10	2144	49-12	187	49-4	ns
49	24	149	9.223	35.115	√	√	√	√	√	√	√	ns	ns	ns	ns	49-5	ns
49	25	101.2	9.502	35.1421	√	√	√	√	√	√	√	11	ns	49-13	188	49-6	ns
49	26	50.6	10.25	35.0628	√	√	√	√	√	√	√	12	ns	ns	189	ns	ns
49	27	5.3	12.02	34.9847	√	√	√	√	√	√	√	13	2145	49-14	190	ns	49-1B
50	3	3630	2.793	34.9467	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	4	3482	2.824	34.9507	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
50	5	3249	2.893	34.9556	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	6	2998	2.947	34.9525	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	7	2749	3.119	34.953	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	8	2500	3.225	34.9386	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	9	2248	3.329	34.9259	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	10	2001	3.532	34.9262	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	11	1798	3.681	34.9236	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	12	1601	3.793	34.9177	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	13	1400	3.865	34.9107	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	14	1200	4.029	34.9154	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	15	999	4.313	34.9351	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	16	800	4.774	34.9674	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	18	699.9	4.92	34.9424	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	19	600	5.563	34.9785	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	20	472.9	6.177	34.941	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	21	421.8	6.475	34.9148	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	22	299	7.842	34.9813	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	23	200.5	8.881	35.0944	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	24	150.6	9.371	35.1395	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	25	97.9	9.594	35.1563	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	26	51.3	10.52	35.2676	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
50	27	4.5	12.22	35.0754	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	3	3081	2.716	34.9314	√	√	√	√	√	√	√	1	151	ns	ns	ns	ns
51	4	3000	2.83	34.9393	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	5	2748	2.999	34.9454	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	6	2499	3.149	34.9416	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	7	2250	3.269	34.9312	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	8	2001	3.425	34.9272	√	√	√	√	√	√	√	2	153	ns	ns	ns	ns
51	9	1800	3.579	34.9249	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	10	1601	3.73	34.9238	√	√	√	√	√	√	√	3	ns	ns	ns	ns	ns
51	11	1400	3.853	34.922	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	12	1200	3.984	34.9216	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	13	1000	4.217	34.9343	√	√	√	√	√	√	√	4	154	ns	ns	ns	ns
51	14	898.9	4.375	34.9459	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	15	800.7	4.554	34.9556	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns
51	16	700	4.516	34.9284	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
51	17	601.1	4.721	34.9169	√	√	√	√	√	√	√	6	155	ns	ns	ns	ns
51	18	499.9	5.021	34.8924	√	√	√	√	√	√	√	7	ns	ns	ns	51-1	ns
51	19	401.3	5.649	34.8915	√	√	√	√	√	√	√	8	156	ns	ns	51-2	ns
51	20	303	6.228	34.8496	√	ns	√	√	√	√	√	9	158	ns	ns	51-3	ns
51	21	303	6.23	34.8497	√	√	√	√	√	√	√	ns	159	ns	ns	51-4	ns
51	22	200.4	7.206	34.8838	√	√	√	√	√	√	√	10	ns	ns	ns	51-5	ns
51	23	149	7.652	34.92	√	√	√	√	√	√	√	ns	ns	ns	ns	51-6	ns
51	24	98.6	8.267	34.9699	√	√	√	√	√	√	√	11	ns	ns	ns	51-7	ns
51	25	49.9	9.815	34.9702	√	√	√	√	√	√	√	12	ns	ns	ns	ns	ns
51	26	5.3	11.8	34.929	√	√	√	√	√	√	√	13	160	ns	ns	ns	51-1B
52	3	3093	2.847	34.9469	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	4	3002	2.883	34.9509	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	5	2750	2.99	34.9527	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	6	2501	3.149	34.9413	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	7	2250	3.304	34.9307	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	8	2001	3.424	34.9257	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	9	1801	3.542	34.9238	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	10	1602	3.688	34.9237	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	11	1402	3.812	34.9203	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	12	1202	3.891	34.9108	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	13	1001	4.056	34.9177	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
52	14	898.9	4.222	34.9313	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	15	799.8	4.496	34.9511	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	16	699.8	4.82	34.9753	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	17	602.1	5.191	34.9972	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	18	500.2	5.496	34.9827	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	19	401.4	5.632	34.8933	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	20	301.5	6.078	34.8158	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	21	201.2	6.921	34.8366	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	22	149.6	7.05	34.8416	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	23	99.8	7.572	34.8713	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	24	51.6	8.864	34.9067	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
52	25	4.7	11.37	34.8088	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
53	3	3663	2.799	34.9521	√	√	√	√	√	√	√	1	145	53-1	ns	ns	ns
53	4	3663	2.799	34.952	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
53	5	3550	2.8	34.9508	√	√	√	√	√	√	√	ns	ns	53-2	191	ns	ns
53	6	3419	2.81	34.9501	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
53	7	3259	2.84	34.9506	√	√	√	√	√	√	√	ns	ns	53-3	192	ns	ns
53	8	3000	2.939	34.9557	√	√	√	√	√	√	√	ns	ns	53-4	ns	ns	ns
53	9	2750	3.073	34.9573	√	√	√	√	√	√	√	2	146	ns	ns	ns	ns
53	10	2500	3.15	34.942	√	√	√	√	√	√	√	ns	ns	53-5	193	ns	ns
53	11	2249	3.273	34.9294	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
53	12	2001	3.414	34.9256	√	√	√	√	√	√	√	ns	ns	53-6	194	ns	ns
53	13	1801	3.576	34.9253	√	√	√	√	√	√	√	ns	ns	53-7	ns	ns	ns
53	14	1600	3.706	34.9237	√	√	√	√	√	√	√	3	147	ns	ns	ns	ns
53	15	1401	3.836	34.9195	√	√	√	√	√	√	√	ns	ns	53-8	195	ns	ns
53	16	1200	3.967	34.9179	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
53	17	1000	4.135	34.9226	√	√	√	√	√	√	√	4	148	53-9	196	ns	ns
53	18	900.6	4.237	34.9233	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
53	19	799.6	4.38	34.9322	√	√	√	√	√	√	√	5	ns	53-10	ns	ns	ns
53	20	700.2	4.529	34.9286	√	√	√	√	√	√	√	ns	ns	ns	197	ns	ns
53	21	599.6	4.733	34.927	√	√	√	√	√	√	√	6	149	53-11	ns	ns	ns
53	22	499.2	5.002	34.9072	√	√	√	√	√	√	√	7	ns	ns	198	53-1	ns
53	23	400.7	5.461	34.8792	√	√	√	√	√	√	√	8	150	53-12	199	53-2	ns
53	24	313.6	5.671	34.7901	√	√	√	√	√	√	√	9	ns	ns	200	53-3	ns
53	25	200	7.015	34.8661	√	√	√	√	√	√	√	10	161	53-13	201	53-4	ns
53	26	150.4	7.553	34.9101	√	√	√	√	√	√	√	ns	ns	ns	ns	53-5	ns
53	27	100.4	8.343	34.9534	√	√	√	√	√	√	√	11	ns	53-14	202	53-6	ns
53	28	50.8	11.28	35.0332	√	√	√	√	√	√	√	12	ns	ns	203	ns	ns
53	29	4.5	11.86	34.9813	√	√	√	√	√	√	√	13	162	53-15	204	ns	53-1B
54	3	3424	2.821	34.9689	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	4	3300	2.815	34.9625	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	5	3200	2.835	34.9605	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	6	3100	2.887	34.9621	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	7	3000	2.925	34.9584	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	8	2749	3.022	34.9541	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	9	2501	3.135	34.9451	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	10	2249	3.288	34.9362	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	11	1999	3.417	34.9291	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	12	1801	3.561	34.9277	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	13	1565	3.721	34.9245	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	14	1400	3.742	34.9072	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	15	1201	3.808	34.9006	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	16	1000	3.951	34.9033	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	17	900.4	4.061	34.9087	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	18	802	4.176	34.9123	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	19	700.6	4.333	34.918	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	20	601.6	4.52	34.9168	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
54	21	500	4.747	34.9045	√	√	√	√	√	√	√	ns	ns	ns	ns	54-1	ns
54	22	399.8	5.044	34.8841	√	√	√	√	√	√	√	ns	ns	ns	ns	54-2	ns
54	23	299.4	5.299	34.8086	√	√	√	√	√	√	√	ns	ns	ns	ns	54-3	ns
54	24	199.8	6.245	34.8254	√	√	√	√	√	√	√	ns	ns	ns	ns	54-4	ns
54	25	150.6	6.768	34.8462	√	√	√	√	√	√	√	ns	ns	ns	ns	54-5	ns
54	26	101.3	7.445	34.8894	√	√	√	√	√	√	√	ns	ns	ns	ns	54-6	ns
54	27	50.6	9.049	34.8963	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
54	28	4.4	11.38	34.7421	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	54-1B
55	3	3276	2.734	34.9462	√	√	√	√	√	√	√	1	137	ns	ns	ns	ns
55	4	3150	2.758	34.9472	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	5	3151	2.758	34.947	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
55	6	3000	2.817	34.952	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	7	2750	2.926	34.9537	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	8	2499	3.077	34.9506	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	9	2249	3.18	34.9399	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	10	2000	3.328	34.9332	√	√	√	√	√	√	√	2	138	ns	ns	ns	ns
55	11	1800	3.469	34.9306	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	12	1600	3.606	34.927	√	√	√	√	√	√	√	3	139	ns	ns	ns	ns
55	13	1400	3.732	34.9216	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	14	1194	3.831	34.9143	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
55	15	999.4	3.919	34.9074	√	√	√	√	√	√	√	5	140	ns	ns	ns	ns
55	16	800.2	4.139	34.9202	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
55	17	700.3	4.251	34.9213	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	18	600.3	4.38	34.9216	√	√	√	√	√	√	√	7	141	ns	ns	ns	ns
55	19	500.1	4.587	34.9219	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
55	20	400.7	4.896	34.9189	√	√	√	√	√	√	√	9	142	ns	ns	ns	ns
55	21	301.9	5.026	34.8617	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	22	198.3	5.389	34.7816	√	√	√	√	√	√	√	10	143	ns	ns	ns	ns
55	23	150.5	5.461	34.7512	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
55	24	120.4	5.558	34.731	√	√	√	√	√	√	√	11	ns	ns	ns	ns	ns
55	25	56.1	7.664	34.7609	√	√	√	√	√	√	√	12	ns	ns	ns	ns	ns
55	26	4.9	11.1	34.6828	√	√	√	√	√	√	√	13	144	ns	ns	ns	ns
56	3	2916	2.784	34.9725	√	√	√	√	√	√	√	ns	ns	ns	208	ns	ns
56	4	2848	2.827	34.9729	√	√	√	√	√	√	√	ns	ns	ns	209	ns	ns
56	5	2794	2.858	34.972	√	√	√	√	√	√	√	ns	ns	ns	210	ns	ns
56	6	2749	2.882	34.9714	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	7	2499	3.033	34.9596	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	8	2251	3.187	34.9442	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	9	2000	3.327	34.9298	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	10	1800	3.459	34.9256	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	11	1601	3.606	34.9246	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	12	1400	3.761	34.9216	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	13	1199	3.899	34.9192	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	14	998.4	4.052	34.9193	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	15	900.3	4.179	34.9292	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	16	800.1	4.333	34.9404	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	19	701.8	4.589	34.9605	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	20	598.7	4.877	34.9835	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	21	501.9	5.427	35.0369	√	√	√	√	√	√	√	ns	ns	ns	ns	56-1	ns
56	22	401.2	5.711	35.0308	√	√	√	√	√	√	√	ns	ns	ns	ns	56-2	ns
56	23	300.6	5.265	34.8623	√	√	√	√	√	√	√	ns	ns	ns	ns	56-3	ns
56	24	200.8	5.601	34.7863	√	√	√	√	√	√	√	ns	ns	ns	ns	56-4	ns
56	25	150.4	6.049	34.7988	√	√	√	√	√	√	√	ns	ns	ns	ns	56-5	ns
56	26	100.3	6.648	34.8197	√	√	√	√	√	√	√	ns	ns	ns	ns	56-6	ns
56	27	51.2	9.192	34.7787	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
56	28	5.2	10.96	34.7929	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	56-1B
57	3	2769	2.776	34.9775	√	√	√	√	√	√	√	1	128	57-1	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
57	4	2702	2.794	34.9715	√	√	√	√	√	√	√	ns	ns	57-2	211	ns	ns
57	5	2600	2.838	34.9678	√	√	√	√	√	√	√	ns	129	57-3	212	ns	ns
57	6	2600	2.838	34.9681	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
57	7	2501	2.916	34.9671	√	√	√	√	√	√	√	ns	ns	57-4	213	ns	ns
57	8	2250	3.184	34.9589	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
57	9	2001	3.377	34.9405	√	√	√	√	√	√	√	2	130	57-5	214	ns	ns
57	10	1803	3.526	34.9304	√	√	√	√	√	√	√	ns	ns	57-6	ns	ns	ns
57	11	1599	3.666	34.924	√	√	√	√	√	√	√	3	131	ns	215	ns	ns
57	12	1403	3.815	34.92	√	√	√	√	√	√	√	ns	ns	57-7	216	ns	ns
57	13	1202	3.973	34.9205	√	√	√	√	√	√	√	4	ns	57-8	ns	ns	ns
57	14	1000	4.148	34.9249	√	√	√	√	√	√	√	5	132	ns	217	ns	ns
57	15	899.2	4.233	34.9238	√	√	√	√	√	√	√	ns	ns	57-9	ns	ns	ns
57	16	800.7	4.511	34.9476	√	ns	√	√	√	√	√	6	ns	ns	218	ns	ns
57	17	699.7	4.901	34.9844	√	√	√	√	√	√	√	ns	ns	57-10	ns	ns	ns
57	18	598.3	5.237	34.9987	√	√	√	√	√	√	√	7	133	ns	219	ns	ns
57	19	522.8	5.75	35.0418	√	√	√	√	√	√	√	8	ns	57-11	ns	ns	ns
57	20	409.6	5.678	34.9066	√	√	√	√	√	√	√	9	134	ns	220	ns	ns
57	21	333.1	5.997	34.9117	√	√	√	√	√	√	√	ns	ns	57-12	221	ns	ns
57	22	270.2	5.606	34.7747	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
57	23	202.7	6.246	34.8088	√	√	√	√	√	√	√	10	135	57-13	222	ns	ns
57	24	150.1	6.941	34.8514	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
57	25	99.1	7.413	34.8586	√	√	√	√	√	√	√	11	ns	57-14	223	ns	ns
57	26	49.9	10.7	34.9013	√	√	√	√	√	√	√	12	ns	ns	224	ns	ns
57	27	5	11.54	34.9038	√	√	√	√	√	√	√	13	136	57-15	225	ns	ns
58	3	2757	2.783	34.9741	√	ns	√	√	√	√	√	ns	ns	ns	205	ns	ns
58	4	2600	2.82	34.9689	√	ns	√	√	√	√	√	ns	ns	ns	206	ns	ns
58	5	2499	2.89	34.9658	√	√	√	√	√	√	√	ns	ns	ns	207	ns	ns
58	6	2400	3.005	34.967	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	7	2250	3.176	34.9593	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	8	2000	3.39	34.9372	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	9	1801	3.552	34.9284	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	10	1600	3.739	34.9241	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	11	1400	3.838	34.9178	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	12	1200	3.969	34.9133	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	13	1002	4.203	34.9223	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	14	900.6	4.447	34.9364	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	15	800.4	4.752	34.9637	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	16	700.3	4.871	34.9526	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	17	600.7	5.395	34.9759	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	18	500	5.873	34.9888	√	√	√	√	√	√	√	ns	ns	ns	ns	58-1	ns
58	19	400.6	6.079	34.9669	√	√	√	√	√	√	√	ns	ns	ns	ns	58-2	ns
58	20	300.8	6.246	34.9228	√	√	√	√	√	√	√	ns	ns	ns	ns	58-3	ns
58	21	200.3	6.482	34.8661	√	√	√	√	√	√	√	ns	ns	ns	ns	58-4	ns
58	22	150.7	7.04	34.8944	√	√	√	√	√	√	√	ns	ns	ns	ns	58-5	ns
58	23	100.9	7.07	34.8698	√	√	√	√	√	√	√	ns	ns	ns	ns	58-6	ns
58	24	49.7	7.491	34.8652	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
58	25	4.7	9.926	34.7278	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	58-1B
59	3	2784	2.776	34.978	√	√	√	√	√	√	√	1	127	ns	ns	ns	ns
59	4	2751	2.791	34.9754	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	5	2601	2.823	34.9706	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	6	2499	2.877	34.9686	√	√	√	√	√	√	√	2	ns	ns	ns	ns	ns
59	7	2499	2.877	34.9687	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	8	2250	3.164	34.9609	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	9	2000	3.385	34.9406	√	√	√	√	√	√	√	3	329	ns	ns	ns	ns
