CRUISE REPORT

HUDSON 95003

NEWFOUNDLAND BASIN

WOCE CONTROL VOLUME AR13

19 APRIL 1995 - 17 MAY 1995

A. CRUISE NARRATIVE

1. Highlights

a. WOCE Designation: Control Volume 4,
Atlantic Repeat Hydrographic Section 13

b. Expedition Designation: Hudson 95003

c. Chief Scientist:
R. Allyn Clarke
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d. Ship: CSS Hudson

e. Ports of Call:
April 19 BIO, Dartmouth, NS, Canada
May 17 BIO, Dartmouth, NS, Canada

f. Cruise Dates: April 19, 1995 to May 17, 1995

2. Cruise Summary Information

a. Cruise Track

A cruise track is included without time information in Figure 1.

The station positions are shown in Figure 2. Some station numbers are indicated for clarity. The various types of stations are indicated. The WHP stations are all contained in the box defined by 38-47 °N and 38-50 °W. Test CTD stations and Scotian shelf monitoring stations were also occupied. This map also shows the locations of the North Atlantic Current Meter Mooring Array (ACM6) set from Oceanus in August 1993.

Ship Track: C.S.S. Hudson; Cruise 95

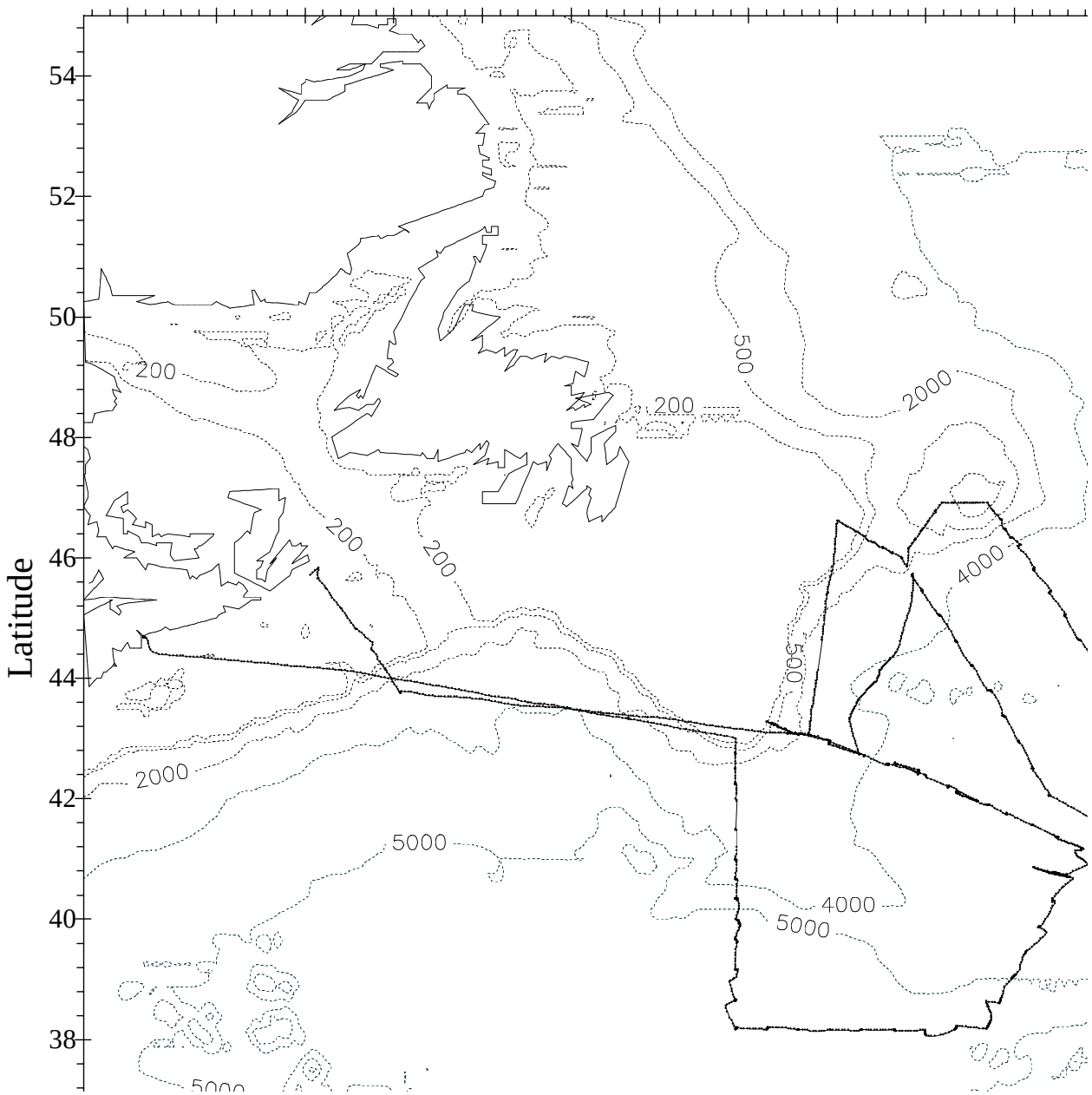

Fig. 1 95003 Cruise Track

C.S.S. Hudson, Cruise: 95003

CTD Stations in the Newfoundland Bas

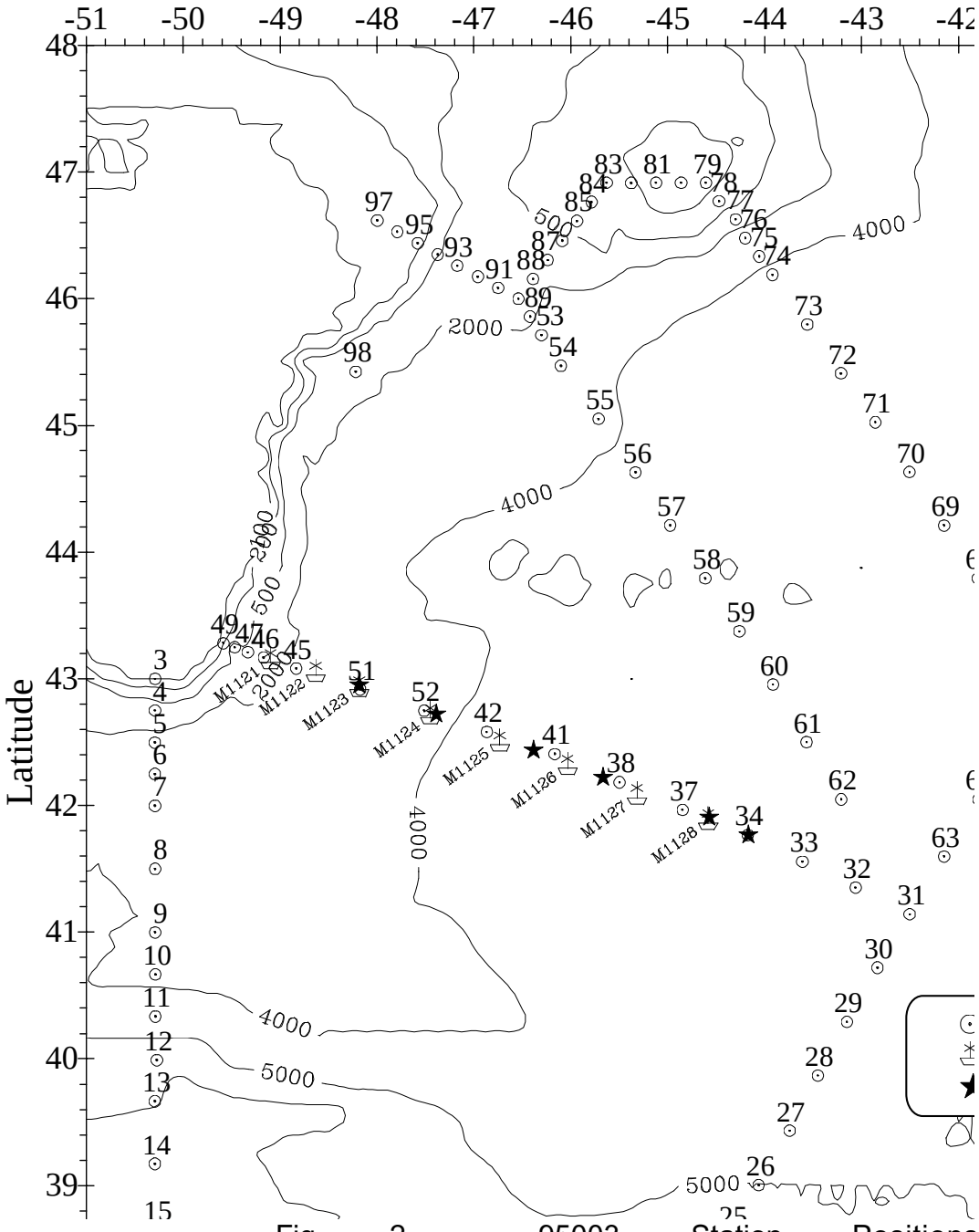

Fig. 2 95003 Station Positions

b. Total Number of Stations Occupied

88 full depth WHP small volume CTD stations with up to 23 rosette samples analyzed for CFC's, carbon tetrachloride, total carbonate, alkalinity, oxygen, salinity and nutrients.

88 full depth velocity profiles using a lowered Acoustic Doppler Current profiler attached to the CTD/rosette

8 full depth Scotian Shelf monitoring stations with up to 12 rosette samples analyzed for oxygen, salinity and nutrients.

3 test CTD stations with or without rosette sampling.

8 current meter mooring stations

3 aborted CTD casts

c. Floats and Drifters deployed

none

d. Moorings deployed or recovered

8 current meter mooring stations; 6 moorings recovered, failed to recover two other moorings in the same array

3. List of Principal Investigators

Name	Affiliation	Responsibility
Allyn Clarke	Physical and Chemical Sciences Bedford Institute of Oceanography clarkea@mar.dfo-mpo.gc.ca	CTD, shipboard ADCP, current meter data
Peter Jones	Physical and Chemical Sciences Bedford Institute of Oceanography jonesp@mar.dfo-mpo.gc.ca	chemical data
Robert Pickart	Physical Oceanography Department Woods Hole Oceanographic Institution	lowered ADCP

pickart@rsp.whoi.edu

Randy Watts Graduate School of Oceanography current meter data
University of Rhode Island
South Ferry Road
Narragansett, RI 02882
randy@drw.gso.uri.edu

4. Scientific Program and Methods

a. Narrative

This was primarily a hydrographic survey involving a series of full depth CTD/Tracer stations spaced at 20 nautical miles or less apart. The sections were selected to be either historical sections for which there were a number of earlier occupations or along TOPEX/POSEIDON ground paths. The sections enclosed three volumes of water; it was hoped that the section data and the boxes could be used to determine the splitting of the Gulf Stream, North Atlantic Current, Labrador Current and Deep Western Undercurrent within this topographically and dynamically complex region. Initial results have indicated that this goal is achievable. It was originally intended to split the southernmost box into two parts with a section crossing the Southeast Newfoundland ridge (normally at a location at which the shallowest depth crossing the ridge would have been about 4000 metres). This section has not been occupied on any of the three hydrographic surveys; the two previous surveys (18HU93039 and 18HU94030) and this one (18HU95003).

During this cruise, an ADCP was added to the CTD/rosette package to provide a estimate of the full depth velocity profile at each CTD station. This data will be useful for the detection and definition of various subsurface currents such as the deep western boundary undercurrents.

The mooring array (ACM6) was set from Oceanus in August 1993. The array was designed to measure the transport of the North Atlantic Current just downstream of the Southeast Newfoundland ridge. The array was also designed to measure the transport of the currents between the North Atlantic Current and the upper continental slope of the Grand Banks of Newfoundland, as well as the transport of the deep western boundary current found in this same region.

5. Major Problems and Goals Not Achieved

Time lost due to poor weather and mooring recovery delays meant that there was not enough time to complete the fourth section across the North Atlantic Current. As an

alternative, an additional section was surveyed to aid in defining the water masses and transports south of Flemish Cap.

Insufficient time did not permit the section across the Southeast Newfoundland Ridge to be occupied. This will reduce our ability to separate what waters move from the Gulf Stream extension into the North Atlantic Current and what waters turn southward back into the Saragasso Sea.

The loss of the main buoyancy packages and the flooding of two current meters will reduce the ability to accurately define the transport of the North Atlantic Current, particularly in the upper kilometre of the water column. Release failures also prevented the recovery of two of the eight moorings. Hopefully an attempt to recover these moorings can be made in June (18HU95011) using cable cutters or dragging. It is known that both moorings are in their original locations and are still upright.

6. Other Incidents of Note

Early in the program, there were several failures of the ground connection between the CTD and the armour of the CTD cable and one failure of the slip rings on the winch. This delayed progress and also resulted in the lack of discrete samples on one CTD station.

7. List of Cruise Participants

Name	Responsibility	Affiliation
Larry Bellefontaine	Watchkeeper	BIO
Gerry Boudreau	Computers/watchkeeper	BIO
Rick Boyce	Watchkeeper/moorings	BIO
Bruce Carson	CTD tech./salts	BIO
Allyn Clarke	Chief Scientist	BIO
Pierre Clement	Nutrients/Oxygen	BIO
Paul d'Entremont	Watchkeeper/moorings	BIO
Bob Gershey	CFC/Alkalinity/Carbonate	BDR Research
Mike Hingston	CFC/Alkalinity/Carbonate	BDR Research
Anthony Isenor	Data Quality/watchkeeper	BIO
Peter Jones	Assistant Scientist	BIO
Daniel Torres	LADCP/Watchkeeper	WHOI
Igor Yashayaev	Data Quality/watchkeeper	Shirshov
Frank Zemlyak	CFC/Alkalinity/Carbonate	BIO

BIO Bedford Institute of Oceanography

	P.O. Box 1006 Dartmouth, NS, CANADA B2Y 2A4
BDR	BDR Research Ltd. Box 652, Station 'M' Halifax, N.S., Canada, B3J 2T3
WHOI	Woods Hole Oceanographic Institution Woods Hole, MA 02543, USA
Shirshov	P.P. Shirshov Institute of Oceanology Russian Academy of Sciences Krasikova, 23 Moscow, Russia

B. UNDERWAY MEASUREMENTS

1. Navigation and Bathymetry — Anthony W. Isenor

The navigation system onboard CSS Hudson consisted of a Trimble Navigation Loran-GPS 10X decoder and a software package called AGCNAV. The decoder receives the satellite fixes and decoded the signals to obtain latitude, longitude and time. The decoder signals were approximately 1Hz. The navigation data was logged at one minute intervals on a personal computer (PC). This PC was running AGCNAV, a PC based display and way-point setting software package developed at the Atlantic Geoscience Centre at BIO. This software graphically displayed ship position, way-points, course, speed, etc. to the various science working areas.

The echo sounder system used for collecting bathymetric data consisted of a Raytheon Line Scan Recorder, Model LSR 1811-1 connected to a hull mounted 12kHz transducer. The transducer beam width was 15 degrees. The sweep rate of the recorder was adjusted throughout the course of data collection to aid in identifying the bottom signal. The recorder was also linked to a clock, and thus could indicate five minute intervals on the sounder paper. The system was used to collect bathymetric soundings at five minute intervals while underway between stations throughout the cruise. In total, 4330 kilometres of deep sea bathymetric sounding data was collected.

2. Acoustic Doppler Current Profiler — Murray Scotney

The Hudson was equipped with a hull mounted RDI acoustic doppler current profiler. The transducer (serial number 177) had SC ADCP electronics (serial number 172) converted for ship board use. Using Transect software, ADCP logging was started on April 19 at 15:35 GMT in Halifax Harbour (Bedford Basin). The configuration of the equipment resulted in a bin length of eight metres and a total of 50 bins. The raw data were stored to disk and backed up every two days. Two days of logging created about 30MB of data. The data was also averaged in real-time over one minute intervals. ADCP logging was stopped on May 16 at 19:06 GMT. In total, 640 hours of Acoustic Doppler Current Profiler data was collected.

3. Thermosalinograph

No instrument was used.

4. XBT and XCTD

No probes were used.

5. Meteorological Observations

Routine reporting of meteorological variables was carried out by the ship's crew.

6. Atmospheric Chemistry

There was no atmospheric chemistry program.

C. HYDROGRAPHIC MEASUREMENTS - DESCRIPTIONS, TECHNIQUES AND CALIBRATIONS

1. CTD Measurements — Allyn Clarke, Anthony Isenor and Igor Yashayaev

a. Description of the Equipment and Technique

The CTD measurements were made with a standard SEABIRD model 9Plus CTD (serial number 09P 7356-0299, BIO System #4 or serial number 09P 9984-0370, BIO System #5) that was equipped with a model 3-02/F temperature sensor, a model 4-02/0 conductivity sensor, a paroscientific digiquartz model 410K-105 pressure sensor and a model 13-02 dissolved oxygen sensor. All but the pressure sensor were mounted in a duct through which a pump pulled sea water. Hence, the water flow past the actual sensors was independent of the lowering rate; this simplified the data processing considerably.

The Seabird CTD was mounted vertically within a custom designed and built CTD/Rosette frame. This frame was square rather than round to better accommodate the restricted space of Hudson's winch room and winch room door. All the pressure cases as well as the sample bottles were mounted vertically to improve the package's stability as it descended through the water column. In the centre of the frame was a 10 inch diameter aluminium tube. The top end of this tube contained a General Oceanics Model 1015-24 bottle rosette unit. The bottom of this tube was designed to hold an RDI 150 khz Broadband ADCP in a shortened pressure case. On this cruise, the short pressure case RDI was not available; instead a full length RDI pressure case was clamped vertically down one side of the central tube. On the second side was clamped the pressure case for the Seabird CTD. The CTD sensors and pump were mounted on the third side. On the fourth side was clamped a rechargeable battery pack for the RDI and below it a General Oceanics model 6000 12 kHz pinger unit.

BIO Rosette #3 (model 1015-24, serial number 1348) was used throughout the cruise.

The rosette bottles were made by the Physical and Chemical Oceanographic Data Facility of the Scripps Institution of Oceanography. The bottles were mounted six to each side of the rosette frame. Each bottle collected 10 litres of water.

b. Sampling Procedure and Data Processing Techniques

The CTD was deployed with a lowering rate of 60 metres/min (40 metres/min in the upper 200 metres or deeper if the conditions were rough). It was recovered at a rate of 75 metres/min (60 metres/min when deeper than 4000 metres or when conditions were rough)

The CTD data was recorded onto disk by a 486 computer using SEABIRD SEASOFT Version 4.205 software. A screen display of temperature, oxygen and salinity profiles vs pressure was used to determine the depths at which bottles were to be tripped on the upcast. The bottles were tripped using the enable and fire buttons on the SEABIRD deck unit. The SEASAVE software stored fifty scans at each bottle trip within a separate file.

At the end of each station, the SEASAVE software was used to create one and two dbar processed data files, a one second processed data file, an IGOSS TESAC message and a processed rosette trip file. All the raw and processed data files associated with the station were then transferred to the ship's MicroVax computer for the purpose of archiving the data, allowing subsequent access to the data, and to enable the distribution of the data to various users on the vessel.

The data processing used the following steps:

DATCNV Converted the raw data to physical parameters.

SPLIT Split the data into DOWN and UP cast.

WILDEDIT For every block of 12 scans, flagged all scans whose pressure, temperature, conductivity and oxygen values differed from the mean by more than two standard deviations. Recomputed the mean and standard deviation from unflagged data then marked as bad all scans exceeding four standard deviations from these new values.

FILTER Used a low pass filter to time match the pressure and conductivity parameters for salinity computation. Time constant used for conductivity was 0.045 seconds, for pressure 0.150 seconds.

LOOPEDIT Marks as bad, all cycles on the down trace for which the vertical velocity of the CTD unit was less than 0.1 metres/sec.

ALIGNCTD Aligned the temperature, conductivity and oxygen values relative to the pressure values accounting for the time delays in the system. Time offsets of 0.010 seconds for conductivity, 0.000 seconds for temperature and 3.000 seconds for oxygen were used.

CELLTM A recursive filter used to remove the thermal mass effects from the conductivity data. Thermal anomaly amplitude and time constants of 0.0300 and 9.0000 were used.

DERIVE Computed oxygen values.

BINAVG Averaged the down cast into one or two dbar pressure bins. (Note: The procedure to produce the two dbar averages took about 5% of the total processing time).

DERIVE Computed salinity, potential temperature and $sigma_{theta}$.

c. Calibration Data

A calibration summary is presented in Table C1. The three headings in the Table (Shipboard Processing, First Calibration and Second Calibration) represent sections in the text that follows. In the Oxygen row, the numerals I, II, and III represent procedures that were followed to determine the applied coefficients. The procedures are described in section (iv) Oxygen Calibration Procedure. The numerics in this table (e.g. 1 - 107) represent station numbers.

Parameter	**24 Hz Data**		**1 and 2 dbar data**
	Shipboard Processing	First Calibration	Second Calibration
Conductivity	1-6, 98-107 7-97	7-97(1)	
Temperature	1-6, 98-107 7-97		
Pressure	1-6, 98-107 7-97		
Salinity			1-6(3) 7-97(4) 98-107(5)

Oxygen	1 2-107	7-97[2] I, II ⇒ 7-97	2-6, 98-107[6] 7-75[7] 76-97[8] I, III ⇒ 1-107

(1) : see Eqn 1 section ii
(2) : see Eqn 2 section ii
(3) : see Eqn 3 section iii
(4) : see Eqn 4 section iii
(5) : see Eqn 5 section iii
(6) : see Eqn 6 section iii
(7) : see Eqn 7 section iii
(8) : see Eqn 8 section iii

Table C1. CTD Calibration Summary.

i. Shipboard Processing

BIO SEABIRD CTD System #5 (Stations 1 to 6 and 98 to 107)

Temperature Sensor (#031638) Coefficients used for Stations 1 to 6 and 98 to 107

$$\text{Temperature} = 1/\{a + b[\ln(F_o/F)] + c[\ln^2[F_o/F] + d[\ln^3(F_o/F)]\} - 273.15$$

where ln indicates a natural logarithm,
F is the frequency (Hz)
a = 3.68096719 E-03
b = 6.02683750 E-04
c = 1.55348636 E-05
d = 2.30707462 E-06
F_o = 6034.530
slope = 1, offset = 0 (Seabird calibration dated July 6, 1994)

System #5 Temperature Sensor (#031638) Calibration, 13-14 September, 1994, no pump

Bath Temperature °C	Seabird Temperature °C	Temperature Freq Hz	Residual Temperature m°C
30.0085	30.0064	11490.993	-2.1
30.0083	30.0059	11490.891	-2.4
25.0070	25.0053	10456.699	-1.7
25.0065	25.0048	10456.590	-1.7
20.0018	20.0010	9487.863	-0.8
20.0020	20.0011	9487.871	-0.9
15.0020	15.0019	8584.242	-0.1
15.0020	15.0018	8584.219	-0.2
9.9973	9.9984	7742.164	+1.1
9.9979	9.9985	7742.188	+0.6
4.9969	4.9979	6960.889	+1.0
4.9964	4.9973	6960.793	+0.9
-0.0065	-0.0043	6237.465	+2.2
-0.0070	-0.0051	6237.355	+1.9
-2.0091	-2.0068	5963.676	+2.3
-2.0090	-2.0068	5963.676	+2.2

System #5, Temperature Sensor (#031638) Calibration, 10-11 January, 1995, no pump

Bath Temperature °C	Seabird Temperature °C	Temperature Freq Hz	Residual Temperature m°C
30.0071	30.0022	11490.094	-4.9
30.0071	30.0020	11490.055	-5.1
25.0059	25.0017	10455.969	-4.2
25.0058	25.0016	10455.953	-4.2
20.0017	19.9981	9487.317	-3.6
20.0015	19.9979	9487.277	-3.6
14.9996	14.9973	8583.441	-2.3
14.9998	14.9973	8583.438	-2.5
9.9970	9.9954	7741.678	-1.6
9.9970	9.9955	7741.699	-1.5
4.9934	4.9915	6959.918	-1.9
4.9945	4.9932	6960.172	-1.3
-0.0120	-0.0128	6236.289	-0.8
-0.0122	-0.0132	6236.234	-1.0
-2.0134	-2.0136	5962.758	-0.2
-2.0133	-2.0135	5962.770	-0.2

System #5, Pressure Sensor (#50601) Coefficients used for Stations 1 to 6 and 98 to 107

$$\text{Pressure} = c\,(1 - T_o^2/T^2)\,(1 - d[1 - T_o^2/T^2])$$

where T is the pressure period

$c = c_1 + c_2\,U + c_3\,U^2$

$d = d_1 + d_2\,U$

$T_o = T_1 + T_2\,U + T_3\,U^2 + T_4\,U^3 + T_5\,U^4$

U is the temperature (°C)

c_1 = -4.274464E+04 psia

c_2 = 1.048032E+00 psia/°C

c_3 = 1.266000E-02 psia/°C^2

d_1 = 4.087300E-02
d_2 = 0
T_1 = 3.009631E+01 μsec
T_2 = -6.293786E-05 μsec/°C
T_3 = 4.345040E-06 μsec/°C^2
T_4 = 2.428830E-09 μsec/°C^3
T_5 = 0
M = 1.145 E-02
B = -8.57985
slop = 1, offset = 0 (Seabird calibration, July 27, 1994)

System #5, Pressure Sensor (#50601) Calibration, BIO, 20 September, 1994

Cylinder Temp °C	Mass Load Kh	Corrected Pressure dbars	Pressure dbars	Pressure Frequency Hz	Pressure Temp °C	Sensitivity dbars	Hysteresis dbars
21.50	0	not connected	- 0.660	33231.281	21.35	-0.660	
21.50	0	connected	- 0.661	33231.265	21.44	-0.661	
21.70	34	6800.008	6799.246	36835.238	21.52	-0.762	
21.67	0	0.0	- 0.705	33231.230	21.52	-0.705	-0.044
21.68	5	1000.050	999.570	33789.896	21.55	-0.480	
21.70	10	2000.084	1999.522	34337.785	21.56	-0.562	
21.72	15	3000.100	2999.689	34875.675	21.58	-0.411	
21.74	20	4000.100	3999.464	35403.796	21.59	-0.636	
21.75	25	5000.082	4999.386	35922.811	21.61	-0.696	
21.77	30	6000.048	5999.109	36432.974	21.63	-0.939	
21.80	34	6800.008	6799.173	36835.191	21.65	-0.835	-0.073
21.80	30	6000.048	5999.060	36432.947	21.66	-0.988	-0.049
21.80	25	5000.082	4999.266	35922.798	21.66	-0.816	-0.120

21.81	20	4000.100	3999.383	35403.740	21.67	-0.717	-0.081
21.83	15	3000.100	2999.438	34875.531	21.68	-0.662	-0.251
21.82	10	2000.084	1999.383	34337.680	21.69	-0.701	-0.139
21.85	5	1000.050	999.350	33789.733	21.71	-0.700	-0.187
21.85	0	0.0	- 0.564	33231.281	21.74	-0.564	-0.141
21.85	0	disconnected	- 0.789	33231.141	21.83	-0.789	-0.129

System #5, Pressure Sensor (#50601) Calibration, BIO, 16 January, 1995

Cylinder Temp °C	Mass Load Kh	Corrected Pressure dbars	Pressure dbars	Pressure Frequency Hz	Pressure Temp °C	Sensitivity dbars	Hysteresis dbars
-	0	not connected 0	- 0.700	33231.215	21.66	-0.700	
-	0	connected 0	- 0.633	33231.244	21.72	-0.633	
21.05	34	6800.042	6799.270	36835.234	21.79	-0.772	
21.02	0	0.0	- 0.700	33231.199	21.77	-0.700	-0.067
21.03	5	1000.055	999.484	33789.797	21.79	-0.571	
21.04	10	2000.094	1999.590	34337.764	21.80	-0.504	
21.05	15	3000.115	2999.649	34875.633	21.81	-0.166	
21.07	20	4000.120	3999.537	35403.809	21.82	-0.583	
21.08	25	5000.107	4999.429	35922.820	21.84	-0.678	
21.10	30	6000.078	5999.205	36433.012	21.85	-0.873	
21.11	34	6800.042	6799.213	36835.203	21.87	-0.829	-0.057
21.12	30	6000.078	5999.137	36432.977	21.87	-0.941	-0.068
21.13	25	5000.107	4999.433	35922.820	21.88	-0.674	+0.004

21.14	20	4000.120	3999.486	35403.777	21.89	-0.634	-0.051
21.14	15	3000.115	2999.486	34875.539	21.89	-0.629	-0.163
21.15	10	2000.094	1999.395	34337.648	21.90	-0.699	-0.195
21.17	5	1000.055	999.408	33789.738	21.91	-0.647	-0.076
21.17	0	0.0	- 0.706	33231.172	21.93	-0.706	-0.006
-	0	disconnected 0	- 0.754	33231.141	21.96	-0.754	-0.054
-	0	20 minutes later	- 0.725	33231.113	22.27	-0.725	-0.025

System #5, Conductivity Sensor (#041375) Coefficients used for Stations 1 to 6 and 98 to 107

Conductivity = $(aF^m + bF^2 + c + dT)/[10(1-9.57(10^{-8})P)]$

where F is the conductivity frequency (Hz)
P is pressure (dbars)
T is the temperature (°C)
m = 4.3
a = 1.18499540E-05
b = 5.13875405405E-01
c = -4.13341052E+02
d = 4.56046244E-05
Cpcor = -9.57 E-08
slope = 1, offset = 0

System #5, Conductivity Sensor (#041375), BIO calibration, 15 September, 1994

Bath Temp T68 °C	Bath Sal psu	Inst Temp °C	Inst Cond s/m	Inst Cond Freq Hz	Inst Sal psu	Residual Sal mpsu
1.7780	34.0935	1.7791	2.986140	8121.917	34.0890	-4.5
1.7829	34.0931	1.7837	2.986542	8122.397	34.0891	-4.0
10.4495	34.0559	10.4500	3.757474	8992.859	34.0498	-6.1
10.4382	34.0567	10.4386	3.756534	8991.850	34.0510	-5.7
17.4698	34.0508	17.4687	4.425574	9683.129	34.0456	-5.2
17.4737	34.0522	17.4730	4.426113	9683.665	34.0466	-5.6

System #5, Conductivity Sensor (#041375), BIO calibration, 12 January, 1995

Bath Temp T68 °C	Bath Sal psu	Inst Temp °C	Inst Cond s/m	Inst Cond Freq Hz	Inst Sal psu	Residual Sal mpsu
1.9366	34.2203	1.9355	3.009724	8149.949	34.2170	-3.3
1.9095	34.2201	1.9083	3.007394	8147.184	34.2171	-3.0
10.1104	34.1524	10.1086	3.735330	8969.055	34.1466	-5.8
10.0882	34.1520	10.0864	3.733313	8966.883	34.1470	-5.0
17.7877	34.1600	17.7845	4.469218	9726.484	34.1551	-4.9
17.7748	34.1610	17.7716	4.468103	9725.379	34.1564	-4.6

System #5, Oxygen Sensor (#130266) Coefficients used for Station 1

$$\text{Oxygen} = [\text{Soc} \leftrightarrow (\text{oc} + \text{tau} \leftrightarrow \frac{\text{doc}}{\text{dt}}) + \text{Boc}] \leftrightarrow \text{OXSAT}(T,S) \leftrightarrow e^{\{\text{tcor} \leftrightarrow [T + \text{wt} \leftrightarrow (T_o - T)] + \text{pcor} \leftrightarrow P\}}$$

where Soc = 2.1015
oc is the oxygen sensor current (μamps)
oc = mV + b
m = 2.4692e-7
V is the oxygen temperature sensor voltage signal
b = -4.1977e-10
tau = 2.0
$\frac{\text{doc}}{\text{dt}}$ is the time derivative of oc
Boc = -0.0646
T is the water temperature (°C)
S is salinity (psu)
e is natural log base
tcor = -0.033
wt = 0.670
To oxygen sensor internal temperature (°C)
To = kV + c
k = 8.8993
c = -7.0715
pcor = 1.5e-4
P is the pressure (psia)

System #5, Oxygen Sensor (#130284) Coefficients used for Stations 2 to 6 and 98 to 107

$$\text{Oxygen} = [\text{Soc} \leftrightarrow (\text{oc} + \text{tau} \leftrightarrow \frac{\text{doc}}{\text{dt}}) + \text{Boc}] \leftrightarrow \text{OXSAT}(T,S) \leftrightarrow e^{\{\text{tcor} \leftrightarrow [T + \text{wt} \leftrightarrow (T_o - T)] + \text{pcor} \leftrightarrow P\}}$$

where Soc = 2.5328
oc is the oxygen sensor current (μamps)
oc = mV + b
m = 2.4528e-7
V is the oxygen temperature sensor voltage signal
b = -3.9245e-9
tau = 2.0
$\frac{\text{doc}}{\text{dt}}$ is the time derivative of oc
Boc = -0.0322

OXSAT is the oxygen saturation value
T is the water temperature (°C)
S is salinity (psu)
e is natural log base
tcor = -0.033
wt = 0.670
To oxygen sensor internal temperature (°C)
To = kV + c
k = 8.9625
c = -6.9161
pcor = 1.5e-4
P is the pressure (psia)

BIO Seabird CTD System #4 (Stations 7 to 97)

System #4, Temperature Sensor (#031422) Coefficients used for Stations 7 to 97

$$\text{Temperature} = 1/\{a + b[\ln(F_o/F)] + c[\ln^2[F_o/F] + d[\ln^3(F_o/F)]\} - 273.15$$

where ln indicates a natural logarithm
F is the temperature frequency (Hz)
a = 3.68096068 E-03
b = 5.98528033 E-04
c = 1.47933699 E-05
d = 2.18572143 E-06
F_o = 6142.890
slope = 1, offset = 0(Seabird calibration 30 March, 1993)

System #4, Temperature Sensor (#031422) Calibration, 5 May, 1993, no pump

Bath Temperature °C	Seabird Temperature °C	Temperature Freq Hz	Residual Temperature m°C
30.0094	30.0072	11745.723	-2.2
30.0091	30.0066	11745.582	-2.5
30.0094	30.0071	11745.703	-2.3
30.0096	30.0071	11745.703	-2.4
25.0082	25.0057	10682.410	-2.5
25.0081	25.0057	10682.410	-2.4
25.0082	25.0057	10682.410	-2.5
25.0081	25.0054	10682.336	-2.7
20.0036	20.0013	9686.863	-2.3
20.0033	20.0010	9686.812	-2.3
20.0035	20.0012	9686.848	-2.3
20.0035	20.0010	9686.836	-2.5
15.0046	15.0022	8758.813	-2.4
15.0044	15.0020	8758.781	-2.4
15.0041	15.0018	8758.743	-2.3
15.0041	15.0020	8758.781	-2.1
10.0029	10.0012	7894.793	-1.7
10.0030	10.0012	7894.793	-1.8
10.0038	10.0017	7894.875	-2.1
10.0039	10.0019	7894.902	-2.0
5.0057	5.0041	7093.652	-1.6
5.0060	5.0043	7093.676	-1.7
5.0068	5.0051	7093.813	-1.7
5.0060	5.0046	7093.739	-1.4
0.0085	0.0081	6352.609	-0.4
0.0085	0.0082	6352.629	-0.3
0.0049	0.0036	6351.972	-1.3
0.0056	0.0044	6352.098	-1.2
-1.9912	-1.9918	6072.230	-0.6
-1.9922	-1.9927	6072.145	-0.5

System #4, Temperature Sensor (#031422) Calibration, 6- 8 February, 1995, no pump

Bath Temperature °C	Seabird Temperature °C	Temperature Freq Hz	Residual Temperature m°C
30.0084	30.0039	11745.004	-4.5
30.0074	30.0030	11744.797	-4.4
25.0071	25.0033	10681.914	-3.8
25.0069	25.0031	10681.859	-3.8
20.0001	19.9971	9686.063	-3.0
20.0001	19.9973	9686.105	-2.8
14.9998	14.9974	8757.953	-2.4
15.0000	14.9976	8757.984	-2.4
9.9953	9.9936	7893.527	-1.7
9.9956	9.9940	7893.594	-1.6
4.9913	4.9906	7091.570	-0.7
4.9912	4.9900	7091.473	-1.2
-0.0133	-0.0136	6249.523	-0.3
-0.0128	-0.0131	6249.598	-0.3
-2.0151	-2.0148	6069.098	+0.3
-2.0153	-2.0146	6069.125	+0.7

System #4, Pressure Sensor (#53355) Coefficients used for Stations 7 to 97

$$\text{Pressure} = c\,(1 - T_o^2/T^2)\,(1 - d[1 - T_o^2/T^2])$$

where T is the pressure period (μsec)

$c = c_1 + c_2\,U + c_3\,U^2$

$d = d_1 + d_2\,U$

$T_o = T_1 + T_2\,U + T_3\,U^2 + T_4\,U^3 + T_5\,U^4$

U is the temperature (°C)

$c_1 =$ -42902.43 psia

$c_2 =$ 5.13724 E-01 psia/°C

$c_3 =$ 1.33407 E-02 psia/°C^2

d_1 = 0.040395
d_2 = 0.0
T_1 = 29.93058 µsec
T_2 = -8.85537 E-05 µsec/°C
T_3 = 3.59773 E-06 µsec/°C^2
T_4 = 5.58385 E-09 µsec/°C^3
T_5 = 0.0
M = 1.146 E-02
B = -8.11354
slope = 1, offset = 0 (Seabird calibration dated 2 February, 1993)

System #4, Pressure Sensor (#53355) Calibration, BIO, 5 May, 1993

Cylinder Temp °C	Mass Load Kh	Corrected Pressure dbars	Pressure dbars	Pressure Frequency Hz	Pressure Temp °C	Sensitivity dbars	Hysteresis dbars
	0	disconnected	- 0.731	33416.126	-	-0.731	
	0	0.10	- 0.594	33416.165	-	-0.694	
21.3	34	6800.108	6799.332	37027.258	-	-0.776	
21.3	0	0.10	- 0.415	33416.149	-	-0.515	+0.179
21.3	5	1000.150	999.522	33975.570	-	-0.628	
21.3	10	2000.184	1999.510	34524.473	-	-0.674	
21.3	15	3000.200	2999.312	35063.238	-	-0.888	
21.3	20	4000.200	3999.544	35592.664	-	-0.656	
21.4	25	5000.182	4999.472	36112.789	-	-0.710	
21.4	30	6000.148	5999.483	36624.219	24.70	-0.665	
21.4	34	6800.108	6799.335	37027.242	24.75	-0.773	
21.4	30	6000.148	5999.577	36624.264	24.80	-0.571	+0.094
21.5	25	5000.182	4999.628	36112.863	24.81	-0.554	+0.156

21.5	20	4000.200	3999.736	35592.754	24.85	-0.464	+0.192
21.5	15	3000.200	2999.540	35063.344	24.87	-0.660	+0.228
21.5	10	2000.184	1999.725	34524.566	24.89	-0.459	+0.215
21.5	5	1000.150	999.497	33975.522	24.92	-0.653	-0.025
21.5	0	0.10	- 0.416	33416.104	24.95	-0.516	-0.001
	0	disconnected	- 0.552	33416.012	25.10	-0.552	+0.179
2.5 hrs later	0	disconnected	- 0.637	33416.100	23.69	-0.637	+0.094

System #4, Pressure Sensor (#53355) Calibration, BIO, 1 February, 1995

Cylinder Temp °C	Mass Load Kh	Corrected Pressure dbars	Pressure dbars	Pressure Frequency Hz	Pressure Temp °C	Sensitivity dbars	Hysteresis dbars
-	0	not connected 0	- 0.393	33416.336	21.74	-0.393	
-	0	connected 0	- 0.305	33416.383	21.77	-0.305	
21.3	34	6800.042	6799.707	37027.379	21.82	-0.335	
21.3	0	0.0	- 0.231	33416.422	21.81	-0.231	+0.074
21.3	5	1000.055	999.480	33975.680	21.83	-0.575	
21.3	10	2000.094	1999.700	34524.676	21.84	-0.394	
21.3	15	3000.115	2999.580	35063.449	21.85	-0.535	
21.3	20	4000.120	3999.679	35592.770	21.88	-0.441	
21.4	25	5000.107	4999.708	36112.914	21.89	-0.399	
21.4	30	6000.078	5999.790	36624.348	21.91	-0.288	
21.4	34	6800.042	6799.693	37027.371	21.92	-0.349	
21.4	30	6000.078	5999.853	36624.379	21.93	-0.225	+0.063
21.4	25	5000.107	4999.893	36113.008	21.95	-0.214	+0.185

21.4	20	4000.120	3999.923	35592.895	21.96	-0.197	+0.244
21.4	15	3000.115	2999.766	35063.543	21.97	-0.349	+0.186
21.4	10	2000.094	1999.766	34524.703	21.98	-0.328	+0.066
21.4	5	1000.055	999.559	33975.711	21.99	-0.496	+0.079
21.4	0	0.0	- 0.220	33416.410	22.01	-0.220	+0.011
-	0	disconnected 0	- 0.300	33416.363	22.04	-0.300	+0.093
-	0	20 minutes later	- 0.279	33416.336	22.48	-0.279	+0.114

System #4, Conductivity Sensor (#041124) Coefficients used for Stations 7 to 97

Conductivity = $(aF^m + bF^2 + c + dT)/[10(1-9.57(10^{-8})P)]$

where F is the conductivity frequency (Hz)
P is the pressure (dbars)
T is the temperature (°C)
m = 4.2
a = 1.35924955 E-05
b = 4.87959496 E-01
c = -4.19483432 E+00
d = -1.04684736 E-04
Cpcor = -957 E-08
slope = 1, offset = 0(Seabird Calibration, 2 April, 1993)

System #4, Conductivity Sensor (#041124), BIO calibration, 5 May, 1993

Bath Temp T68 °C	Bath Sal psu	Inst Temp °C	Inst Cond s/m	Inst Cond Freq Hz	Inst Sal psu	Residual Sal mpsu
0.1267	35.0423	0.1277	2.917687	8257.891	35.0411	-1.2
0.1240	35.0424	0.1251	2.917472	8257.625	35.0412	-1.2
0.1215	35.0424	0.1227	2.917263	8257.367	35.0412	-1.2
4.3346	35.0210	4.3355	3.286899	8701.239	35.0176	-3.4
4.3409	35.0210	4.3419	3.287479	8701.918	35.0177	-3.3
7.7561	35.0356	7.7584	3.601437	9061.598	35.0317	-3.9
7.7523	35.0352	7.7529	3.600926	9061.024	35.0318	-3.4
7.7456	35.0352	7.7459	3.600312	9060.344	35.0321	-3.1
10.6795	35.0226	10.6796	3.875049	9363.619	35.0183	-4.3
10.6639	35.0226	10.6642	3.873605	9362.052	35.0185	-4.1
13.4486	35.0389	13.4484	4.143345	9650.443	35.0349	-4.0
13.4452	35.0391	13.4451	4.143054	9650.136	35.0350	-4.1
13.4459	35.0391	13.4455	4.143132	9650.212	35.0354	-3.7
-	35.0228	19.4106	4.733862	10252.997	35.0192	-3.6
19.4216	35.0238	19.4204	4.734923	10254.047	35.0198	-4.0
19.4255	35.0238	19.4248	4.735397	10254.516	35.0200	-3.8
19.4285	35.0238	19.4278	4.735699	10254.815	35.0200	-3.8

System #4, Conductivity Sensor (#041124), BIO calibration, 9 - 10 February, 1995

Bath Temp T68 °C	Bath Sal psu	Inst Temp °C	Inst Cond s/m	Inst Cond Freq Hz	Inst Sal psu	Residual Sal mpsu
2.8866	33.4953	2.8863	3.032501	8398.320	33.4886	- 6.7
2.8588	33.4955	2.8569	3.030037	8395.332	33.4892	- 6.3
11.5195	34.4262	11.5169	3.894080	9384.266	34.4164	- 9.8
11.4847	34.4268	11.4823	3.890868	9380.785	34.4169	- 9.9
16.7196	34.4033	16.7165	4.391920	9908.648	34.3923	-11.0
16.7063	34.4044	16.7033	4.390761	9907.461	34.3935	-10.9

System #4, Oxygen Sensor (#130284) Coefficients used for Stations 7 to 97

$$\text{Oxygen} = [\text{Soc} \leftrightarrow (\text{oc} + \text{tau} \leftrightarrow \frac{\text{doc}}{\text{dt}}) + \text{Boc}] \leftrightarrow \text{OXSAT(T,S)} \leftrightarrow e^{\{\text{tcor} \leftrightarrow T + \text{wt} \leftrightarrow (T_o - T)] + \text{pcor} \leftrightarrow P\}}$$

where Soc = 2.5328

oc is the oxygen sensor current (μamps)

oc = mV + b

m = 2.4528e-7

V is the oxygen temperature sensor voltage signal

b = -3.9245e-9

tau = 2.0

$\frac{\text{doc}}{\text{dt}}$ is the time derivative of oc

Boc = -0.0322

OXSAT is the oxygen saturation value

T is the water temperature (°C)

S is salinity (psu)

e is natural log base

tcor = -0.033

wt = 0.670

T_o oxygen sensor internal temperature (°C)

T_o = kV + c

k = 8.9625

c = -6.9161

pcor = 1.5e-4

P is the pressure (psia)

ii. First Calibration

The generated shipboard 1dbar downcast ODF data and the water sample data were used to determine calibrations (given below) for the System #4 CTD conductivity and oxygen data. These new calibrations were then applied to the raw 24 Hz data. The pressure, temperature and conductivity sensor coefficients given in section (i) for System #4 were applied, with the following changes:

a) the conductivity slope and offset were changed according to Eqn. 1 below,
b) Oxygen sensor coefficients were changed according to Eqn. 2 below.

Conductivity Sensor (#041124) Coefficients used for Stations 7 to 97

Conductivity = 1.00039254 * Conductivity - 0.00054 Eqn. 1

Oxygen Sensor (#130284) Coefficients for System #4 (Stations 7 to 97)

Oxygen =

$$[Soc \cdot (oc + tau \cdot \frac{doc}{dt}) + Boc] \cdot OXSAT(T,S) \cdot e^{\{tcor \cdot [T + wt \cdot (T_o - T)] + pcor \cdot P\}} \quad \text{Eqn .2}$$

where Soc = 3.679
oc is the oxygen sensor current (μamps)
oc = mV + b
m = 2.4528e-7
V is the oxygen temperature sensor voltage signal
b = -3.9245e-9
tau = 2.0
$\frac{doc}{dt}$ is the time derivative of oc
Boc = -0.0696
OXSAT is the oxygen saturation value
T is the water temperature (°C)
S is salinity (psu)
e is natural log base
tcor = -0.033
wt = 0.670
T_o oxygen sensor internal temperature (°C)
T_o = kV + c
k = 8.9625
c = -6.9161
pcor = 1.70e-4
P is the pressure (psia)

iii. Second Calibration

The second calibration was applied to the 1 and 2 dbar dataset that resulted from the first calibration, section (ii). The second calibration is represented in Eqns. 3 - 8.

Salinity Calibration for Station 1 to 6

$$Salinity_{calibrated} = CTD\ Salinity_{raw} + p_0 + p_1 \times P_{CTD} \quad \text{Eqn. 3}$$

where p_0 = 0.0033532
p_1 = -6.78158E-07
P_{CTD} is the CTD pressure in dbars

Salinity Calibration for Station 7 to 97

$$Salinity_{calibrated} = Salinity_{raw} + p_0 + p_1 \times P_{CTD} + p_2 \times P_{CTD}^2 + p_3 \times P_{CTD}^3 + p_4 \times P_{CTD}^4 \quad \text{Eqn. 4}$$

where p_0 = 6.79984E-05
p_1 = 2.17599E-06
p_2 = -1.60105E-09
p_3 = 3.4602E-13
p_4 = -2.53291E-17
P_{CTD} is the CTD pressure in dbars

Salinity Calibration for Station 98 to 107

$$Salinity_{calibrated} = Salinity_{raw} + 0.0045 \quad \text{Eqn. 5}$$

Oxygen calibration for Stations 2 to 6 and 98 to 107 (see section iv):

$$Ox_{ctd} = Ox_{ctd} + o \_ Ox_{ctd} + t_1 \times T_{CTD} + t_2 \times T_{CTD}^2 + a \quad \text{Eqn. 6}$$

where a = 0.578
o = 0.296214
t_1 = 0.0908199
t_2 = -0.013218

Oxygen calibration for Stations 7 to 75 (see section iv):

$$Ox_{ctd} = Ox_{ctd} + o\_Ox_{ctd} + t_1 \leftarrow T_{CTD} + t_2 \leftarrow T^2_{CTD} + t_3 \leftarrow T^3_{CTD} + p_1 \leftarrow P_{CTD} + p_2 \leftarrow P^2_{CTD} + a + \text{Time\_cor (Station number)}$$

Eqn. 7

where
a = -0.3315964
o = 5.15001E-02
t_1 = -1.8817E-02
t_2 = -1.31562E-03
t_3 = 1.44749E-04
p_1 = -4.04006E-05
p_2 = 9.03202E-09
Time_cor (Station number) - see Table C. 2
P_{CTD} is the CTD pressure in dbars

Oxygen calibration for Stations 76 to 97 (see section iv):

$$Ox_{ctd} = Ox_{ctd} + o\_Ox_{ctd} + t \leftarrow T_{CTD} + p_1 \leftarrow P_{CTD} + p_2 \leftarrow P^2_{CTD} + p_3 \leftarrow P^3_{CTD} + p_4 \leftarrow P^4_{CTD} + a$$

Eqn. 8

where
a = -1.913914
o = 0.184303
t = 0.162267
p_1 = 9.83471E-04
p_2 = -9.91903E-07
p_3 = 4.28312E-10
p_4 = -6.37949E-14
P_{CTD} is the CTD pressure in dbars

Table C.2 Station-to-station corrections.

Station number	Correction (Time_cor)
7	0.2848143
8	0.1813909
9	0.0405818
10	0.11
11	0.1879071
12	0.11305
13	0.13994
14	0.0777733
15	0.0892929
16	0.1337333
17	0.1223
18	0.0491714
19	0.0699636
20	0.0081417
21	0.1265182
22	0.0220546
23	-0.004567
24	0.0400077
25	0.0425539
26	0.0189364
27	0.0440455
28	-0.017883
29	0.022882
30	0.039858
31	0.019646
32	-0.004789
33	-0.0143
34	-0.007567
35	0
36	0.005
37	0.01579
38	0.1192818
39	0.08
40	0.07
41	0.0534875
42	0.0356818
43	0.04
44	0.04
45	0.0404813
46	0.1236333
47	0.0064167
48	0.01
49	0.03
50	0.05
51	0.0964111
52	0.12847
53	0.056325
54	0.2120667
55	0.1764167
56	0.21886
57	0.2479417
58	0.2709636
59	0.2614
60	0.295
61	0.475
62	0.285
63	0.2352154
64	0.2514615
65	0.2502929
66	0.2640154
67	0.2613273
68	0.26248
69	0.2750556
70	0.277625
71	0.3096555
72	0.3310714
73	0.2840727
74	0.30094
75	0.28303

iv. Oxygen Calibration Procedure

The calibration parameters for the CTD oxygen data (see equations 6, 7 and 8) were based on down trace CTD data and measurements of water sample oxygen concentration from bottles tripped on the uptrace. Although these datasets are inconsistent (to some degree) in time and spatial location, they were considered the only reliable source of information for calibration of CTD oxygen.

The procedure for finding the calibrations to be applied to the downcast CTD oxygen was subdivided into three stages (both II and III are iterative procedures):

I. Creating a calibration file,
II. Computing non-linear 'hardware' coefficients,
III. Computing corrections of time drift and residual effects of pressure, temperature and oxygen (*secondary correction*).

I. Creating a Calibration File

1) The *calibration file* is used for finding and testing calibrations (set of coefficients) later applied to the CTD data, while computing CTD Oxygen. A base for this file consisted of discrete CTD readings of temperature, pressure, salinity, etc. averaged over three seconds at the depth and time of bottle tripping. The *calibration file* creation steps are outlined below;

2) Water sample salinity and oxygen concentration determined onboard were added to the *calibration file*;

3) For initial 'indirect' check of quality, the differences between water sample and calibrated CTD salinity were computed. If the absolute difference exceeded 0.004 the point (record) containing this data was considered unreliable and discarded from further analysis;

4) Next, a search and selection was performed for each record of the *calibration file*. The goal is to find a point in a downtrace profile in the same general water type.

   - data from a downtrace profile were restricted to a certain pressure (or/and) density (or/and) temperature (or/and) salinity vicinity of the uptrace point (the *calibration file*). This defines a *group*. Typical criteria (definition of vicinity): differences between uptrace and downtrace pressure 25 db, potential temperature 0.5K, salinity 0.02. [Note: For some upcast data points, no downcast point was found within the defined criteria. In these cases, the CTD oxygen in the SEA file is indicated with a null value of -9.0 and a quality flag of 9, not sampled.]

- find a point in the *group* which is closest to the uptrace data point (from the *calibration file*) in multidimensional space, where dimensions are normalized (weighted or rescaled) pressure, potential temperature, salinity and density. Normalization for each axis was done according to expected variability within a water type. In ultimate cases only one or two dimensions were chosen. The found point was identified as being "closest" to the upcast CTD data point at the time of bottle trip.

At this point, the downtrace CTD data has been added to the calibration file.

5) Next the dataset was split into *sets* based on distinct changes in the sensors behavior. The *set* represented quasi-steady periods of oxygen sensor behavior. This avoided extreme temporal drifts in any of the *sets* and allowed the use of the same non-linear coefficients for each *set*.

II. Computing Non-linear 'Hardware' Coefficients

1) A nonlinear multiparametric least square technique was used to determine the oxygen sensor processing coefficients (*soc, boc, tcor,* and *bcor*) using $oxygen_{ws}$ vs. downcast $temperature_{ctd}$, $salinity_{ctd}$, $pressure_{ctd}$, $oxygen\ current_{ctd}$ and $oxygen\ temperature_{ctd}$ (where the *ws*/*ctd* subscripts represents water sample/CTD data).

2) Applying the results of step II.1, the $oxygen_{ctd}$ was derived.

3) Compute $oxygen_{ws}$ - $oxygen_{ctd}$. Statistics of the difference were computed and the records that produced outliers (no matter if the outliers were produced by $oxygen_{ws}$ or $oxygen_{ctd}$) were marked or deleted from the *calibration file*.

4) Checking the $oxygen_{ws}$ - $oxygen_{ctd}$ distributions:

- if the differences ($oxygen_{ws}$ - $oxygen_{ctd}$) are randomly distributed versus all parameters (temperature, pressure, oxygen current, and oxygen temperature) and there are no evident outliers, proceed to stage III,

- otherwise, using the cleaned *calibration file* (derived in stage I and cleaned according to II.3) repeat all the steps of stage II until the first part of the check II.4 is true (typically, it requires 10 to 15 iterations to clean the *calibration file* and determine the oxygen sensor processing coefficients *soc, boc, tcor,* and *bcor*).

III. Computing corrections of time drift and residual effects of pressure, temperature and oxygen

1) Using the differences from II.4 (*first iteration on this stage*) or III.4 (*second and higher iteration*), compute the median $oxygen_{ws}$ - $oxygen_{ctd}$ for each station. The series of station-by-station medians represents the *time drift* of the sensor.

2) Subtract the individual station median (*time drift*, III.1) from the differences $oxygen_{ws}$ - $oxygen_{ctd}$ for that station, which must be taken from II.4.

3) Individually for pressure, temperature and then oxygen, use the *set* of stations (as defined in I.5) to compute a polynomial fit of the residuals from III.2 in pressure, temperature and oxygen.

4) Subtract the polynomial correction, derived in III.3, from the differences computed in II.4 (before subtraction of the *time-drift*). Check if there are any outliers.

5) Subtract the *time drift* (station median) from the results of III.4.

   - If these (*new* III.5) residuals don't depend on pressure, temperature, oxygen or time and their statistics is not improving with any sequential iteration (distribution getting tighter) advance to III.6.

   - Otherwise, use the results of step III.4 and repeat all the steps of stage III until the first bulleted part of III.5 is true. This iteration typically requires 7 to 14 repetitions.

6) Finalize calibration coefficients.

v. CTD Quality Flagging

The processed 2 dbar CTD was quality flagged by applying "bad" flags to the near-surface data. This data would have been collected before the system pump was activated, and thus does not represent a measurement from a properly operating system. This typically meant that the temperature, salinity and oxygen data above 10 dbars is flagged using WOCE flag "4".

2. Salinity — Bruce Carson

a. Description of Equipment and Technique

Salinity samples were analyzed on one of two Guildline Autosal model 8400 salinometers. Samples were drawn in 150 ml medicine bottles. New caps, equipped with plastic liners, were placed on the sample bottles for each use.

The salinometer cell was filled and rinsed three times with sample water before readings were recorded. Two readings of the salinometer were recorded for every sample and standardization. If the values were fluctuating, more readings were taken.

b. Sampling Procedure and Data Processing Technique

Salinity samples were drawn into medicine bottles after three rinses. The bottles were filled up to the shoulders and then capped with new caps with plastic liners.

One conductivity file for the entire cruise was prepared. The file consisted of a sequential record number, the bath temperature, sample ID number, average conductivity ratio and a quality flag. A PC based program running under a commercial DBMS computed the salinity using the average conductivity ratio and the standard IAPSO formula. Any changes in the salinometer readings between successive standardizations was assumed to have occurred as a linear drift of the instrument. Thus, the program applied a correction to the ratios, which varied linearly with the samples analyzed. The salinity data was then placed in the water sample database.

c. Laboratory and Sample Temperatures

Full cases of samples were taken from the winch room to the GP lab where they were left for a period of at least 10 hours to equilibrate to laboratory temperature before being analyzed.

The baths in these two salinometers were kept at 21^{o}C and 24^{o}C. The salinometer which was just above the current laboratory temperature would be the one that was used for any given run of samples.

d. Replicate Analysis

A duplicate salinity sample was drawn from one of the rosette bottles on every cast. In total, 82 duplicate samples were drawn for 82 sample id numbers. Seven of these sample id numbers (152952, 153208, 153686, 153831, 153832, 153833 and 154400) had at least one unacceptable sample value. All duplicate samples and their quality flags are given in Table C.3. Computed statistics on the absolute value of acceptable duplicate differences follow.

Statistic	Value
Number of Duplicate Differences	75
Minimum	0
Maximum	0.0092
Mean	0.0007
Median	0.0006
Standard Deviation	0.0011

e. Standards Used

The salinometer was standardized using IAPSO standard water, Batch P120, prepared on April 6, 1992. Standardization with a new ampoule was carried out at the beginning, middle and end of every 32 bottle case and at intermediate points during a case if instrument drift was suspected.

Table C.3 Replicate water sample salinity values.

Sample ID Number	Salinity	WOCE QF	Sample ID Number	Salinity	WOCE QF
152949	33.0339	2	153208	34.8680	2
152949	33.0337	2	153208	34.8749	3
152952	32.8931	2	153232	34.8723	2
152952	34.8676	4	153232	34.8722	2
152956	34.7786	2			
152956	34.7788	2			
152962	34.8739	2			
152962	34.8751	2			
152980	34.9245	2			
152980	34.9247	2			
153032	34.9039	2			
153032	34.9041	2			
153049	34.9014	2			
153049	34.9013	2			
153083	34.9363	2			
153083	34.9369	2			
153094	34.8793	2			
153094	34.8800	2			
153121	34.8929	2			
153121	34.9022	2			
153149	34.9442	2			
153149	34.9451	2			
153172	34.9448	2			
153172	34.9460	2			
153174	34.9608	2			
153174	34.9610	2			
153188	34.8833	2			
153188	34.8837	2			

Table C.3 Replicate water sample salinity values.