59	10	1801	3.544	34.9285	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	11	1600	3.7	34.9238	√	√	√	√	√	√	√	4	330	ns	ns	ns	ns
59	13	1200	3.962	34.9143	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
59	14	1001	4.128	34.9187	√	√	√	√	√	√	√	5	331	ns	ns	ns	ns
59	15	901.5	4.285	34.9285	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	16	800.1	4.518	34.9464	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
59	17	699.5	4.7	34.945	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	18	599.3	5.11	34.9695	√	√	√	√	√	√	√	7	332	ns	ns	ns	ns
59	19	500.8	5.54	34.9658	√	√	√	√	√	√	√	8	333	ns	ns	ns	ns
59	20	400.9	6.037	34.9747	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	21	317.3	5.693	34.8661	√	√	√	√	√	√	√	9	ns	ns	ns	ns	ns
59	22	201.7	6.42	34.8828	√	√	√	√	√	√	√	10	334	ns	ns	ns	ns
59	23	151.4	6.581	34.8216	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
59	24	101.9	7.348	34.8624	√	√	√	√	√	√	√	11	ns	ns	ns	ns	ns
59	25	51.2	10.71	34.865	√	√	√	√	√	√	√	12	ns	ns	ns	ns	ns
59	26	6.2	11	34.8118	√	√	√	√	√	√	√	13	335	ns	ns	ns	ns
60	3	2637	2.755	34.9798	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	4	2551	2.783	34.9811	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	5	2501	2.804	34.9807	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	6	2252	3.094	34.9794	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	7	2060	3.405	34.9681	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	8	2000	3.394	34.949	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	9	1801	3.555	34.9308	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	10	1600	3.766	34.9322	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	11	1401	3.877	34.9201	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	12	1202	4.013	34.9171	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	13	1000	4.251	34.9293	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	14	900.2	4.442	34.9437	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	15	799.9	4.703	34.9606	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	16	700.2	5.065	34.9765	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	17	600.1	5.48	34.9938	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	18	500.3	5.943	35.0071	√	√	√	√	√	√	√	ns	ns	ns	ns	60-1	ns
60	19	400	6.423	35.0336	√	√	√	√	√	√	√	ns	ns	ns	ns	60-2	ns
60	20	299.8	5.973	34.9063	√	√	√	√	√	√	√	ns	ns	ns	ns	60-3	ns
60	21	200.6	5.939	34.8167	√	√	√	√	√	√	√	ns	ns	ns	ns	60-4	ns
60	22	150.9	6.874	34.925	√	√	√	√	√	√	√	ns	ns	ns	ns	60-5	ns
60	23	100.1	7.134	34.8892	√	√	√	√	√	√	√	ns	ns	ns	ns	60-6	ns
60	24	50.5	9.152	34.7796	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
60	25	7.1	10.11	34.7581	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	60-1B
61	3	2480	2.808	34.9819	√	√	√	√	√	√	√	1	322	61-1	226	ns	ns
61	4	2402	2.812	34.9821	√	√	√	√	√	√	√	2	323	61-2	227	ns	ns
61	5	2401	2.813	34.982	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
61	6	2250	2.891	34.98	√	√	√	√	√	√	√	ns	ns	61-3	228	ns	ns
61	7	2001	3.221	34.9588	√	√	√	√	√	√	√	3	ns	61-4	ns	ns	ns
61	8	1800	3.463	34.9397	√	√	√	√	√	√	√	ns	ns	ns	229	ns	ns
61	9	1602	3.65	34.9295	√	√	√	√	√	√	√	4	324	61-5	ns	ns	ns
61	10	1401	3.781	34.9227	√	√	√	√	√	√	√	ns	ns	ns	230	ns	ns
61	11	1200	3.894	34.9146	√	√	√	√	√	√	√	ns	ns	61-6	ns	ns	ns
61	12	1002	4.045	34.9141	√	√	√	√	√	√	√	5	325	ns	231	ns	ns
61	13	900	4.252	34.9304	√	√	√	√	√	√	√	ns	ns	61-7	ns	ns	ns
61	14	800.6	4.458	34.9459	√	√	√	√	√	√	√	6	ns	ns	232	ns	ns
61	15	700.5	4.644	34.9497	√	√	√	√	√	√	√	ns	ns	61-8	ns	ns	ns
61	16	599.8	5.111	34.9824	√	√	√	√	√	√	√	7	326	ns	233	ns	ns
61	17	501.2	5.671	35.0105	√	√	√	√	√	√	√	ns	ns	61-9	ns	ns	ns
61	18	399.5	5.874	34.9914	√	√	√	√	√	√	√	8	ns	ns	234	ns	ns
61	19	298.5	6.056	34.9629	√	√	√	√	√	√	√	ns	ns	61-10	235	ns	ns
61	20	200.5	5.984	34.8953	√	√	√	√	√	√	√	9	327	ns	236	ns	ns
61	21	148.5	6.084	34.8682	√	√	√	√	√	√	√	ns	ns	61-11	237	ns	ns
61	22	101.1	6.45	34.8692	√	√	√	√	√	√	√	10	ns	61-12	238	ns	ns
61	23	51	8.698	34.7972	√	√	√	√	√	√	√	11	ns	61-13	239	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
61	24	5.3	9.872	34.7453	√	√	√	√	√	√	√	12	328	61-14	240	ns	ns
62	3	2160	2.87	34.9843	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	4	2101	2.929	34.9841	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	5	2002	3.097	34.9808	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	6	1902	3.209	34.9673	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	7	1802	3.31	34.9512	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	8	1602	3.511	34.9351	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	9	1400	3.719	34.9296	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	10	1199	3.856	34.9202	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	11	1000	4.076	34.9243	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	12	899	4.19	34.9272	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	13	800.7	4.423	34.9437	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	14	697.1	4.719	34.9618	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	15	598.9	5.033	34.9787	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	16	501.4	5.627	35.0069	√	√	√	√	√	√	√	ns	ns	ns	ns	62-1	ns
62	17	400.5	6.293	35.0596	√	√	√	√	√	√	√	ns	ns	ns	ns	62-2	ns
62	18	298.5	6.512	35.0582	√	√	√	√	√	√	√	ns	ns	ns	ns	62-3	ns
62	19	201.5	6.512	35.0115	√	√	√	√	√	√	√	ns	ns	ns	ns	62-4	ns
62	20	150.2	6.267	34.9248	√	√	√	√	√	√	√	ns	ns	ns	ns	62-5	ns
62	21	99.2	6.023	34.8167	√	√	√	√	√	√	√	ns	ns	ns	ns	62-6	ns
62	22	53.4	6.712	34.8438	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
62	23	5.1	9.885	34.7595	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	62-1B
63	3	2258	2.947	34.9836	√	√	√	√	√	√	√	1	315	ns	ns	ns	ns
63	4	2180	2.955	34.9832	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	5	2150	2.958	34.9831	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	6	2000	3.026	34.9801	√	√	√	√	√	√	√	2	316	ns	ns	ns	ns
63	7	2000	3.026	34.9801	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
63	8	1800	3.296	34.9602	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	9	1601	3.563	34.9523	√	√	√	√	√	√	√	3	317	ns	ns	ns	ns
63	10	1400	3.768	34.9363	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	11	1201	3.906	34.9229	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	12	1001	4.129	34.9288	√	√	√	√	√	√	√	4	318	ns	ns	ns	ns
63	13	900.7	4.288	34.9387	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	14	801.4	4.481	34.9521	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	15	699.8	4.776	34.9691	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	16	601.1	5.107	34.9827	√	√	√	√	√	√	√	5	319	ns	ns	ns	ns
63	17	500.3	5.523	34.9998	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
63	18	399.9	5.97	35.0275	√	√	√	√	√	√	√	7	ns	ns	ns	ns	ns
63	19	301.6	6.178	35.0129	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	20	199	6.12	34.9479	√	√	√	√	√	√	√	8	320	ns	ns	ns	ns
63	21	150	6.281	34.9344	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
63	22	100.4	6.593	34.9239	√	√	√	√	√	√	√	9	ns	ns	ns	ns	ns
63	23	49.3	8.972	34.8308	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
63	24	5.3	9.848	34.7938	√	√	√	√	√	√	√	11	321	ns	ns	ns	ns
64	3	2197	3.294	34.9878	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	4	2100	3.335	34.9878	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	5	2000	3.348	34.9878	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	6	1801	3.376	34.9879	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	7	1601	3.54	34.9823	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	8	1400	3.683	34.9405	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	9	1200	3.916	34.9289	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	10	1001	4.148	34.9281	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	11	900.6	4.359	34.943	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	12	799.2	4.613	34.9602	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	13	700.4	4.96	34.98	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	14	600.6	5.46	35.0113	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	15	500.2	5.882	35.0181	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
64	16	400.1	6.051	34.9892	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	17	300.2	5.89	34.9157	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	18	199.8	5.856	34.846	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	19	149.9	6.133	34.8479	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	20	100.7	6.423	34.8251	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	21	49.7	9.277	34.7582	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
64	22	5	10.27	34.7516	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
65	3	1624	3.675	34.9827	√	√	√	√	√	√	√	1	305	65-1	241	ns	ns
65	5	1500	3.733	34.9852	√	√	√	√	√	√	√	ns	ns	ns	242	ns	ns
65	6	1401	3.833	34.9823	√	√	√	√	√	√	√	2	ns	65-2	ns	ns	ns
65	7	1201	3.974	34.9569	√	√	√	√	√	√	√	ns	ns	65-3	243	ns	ns
65	8	1000	4.325	34.9638	√	√	√	√	√	√	√	3	306	65-4	244	ns	ns
65	9	800.5	4.916	35	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
65	10	700.2	5.421	35.0387	√	√	√	√	√	√	√	ns	ns	65-5	245	ns	ns
65	11	600.8	5.762	35.0425	√	√	√	√	√	√	√	4	307	65-6	ns	ns	ns
65	12	509.7	6.048	35.0257	√	√	√	√	√	√	√	5	309	ns	246	ns	ns
65	13	399.9	6.405	35.0458	√	√	√	√	√	√	√	6	311	65-7	247	ns	ns
65	14	269.1	6.549	35.0124	√	√	√	√	√	√	√	ns	ns	65-8	248	ns	ns
65	15	180.8	6.087	34.8428	√	√	√	√	√	√	√	7	312	65-9	249	ns	ns
65	16	129.3	6.573	34.8396	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
65	17	88.3	7.197	34.8945	√	√	√	√	√	√	√	ns	ns	65-10	250	ns	ns
65	18	49.5	8.6	34.8412	√	√	√	√	√	√	√	9	ns	ns	251	ns	ns
65	19	6.5	10.24	34.7714	√	√	√	√	√	√	√	10	313	65-11	252	ns	ns
66	3	1456	4.006	34.9864	√	√	√	√	√	√	√	ns	ns	ns	ns	66-1	ns
66	4	1202	4.029	34.9855	√	√	√	√	√	√	√	ns	ns	ns	ns	66-2	ns
66	5	1002	4.354	34.9867	√	√	√	√	√	√	√	ns	ns	ns	ns	66-3	ns
66	6	850.7	5.147	35.0309	√	√	√	√	√	√	√	ns	ns	ns	ns	66-4	ns
66	7	721.6	5.644	35.0386	√	√	√	√	√	√	√	ns	ns	ns	ns	66-5	ns
66	8	595.9	6.258	35.0726	√	√	√	√	√	√	√	ns	ns	ns	ns	66-6	ns
66	9	520.6	6.579	35.0886	√	√	√	√	√	√	√	ns	ns	ns	ns	66-7	ns
66	10	399.5	6.801	35.0921	√	√	√	√	√	√	√	ns	ns	ns	ns	66-8	ns
66	11	300.8	6.836	35.0812	√	√	√	√	√	√	√	ns	ns	ns	ns	66-9	ns
66	12	199.7	6.887	35.0625	√	√	√	√	√	√	√	ns	ns	ns	ns	66-10	ns
66	13	150.8	6.927	35.042	√	√	√	√	√	√	√	ns	ns	ns	ns	66-11	ns
66	14	99.5	6.57	34.9095	√	√	√	√	√	√	√	ns	ns	ns	ns	66-12	ns
66	15	39.9	7.917	34.9081	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
66	16	5.6	9.914	34.8382	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	66-1B
67	3	1490	4.046	34.9855	√	√	√	√	√	√	√	1	296	ns	ns	ns	ns
67	4	1299	4.05	34.9852	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
67	5	1100	4.219	34.9833	√	√	√	√	√	√	√	2	297	ns	ns	ns	ns
67	6	902.2	5.186	35.029	√	√	√	√	√	√	√	3	ns	ns	ns	ns	ns
67	7	702.5	5.862	35.0464	√	√	√	√	√	√	√	4	298	ns	ns	ns	ns
67	8	602.2	6.161	35.0462	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
67	9	499.8	6.393	35.0611	√	√	√	√	√	√	√	5	300	ns	ns	ns	ns
67	10	399.9	6.522	35.0646	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
67	11	301.1	6.667	35.0704	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
67	12	200.2	6.613	35.0322	√	√	√	√	√	√	√	7	301	ns	ns	ns	ns
67	13	149.7	6.572	34.9684	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
67	14	99.4	6.492	34.9158	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
67	15	51	8.715	34.8661	√	√	√	√	√	√	√	9	ns	ns	ns	ns	ns
67	16	5.4	9.538	34.8662	√	ns	√	√	√	√	√	10	303	ns	ns	ns	ns
68	3	1708	3.882	34.9745	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	4	1602	3.927	34.9761	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	5	1402	3.921	34.9763	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	6	1202	3.929	34.9718	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	7	1002	4.121	34.9519	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	8	899.8	4.358	34.9592	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
68	9	800.6	4.591	34.9677	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	10	724.6	4.938	34.994	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	11	602.7	4.797	34.9256	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	12	501.2	5.102	34.9351	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	13	418.9	5.935	35.0396	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	14	303.1	6.505	35.0738	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	15	200.1	6.737	35.08	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	16	153.4	6.699	35.0554	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	17	103	6.591	34.9621	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	18	40.2	8.176	34.7868	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
68	19	4.4	9.25	34.7985	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
69	3	1894	3.406	34.9513	√	ns	√	√	√	√	√	1	295	ns	ns	ns	ns
69	4	1799	3.422	34.9516	√	√	√	√	√	√	√	ns	ns	69-1	253	ns	ns
69	5	1600	3.557	34.9512	√	√	√	√	√	√	√	ns	ns	69-2	ns	ns	ns
69	6	1399	3.725	34.9486	√	√	√	√	√	√	√	2	2263	69-3	254	ns	ns
69	7	1201	3.842	34.9497	√	√	√	√	√	√	√	ns	ns	69-4	255	ns	ns
69	8	1026	3.765	34.924	√	ns	√	√	√	√	√	3	2264	69-5	256	ns	ns
69	9	856.5	4.105	34.9571	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
69	10	800.9	4.04	34.9384	√	√	√	√	√	√	√	4	2266	69-6	257	ns	ns
69	11	701.1	4.133	34.9419	√	√	√	√	√	√	√	ns	ns	69-7	ns	ns	ns
69	12	600.6	4.266	34.9449	√	√	√	√	√	√	√	ns	ns	69-8	258	ns	ns
69	13	500.5	4.416	34.9505	√	√	√	√	√	√	√	5	2267	69-9	259	ns	ns
69	14	399.9	4.588	34.9516	√	√	√	√	√	√	√	6	ns	69-10	ns	ns	ns
69	15	300.9	4.774	34.9549	√	√	√	√	√	√	√	ns	ns	69-11	260	ns	ns
69	16	200.6	5.008	34.9585	√	√	√	√	√	√	√	7	2268	69-12	261	ns	ns
69	17	149.5	5.329	34.9578	√	√	√	√	√	√	√	ns	ns	ns	262	ns	ns
69	18	101	5.816	34.9327	√	√	√	√	√	√	√	8	ns	69-13	263	ns	ns
69	19	39.9	8.472	34.7836	√	√	√	√	√	√	√	9	ns	ns	264	ns	ns
69	20	5.1	9.036	34.7783	√	√	√	√	√	√	√	10	2269	69-14	265	ns	ns
70	3	2304	3.133	34.9437	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	4	2201	3.193	34.9456	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	5	2099	3.235	34.9463	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	6	2000	3.331	34.9481	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	7	1801	3.532	34.9514	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	8	1597	3.671	34.95	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	9	1399	3.771	34.9462	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	10	1203	3.621	34.9004	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	11	1001	3.619	34.89	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	12	802	3.822	34.908	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	13	600.8	4.077	34.9211	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
70	14	450.3	4.388	34.9228	√	√	√	√	√	√	√	ns	ns	ns	ns	70-1	ns
70	15	300	4.701	34.9252	√	√	√	√	√	√	√	ns	ns	ns	ns	70-2	ns
70	16	200.9	5.094	34.9414	√	√	√	√	√	√	√	ns	ns	ns	ns	70-3	ns
70	17	150.9	5.395	34.9626	√	√	√	√	√	√	√	ns	ns	ns	ns	70-4	ns
70	18	101.3	5.738	34.9764	√	ns	√	√	√	√	√	ns	ns	ns	ns	70-5	ns
70	19	39.8	8.231	34.8025	√	√	√	√	√	√	√	ns	ns	ns	ns	70-6	ns
70	20	4.7	8.845	34.7933	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	70-1B
71	3	2312	3.026	34.9395	√	√	√	√	√	√	√	1	2254	ns	ns	ns	ns
71	4	2000	3.155	34.9412	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
71	5	1801	3.336	34.9505	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
71	6	1670	3.405	34.9423	√	√	√	√	√	√	√	2	2255	ns	ns	ns	ns
71	7	1399	3.667	34.957	√	√	√	√	√	√	√	3	2256	ns	ns	ns	ns
71	8	998.8	3.744	34.9296	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
71	9	900.6	3.63	34.9019	√	√	√	√	√	√	√	5	2257	ns	ns	ns	ns
71	10	700.3	3.767	34.9074	√	√	√	√	√	√	√	6	2258	ns	ns	ns	ns
71	11	601.1	3.995	34.9269	√	√	√	√	√	√	√	7	2259	ns	ns	ns	ns
71	12	500.3	4.104	34.9258	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
71	13	398.5	4.252	34.9277	√	√	√	√	√	√	√	8	2260	ns	ns	ns	ns
71	14	299.5	4.418	34.9261	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
71	15	201.1	4.722	34.9387	√	√	√	√	√	√	√	9	2261	ns	ns	ns	ns