Sample ID Number	Salinity	WOCE QF	Sample ID Number	Salinity	WOCE QF
153262	34.9417	2	153580	34.9092	2
153262	34.9419	2	153580	34.9088	2
153278	34.8755	2	153600	34.8924	2
153278	34.8757	2	153600	34.8908	2
153306	34.9148	2			
153306	34.9157	2			
153323	34.8747	2			
153323	34.8755	2			
153354	34.9342	2			
153354	34.9346	2			
153372	34.8972	2			
153372	34.8976	2			
153392	34.8822	2			
153392	34.8824	2			
153419	34.9117	2			
153419	34.9119	2			
153444	34.9134	2			
153444	34.9136	2			
153470	34.9273	2			
153470	34.9263	2			
153485	34.8949	2			
153485	34.8953	2			
153519	34.9595	2			
153519	34.9601	2			
153530	34.8900	2			
153530	34.8908	2			
153564	34.9319	2			
153564	34.9327	2			

Sample ID Number	Salinity	WOCE QF
153625	34.9038	2
153625	34.9039	2
153650	34.9144	2
153650	34.9149	2
153686	35.1460	2
153686	35.1460	3
153695	34.9078	2
153695	34.9067	2
153723	34.8846	2
153723	34.8862	2
153744	33.0321	2
153744	33.0322	2
153747	34.8614	2
153747	34.8620	2
153755	34.7606	2
153755	34.7616	2
153764	32.8646	2
153764	32.8634	2
153779	34.8900	2
153779	34.8899	2
153794	34.9209	2
153794	34.9211	2
153816	34.8535	2
153816	34.8541	2
153831	34.8939	3
153831	36.2645	4
153832	34.8984	3
153832	36.2808	4
153833		5
153833	34.9023	3
153836	34.9167	2
153836	34.9167	2
153857	34.9129	2
153857	34.9130	2

Sample ID Number	Salinity	WOCE QF
153884	34.9145	2
153884	34.9149	2
153902	34.8949	2
153902	34.8955	2
153927	34.9028	2
153927	34.9036	2
153946	34.8927	2
153946	34.8929	2
153970	34.8920	2
153970	34.8924	2
153993	34.8920	2
153993	34.8928	2
154024	34.9331	2
154024	34.9337	2
154044	34.9288	2
154044	34.9286	2
154069	34.9160	2
154069	34.9181	2
154085	34.8943	2
154085	34.8949	2
154109	34.8993	2
154109	34.8997	2
154131	34.8947	2
154131	34.8948	2
154171	34.9994	2
154171	35.0010	2
154177	34.8948	2
154177	34.8951	2
154202	34.9083	2
154202	34.9093	2
154223	34.8951	2
154223	34.8957	2
154246	34.8947	2
154246	34.8955	2

Sample ID Number	Salinity	WOCE QF	Sample ID Number	Salinity	WOCE QF
154275	34.9292	2	154400		5
154275	34.9284	2	154400	34.8736	2
154308	34.8585	2	154413	34.8186	2
154308	34.8589	2	154413	34.8186	2
154322	34.9014	2	154417	34.8758	2
154322	34.9024	2	154417	34.8776	2
154337	34.9107	2	154424	34.8535	2
154337	34.9120	2	154424	34.8545	2
154356	34.0929	2	154434	34.8677	2
154356	34.0931	2	154434	34.8669	2
154359	34.4786	2	154450	32.5194	2
154359	34.4782	2	154450	32.5202	2
154363	34.1558	2	154457	34.9317	2
154363	34.1542	2	154457	34.9329	2
154374	33.8869	2	154480	32.3407	2
154374	33.8870	2	154480	32.3399	2

3. Oxygen — Pierre Clement

a. Description of Equipment and Technique

The oxygen samples were analyzed using an automated procedure developed by the Physical and Chemical Services Branch (PCS) of the Bedford Institute of Oceanography (BIO) from a manual titration system (Levy et al. 1977). The PCS procedure used a modified Winkler titration from Carritt and Carpenter (1966), using a whole bottle titration. In this method there was no starch indicator, and a wetting agent (Wetting Agent A, BDH) was introduced to reduce bubble formation. This automated titration system consisted of an IBM PC linked to a Brinkmann PC800 colorimeter and a Metrohm 665 Multi-Dosimat Automatic Titrator. A full description of the system and method can be found in Jones, et al. (1992).

b. Sampling Procedure and Data Processing Technique

The sampling bottles were 125ml Iodine flasks with custom ground stoppers (Levy et al. 1977). The flask volumes were determined gravimetrically. The matched flasks and stoppers were etched with identification numbers and entered into the Oxygen program database.

For this cruise 10 litre rosette bottles were used to obtain the original sample. The oxygen subsamples were drawn, immediately following the drawing of the CFC subsamples, through the bottles spigot with a latex or silicone tube attached so as to introduce the water to the bottom of the flask. The flask and its stopper were thoroughly rinsed and filled to overflowing. The flow was allowed to continue until at least two to three flask volumes overflowed. The flask was then slowly retracted with continuous low flow to ensure that no air got trapped in the flask. The flask was then brought to the reagent station and one millilitre each of the Alkaline Iodide and Manganous Chloride Reagents were added and the stoppers carefully inserted, again ensuring that no air got into the flasks. The flasks were thoroughly shaken then carried to the lab for analysis.

c. Replicate Analysis

There were 1593 unique sample id numbers analyzed for dissolved oxygen, of which 1509 had one sample value, 83 had two sample values and 1 had three sample values. The replicate samples were taken from a water sample bottle at each station in order to monitor precision, which can be affected by flaws in sampling or titration.

Statistics of the replicate differences follow. Only acceptable values were used in calculating the replicate differences. The calculated replicate statistics used the absolute value of the replicate differences. Of the 84 unique ids that had replicate samples, a replicate difference could not be calculated for seven of them. The sample id numbers were: 152952 , 153046, 153649, 153959, 153969, 154068 and 154176. The replicate difference could not be calculated for these sample id

numbers because one or both of the sample values were unacceptable. In total, 157 acceptable sample values were used in calculating the 79 replicate differences. All of replicate sample values and their quality flags are listed in Table C.4 below.

Number of replicate differences
= (83 - 7) sample id numbers having one replicate * 1 possible difference
+ (1) sample id numbers having two replicates * 3 possible differences
= 79

Median of [(absolute difference/sample mean concentration of all samples) * 100%] = 0.17 %

Statistic	Value (μmoles/kg)
Minimum	0.0
Maximum	4.6
Mean	1.0
Median	0.4
Standard Deviation	1.2

Cumulative Frequency	Oxygen Difference (μmoles/kg)
50 %	≤ 0.4
68 %	≤ 0.9
95 %	≤ 3.3

Table C.4 Replicate water sample oxygen values in μmoles/kg.

Sample ID Number	Oxygen	WOCE QF	Sample ID Number	Oxygen	WOCE QF
152949	353.4	2			
152949	353.2	2	153231	256.9	2
			153231	257.0	2
152952	284.8	4			
152952	381.6	2	153269	209.5	2
			153269	210.2	2
152960	276.7	2			
152960	276.7	2			
152990	266.1	2			
152990	266.3	2			
153002	274.8	2			
153002	275.2	2			
153027	275.4	2			
153027	275.3	2			
153046	266.6	3			
153046	267.3	2			
153082	265.7	2			
153082	268.9	2			
153093	256.1	2			
153093	257.0	2			
153129	268.0	2			
153129	268.3	2			
153139	256.9	2			
153139	256.4	2			
153166	263.9	2			
153166	263.7	2			
153195	265.9	2			
153195	266.3	2			
153209	256.9	2			
153209	257.0	2			

Table C.4 Replicate water sample oxygen values in μmoles/kg.

Sample ID Number	Oxygen	WOCE QF	Sample ID Number	Oxygen	WOCE QF
153277	255.2	2			
153277	257.0	2	153599	265.5	2
			153599	265.8	2
153312	270.8	2			
153312	270.6	2	153637	224.1	2
			153637	223.7	2
153329	266.4	2			
153329	269.3	2			
153361	265.5	2			
153361	265.6	2			
153370	263.6	2			
153370	263.7	2			
153393	263.6	2			
153393	264.4	2			
153422	265.3	2			
153422	265.4	2			
153457	184.6	2			
153457	184.9	2			
153463	273.5	2			
153463	273.7	2			
153503	199.9	2			
153503	199.9	2			
153510	273.7	2			
153510	273.6	2			
153531	268.0	2			
153531	268.2	2			
153573	233.1	2			
153573	233.2	2			
153589	250.1	2			
153589	250.2	2			

Sample ID Number	Oxygen	WOCE QF	Sample ID Number	Oxygen	WOCE QF
153649	273.4	2	153897	160.9	2
153649	267.6	3	153897	161.1	2
153681	241.9	2	153904	274.0	2
153681	245.3	2	153904	274.3	2
153681	246.6	2			
			153923	275.4	2
153692	277.5	2	153923	274.8	2
153692	279.8	2			
153706	268.2	2			
153706	268.6	2			
153727	268.4	2			
153727	268.2	2			
153737	285.1	2			
153737	286.5	2			
153750	275.7	2			
153750	276.9	2			
153759	336.7	2			
153759	336.9	2			
153764	369.8	2			
153764	370.2	2			
153771	274.0	2			
153771	273.3	2			
153808	228.1	2			
153808	229.8	2			
153821	295.0	2			
153821	295.4	2			
153834	279.3	2			
153834	280.2	2			
153854	284.3	2			
153854	285.6	2			

Sample ID Number	Oxygen	WOCE QF
153959	266.7	4
153959	266.9	4
153969	267.4	2
153969	269.5	3
153992	268.2	2
153992	268.6	2
154016	270.2	2
154016	270.4	2
154051	274.5	2
154051	274.5	2
154063	272.9	2
154063	276.2	2
154068	273.3	3
154068	279.1	3
154084	273.1	2
154084	273.5	2
154110	277.5	2
154110	275.3	2
154136	273.9	2
154136	274.1	2
154161	278.2	2
154161	278.3	2
154176	267.7	3
154176	269.4	2
154200	270.8	2
154200	271.4	2
154222	282.8	2
154222	282.3	2
154245	274.8	2
154245	273.4	2
154277	274.8	2
154277	276.9	2
154303	293.9	2
154303	298.4	2

Sample ID Number	Oxygen	WOCE QF	Sample ID Number	Oxygen	WOCE QF
154317	281.2	2	154419	279.2	2
154317	281.6	2	154419	281.1	2
154338	282.4	2	154430	298.2	2
154338	283.1	2	154430	298.6	2
154353	284.8	2	154433	291.6	2
154353	284.5	2	154433	295.5	2
154360	318.8	2	154445	305.0	2
154360	320.1	2	154445	309.3	2
154362	283.9	2	154448	322.0	2
154362	285.8	2	154448	324.4	2
154378	331.3	2	154452	377.7	2
154378	333.7	2	154452	376.9	2
154379	277.0	2	154462	154.1	2
154379	278.0	2	154462	157.0	2
154384	275.8	2	154475	358.5	2
154384	275.3	2	154475	358.8	2
154398	277.8	2	154482	354.0	2
154398	277.6	2	154482	353.8	2

4. Nutrients — Pierre Clement

a. Description of Equipment and Technique

Nutrient concentrations were determined using a Technicon Autoanalyser II. The chemistries were standard Technicon (Silicate 186-72W, Phosphate 155-71W, Nitrate/Nitrite 158-71W) except for Phosphate which was modified by separating the Ascorbic Acid (4.0 gms/l) from the Mixed Reagent. This alteration was achieved by introducing the modified Mixed Reagent instead of water at the start of the sample stream at 0.23 ml/min and the Ascorbic Acid was pumped into the stream between the two mixing coils at 0.32 ml/min.

b. Sampling Procedure and Data Processing Technique

Duplicate nutrient subsamples were drawn into 30 ml HDPE (Nalge) wide mouth sample bottles from 10 litre Niskins. The bottles were 10% HCl washed, rinsed once with tap water, three times with Super-Q and oven dried at more than 100 Degrees F.

A sample run included six Working Standards run at the beginning and end. Duplicate Check Standards were run every 16 samples followed by blanks as a Baseline Check. These Standards were made up in 33 ppt NaCl (VWR,Analar grade) as is the wash water. The Standards were tested against CSK Solution Standards (Sagami Chemical Center, Japan).

Analog data was converted to digital, processed and statistics calculated by a Pascal 6.0 in house program (Logger) on a PC. Chart recordings, hard copy and disk copies of the data were kept for reference.

c. Replicate Analysis

A total of 3136 seawater samples were analyzed for silicate, phosphate and NO_2+NO_3. Included in these samples were a total of 1543 duplicate samples. Duplicate samples were drawn from each rosette bottle on every cast. Statistics relating to the precision of the sample values follow. All values are given in μmoles/kg. Only the samples that had acceptable duplicate values were included in the statistics. All duplicate values and their quality flags are given in Table C.5.

Precision is a measure of the variability of individual measurements and in the following analysis two categories of precision were determined; field and analytical precision. Analytical precision is based on the pooled estimate of the standard deviation of the check standards over the course of a complete autoanalyzer run and is a measure of the greatest precision possible for a particular analysis. Field precision is based on the analysis of two or more water samples taken from a single Niskin sampling bottle and has an added component of variance due to subsampling, storage and natural sample variability.

Both categories of precision were determined by computing the variance, σ_i^2 , of each replicate set, where "i" is the index of the replicate set. In the case of analytical (field) precision, a replicate set consisted of all the check standards (duplicate samples). Given p replicate sets and n samples within any replicate set, the mean standard deviation, $\overline{\sigma}$, was determined from

$$\overline{\sigma} = \sqrt{\frac{\sum_{i=1}^{p} (n-1)_i \sigma_i^2}{\sum_{i=1}^{p} (n-1)_i}}$$

The precision expressed in percent was based on the mean concentration, M, of the check standards (analytical precision) or water samples (field precision) and was given by

$$P_{\%} = \frac{\overline{\sigma}}{M} \leftarrow 100\%$$

The following table indicates the analytical and field precision obtained for this cruise.

Statistic	Silicate	Phosphate	NO2+NO3
Number of Samples	3136	3136	3136
Number of Duplicates	1543	1543	1543
Mean concentration (μmoles/kg)	14.07	1.07	15.64
Field Precision (μmoles/kg)	0.24	0.03	0.42
Field Precision (%)	1.70	3.00	2.70
Analytical Precision (μmoles/kg)	0.38	0.05	0.23
Analytical Precision (%)	1.18	4.40	1.41
Detection Limit (μmoles/kg)	0.16	0.04	0.16

The laboratory temperature during all analyses was between 21 and 23 °C.

The conversion to mass units for the analytical precision and detection limits used a standard density of 1.02443 kg/litre corresponding to 33 ppt and 15°C. The conversion of individual sample values from volume to mass units used a potential density with a fixed temperature of 15°C.

Duplicate samples were drawn from each rosette bottle for the determination of silicate, phosphate and nitrate concentrations.

The nutrient detection limits noted in the above table were applied to the dataset. All values at or below the detection limits were set to zero.

The following duplicate measurements (Table C.5) were used to compute the values given in the SEA file. All values that follow are in μmoles/kg.

Table C.5 Nutrient replicate water sample values in µmoles/kg.

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
152925 2	13.57	1.45	20.90	2 2					
152925 2	13.53	1.45	21.06	2 2	152934 2	14.06	1.45	21.70	2 2
152926 2	13.27	1.53	21.32	2 2	152934 2	13.93	1.41	21.22	2 2
152926 2	13.36	1.49	21.58	2 2	152935 2	14.06	1.49	21.90	2 2
152928 2	13.33	1.45	21.02	2 2	152935 2	13.86	1.46	22.10	2 2
152928 2	13.52	1.47	21.02	2 2	152936 2	13.95	1.45	22.02	2 2
152929 2	13.42	1.42	21.42	2 2	152936 2	14.31	1.43	21.46	2 2
152929 2	13.62	1.46	21.24	2 2	152937 2	14.17	1.44	21.72	2 2
152930 2	13.57	1.45	21.28	2 2	152937 2	14.27	1.45	21.94	2 2
152930 2	13.45	1.43	21.54	2 2	152938 2	13.91	1.45	22.06	2 2
152931 2	13.67	1.44	21.02	2 2	152938 2	14.00	1.46	21.92	2 2
152931 2	13.80	1.46	21.34	2 2	152939 2	14.10	1.43	22.30	2 2
152932 2	13.59	1.48	21.82	2 2	152939 2	14.19	1.44	21.64	2 2
152932 2	13.76	1.45	21.68	2 2	152940 2	14.28	1.44	21.90	2 2
152933 2	13.72	1.44	21.34	2 2	152940 2	14.28	1.44	22.18	2 2
152933 2	13.82	1.46	21.32	2 2	152941 2	14.05	1.46	21.74	2 2

Table C.5 Nutrient replicate water sample values in µmoles/kg.

ID	WOCE SiO4	PO4	NO2+NO3	QF	WOCE NO2+NO3 QF
152941 2	14.34	1.44	22.24	2 2	
152942 2	14.26	1.40	21.57	2 2	
152942 2	14.10	1.43	21.99	2 2	
152943 2	14.35	1.45	21.87	2 2	
152943 2	14.28	1.42	21.85	2 2	
152944 2	14.02	1.43	22.13	2 2	
152944 2	14.11	1.41	22.35	2 2	

ID	SiO4	PO4	NO2+NO3	QF
152945 2	14.14	1.45	21.89	2 2
152945 2	14.30	1.41	21.79	2 2
152946 2	14.19	1.44	22.17	2 2
152946 2	14.20	1.44	22.25	2 2
152947 2	14.32	1.43	21.85	2 2
152947 2	14.32	1.46	21.73	2 2
152948 2	14.38	1.43	22.09	2 2
152948 2	14.15	1.42	22.07	2 2
152949 2	7.75	0.97	6.85	2 2
152949 2	7.92	0.89	6.96	2 2
152950 2	8.47	0.93	7.08	2 2
152950 2	8.67	0.87	7.06	2 2
152951 2	6.93	0.84	6.45	2 2
152951 2	6.93	0.88	6.51	2 2
152952 2	4.26	0.65	2.92	2 2
152952 2	4.37	0.63	2.98	2 2

Table C.5 Nutrient replicate water sample values in µmoles/kg.

WOCE ID	WOCE SiO4	PO4	NO2+NO3	QF	WOCE ID	SiO4	PO4	NO2+NO3	QF
152952 4	10.36	1.14	16.78	4 4					
152952 4	10.50	1.09	16.94	4 4	152960 2	13.38	1.13	17.12	2 2
152953 2	10.55	1.10	16.54	2 2	152960 2	13.41	1.13	16.77	2 2
152953 2	10.82	1.12	16.73	2 2	152961 2	12.10	1.17	16.81	2 2
152954 2	10.93	1.12	17.16	2 2	152961 2	12.20	1.16	16.77	2 2
152954 2	10.93	1.14	17.03	2 2	152962 2	11.17	1.14	16.93	2 2
152955 2	10.72	1.12	17.46	2 2	152962 2	11.07	1.16	16.97	2 2
152955 2	10.83	1.12	17.26	2 2	152963 2	10.59	1.14	16.77	2 2
152956 2	11.65	1.28	17.67	2 2	152963 2	10.76	1.14	16.29	2 2
152956 2	11.72	1.19	18.01	2 2					
152957 2	8.60	1.04	14.73	2 2					
152957 2	8.66	1.06	14.79	2 2					
152958 2	5.56	0.67	4.20	2 2					
152958 2	5.56	0.70	4.18	2 2					
152959 2	7.40	0.84	7.75	2 2					
152959 2	7.50	0.86	7.91	2 2					

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
152964 2	10.62	1.20	16.93	2 2	152972 2	5.40	0.86	5.33	2 2
152964 2	10.86	1.12	16.64	2 2	152972 2	5.36	0.82	5.33	2 2
152965 2	10.73	1.15	16.83	2 2	152973 2	6.52	0.82	6.19	2 2
152965 2	10.80	1.14	16.85	2 2	152973 2	6.52	0.90	6.02	2 2
152966 2	10.59	1.14	17.12	2 2	152974 2	2.69	0.58	0.37	2 2
152966 2	10.52	1.15	17.28	2 2	152974 2	2.62	0.54	0.41	2 2
152967 2	10.45	1.15	16.83	2 2	152976 2	18.67	1.14	16.71	2 2
152967 2	10.28	1.14	16.99	2 2	152976 2	18.32	1.18	16.37	2 2
152968 2	10.63	1.17	16.99	2 2	152977 2	17.79	1.13	16.87	2 2
152968 2	10.76	1.17	17.10	2 2	152977 2	18.07	1.13	16.93	2 2
152969 2	11.42	1.16	16.66	2 2	152978 2	16.08	1.12	16.61	2 2
152969 2	11.56	1.18	16.56	2 2	152978 2	16.11	1.11	16.45	2 2
152970 3	10.15	0.97	10.54	3 2	152979 2	16.15	1.15	17.25	2 2
152970 3	10.91	1.04	12.68	3 2	152979 2	16.25	1.16	17.23	2 2
152971 2	10.05	0.98	10.15	2 2	152980 2	13.54	1.12	16.49	2 2
152971 2	10.15	0.98	10.13	2 2	152980 2	13.61	1.12	16.53	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
152981 2	14.44	1.16	17.39	2 2	152989 2	10.99	1.14	17.48	2 2
152981 2	14.20	1.25	17.19	2 2	152989 2	11.03	1.24	17.19	2 2
152982 2	12.85	1.12	17.25	2 2	152990 2	11.10	1.16	17.92	2 2
152982 2	12.96	1.13	17.17	2 2	152990 2	11.13	1.14	17.96	2 2
152983 2	11.89	1.13	17.41	2 2	152991 2	10.89	1.14	17.74	2 2
152983 2	11.92	1.12	17.29	2 2	152991 2	10.89	1.14	17.92	2 2
152984 2	11.71	1.13	17.05	2 2	152992 2	10.37	1.13	16.89	2 2
152984 2	11.92	1.14	17.19	2 2	152992 2	10.31	1.14	17.17	2 2
152985 2	12.02	1.15	17.29	2 2	152993 2	10.96	1.19	17.88	2 2
152985 2	11.71	1.13	17.42	2 2	152993 2	10.99	1.16	18.09	2 2
152986 2	11.68	1.15	17.56	2 2	152994 2	10.17	1.06	15.93	2 2
152986 2	11.71	1.15	17.60	2 2	152994 2	10.21	1.08	15.91	2 2
152987 2	10.92	1.13	17.11	2 2	152995 2	12.79	1.28	19.04	2 2
152987 2	10.92	1.14	17.07	2 2	152995 2	12.86	1.30	19.00	2 2
152988 2	11.20	1.15	17.09	2 2	152996 2	10.59	0.97	11.72	2 2
152988 2	11.20	1.16	17.25	2 2	152996 2	10.49	0.99	11.62	2 2

WOCE

WOCE ID	SiO4	PO4	NO2+NO3	QF	WOCE ID	SiO4	PO4	NO2+NO3	QF
152997 2	2.10	0.48	1.20	2 2	153008 2	12.12	1.13	17.21	2 2
152997 2	2.17	0.47	1.31	2 2	153008 2	12.54	1.13	17.38	2 2
152998 2	0.87	0.41	0.00	2 2	153009 2	12.27	1.12	17.52	2 2
152998 2	0.93	0.39	0.00	2 2	153009 2	12.17	1.26	17.20	2 2
152999 2	20.77	1.23	16.73	2 2	153010 2	11.42	1.13	17.37	2 2
152999 2	21.26	1.14	17.22	2 2	153010 2	11.48	1.09	17.12	2 2
153000 2	19.17	1.12	17.09	2 2	153011 2	10.86	1.11	17.54	2 2
153000 2	18.71	1.10	16.55	2 2	153011 2	10.77	1.10	17.29	2 2
153001 2	17.86	1.12	17.03	2 2	153012 2	10.67	1.12	16.94	2 2
153001 2	17.34	1.12	16.84	2 2	153012 2	10.63	1.12	17.07	2 2
153002 2	16.13	1.11	16.93	2 2	153013 2	11.51	1.18	18.04	2 2
153002 2	16.23	1.10	16.64	2 2	153013 2	11.61	1.23	18.19	2 2
153003 2	16.00	1.11	16.89	2 2	153014 2	11.63	1.18	18.19	2 2
153003 2	16.00	1.13	17.50	2 2	153014 2	11.83	1.18	17.83	2 2
153004 2	15.77	1.14	17.50	2 2	153015 2	11.57	1.19	18.32	2 2
153004 2	15.93	1.14	17.69	2 2	153015 2	11.73	1.18	18.62	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153016 2	12.31	1.23	18.68	2 2	153024 2	23.30	1.14	17.67	2 2
153016 2	12.34	1.23	18.77	2 2	153024 2	23.37	1.16	18.01	2 2
153017 2	12.56	1.26	19.09	2 2	153025 2	21.24	1.14	17.34	2 2
153017 2	12.50	1.40	19.26	2 2	153025 2	21.57	1.28	16.96	2 2
153018 2	10.35	1.04	15.23	2 2	153026 2	20.26	1.12	17.51	2 2
153018 2	10.48	1.02	15.15	2 2	153026 2	20.55	1.14	17.31	2 2
153019 2	11.49	1.06	14.23	2 2	153027 2	17.65	1.11	16.82	2 2
153019 2	11.55	1.07	13.74	2 2	153027 2	17.38	1.11	17.06	2 2
153020 2	7.08	0.82	8.08	2 2	153028 2	16.73	1.12	17.21	2 2
153020 2	7.28	0.79	8.10	2 2	153028 2	16.54	1.11	17.30	2 2
153021 2	1.01	0.32	0.00	2 2	153029 2	15.72	1.09	17.09	2 2
153021 2	0.94	0.37	0.00	2 2	153029 2	15.91	1.13	17.49	2 2
153022 2	25.27	1.26	17.74	2 2	153030 2	15.88	1.16	17.63	2 2
153022 2	25.56	1.18	18.26	2 2	153030 2	16.04	1.13	17.40	2 2
153023 2	25.26	1.18	18.29	2 2	153031 2	13.65	1.11	17.61	2 2
153023 2	25.39	1.17	17.63	2 2	153031 2	13.69	1.10	17.36	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153032	12.32	1.16	16.99	2 2	153041	11.89	1.21	18.81	2 2
153032	12.48	1.11	17.12	2 2	153041	11.79	1.23	18.69	2 2
153033	12.56	1.12	17.41	2 2	153042	12.11	1.21	18.86	2 2
153033	12.37	1.26	17.32	2 2	153042	12.27	1.36	18.47	2 2
153034	11.84	1.12	17.22	2 2	153043	12.86	1.36	20.57	2 2
153034	12.17	1.10	17.05	2 2	153043	12.99	1.35	20.37	2 2
153035	11.74	1.13	17.14	2 2	153044	9.27	0.96	13.39	2 2
153035	11.91	1.16	17.08	2 2	153044	9.36	1.05	13.46	2 2
153036	11.94	1.14	17.53	2 2	153045	2.05	0.43	0.91	2 2
153036	12.03	1.16	17.93	2 2	153045	2.15	0.57	0.98	2 2
153037	11.44	1.14	17.19	2 2	153046	29.82	1.36	18.86	2 2
153037	11.51	1.15	17.83	2 2	153046	30.77	1.26	18.82	2 2
153038	10.53	1.12	17.03	2 2	153047	22.77	1.17	17.45	2 2
153038	10.59	1.14	17.28	2 2	153047	23.19	1.18	17.17	2 2
153040	11.44	1.18	17.96	2 2	153048	21.10	1.14	17.11	2 2
153040	11.70	1.20	17.63	2 2	153048	21.62	1.16	17.38	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153049 2	20.64	1.17	16.97	2 2	153057 2	12.54	1.14	17.24	2 2
153049 2	20.35	1.16	17.29	2 2	153057 2	12.71	1.16	16.95	2 2
153050 2	20.08	1.28	16.72	2 2	153058 2	11.88	1.24	16.83	2 2
153050 2	20.21	1.14	16.91	2 2	153058 2	11.91	1.16	17.06	2 2
153051 2	17.53	1.10	16.89	2 2	153059 2	11.71	1.14	17.06	2 2
153051 2	17.75	1.13	17.13	2 2	153059 2	11.71	1.16	16.81	2 2
153052 2	16.74	1.14	16.71	2 2	153061 2	11.58	1.18	17.63	2 2
153052 2	17.10	1.14	16.83	2 2	153061 2	11.42	1.17	17.74	2 2
153053 2	15.86	1.13	17.05	2 2	153062 2	11.48	1.15	17.27	2 2
153053 2	16.05	1.15	17.22	2 2	153062 2	11.15	1.16	17.69	2 2
153054 2	16.15	1.14	17.01	2 2	153063 2	10.43	1.15	17.39	2 2
153054 2	15.82	1.15	17.35	2 2	153063 2	10.46	1.15	16.74	2 2
153055 2	14.77	1.16	17.68	2 2	153064 2	10.56	1.15	17.20	2 2
153055 2	14.90	1.16	17.44	2 2	153064 2	10.72	1.16	17.52	2 2
153056 2	13.49	1.14	17.32	2 2	153066 2	12.75	1.33	19.13	2 2
153056 2	13.56	1.12	17.09	2 2	153066 2	12.84	1.30	18.58	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153067 2	12.51	1.36	19.89	2 2	153076 2	22.05	1.18	17.85	2 2
153067 2	12.48	1.36	19.89	2 2	153076 2	22.05	1.17	17.76	2 2
153068 2	7.87	0.97	12.73	2 2	153077 2	20.66	1.17	17.65	2 2
153068 2	7.90	1.01	12.79	2 2	153077 2	20.66	1.19	17.99	2 2
153070 2	30.07	1.25	18.48	2 2	153078 2	18.96	1.16	18.15	2 2
153070 2	30.91	1.32	18.63	2 2	153078 2	18.93	1.21	18.15	2 2
153071 2	30.00	1.23	18.19	2 2	153079 2	17.47	1.18	17.42	2 2
153071 2	30.14	1.27	18.14	2 2	153079 2	17.53	1.24	17.54	2 2
153072 2	25.82	1.19	18.01	2 2	153080 2	17.83	1.20	18.10	2 2
153072 2	25.53	1.18	17.67	2 2	153080 2	17.80	1.18	17.84	2 2
153073 2	24.09	1.17	17.92	2 2	153081 2	16.47	1.18	18.22	2 2
153073 2	24.02	1.18	17.68	2 2	153081 2	16.27	1.18	18.19	2 2
153074 2	23.89	1.20	17.93	2 2	153082 2	15.01	1.17	17.77	2 2
153074 2	23.92	1.28	17.72	2 2	153082 2	15.01	1.19	17.81	2 2
153075 2	23.32	1.18	17.84	2 2	153083 2	13.52	1.15	17.78	2 2
153075 2	23.39	1.18	17.82	2 2	153083 2	13.52	1.23	17.71	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153084 2	11.91	1.13	17.58	2 2	153092 2	1.21	0.43	0.00	2 2
153084 2	11.97	1.14	17.53	2 2	153092 2	1.24	0.39	0.27	2 2
153085 2	11.67	1.14	17.65	2 2	153093 2	44.77	1.47	21.68	2 2
153085 2	11.67	1.14	17.67	2 2	153093 2	45.00	1.51	21.88	2 2
153086 2	11.97	1.17	18.51	2 2	153094 2	39.97	1.38	20.73	2 2
153086 2	11.94	1.21	18.46	2 2	153094 2	40.07	1.43	20.88	2 2
153087 2	11.01	1.17	17.71	2 2	153095 2	36.97	1.35	20.14	2 2
153087 2	11.14	1.16	17.91	2 2	153095 2	37.20	1.35	20.29	2 2
153088 2	11.94	1.30	18.62	2 2	153096 2	35.46	1.35	20.34	2 2
153088 2	12.07	1.21	18.54	2 2	153096 2	35.23	1.31	20.19	2 2
153089 2	11.94	1.18	16.88	2 2	153097 2	32.54	1.31	19.98	2 2
153089 2	11.94	1.25	17.16	2 2	153097 2	31.94	1.34	19.73	2 2
153090 2	11.05	1.23	17.63	2 2	153098 2	29.25	1.31	19.15	2 2
153090 2	10.95	1.23	17.35	2 2	153098 2	29.35	1.31	19.19	2 2
153091 2	8.31	1.09	17.77	2 2	153099 2	26.36	1.24	18.83	2 2
153091 2	8.67	1.10	17.63	2 2	153099 2	28.35	1.33	18.96	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153100 2	24.60	1.21	18.98	2 2	153108 2	12.48	1.19	18.86	2 2
153100 2	24.67	1.20	19.09	2 2	153108 2	12.48	1.18	18.93	2 2
153101 2	21.49	1.21	18.58	2 2	153109 2	12.35	1.29	18.65	2 2
153101 2	21.56	1.28	18.60	2 2	153109 2	12.25	1.19	18.71	2 2
153102 2	19.94	1.26	18.87	2 2	153110 2	12.54	1.27	19.42	2 2
153102 2	19.44	1.20	19.10	2 2	153110 2	12.61	1.32	19.46	2 2
153103 2	17.62	1.26	18.47	2 2	153111 2	13.50	1.39	21.53	2 2
153103 2	17.65	1.29	18.31	2 2	153111 2	13.59	1.44	21.63	2 2
153104 2	16.07	1.22	18.22	2 2	153112 2	14.35	1.52	24.89	2 2
153104 2	16.30	1.26	18.34	2 2	153112 2	15.14	1.51	24.81	2 2
153105 2	14.62	1.24	18.66	2 2	153113 2	5.45	0.74	12.25	2 2
153105 2	14.66	1.14	18.45	2 2	153113 2	5.45	0.82	12.13	2 2
153106 2	12.84	1.19	19.44	2 2	153114 2	2.40	0.38	8.10	2 2
153106 2	12.94	1.18	19.26	2 2	153114 2	2.50	0.34	6.24	2 2
153107 2	12.09	1.25	18.52	2 2	153115 2	1.48	0.18	3.46	2 2
153107 2	12.35	1.16	20.14	2 2	153115 2	1.51	0.18	3.51	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1531172	40.11	1.43	20.77	2 2	1531252	21.04	1.25	18.66	2 2
1531172	40.70	1.40	20.88	2 2	1531252	21.17	1.25	18.45	2 2
1531182	37.88	1.37	19.92	2 2	1531262	20.31	1.27	18.52	2 2
1531182	37.85	1.36	20.21	2 2	1531262	20.61	1.27	18.73	2 2
1531192	34.83	1.40	19.85	2 2	1531272	17.94	1.23	18.31	2 2
1531192	34.96	1.35	19.80	2 2	1531272	18.14	1.28	18.37	2 2
1531202	32.32	1.32	19.44	2 2	1531282	16.27	1.25	18.64	2 2
1531202	32.38	1.28	19.54	2 2	1531282	16.37	1.25	18.31	2 2
1531212	30.63	1.30	19.52	2 2	1531292	14.69	1.22	18.51	2 2
1531212	30.66	1.28	19.44	2 2	1531292	14.69	1.21	18.40	2 2
1531222	29.08	1.29	19.20	2 2	1531302	12.66	1.21	18.15	2 2
1531222	28.45	1.29	18.90	2 2	1531302	12.79	1.21	17.96	2 2
1531232	26.57	1.34	18.64	2 2	1531312	12.59	1.24	18.08	2 2
1531232	26.60	1.30	18.73	2 2	1531312	12.63	1.25	18.35	2 2
1531242	23.15	1.24	18.54	2 2	1531322	12.07	1.23	18.61	2 2
1531242	23.21	1.25	18.68	2 2	1531322	12.14	1.23	18.57	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1531332	13.08	1.34	20.30	2 2	1531412	38.60	1.38	20.63	2 2
1531332	13.12	1.35	20.59	2 2	1531412	39.03	1.39	20.75	2 2
1531342	11.44	1.38	21.76	2 2	1531422	33.32	1.35	19.24	2 2
1531342	11.34	1.38	21.51	2 2	1531422	34.34	1.32	19.52	2 2
1531352	4.14	0.76	10.91	2 2	1531432	31.24	1.39	18.21	2 2
1531352	4.17	0.73	11.05	2 2	1531432	31.40	1.28	18.43	2 2
1531362	1.40	0.17	3.02	2 2	1531442	30.27	1.27	18.64	2 2
1531362	1.43	0.19	2.95	2 2	1531442	30.14	1.35	18.38	2 2
1531372	1.20	0.13	1.83	2 2	1531452	27.85	1.26	18.45	2 2
1531372	1.26	0.13	1.84	2 2	1531452	28.04	1.25	18.53	2 2
1531382	0.81	0.08	0.70	2 2	1531462	25.04	1.24	17.87	2 2
1531382	0.64	0.08	0.70	2 2	1531462	24.95	1.23	17.94	2 2
1531392	43.27	1.45	20.89	2 2	1531472	22.14	1.21	17.84	2 2
1531392	43.05	1.52	20.86	2 2	1531472	22.04	1.22	17.43	2 2
1531402	40.78	1.42	20.80	2 2	1531482	20.23	1.20	17.80	2 2
1531402	40.97	1.52	21.07	2 2	1531482	20.39	1.20	17.85	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153149 2	17.39	1.20	17.25	2 2	153157 2	6.54	0.95	14.92	2 2
153149 2	17.68	1.19	17.39	2 2	153157 2	6.57	0.91	15.08	2 2
153150 2	16.07	1.20	17.62	2 2	153158 2	3.16	0.54	8.54	2 2
153150 2	16.20	1.20	17.76	2 2	153158 2	3.16	0.51	8.58	2 2
153151 2	14.45	1.27	17.12	2 2	153159 2	1.09	0.14	1.53	2 2
153151 2	14.90	1.20	17.27	2 2	153159 2	1.10	0.16	1.55	2 2
153152 2	13.00	1.19	17.37	2 2	153160 2	1.09	0.14	1.52	2 2
153152 2	13.00	1.17	17.48	2 2	153160 2	1.09	0.16	1.50	2 2
153153 2	12.09	1.18	17.61	2 2	153161 2	1.12	0.13	1.54	2 2
153153 2	12.09	1.17	17.66	2 2	153161 2	1.12	0.13	1.52	2 2
153154 2	11.93	1.22	18.05	2 2	153162 2	44.43	1.52	20.94	2 2
153154 2	12.09	1.23	18.02	2 2	153162 2	44.14	1.45	20.42	2 2
153155 2	13.08	1.33	19.81	2 2	153163 2	38.80	1.40	19.69	2 2
153155 2	13.12	1.34	19.64	2 2	153163 2	38.70	1.40	19.71	2 2
153156 2	13.66	1.52	23.46	2 2	153164 2	37.09	1.35	19.61	2 2
153156 2	13.63	1.51	23.54	2 2	153164 2	37.28	1.36	19.65	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153165 2	34.93	1.35	18.84	2 2	153173 2	17.59	1.25	18.05	2 2
153165 2	35.44	1.33	19.36	2 2	153173 2	17.65	1.26	17.85	2 2
153166 2	34.05	1.32	19.14	2 2	153174 2	17.23	1.24	17.42	2 2
153166 2	34.09	1.34	18.93	2 2	153174 2	17.26	1.25	17.48	2 2
153167 2	32.43	1.34	18.50	2 2	153175 2	13.30	1.26	17.08	2 2
153167 2	32.66	1.40	18.74	2 2	153175 2	13.23	1.18	16.92	2 2
153168 2	29.44	1.31	18.34	2 2	153176 2	12.37	1.20	17.10	2 2
153168 2	29.28	1.31	18.24	2 2	153176 2	12.43	1.20	17.49	2 2
153169 2	26.99	1.29	18.02	2 2	153177 2	12.14	1.22	18.01	2 2
153169 2	27.12	1.28	18.23	2 2	153177 2	12.23	1.24	18.19	2 2
153170 2	24.28	1.27	17.73	2 2	153178 2	12.52	1.30	18.73	2 2
153170 2	24.61	1.27	18.25	2 2	153178 2	12.55	1.29	18.95	2 2
153171 2	21.64	1.26	17.53	2 2	153179 2	13.03	1.45	20.69	2 2
153171 2	21.77	1.27	17.44	2 2	153179 2	13.06	1.44	20.81	2 2
153172 2	19.58	1.27	17.66	2 2	153180 2	10.36	1.31	19.54	2 2
153172 2	19.74	1.24	17.94	2 2	153180 2	10.39	1.29	19.58	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153181 2	3.87	0.64	9.45	2 2	153189 2	35.27	1.35	19.02	2 2
153181 2	3.87	0.59	9.63	2 2	153189 2	36.01	1.35	19.60	2 2
153182 2	0.98	0.15	1.53	2 2	153190 2	33.69	1.35	18.86	2 2
153182 2	1.01	0.12	1.59	2 2	153190 2	33.86	1.35	18.91	2 2
153183 2	1.16	0.15	1.27	2 2	153191 2	31.95	1.41	18.36	2 2
153183 2	1.10	0.12	1.24	2 2	153191 2	32.07	1.34	18.31	2 2
153184 2	0.94	0.11	0.93	2 2	153192 2	30.44	1.33	18.22	2 2
153184 2	0.97	0.11	0.91	2 2	153192 2	30.60	1.33	18.39	2 2
153185 2	40.49	1.48	19.96	2 2	153193 2	25.94	1.26	17.85	2 2
153185 2	40.84	1.40	20.24	2 2	153193 2	26.13	1.27	17.94	2 2
153186 2	39.07	1.41	19.42	2 2	153194 2	22.50	1.25	17.24	2 2
153186 2	39.85	1.40	19.92	2 2	153194 2	22.60	1.26	17.45	2 2
153187 2	37.95	1.40	19.37	2 2	153195 2	21.02	1.26	18.02	2 2
153187 2	38.07	1.40	19.46	2 2	153195 2	20.83	1.26	17.67	2 2
153188 2	37.17	1.39	19.82	2 2	153196 2	17.75	1.23	17.84	2 2
153188 2	36.82	1.39	19.47	2 2	153196 2	18.10	1.25	18.04	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1531972	15.95	1.23	17.51	2 2	1532062	0.92	0.14	1.42	2 2
1531972	15.98	1.23	17.23	2 2	1532062	0.92	0.11	1.45	2 2
1531982	13.16	1.21	17.18	2 2	1532072	0.34	0.07	0.00	2 2
1531982	13.25	1.22	17.25	2 2	1532072	0.34	0.07	0.00	2 2
1531992	13.28	1.30	17.13	2 2	1532082	46.34	1.48	21.13	2 2
1531992	13.21	1.25	17.44	2 2	1532082	46.34	1.62	20.77	2 2
1532012	12.15	1.25	18.13	2 2	1532092	42.27	1.46	20.29	2 2
1532012	12.18	1.27	17.96	2 2	1532092	42.43	1.46	20.68	2 2
1532022	12.60	1.33	18.87	2 2	1532102	39.83	1.44	19.66	2 2
1532022	12.63	1.34	19.24	2 2	1532102	39.51	1.44	19.46	2 2
1532032	13.14	1.40	19.95	2 2	1532112	36.89	1.43	19.78	2 2
1532032	13.46	1.40	20.14	2 2	1532112	36.92	1.40	19.80	2 2
1532042	10.60	1.34	20.04	2 2	1532122	32.77	1.36	18.83	2 2
1532042	10.54	1.31	20.06	2 2	1532122	32.58	1.35	19.11	2 2
1532052	2.94	0.46	8.00	2 2	1532132	30.50	1.33	18.40	2 2
1532052	2.91	0.51	7.78	2 2	1532132	30.43	1.35	18.54	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1532142	27.67	1.31	18.15	2 2	1532222	8.34	0.96	13.51	2 2
1532142	27.70	1.32	18.31	2 2	1532222	8.43	0.92	13.47	2 2
1532152	24.11	1.29	17.80	2 2	1532232	12.39	1.34	19.08	2 2
1532152	24.53	1.29	18.17	2 2	1532232	12.52	1.36	19.23	2 2
1532162	22.02	1.28	18.10	2 2	1532242	13.06	1.49	20.39	2 2
1532162	22.41	1.34	18.25	2 2	1532242	13.12	1.42	20.58	2 2
1532172	19.94	1.28	17.69	2 2	1532252	9.99	1.28	18.99	2 2
1532172	20.10	1.28	17.77	2 2	1532252	9.95	1.26	18.77	2 2
1532182	17.08	1.25	17.70	2 2	1532262	6.69	0.99	14.73	2 2
1532182	17.05	1.26	17.58	2 2	1532262	6.69	0.97	14.80	2 2
1532192	14.84	1.23	17.53	2 2	1532272	4.48	0.73	11.11	2 2
1532192	14.97	1.22	17.77	2 2	1532272	4.51	0.74	11.06	2 2
1532202	12.47	1.23	17.35	2 2	1532282	2.37	0.41	6.54	2 2
1532202	12.57	1.24	17.53	2 2	1532282	2.40	0.39	6.50	2 2
1532212	12.31	1.25	17.89	2 2	1532292	1.06	0.14	2.12	2 2
1532212	12.37	1.25	17.74	2 2	1532292	1.12	0.15	2.10	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153230 2	0.32	0.06	0.00	2 2	153238 2	24.21	1.26	17.85	2 2
153230 2	0.42	0.05	0.00	2 2	153238 2	24.08	1.26	18.22	2 2
153231 2	43.77	1.53	20.49	2 2	153239 2	22.48	1.30	17.95	2 2
153231 2	44.19	1.52	21.01	2 2	153239 2	22.68	1.30	17.44	2 2
153232 2	42.95	1.43	20.26	2 2	153240 2	19.70	1.24	18.32	2 2
153232 2	43.95	1.51	20.28	2 2	153240 2	19.82	1.26	18.32	2 2
153233 2	42.54	1.49	20.66	2 2	153241 2	16.94	1.30	18.05	2 2
153233 2	41.96	1.42	20.34	2 2	153241 2	17.04	1.28	17.71	2 2
153234 2	38.29	1.37	20.22	2 2	153242 2	15.71	1.19	17.97	2 2
153234 2	38.65	1.39	20.41	2 2	153242 2	15.80	1.27	18.20	2 2
153235 2	34.08	1.31	18.87	2 2	153243 2	13.40	1.18	17.32	2 2
153235 2	34.38	1.32	19.58	2 2	153243 2	13.38	1.21	17.77	2 2
153236 2	29.43	1.28	18.38	2 2	153244 2	12.53	1.26	17.53	2 2
153236 2	29.63	1.28	18.36	2 2	153244 2	12.59	1.20	17.67	2 2
153237 2	26.78	1.28	18.36	2 2	153245 2	12.67	1.21	17.45	2 2
153237 2	26.69	1.33	18.24	2 2	153245 2	12.45	1.21	17.89	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1532462	12.79	1.27	18.34	2 2	1532542	43.07	1.45	20.47	2 2
1532462	12.56	1.26	18.36	2 2	1532542	43.72	1.40	20.37	2 2
1532472	12.15	1.28	18.29	2 2	1532552	40.60	1.38	20.04	2 2
1532472	12.30	1.25	18.72	2 2	1532552	40.54	1.45	20.18	2 2
1532482	13.07	1.45	22.51	2 2	1532562	36.45	1.33	19.45	2 2
1532482	13.16	1.45	22.70	2 2	1532562	36.57	1.35	19.57	2 2
1532492	4.87	0.69	10.67	2 2	1532572	33.53	1.34	19.10	2 2
1532492	4.91	0.69	10.83	2 2	1532572	33.73	1.34	19.20	2 2
1532502	3.05	0.41	6.73	2 2	1532582	30.59	1.28	17.97	2 2
1532502	3.17	0.42	6.58	2 2	1532582	30.86	1.27	18.32	2 2
1532512	1.69	0.16	2.03	2 2	1532592	28.25	1.28	17.89	2 2
1532512	1.60	0.15	2.11	2 2	1532592	28.50	1.27	18.40	2 2
1532522	1.59	0.15	1.92	2 2	1532602	25.35	1.26	17.85	2 2
1532522	1.64	0.13	1.95	2 2	1532602	25.84	1.24	17.97	2 2
1532532	0.71	0.05	0.00	2 2	1532612	23.65	1.26	18.54	2 2
1532532	0.75	0.06	0.00	2 2	1532612	23.50	1.25	18.22	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153262	22.03	1.25	18.37	2 2	153270	12.34	1.34	20.18	2 2
153262	22.03	1.26	17.87	2 2	153270	12.22	1.34	20.65	2 2
153263	18.80	1.27	17.57	2 2	153271	10.51	1.26	19.57	2 2
153263	19.22	1.24	18.23	2 2	153271	10.49	1.29	19.08	2 2
153264	16.28	1.20	17.89	2 2	153272	8.77	1.08	16.80	2 2
153264	16.34	1.20	17.54	2 2	153272	8.82	1.07	17.08	2 2
153265	13.82	1.19	17.50	2 2	153273	3.36	0.51	7.54	2 2
153265	13.98	1.20	17.77	2 2	153273	3.50	0.44	7.71	2 2
153266	12.87	1.19	17.26	2 2	153274	2.48	0.35	5.40	2 2
153266	12.75	1.20	17.75	2 2	153274	2.52	0.35	5.43	2 2
153267	12.18	1.22	17.57	2 2	153275	1.29	0.15	1.62	2 2
153267	12.19	1.22	17.57	2 2	153275	1.29	0.13	1.64	2 2
153268	12.72	1.27	18.77	2 2	153276	1.25	0.14	1.38	2 2
153268	12.81	1.25	18.49	2 2	153276	1.21	0.13	1.42	2 2
153269	12.67	1.30	19.31	2 2	153277	43.06	1.45	19.54	2 2
153269	12.74	1.29	18.87	2 2	153277	43.78	1.50	19.96	2 2

WOCE

WOCE ID	SiO4	PO4	NO2+NO3	QF	WOCE ID	SiO4	PO4	NO2+NO3	QF
153278 2	41.45	1.42	19.58	2 2	153286 2	19.89	1.23	17.21	2 2
153278 2	41.33	1.42	19.42	2 2	153286 2	20.06	1.22	17.05	2 2
153279 2	37.20	1.41	18.54	2 2	153287 2	17.15	1.21	16.82	2 2
153279 2	36.84	1.38	18.56	2 2	153287 2	17.32	1.24	16.76	2 2
153280 2	30.75	1.31	17.85	2 2	153288 2	15.89	1.21	17.21	2 2
153280 2	30.93	1.28	18.33	2 2	153288 2	15.89	1.22	17.38	2 2
153281 2	29.18	1.28	17.91	2 2	153289 2	12.99	1.20	16.95	2 2
153281 2	29.93	1.28	18.15	2 2	153289 2	13.01	1.17	16.56	2 2
153282 2	28.40	1.28	17.68	2 2	153290 2	12.39	1.23	16.82	2 2
153282 2	28.55	1.28	17.70	2 2	153290 2	12.56	1.20	16.60	2 2
153283 2	26.60	1.26	17.28	2 2	153291 2	11.81	1.21	16.86	2 2
153283 2	27.29	1.26	17.19	2 2	153291 2	11.87	1.18	16.55	2 2
153284 2	24.14	1.26	18.03	2 2	153292 2	11.85	1.29	17.07	2 2
153284 2	23.98	1.26	17.77	2 2	153292 2	11.95	1.24	16.95	2 2
153285 2	20.52	1.20	16.70	2 2	153293 2	12.26	1.23	17.79	2 2
153285 2	20.65	1.20	17.21	2 2	153293 2	12.45	1.22	17.46	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153294 2	13.02	1.30	19.08	2 2	153302 2	36.33	1.33	20.18	2 2
153294 2	12.83	1.31	19.43	2 2	153302 2	36.95	1.34	20.22	2 2
153295 2	16.00	1.61	23.98	2 2	153303 2	33.02	1.38	19.89	2 2
153295 2	15.88	1.74	24.79	2 2	153303 2	33.12	1.28	19.71	2 2
153296 2	6.09	0.90	13.82	2 2	153304 2	30.19	1.24	19.54	2 2
153296 2	6.10	0.85	13.76	2 2	153304 2	30.29	1.28	18.90	2 2
153297 2	4.42	0.68	10.91	2 2	153305 2	27.86	1.25	18.78	2 2
153297 2	4.47	0.67	10.61	2 2	153305 2	27.98	1.25	18.61	2 2
153298 2	1.29	0.14	2.25	2 2	153306 2	25.01	1.23	18.43	2 2
153298 2	2.73	0.17	2.16	4 2	153306 2	25.07	1.23	18.47	2 2
153299 2	0.35	0.08	0.30	2 2	153307 2	21.06	1.19	18.16	2 2
153299 2	0.37	0.08	0.26	2 2	153307 2	20.64	1.19	18.28	2 2
153300 2	41.41	1.61	20.37	2 4	153308 2	17.73	1.27	17.52	2 2
153300 2	41.38	1.35	20.49	2 2	153308 2	17.76	1.17	17.58	2 2
153301 2	30.66	1.24	18.56	2 2	153309 2	16.34	1.15	17.76	2 2
153301 2	31.41	1.20	18.46	2 2	153309 2	16.37	1.15	17.80	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153310 2	13.47	1.12	17.72	2 2	153318 2	4.11	0.56	9.76	2 2
153310 2	13.54	1.13	17.84	2 2	153318 2	4.11	0.61	9.84	2 2
153311 2	12.73	1.12	17.84	2 2	153319 2	3.31	0.51	9.35	2 2
153311 2	12.76	1.12	17.86	2 2	153319 2	3.37	0.50	9.35	2 2
153312 2	11.61	1.15	18.29	2 2	153320 2	1.21	0.14	2.32	2 2
153312 2	11.64	1.15	18.30	2 2	153320 2	1.15	0.16	2.24	2 2
153313 2	11.76	1.17	18.24	2 2	153321 2	0.90	0.11	1.05	2 2
153313 2	11.92	1.17	18.22	2 2	153321 2	0.96	0.11	1.03	2 2
153314 2	11.54	1.16	18.03	2 2	153322 2	0.58	0.07	0.32	2 2
153314 2	11.57	1.17	18.18	2 2	153322 2	0.58	0.08	0.34	2 2
153315 2	13.30	1.37	21.41	2 2	153323 2	41.51	1.48	20.63	2 2
153315 2	13.23	1.34	21.53	2 2	153323 2	41.70	1.35	21.00	2 2
153316 2	13.41	1.55	23.55	2 3	153324 2	36.35	1.43	20.03	2 3
153316 2	13.48	1.41	23.04	2 2	153324 2	36.38	1.31	20.27	2 2
153317 2	7.94	1.04	17.15	2 2	153325 2	34.17	1.29	19.66	2 2
153317 2	8.00	1.03	17.38	2 2	153325 2	34.20	1.30	19.43	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153326 2	32.35	1.27	19.27	2 2	153334 2	14.27	1.15	17.95	2 2
153326 2	32.35	1.28	19.28	2 2	153334 2	14.27	1.20	17.77	2 3
153327 2	28.24	1.21	18.85	2 2	153335 2	13.47	1.15	17.97	2 2
153327 2	27.95	1.21	18.93	2 2	153335 2	13.21	1.13	18.05	2 2
153328 2	27.78	1.22	19.12	2 2	153336 2	7.46	0.83	14.25	2 2
153328 2	27.94	1.21	19.16	2 2	153336 2	7.46	0.87	14.33	2 2
153329 2	26.13	1.20	19.13	2 2	153339 2	11.74	1.18	18.68	2 2
153329 2	26.16	1.22	18.87	2 2	153339 2	11.84	1.16	18.80	2 2
153330 2	21.11	1.16	17.97	2 2	153340 2	12.41	1.24	19.62	2 2
153330 2	21.24	1.16	18.07	2 2	153340 2	12.44	1.29	19.37	2 2
153331 2	18.83	1.15	17.96	2 2	153341 2	14.38	1.46	23.56	2 2
153331 2	18.80	1.21	17.76	2 3	153341 2	14.41	1.42	23.66	2 2
153332 2	17.02	1.25	18.22	2 2	153342 2	11.63	1.40	21.45	2 2
153332 2	17.12	1.14	17.97	2 2	153342 2	11.72	1.28	21.53	2 2
153333 2	15.23	1.15	17.75	2 2	153343 2	8.17	1.04	16.17	2 2
153333 2	15.26	1.14	18.03	2 2	153343 2	8.11	1.00	15.98	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153344 2	3.34	0.45	7.65	2 2	153352 2	23.28	1.19	17.90	2 2
153344 2	3.34	0.50	7.59	2 2	153352 2	23.35	1.19	17.94	2 2
153345 2	0.67	0.13	0.88	2 2	153353 2	18.61	1.15	17.39	2 2
153345 2	0.67	0.10	0.94	2 2	153353 2	18.64	1.16	17.55	2 2
153346 2	37.60	1.42	20.15	2 2	153354 2	16.82	1.13	17.71	2 2
153346 2	37.57	1.32	20.50	2 2	153354 2	17.37	1.16	17.63	2 2
153347 2	36.65	1.30	20.42	2 2	153355 2	16.79	1.15	18.36	2 2
153347 2	37.17	1.31	20.27	2 2	153355 2	16.73	1.16	18.30	2 2
153348 2	33.34	1.27	19.60	2 2	153356 2	15.32	1.15	17.93	2 2
153348 2	33.47	1.27	19.23	2 2	153356 2	15.39	1.15	17.97	2 2
153349 2	29.62	1.23	18.67	2 2	153357 2	14.40	1.15	17.83	2 2
153349 2	29.74	1.24	18.61	2 2	153357 2	14.40	1.15	17.77	2 2
153350 2	26.02	1.30	18.52	2 2	153358 2	12.93	1.14	18.00	2 2
153350 2	26.57	1.19	18.81	2 2	153358 2	13.06	1.27	17.80	2 2
153351 2	25.21	1.20	18.07	2 2	153359 2	12.96	1.22	18.00	2 2
153351 2	24.89	1.19	18.44	2 2	153359 2	13.15	1.15	18.00	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153360 2	11.98	1.14	17.65	2 2	153368 2	0.50	0.12	0.00	2 2
153360 2	12.04	1.16	17.59	2 2	153368 2	0.53	0.12	0.00	2 2
153361 2	11.88	1.19	17.91	2 2	153369 2	36.94	1.41	19.80	2 2
153361 2	11.79	1.16	17.73	2 2	153369 2	37.98	1.30	20.08	2 3
153362 2	11.94	1.19	18.48	2 2	153370 2	34.01	1.25	19.79	2 2
153362 2	11.91	1.19	18.38	2 2	153370 2	34.27	1.27	19.98	2 2
153363 2	11.69	1.17	18.75	2 2	153371 2	31.31	1.27	19.50	2 2
153363 2	11.72	1.18	18.89	2 2	153371 2	31.64	1.23	19.46	2 2
153364 2	12.09	1.21	19.21	2 2	153372 2	28.63	1.24	18.95	2 2
153364 2	12.16	1.24	19.46	2 2	153372 2	28.83	1.24	19.21	2 2
153365 2	12.47	1.28	19.81	2 2	153373 2	26.38	1.22	18.19	2 2
153365 2	12.57	1.28	20.14	2 2	153373 2	26.48	1.24	18.29	2 2
153366 2	12.24	1.33	21.36	2 2	153374 2	24.23	1.27	18.39	2 2
153366 2	12.34	1.50	21.24	2 2	153374 2	24.22	1.21	18.83	2 2
153367 2	3.16	0.42	7.53	2 2	153375 2	21.00	1.19	18.62	2 2
153367 2	3.06	0.51	7.45	2 2	153375 2	21.12	1.18	18.34	2 2