71	16	101.4	5.141	34.9412	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
71	17	62.1	5.913	34.923	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
71	18	5.9	8.892	34.849	√	√	√	√	√	√	√	11	2262	ns	ns	ns	ns
72	3	2547	3.082	34.9388	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	4	2254	3.221	34.9411	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	5	2000	3.375	34.939	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	6	1600	3.628	34.9329	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	7	1557	3.753	34.9492	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	8	1400	3.778	34.9393	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	9	1150	3.531	34.8838	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	10	699.9	3.734	34.9041	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	11	599.8	3.815	34.9083	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	12	497	3.924	34.9139	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	13	401.2	4.08	34.9207	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	14	300.4	4.424	34.9438	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	15	200.1	4.62	34.9363	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	16	149.4	4.794	34.9343	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	17	80	5.277	34.9435	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	18	41.3	7.334	34.8509	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
72	19	5	9.017	34.819	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	72-1B
73	3	3027	2.411	34.9175	√	√	√	√	√	√	√	1	2242	73-1	266	ns	ns
73	4	3027	2.414	34.9172	√	√	√	√	√	√	√	ns	2243	ns	ns	ns	ns
73	5	2902	2.907	34.9345	√	√	√	√	√	√	√	ns	2244	73-2	ns	ns	ns
73	6	2751	2.998	34.9375	√	√	√	√	√	√	√	2	2245	73-3	267	ns	ns
73	7	2499	3.1	34.9421	√	√	√	√	√	√	√	ns	ns	73-4	268	ns	ns
73	8	2197	3.288	34.9475	√	√	√	√	√	√	√	3	2246	73-5	269	ns	ns
73	9	2002	3.392	34.9418	√	√	√	√	√	√	√	ns	ns	73-6	270	ns	ns
73	10	1750	3.592	34.9388	√	√	√	√	√	√	√	ns	ns	73-7	271	ns	ns
73	11	1621	3.758	34.9546	√	√	√	√	√	√	√	4	2248	73-8	ns	ns	ns
73	12	1449	3.67	34.9171	√	√	√	√	√	√	√	ns	ns	73-9	272	ns	ns
73	13	1349	3.483	34.8806	√	√	√	√	√	√	√	5	2249	73-10	273	ns	ns
73	14	998.3	3.528	34.8829	√	√	√	√	√	√	√	6	ns	73-11	274	ns	ns
73	15	599.6	3.671	34.8941	√	√	√	√	√	√	√	7	2250	73-12	275	ns	ns
73	16	400.3	3.97	34.9155	√	√	√	√	√	√	√	8	ns	73-13	276	ns	ns
73	17	200	4.455	34.9273	√	√	√	√	√	√	√	9	2251	ns	277	ns	ns
73	18	100.2	4.83	34.9274	√	√	√	√	√	√	√	10	ns	73-14	278	ns	ns
73	19	29.9	7.333	34.8645	√	√	√	√	√	√	√	11	ns	ns	279	ns	ns
73	20	4.7	8.975	34.8462	√	√	√	√	√	√	√	12	2252	73-15	280	ns	ns
74	3	3140	1.994	34.9069	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-1
74	4	3000	2.529	34.9211	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
74	5	2800	2.825	34.93	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-2
74	6	2500	3.038	34.9346	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
74	7	2250	3.228	34.9418	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
74	8	1998	3.357	34.9351	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
74	9	1771	3.522	34.9379	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-3
74	10	1601	3.662	34.9399	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
74	11	1400	3.638	34.9152	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-4
74	12	1202	3.488	34.8804	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
74	13	1043	3.557	34.8887	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-5
74	14	800.1	3.62	34.8941	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
74	15	601	3.659	34.8949	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-6
74	16	500.7	3.733	34.8999	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
74	17	401.3	3.808	34.9015	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-7
74	18	302.7	3.966	34.9057	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
74	19	201	4.34	34.9284	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-8
74	20	149.5	4.555	34.9346	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-9
74	21	100.8	4.762	34.9348	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-10
74	22	39.7	7.251	34.8688	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	74-11
74	23	5.3	8.701	34.8598	√	√	√	√	√	√	√	ns	ns	ns	ns	74-1B	74-12
75	3	3135	1.541	34.9016	√	√	√	√	√	√	√	1	2233	ns	281	ns	ns
75	4	3001	2.409	34.9148	√	√	√	√	√	√	√	ns	ns	ns	282	ns	ns
75	5	3001	2.41	34.9148	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	6	2750	2.853	34.9306	√	√	√	√	√	√	√	2	2234	ns	283	ns	ns
75	7	2501	3.067	34.9346	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	8	2249	3.244	34.9338	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	9	2000	3.419	34.9331	√	√	√	√	√	√	√	3	2235	ns	ns	ns	ns
75	10	1698	3.71	34.9422	√	√	√	√	√	√	√	4	2236	ns	ns	ns	ns
75	11	1600	3.656	34.9187	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	12	1468	3.478	34.8797	√	√	√	√	√	√	√	5	2237	ns	ns	ns	ns
75	13	1200	3.488	34.8784	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	14	799.4	3.564	34.888	√	√	√	√	√	√	√	6	2239	ns	ns	ns	ns
75	15	600.4	3.604	34.8904	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	16	500.8	3.677	34.8957	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	17	402	3.762	34.9011	√	√	√	√	√	√	√	7	2240	ns	ns	ns	ns
75	18	300.2	3.928	34.9108	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	19	200.4	4.206	34.9255	√	√	√	√	√	√	√	8	2241	ns	ns	ns	ns
75	20	149.3	4.349	34.9268	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
75	21	100.3	4.566	34.9279	√	√	√	√	√	√	√	9	ns	ns	ns	ns	ns
75	22	39	7.539	34.8475	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
75	23	4.3	8.555	34.8428	√	√	√	√	√	√	√	11	2253	ns	ns	ns	ns
76	3	3157	1.509	34.902	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	4	3000	2.449	34.915	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	5	2800	2.779	34.9294	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	6	2500	3.032	34.9341	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	7	2001	3.417	34.934	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	8	1650	3.667	34.9298	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	9	1399	3.463	34.8765	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	10	1200	3.467	34.8762	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	11	999	3.505	34.8811	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	12	800.2	3.538	34.8844	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	13	603	3.624	34.8937	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	14	500.2	3.632	34.8909	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	15	400.1	3.721	34.8976	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	16	200.4	4.155	34.9154	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	17	101	5.083	34.9697	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	18	31	7.381	34.8624	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
76	19	5.6	8.507	34.8705	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
77	3	3152	1.486	34.9015	√	√	√	√	√	√	√	1	286	77-1	284	ns	ns
77	4	3152	1.485	34.9015	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
77	5	3101	2.077	34.9054	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
77	6	3000	2.537	34.918	√	√	√	√	√	√	√	2	287	77-2	285	ns	ns
77	7	2801	2.867	34.9336	√	√	√	√	√	√	√	3	288	77-3	ns	ns	ns
77	8	2500	3.09	34.9322	√	√	√	√	√	√	√	ns	ns	77-4	286	ns	ns
77	9	2200	3.337	34.9317	√	√	√	√	√	√	√	4	289	77-5	ns	ns	ns
77	10	1899	3.627	34.932	√	√	√	√	√	√	√	5	290	ns	287	ns	ns
77	11	1801	3.652	34.9169	ns	√	√	√	√	√	√	ns	ns	77-6	ns	ns	ns
77	12	1649	3.485	34.8762	√	√	√	√	√	√	√	6	291	ns	ns	ns	ns
77	13	1601	3.478	34.8748	√	√	√	√	√	√	√	ns	ns	77-7	288	ns	ns
77	14	1499	3.486	34.8758	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
77	15	1400	3.496	34.8775	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
77	16	1299	3.507	34.8792	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
77	17	1200	3.517	34.8804	√	√	√	√	√	√	√	7	292	77-8	289	ns	ns
77	18	1100	3.527	34.8816	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
77	19	998.5	3.542	34.8841	√	√	√	√	√	√	√	ns	ns	77-9	ns	ns	ns
77	21	900.5	3.552	34.8855	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
77	22	800.1	3.562	34.8867	√	√	√	√	√	√	√	8	293	77-10	290	ns	ns
77	23	699.4	3.574	34.8872	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
77	24	599.6	3.601	34.8888	√	√	√	√	√	√	√	ns	ns	77-11	291	ns	ns
77	25	500.1	3.643	34.8921	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
77	26	349.8	3.727	34.898	√	√	√	√	√	√	√	9	294	77-12	292	ns	ns
77	27	250.7	3.794	34.8967	√	√	√	√	√	√	√	ns	ns	ns	293	ns	ns
77	28	99.7	3.925	34.8978	√	√	√	√	√	√	√	10	2232	77-13	294	ns	ns
77	29	46.7	4.231	34.9155	√	√	√	√	√	√	√	11	ns	ns	295	ns	ns
77	30	5.5	9.151	34.8506	√	√	√	√	√	√	√	12	2230	77-14	296	ns	ns
78	3	3080	1.325	34.9019	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	4	3001	1.898	34.9041	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	5	2800	2.656	34.9186	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	6	2600	2.919	34.9265	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	7	2299	3.167	34.9317	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	8	2001	3.37	34.9273	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	9	1700	3.609	34.9284	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	10	1581	3.619	34.9152	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	11	1471	3.397	34.8698	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	12	1401	3.39	34.8681	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
78	13	1300	3.404	34.8692	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
78	14	1199	3.405	34.8694	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	15	1101	3.415	34.8712	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
78	16	999.5	3.429	34.8732	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	17	899.4	3.443	34.8752	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
78	18	800.5	3.457	34.8771	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	19	700.9	3.477	34.8792	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
78	20	600	3.521	34.8845	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	21	500.6	3.535	34.8853	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
78	22	399.9	3.596	34.8908	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	23	350	3.607	34.8901	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
78	24	300.9	3.645	34.8921	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	25	198.9	3.725	34.8937	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	26	149.6	3.876	34.8999	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	27	79.6	4.128	34.8989	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	28	39.5	7.249	34.8374	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
78	29	5	7.935	34.8345	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	78-1B
79	3	2964	1.348	34.9014	√	√	√	√	√	√	√	1	274	ns	ns	ns	ns
79	4	2801	2.529	34.9191	√	√	√	√	√	√	√	ns	275	ns	ns	ns	ns
79	5	2801	2.531	34.9191	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
79	6	2621	2.7	34.9284	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
79	7	2439	2.953	34.9361	√	√	√	√	√	√	√	2	276	ns	ns	ns	ns
79	8	2001	3.183	34.9315	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
79	9	1551	3.599	34.93	√	√	√	√	√	√	√	3	277	ns	ns	ns	ns
79	10	1378	3.496	34.8918	√	√	√	√	√	√	√	4	278	ns	ns	ns	ns
79	11	1202	3.376	34.8672	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
79	12	999.8	3.404	34.8711	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
79	13	800.9	3.42	34.8729	√	√	√	√	√	√	√	5	280	ns	ns	ns	ns
79	14	599	3.465	34.8783	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
79	15	501.9	3.496	34.8813	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
79	16	400.2	3.535	34.8843	ns	√	√	√	√	√	√	7	281	ns	ns	ns	ns
79	17	351.5	3.555	34.8853	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
79	18	201.7	3.703	34.8932	√	√	√	√	√	√	√	8	282	ns	ns	ns	ns
79	19	149.7	3.827	34.9002	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
79	20	100.4	4.027	34.9043	√	√	√	√	√	√	√	9	283	ns	ns	ns	ns
79	21	50	4.578	34.897	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
79	22	5.1	7.678	34.8342	√	√	√	√	√	√	√	11	284	ns	ns	ns	ns
80	3	2896	1.392	34.9009	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
80	4	2501	2.797	34.9264	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
80	5	2001	3.24	34.9282	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
80	6	1400	3.325	34.8593	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
80	7	800.1	3.477	34.881	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
80	8	4	7.94	34.8232	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
81	3	2828	1.389	34.9021	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	4	2750	1.768	34.9033	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	5	2700	2.086	34.9046	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	6	2499	2.747	34.9202	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	7	2250	3.076	34.9327	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	8	2000	3.3	34.9324	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	9	1799	3.46	34.9323	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	10	1600	3.611	34.9319	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	11	1446	3.667	34.9223	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	12	1268	3.487	34.8801	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	13	1001	3.509	34.8827	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	14	900	3.534	34.886	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	15	799.6	3.551	34.8879	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	16	699.8	3.573	34.8906	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	17	600	3.595	34.8935	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	18	500.5	3.617	34.8956	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	19	399.5	3.654	34.8977	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	20	300.2	3.712	34.9012	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	21	200.2	3.848	34.9097	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	22	149.9	3.956	34.9181	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	23	100.3	4.136	34.9182	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	24	51.3	4.441	34.9114	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
81	25	4.2	8.134	34.8238	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
82	3	2765	1.452	34.9005	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
82	4	2502	2.509	34.9138	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
82	5	2001	3.242	34.9277	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
82	6	1401	3.42	34.8762	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
82	7	599.4	3.502	34.883	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
82	8	4.4	8.685	34.8438	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
83	3	2688	1.527	34.9003	√	√	√	√	√	√	√	1	265	83-1	297	ns	ns
83	4	2596	1.849	34.9038	√	√	√	√	√	√	√	2	266	83-2	ns	ns	ns
83	5	2467	2.387	34.9125	√	√	√	√	√	√	√	ns	ns	83-3	298	ns	ns
83	6	2224	2.974	34.9243	√	√	√	√	√	√	√	3	267	83-4	ns	ns	ns
83	7	1974	3.287	34.9305	√	√	√	√	√	√	√	ns	ns	83-5	299	ns	ns
83	8	1800	3.451	34.9297	√	√	√	√	√	√	√	ns	ns	83-6	ns	ns	ns
83	9	1601	3.615	34.9279	√	√	√	√	√	√	√	4	268	83-7	300	ns	ns
83	10	1370	3.384	34.8685	√	√	√	√	√	√	√	5	269	83-8	ns	ns	ns
83	11	1201	3.409	34.8707	√	√	√	√	√	√	√	ns	ns	83-9	301	ns	ns
83	12	1201	3.408	34.8707	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
83	13	1001	3.438	34.8745	√	√	√	√	√	√	√	6	270	83-10	302	ns	ns
83	14	800.5	3.503	34.8833	√	√	√	√	√	√	√	ns	ns	83-11	303	ns	ns
83	15	601.6	3.558	34.8893	√	√	√	√	√	√	√	7	271	83-12	ns	ns	ns
83	16	401.3	3.651	34.897	√	√	√	√	√	√	√	8	272	ns	304	ns	ns
83	17	288.2	3.739	34.902	√	√	√	√	√	√	√	9	ns	83-13	305	ns	ns
83	18	200.4	4.027	34.9307	√	√	√	√	√	√	√	10	273	ns	306	ns	ns
83	19	99.2	4.233	34.9424	√	√	√	√	√	√	√	11	285	83-14	307	ns	ns
83	20	50.4	4.622	34.925	√	√	√	√	√	√	√	12	ns	ns	308	ns	ns
83	21	6.3	8.312	34.8285	√	√	√	√	√	√	√	13	2238	83-15	309	ns	83-1B