WOCE

ID	WOCE SiO4 QF	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153376 2	20.38	1.19	18.28	2 2	153384 4	11.33	1.14	18.32	4 4
153376 2	20.54	1.19	18.44	2 2	153384 4	11.33	1.14	18.14	4 4
153377 2	18.80	1.19	18.41	2 2	153385 2	6.43	0.67	10.61	2 2
153377 2	18.90	1.20	18.53	2 2	153385 2	6.43	0.65	10.73	2 2
153378 2	16.14	1.18	18.47	2 2	153386 2	12.15	1.18	18.92	2 2
153378 2	16.17	1.18	18.35	2 2	153386 2	12.06	1.23	19.27	2 2
153379 2	13.93	1.14	17.79	2 2	153387 2	15.79	1.57	25.27	2 2
153379 2	13.96	1.15	18.33	2 2	153387 2	15.89	1.55	25.51	2 2
153380 2	13.03	1.15	17.94	2 2	153388 2	3.82	0.55	9.41	2 2
153380 2	13.19	1.14	18.08	2 2	153388 2	3.95	0.50	9.51	2 2
153381 2	12.10	1.13	18.26	2 2	153389 2	1.36	0.12	2.20	2 2
153381 2	12.36	1.13	18.12	2 2	153389 2	1.42	0.10	2.32	2 2
153382 2	11.81	1.15	18.38	2 2	153390 2	0.85	0.08	1.19	2 2
153382 2	11.75	1.20	18.15	2 2	153390 2	0.88	0.11	1.17	2 2
153383 2	11.71	1.13	18.22	2 2	153391 2	0.84	0.11	1.07	2 2
153383 2	11.74	1.16	18.66	2 2	153391 2	3.21	0.10	1.03	4 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153392	36.71	1.33	20.41	2 2	153400	17.07	1.15	17.78	2 2
153392	40.27	1.37	20.23	4 2	153400	17.04	1.17	18.04	2 2
153393	34.45	1.29	19.55	2 2	153401	16.23	1.17	18.59	2 2
153393	34.45	1.32	20.21	2 2	153401	16.49	1.18	18.33	2 2
153394	32.20	1.27	19.31	2 2	153402	15.08	1.19	18.73	2 2
153394	32.30	1.28	19.52	2 2	153402	15.21	1.20	18.64	2 2
153395	27.88	1.25	19.02	2 2	153403	13.99	1.18	18.20	2 2
153395	28.20	1.26	18.90	2 2	153403	14.06	1.19	18.70	2 2
153396	27.59	1.24	18.54	2 2	153404	13.00	1.16	18.30	2 2
153396	27.59	1.24	18.70	2 2	153404	13.07	1.14	18.00	2 2
153397	25.32	1.21	18.50	2 2	153405	12.07	1.16	18.23	2 2
153397	25.38	1.23	18.69	2 2	153405	12.11	1.16	18.39	2 2
153398	21.96	1.19	18.18	2 2	153406	12.04	1.23	18.96	2 2
153398	22.09	1.23	17.85	2 2	153406	12.23	1.20	18.90	2 2
153399	18.64	1.17	18.34	2 2	153407	12.22	1.21	18.75	2 2
153399	18.87	1.18	18.12	2 2	153407	12.19	1.22	19.14	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1534082	12.19	1.23	19.17	2 2	1534162	29.97	1.24	19.41	2 2
1534082	12.29	1.21	18.95	2 2	1534162	30.10	1.26	19.27	2 2
1534092	12.60	1.34	21.42	2 2	1534172	27.84	1.24	18.81	2 2
1534092	12.76	1.34	21.16	2 2	1534172	28.32	1.25	18.79	2 2
1534102	11.74	1.37	22.21	2 2	1534182	25.44	1.19	18.74	2 2
1534102	11.83	1.35	22.17	2 2	1534182	25.57	1.18	18.54	2 2
1534112	4.81	0.65	11.44	2 2	1534192	24.25	1.20	18.78	2 2
1534112	4.84	0.69	11.50	2 2	1534192	23.99	1.20	18.86	2 2
1534122	2.65	0.40	6.65	2 2	1534202	22.28	1.22	18.65	2 2
1534122	2.72	0.40	6.86	2 2	1534202	22.38	1.21	18.50	2 2
1534132	1.39	0.15	2.36	2 2	1534212	20.42	1.21	18.97	2 2
1534132	1.39	0.15	2.42	2 2	1534212	20.51	1.22	19.01	2 2
1534142	0.94	0.10	1.07	2 2	1534222	18.42	1.19	18.82	2 2
1534142	0.97	0.11	1.03	2 2	1534222	18.42	1.22	18.64	2 2
1534152	33.02	1.29	19.33	2 2	1534242	14.96	1.16	18.45	2 2
1534152	33.02	1.26	19.67	2 2	1534242	15.09	1.16	17.84	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153425 2	12.98	1.13	17.67	2 2	153433 2	12.48	1.39	22.91	2 2
153425 2	13.04	1.13	17.62	2 2	153433 2	12.48	1.36	22.73	2 2
153426 2	12.75	1.15	18.42	2 2	153434 2	6.21	0.86	14.07	2 2
153426 2	12.85	1.14	18.23	2 2	153434 2	6.24	0.83	14.37	2 2
153427 2	11.32	1.12	17.93	2 2	153435 2	2.12	0.30	5.31	2 2
153427 2	11.44	1.14	17.39	2 2	153435 2	2.15	0.27	5.41	2 2
153428 2	11.86	1.16	17.96	2 2	153436 2	0.95	0.09	1.29	2 2
153428 2	11.92	1.15	17.92	2 2	153436 2	0.92	0.11	1.29	2 2
153429 2	12.08	1.18	18.81	2 2	153437 2	0.92	0.09	1.23	2 2
153429 2	12.17	1.16	18.61	2 2	153437 2	0.91	0.09	1.21	2 2
153430 2	11.53	1.18	18.87	2 2	153438 2	28.09	1.26	18.35	2 2
153430 2	11.69	1.18	18.37	2 2	153438 2	28.19	1.17	18.57	2 2
153431 2	11.56	1.24	18.60	2 2	153439 2	25.18	1.20	18.08	2 2
153431 2	11.75	1.19	18.40	2 2	153439 2	25.34	1.20	17.86	2 2
153432 2	13.41	1.29	20.70	2 2	153440 2	23.12	1.16	18.08	2 2
153432 2	13.34	1.32	20.50	2 2	153440 2	23.38	1.17	18.23	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153441	22.80	1.25	18.15	2 2	153449	12.69	1.15	17.65	2 2
153441	22.96	1.16	17.51	2 2	153449	12.79	1.17	17.59	2 2
153442	22.38	1.17	17.69	2 2	153451	12.02	1.14	17.97	2 2
153442	22.25	1.16	17.85	2 2	153451	11.96	1.14	18.28	2 2
153443	20.93	1.16	18.10	2 2	153452	11.83	1.17	18.79	2 2
153443	21.03	1.15	18.26	2 2	153452	11.89	1.18	18.38	2 2
153444	20.54	1.16	17.40	2 2	153453	12.24	1.23	18.61	2 2
153444	20.45	1.15	17.70	2 2	153453	12.18	1.23	19.23	2 2
153445	15.80	1.12	17.32	2 2	153454	12.59	1.29	19.70	2 2
153445	15.77	1.13	17.38	2 2	153454	12.59	1.28	19.48	2 2
153446	14.65	1.14	17.67	2 2	153455	13.19	1.38	22.05	2 2
153446	14.78	1.12	17.55	2 2	153455	13.22	1.39	22.15	2 2
153447	14.61	1.13	17.70	2 2	153456	13.25	1.48	22.71	2 2
153447	14.74	1.20	17.40	2 2	153456	13.41	1.42	22.49	2 2
153448	13.65	1.13	17.87	2 2	153457	6.63	0.93	14.56	2 2
153448	13.68	1.14	17.63	2 2	153457	6.66	0.89	14.85	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1534582	3.90	0.57	8.97	2 2	1534662	18.33	1.18	17.50	2 2
1534582	3.99	0.57	9.00	2 2	1534662	18.46	1.18	17.64	2 2
1534592	1.36	0.20	2.85	2 2	1534672	18.30	1.18	17.75	2 2
1534592	1.36	0.18	2.93	2 2	1534672	17.95	1.17	17.70	2 2
1534602	0.70	0.11	1.15	2 2	1534682	15.99	1.18	17.29	2 2
1534602	0.70	0.12	1.19	2 2	1534682	15.99	1.17	17.73	2 2
1534612	30.68	1.27	18.86	2 2	1534692	15.07	1.19	17.43	2 2
1534612	30.84	1.29	19.16	2 2	1534692	15.16	1.18	17.59	2 2
1534622	27.61	1.30	18.47	2 2	1534702	13.68		17.81	2 5
1534622	28.00	1.24	18.17	2 2	1534702	13.64	1.10	17.52	2 3
1534632	23.53	1.19	18.05	2 2	1534712	12.02	1.10	17.53	2 3
1534632	23.53	1.19	17.79	2 2	1534712	12.04	1.12	17.24	2 3
1534642	22.44	1.19	17.97	2 2	1534722	12.25		17.98	2 5
1534642	22.56	1.19	17.71	2 2	1534722	12.00	1.16	17.83	2 3
1534652	20.80	1.16	17.39	2 2	1534732	11.64	1.13	18.45	2 3
1534652	20.89	1.22	17.43	2 2	1534732	11.84	1.20	18.22	2 3

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153474 2	11.96	1.16	18.85	2 3	153483 2	1.23		2.01	2 5
153474 2	11.93	1.18	19.14	2 3	153483 2	1.00		2.02	2 5
153475 2	12.66	1.25	19.69	2 3	153484 2	27.74		18.38	2 5
153475 2	12.73	1.24	19.53	2 3	153484 2	27.90		18.96	2 5
153477 2	12.88	1.39	21.71	2 3	153485 2	27.79		19.05	2 5
153477 2	13.10	1.39	21.65	2 3	153485 2	27.89		19.21	2 5
153478 2	11.52	1.28	21.03	2 3	153486 2	24.19		17.97	2 5
153478 2	11.58	1.35	21.40	2 3	153486 2	24.39		18.22	2 5
153479 2	8.14		17.46	2 5	153487 2	22.97	1.28	17.74	2 3
153479 2	8.40		17.19	2 5	153487 2	22.78	1.22	17.48	2 3
153480 2	4.24		9.86	2 5	153488 2	20.84	1.21	17.79	2 3
153480 2	4.24		9.98	2 5	153488 2	20.78	1.18	17.48	2 3
153481 2	2.06		5.16	2 5	153489 2	18.30	1.20	18.05	2 3
153481 2	2.16		5.14	2 5	153489 2	19.47		18.47	2 5
153482 2	2.29		5.59	2 5	153490 2	16.95	1.19	17.73	2 3
153482 2	2.65		5.67	2 5	153490 2	17.17	1.17	17.63	2 3

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153491 2	17.23	1.30	18.11	2 3	153499 2	12.57	1.28	19.64	2 3
153491 2	17.42	1.18	18.31	2 3	153499 2	12.61	1.29	19.34	2 3
153492 2	15.10		18.68	2 5	153500 2	12.18	1.27	20.13	2 3
153492 2	15.53		18.62	2 5	153500 2	12.28	1.28	19.91	2 3
153493 2	13.62		18.58	2 5	153501 2	11.06	1.23	19.33	2 3
153493 2	13.52		18.52	2 5	153501 2	11.03	1.33	19.97	2 3
153494 2	13.06		18.26	2 5	153502 2	9.61		19.09	2 5
153494 2	12.79	1.25	17.65	2 3	153502 2	9.64		19.13	2 5
153495 2	12.16	1.47	17.58	2 3	153503 2	4.00	0.65	10.02	2 3
153495 2	12.06	1.32	17.54	2 3	153503 2	4.17		10.39	2 5
153496 2	12.43		18.61	2 5	153504 2	1.57	0.52	3.53	2 3
153496 2	11.99	1.27	18.00	2 3	153504 2	1.61	0.65	3.55	2 3
153497 2	11.82	1.26	18.72	2 3	153505 2	0.96	0.44	1.70	2 3
153497 2	12.13		19.08	2 5	153505 2	1.00	0.15	1.71	2 3
153498 2	12.04	1.29	19.02	2 3	153506 2	0.92		1.15	2 5
153498 2	12.42		18.84	2 5	153506 2	1.35		1.18	2 5

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153507 2	33.26	1.54	19.77	2 2	153515 2	21.20	1.34	19.56	2 2
153507 2	33.54	1.29	20.01	2 2	153515 2	21.39	1.20	19.35	2 2
153508 2	28.45	1.23	18.49	2 2	153516 2	15.86	1.13	18.19	2 2
153508 2	28.36	1.25	18.84	2 2	153516 2	15.85	1.17	18.24	2 2
153509 2	24.11	1.18	17.85	2 2	153517 2	13.21	1.10	18.10	2 2
153509 2	24.40	1.18	17.92	2 2	153517 2	13.56	1.13	18.36	2 2
153510 2	23.74	1.15	17.95	2 2	153518 2	12.58	1.09	18.40	2 2
153510 2	23.80	1.17	18.13	2 2	153518 2	12.64	1.17	18.56	2 2
153511 2	21.68	1.14	18.15	2 2	153519 2	12.24	1.13	18.17	2 2
153511 2	21.86	1.15	18.29	2 2	153519 2	12.24	1.12	18.54	2 2
153512 2	19.74	1.13	18.21	2 2	153520 2	12.29	1.12	18.70	2 2
153512 2	19.77	1.16	18.02	2 2	153520 2	12.26	1.13	18.55	2 2
153513 2	21.36	1.16	18.07	2 2	153521 2	12.18	1.14	19.19	2 2
153513 2	21.48	1.16	18.16	2 2	153521 2	12.21	1.15	19.43	2 2
153514 2	20.59	1.18	18.74	2 2	153522 2	12.42	1.16	19.97	2 2
153514 2	20.98	1.18	18.59	2 2	153522 2	12.43	1.17	20.03	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1535232	12.65	1.42	20.94	2 2	1535332	26.03	1.32	18.55	2 2
1535232	12.74	1.28	20.99	2 2	1535332	26.25	1.30	18.43	2 2
1535242	13.00	1.35	21.25	2 2	1535342	25.04	1.19	18.15	2 2
1535242	13.09	1.36	21.48	2 2	1535342	25.21	1.17	18.00	2 2
1535252	11.74	1.25	20.62	2 2	1535352	23.34	1.18	18.26	2 2
1535252	11.88	1.25	20.32	2 2	1535352	23.47	1.19	18.34	2 2
1535262	2.45	0.35	5.79	2 2	1535362	23.36	1.17	18.71	2 2
1535262	2.58	0.25	5.92	2 2	1535362	23.17	1.16	18.51	2 2
1535272	1.69	0.20	3.12	2 2	1535372	19.48	1.15	17.49	2 2
1535272	1.73	0.19	3.17	2 2	1535372	19.49	1.14	17.90	2 2
1535302	31.19	1.23	19.44	2 2	1535382	18.30	1.16	18.17	2 2
1535302	31.69	1.39	18.97	2 2	1535382	18.66	1.18	18.14	2 2
1535312	30.89	1.22	19.66	2 2	1535392	17.13	1.13	18.32	2 2
1535312	30.96	1.24	19.72	2 2	1535392	17.25	1.15	18.41	2 2
1535322	27.79	1.19	18.81	2 2	1535402	15.84	1.13	17.82	2 2
1535322	27.85	1.20	18.65	2 2	1535402	15.85	1.15	17.91	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153541	13.02	1.23	17.49	2 2	153549	3.89	0.56	8.79	2 2
153541	13.11	1.11	17.36	2 2	153549	3.89	0.63	9.00	2 2
153542	12.36	1.11	17.55	2 2	153550	1.91	0.23	4.06	2 2
153542	12.49	1.14	17.70	2 2	153550	1.94	0.28	4.09	2 2
153543	12.08	1.13	18.36	2 2	153551	1.63	0.20	3.19	2 2
153543	12.06	1.13	18.22	2 2	153551	1.61	0.20	3.18	2 2
153544	6.93	0.63	10.89	4 4	153552	1.53	0.20	3.10	2 2
153544	6.95	0.69	10.74	4 4	153552	1.56	0.19	3.03	2 2
153545	12.61	1.30	19.61	2 2	153553	29.83	1.31	18.79	2 2
153545	12.64	1.23	19.56	2 2	153553	30.12	1.25	18.90	2 2
153546	12.60	1.28	20.33	2 2	153554	27.91	1.22	18.73	2 2
153546	12.73	1.29	20.22	2 2	153554	28.10	1.22	18.39	2 2
153547	12.49	1.31	20.85	2 2	153555	25.86	1.23	17.97	2 2
153547	12.56	1.29	20.99	2 2	153555	25.64	1.21	17.77	2 2
153548	11.28	1.22	19.99	2 2	153556	22.53	1.19	17.61	2 2
153548	11.31	1.23	19.81	2 2	153556	22.66	1.18	17.87	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153557 2	21.25	1.22	17.97	2 2	153565 2	11.89	1.17	17.93	2 2
153557 2	21.32	1.16	17.84	2 2	153565 2	11.92	1.18	17.78	2 2
153558 2	18.98	1.16	17.84	2 2	153566 2	11.80	1.19	18.71	2 2
153558 2	19.20	1.16	17.87	2 2	153566 2	11.92	1.19	18.40	2 2
153559 2	18.98	1.18	17.60	2 2	153567 2	11.99	1.21	18.99	2 2
153559 2	19.49	1.18	17.49	2 2	153567 2	11.96	1.22	19.10	2 2
153560 2	15.36	1.15	17.53	2 2	153568 2	12.31	1.28	19.75	2 2
153560 2	15.36	1.14	17.62	2 2	153568 2	12.37	1.27	19.80	2 2
153561 2	13.13	1.13	17.03	2 2	153569 2	12.48	1.40	21.18	2 2
153561 2	13.45	1.20	17.24	2 2	153569 2	12.64	1.34	21.51	2 2
153562 2	12.14	1.12	17.42	2 2	153570 2	10.46	1.24	19.02	2 2
153562 2	12.14	1.13	17.53	2 2	153570 2	10.62	1.22	19.56	2 2
153563 2	12.01	1.15	17.86	2 2	153571 2	8.51	1.05	16.39	2 2
153563 2	12.14	1.14	17.88	2 2	153571 2	8.45	1.06	16.33	2 2
153564 2	12.01	1.19	17.89	2 2	153572 2	2.50	0.39	5.94	2 2
153564 2	12.02	1.16	17.63	2 2	153572 2	2.50	0.35	5.94	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1535732	1.57	0.24	3.47	2 2	1535812	19.13	1.19	17.58	2 2
1535732	1.61	0.21	3.35	2 2	1535812	19.26	1.16	17.44	2 2
1535742	1.58	0.20	3.32	2 2	1535822	17.91	1.16	17.40	2 2
1535742	1.58	0.20	3.31	2 2	1535822	17.95	1.16	17.65	2 2
1535752	1.51	0.19	3.27	2 2	1535832	15.93	1.16	17.53	2 2
1535752	1.55	0.21	3.32	2 2	1535832	16.00	1.17	17.27	2 2
1535762	30.54	1.30	19.05	2 2	1535842	14.43	1.16	17.51	2 2
1535762	30.92	1.27	19.35	2 2	1535842	14.62	1.16	17.45	2 2
1535772	26.93	1.23	18.20	2 2	1535852	13.13	1.15	17.25	2 2
1535772	26.64	1.28	17.91	2 2	1535852	13.13	1.20	17.36	2 2
1535782	25.04	1.21	18.24	2 2	1535862	12.68	1.17	17.59	2 2
1535782	25.20	1.22	18.16	2 2	1535862	12.68	1.17	17.86	2 2
1535792	25.46	1.24	18.39	2 2	1535872	12.04	1.16	18.09	2 2
1535792	25.14	1.23	18.16	2 2	1535872	11.95	1.19	17.98	2 2
1535802	23.83	1.22	17.64	2 2	1535882	11.95	1.19	18.40	2 2
1535802	23.35	1.23	17.96	2 2	1535882	11.98	1.19	18.48	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153589 2	11.95	1.21	18.52	2 2	153597 2	1.30	0.19	2.76	2 2
153589 2	11.98	1.22	18.40	2 2	153597 2	1.36	0.19	2.72	2 2
153590 2	12.21	1.25	19.22	2 2	153598 2	1.37	0.19	2.84	2 2
153590 2	12.27	1.29	18.93	2 2	153598 2	1.40	0.20	2.84	2 2
153591 2	12.85	1.36	20.85	2 2	153599 2	31.98	1.30	18.93	2 2
153591 2	13.01	1.36	20.97	2 2	153599 2	32.21	1.41	19.01	2 2
153592 2	12.88	1.38	21.02	2 2	153600 2	31.76	1.29	19.29	2 2
153592 2	12.95	1.38	20.94	2 2	153600 2	31.89	1.30	19.09	2 2
153593 2	11.48	1.36	19.51	2 2	153601 2	29.24	1.26	18.59	2 2
153593 2	11.61	1.31	19.87	2 2	153601 2	29.11	1.33	18.37	2 2
153594 2	7.68	0.98	15.44	2 2	153602 2	27.77	1.25	18.67	2 2
153594 2	7.78	0.99	15.42	2 2	153602 2	28.00	1.26	18.85	2 2
153595 2	2.41	0.37	5.81	2 2	153604 2	23.40	1.22	17.89	2 2
153595 2	2.47	0.35	5.96	2 2	153604 2	23.62	1.24	18.26	2 2
153596 2	1.42	0.19	2.82	2 2	153605 2	20.46	1.21	18.23	2 2
153596 2	1.42	0.19	2.70	2 2	153605 2	20.52	1.23	18.17	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153606 2	17.94	1.20	17.74	2 2	153615 2	12.53	1.38	20.38	2 2
153606 2	18.00	1.17	17.64	2 2	153615 2	12.75	1.37	20.87	2 2
153608 2	14.84	1.20	17.41	2 2	153616 2	12.08	1.36	20.47	2 2
153608 2	15.13	1.18	17.83	2 2	153616 2	12.21	1.35	20.71	2 2
153609 2	12.70	1.16	17.20	2 2	153617 2	6.37	0.91	13.98	2 2
153609 2	12.73	1.15	17.54	2 2	153617 2	6.52	0.89	14.63	2 2
153610 2	12.48	1.17	17.80	2 2	153618 2	4.81	0.76	10.28	2 2
153610 2	12.45	1.15	17.39	2 2	153618 2	4.77	0.74	10.10	2 2
153611 2	12.04	1.23	17.47	2 2	153619 2	3.63	0.61	9.43	2 2
153611 2	12.07	1.16	17.77	2 2	153619 2	3.66	0.67	9.13	2 2
153612 2	11.66	1.18	17.49	2 2	153620 2	1.24	0.19	3.01	2 2
153612 2	11.75	1.19	17.88	2 2	153620 2	1.30	0.21	2.88	2 2
153613 2	12.07	1.24	18.81	2 2	153621 2	1.18	0.19	2.71	2 2
153613 2	12.08	1.25	18.79	2 2	153621 2	1.21	0.20	2.68	2 2
153614 2	12.49	1.30	19.71	2 2	153622 2	31.29	1.29	18.94	2 2
153614 2	12.52	1.31	19.73	2 2	153622 2	30.80	1.30	18.59	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153623 2	30.23	1.27	19.23	2 2	153632 2	12.23	1.11	17.75	2 2
153623 2	30.43	1.27	18.64	2 2	153632 2	12.36	1.12	18.00	2 2
153624 2	24.19	1.19	18.19	2 2	153633 2	11.84	1.12	17.97	2 2
153624 2	24.49	1.18	18.03	2 2	153633 2	12.13	1.12	17.48	2 2
153625 2	22.72	1.18	17.92	2 2	153634 2	11.65	1.14	17.87	2 2
153625 2	22.82	1.16	17.41	2 2	153634 2	11.81	1.12	17.71	2 2
153626 2	21.77	1.17	18.15	2 2	153635 2	11.71	1.18	18.11	2 2
153626 2	22.06	1.16	17.64	2 2	153635 2	11.65	1.16	18.52	2 2
153627 2	19.07	1.16	17.89	2 2	153636 2	6.15	0.65	10.51	2 2
153627 2	19.16	1.13	17.67	2 2	153636 2	6.18	0.64	10.29	2 2
153628 2	16.60	1.15	17.31	2 2	153637 2	12.38	1.26	19.89	2 2
153628 2	16.69	1.13	17.55	2 2	153637 2	12.42	1.26	19.68	2 2
153629 2	14.53	1.13	17.75	2 2	153638 2	12.16	1.27	20.66	2 2
153629 2	14.75	1.12	17.17	2 2	153638 2	12.29	1.28	20.12	2 2
153631 2	12.33	1.14	17.40	2 2	153639 2	11.15	1.27	20.65	2 2
153631 2	12.39	1.12	17.32	2 2	153639 2	10.93	1.28	20.62	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153640 2	5.24	0.73	12.22	2 2	153648 2	24.57	1.22	17.60	2 2
153640 2	5.08	0.77	12.52	2 2	153648 2	23.96	1.21	18.09	2 2
153641 2	2.65	0.42	6.60	2 2	153649 2	23.28	1.22	18.22	2 2
153641 2	2.71	0.43	6.55	2 2	153649 2	23.53	1.21	17.79	2 2
153642 2	1.37	0.19	2.86	2 2	153650 2	19.68	1.16	17.49	2 2
153642 2	1.40	0.20	2.93	2 2	153650 2	19.97	1.18	17.77	2 2
153643 2	1.11	0.18	2.45	2 2	153651 2	17.29	1.16	17.51	2 2
153643 2	1.11	0.18	2.51	2 2	153651 2	17.68	1.19	17.25	2 2
153644 2	1.11	0.18	2.46	2 2	153652 2	16.42	1.18	17.87	2 2
153644 2	1.14	0.17	2.46	2 2	153652 2	16.58	1.19	17.34	2 2
153645 2	31.71	1.28	18.85	2 2	153653 2	16.10	1.18	17.77	2 2
153645 2	31.48	1.28	19.34	2 2	153653 2	16.03	1.26	17.95	2 2
153646 2	31.44	1.31	19.45	2 2	153654 2	14.13	1.17	17.64	2 2
153646 2	32.06	1.30	19.19	2 2	153654 2	14.23	1.18	17.32	2 2
153647 2	25.77	1.21	18.39	2 2	153655 2	12.33	1.10	17.48	2 2
153647 2	25.29	1.23	17.94	2 2	153655 2	12.52	1.14	16.92	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153656 2	12.01	1.12	17.20	2 2	153664 2	5.70	0.83	12.85	2 2
153656 2	12.04	1.13	17.17	2 2	153664 2	5.70	0.81	12.66	2 2
153657 2	11.88	1.14	17.76	2 2	153665 2	1.66	0.25	3.55	2 2
153657 2	11.68	1.14	17.77	2 2	153665 2	1.73	0.24	3.61	2 2
153658 2	11.59	1.16	17.98	2 2	153666 2	1.66	0.25	3.54	2 2
153658 2	11.88	1.15	17.63	2 2	153666 2	1.66	0.25	3.50	2 2
153659 2	11.68	1.20	18.30	2 2	153667 2	1.63	0.23	3.49	2 2
153659 2	11.75	1.23	17.77	2 2	153667 2	1.63	0.23	3.53	2 2
153660 2	11.75	1.24	18.46	2 2	153668 2	28.09	1.27	18.07	2 2
153660 2	11.78	1.24	18.80	2 2	153668 2	28.25	1.26	18.39	2 2
153661 2	12.10	1.36	18.92	2 2	153669 2	27.73	1.26	18.53	2 2
153661 2	12.19	1.25	19.32	2 2	153669 2	27.50	1.26	18.35	2 2
153662 2	11.10	1.29	20.53	2 2	153670 2	23.22	1.21	17.20	2 2
153662 2	11.23	1.29	20.49	2 2	153670 2	23.25	1.26	17.62	2 2
153663 2	8.78	1.14	17.34	2 2	153671 2	22.31	1.19	17.35	2 2
153663 2	8.53	1.13	17.71	2 2	153671 2	22.63	1.19	17.34	2 2

WOCE ID	SiO4	PO4	NO2+NO3	QF	WOCE ID	SiO4	PO4	NO2+NO3	QF
153672 2	20.62	1.18	17.19	2 2	153681 2	7.90	0.89	12.89	2 2
153672 2	20.85	1.18	17.51	2 2	153681 2	7.93	0.89	12.79	2 2
153673 2	18.39	1.21	17.42	2 2	153682 2	11.67	1.24	17.79	2 2
153673 2	18.42	1.21	17.48	2 2	153682 2	11.77	1.22	17.64	2 2
153674 2	16.96	1.21	17.19	2 2	153683 2	11.64	1.24	18.24	2 2
153674 2	17.22	1.20	17.42	2 2	153683 2	11.70	1.24	18.47	2 2
153675 2	15.24	1.20	17.20	2 2	153684 2	12.15	1.28	19.32	2 2
153675 2	15.54	1.20	17.01	2 2	153684 2	12.18	1.30	19.33	2 2
153677 2	13.27	1.18	16.84	2 2	153685 2	12.37	1.32	19.75	2 2
153677 2	13.17	1.19	17.24	2 2	153685 2	12.33	1.33	19.75	2 2
153678 2	12.55	1.17	17.21	2 2	153686 2	13.23	1.48	22.36	2 2
153678 2	12.78	1.19	17.19	2 2	153686 2	13.27	1.49	22.31	2 2
153679 2	12.10	1.18	17.34	2 2	153687 2	7.10	1.01	14.79	2 2
153679 2	12.20	1.21	17.51	2 2	153687 2	7.10	1.02	14.87	2 2
153680 2	11.87	1.22	17.56	2 2	153688 2	1.55	0.27	3.57	2 2
153680 2	11.87	1.20	17.69	2 2	153688 2	1.59	0.26	3.64	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153689 2	1.42	0.25	3.21	2 2	153698 2	14.66	1.17	16.85	2 2
153689 2	1.42	0.25	3.23	2 2	153698 2	14.75	1.17	16.72	2 2
153691 2	19.27	1.16	16.65	2 2	153699 2	13.36	1.14	16.88	2 2
153691 2	19.50	1.17	16.35	2 2	153699 2	13.52	1.15	16.89	2 2
153692 2	20.69	1.20	16.59	2 2	153700 2	12.97	1.16	16.80	2 2
153692 2	20.88	1.19	16.63	2 2	153700 2	13.04	1.17	17.01	2 2
153693 2	20.56	1.20	16.93	2 2	153701 2	12.16	1.16	16.68	2 2
153693 2	20.78	1.20	17.09	2 2	153701 2	12.23	1.16	16.56	2 2
153694 2	20.81	1.19	16.69	2 2	153702 2	11.67	1.17	16.87	2 2
153694 2	20.87	1.17	16.96	2 2	153702 2	11.57	1.17	17.08	2 2
153695 2	19.35	1.18	17.18	2 2	153703 2	11.51	1.17	16.78	2 2
153695 2	19.35	1.18	17.01	2 2	153703 2	11.51	1.17	16.75	2 2
153696 2	16.89	1.18	17.13	2 2	153704 2	11.08	1.16	17.10	2 2
153696 2	16.92	1.23	17.12	2 2	153704 2	11.18	1.18	17.33	2 2
153697 2	16.63	1.19	16.83	2 2	153705 2	11.37	1.19	17.55	2 2
153697 2	16.66	1.21	16.84	2 2	153705 2	11.47	1.19	17.59	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
15370602	11.50	1.22	17.72	2 2	15371402	11.44	1.18	16.52	2 2
15370602	11.43	1.22	17.47	2 2	15371402	11.34	1.23	16.46	2 2
15370702	11.53	1.22	17.69	2 2	15371502	10.95	1.18	16.38	2 2
15370702	11.43	1.22	17.60	2 2	15371502	10.83	1.18	16.44	2 2
15370802	11.78	1.25	18.59	2 2	15371602	10.82	1.15	16.12	2 2
15370802	11.82	1.24	18.43	2 2	15371602	10.88	1.16	16.31	2 2
15370902	12.62	1.34	19.97	2 2	15371704	8.73	1.09	13.88	4 4
15370902	12.68	1.33	19.91	2 2	15371704	8.80	1.08	13.75	4 4
15371002	11.67	1.39	21.31	2 2	15371802	10.59	1.20	16.30	2 2
15371002	11.83	1.39	21.44	2 2	15371802	10.68	1.18	16.30	2 2
15371102	6.60	0.95	13.05	2 2	15371902	11.00	1.19	16.62	2 2
15371102	6.67	0.96	12.87	2 2	15371902	11.03	1.19	16.87	2 2
15371202	2.86	0.44	4.86	2 2	15372002	10.84	1.20	16.98	2 2
15371202	2.82	0.44	4.89	2 2	15372002	10.64	1.19	16.96	2 2
15371302	2.88	0.43	4.86	2 2	15372102	10.80	1.21	16.56	2 2
15371302	2.89	0.43	4.87	2 2	15372102	10.90	1.21	16.69	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153722	10.89	1.18	16.61	2 2	153730	9.28	1.13	15.08	2 2
153722	10.73	1.21	16.27	2 2	153730	9.18	1.12	15.04	2 2
153723	10.63	1.20	16.95	2 2	153732	2.13	0.69	4.21	2 2
153723	10.63	1.19	16.85	2 2	153732	2.20	0.67	4.31	2 2
153724	10.66	1.22	17.31	2 2	153733	1.72	0.64	3.40	2 2
153724	10.69	1.22	16.87	2 2	153733	1.75	0.62	3.44	2 2
153725	10.30	1.19	16.66	2 2	153734	10.45	1.19	16.63	2 2
153725	10.36	1.19	16.85	2 2	153734	10.55	1.19	16.90	2 2
153726	10.71	1.23	17.53	2 2	153735	10.38	1.20	16.99	2 2
153726	10.94	1.24	17.45	2 2	153735	10.52	1.18	17.09	2 2
153727	10.74	1.23	16.90	2 2	153736	10.25	1.20	16.61	2 2
153727	10.77	1.25	17.47	2 2	153736	10.29	1.19	16.78	2 2
153728	11.47	1.25	17.56	2 2	153737	10.12	1.19	16.57	2 2
153728	11.54	1.26	17.90	2 2	153737	10.12	1.20	16.59	2 2
153729	10.25	1.18	16.42	2 2	153738	10.09	1.19	16.74	2 2
153729	10.38	1.18	16.50	2 2	153738	10.09	1.20	16.68	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153739 2	10.07	1.17	16.78	2 2	153747 2	10.41	1.17	16.64	2 2
153739 2	10.26	1.16	17.10	2 2	153747 2	10.42	1.17	16.68	2 2
153740 2	9.97	1.14	15.83	2 2	153748 2	10.32	1.16	16.81	2 2
153740 2	10.03	1.15	15.94	2 2	153748 2	10.47	1.15	16.92	2 2
153741 2	9.71	1.10	14.50	2 2	153749 2	9.96	1.16	16.54	2 2
153741 2	9.81	1.10	14.63	2 2	153749 2	10.25	1.15	16.81	2 2
153742 2	10.25	1.06	13.47	2 2	153750 2	10.21	1.15	15.38	2 2
153742 2	10.35	1.06	13.58	2 2	153750 2	10.24	1.16	15.34	2 2
153743 2	9.23	0.99	9.82	2 2	153751 2	10.35	1.03	10.59	2 2
153743 2	9.42	0.98	10.01	2 2	153751 2	10.47	1.04	10.72	2 2
153744 2	5.80	0.89	5.22	2 2	153752 2	9.03	1.02	9.74	2 2
153744 2	5.70	0.81	5.45	2 2	153752 2	8.97	1.01	9.63	2 2
153745 2	0.86	0.41	0.00	2 2	153753 2	0.82	0.44	0.00	2 2
153745 2	0.89	0.47	0.00	3 3	153753 2	0.86	0.49	0.00	2 2
153746 2	10.36	1.17	16.64	2 2	153754 2	10.35	1.16	15.84	2 2
153746 2	10.51	1.16	16.55	2 2	153754 2	10.48	1.12	16.18	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153755 2	10.51	1.14	16.46	2 2	153764 2	1.20	0.54	0.74	2 2
153755 2	10.54	1.13	16.35	2 2	153764 2	1.20	0.54	0.61	2 2
153756 2	10.28	1.13	15.23	2 2	153765 2	17.73	1.09	16.31	2 2
153756 2	10.25	1.12	15.46	2 2	153765 2	17.54	1.14	16.03	2 2
153757 2	11.24	1.21	15.62	2 2	153766 2	17.15	1.08	15.95	2 2
153757 2	11.21	1.20	15.57	2 2	153766 2	17.05	1.09	16.44	2 2
153758 2	10.21	1.02	11.22	2 2	153767 2	16.67	1.10	16.23	2 2
153758 2	10.25	1.02	11.16	2 2	153767 2	16.73	1.10	16.60	2 2
153759 2	9.19	1.06	8.63	2 2	153768 2	6.65	0.77	10.19	2 2
153759 2	9.32	1.02	8.78	2 2	153768 2	6.75	0.77	10.17	2 2
153760 2	3.36	0.63	3.46	2 2	153769 2	15.29	1.12	16.67	2 2
153760 2	3.46	0.66	3.44	2 2	153769 2	15.52	1.12	16.99	2 2
153761 2	9.62	1.00	10.57	2 2	153770 2	14.53	1.09	16.66	2 2
153761 2	9.68	0.97	10.66	2 2	153770 2	14.62	1.10	16.27	2 2
153763 2	4.69	0.87	4.13	2 2	153771 2	14.82	1.15	16.79	2 2
153763 2	4.66	0.84	4.19	2 2	153771 2	14.79	1.11	17.03	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153772	13.42	1.15	16.41	2 2	153780	11.01	1.21	17.08	2 2
153772	13.59	1.15	16.80	2 2	153780	11.04	1.10	16.89	2 2
153773	13.11	1.13	16.37	2 2	153781	11.08	1.18	16.88	2 2
153773	13.39	1.20	16.92	2 2	153781	11.22	1.14	17.21	2 2
153774	12.16	1.12	16.61	2 2	153782	10.19	1.16	16.61	2 2
153774	12.22	1.14	16.78	2 2	153782	10.36	1.14	16.95	2 2
153775	11.84	1.19	16.83	2 2	153783	10.56	1.14	16.59	2 2
153775	11.97	1.12	16.53	2 2	153783	10.59	1.16	16.79	2 2
153776	11.43	1.12	16.60	2 2	153784	12.65	1.36	19.48	2 2
153776	11.52	1.14	17.01	2 2	153784	12.71	1.33	18.99	2 2
153777	11.28	1.15	16.61	2 2	153785	11.45	1.28	18.12	2 2
153777	11.38	1.11	16.61	2 2	153785	11.61	1.29	18.43	2 2
153778	11.24	1.14	16.98	2 2	153786	6.34	0.89	11.46	2 2
153778	11.20	1.13	16.94	2 2	153786	6.27	0.88	11.39	2 2
153779	11.09	1.15	16.86	2 2	153787	2.49	0.50	4.30	2 2
153779	11.19	1.15	16.86	2 2	153787	2.56	0.47	4.32	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153788	17.48	1.13	15.61	2 2	153796	12.87	1.17	16.91	2 2
153788	17.68	1.13	15.85	2 2	153796	12.97	1.15	16.99	2 2
153789	18.87	1.13	16.39	2 2	153797	12.54	1.21	16.45	2 2
153789	19.28	1.23	16.36	2 2	153797	12.63	1.14	16.84	2 2
153790	19.09	1.10	16.35	2 2	153798	11.38	1.14	16.58	2 2
153790	18.86	1.20	16.15	2 2	153798	11.41	1.15	16.35	2 2
153791	17.43	1.15	16.20	2 2	153799	11.23	1.13	16.74	2 2
153791	17.49	1.16	15.95	2 2	153799	11.30	1.13	16.96	2 2
153792	15.48	1.11	16.08	2 2	153800	11.05	1.14	16.62	2 2
153792	15.55	1.20	16.36	2 2	153800	11.32	1.18	16.80	2 2
153793	15.07	1.14	16.43	2 2	153801	11.08	1.14	17.19	2 2
153793	15.13	1.14	16.33	2 2	153801	11.17	1.16	17.19	2 2
153794	14.92	1.13	16.79	2 2	153802	10.73	1.23	16.59	2 2
153794	14.99	1.14	16.63	2 2	153802	10.86	1.17	16.61	2 2
153795	14.74	1.13	16.29	2 2	153803	11.69	1.19	17.58	2 2
153795	14.94	1.14	16.62	2 2	153803	11.70	1.20	17.64	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153804 2	11.89	1.23	17.84	2 2	153812 2	10.39	1.06	16.38	2 2
153804 2	11.85	1.23	18.15	2 2	153812 2	10.49	1.06	16.50	2 2
153805 2	12.63	1.44	19.70	2 2	153813 2	10.17	1.05	16.05	2 2
153805 2	12.66	1.26	19.16	2 2	153813 2	10.24	1.07	15.81	2 2
153806 2	13.06	1.35	20.22	2 2	153814 2	10.19	1.04	16.08	2 2
153806 2	13.16	1.32	20.47	2 2	153814 2	10.20	1.09	16.07	2 2
153807 2	14.13	1.52	22.76	2 2	153815 2	9.94	1.04	16.45	2 2
153807 2	14.26	1.53	22.16	2 2	153815 2	10.01	1.04	16.40	2 2
153808 2	10.18	1.13	15.02	2 2	153816 2	9.90	1.04	16.35	2 2
153808 2	10.24	1.15	15.15	2 2	153816 2	9.96	1.05	16.35	2 2
153809 2	2.97	0.56	4.68	2 2	153817 2	10.06	1.05	16.46	2 2
153809 2	3.08	0.52	4.70	2 2	153817 2	10.13	1.04	16.10	2 2
153810 2	2.70	0.42	5.44	2 2	153818 2	10.12	1.05	16.35	2 2
153810 2	2.76	0.43	5.38	2 2	153818 2	10.12	1.05	16.24	2 2
153811 2	10.54	1.13	15.93	2 2	153820 2	10.23	1.04	16.51	2 2
153811 2	10.46	1.06	16.10	2 2	153820 2	9.99	1.11	16.21	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153821 2	9.87	1.02	16.74	2 2	153830 2	0.93	0.47	4.74	2 3
153821 2	9.94	1.02	16.68	2 2	153830 2	1.00	0.56	4.68	2 3
153822 2	9.87	1.04	16.72	2 2	153831 2	17.29	1.04	15.76	2 2
153822 2	9.93	1.06	16.73	2 2	153831 2	17.36	1.02	15.68	2 2
153823 2	10.13	1.08	16.49	2 2	153832 2	17.17	1.04	16.17	2 2
153823 2	10.13	1.07	16.55	2 2	153832 2	17.35	1.04	16.03	2 2
153824 2	10.22	1.08	16.92	2 2	153833 2	16.38	1.03	16.38	2 2
153824 2	10.19	1.09	16.60	2 2	153833 2	16.47	1.04	16.32	2 2
153825 2	10.14	1.07	17.09	2 2	153834 2	14.20	1.03	15.94	2 2
153825 2	10.18	1.07	17.09	2 2	153834 2	14.36	1.03	16.07	2 2
153826 2	9.93	1.06	16.57	2 2	153835 2	14.04	1.03	16.14	2 2
153826 2	9.99	1.06	16.46	2 2	153835 2	14.05	1.03	16.09	2 2
153827 2	10.40	1.08	16.64	2 2	153836 2	13.30	1.10	16.09	2 2
153827 2	10.53	1.08	16.83	2 2	153836 2	13.33	1.04	16.36	2 2
153829 2	9.03	1.00	14.24	2 2	153837 2	13.01	1.07	16.61	2 2
153829 2	9.07	1.07	13.99	2 2	153837 2	13.01	1.06	16.83	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153838 2	12.00	1.06	16.96	2 2	153846 2	10.49	1.06	16.55	2 2
153838 2	12.21	1.04	16.80	2 2	153846 2	10.53	1.04	16.86	2 2
153839 2	10.55	1.04	16.16	2 2	153847 2	10.17	1.05	16.68	2 2
153839 2	10.65	1.04	16.08	2 2	153847 2	10.11	1.05	16.42	2 2
153840 2	10.40	1.07	16.31	2 2	153848 2	11.12	1.11	17.61	2 2
153840 2	10.47	1.04	16.41	2 2	153848 2	11.20	1.10	17.46	2 2
153841 2	10.39	1.05	16.72	2 2	153849 2	10.47	1.10	17.23	2 2
153841 2	10.25	1.03	16.34	2 2	153849 2	10.43	1.08	17.17	2 2
153842 2	10.31	1.04	16.22	2 2	153850 2	11.89	1.14	18.07	2 2
153842 2	10.11	1.04	16.18	2 2	153850 2	11.83	1.15	18.41	2 2
153843 2	10.20	1.04	16.54	2 2	153851 2	12.16	1.18	18.71	2 2
153843 2	10.34	1.04	16.45	2 2	153851 2	12.19	1.19	18.50	2 2
153844 2	10.00	1.10	16.15	2 2	153852 2	10.18	1.03	13.52	2 2
153844 2	10.13	1.05	16.42	2 2	153852 2	10.31	0.98	13.83	2 2
153845 2	10.57	1.07	17.14	2 2	153853 2	2.11	0.51	2.76	2 2
153845 2	10.71	1.08	16.97	2 2	153853 2	2.14	0.47	2.84	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153854 2	14.89	1.04	15.40	2 2	153862 2	10.67	1.07	16.68	2 2
153854 2	15.02	1.00	15.39	2 2	153862 2	10.84	1.04	16.56	2 2
153855 2	16.28	1.04	16.03	2 2	153863 2	10.66	1.06	16.41	2 2
153855 2	16.08	1.03	15.65	2 2	153863 2	10.77	1.04	16.34	2 2
153856 2	15.72	1.05	16.09	2 2	153864 2	10.79	1.06	16.85	2 2
153856 2	16.10	1.05	15.99	2 2	153864 2	10.86	1.07	16.66	2 2
153857 2	14.78	1.05	16.51	2 2	153865 2	10.71	1.07	17.06	2 2
153857 2	14.62	1.07	16.40	2 2	153865 2	10.84	1.09	16.73	2 2
153858 2	14.09	1.05	16.01	2 2	153866 2	10.87	1.09	16.53	2 2
153858 2	14.13	1.06	16.21	2 2	153866 2	10.94	1.08	16.66	2 2
153859 3	14.42	1.07	16.54	3 3	153867 2	10.93	1.09	16.97	2 2
153859 3	14.59	1.07	16.69	3 3	153867 2	11.00	1.07	17.14	2 2
153860 2	13.09	1.12	16.22	2 2	153868 2	11.18	1.15	17.03	2 2
153860 2	13.22	1.05	16.47	2 2	153868 2	11.20	1.09	17.22	2 2
153861 2	11.33	1.06	16.70	2 2	153869 2	10.89	1.12	17.68	2 2
153861 2	11.61	1.06	16.63	2 2	153869 2	11.06	1.12	17.45	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153870 2	11.08	1.12	17.20	2 2	153878 2	24.88	1.17	17.03	2 2
153870 2	11.09	1.13	18.00	2 2	153878 2	24.86	1.18	17.66	2 2
153871 2	11.69	1.15	17.74	2 2	153879 2	22.90	1.14	16.89	2 2
153871 2	11.69	1.16	17.84	2 2	153879 2	23.16	1.14	17.12	2 2
153872 2	11.92	1.18	18.53	2 2	153880 2	17.21	1.08	16.59	2 2
153872 2	11.92	1.17	18.28	2 2	153880 2	17.49	1.08	16.50	2 2
153873 2	12.32	1.27	19.00	2 2	153881 2	14.44	1.07	16.30	2 2
153873 2	12.32	1.26	19.39	2 2	153881 2	14.54	1.08	15.95	2 2
153874 2	11.80	1.26	18.51	2 2	153882 2	13.06	1.06	15.82	2 2
153874 2	11.93	1.26	18.51	2 2	153882 2	13.06	1.07	15.85	2 2
153875 2	8.30	1.02	14.50	2 2	153883 2	13.60	1.06	16.32	2 2
153875 2	8.41	0.99	14.22	2 2	153883 2	13.63	1.08	16.36	2 2
153876 2	1.99	0.54	2.81	2 2	153884 2	12.58	1.16	16.53	2 2
153876 2	2.02	0.50	2.87	2 2	153884 2	12.74	1.07	16.45	2 2
153877 2	15.60	1.04	15.96	2 2	153885 2	11.61	1.08	16.20	2 2
153877 2	15.81	1.07	15.67	2 2	153885 2	11.75	1.08	16.43	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153886 2	10.55	1.09	16.52	2 2	153894 2	11.97	1.20	17.70	2 2
153886 2	10.51	1.09	16.19	2 2	153894 2	11.98	1.19	17.85	2 2
153887 2	10.57	1.07	16.20	2 2	153895 2	12.34	1.28	19.13	2 2
153887 2	10.63	1.08	16.39	2 2	153895 2	12.48	1.28	18.73	2 2
153888 2	10.52	1.10	16.62	2 2	153896 2	12.85	1.35	20.17	2 2
153888 2	10.63	1.09	16.76	2 2	153896 2	12.98	1.32	19.84	2 2
153889 2	10.59	1.09	16.35	2 2	153897 2	13.48	1.47	22.22	2 2
153889 2	10.61	1.09	16.48	2 2	153897 2	13.92	1.47	22.19	2 2
153890 2	11.12	1.11	16.90	2 2	153899 2	3.05	0.49	6.08	2 2
153890 2	10.84	1.11	17.09	2 2	153899 2	3.12	0.43	6.27	2 2
153891 2	11.31	1.15	16.87	2 2	153900 2	17.89	1.13	15.57	2 2
153891 2	11.32	1.14	17.08	2 2	153900 2	17.92	1.10	15.76	2 2
153892 2	11.35	1.21	16.77	2 2	153901 2	20.48	1.20	16.36	2 2
153892 2	11.62	1.15	17.27	2 2	153901 2	20.71	1.15	16.03	2 2
153893 2	11.58	1.18	18.03	2 2	153902 2	22.78	1.15	16.39	2 2
153893 2	11.65	1.17	17.82	2 2	153902 2	22.84	1.16	16.73	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153903 2	22.57	1.17	17.03	2 2	153911 2	12.32	1.24	16.49	2 2
153903 2	22.36	1.19	16.88	2 2	153911 2	12.52	1.12	16.81	2 2
153904 2	21.87	1.18	16.53	2 2	153912 2	11.49	1.16	16.63	2 2
153904 2	22.24	1.17	16.79	2 2	153912 2	11.57	1.14	16.88	2 2
153905 2	19.10	1.17	16.86	2 2	153913 2	11.72	1.13	16.75	2 2
153905 2	19.51	1.16	16.75	2 2	153913 2	11.59	1.16	16.55	2 2
153906 2	15.46	1.13	16.06	2 2	153914 2	11.44	1.16	17.11	2 2
153906 2	15.62	1.11	15.67	2 2	153914 2	11.82	1.14	16.96	2 2
153907 2	15.58	1.14	16.56	2 2	153915 2	11.23	1.18	16.70	2 2
153907 2	15.48	1.14	16.03	2 2	153915 2	11.13	1.18	16.95	2 2
153908 2	14.62	1.15	16.96	2 2	153916 2	11.42	1.15	17.38	2 2
153908 2	14.58	1.14	16.36	2 2	153916 2	11.32	1.19	17.14	2 2
153909 2	14.08	1.19	16.35	2 2	153917 2	11.42	1.16	17.87	2 2
153909 2	14.11	1.13	16.67	2 2	153917 2	11.60	1.27	17.82	2 2
153910 2	12.81	1.14	16.84	2 2	153918 2	11.93	1.19	17.89	2 2
153910 2	12.84	1.15	16.79	2 2	153918 2	11.99	1.18	18.15	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153919 2	12.56	1.26	19.66	2 2	153927 5				5 5
153919 2	12.63	1.26	19.40	2 2	153927 2	22.02	1.19	16.99	2 2
153920 2	10.62	1.16	16.33	2 2	153927 2	22.29	1.16	16.82	2 2
153920 2	10.65	1.14	15.93	2 2	153928 2	20.07	1.18	16.57	2 2
153921 2	3.55	0.53	6.25	2 2	153928 2	20.48	1.16	16.63	2 2
153921 2	3.55	0.57	6.34	2 2	153929 2	16.71	1.16	16.17	2 2
153922 2	2.25	0.54	3.58	2 2	153929 2	16.84	1.14	15.84	2 2
153922 2	2.25	0.53	3.75	2 2	153930 2	16.53	1.15	16.65	2 2
153923 2	23.44	1.16	16.96	2 2	153930 2	16.70	1.14	16.35	2 2
153923 2	23.65	1.20	16.62	2 2	153931 2	14.79	1.14	16.67	2 2
153924 2	23.13	1.17	17.24	2 2	153931 2	14.89	1.15	16.17	2 2
153924 2	23.36	1.18	17.33	2 2	153932 2	12.00	1.13	15.94	2 2
153925 2	23.53	1.17	16.93	2 2	153932 2	12.07	1.12	16.22	2 2
153925 2	23.03	1.25	16.80	2 2	153933 2	11.27	1.13	16.77	2 2
153926 2	22.71	1.18	17.13	2 2	153933 2	11.57	1.13	16.58	2 2
153926 2	22.74	1.19	17.09	2 2	153934 2	11.60	1.12	17.38	2 2
					153934 2	11.66	1.19	16.89	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153935 2	11.56	1.14	17.66	2 2	153943 2	8.49	1.07	16.88	2 2
153935 2	11.70	1.11	17.03	2 2	153943 2	8.69	1.06	16.87	2 2
153936 2	11.89	1.16	17.98	2 2	153944 2	2.58	0.42	5.70	2 3
153936 2	12.00	1.15	17.65	2 2	153944 2	2.55	0.38	5.70	2 2
153937 2	8.85	0.93	13.99	2 2	153945 2	2.38	0.34	5.08	2 2
153937 2	8.61	0.92	14.24	2 2	153945 2	2.41	0.35	5.17	2 2
153938 2	11.89	1.23	18.40	2 2	153946 2	18.60	1.18	15.89	2 2
153938 2	12.26	1.19	18.19	2 2	153946 2	18.67	1.12	15.66	2 2
153939 2	12.22	1.23	19.18	2 2	153947 2	20.33	1.13	16.45	2 2
153939 2	12.43	1.22	18.71	2 2	153947 2	20.46	1.21	16.61	2 2
153940 2	12.16	1.23	18.42	2 2	153948 2	25.05	1.21	17.59	2 2
153940 2	12.29	1.21	18.37	2 2	153948 2	25.49	1.21	17.99	2 2
153941 2	12.59	1.29	19.12	2 2	153949 3	22.46	1.16	17.02	3 3
153941 2	12.69	1.27	19.12	2 2	153949 2	23.65	1.27	18.81	2 2
153942 2	12.65	1.43	20.73	2 2	153950 2	21.27	1.14	17.24	2 2
153942 2	12.75	1.37	20.84	2 2	153950 2	21.34	1.15	16.91	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
15395112	18.01	1.14	16.58	22	15395944	11.91	1.16	18.01	44
15395122	18.34	1.11	16.73	22	15395944	11.94	1.15	17.80	44
15395222	17.32	1.13	17.06	22	15396044	6.69	0.71	10.99	44
15395222	16.92	1.13	16.87	22	15396044	6.90	0.70	11.30	44
15395322	15.66	1.13	17.23	22	15396122	8.42	0.88	13.71	22
15395322	15.93	1.11	16.85	22	15396122	8.62	0.90	13.58	22
15395422	13.75	1.12	16.85	22	15396222	12.23	1.30	18.89	22
15395422	13.78	1.10	17.12	22	15396222	12.43	1.23	18.56	22
15395522	11.65	1.12	17.22	22	15396322	12.50	1.31	20.00	22
15395522	11.78	1.10	16.75	22	15396322	12.70	1.29	19.55	22
15395622	11.68	1.10	16.89	22	15396422	10.13	1.20	18.80	22
15395622	11.68	1.09	17.24	22	15396422	10.19	1.21	19.01	22
15395722	12.29	1.14	17.27	22	15396522	5.32	0.78	12.41	22
15395722	12.56	1.12	17.30	22	15396522	5.42	0.78	12.41	22
15395822	11.94	1.15	17.53	22	15396622	2.42	0.39	5.92	22
15395822	12.04	1.13	17.06	22	15396622	2.49	0.37	5.79	22

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153967 2	1.57	0.24	3.46	2 2	153975 5				5 5
153967 2	1.64	0.24	3.41	2 2	153975 2	18.19	1.17	16.84	2 2
					153975 2	18.33	1.15	17.37	2 2
153968 2	0.56	0.16	2.06	2 2					
153968 2	0.56	0.15	2.01	2 2	153976 2	16.77	1.17	17.22	2 2
					153976 2	16.70	1.17	17.10	2 2
153969 2	30.11	1.29	18.33	2 2					
153969 2	30.34	1.23	18.57	2 2	153977 2	14.47	1.12	16.97	2 2
					153977 2	14.67	1.13	16.99	2 2
153970 2	28.54	1.20	18.45	2 2					
153970 2	28.85	1.25	17.88	2 2	153978 4	7.95	0.73	11.71	4 4
					153978 4	8.05	0.76	11.91	4 4
153971 2	26.30	1.22	17.55	2 2					
153971 2	26.64	1.22	17.83	2 2	153979 2	12.17	1.14	16.75	2 2
					153979 2	12.17	1.16	16.95	2 2
153972 2	24.27	1.22	17.45	2 2					
153972 2	24.23	1.18	17.06	2 2	153980 2	11.66	1.17	17.33	2 2
					153980 2	11.76	1.16	17.15	2 2
153973 2	21.89	1.25	17.23	2 2					
153973 2	21.48	1.16	17.12	2 2	153981 2	11.55	1.24	17.15	2 2
					153981 2	11.58	1.18	17.27	2 2
153974 2	18.84	1.15	16.63	2 2					
153974 2	18.97	1.16	16.85	2 2	153982 2	11.78	1.21	17.73	2 2
					153982 2	11.99	1.21	17.87	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153983	12.05	1.23	17.77	2 2					
153983	12.18	1.23	18.13	2 2					
153984	12.65	1.34	20.20	2 2					
153984	12.45	1.32	20.28	2 2					
153985	11.34	1.26	19.33	2 2					
153985	11.43	1.31	19.55	2 2					
153986	7.22	1.00	15.15	2 2					
153986	7.49	0.99	15.42	2 2					
153987	4.85	0.72	10.99	2 2					
153987	4.86	0.70	10.91	2 2					
153988	2.66	0.43	6.21	2 2					
153988	2.66	0.40	6.32	2 2					
153989	1.65	0.29	3.43	2 2					
153989	1.61	0.26	3.47	2 2					
153990	1.64	0.26	3.53	2 2					
153990	1.64	0.27	3.61	2 2					

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
153991	1.64	0.26	3.69	2 2	153999	15.70	1.17	16.65	2 2
153991	1.64	0.25	3.63	2 2	153999	15.90	1.19	16.79	2 2
153992	30.01	1.24	18.04	2 2	154000	14.59	1.17	16.55	2 2
153992	30.38	1.31	18.28	2 2	154000	14.65	1.17	16.80	2 2
153993	29.03	1.25	18.08	2 2	154001	13.41	1.17	16.95	2 2
153993	29.06	1.26	18.16	2 2	154001	13.37	1.19	16.79	2 2
153994	26.89	1.23	17.39	2 2	154002	11.42	1.14	16.12	2 2
153994	27.40	1.23	17.65	2 2	154002	11.65	1.15	16.34	2 2
153995	24.70	1.21	17.45	2 2	154003	11.78	1.16	16.61	2 2
153995	24.36	1.21	17.27	2 2	154003	11.82	1.15	16.25	2 2
153996	22.06	1.19	16.90	2 2	154004	11.71	1.18	16.55	2 2
153996	21.82	1.20	16.86	2 2	154004	11.81	1.18	16.88	2 2
153997	18.24	1.17	16.64	2 2	154005	11.74	1.23	16.90	2 2
153997	18.24	1.22	16.45	2 2	154005	11.80	1.18	17.08	2 2
153998	17.26	1.16	16.46	2 2	154005				5 5
153998	17.46	1.19	16.63	2 2	154006				5 5
					154006	11.84	1.19	16.86	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1540062	11.84	1.20	17.23	2 2	1540142	1.11	0.23	2.73	2 2
1540075				5 5	1540142	1.11	0.22	2.75	2 2
1540072	11.90	1.25	17.51	2 2	1540152	29.82	1.35	17.66	2 2
1540072	11.93	1.25	17.80	2 2	1540152	30.66	1.31	17.91	2 2
1540082	12.54	1.30	18.78	2 2	1540162	29.14	1.22	18.02	2 2
1540082	12.67	1.28	19.03	2 2	1540162	29.41	1.22	18.08	2 2
1540092	12.60	1.34	20.14	2 2	1540172	24.62	1.20	16.83	2 2
1540092	12.67	1.35	19.98	2 2	1540172	24.72	1.18	17.16	2 2
1540102	9.40	1.18	17.04	2 2	1540182	24.95	1.23	16.65	2 2
1540102	9.57	1.17	17.26	2 2	1540182	24.99	1.22	16.81	2 2
1540112	4.38	0.70	10.20	2 2	1540192	24.62	1.24	16.71	2 2
1540112	4.38	0.67	10.24	2 2	1540192	24.45	1.24	16.78	2 2
1540122	1.96	0.33	4.51	2 2	1540202	23.00	1.23	16.80	2 2
1540122	2.06	0.31	4.55	2 2	1540202	23.03	1.24	16.78	2 2
1540132	1.35	0.26	3.21	2 2	1540212	20.23	1.25	17.10	2 2
1540132	1.35	0.29	3.13	2 2	1540212	20.33	1.18	17.20	2 2

WOCE

WOCE ID	SiO4	PO4	NO2+NO3	QF	WOCE ID	SiO4	PO4	NO2+NO3	QF
154022 2	16.69	1.14	16.63	2 2	154030 2	12.23	1.24	18.58	2 2
154022 2	16.96	1.15	16.77	2 2	154030 2	12.40	1.22	18.89	2 2
154023 2	15.71	1.17	16.81	2 2	154031 2	12.70	1.30	20.16	2 2
154023 2	15.75	1.17	16.75	2 2	154031 2	12.60	1.29	20.20	2 2
154024 2	13.73	1.16	16.71	2 2	154032 2	11.67	1.27	20.29	2 2
154024 2	13.73	1.16	16.67	2 2	154032 2	11.73	1.28	20.14	2 2
154025 2	12.85	1.17	16.82	2 2	154033 2	9.81	1.13	18.52	2 2
154025 2	12.82	1.17	16.78	2 2	154033 2	9.80	1.16	18.43	2 2
154026 2	11.60	1.16	16.84	2 2	154034 2	4.68	0.68	10.66	2 2
154026 2	11.54	1.16	16.80	2 2	154034 2	4.72	0.58	10.77	2 2
154027 2	11.77	1.19	17.15	2 2	154035 2	1.85	0.29	4.60	2 2
154027 2	11.80	1.19	17.21	2 2	154035 2	1.86	0.22	4.67	2 2
154028 2	11.73	1.20	17.21	2 2	154036 2	0.90	0.16	2.65	2 2
154028 2	11.73	1.19	17.27	2 2	154036 2	0.90	0.17	2.72	2 2
154029 2	11.69	1.39	17.54	2 2	154037 2	0.78	0.18	2.42	2 2
154029 2	11.72	1.15	17.58	2 2	154037 2	0.82	0.14	2.40	2 2