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
84	3	2659	1.735	34.9003	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	4	2600	1.738	34.9003	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	5	2529	1.746	34.9008	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	6	2300	2.614	34.9168	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	7	2001	3.125	34.9287	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	8	1799	3.345	34.9279	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	9	1600	3.544	34.929	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	10	1451	3.615	34.9203	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	11	1300	3.346	34.8638	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	12	1100	3.369	34.8661	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	13	1000	3.388	34.8688	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	14	800.8	3.433	34.875	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	15	596	3.507	34.8845	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	16	500.4	3.539	34.888	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	17	400.3	3.572	34.8905	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	18	300.8	3.641	34.8963	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	19	199.1	3.861	34.9149	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	20	149.8	4.007	34.9253	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	21	71.6	4.538	34.9518	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
84	22	29.3	6.806	34.844	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
85	3	2294	1.927	34.9031	√	√	√	√	√	√	√	1	253	ns	ns	ns	ns
85	4	2202	1.948	34.9037	√	√	√	√	√	√	√	2	254	ns	ns	ns	ns
85	5	2099	2.488	34.914	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
85	6	2000	2.785	34.9217	√	√	√	√	√	√	√	3	255	ns	ns	ns	ns
85	7	2000	2.786	34.9217	√	√	√	√	√	√	√	ns	256	ns	ns	ns	ns
85	8	1800	3.154	34.9296	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
85	9	1600	3.409	34.9301	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
85	10	1350	3.61	34.9212	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
85	11	1240	3.331	34.8622	√	√	√	√	√	√	√	5	258	ns	ns	ns	ns
85	12	1001	3.424	34.8732	√	√	√	√	√	√	√	6	259	ns	ns	ns	ns
85	13	799.2	3.485	34.8803	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
85	14	600.7	3.577	34.8909	√	√	√	√	√	√	√	7	260	ns	ns	ns	ns
85	15	499.8	3.599	34.8919	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
85	16	399.8	3.696	34.9001	√	√	√	√	√	√	√	8	261	ns	ns	ns	ns
85	17	299.5	3.851	34.9133	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
85	18	200	4.151	34.9399	√	√	√	√	√	√	√	9	262	ns	ns	ns	ns
85	19	151.3	4.273	34.9489	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
85	20	100	4.503	34.9623	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
85	21	52.9	5.012	34.986	√	√	√	√	√	√	√	11	ns	ns	ns	ns	ns
85	22	5.3	8.287	34.8651	√	√	√	√	√	√	√	12	263	ns	ns	ns	ns
86	3	2059	2.237	34.9085	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	4	2001	2.234	34.9086	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	5	1950	2.271	34.9102	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	6	1799	2.768	34.9221	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	7	1601	3.128	34.9306	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	8	1400	3.441	34.9326	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	9	1200	3.681	34.9358	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	10	998.4	3.764	34.9234	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	11	900.3	3.772	34.9188	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	12	800.1	3.794	34.9157	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	13	700.7	3.864	34.9188	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	14	591.6	4.033	34.9312	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	15	499.6	4.186	34.9418	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	16	400.6	4.374	34.9535	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	17	299.4	4.763	34.9793	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	18	200.3	5.147	35.0033	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	19	149.8	5.479	35.0293	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
86	20	99	6.008	35.0523	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	21	51.8	6.653	34.9982	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
86	22	4.5	9.021	34.9052	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	3	1860	2.6	34.9161	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	4	1800	2.642	34.9168	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	5	1750	2.695	34.9182	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	6	1700	2.792	34.9229	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	7	1600	3.053	34.9292	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	8	1400	3.288	34.9303	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	9	1201	3.606	34.9358	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	10	999.4	3.734	34.9323	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	11	898.8	3.846	34.9273	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	12	800.2	3.926	34.924	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	13	700.7	4.078	34.933	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	14	600.3	4.22	34.9439	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	15	500	4.467	34.9608	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	16	399.3	4.713	34.9759	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	17	299.8	5.059	35.0007	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	18	199.6	5.554	35.0356	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	19	150.4	5.799	35.0492	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	20	87.1	6.155	35.0427	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	21	45.4	7.23	34.9575	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
87	22	4.5	8.966	34.8804	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
88	3	1735	3.018	34.9253	√	√	√	√	√	√	√	1	1843	88-1	310	ns	ns
88	4	1700	3.084	34.9265	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
88	5	1648	3.12	34.927	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
88	6	1600	3.162	34.9278	√	√	√	√	√	√	√	ns	ns	88-2	311	ns	ns
88	7	1400	3.408	34.9315	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
88	8	1199	3.633	34.935	√	√	√	√	√	√	√	2	1845	88-3	312	ns	ns
88	9	1079	3.745	34.9269	√	√	√	√	√	√	√	ns	ns	88-4	ns	ns	ns
88	10	899.3	3.998	34.9324	√	√	√	√	√	√	√	ns	ns	ns	313	ns	ns
88	11	800.9	4.165	34.942	√	√	√	√	√	√	√	3	1846	88-5	ns	ns	ns
88	12	701	4.272	34.9475	√	√	√	√	√	√	√	ns	ns	ns	314	ns	ns
88	13	599.9	4.496	34.962	√	√	√	√	√	√	√	4	1848	88-6	ns	ns	ns
88	14	498.6	4.717	34.975	√	√	√	√	√	√	√	ns	ns	ns	315	ns	ns
88	15	401.4	5.048	34.9987	√	√	√	√	√	√	√	5	1849	88-7	316	ns	ns
88	16	300.6	5.422	35.0225	√	√	√	√	√	√	√	6	ns	ns	317	ns	ns
88	17	201.3	5.87	35.0572	√	√	√	√	√	√	√	7	1850	88-8	318	ns	ns
88	18	148.7	6.014	35.058	√	√	√	√	√	√	√	ns	ns	ns	319	ns	ns
88	19	99.6	6.348	35.0351	√	√	√	√	√	√	√	8	ns	88-9	320	ns	ns
88	20	49.7	7.56	34.9402	√	√	√	√	√	√	√	9	ns	ns	321	ns	ns
88	21	4.4	8.714	34.8957	√	√	√	√	√	√	√	10	1851	88-10	322	ns	88-1
89	3	1221	3.718	34.9268	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	4	1150	3.842	34.9237	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	5	1080	4.026	34.933	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	6	970.3	4.045	34.9341	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	7	877.4	4.554	34.9581	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	8	800	4.801	34.9598	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	9	699.8	4.903	34.9548	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	10	600.9	4.887	34.9481	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	11	400	5.117	34.9507	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	12	300.2	4.821	34.8602	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	13	199.8	4.819	34.8224	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	14	150	4.855	34.7855	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	15	100.6	4.781	34.7391	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	16	50.3	4.064	34.5043	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
89	17	3.7	3.949	34.0504	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
90	3	896.6	4.453	34.9545	√	√	√	√	√	√	√	1	1839	ns	ns	ns	ns
90	4	799.7	4.601	34.9594	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
90	5	761	4.604	34.9593	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
90	6	597	4.806	34.958	√	√	√	√	√	√	√	2	1840	ns	ns	ns	ns
90	7	500.4	5.011	34.96	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
90	8	414.1	5.061	34.9207	√	√	√	√	√	√	√	3	1841	ns	ns	ns	ns
90	9	372.6	5.415	34.9721	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
90	10	300.7	4.678	34.8119	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns
90	11	199.7	4.857	34.7895	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
90	12	109.6	4.658	34.7101	√	√	√	√	√	√	√	6	1842	ns	ns	ns	ns
90	13	50.4	4.301	34.5536	√	√	√	√	√	√	√	7	ns	ns	ns	ns	ns
90	14	4.4	4.191	33.932	√	√	√	√	√	√	√	8	264	ns	ns	ns	90-1
91	3	544	4.999	34.9621	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
91	4	501	5.01	34.9617	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
91	5	400.5	5.044	34.947	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
91	6	300	5.055	34.8823	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
91	7	200.6	4.812	34.7596	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
91	8	150.4	4.707	34.7264	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
91	9	100.4	4.36	34.6394	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
91	10	50	4.509	34.5163	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
91	11	4.4	4.706	34.0719	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	91-1B
92	3	298.3	5.004	34.8317	√	√	√	√	√	√	√	ns	ns	ns	323	ns	ns
92	4	298.3	5.004	34.8311	ns	ns	√	√	ns	ns	ns	1	1834	ns	ns	ns	ns
92	5	249.8	4.903	34.7936	√	√	√	√	√	√	√	ns	ns	ns	324	ns	ns
92	6	249.8	4.903	34.7937	ns	ns	√	√	ns	ns	ns	2	ns	ns	ns	ns	ns
92	7	199.7	4.846	34.7726	√	√	√	√	√	√	√	ns	ns	ns	325	ns	ns
92	8	199.7	4.846	34.7724	ns	ns	√	√	ns	ns	ns	3	1835	ns	ns	ns	ns
92	9	149.7	4.535	34.6862	√	√	√	√	√	√	√	ns	ns	ns	326	ns	ns
92	10	149.9	4.534	34.6858	ns	ns	√	√	ns	ns	ns	4	ns	ns	ns	ns	ns
92	11	100.4	4.458	34.6439	√	ns	√	√	√	√	√	ns	ns	ns	327	ns	ns
92	12	100.5	4.457	34.6435	ns	ns	√	√	ns	ns	ns	5	1836	ns	ns	ns	ns
92	13	39.4	5.544	34.6285	√	√	√	√	√	√	√	ns	ns	ns	328	ns	ns
92	14	39.5	5.516	34.6255	ns	ns	√	√	ns	ns	ns	6	ns	ns	ns	ns	ns
92	15	4.3	5.563	34.3002	√	√	√	√	√	√	√	ns	ns	ns	329	ns	ns
92	16	4.3	5.578	34.3006	ns	ns	√	√	ns	ns	ns	7	1838	ns	ns	ns	ns
93	3	221.2	5.711	34.9769	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	93-1
93	4	199.3	5.054	34.8213	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	93-2
93	5	151.2	4.837	34.7574	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	93-3
93	6	110.7	4.658	34.6981	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	93-4
93	7	40.5	4.359	34.4028	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	93-5
93	8	5.3	4.993	34.2622	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	93-6
94	3	193.3	4.975	34.8323	√	√	√	√	√	√	√	1	ns	ns	ns	ns	ns
94	4	150	4.997	34.8242	√	√	√	√	√	√	√	2	ns	ns	ns	ns	ns
94	5	95.6	6.186	34.9288	√	√	√	√	√	√	√	3	ns	ns	ns	ns	ns
94	6	37.3	6.88	34.6681	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
94	7	4.7	4.962	34.2273	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns
95	3	176.1	4.794	34.7672	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	95-1
95	4	145.8	4.816	34.7487	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	95-2
95	5	87.3	4.687	34.5296	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	95-3
95	6	63.5	6.002	34.6469	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	95-4
95	7	33.8	7.686	34.81	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	95-5
95	9	3.7	6.009	34.3438	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	95-6
96	3	176.1	4.765	34.7399	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	96-1
96	4	130.2	4.666	34.6811	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	96-2
96	5	110.2	3.812	34.4751	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	96-3
96	6	74.1	3.738	34.3313	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	96-4
96	7	16.6	2.944	33.5247	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	96-5