WOCE ID	SiO4	PO4	NO2+NO3	QF	WOCE ID	SiO4	PO4	NO2+NO3	QF
154038 2	32.18	1.39	18.30	2 2					
154038 2	32.46	1.22	18.37	2 2	154046 2	14.75	1.08	16.23	2 2
154039 5				5 5	154046 2	14.68	1.07	16.03	2 2
154039 2	30.52	1.21	18.08	2 2	154047 2	13.92	1.13	16.74	2 2
154039 2	30.63	1.20	17.97	2 2	154047 2	13.92	1.08	16.72	2 2
154040 2	26.85	1.15	17.40	2 2	154048 2	12.65	1.11	16.56	2 2
154040 2	26.85	1.17	17.33	2 2	154048 2	12.64	1.04	16.48	2 2
154041 2	24.65	1.13	17.05	2 2	154049 2	12.26	1.04	16.41	2 2
154041 2	24.58	1.13	17.16	2 2	154049 2	12.57	1.04	16.39	2 2
154042 2	24.08	1.14	17.12	2 2					
154042 2	24.12	1.13	17.03	2 2					
154043 2	20.09	1.13	16.66	2 2					
154043 2	20.17	1.11	16.74	2 2					
154044 2	17.98	1.12	16.84	2 2					
154044 2	18.09	1.12	16.81	2 2					
154045 2	16.00	1.27	16.38	2 2					
154045 2	16.13	1.08	16.36	2 2					

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154050 2	12.25	1.06	16.39	2 2	154058 2	6.09	0.79	12.30	2 2
154050 2	12.29	1.06	16.55	2 2	154058 2	6.09	0.75	12.43	2 2
154051 2	11.98	1.06	16.44	2 2	154059 3	1.68	0.22	3.11	3 3
154051 2	12.01	1.06	16.33	2 2	154059 3	1.72	0.11	3.17	3 3
154052 2	11.93	1.10	16.60	2 2	154060 3				3 3
154052 2	12.00	1.10	16.73	2 2	154060 3	0.94	0.11	1.42	3 3
154053 2	11.77	1.30	17.14	2 2	154060 3	0.94	0.10	1.46	3 3
154053 2	11.80	1.13	16.85	2 2	154061 2	26.05	1.34	16.37	2 2
154054 2	11.97	1.13	17.14	2 2	154061 2	26.15	1.14	16.48	2 2
154054 2	12.00	1.14	17.09	2 2	154062 2	26.07	1.16	16.64	2 2
154055 2	12.57	1.24	18.94	2 2	154062 2	26.11	1.14	16.59	2 2
154055 2	12.47	1.25	18.78	2 2	154063 2	25.16	1.14	16.66	2 2
154056 2	12.12	1.24	19.29	2 2	154063 2	24.99	1.14	16.59	2 2
154056 2	12.09	1.26	19.14	2 2	154064 2	22.80	1.12	16.53	2 2
154057 2	7.25	0.91	14.43	2 2	154064 2	22.91	1.13	16.46	2 2
154057 2	7.32	0.85	14.65	2 2	154065 2	21.83	1.11	16.71	2 2
					154065 2	22.04	1.09	16.53	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154066 2	20.17	1.09	16.45	2 2					
154066 2	20.24	1.09	16.54	2 2					
154067 2	17.87	1.08	16.54	2 2					
154067 2	17.90	1.08	16.52	2 2					
154068 2	15.91	1.08	16.61	2 2					
154068 2	15.94	1.07	16.56	2 2					
154069 2	13.19	1.22	15.86	2 2					
154069 2	13.32	1.14	16.13	2 2					

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154070 2	11.82	1.02	16.22	2 2	154078 2	13.20	1.30	19.94	2 2
154070 2	11.82	0.99	16.04	2 2	154078 2	13.24	1.29	19.87	2 2
154071 2	12.49	1.05	16.60	2 2	154079 2	11.67	1.24	19.65	2 2
154071 2	12.60	1.08	16.62	2 2	154079 2	11.70	1.26	19.63	2 2
154072 2	12.45	1.06	16.60	2 2	154080 2	4.73	0.50	9.62	2 2
154072 2	12.48	1.10	16.49	2 2	154080 2	4.69	0.62	9.44	2 2
154073 2	12.04	1.08	16.45	2 2	154081 2	4.09	0.53	8.57	2 2
154073 2	12.10	1.08	16.40	2 2	154081 2	4.15	0.58	8.55	2 2
154074 2	11.89	1.12	16.76	2 2	154082 2	2.19	0.25	4.24	2 2
154074 2	11.92	1.10	16.83	2 2	154082 2	2.20	0.18	4.26	2 2
154075 2	12.12	1.12	17.50	2 2	154083 2	1.72	0.15	1.81	2 2
154075 2	12.06	1.12	17.34	2 2	154083 2	1.72	0.15	1.85	2 2
154076 2	12.42	1.15	18.03	2 2	154084 2	25.80	1.31	16.46	2 2
154076 2	12.45	1.16	18.23	2 2	154084 2	26.04	1.13	16.73	2 2
154077 2	12.77	1.41	18.42	2 2	154085 2	26.49	1.31	16.73	2 2
154077 2	12.80	1.21	18.69	2 2	154085 2	26.62	1.15	16.94	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154086	25.17	1.14	17.18	2 2	154094	13.56	1.06	16.61	2 2
154086	25.48	1.13	17.00	2 2	154094	13.62	1.12	16.65	2 2
154087	23.42	1.12	16.96	2 2	154095	12.06	1.06	16.08	2 2
154087	23.65	1.12	16.61	2 2	154095	12.06	1.05	15.70	2 2
154088	22.62	1.09	16.32	2 2	154096	12.43	1.07	16.06	2 2
154088	22.65	1.10	16.41	2 2	154096	12.56	1.08	16.22	2 2
154089	21.51	1.11	16.66	2 2	154097	11.64	1.07	16.35	2 2
154089	21.82	1.10	16.55	2 2	154097	11.71	1.08	16.57	2 2
154090	20.54	1.11	16.57	2 2	154098	11.50	1.10	16.51	2 2
154090	20.45	1.11	16.73	2 2	154098	11.56	1.10	16.24	2 2
154091	18.94	1.11	16.15	2 2	154099	11.79	1.11	16.91	2 2
154091	19.03	1.11	16.29	2 2	154099	11.80	1.13	16.80	2 2
154092	17.25	1.09	16.51	2 2	154100	7.07	0.78	11.16	2 2
154092	17.29	1.10	16.40	2 2	154100	7.17	0.66	11.12	2 2
154093	15.39	1.10	16.63	2 2	154101	12.27	1.34	17.92	2 2
154093	15.50	1.25	16.36	2 2	154101	12.03	1.16	18.21	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
15410222	12.80	1.32	19.04	22	15411022	22.04	1.11	16.35	22
15410222	12.70	1.25	19.31	22	15411022	22.14	1.18	16.24	22
15410322	12.46	1.23	19.76	22	15411122	20.67	1.10	16.27	22
15410322	12.52	1.27	19.96	22	15411122	20.74	1.03	16.18	22
15410422	5.05	0.71	10.69	22	15411222	19.41	1.09	16.49	22
15410422	5.12	0.61	10.64	22	15411222	19.47	1.12	16.47	22
15410522	2.17	0.34	4.74	22	15411322	17.74	1.11	16.18	22
15410522	2.17	0.24	4.86	22	15411322	17.87	1.11	16.05	22
15410622	0.33	0.11	1.43	22	15411422	15.66	1.08	16.27	22
15410622	0.33	0.10	1.45	22	15411422	15.73	1.08	16.10	22
15410722	23.04	1.24	16.27	22	15411522	13.23	1.10	16.32	22
15410722	22.77	1.18	16.56	22	15411522	13.26	1.15	16.25	22
15410822	22.72	1.19	16.34	22	15411622	11.88	1.01	15.88	22
15410822	22.73	1.08	16.61	22	15411622	11.87	1.03	15.57	22
15410925	23.17	1.07	16.64	22	154116 5				55
15410922	22.94	1.37	16.73	22	15411722	11.55	1.07	15.53	22
					15411722	11.45	1.25	15.71	22

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154118 2	11.58	1.09	15.96	2 2	154126 2	8.82	0.99	16.53	2 2
154118 2	11.71	1.07	16.38	2 2	154126 2	8.92	1.08	16.47	2 2
154119 2	11.43	1.07	16.83	2 2	154127 2	5.54	0.72	11.41	2 2
154119 2	11.46	1.16	16.92	2 2	154127 2	5.57	0.71	11.17	2 2
154120 2	11.56	1.08	16.34	2 2	154128 2	2.40	0.33	4.91	2 2
154120 2	11.49	1.02	16.76	2 2	154128 2	2.40	0.27	4.91	2 2
154121 2	11.65	1.12	16.59	2 2	154129 2	1.93	0.21	2.58	2 2
154121 2	11.72	1.10	16.74	2 2	154129 2	1.97	0.22	2.56	2 2
154122 2	11.74	1.22	17.41	2 2					
154122 2	11.78	1.14	17.37	2 2					
154123 2	12.24	1.24	18.26	2 2					
154123 2	12.34	1.17	17.95	2 2					
154124 2	12.94	1.28	18.87	2 2					
154124 2	12.94	1.27	18.94	2 2					
154125 2	10.94	1.36	18.30	2 2					
154125 2	11.07	1.21	18.57	2 2					

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
15413026	26.36	1.31	17.11	2 2	15413826	14.21	1.08	15.66	2 2
15413026	26.59	1.15	17.00	2 2	15413826	14.21	1.15	16.00	2 2
15413126	26.24	1.20	16.62	2 2	15413926	12.63	1.08	15.53	2 2
15413126	26.44	1.11	16.64	2 2	15413926	12.76	1.08	15.62	2 2
15413226	24.74	1.11	16.49	2 2	15414026	12.42	1.15	15.87	2 2
15413226	24.77	1.15	16.53	2 2	15414026	12.48	1.05	15.87	2 2
15413326	22.74	1.11	16.56	2 2	15414126	11.89	1.08	16.23	2 2
15413326	23.25	1.28	16.54	2 2	15414126	11.83	1.27	16.21	2 2
15413426	21.65	1.10	16.45	2 2	15414226	11.42	1.11	15.81	2 2
15413426	21.75	1.12	16.30	2 2	15414226	11.48	1.09	15.84	2 2
15413526	19.96	1.17	15.68	2 2	15414326	11.38	1.11	16.64	2 2
15413526	20.05	1.08	15.64	2 2	15414326	11.41	1.11	16.31	2 2
15413626	17.45	1.17	15.86	2 2	15414426	11.44	1.10	17.25	2 2
15413626	17.15	1.10	16.17	2 2	15414426	11.44	1.13	17.22	2 2
15413726	16.40	1.10	16.51	2 2	15414526	11.67	1.15	17.07	2 2
15413726	16.50	1.08	16.51	2 2	15414526	11.73	1.15	16.62	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154146 2	12.02	1.19	17.30	2 2	154155 2	22.84	1.13	17.52	2 2
154146 2	12.06	1.20	17.18	2 2	154155 2	23.01	1.15	17.67	2 2
154147 2	12.45	1.30	18.87	2 2	154156 2	21.82	1.13	17.73	2 2
154147 2	12.48	1.28	18.98	2 2	154156 2	21.89	1.17	17.92	2 2
154148 2	11.71	1.27	19.23	2 2	154157 2	21.17	1.17	17.70	2 2
154148 2	11.74	1.28	19.21	2 2	154157 2	20.86	1.13	17.69	2 2
154149 2	6.82	0.95	14.94	2 2	154158 2	18.99	1.11	17.58	2 2
154149 2	6.88	0.89	14.88	2 2	154158 2	19.20	1.11	17.81	2 2
154150 2	2.68	0.41	6.68	2 2	154159 2	16.92	1.10	17.49	2 2
154150 2	2.71	0.48	6.66	2 2	154159 2	17.16	1.11	17.83	2 2
154151 2	1.86	0.28	4.46	2 2	154160 2	13.70	1.07	17.25	2 2
154151 2	1.83	0.29	4.46	2 2	154160 2	13.83	1.09	17.56	2 2
154153 2	29.27	1.24	18.66	2 2	154161 2	13.12	1.09	17.73	2 2
154153 2	29.54	1.22	18.96	2 2	154161 2	13.22	1.09	17.75	2 2
154154 2	25.52	1.17	18.12	2 2	154162 2	11.90	1.06	17.21	2 2
154154 2	25.56	1.17	18.38	2 2	154162 2	12.04	1.05	17.29	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1541632	11.29	1.09	17.64	2 2	1541712	12.36	1.23	21.40	2 2
1541632	11.22	1.05	17.65	2 2	1541712	12.23	1.25	21.17	2 2
1541642	11.73	1.12	17.64	2 2	1541722	6.11	0.75	13.50	2 2
1541642	11.59	1.05	17.57	2 2	1541722	6.14	0.77	13.12	2 2
1541652	11.25	1.07	17.71	2 2	1541732	4.96	0.71	11.88	2 2
1541652	11.42	1.05	18.15	2 2	1541732	5.09	0.76	11.70	2 2
1541662	11.62	1.07	18.52	2 2	1541742	2.03	0.28	4.79	2 2
1541662	11.73	1.07	18.22	2 2	1541742	2.09	0.27	4.77	2 2
1541672	11.52	1.10	18.37	2 2	1541752	1.52	0.17	2.59	2 2
1541672	11.52	1.09	18.15	2 2	1541752	1.52	0.17	2.57	2 2
1541682	11.86	1.13	18.87	2 2	1541762	29.27	1.21	19.18	2 2
1541682	11.89	1.14	19.05	2 2	1541762	29.68	1.23	18.89	2 2
1541692	12.50	1.20	20.15	2 2	1541772	25.67	1.16	18.75	2 2
1541692	12.40	1.22	19.78	2 2	1541772	25.70	1.15	18.87	2 2
1541702	12.84	1.29	20.72	2 2	1541782	25.19	1.18	18.26	2 2
1541702	12.91	1.28	21.03	2 2	1541782	25.06	1.16	18.46	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154179 2	23.12	1.19	18.13	2 2	154187 2	11.50	1.17	18.39	2 2
154179 2	22.51	1.20	18.18	2 2	154187 2	11.57	1.13	18.06	2 2
154180 2	21.15	1.16	18.19	2 2	154188 2	11.91	1.14	18.37	2 2
154180 2	21.22	1.13	18.35	2 2	154188 2	11.87	1.15	18.20	2 2
154181 2	18.88	1.16	17.93	2 2	154189 2	11.73	1.17	18.59	2 2
154181 2	18.95	1.10	17.98	2 2	154189 2	12.01	1.17	18.25	2 2
154182 2	17.35	1.12	17.61	2 2	154190 2	11.87	1.18	19.14	2 2
154182 2	17.39	1.09	17.70	2 2	154190 2	11.97	1.18	19.29	2 2
154183 2	14.85	1.14	17.68	2 2	154191 2	12.58	1.24	20.47	2 2
154183 2	14.88	1.12	17.82	2 2	154191 2	12.71	1.23	20.14	2 2
154184 2	13.63	1.09	17.92	2 2	154192 2	12.74	1.30	20.95	2 2
154184 2	13.60	1.11	18.03	2 2	154192 2	12.88	1.28	20.63	2 2
154185 2	12.35	1.09	17.43	2 2	154193 2	11.39	1.30	21.60	2 2
154185 2	12.35	1.11	17.69	2 2	154193 2	11.46	1.29	21.49	2 2
154186 2	11.64	1.12	17.89	2 2	154194 2	5.20	0.71	12.00	2 2
154186 2	11.74	1.11	18.00	2 2	154194 2	5.17	0.69	12.27	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1541952	3.76	0.52	8.97	2 2	1542032	21.13	1.17	18.32	2 2
1541952	3.73	0.55	9.06	2 2	1542032	21.17	1.17	18.23	2 2
1541962	2.25	0.32	5.60	2 2	1542042	18.26	1.17	17.87	2 2
1541962	2.25	0.33	5.59	2 2	1542042	18.26	1.17	18.14	2 2
1541972	1.75	0.28	4.51	2 2	1542052	16.60	1.19	17.79	2 2
1541972	1.82	0.30	4.46	2 2	1542052	16.84	1.13	17.63	2 2
1541982	0.68	0.18	2.68	2 2	1542062	14.68	1.15	17.72	2 2
1541982	0.68	0.18	2.63	2 2	1542062	14.92	1.13	17.47	2 2
1541992	26.80	1.20	18.68	2 2	1542072	12.79	1.13	17.76	2 2
1541992	27.14	1.21	18.37	2 2	1542072	12.86	1.12	17.66	2 2
1542002	28.02	1.24	19.25	2 2	1542082	13.63	1.13	18.03	2 2
1542002	27.65	1.25	19.12	2 2	1542082	13.67	1.15	17.83	2 2
1542012	26.22	1.20	18.80	2 2	1542092	13.36	1.16	17.77	2 2
1542012	26.42	1.19	18.58	2 2	1542092	13.13	1.17	17.99	2 2
1542022	22.12	1.15	17.72	2 2	1542102	12.25	1.18	18.12	2 2
1542022	21.64	1.17	17.95	2 2	1542102	12.19	1.19	18.01	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
15421112	11.58	1.16	17.91	2 2	15421912	2.05	0.34	4.60	2 2
15421112	11.65	1.18	17.59	2 2	15421912	2.08	0.31	4.63	2 2
15421212	11.54	1.15	18.10	2 2	15422012	0.88	0.20	2.61	2 2
15421212	11.68	1.16	17.88	2 2	15422012	0.92	0.19	2.62	2 2
15421312	11.68	1.19	18.46	2 2	15422212	18.39	1.15	16.77	2 2
15421312	11.81	1.20	18.09	2 2	15422212	18.49	1.12	16.55	2 2
15421412	11.84	1.22	19.07	2 2	15422312	22.34	1.16	17.33	2 2
15421412	11.84	1.23	18.94	2 2	15422312	22.44	1.17	17.27	2 2
15421512	12.35	1.24	19.09	2 2	15422412	22.10	1.18	17.64	2 2
15421512	12.28	1.27	19.48	2 2	15422412	22.34	1.19	17.84	2 2
15421612	12.48	1.33	20.66	2 2	15422512	20.48	1.17	17.63	2 2
15421612	12.65	1.33	20.40	2 2	15422512	20.54	1.18	17.20	2 2
15421712	11.30	1.30	20.72	2 2	15422604	5.18	0.65	9.72	4 4
15421712	11.24	1.31	20.72	2 2	15422604	5.22	0.64	9.70	4 4
15421812	5.55	0.81	12.55	2 2	15422712	17.34	1.17	17.27	2 2
15421812	5.58	0.83	12.37	2 2	15422712	17.37	1.16	17.49	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
15422822	15.12	1.14	17.13	22	15423622	11.15	1.21	18.22	22
15422822	15.19	1.15	16.82	22	15423622	11.39	1.22	18.12	22
15422922	14.65	1.16	17.16	22	15423722	11.75	1.24	19.06	22
15422922	14.75	1.16	17.34	22	15423722	11.79	1.26	18.83	22
15423022	12.97	1.14	17.28	22	15423822	12.25	1.32	19.93	22
15423022	13.24	1.17	16.98	22	15423822	12.29	1.35	19.80	22
15423122	11.43	1.14	17.28	22	15423922	12.09	1.40	20.37	22
15423122	11.43	1.15	17.09	22	15423922	12.29	1.40	20.57	22
15423222	12.23	1.14	17.02	22	15424022	11.38	1.35	20.34	22
15423222	12.26	1.23	16.92	22	15424022	11.15	1.34	20.46	22
15423322	11.16	1.15	17.41	22	15424122	5.55	0.82	13.15	22
15423322	10.92	1.16	17.57	22	15424122	5.52	0.84	12.90	22
15423422	11.29	1.18	17.91	22	15424222	2.90	0.49	6.92	22
15423422	11.42	1.19	17.74	22	15424222	2.93	0.49	6.95	22
15423522	10.99	1.20	17.39	22	15424322	1.11	0.28	3.19	22
15423522	11.15	1.21	17.57	22	15424322	1.11	0.28	3.19	22

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
15424422	1.05	0.21	2.42	22	15425222	18.59	1.15	17.78	22
15424422	1.05	0.21	2.40	22	15425222	18.69	1.15	17.60	22
15424522	24.76	1.18	17.99	22	15425322	16.44	1.16	17.49	22
15424522	25.13	1.22	17.55	22	15425322	16.57	1.11	17.23	22
15424622	25.90	1.18	18.34	22	15425422	14.53	1.10	17.35	22
15424622	25.57	1.17	18.42	22	15425422	14.57	1.11	17.44	22
15424722	24.14	1.17	17.53	22	15425522	16.00	1.12	17.13	22
15424722	24.18	1.17	17.67	22	15425522	16.13	1.12	17.12	22
15424822	23.24	1.20	17.83	22	15425622	14.53	1.12	17.40	22
15424822	23.33	1.16	17.67	22	15425622	14.29	1.14	17.58	22
15424922	22.73	1.18	18.01	22	15425722	13.42	1.11	17.67	22
15424922	22.79	1.20	17.77	22	15425722	13.32	1.11	17.74	22
15425022	21.31	1.16	17.68	22	15425822	12.02	1.10	17.30	22
15425022	21.18	1.16	17.78	22	15425822	12.09	1.11	17.10	22
15425122	19.57	1.15	17.44	22	15425922	11.05	1.10	17.54	22
15425122	19.67	1.15	17.32	22	15425922	11.19	1.11	17.36	22

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154260 2	11.25	1.11	17.81	2 2	154268 2	20.88	1.11	17.25	2 2
154260 2	11.35	1.12	17.78	2 2	154268 2	20.98	1.10	17.47	2 2
154261 2	11.64	1.13	18.08	2 2	154269 2	25.99	1.16	18.33	2 2
154261 2	11.73	1.11	17.67	2 2	154269 2	26.02	1.20	18.30	2 2
154262 2	11.70	1.14	18.17	2 2	154270 2	25.25	1.16	17.98	2 2
154262 2	11.60	1.21	18.31	2 2	154270 2	25.41	1.16	17.90	2 2
154263 2	12.00	1.17	19.27	2 2	154271 2	21.73	1.14	17.77	2 2
154263 2	12.16	1.19	19.43	2 2	154271 2	21.73	1.13	17.49	2 2
154264 2	12.99	1.29	20.71	2 2	154272 2	20.75	1.13	17.68	2 2
154264 2	12.99	1.30	20.72	2 2	154272 2	20.92	1.11	17.54	2 2
154265 2	11.26	1.30	19.13	2 2	154273 2	18.81	1.11	17.30	2 2
154265 2	11.46	1.29	19.06	2 2	154273 2	19.25	1.11	17.29	2 2
154266 2	2.92	0.43	6.45	2 2	154274 2	16.21	1.11	17.26	2 2
154266 2	3.03	0.39	6.66	2 2	154274 2	16.27	1.10	17.50	2 2
154267 2	1.30	0.20	3.12	2 2	154275 2	15.17	1.10	17.49	2 2
154267 2	1.37	0.19	3.09	2 2	154275 2	15.20	1.08	17.10	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154276 2	14.70	1.09	17.46	2 2	154284 2	11.67	1.16	19.03	2 2
154276 2	14.37	1.10	17.66	2 2	154284 2	11.77	1.17	18.90	2 2
154277 2	13.23	1.12	17.43	2 2	154285 2	12.42	1.24	19.58	2 2
154277 2	13.32	1.12	17.86	2 2	154285 2	12.49	1.22	19.56	2 2
154278 2	15.19	1.10	17.60	2 2	154286 2	13.32	1.34	21.19	2 2
154278 2	15.68	1.10	17.44	2 2	154286 2	13.38	1.35	21.47	2 2
154279 2	11.39	1.08	17.30	2 2	154287 2	8.93	1.08	18.25	2 2
154279 2	11.76	1.09	17.20	2 2	154287 2	8.89	1.10	18.25	2 2
154280 2	11.39	1.10	17.77	2 2	154288 2	2.24	0.28	5.19	2 2
154280 2	11.42	1.11	17.76	2 2	154288 2	2.20	0.29	5.04	2 2
154281 2	11.51	1.10	17.78	2 2	154289 2	1.97	0.25	4.32	2 2
154281 2	11.35	1.12	17.90	2 2	154289 2	2.00	0.25	4.30	2 2
154282 2	11.31	1.11	17.89	2 2	154290 2	1.93	0.21	3.57	2 2
154282 2	11.65	1.12	17.79	2 2	154290 2	1.93	0.21	3.57	2 2
154283 2	11.41	1.16	18.63	2 2	154291 2	13.93	1.00	15.79	2 2
154283 2	11.54	1.14	18.66	2 2	154291 2	13.96	1.00	16.07	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154292	26.02	1.18	18.29	2 2					
2					154301	14.65	1.10	16.97	2 2
154292	26.05	1.18	17.96	2 2	2				
2					154301	14.69	1.09	17.49	2 2
154293	23.94	1.15	17.78	2 2	2				
2					154302	11.42	1.10	16.68	2 2
154293	23.73	1.13	17.66	2 2	2				
2					154302	11.45	1.09	16.77	2 2
154294				5 5	2				
5					154303	10.49	1.06	16.79	2 2
154294	22.63	1.16	17.83	2 2	2				
2					154303	10.56	1.07	17.02	2 2
154294	22.76	1.15	17.96	2 2	2				
2					154304	10.29	1.06	16.54	2 2
154296	20.56	1.14	17.48	2 2	2				
2					154304	10.32	1.07	16.85	2 2
154296	20.86	1.11	17.34	2 2	2				
2					154305	9.99	1.07	16.86	2 2
154297	19.96	1.12	17.62	2 2	2				
2					154305	10.02	1.07	16.98	2 2
154297	19.55	1.14	17.75	2 2	2				
2					154306	9.98	1.06	17.05	2 2
154298	14.20	1.07	16.94	2 2	2				
2					154306	10.05	1.08	17.15	2 2
154298	14.23	1.07	16.67	2 2	2				
2					154307	10.01	1.07	16.86	2 2
154299	14.06	1.07	16.95	2 2	2				
2					154307	10.01	1.06	16.66	2 2
154299	14.20	1.07	16.64	2 2	2				
2					154308	9.74	1.06	16.95	2 2
154300	13.23	1.07	17.25	2 2	2				
2					154308	9.78	1.06	17.22	2 2
154300	13.23	1.08	17.19	2 2	2				
2									

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154309 2	9.74	1.06	17.16	2 2					
154309 2	9.77	1.07	17.20	2 2					
154310 2	9.40	1.07	16.61	2 2					
154310 2	9.43	1.07	16.80	2 2					
154311 2	10.29	1.08	16.22	2 2					
154311 2	10.19	1.07	16.30	2 2					
154312 2	11.45	1.21	17.68	2 2					
154312 2	11.48	1.22	17.72	2 2					

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1543132	3.27	0.50	4.34	2 2	1543212	12.03	1.08	16.68	2 2
1543132	3.40	0.49	4.44	2 2	1543212	12.04	1.07	16.65	2 2
1543142	14.29	1.05	15.83	2 2	1543222	11.60	1.08	16.90	2 2
1543142	14.35	1.03	16.08	2 2	1543222	11.70	1.09	16.51	2 2
1543152	14.88	1.04	16.25	2 2	1543232	10.97	1.09	16.53	2 2
1543152	15.05	1.04	16.17	2 2	1543232	10.87	1.09	16.40	2 2
1543162	17.40	1.08	16.26	2 2	1543242	11.26	1.09	16.57	2 2
1543162	17.57	1.08	16.61	2 2	1543242	11.30	1.09	16.61	2 2
1543172	17.49	1.09	16.73	2 2	1543252	9.97	1.10	17.00	2 2
1543172	17.56	1.10	16.59	2 2	1543252	10.00	1.10	16.78	2 2
1543182	18.01	1.16	16.97	2 2	1543262	10.12	1.12	16.79	2 2
1543182	18.01	1.13	17.24	2 2	1543262	10.29	1.11	16.48	2 2
1543192	16.25	1.12	16.68	2 2	1543272	9.99	1.11	16.96	2 2
1543192	16.32	1.13	16.84	2 2	1543272	10.09	1.11	17.13	2 2
1543202	12.70	1.07	16.47	2 2	1543282	10.08	1.09	17.23	2 2
1543202	12.74	1.09	16.39	2 2	1543282	10.01	1.10	17.21	2 2