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
96	8	5.2	2.748	33.3875	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	96-6
97	3	176	4.809	34.7251	√	√	√	√	√	√	√	1	ns	ns	330	ns	97-1
97	4	148.5	4.696	34.6844	√	√	√	√	√	√	√	2	ns	ns	331	ns	97-2
97	5	80.6	3.796	34.3396	√	√	√	√	√	√	√	3	ns	ns	332	ns	97-3
97	6	44.7	2.373	34.0073	√	√	√	√	√	√	√	4	ns	ns	333	ns	97-4
97	7	6	3.512	33.4454	√	√	√	√	√	√	√	5	ns	ns	334	ns	97-5
98	3	157.1	3.95	34.4827	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	98-1
98	4	121.1	3.607	34.3767	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	98-2
98	5	90.6	3.098	34.2346	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	98-3
98	6	35.5	2.506	33.5006	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	98-4
98	7	4.9	4.501	32.2099	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	98-5
99	3	153.7	3.651	34.3763	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	99-1
99	4	112.1	3.689	34.2139	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	99-2
99	5	41.8	0.558	32.8624	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	99-3
99	6	5.9	4.612	31.3264	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	99-4
100	3	1714	3.476	34.9846	√	√	√	√	ns	ns	ns	1	ns	ns	ns	ns	ns
100	4	1714	3.476	34.9847	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
100	5	1714	3.476	34.9847	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
100	6	1714	3.476	34.9847	√	√	√	√	ns	ns	ns	2	ns	ns	ns	ns	ns
100	7	1714	3.476	34.9846	√	√	√	√	ns	ns	ns	3	ns	ns	ns	ns	ns
100	8	1714	3.476	34.9845	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
101	3	2231	3.231	34.9776	√	√	√	√	√	√	√	ns	1825	101-15	335	ns	ns
101	4	2000	3.28	34.9762	√	ns	√	√	√	√	√	ns	ns	101-2	336	ns	ns
101	5	1800	3.315	34.9739	√	√	√	√	√	√	√	ns	ns	101-3	337	ns	ns
101	6	1599	3.415	34.9672	√	√	√	√	√	√	√	ns	1826	ns	338	ns	ns
101	7	1401	3.622	34.9509	√	√	√	√	√	√	√	ns	1827	101-4	339	ns	ns
101	8	1200	3.738	34.9324	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
101	9	999.2	3.866	34.9182	√	√	√	√	√	√	√	ns	ns	101-5	340	ns	ns
101	10	899.7	3.936	34.9156	√	√	√	√	√	√	√	4	1829	ns	ns	ns	ns
101	11	800.2	3.998	34.9137	√	√	√	√	√	√	√	ns	ns	101-6	341	ns	ns
101	12	700.3	4.106	34.916	√	√	√	√	√	√	√	5	1830	ns	ns	ns	ns
101	13	599.5	4.246	34.9213	√	√	√	√	√	√	√	ns	ns	101-7	342	ns	ns
101	14	500.2	4.429	34.9274	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
101	15	400	4.698	34.9282	√	√	√	√	√	√	√	6	1831	101-8	343	ns	ns
101	16	299.3	4.948	34.9201	√	√	√	√	√	√	√	7	ns	101-9	344	ns	ns
101	17	199.3	5.162	34.9075	√	√	√	√	√	√	√	8	1832	101-10	345	ns	ns
101	18	150.6	5.07	34.8566	√	√	√	√	√	√	√	ns	ns	101-11	346	ns	ns
101	19	100.2	5.098	34.829	√	√	√	√	√	√	√	9	ns	101-12	347	ns	ns
101	20	30.5	8.516	34.6689	√	√	√	√	√	√	√	10	ns	101-13	348	ns	ns
101	21	5.3	10.05	34.6447	√	√	√	√	ns	ns	ns	11	1833	101-14	ns	ns	ns
102	3	1466	3.601	34.954	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	4	1300	3.725	34.938	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	5	1100	3.803	34.9254	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	6	899	3.919	34.9198	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	7	700.7	4.218	34.9219	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	8	600.4	4.313	34.9267	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	9	455.6	4.669	34.9276	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	10	400.1	4.786	34.9217	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	11	299	5.068	34.9247	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	12	199.8	5.136	34.8834	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	13	160.4	5.079	34.8576	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	14	99.7	5.134	34.7806	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	15	34.3	9.406	34.6685	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
102	16	4.5	9.876	34.6539	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
103	3	1847	3.267	34.9772	√	√	√	√	√	√	√	1	ns	ns	ns	ns	ns
103	4	1800	3.293	34.9761	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
103	5	1601	3.465	34.9615	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
103	6	1400	3.669	34.9456	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
103	7	1200	3.817	34.9314	√	√	√	√	√	√	√	2	ns	ns	ns	ns	ns
103	8	999.5	3.959	34.9167	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
103	9	900	4.038	34.9137	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
103	10	800.1	4.129	34.916	√	√	√	√	√	√	√	3	ns	ns	ns	ns	ns
103	11	699.7	4.375	34.9351	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
103	12	600	4.644	34.9447	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns
103	13	499.4	4.915	34.9453	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
103	14	431.2	5.158	34.9526	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns
103	15	338.2	5.404	34.949	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
103	16	281.3	5.626	34.9758	√	√	√	√	√	√	√	7	ns	ns	ns	ns	ns
103	17	150.9	5.636	34.928	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
103	18	84.3	5.476	34.8367	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
103	19	50.2	6.368	34.7641	√	√	√	√	√	√	√	9	ns	ns	ns	ns	ns
103	20	4.3	9.77	34.6853	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
104	3	1722	3.632	34.9609	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	4	1601	3.642	34.9578	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	5	1401	3.735	34.949	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	6	1091	3.882	34.9252	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	7	1000	3.969	34.921	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	8	890.2	4.093	34.9194	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	9	601.3	4.657	34.9447	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	10	500.6	4.949	34.9535	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	11	402	5.275	34.9633	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	12	299.7	5.689	34.9851	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	13	228.4	5.894	34.9952	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	14	101.1	5.317	34.8042	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	15	51.1	7.366	34.7361	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
104	16	6.5	9.609	34.6791	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
105	3	1285	3.905	34.9365	√	√	√	√	√	√	√	1	1817	ns	ns	ns	ns
105	4	1073	4.144	34.9306	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
105	5	900	4.276	34.9364	√	√	√	√	√	√	√	2	1818	ns	ns	ns	ns
105	6	800.1	4.468	34.9455	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
105	7	699.9	4.641	34.9528	√	√	√	√	√	√	√	3	1819	ns	ns	ns	ns
105	8	574.6	5.136	34.9979	√	√	√	√	√	√	√	4	1820	ns	ns	ns	ns
105	9	504.5	5.419	35.0029	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
105	10	432	5.772	35.0263	√	√	√	√	√	√	√	5	1821	ns	ns	ns	ns
105	11	299.8	6.045	35.0081	√	√	√	√	√	√	√	6	1822	ns	ns	ns	ns
105	12	200.5	6.095	34.9821	√	√	√	√	√	√	√	7	1823	ns	ns	ns	ns
105	13	159.4	6.044	34.9535	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
105	14	111.6	5.79	34.8868	√	√	√	√	√	√	√	9	ns	ns	ns	ns	ns
105	15	50.9	7.436	34.8059	√	√	√	√	√	√	√	10	ns	ns	ns	ns	ns
105	16	4	9.958	34.7344	√	√	√	√	√	√	√	11	1824	ns	ns	ns	ns
106	3	1848	3.326	34.9819	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
107	3	2423	3.205	34.9808	√	√	√	√	√	√	√	1	1636	ns	350	ns	ns
107	4	2250	3.224	34.9813	√	√	√	√	√	√	√	ns	ns	ns	351	ns	ns
107	5	2000	3.376	34.9821	√	√	√	√	√	√	√	ns	ns	ns	352	ns	ns
107	6	1800	3.514	34.9797	√	√	√	√	√	√	√	2	1810	ns	353	ns	ns
107	7	1599	3.667	34.9686	√	√	√	√	√	√	√	ns	ns	ns	354	ns	ns
107	8	1400	3.72	34.9411	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
107	9	1200	3.838	34.9203	√	√	√	√	√	√	√	3	1811	ns	355	ns	ns
107	10	1000	3.949	34.9084	√	√	√	√	√	√	√	4	1812	ns	ns	ns	ns
107	11	900.5	4.269	34.9388	√	√	√	√	√	√	√	ns	ns	ns	356	ns	ns
107	12	798.4	4.526	34.9495	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
107	13	700	4.827	34.9709	√	√	√	√	√	√	√	5	ns	ns	357	ns	ns
107	14	652.4	5.087	34.9908	√	√	√	√	√	√	√	6	1813	ns	ns	ns	ns
107	15	499.5	5.71	35.0103	√	√	√	√	√	√	√	7	ns	ns	358	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
107	16	400.6	5.951	35.0071	√	√	√	√	√	√	√	8	1814	ns	ns	ns	ns
107	17	299.3	6.527	35.065	√	√	√	√	√	√	√	ns	ns	ns	359	ns	ns
107	18	200.1	6.748	35.0774	√	√	√	√	√	√	√	9	1815	ns	360	ns	ns
107	19	165.3	6.718	35.0607	√	√	√	√	√	√	√	ns	ns	ns	361	ns	ns
107	20	100.9	6.575	34.9912	√	√	√	√	√	√	√	10	ns	ns	362	ns	ns
107	21	49.1	7.668	34.8304	√	√	√	√	√	√	√	11	ns	ns	363	ns	ns
107	22	5.3	9.816	34.73	√	√	√	√	√	√	√	12	1816	ns	364	ns	ns
108	3	1704	3.548	34.9764	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
109	3	1100	4.035	34.9347	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	4	998.9	4.215	34.9352	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	5	944	4.319	34.9389	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	6	800.3	4.565	34.952	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	7	699.5	4.77	34.9626	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	8	620.7	5.144	34.9802	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	9	500.9	5.613	34.9956	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	10	354.6	6.292	35.056	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	11	301.7	6.181	35.0216	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	12	202.4	6.263	34.9972	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	13	150.4	6.281	34.9821	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	14	84.6	6.06	34.8564	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	15	36.6	8.629	34.7847	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
109	16	5.4	9.639	34.736	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
110	3	1912	3.452	34.9819	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
111	3	1940	3.569	34.9799	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	4	1801	3.633	34.9783	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	5	1601	3.708	34.9733	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	6	1400	3.766	34.9647	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	7	1200	3.92	34.9457	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	8	1075	4.085	34.9362	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	9	879.2	4.482	34.9481	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	10	766.6	4.778	34.9597	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	11	660	4.918	34.9378	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	12	600.3	5.157	34.9526	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	13	500.8	5.782	35.001	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	14	400	6.205	35.0307	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	15	301	6.193	35.0106	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	16	200.5	6.054	34.9462	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	17	150.9	5.922	34.8982	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	18	100.5	5.824	34.8568	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	19	50.5	6.807	34.8286	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
111	20	4.6	9.646	34.7212	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
112	3	1655	3.71	34.9726	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
113	3	1071	4.149	34.9367	√	√	√	√	√	√	√	1	ns	113-1	ns	ns	ns
113	4	799.5	4.5	34.9377	√	√	√	√	√	√	√	2	ns	113-2	ns	ns	ns
113	5	611.6	4.653	34.9263	√	√	√	√	√	√	√	3	ns	113-3	ns	ns	ns
113	6	514.6	5.578	35.0016	√	√	√	√	√	√	√	4	ns	113-4	ns	ns	ns
113	7	446.3	5.76	35.0034	√	√	√	√	√	√	√	5	ns	113-5	ns	ns	ns
113	8	401.3	5.842	35.0039	√	√	√	√	√	√	√	ns	ns	113-6	ns	ns	ns
113	9	310.2	5.902	34.9902	√	√	√	√	√	√	√	ns	ns	113-7	ns	ns	ns
113	10	201.2	5.91	34.9507	√	√	√	√	√	√	√	6	ns	113-8	ns	ns	ns
113	11	150.9	5.793	34.8905	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
113	12	100.2	6.022	34.84	√	√	√	√	√	√	√	7	ns	113-9	ns	ns	ns
113	13	51.3	7.779	34.8095	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
113	14	5	9.659	34.7456	√	√	√	√	√	√	√	9	ns	113-10	ns	ns	ns
114	3	1742	3.843	34.9767	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	4	1601	3.837	34.9764	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	5	1401	3.871	34.9705	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
114	6	1201	4.015	34.9557	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	7	1000	4.186	34.9346	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	8	801.3	4.525	34.944	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	9	599.7	4.973	34.9409	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	10	434.1	5.494	34.9678	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	11	355.5	5.608	34.9585	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	12	302.1	5.987	35.0055	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	13	201	5.699	34.9159	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	14	121.4	5.508	34.8212	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	15	68.9	6.954	34.8154	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
114	16	5.6	9.33	34.7386	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
115	3	1438	3.828	34.9688	√	√	√	√	√	√	√	1	1632	ns	ns	ns	ns
115	4	1201	3.949	34.9474	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
115	5	1099	4.244	34.9287	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
115	6	951.1	4.611	34.9455	√	√	√	√	√	√	√	2	1633	ns	ns	ns	ns
115	7	799.6	4.885	34.933	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
115	8	700.7	5.274	34.9575	√	√	√	√	√	√	√	3	1634	ns	ns	ns	ns
115	9	600.8	5.477	34.9709	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
115	10	499.7	5.502	34.9744	√	√	√	√	√	√	√	4	1635	ns	ns	ns	ns
115	11	397.7	5.509	34.9728	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
115	12	272.4	6.044	35.0203	√	√	√	√	√	√	√	ns	1637	ns	ns	ns	ns
115	13	169.9	6.363	35.0308	√	√	√	√	√	√	√	ns	1638	ns	ns	ns	ns
115	14	99.5	5.951	34.9084	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns
115	15	30	6.484	34.8246	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
115	16	6.1	9.222	34.7381	√	√	√	√	√	√	√	7	1640	ns	ns	ns	ns
116	3	1608	3.885	34.9785	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	4	1401	3.891	34.9716	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	5	1200	3.966	34.964	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	6	1001	4.273	34.9546	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	7	900.2	4.488	34.9662	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	8	800.4	4.737	34.9733	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	9	634.3	5.453	35.0214	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	10	500.8	5.555	34.9802	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	11	399.7	5.797	34.9859	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	12	325	6.002	34.9966	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	13	202.8	5.972	34.9468	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	14	101.9	6.002	34.8384	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	15	55	8.413	34.8308	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
116	16	5.2	9.8	34.7587	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
117	3	1672	3.946	34.9815	√	√	√	√	√	√	√	1	1623	ns	365	ns	ns
117	4	1400	3.943	34.9809	√	√	√	√	√	√	√	ns	ns	ns	366	ns	ns
117	5	1200	3.963	34.9772	√	√	√	√	√	√	√	ns	ns	ns	367	ns	ns
117	6	1001	4.215	34.9708	√	√	√	√	√	√	√	2	1624	ns	368	ns	ns
117	7	799.8	4.785	35.0027	√	√	√	√	√	√	√	ns	ns	ns	369	ns	ns
117	8	600.6	5.619	35.0524	√	√	√	√	√	√	√	3	1625	ns	ns	ns	ns
117	9	499.7	6.054	35.07	√	√	√	√	√	√	√	4	1626	ns	370	ns	ns
117	10	400.9	6.313	35.0645	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
117	11	349.1	6.23	35.0267	√	√	√	√	√	√	√	5	1627	ns	371	ns	ns
117	12	271.8	6.722	35.0796	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
117	13	189.2	6.243	34.9643	√	√	√	√	√	√	√	7	1628	ns	372	ns	ns
117	14	79.9	6.962	34.88	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
117	15	50.7	9.3	34.8411	√	√	√	√	√	√	√	8	ns	ns	373	ns	ns
117	16	4.7	10.33	34.7555	√	√	√	√	√	√	√	9	1629	ns	374	ns	ns
118	3	1471	4.075	34.9892	ns	ns	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	3	1713	3.626	34.9583	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	4	1601	3.715	34.9644	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	5	1400	3.776	34.9691	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
119	6	1198	3.819	34.9685	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	7	1002	3.892	34.9559	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	8	777.8	4.022	34.9336	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	9	620.7	4.452	34.9645	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	10	501.7	4.436	34.9394	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	11	400.7	4.648	34.9492	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	12	300.1	4.706	34.9306	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	13	200.2	4.819	34.9167	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	14	120.5	5.234	34.9145	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	15	41.2	8.465	34.7683	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
119	16	6	9.615	34.7402	√	√	√	√	ns	ns	ns	ns	ns	ns	ns	ns	ns
120	3	1464	4.063	34.9883	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	4	1400	4.059	34.9884	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	5	1201	4.051	34.9877	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	6	999.8	4.248	34.9794	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	7	799.5	5.056	35.0216	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	8	648.4	5.68	35.0441	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	9	499.4	6.287	35.0577	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	10	399.4	6.596	35.0737	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	11	300.6	7.031	35.1169	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	12	200.3	7.128	35.1054	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	13	150	7.108	35.0689	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	14	109.6	6.664	34.919	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	15	50.9	9.39	34.8375	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
120	16	5.2	10.23	34.7911	√	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
121	3	1304	4.135	34.99	√	√	√	√	√	√	√	1	ns	121-1	375	ns	ns
121	4	1198	4.14	34.989	√	√	√	√	√	√	√	ns	ns	121-2	376	ns	ns
121	5	999	4.302	34.9906	√	√	√	√	√	√	√	2	ns	121-3	377	ns	ns
121	6	814.6	5.153	35.0334	√	√	√	√	√	√	√	3	ns	ns	378	ns	ns
121	7	774.3	5.005	34.9725	√	√	√	√	√	√	√	ns	ns	121-4	379	ns	ns
121	8	554.2	5.922	35.0178	√	√	√	√	√	√	√	4	ns	121-5	380	ns	ns
121	9	500.8	5.847	34.98	√	√	√	√	√	√	√	ns	ns	121-6	381	ns	ns
121	10	401.9	6.433	35.0499	√	√	√	√	√	√	√	5	ns	121-7	382	ns	ns
121	11	299.5	6.652	35.0697	√	√	√	√	√	√	√	ns	ns	121-8	383	ns	ns
121	12	199.3	6.655	35.0482	√	√	√	√	√	√	√	6	ns	121-9	384	ns	ns
121	13	149.8	6.489	35.0007	√	√	√	√	√	√	√	ns	ns	ns	385	ns	ns
121	14	100.4	6.262	34.919	√	√	√	√	√	√	√	7	ns	121-10	386	ns	ns
121	15	55	7.349	34.8747	√	√	√	√	√	√	√	8	ns	ns	387	ns	ns
121	16	5.5	9.955	34.7951	√	√	√	√	√	√	√	9	ns	121-11	388	ns	ns
122	3	1308	4.176	34.9898	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	4	1201	4.178	34.9892	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	5	1000	4.551	34.9975	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	6	800.5	5.334	35.0337	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	7	600.8	6.307	35.0798	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	8	552	6.437	35.068	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	9	378.4	6.543	35.0644	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	10	301.8	6.849	35.1051	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	11	200.9	6.744	35.0393	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	12	150.4	7.181	35.1048	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	13	99.7	7.126	35.0508	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	14	56.5	7.418	34.8854	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
122	15	4.4	10.2	34.876	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
123	3	1245	4.177	34.984	√	√	√	√	√	√	√	1	1619	ns	ns	ns	ns
123	4	1201	4.172	34.9841	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
123	5	1001	4.69	34.9834	√	√	√	√	√	√	√	2	1620	ns	ns	ns	ns
123	6	800.1	5.56	35.0129	√	√	√	√	√	√	√	3	ns	ns	ns	ns	ns
123	7	600.3	6.556	35.0828	√	√	√	√	√	√	√	4	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
123	8	499.7	6.537	35.0743	√	√	√	√	√	√	√	5	1621	ns	ns	ns	ns
123	9	400	6.426	35.0405	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
123	10	300.1	6.485	35.0459	√	√	√	√	√	√	√	6	1622	ns	ns	ns	ns
123	11	201.1	6.701	35.0662	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
123	12	142.5	7.086	35.1113	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
123	13	100.6	6.441	34.9557	√	√	√	√	√	√	√	7	1613	ns	ns	ns	ns
123	14	50.6	7.5	34.8598	√	√	√	√	√	√	√	8	ns	ns	ns	ns	ns
123	15	4.2	10.5	34.8021	√	√	√	√	√	√	√	9	1631	ns	ns	ns	ns
124	3	989.2	4.538	34.9945	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	4	861.1	4.823	34.9946	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	5	662.2	5.178	34.9515	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	6	612.8	5.791	35.0198	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	7	500.4	6.376	35.0633	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	8	436.4	6.534	35.0757	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	9	277.5	6.71	35.0717	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	10	200.4	6.77	35.0614	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	11	152	6.538	34.9974	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	12	101	6.551	34.9648	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	13	40.2	9.474	34.8044	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
124	14	4.5	10.52	34.805	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
125	3	693.9	5.855	35.0668	√	√	√	√	√	√	√	1	ns	125-1	ns	ns	ns
125	4	602.1	6.662	35.1034	√	√	√	√	√	√	√	2	ns	125-2	389	ns	ns
125	5	500.3	6.882	35.1023	√	√	√	√	√	√	√	3	ns	125-3	390	ns	ns
125	6	400.3	7.025	35.1111	√	√	√	√	√	√	√	ns	ns	125-4	391	ns	ns
125	7	298.1	7.183	35.1199	√	√	√	√	√	√	√	4	ns	125-5	392	ns	ns
125	8	199.7	7.142	35.0926	√	√	√	√	√	√	√	ns	ns	125-6	393	ns	ns
125	9	152.6	7.274	35.1022	√	ns	√	√	√	√	√	ns	ns	125-7	394	ns	ns
125	10	88.1	7.158	35.0232	√	√	√	√	√	√	√	5	ns	125-8	395	ns	ns
125	11	50.5	8.579	34.9854	√	√	√	√	√	√	√	6	ns	ns	396	ns	ns
125	12	5.9	10.49	34.9535	√	√	√	√	√	√	√	7	ns	125-9	397	ns	ns
126	3	1278	4.863	35.012	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	4	1001	4.926	35.0194	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	5	900.1	5.068	35.0292	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	6	801.5	5.669	35.0619	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	7	661.8	6.331	35.0955	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	8	552.9	6.742	35.1095	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	9	500.5	6.869	35.1132	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	10	399.9	6.963	35.1061	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	11	300.5	7.19	35.1181	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	12	200.9	7.317	35.1246	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	13	149.5	7.344	35.1175	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	14	101.3	7.236	35.0722	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	15	43.2	7.76	34.991	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
126	16	6.1	10.97	34.9051	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
127	3	793.7	5.754	35.0612	√	√	√	√	√	√	√	1	1610	ns	ns	ns	ns
127	4	600	6.376	35.0832	√	√	√	√	√	√	√	2	1611	ns	ns	ns	ns
127	5	499.1	6.651	35.091	√	√	√	√	√	√	√	3	1614	ns	ns	ns	ns
127	6	399.7	7.006	35.1223	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
127	7	300.2	7.149	35.1261	√	√	√	√	√	√	√	4	1615	ns	ns	ns	ns
127	8	200.2	7.257	35.1258	√	√	√	√	√	√	√	5	1616	ns	ns	ns	ns
127	9	150.6	7.289	35.1239	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
127	10	99.9	7.236	35.0998	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
127	11	49.5	7.164	34.993	√	√	√	√	√	√	√	7	ns	ns	ns	ns	ns
127	12	4.9	10.61	34.8979	√	√	√	√	√	√	√	8	1617	ns	ns	ns	ns
128	3	655.5	5.997	35.0793	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
128	4	601.1	6.381	35.0983	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
128	5	499.9	6.803	35.1173	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
128	6	398.8	6.994	35.1253	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
128	7	299.5	7.203	35.1362	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
128	8	198.5	7.269	35.1264	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
128	9	150.5	7.121	35.0854	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
128	10	107.1	7.301	35.0821	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
128	11	50.8	8.209	35.0484	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
128	12	6.2	11.01	34.9211	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
129	3	675.2	6.312	35.0925	√	√	√	√	√	√	√	ns	ns	129-1	ns	ns	ns
129	4	600.9	6.663	35.101	√	√	√	√	√	√	√	ns	ns	129-2	398	ns	ns
129	5	500	6.978	35.1134	√	√	√	√	√	√	√	ns	ns	129-3	399	ns	ns
129	6	401.2	7.129	35.1143	√	√	√	√	√	√	√	ns	ns	129-4	400	ns	ns
129	7	299.5	7.27	35.1241	√	√	√	√	√	√	√	ns	ns	129-5	401	ns	ns
129	8	200.2	7.368	35.128	√	√	√	√	√	√	√	ns	ns	129-6	402	ns	ns
129	9	150.3	7.382	35.1244	√	√	√	√	√	√	√	ns	ns	ns	403	ns	ns
129	10	100.5	7.346	35.1047	√	√	√	√	√	√	√	ns	ns	129-7	404	ns	ns
129	11	64.2	7.581	35.0936	√	√	√	√	√	√	√	ns	ns	ns	405	ns	ns
129	12	4.5	10.88	34.9773	√	√	√	√	√	√	√	ns	ns	129-8	406	ns	ns
130	3	712.5	6.11	35.0787	√	√	√	√	√	√	√	1	1600	ns	ns	ns	ns
130	4	600.6	6.516	35.0947	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
130	5	500.9	6.758	35.1034	√	√	√	√	√	√	√	2	1601	ns	ns	ns	ns
130	6	399.5	6.958	35.1128	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
130	7	300.3	7.072	35.11	√	√	√	√	√	√	√	3	1602	ns	ns	ns	ns
130	8	200	7.172	35.1086	√	√	√	√	√	√	√	4	1603	ns	ns	ns	ns
130	9	149.9	7.289	35.1162	√	√	√	√	√	√	√	ns	ns	ns	ns	ns	ns
130	10	100.9	7.178	35.0685	√	√	√	√	√	√	√	5	ns	ns	ns	ns	ns
130	11	50.2	7.653	35	√	√	√	√	√	√	√	6	ns	ns	ns	ns	ns
130	12	4.6	11.02	34.9341	√	√	√	√	√	√	√	7	1604	ns	ns	ns	ns
131	3	1045	5.622	35.0617	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	4	801.1	5.753	35.0705	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	5	598.8	6.179	35.0899	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	6	500.7	6.398	35.0821	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	7	400.7	6.763	35.1024	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	8	300	6.941	35.1102	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	9	200	7.081	35.1115	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	11	151.2	7.102	35.099	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	12	99.2	7.075	35.0657	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	13	50.3	7.918	34.9032	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
131	14	6	11.1	34.8809	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	3	774.3	5.785	35.0724	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	4	601.2	6.351	35.0943	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	5	501.5	6.657	35.1108	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	6	401.5	6.977	35.1289	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	7	301	7.155	35.1209	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	8	200.8	7.33	35.1303	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	9	101.2	7.379	35.1123	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	10	50.8	8.179	35.0478	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
132	11	6.2	11.53	34.9582	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
133	3	677.8	6.414	35.0915	ns	ns	√	√	√	√	√	1	1605	ns	407	ns	ns
133	4	599.6	6.44	35.0923	ns	ns	√	√	√	√	√	ns	ns	ns	408	ns	ns
133	5	499.5	6.573	35.098	ns	ns	√	√	√	√	√	2	1606	ns	409	ns	ns
133	6	399.5	6.769	35.1048	ns	ns	√	√	√	√	√	ns	ns	ns	410	ns	ns
133	7	299	6.978	35.11	ns	ns	√	√	√	√	√	ns	1607	ns	411	ns	ns
133	8	191.3	7.201	35.1297	ns	ns	√	√	√	√	√	3	1608	ns	412	ns	ns
133	9	100.8	7.286	35.1156	ns	ns	√	√	√	√	√	4	ns	ns	413	ns	ns
133	10	49.9	8.069	35.0504	ns	ns	√	√	√	√	√	5	ns	ns	414	ns	ns
133	11	4.7	11.45	34.9659	ns	ns	√	√	√	√	√	6	1609	ns	415	ns	ns
134	3	607.6	6.746	35.1238	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns

St.	Bottl	Pres	Tis	CTD-S	Salinity	O2 Winkl	SiO2	NO3	PO4	TAlk	pHT25	N2O/ CH4	CFC code	C_T	DOC	$^{18}O_2$ ^{13}C IPMA	$^{18}O_2$ ^{13}C LOCEAN
134	4	500.2	6.811	35.1272	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
134	5	299.3	7.112	35.1302	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
134	6	196.3	7.285	35.1334	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
134	7	50.2	7.909	35.0841	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
134	8	5.6	10.92	34.9822	ns	ns	√	√	√	√	√	ns	ns	ns	ns	ns	ns
135	3	250.7	7.038	35.1375	ns	ns	√	√	√	√	√	1	ns	ns	ns	ns	ns
135	4	149.4	7.161	35.1336	ns	ns	√	√	√	√	√	2	ns	ns	ns	ns	ns
135	5	99.5	7.18	35.1325	ns	ns	√	√	√	√	√	3	ns	ns	ns	ns	ns
135	6	50.3	7.796	35.1013	ns	ns	√	√	√	√	√	4	ns	ns	ns	ns	ns
135	7	4.4	12.27	34.967	ns	ns	√	√	√	√	√	5	ns	ns	ns	ns	ns
136	3	133.5	7.66	35.1149	ns	ns	√	√	√	√	√	ns	ns	ns	416	ns	ns
136	4	100.2	8.021	35.1021	ns	ns	√	√	√	√	√	ns	ns	ns	417	ns	ns
136	5	49.8	8.3	35.0956	ns	ns	√	√	√	√	√	ns	ns	ns	418	ns	ns
136	6	4.5	9.682	35.0651	ns	ns	√	√	√	√	√	ns	ns	ns	419	ns	ns

13.- ANNEX II: Press Report

CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS
DELEGACIÓN DE GALICIA

NOTA DE PRENSA. Más información:

Ana Bellón Rodríguez
981 55 27 88 / 696 926 189
E-mail: ana.bellon@csic.es

Regresará a Vigo el 9 de agosto

El Sarmiento de Gamboa parte hoy del Puerto de Vigo hacia Groenlandia

-La expedición científica está dirigida Fiz Fernández Pérez, profesor de investigación del CSIC en el IIM y miembro del grupo de Oceanología y se enmarca en el proyecto BOCATS, que se inició en 2014 y concluirá este año.

-A bordo van 20 científicos y técnicos del IIM, UVigo, Ifremer y UTM-Sede Atlántica.

Santiago de Compostela, 17 de junio de 2016. El buque oceanográfico Sarmiento de Gamboa, una de las grandes instalaciones científico-técnicas del Consejo Superior de Investigaciones Científicas (CSIC), parte hoy a las 22.00 horas del Puerto de Vigo (muelle transversal), donde tiene su base de operaciones, hacia Groenlandia.

A bordo va personal del CSIC (IIM y UTM-Sede Atlántica), de la UVigo y del Infremer a bordo para continuar con los estudios sobre la incidencia del dióxido de carbono de origen humana y la acidificación oceánica que vienen realizando desde hace dos décadas. Este año, se evaluarán por primera vez la importancia de la dinámica de los sedimentos en los flujos de carbono en el Atlántico Norte. Estos trabajos científicos constituyen parte del proyecto “Observación bienal de carbono, acidificación, transporte y sedimentación en el Atlántico Norte (BOCATS)”.

El Sarmiento de Gamboa

Presta un servicio muy importante a la investigación oceanográfica de España y participa en numerosas campañas. Está destinado a la investigación en aguas del Océano Atlántico, por lo que su base de operaciones está en el Puerto de Vigo.

Dispone de gran variedad de equipamiento científico y técnico para Oceanografía, Biología y Geoquímica Marina, así como equipamiento de laboratorio y auxiliar. Incorpora, además, las tecnologías más avanzadas en cuanto a los sistemas de navegación.

El CSIC es el responsable del mantenimiento del equipamiento científico del buque y aporta el personal técnico de apoyo para la realización de campañas oceanográficas.

FARO DE VIGO

PAÍS: España
PÁGINAS: 49
TARIFA: 1282 €
ÁREA: 226 CM² - 21%

FRECUENCIA: Diario
O.J.D.: 28544
E.G.M.: 263000
SECCIÓN: MAR

18 Junio, 2016

El "Sarmiento de Gamboa" analiza en el Atlántico norte la huella humana en el mar

El buque parte hacia Groenlandia para estudiar la incidencia del dióxido de carbono en los océanos

REDACCIÓN ■ Vigo

El buque oceanográfico *Sarmiento de Gamboa* del Consejo Superior de Investigaciones Científicas (CSIC) partió ayer por la noche de Vigo con destino a Groenlandia para estudiar la incidencia del dióxido de carbono de origen humana y también la acidificación oceánica como parte del proyecto "Observación bienal de carbono, acidificación, transporte y sedimentación en el Atlántico Norte (BOCATS)".

A bordo del barco va personal del CSIC (Instituto de Investigaciones Marinas y UTM-Sede Atlántica), de la Universidade de Vigo y del Infremer para continuar con los estudios que vienen realizando desde hace dos décadas. Este año, se evaluarán por primera vez la importancia de la dinámica de los sedimentos en los flujos de carbono en el Atlántico Norte.

El buque, una de las grandes instalaciones científico-técnicas del CSIC, partió en torno a las 22.00 horas desde el muelle transversal del Puerto de Vigo, donde tiene su base de operaciones.

El "Sarmiento de Gamboa", antes de partir. // M. Canosa

Atlántico Diario

PAÍS: España
PÁGINAS: 8
TARIFA: 991 €
ÁREA: 341 CM² - 56%

FRECUENCIA: Diario
O.J.D.: 2941
E.G.M.: 13000
SECCIÓN: VIGO

18 Junio, 2016

24 horas

La graduación de Comercio tuvo como padrino a Patricio Sánchez


LANFOCO

La Universidad de Vigo celebra estos días la graduación de las distintas promociones y ayer fue un día completo con seis actos de carreras que se imparten en los tres campus. En el caso de Vigo se celebraron las graduaciones de Comercio, Química y la de Relacións Laborais e Recursos Humanos, estas dos últimas en el propio Campus. La graduación de la tercera promoción del grado en Comercio se celebró en cambio en el Centro Social Afundación y contó con la participación del alcalde, Abel Caballero. El padrino de esta promoción de alumnos fue Patricio Sánchez Bello, que fue el decano de la Escuela durante doce años y que se jubiló en fecha reciente.


VICENTE ALONSO

El "Sarmiento de Gamboa" zarpó ayer a Groenlandia con una misión

El buque oceanográfico "Sarmiento de Gamboa" zarpó ayer del Puerto de Vigo con destino a Groenlandia. A bordo viaja personal del Consejo Superior de Investigaciones Científicas, de la Universidad de Vigo y del Ifremer para estudiar la incidencia del dióxido de carbono de origen humano y la acidificación oceánica que vienen realizando desde hace dos décadas. Este buque está destinado a la investigación en aguas del Atlántico.


VICENTE ALONSO

La torre del Xeral se queda al fin vacía

La torre del viejo Hospital Xeral despidió ayer a los últimos inquilinos de la sanidad, al producirse el traslado de dos unidades de laboratorio que quedaban operativas en este centro. Se trata de la Unidad de Citogenética, que se trasladó al Cunqueiro, y el Laboratorio de Radioinmunología, que se fue al Hospital do Meixoeiro. Ahora, la torre ya se puede devolver al Estado.

El Concello explica el viaje a Reino Unido de 420 alumnos de la ESO

El alcalde de Vigo, Abel Caballero, mantuvo ayer una reuión informativa con el alumnado de ESO beneficiario do programa "Vigo en inglés 2016" y con sus familiares. Como en ocasiones anteriores, la charla informativa con los representantes de la concejalía de Educación y de la empresa que organiza las estancias en Reino Unido se celebró en el Auditorio Mar de Vigo, donde los padres pudieron aclarar sus dudas y recibir todos los datos para el viaje de los escolares, que se producirá en el mes de septiembre. Esta semana viajaron a Inglaterra los 150 alumnos de Bachillerato que fueron incluidos de forma excepcional este año en el programa de inmersión lingüística en inglés del Concello de Vigo.


LANFOCO

Radio Vigo
RADIO CORUÑA RADIO GALICIA RADIO OURENSE

http://cadenaser.com/emisora/2016/06/17/radio_vigo/1466174594_303699.html

El Sarmiento de Gamboa parte hacia Groenlandia para estudiar el efecto invernadero en el mar

Saldrá esta noche del Puerto de Vigo y analizará los niveles de PH en la columna de agua de 120 puntos del trayecto para estudiar el nivel de absorción de CO2 por la acción humana en el océano

El buque oceanográfico Sarmiento de Gamboa atracado en el Puerto de Vigo / Felipe Troitiño (Iniciativas Audiovisuales de Vigo)

JAIME GONZÁLEZ DE HAZ VIGO 17/06/2016 - 16:43 CET

El buque oceanográfico Sarmiento de Gamboa, una de las grandes instalaciones científico-técnicas del Consejo Superior de Investigaciones Científicas (CSIC), volverá a partir esta noche del Puerto de Vigo rumbo a Groenlandia. A bordo irá personal del CSIC (IIM y UTM-Sede Atlántica), de la UVigo y del Infremer a bordo para continuar con los estudios sobre la incidencia del dióxido de carbono de origen humana y la acidificación oceánica que vienen realizando desde hace dos décadas. Un trabajo que forma parte del proyecto “Observación bienal de carbono, acidificación, transporte y sedimentación en el Atlántico Norte (BOCATS)”.

La misión se detendrá "en unas 120 estaciones en las que se lanzará un equipo llamado CTD que a medida que se vaya hundiendo hasta el fondo, irá registrando la temperatura, la salinidad y la presión,así como las corrientes" según ha explicado en Radio Vigo Cadena SER el director de la misión, Fiz Fernández. "Cuando el equipo llega al fondo marino se detiene y retorna de nuevo a la superficie. En ese camino de vuelta se van cerrando las botellas hidrográficas en las que se guardan muestras de agua que nos permitirán, una vez en el barco, medir una serie de parámetros químicos del agua como el oxígeno disuelto, la salinidad, el contenido de nutrientes... y también las variables del sistema del carbónico, del sistema del CO2", añadió.

Según indicó el profesor del CSIC, "desde que el hombre está emitiendo CO2 procedente de combustibles fósiles o de las industrias térmicas, etc. el CO2 en la atmósfera ha aumentado de una manera muy llamativa. En este proceso, el océano absorve un 30% del CO2 emitido, aunque esto tiene consecuencias, porque según se va acumulando en la columna de agua, va haciendo que el agua sea más ácida" influyendo en el desarrollo de parte de la fauna marina. "El océano tiene un PH algo superior al valor neutro, es decir, ligeramente básico, y esto es lo que aprovechan los organismos marinos que tienen concha o estructuras calcáreas como los bivalvos o los corales, que aprovechando esta basicidad del océano, forman estructuras de carboato de calcio", señaló.

De este modo, el aumento de la acidez de las aguas está haciendo que muchas de estas estructuras se deshagan afectando a estos organismos y sus ecosistemas, algo

www.farodevigo.es
FARO DE VIGO

http://www.farodevigo.es/mar/2016/06/18/sarmiento-gamboa-analiza-atlantico-norte/1482454.html

El "Sarmiento de Gamboa" analiza en el Atlántico norte la huella humana en el mar

El buque parte hacia Groenlandia para estudiar la incidencia del dióxido de carbono en los océanos

Redacción | Vigo 18.06.2016 | 02:44

El "Sarmiento de Gamboa", antes de partir. // M. Canosa

El buque oceanográfico *Sarmiento de Gamboa*del Consejo Superior de Investigaciones Científicas (CSIC) partió ayer por la noche de Vigo con destino a Groenlandia para estudiar la incidencia del dióxido de carbono de origen humana y también la acidificación oceánica como parte del proyecto "Observación bienal de carbono, acidificación, transporte y sedimentación en el Atlántico Norte (BOCATS)".

A bordo del barco va personal del CSIC (Instituto de Investigaciones Marinas y UTM-Sede Atlántica), de la Universidade de Vigo y del Infremer para continuar con los estudios que vienen realizando desde hace dos décadas. Este año, se evaluarán por primera vez la importancia de la dinámica de los sedimentos en los flujos de carbono en el Atlántico Norte.

El buque, una de las grandes instalaciones científico-técnicas del CSIC, partió en torno a las 22.00 horas desde el muelle transversal del Puerto de Vigo, donde tiene su base de operaciones.

Atlántico Vigo

http://www.atlantico.net/articulo/vigo/sarmiento-gamboa-zarpo-ayer-groenlandia-mision/20160618013936536407.html

VIGO

El “Sarmiento de Gamboa” zarpó ayer a Groenlandia con una misión

TEMAS SARMIENTO GAMBOA ZARPÓ AYER GROENLANDIA MISIÓN

El “Sarmiento de Gamboa” zarpó ayer a Groenlandia con una misión

REDACCIÓN VIGO18/06/2016 01:39 H.

El buque oceanográfico “Sarmiento de Gamboa” zarpó ayer del Puerto de Vigo con destino a Groenlandia. A bordo viaja personal del Consejo Superior de Investigaciones Científicas, de la Universidad de Vigo y del Ifremer para estudiar la incidencia del dióxido de carbono de origen humano y la acidificación oceánica que vienen realizando desde hace dos décadas. Este buque está destinado a la investigación en aguas del Atlántico.

Universida de Vigo

Diario da
Universidade de Vigo

Xoves, 16 de xuño do 2016

Investigadores da Universidade, CSIC e Ifremer partirán mañá de Vigo a bordo do Sarmiento de Gamboa

A campaña BOCATS estudará por primeira vez no Atlántico Norte o balance do ciclo de carbono analizando tamén os sedimentos

Os estudos previos restrínxense exclusivamente á columna de auga

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Mª del Carmen Echevarría | Vigo

O progresivo incremento nos niveis de dióxido de carbono atmosféricos desde o inicio da era industrial, repercute tamén nas augas oceánicas superficiais ao absorber estas parte dese CO_2 antrópico. Se por unha banda, os océanos contribúen a mitigar o quecemento global ao captar parte dese dióxido de carbono atmosférico, pola outra, o mar se está a acidificar porque cada vez hai máis CO_2 disolto, o que ocasiona efectos negativos para organismos con cachos, esqueletos, cunchas, etc. carbonatados, especies algunhas delas de interese económico. Estes efectos descritos en numerosos traballos científicos ocorren na columna de auga, pero que sucede nos fondos nos que se acumula unha parte do carbono "secuestrado" polos organismos, como tamén o fan o resto de cachos ou esqueletos, en forma de carbonato cálcico, cando os organismos morren? "Aí é onde estriba a importancia dos sedimentos, porque neles podemos medir canto carbono orgánico e carbonato conteñen e podemos medir como foi cambiando a súa concentración ao longo do tempo, mesmo uns cantos séculos. É dicir, podemos medir a concentración que había antes da era industrial e canto foi variando ao longo desta, ata os nosos días". Así explica Guillermo Francés, docente e investigador do Departamento de Xeociencias Mariñas e Ordenación do Territorio da Universidade de Vigo, a importancia de, á hora de calcular fluxos do ciclo do carbono, non restrinxirse unicamente á columna de auga, como ocorre na maioría de estudos realizados, senón introducir no cálculo a parte que "aínda minoritaria, non é desprezable", vai aos sedimentos ou, eventualmente, que os sedimentos están a devolver ao océano.

Aínda que, como detalla Francés, "os sedimentos permiten facer estimacións sobre a produtividade primaria e a circulación de masas de auga (os dous grandes grupos de variables que interveñen no ciclo do carbono) no pasado recente, e ademais, para os tempos actuais, permiten relacionar as concentracións no sedimento máis superficial co que está a ocorrer a diferentes profundidades da columna de auga", o estudo integral, que ademais da columna de auga considera tamén os sedimentos, é algo absolutamente novo, cando menos no Atlántico Norte. De aí a importancia da campaña BOCATS que este venres 17 de xuño comeza e que se prolongará ata principios de agosto e na que persoal investigador e técnico da Universidade de Vigo, o Instituto de Investigacións Mariñas do CSIC en Vigo e Ifremer navegará a bordo do buque oceanográfico Sarmiento de Gamboa de Vigo a Reikiavik. Durante ese período os investigadores e investigadoras, así como o persoal técnico, tomarán medidas de diversas variables oceanográficas en aproximadamente 126 puntos ao longo dun transecto do Atlántico Norte comprendido entre Vigo e Groenlandia (sección OVIDE), para a continuación navegar cara ao sur ata a dorsal de Reykjanes e continuar o transecto (sección RREX) seguindo a orientación desta cordilleira submarina ata finalizar en Islandia.

Investigadores da Universidade centrados no estudo dos sedimentos

Xunto a Guillermo Francés, Irene Alejo, Víctor Pelayo e Susa Álvarez completan a representación da Universidade de Vigo na campaña BOCATS, que se desenvolve no marco do proxecto do mesmo nome, acrónimo de *Biennial Observation of Carbon, Acidification,Transport and Sedimentation in the North Atlantic*, Observación bienal do carbono, acidificación, transporte e sedimentación no Atlántico Norte, un proxecto financiado polo MINECO con máis de 158.000 euros (sen incluír a campaña) e que lidera o investigador do Departamento de Oceanografía do Instituto de Investigacións Mariñas do CSIC en Vigo Fiz Fernández.

"A campaña BOATS ten como obxectivo avaliar os transportes de auga, sal, calor, carbono natural e antropoxénico, outros trazadores bioxeoquímicos e determinar os fluxos de carbono entre a columna de auga e o sedimento do fondo oceánico", detalla Guillermo Francés en relación coa campaña, que no caso dos investigadores e investigadoras da Universidade de Vigo se concreta no estudo dos sedimentos do fondo oceánico co fin de establecer cambios a escala centenaria da velocidade das correntes de fondo e taxas de acumulación de carbonato cálcico e de carbono orgánico. "A vantaxe deste estudio consiste en que os datos sedimentarios serán adquiridos nos mesmos puntos en que se caracterice a auga de fondo, polo que nos permitirá establecer relacións entre o rexistro sedimentario actual e as propiedades físico-químicas da masa de auga en contacto directamente co fondo", destaca o investigador do Departamento de Xeociencias Mariñas e Ordenación do Territorio.

No caso da sección OVIDE existen medidas da columna de auga repetidas cada dous anos desde 2002, pero esta será a primeira vez que se leve a cabo a análise integral da columna de auga e sedimentos. Pola súa banda, a columna da auga da sección RREX mediuse por primeira vez o ano pasado, pero nesa ocasión non se mediron sedimentos. "Ata onde lembramos tanto Fiz Fernández coma min, non coñecemos ningún estudo deste tipo nunha zona tan extensa do océano, con tantos puntos de medida, a profundidades diversas e en diferentes masas de auga de fondo. Ben é certo que se fixo algo parecido nalgúns sectores moi restrinxidos, pero nada que ver que co que nós propoñemos", explica Guillermo Francés.

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Caixa de queixas, suxestións e parabéns

A campaña BOCATS remata a súa primeira fase de recollida de sedimentos no Atlántico Norte

Ourense

O tempo libre, fonte de formación e emprego no verán

Nace 'Cómaros', revista interdisciplinar de pensamento galego

Arqueólogos da Universidade escavarán por primeira vez o castro galaico-romano de Santa Lucía

Pontevedra

Enxeñaría Forestal, primeiro centro do campus con selo Q de Calidade

Os personaxes de Molita xogan a agocharse no Hospital Provincial

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Vigo

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Novidades

19 de xullo de 2016
Consello de Goberno_Correcc. orde do día 22/07/16

18 de xullo de 2016
Consello de Goberno

18 de xullo de 2016
Negociación da RPT do PAS funcionario

Axenda

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Axudas

15 de xullo de 2016
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15 de xullo de 2016
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13 de xullo de 2016
ERASMUS+ ESTUDOS 2015-2016. Axudas da Deputación de ...

Axenda

+ Axudas

Accesos Directos

- Concursos de profesorado
- Unidade igualdade
- Emprego e Emprendemento
- Secretaría Xeral

Martes, 19 de xullo do 2016

O grupo XM1 encárgase, por primeira vez, da recollida e análise das mostras sedimentarias

A campaña BOCATS remata a súa primeira fase de recollida de sedimentos no Atlántico Norte

Os datos obtidos, xunto cos da columna de auga, permitirán estudar os fluxos do ciclo de carbono

Me gusta 0 Tweet Share Delicious

Mª del Carmen Echevarría | Vigo

De "moi positiva" cualifica docente o e investigador do Departamento de Xeociencias Mariñas e Ordenación do Territorio da Universidade de Vigo Guillermo Francés a primeira fase da campaña Bocats, despois que o buque oceanográfico Sarmiento de Gamboa arribase ás costas de Groenlandia. Atrás, queda algo máis dun mes de navegación por augas do Atlántico Norte no transecto comprendido entre Vigo e Groenlandia (sección OVIDE), no que persoal do Instituto de Investigación Mariñas do CSIC en Vigo e do Ifremer, xunto ao da Universidade de Vigo, mediu diversas propiedades físicas e químicas da columna de auga (pH, alcalinidade, concentración en CO2, osíxeno, nutrientes, etc.) en 99 estacións separadas entre si uns 30 quilómetros de media, cumpríndose así un dos obxectivos da campaña, como é a caracterización das masas de auga ao longo dun transecto que se repite cada dous anos desde 2002. "Por primeira vez, nesta serie de medidas, estanse a obter mostras de sedimentos nos mesmos puntos. Ata o de agora recuperamos sedimentos en 26 puntos e nos próximos días completaremos o transecto prospectando un mínimo de 25 estacións máis na conca de Irminger", explica Francés, ao que acompañan en representación da Universidade de Vigo a tamén investigadora Irene Alejo e os estudantes Susa Álvarez e Víctor Pelayo.

As mostras de sedimentos superficiais recollidas en todas as estacións acadan un espesor comprendido entre os 20 e os 35 cm. e tendo en conta que as análises que os investigadores e investigadoras vigueses pretenden facer son de cada centímetro, o total de mostras a estudar superará as 1300. "Isto implica que a cantidade de datos e información que obteremos nos permitirá realizar unha caracterización detallada do sedimento e da súa relación coas masas de auga do fondo", explica Francés, que destaca a importancia que ten á hora de calcular os fluxos do ciclo de carbono, non restrinxirse unicamente á columna de auga, como ocorre na maioría de estudos realizados, senón introducir no cálculo a parte que, aínda que minoritaria, non desprezable, vai aos sedimentos ou, eventualmente, que os sedimentos están a devolver ao océano.
A campaña BOCATS, *Biennial Observation of Carbon, Acidification,Transport and Sedimentation in the North Atlantic*, *Observación bienal do carbono, acidificación, transporte e sedimentación no Atlántico Norte*, é un proxecto financiado polo Mineco con máis de 158.000 euros (sen incluír a campaña), que lidera o investigador do Departamento de Oceanografía do Instituto de Investigacións Mariñas do CSIC en Vigo Fiz Fernández.

Chegada a Reikiavik e posterior análise dos sedimentos

Tras pasar unhas horas ao abrigo da costa de Groenlandia por mor dunha forte borrasca, que provocou rachas de vento de 45 nos e olas de ata cinco metros, o Sarmiento de Gamboa iniciou un percorrido inverso, dedicado exclusivamente á recuperación dos sedimentos do fondo, para a continuación afrontar os derradeiros días da campaña que se desenvolverá no tramo paralelo á dorsal de Reykjanes e continuar o transecto (sección RREX), seguindo a orientación desta cordilleira submarina ata finalizar na capital de Islandia, onde agardan chegar a finais de mes.

"Finalizada a campaña BOCATS e unha vez en terra todas as análises dos sedimentos son responsabilidade do grupo XM1, non só dos investigadores que embarcamos, senón do resto do equipo. Isto inclúe análises de tamaño de gran, de composición, de contido en materia orgánica, de microfósiles e datación de sedimentos", detalla o investigador do Departamento de Xeociencias Mariñas e Ordenación do Territorio sobre o traballo que lles agarda e cuxos resultados serán relacionados cos obtidos na columna de auga polo grupo do IIM e de Ifremer. Así mesmo, os e as investigadoras da Universidade de Vigo pretenden establecer colaboracións con outros grupos para levar a cabo outras análises complementarias que eles non son quen de abordar.

FARO DE VIGO
MARTES, 12 DE JULIO DE 2016

La memoria de Aida Fernández impulsa al “Sarmiento”

Los miembros de la campaña Bocats recuerdan a la investigadora viguesa ▶ Sus compañeros del CSIC activan una web para homenajearla

S. PENELAS

Foto de familia de los investigadores y la tripulación en la cubierta del buque “Sarmiento de Gamboa”.

Cada reunión de los científicos de la campaña Bocats a bordo del *Sarmiento de Gamboa* arranca con un inevitable recuerdo a la valía profesional y humana de la investigadora viguesa Aida Fernández Ríos. La expedición por el Atlántico norte se ha convertido este año en un homenaje a quien fue una de sus precursoras y el director científico de la travesía, Fiz Fernández, su compañero del Instituto de Investigaciones Marinas-CSIC, ha hecho coincidir la navegación con la puesta en marcha de una web en recuerdo de la científica fallecida en diciembre. Colegas de todo el mundo, familiares y amigos han enviado ya sus testimonios en homenaje a una mujer que todos coinciden en definir como vital, alegre, cálida y muy trabajadora.

“Está siendo una campaña difícil y todos recordamos su figura y su talento. Desde el triste fallecimiento, mucha gente ha ido dejando sus testimonios porque Aida tenía muy buen trato y allí donde iba hacía amigos, por eso nos pareció oportuno hacer la web. Tras unos meses en pruebas, el viernes la añadimos al portal del Instituto de Investigaciones Marinas para que quien lo desee pueda seguir contribuyendo. Antonio Padín, que fue uno de sus doctorandos favoritos, explicó la iniciativa a bordo el otro día y mucha gente quería adherirse”, explica Fernández por teléfono desde el Mar de Irminger, a unas 200 millas de Groenlandia.

Una veintena de investigadores del IIM, la Universidad de Vigo y el Ifremer francés cubren este transecto desde la Península para estudiar los cambios en los movimientos de las corrientes y la acidificación del océano a consecuencia de la absorción del CO_2, aspectos clave para determinar los efectos del cambio climático. “La primera campaña se hizo en 2002 y desde entonces la repetimos cada dos años. En 2012, Aida fue la jefa científica y esta edición queremos que sea en honor a su memoria”, añade.

No es el único reconocimiento en memoria de la investigadora viguesa, pues el V Simposio Internacional de Ciencias del Mar, que se celebra la próxima semana en Alicante, ha decidido que el premio a la mejor presentación realizada por un alumno de doctorado lleve su nombre.

“Era muy vital y, aunque estaba a dos años de su jubilación definitiva, conservaba esa energía. Siempre fomentó que la gente joven trabajase en oceanografía y CO_2. Formaba parte de la comisión de docencia del programa de doctorado del Campus del Mar y tenía una labor muy activa y dinamizadora”, destaca su colega.

Detalle de la web en homenaje a Aida Fernández.

El simposio también destaca el empuje de una científica que empezó en 1972 como auxiliar de laboratorio en el mismo centro que llegaría a dirigir entre 2006 y 2011 y en el que alcanzó la máxima categoría dentro del CSIC.

“Recorrió todos los peldaños y siempre cuidando de la gente y, como dicen ahora, de buen rollo. Su vocación por la biología marina se despertó mientras trabajaba con Fernando Fraga y ella hizo las primeras medidas de PH en las costas gallegas. Era una trabajadora incansable y muchos le llamaban la hormiguita”, recuerda Fernández, que ha titulado con el acrónimo AIDA el último proyecto de investigación sobre acidificación en rías que ha solicitado al plan nacional de I+D.

Aida Fernández sumaba más de 500 días en el mar. Dirigió muchas de las 30 campañas oceanográficas nacionales e internacionales en las que participó, en varias ocasiones a bordo del *Sarmiento de Gamboa*, y representaba a España en diferentes comités.

El Atlántico y la meteorología parecen haberse sumado al homenaje y la campaña Bocats está transcurriendo a la perfección desde su salida de Vigo el pasado junio: “El ambiente es muy bueno y todo está yendo francamente bien. Hemos hecho 70 estaciones bajando la roseta hasta el fondo, de forma que tenemos perfiles hasta de más de 5.000 metros de profundidad. Y el grupo de la Universidad, con Guillermo Francés e Irene Alejo, lleva ya 30 testigos de sedimentos recogidos y en esta última fase intensificarán la frecuencia”. Tras más de un mes de trabajo, los investigadores arribará a Reikiavik el 28 o el 29 de julio.

Una de las primeras mujeres a bordo de oceanográficos

Cuando Aida Fernández participó en su primera campaña en 1974 solo había otra mujer entre la tripulación de científicos. Años después se convirtió en la primera directora del Instituto de Investigaciones Marinas de Bouzas y en 2001 recibió el premio Galega Destacada en reconocimiento a una trayectoria que el año pasado la convertía también en la tercera mujer que ingresaba en la Reak Academia Galega de Ciencias.

“Es curioso pero en esta campaña, además de un grupo de investigadoras importante, coinciden la capitana María Ángeles Campos [la ourensana que en 2014 rescató a 194 sirios en el Mediterráneo], varias alumnas en el puente de mando y también hay trabajadoras en máquinas. A Aida le alegraría porque también destacó por su trabajo a favor de la mujer”, celebra Fiz Fernández.

Investigadoras e integrantes de la tripulación que participan en la campaña a bordo del “Sarmiento”.

DATOS DE AUDIENCIA DA BITÁCORA
'A BORDO DO SARMIENTO DE GAMBOA'

Lecturas totales en GCiencia: 9.145 clicks
Total alcance en Facebook: 68.037 personas alcanzadas

“Cold Water & Farewell”
Clicks de lectores: 421 Alcance en Facebook: 2068 personas/ 25 Me gusta / 1 compartido

“Os Outros”
Clicks de lectores: 784 Alcance en Facebook: 3.504 personas/ 46 Me gusta / 3 compartido

“O corazón e as veas do Sarmiento de Gamboa”
Clicks de lectores: 574 Alcance en Facebook: 2640 personas/ 42 Me gusta / 4 compartido

“Os oceanógrafos físicos franceses abordan o barco”
Clicks de lectores: 375 Alcance en Facebook: 2.305 personas/ 41 Me gusta / 1 compartido

“Liñas e aparellos para o futuro”
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“No Sarmiento de Gamboa… Non todo vai ser traballar!”
Clicks de lectores: 612 Alcance en Facebook: 9.466 personas/ 200 Me gusta / 23 compartido

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“Tocando fondo a 4.000 metros baixo do mar”
Clicks de lectores: 843 Alcance en Facebook: 9.888 personas/ 202 Me gusta / 26 compartido

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Clicks de lectores: 2.631 lcance en Facebook: 12.880 personas/ 264 Me gusta / 46 compartido