WOCE

WOCE ID	SiO4	PO4	NO2+NO3	QF	WOCE ID	SiO4	PO4	NO2+NO3	QF
154329 2	9.78	1.10	17.07	2 2	154337 2	12.66	1.08	16.28	2 2
154329 2	9.85	1.10	16.78	2 2	154337 2	12.79	1.08	16.01	2 2
154330 2	9.51	1.09	16.10	2 2	154338 2	12.92	1.11	16.01	2 2
154330 2	9.61	1.09	16.34	2 2	154338 2	12.85	1.10	15.97	2 2
154331 2	9.18	1.05	16.08	2 2	154339 2	12.35	1.08	16.29	2 2
154331 2	9.21	1.08	16.10	2 2	154339 2	12.35	1.08	16.18	2 2
154332 2	8.71	1.02	15.32	2 2	154340 2	12.51	1.09	16.64	2 2
154332 2	8.75	1.02	15.26	2 2	154340 2	12.58	1.09	16.60	2 2
154333 2	8.01	0.98	13.66	2 2	154341 4	7.88	0.93	12.83	4 4
154333 2	8.02	0.97	13.62	2 2	154341 4	7.98	0.94	12.99	4 4
154334 2	6.55	0.86	10.48	2 2	154342 2	10.48	1.09	16.58	2 2
154334 2	6.55	0.86	10.60	2 2	154342 2	10.48	1.10	16.77	2 2
154335 2	6.28	0.82	10.16	2 2	154343 2	11.21	1.13	16.58	2 2
154335 2	6.35	0.83	10.12	2 2	154343 2	11.04	1.14	16.78	2 2
154336 2	3.04	0.60	7.46	2 2	154344 2	10.87	1.12	16.98	2 2
154336 2	3.17	0.60	7.39	2 2	154344 2	11.00	1.12	17.20	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154345	10.07	1.13	16.93	2 2	154353	9.88	1.13	17.38	2 2
154345	10.08	1.11	17.08	2 2	154353	9.95	1.16	17.09	2 2
154346	9.97	1.14	16.65	2 2	154354	10.17	1.14	17.63	2 2
154346	10.24	1.13	16.57	2 2	154354	10.21	1.14	17.26	2 2
154347	9.97	1.11	16.79	2 2	154355	8.28	1.01	14.03	2 2
154347	10.13	1.10	16.97	2 2	154355	8.07	1.00	14.28	2 2
154348	10.82	1.15	17.63	2 2	154356	2.42	0.62	7.11	2 2
154348	10.82	1.16	17.84	2 2	154356	2.46	0.61	7.15	2 2
154349	9.43	1.09	15.83	2 2	154358	10.82	1.15	17.25	2 2
154349	9.40	1.09	16.01	2 2	154358	10.76	1.14	17.58	2 2
154350	7.07	0.91	12.30	2 2	154359	9.02	1.06	14.49	2 2
154350	7.04	0.92	11.99	2 2	154359	9.25	1.02	14.60	2 2
154351	5.74	0.72	9.46	2 2	154360	6.82	0.87	11.00	2 2
154351	5.81	0.74	9.25	2 2	154360	6.85	0.87	10.61	2 2
154352	11.28	1.15	17.75	2 2	154361	0.23	0.33	3.93	2 2
154352	11.41	1.13	17.23	2 2	154361	0.23	0.31	3.94	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154362	10.53	1.09	15.50	2 2	154370	0.23	0.42	4.05	2 2
154362	10.63	1.10	15.00	2 2	154370	0.27	0.40	4.09	2 2
154363	7.13	0.90	11.50	2 2	154371	13.20	1.24	17.82	2 2
154363	7.20	0.89	11.61	2 2	154371	12.93	1.25	18.21	2 2
154364	0.24	0.40	4.26	2 2	154372	7.04	0.93	11.60	2 2
154364	0.28	0.38	4.46	2 2	154372	7.04	0.90	11.70	2 2
154365	10.45	1.09	15.06	2 2	154373	13.32	1.23	18.42	2 2
154365	10.38	1.09	15.18	2 2	154373	13.52	1.27	18.13	2 2
154366	7.02	0.87	10.72	2 2	154374	0.28	0.43	4.08	2 2
154366	6.85	0.85	10.85	2 2	154374	0.35	0.40	4.12	2 2
154367	0.22	0.36	3.70	2 2	154375	14.57	1.31	18.62	2 2
154367	0.22	0.35	3.76	2 2	154375	14.53	1.29	19.16	2 2
154368	12.22	1.20	16.81	2 2	154376	8.27	0.98	13.40	2 2
154368	12.42	1.20	17.23	2 2	154376	8.44	0.98	13.17	2 2
154369	6.26	0.85	9.68	2 2	154377	6.27	0.85	9.78	2 2
154369	6.36	0.84	9.52	2 2	154377	6.31	0.83	9.86	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
15437822	0.31	0.43	4.22	22	15438622	0.19	0.44	4.52	22
15437822	0.35	0.43	4.38	22	15438622	0.23	0.43	4.57	22
15437922	11.75	1.18	17.48	22	15438722	12.20	1.14	17.00	22
15437922	11.95	1.19	17.64	22	15438722	11.96	1.13	17.37	22
15438022	10.95	1.16	17.11	22	15438822	10.49	1.14	17.04	22
15438022	11.15	1.15	16.80	22	15438822	10.56	1.12	17.48	22
15438122	8.92	1.00	13.70	22	15438922	9.96	1.10	16.15	22
15438122	8.81	1.02	13.85	22	15438922	9.89	1.08	16.54	22
15438222	0.29	0.44	4.69	22	15439022	7.19	0.91	11.12	22
15438222	0.29	0.45	4.64	22	15439022	7.19	0.94	11.36	22
15438322	10.52	1.12	17.19	22	15439122	10.93	1.13	16.86	22
15438322	10.65	1.15	16.65	22	15439122	11.16	1.11	16.76	22
15438422	11.31	1.16	17.34	22	15439222	10.46	1.10	17.27	22
15438422	11.35	1.18	17.44	22	15439222	10.59	1.13	16.82	22
15438522	8.58	1.01	14.14	22	15439322	10.66	1.14	17.36	22
15438522	8.65	1.02	13.71	22	15439322	10.69	1.11	17.24	22

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154394 2	10.68	1.14	17.80	2 2	154402 2	10.57	1.18	16.21	2 2
154394 2	10.89	1.15	17.51	2 2	154402 2	10.63	1.16	16.44	2 2
154395 2	10.81	1.18	17.63	2 2	154403 4	2.04	0.53	2.69	4 4
154395 2	10.84	1.17	17.97	2 2	154403 4	2.08	0.57	2.82	4 4
154396 2	7.72	0.97	12.08	2 2	154404 2	10.59	1.09	16.24	2 2
154396 2	7.85	0.98	11.88	2 2	154404 2	10.62	1.08	16.42	2 2
154397 2	1.92	0.51	3.11	2 2	154405 2	10.09	1.07	16.04	2 2
154397 2	1.96	0.50	3.22	2 2	154405 2	10.12	1.07	16.23	2 2
154398 2	12.00	1.18	17.58	2 2	154406 2	10.31	1.09	16.29	2 2
154398 2	12.06	1.17	18.02	2 2	154406 2	10.28	1.08	16.22	2 2
154399 2	11.08	1.15	17.93	2 2	154407 2	10.51	1.09	16.45	2 2
154399 2	11.18	1.21	17.49	2 2	154407 2	10.54	1.09	16.52	2 2
154400 2	10.54	1.16	17.62	2 2	154408 2	10.54	1.10	16.77	2 2
154400 2	10.57	1.17	17.41	2 2	154408 2	10.60	1.10	16.85	2 2
154401 2	11.27	1.21	18.44	2 2	154409 2	10.80	1.13	17.19	2 2
154401 2	11.20	1.21	18.41	2 2	154409 2	10.83	1.13	17.21	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1544102	10.00	1.07	15.57	2 2	1544212	8.99	0.99	14.08	2 2
1544102	10.06	1.10	15.67	2 2	1544212	8.96	1.00	13.98	2 2
1544122	12.01	1.14	17.06	2 2	1544222	10.08	1.01	13.74	2 2
1544122	12.08	1.14	17.00	2 2	1544222	10.08	1.02	13.72	2 2
1544132	11.40	1.15	17.49	2 2	1544232	1.24	0.36	0.48	2 2
1544132	11.33	1.14	17.58	2 2	1544232	1.24	0.37	0.49	2 2
1544162	10.80	1.08	16.58	2 2	1544242	11.28	1.08	16.08	2 2
1544162	10.80	1.10	16.59	2 2	1544242	11.34	1.08	16.25	2 2
1544172	10.83	1.10	16.66	2 2	1544252	11.10	1.09	16.27	2 2
1544172	10.89	1.11	16.77	2 2	1544252	11.17	1.08	16.30	2 2
1544182	10.69	1.11	16.85	2 2	1544262	10.31	1.08	16.38	2 2
1544182	10.72	1.12	16.93	2 2	1544262	10.37	1.08	16.35	2 2
1544192	11.01	1.13	17.15	2 2	1544272	10.13	1.09	16.40	2 2
1544192	11.08	1.13	17.18	2 2	1544272	10.17	1.09	16.33	2 2
1544202	11.08	1.16	17.51	2 2	1544282	9.93	1.08	16.26	2 2
1544202	11.11	1.16	17.58	2 2	1544282	9.96	1.08	16.24	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154429 2	9.20	1.06	15.46	2 2	154438 2	8.96	1.00	14.36	2 2
154429 2	9.27	1.07	15.41	2 2	154438 2	9.06	1.01	14.40	2 2
154430 2	9.33	1.04	14.99	2 2	154439 2	10.57	0.99	12.58	2 2
154430 2	9.30	1.05	15.00	2 2	154439 2	10.64	1.00	12.66	2 2
154431 2	9.62	1.00	13.64	2 2	154440 2	1.11	0.30	0.00	2 2
154431 2	9.58	1.00	13.75	2 2	154440 2	1.14	0.41	0.00	2 3
154433 2	10.72	1.11	16.64	2 2	154441 2	10.21	1.02	13.96	2 2
154433 2	10.73	1.11	16.42	2 2	154441 2	10.18	1.02	13.80	2 2
154434 2	10.13	1.10	16.61	2 2	154442 2	11.96	1.06	13.72	2 2
154434 2	10.33	1.10	16.71	2 2	154442 2	12.05	1.05	13.76	2 2
154435 2	9.43	1.08	16.28	2 2	154443 2	9.32	0.91	9.66	2 2
154435 2	9.50	1.06	16.23	2 2	154443 2	9.46	0.91	9.74	2 2
154436 2	9.29	1.06	15.97	2 2	154444 2	1.68	0.41	0.00	2 2
154436 2	9.30	1.08	15.94	2 2	154444 2	1.71	0.39	0.00	2 2
154437 2	9.29	1.04	15.51	2 2	154445 2	12.08	1.02	10.86	2 2
154437 2	9.22	1.04	15.58	2 2	154445 2	12.18	1.03	10.91	2 2

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154446 2	9.64	0.97	8.00	2 2	154455 2	16.07	1.06	17.76	2 2
154446 2	9.64	0.97	7.95	2 2	154455 2	16.15	1.07	17.47	2 2
154447 2	2.98	0.55	0.93	2 2	154456 2	15.31	1.12	17.57	2 2
154447 3	2.91	0.54	1.31	2 2	154456 2	12.54	1.01	14.01	2 2
154448 2	11.92	1.04	9.91	2 2	154457 2	13.01	1.08	17.57	2 2
154448 2	11.89	1.04	9.84	2 2	154457 2	13.34	1.02	16.08	2 2
154449 2	9.35	0.97	8.36	2 2	154458 2	11.48	1.08	17.08	2 2
154449 2	9.36	0.97	8.33	2 2	154458 2	11.56	1.02	14.10	2 2
154450 2	0.51	0.40	0.00	2 2	154459 2	11.09	1.05	16.44	2 2
154450 2	0.51	0.41	0.00	2 2	154459 2	12.25	1.15	17.48	2 2
154451 2	12.89	1.19	9.95	2 2	154460 2	9.59	1.07	14.94	2 2
154451 2	12.93	1.19	10.09	2 2	154460 2	11.15	1.14	17.07	2 2
154452 2	2.59	0.64	1.38	2 2	154461 2	15.67	1.41	22.74	2 2
154452 2	2.66	0.64	1.58	2 2	154461 2	16.79	1.33	20.65	2 2
154454 2	16.74	1.04	17.62	2 2	154462 2	12.82	1.30	21.88	2 2
154454 2	16.21	1.06	16.87	2 2	154462 2	13.80	1.31	22.04	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
1544632	6.38	0.74	11.28	2 2	1544712	6.66	0.83	11.12	2 2
1544632	6.11	0.78	12.05	2 2	1544712	5.40	0.75	8.94	2 2
1544642	4.11	0.57	8.55	2 2	1544722	1.10	0.37	0.25	2 2
1544642	3.98	0.56	8.10	2 2	1544722	1.42	0.44	0.41	2 2
1544652	1.65	0.35	0.64	2 2	1544732	1.17	0.49	0.24	2 2
1544652	1.71	0.36	0.69	2 2	1544732	1.23	0.49	0.25	2 2
1544662	10.91	1.02	16.46	2 2	1544742	0.78	0.48	0.00	2 2
1544662	12.00	1.09	18.12	2 2	1544742	0.85	0.53	0.00	2 2
1544672	10.39	1.06	15.76	2 2	1544752	0.39	0.40	0.00	2 2
1544672	11.43	1.08	17.13	2 2	1544752	0.46	0.43	0.00	2 2
1544682	12.64		18.74	2 5	1544762	10.07	1.07	10.03	2 2
1544682	14.04		20.78	2 5	1544762	10.43	1.09	9.99	2 2
1544692	13.49	1.43	21.57	2 2	1544772	9.53	1.03	8.93	2 2
1544692	13.33	1.29	21.51	2 2	1544772	9.85	1.08	9.54	2 2
1544702	11.82	1.24	20.57	2 2	1544782	6.72	0.99	7.59	2 2
1544702	11.89	1.27	20.14	2 2	1544782	6.91	1.00	7.46	2 2

WOCE

ID	WOCE SiO4	PO4	NO2+NO3	QF	ID	SiO4	PO4	NO2+NO3	QF
154479 2	0.63	0.36	0.00	2 2	154487 2	8.18	0.95	8.04	2 2
154479 2	3.51	0.36	0.00	2 2	154487 2	8.51	1.00	8.32	2 2
154480 2	8.02	0.98	7.46	2 2	154488 2	3.31	0.67	3.32	2 2
154480 2	9.00	1.06	8.41	2 2	154488 2	3.55	0.66	3.61	2 2
154481 2	1.99	0.70	2.02	2 2	154489 2	0.75	0.37	0.00	2 2
154481 2	2.04	0.68	1.98	2 2	154489 2	0.88	0.39	0.00	2 2
154482 2	0.72	0.36	0.00	2 2	154490 2	0.83	0.33	0.00	2 2
154482 2	0.73	0.38	0.00	2 2	154490 2	0.84	0.34	0.00	2 2
154483 2	11.53	1.08	10.32	2 2	154491 2	2.54	0.65	2.13	2 2
154483 2	11.86	1.08	10.79	2 2	154491 2	2.56	0.66	2.12	2 2
154484 2	2.11	0.70	3.01	2 2	154492 2	1.57	0.49	0.59	2 2
154484 2	2.15	0.71	3.12	2 2	154492 2	1.65	0.51	0.67	2 2
154485 2	2.08	0.61	1.66	2 2	154493 2	2.69	0.39	0.00	2 2
154485 2	2.09	0.61	1.64	2 2	154493 2	1.26	0.32	0.00	2 2
154486 2	1.61	0.42	0.00	2 2					
154486 2	1.32	0.36	0.00	2 2					

5. Dissolved Inorganic Carbon in Seawater Bob Gershey

a. Description of Equipment and Technique

The total dissolved inorganic carbon content of seawater is defined as the total concentration of carbonate ion, bicarbonate ion and unionized species of carbon dioxide. Before analysis, the sample was treated with acid to convert all ionized species to the unionized form, which was then separated from the liquid phase and subsequently measured using the coulometric titration technique. This involved the reaction of carbon dioxide gas with a dimethysulfoxide solution of ethanoline to produce hydroxyethylcarbamic acid. The acidic solution was titrated with hydroxide ion formed by the electrolytic decomposition of water. The progress of the titration was followed through colorimetric measurement of the absorbance of a pH indicator dye (thymolphthalein) in the ethanolamine solution.

A known volume of seawater was dispensed into a stripping chamber from a pipet of known volume and temperature controlled to within 0.4 °C. It was then acidified with ten percent its volume of an eight percent solution of carbon dioxide-free phosphoric acid. The solution was stripped of carbon dioxide gas by bubbling with a stream of nitrogen gas directed through a glass frit. The carrier gas exiting the stripper passed through a magnesium perchlorate trap to remove water vapour and acidic water droplets.

The gas stream was then directed into the coulometric titrator where the total amount of carbon dioxide gas was quantified. The coulometer was calibrated in two ways. Calibration using gas loops was accomplished by filling stainless steel sample loops (1.5, 2.5 ml) with 99.995% carbon dioxide gas and injecting these into the coulometer. The temperature and pressure of the gas within the loops must be known to within 0.05 °C and 20 Pa respectively. Standard solutions of sodium carbonate were also used to calibrate the system. These samples were treated in the same manner as a seawater sample.

Values were reported in units of μmol/kg. The overall precision of the analysis should have been at least 1.5 μmol/kg for samples with concentrations in the range of 1800-2300 μmol/kg.

b. Sampling Procedure and Data Processing Technique

Water samples were initially collected using a 10 litre rosette bottle. Samples for analysis of total inorganic carbon were drawn immediately following the drawing of the oxygen samples in order to minimize exchange of carbon dioxide gas with the head space in the sampler. This exchange typically results in a loss of carbon dioxide. It was desirable that the samples be drawn before half the sampler was emptied and within ten minutes of recovery. Clean borosilicate glass bottles were rinsed twice with 30 - 50 ml of the sample. The bottle was then filled from the bottom

using a length of vinyl tubing attached to the spigot of the sampler. The sample was overflowed by at least a half of the volume of the bottle (typically 250 ml). A head space of 1% was left to allow for expansion without leakage. If samples were not to be analyzed within four to five hours, the sample were poisoned with 100 μl/250 ml of 50% saturated mercuric chloride solution. The bottle was tightly sealed and stored preferably at the temperature of collection.

c. Replicate Analysis

In total, 85 replicate carbonate measurements were obtained for 84 sample id numbers. Eighty-three sample id numbers had one replicate, while one sample id number had two replicates. No replicate difference could be calculated for four sample id numbers because at least one of the two sample values was unacceptable or unavailable. Thus, only 80 sample id numbers were used in calculating 82 replicate difference statistics. The following is a statistical summary of the absolute value of the replicate differences. Table C.6 lists all 85 replicate measurements.

Number of Replicate Differences = 1 id had two replicates * 3 possible differences
+ 79 ids had one replicate * 1 possible difference = 3 + 79 = 82

Statistic	Value
Number of Replicate Differences	82
Minimum (μmoles/kg)	0
Maximum (μmoles/kg)	77.0
Mean (μmoles/kg)	3.6
Median (μmoles/kg)	1.4
Standard Deviation (μmoles/kg)	9.4

Table C.6 Replicate water sample total carbon values in μmoles/kg.

Sample ID Number	Total Carbon	WOCE QF	Sample ID Number	Total Carbon	WOCE QF
152937	2244.8	2	153124	2154.2	2
152937	2240.3	2	153124	2158.5	2
152948	2247.0	2	153140	2189.2	2
152948	2248.1	2	153140	2189.5	2
152951	2103.6	2	153163	2171.2	2
152951	2107.1	2	153163	2174.9	2
152954	2163.1	2			
152954	2165.6	2			
152974	2057.9	2			
152974	2060.0	2			
152978	2056.1	2			
152978	2048.0	2			
152989	2161.8	2			
152989	2164.2	2			
153000	2163.7	2			
153000	2163.9	2			
153022	2168.6	2			
153022	2170.7	2			
153034	2154.6	2			
153034	2154.6	2			
153042	2169.2	2			
153042	2167.2	2			
153078	2149.3	2			
153078		5			
153095	2175.7	2			
153095	2177.2	2			

Table C.6 Replicate water sample total carbon values in μmoles/kg.

Sample ID Number	Total Carbon	WOCE QF	Sample ID Number	Total Carbon	WOCE QF
153173	2152.3	2	153534	2160.7	2
153173	2153.1	2	153534	2162.8	2
153254	2184.6	2	153553	2171.4	2
153254	2184.4	2	153553	2171.8	2
153301	2165.0	2	153577	2170.3	2
153301	2175.8	2	153577	2168.5	2
153312	2152.5	2			
153312	2152.9	2			
153334	2151.4	2			
153334	2153.0	2			
153351	2163.9	2			
153351	2165.4	2			
153369	2179.4	2			
153369	2180.9	2			
153420	2163.3	2			
153420	2164.1	2			
153461	2175.2	2			
153461	2175.8	2			
153482	2090.6	2			
153482	2096.4	2			
153492	2154.5	2			
153492	2153.0	2			
153498	2094.3	2			
153498	2112.9	2			
153507	2178.2	2			
153507	2178.4	2			

Sample ID Number	Total Carbon	WOCE QF	Sample ID Number	Total Carbon	WOCE QF
153589	2163.5	2			
153589	2161.8	2	153806	2171.1	2
			153806	2174.7	2
153611	2154.1	2			
153611	2156.8	2	153812	2153.1	2
			153812	2152.7	2
153632		5			
153632		5	153816	2151.7	2
			153816	2152.3	2
153645		5			
153645		5			
153674	2156.3	2			
153674	2158.3	2			
153698	2155.3	2			
153698	2156.7	2			
153720	2151.5	2			
153720	2151.0	2			
153737	2155.4	2			
153737	2155.4	2			
153753	2040.9	2			
153753	2043.7	2			
153757	2148.7	2			
153757	2151.4	2			
153763	2087.5	2			
153763	2087.4	2			
153765	2158.1	2			
153765	2158.9	2			
153778	2150.6	2			
153778	2151.2	2			
153791	2151.2	2			
153791	2158.5	2			

Sample ID Number	Total Carbon	WOCE QF	Sample ID Number	Total Carbon	WOCE QF
153835	2156.1	2	154080	2119.7	2
153835	2156.2	2			
			154087	2170.2	2
153842	2153.6	2	154087	2166.1	2
153842	2154.2	2			
			154107	2166.6	2
153860	2155.3	2	154107	2168.0	2
153860	2157.2	2			
153866	2177.7	2			
153866	2155.7	2			
153877	2160.3	2			
153877	2159.4	2			
153887	2153.3	2			
153887	2153.4	2			
153893	2162.7	2			
153893	2162.8	2			
153940	2163.1	2			
153940	2169.1	2			
153940	2169.8	2			
153941	2170.1	2			
153941	2163.1	2			
153949	2165.4	2			
153949	2165.5	2			
153995	2168.8	2			
153995	2169.1	2			
154015		9			
154015	2174.7	2			
154061	2167.6	2			
154061	2172.4	2			
154080	2121.9	2			

Sample ID Number	Total Carbon	WOCE QF	Sample ID Number	Total Carbon	WOCE QF
154126	2079.4	2	154362	2149.7	2
154126	2156.4	2	154362	2150.1	2
154144	2160.3	2	154380	2159.3	2
154144	2160.5	2	154380	2159.4	2
154181	2159.5	2	154385	2140.4	2
154181	2159.8	2	154385	2141.7	2
154205	2158.4	2	154399	2050.7	2
154205	2158.1	2	154399	2077.5	2
154212	2158.2	2	154412	2095.5	2
154212	2159.6	2	154412	2100.5	2
154248	2166.7	2	154420	2160.7	2
154248	2167.1	2	154420	2160.1	2
154273	2160.6	2	154439	2132.6	2
154273	2161.1	2	154439	2133.2	2
154315	2158.4	2	154449	2108.7	2
154315	2158.9	2	154449	2110.4	2
154321	2155.9	2	154451	2143.4	2
154321	2155.8	2	154451	2143.2	2
154340	2157.7	2			
154340	2156.0	2			

6. Alkalinity — Frank Zemlyak

a. Description of Equipment and Technique

Total alkalinity was determined using the Marine Chemistry automated titration system. Total alkalinity was determined using a potentiometric titration of the sea water sample using hydrochloric acid. Once the sample was connected to the system, the operation proceeded automatically, from the reaction vessel being rinsed and filled with the sea water sample, to the final calculations at the conclusion of the titration.

When the reaction vessel was filled, the semi-micro combination Ross electrode sensed when the sample had come to equilibrium, the initial relative mvolt reading was then logged, at the same time, the cell temperature was also recorded. At this point, a rather large quantity of 0.2N hydrochloric acid, was added to the cell with a Metrohm E-655 Dosimat. This large quantity of acid titrated the sample beyond the carbonate endpoint, at this point, smaller aliquots (0.040ml) of acid were added until the sample has been titrated to and beyond the second inflection point. With each addition of acid the sample was allowed to come to equilibrium, the mvolt reading was logged. Thus, with these relative changes in the voltage in the cell, the endpoint was calculated by using a modified Gran function. Corrections to the final total alkalinity result were made by using the sample salinity, sample temperature and the nutrients, silicate and phosphate.

b. Sampling Procedure and Data Processing Technique

The 500ml samples used for alkalinity analysis were collected from 10 litre rosette bottles in much the same fashion as the total carbonate samples. The alkalinity samples were drawn immediately following the drawing of the total carbonate samples. The samples were stored in a cold water bath whilst awaiting analysis.

Note: The alkalinity data is currently under quality review.

c. Replicate Analysis

No replicate information is currently available.

7. CFC's — Mike Hingston

a. Description of Equipment and Technique

The analyses were carried out on two purge and trap systems developed at the Bedford Institute of Oceanography. The water samples were injected into the systems directly from the syringes. To ensure proper rinsing, at least two volumes of water was passed through the sample pipette before the actual sample volume. The samples were purged for 4 minutes with ultra high purity nitrogen at a flow rate of 60 ml/min. The components were trapped in Porapak-N trap which was cooled to a temperature of less than 10_°C. They were then desorbed by heating the trap up to at least 170_°C. The contents of the trap were then passed through a 75m DB-624 megabore column.

b. Sampling Procedure and Data Processing Technique

All samples were collected directly from the Niskin bottles using 100ml syringes. The syringes were rinsed three times before they were filled. To prevent contamination, the CFC samples were the first samples which were collected from the Niskin bottles. The samples were then stored in a water bath of continuously flowing surface sea water until analysis. Air samples from the winch room were taken periodically to ensure that it had not become contaminated. The analysis of the samples was always completed within 24 hours after they had been drawn.

c. Replicate Analysis

A total of 62 unique sample id numbers had replicate CFC water samples drawn. In total, three sample id numbers had duplicate samples drawn and 59 sample id numbers had triplicate samples drawn. Replicates were taken at each station, with some of these being run on each system to ensure that the results were comparable. A statistical summary of the absolute value of the replicate differences is below. Only acceptable sample values were used when calculating replicate differences. All replicates and their quality flags are given in Table C.7.

Statistic	CFC11	CFC12	CFC113	Carbon Tet.	Methyl Chl.
Number of Replicate Differences	166	166	163	137	168
Minimum (pmoles/kg)	0.000	0.000	0	0.004	0
Maximum (pmoles/kg)	0.654	1.208	0.240	7.441	4.265
Mean (pmoles/kg)	0.108	0.184	0.039	1.773	0.835
Median (pmoles/kg)	0.078	0.133	0.027	1.430	0.480
Standard Deviation (pmoles/kg)	0.109	0.195	0.040	1.521	0.918
Detection Limits (pmoles/kg)	0.022	0.017	0.010	0.040	0.017

Table C.7 Replicate water sample CFC values in pmoles/kg.

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
152956	2.736	1.483	0.186	6.972	11.879	22222
152956	2.673	1.583	0.197	4.471	11.895	22222
152956	2.575	1.167	0.155	7.898	10.447	22222
152968	2.966	1.419	0.190	7.762	10.019	22222
152968	2.998	1.690	0.204	5.134	10.051	22222
152968	3.272	1.771	0.217	6.183	12.783	22222
152987	2.447	1.233	0.132	9.558	7.847	22222
152987	2.318	1.254	0.122	7.124	7.840	22222
152987	2.530	1.290	0.131	7.560	8.467	22222
153010	2.149	0.815	0.102	8.503	8.036	22222
153010	2.024	0.948	0.106	6.596	7.121	22222
153010	2.188	1.063	0.100	4.529	8.366	22222
153030	0.732	0.141	0.000	8.381	3.454	22222
153030	0.580	0.362	0.062	6.891	1.779	22222
153030	0.585	0.373	0.069	4.814	1.532	22222
153059	2.010	0.993	0.130	5.089	7.127	22222
153059	2.122	1.078	0.125	8.204	6.837	22222
153059	2.133	1.937	0.222		7.646	22252
153085	1.772	0.865	0.118	16.244	11.081	22242
153085	1.815	0.870	0.169	7.373	10.810	22222
153085	1.760	0.928	0.120	4.315	10.472	22222
153100	0.254	0.493	0.073		1.318	22252
153100	0.000	0.106	0.040	5.232	0.220	22222
153100	0.262	0.286	0.064	2.172	0.983	22222
153121	0.527	0.186	0.085	1.218	2.437	22222
153121	0.334	0.148	0.034	4.931	1.492	22222
153121	0.340	0.178	0.035	4.888	1.784	22222
153160	1.908	0.877	0.147	6.878	8.550	22222
153160	2.053	0.936	0.135	16.009	9.576	22242
153160	1.906	1.290	0.101	2.434	8.559	22222
153165	0.412	0.000	0.050	5.639	1.856	33333

Table C.7 Replicate water sample CFC values in pmoles/kg.

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
153165	0.203	0.117	0.039	4.336	1.019	22222
153165	0.170	0.122	0.012	7.102	0.633	22222
153203	0.962	0.538	0.069	4.255	3.059	22222
153203	0.963	0.488	0.030	2.830	3.149	22222
153203	0.957	0.489	0.069	5.061	2.683	22222

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
153220	0.936	0.792	0.053	6.911	2.479	22222
153220	1.038	0.458	0.037	7.520	2.472	22222
153220	1.019	0.485	0.052	6.377	2.135	22222
153240						55555
153240	0.173	0.114	0.024	4.119	0.000	22222
153240	0.249	0.174	0.031	4.807	0.872	22222
153260	0.206	0.000	0.000	2.452	1.561	22222
153260	0.178	0.073	0.014	3.882	1.364	22222
153260	0.252	0.324	0.013	8.463	1.200	22222
153283	0.288	0.097	0.035	2.253	2.176	22222
153283	0.325	0.220	0.016	2.737	1.366	22222
153283	0.330	0.301	0.000	4.108	1.187	22222
153303	0.231	0.103	0.029	4.478	0.878	22222
153303	0.238	0.139	0.047	5.320	0.627	22222
153303	0.325	0.161	0.000	3.486	1.462	22222
153359						55555
153359	1.313	0.462	0.116		5.059	22252
153359	1.162	0.473	0.074	4.825	3.714	22222
153385	1.830	0.663	0.128	6.900	5.918	22222
153385	1.967	0.970	0.088	6.896	5.764	22222
153385	1.996	1.168	0.109	6.064	6.226	22222
153399	0.385	0.183	0.000	3.378	0.993	22222
153399	0.495	0.222	0.091	1.634	1.208	22222
153399	0.556	0.156	0.083	3.195	1.369	22222
153429	1.127	0.576	0.000		2.973	22252
153429	1.164	0.587	0.104	3.531	2.969	22222
153429	1.091	0.458	0.000	6.610	3.074	22222
153447			0.089	2.771	3.134	55222
153447	0.811	0.392	0.033	9.978	1.649	22222
153447	0.794	0.425	0.060	2.537	2.780	22222
153475	1.405	0.682	0.092	3.298	5.445	22222
153475	1.262	0.656	0.118	3.092	4.744	22222
153475	1.399	0.671	0.069	3.213	5.036	22222

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
153490	0.663	0.482	0.026	2.897	2.598	22222
153490	0.638	0.389	0.000	3.927	2.608	22222
153490	0.662	0.391	0.032	3.961	1.884	22222

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
153520	1.219	0.583	0.037	2.382	3.607	22222
153520	1.281	0.623	0.062	2.975	0.000	22222
153520	1.225	0.678	0.000	3.590	3.557	22222
153538	0.416	0.133	0.016	10.455	0.000	22232
153538	0.409	0.184	0.000	3.910	0.000	22222
153538	0.490	0.322	0.000	3.184	0.833	22222
153572	2.119	1.323	0.185	1.607	5.922	22222
153572	1.993	0.994	0.137	4.608	5.753	22222
153572	2.218	1.005	0.067	2.067	1.657	22222
153578	0.759	0.426	0.037	10.615	2.208	22232
153578	0.731	0.182	0.065	4.803	2.341	22222
153578	0.806	0.366	0.042	3.839	2.783	22222
153617	1.671	0.631	0.190	1.569	3.550	22222
153617	1.505	0.666	0.049	7.702	0.672	22222
153617	1.708	0.717	0.196	2.671	6.009	33333
153634	1.570	0.704	0.073	5.438	0.777	22222
153634	1.596	0.793	0.202	5.873	0.520	22222
153634	1.552	0.802	0.133	5.526	4.468	22222
153651	0.762	0.498	0.029	4.029	0.000	22222
153651	0.777	0.522	0.078	4.456	1.583	22222
153651	0.790	0.411	0.038	2.429	1.477	22222
153675	0.852	0.323	0.090	7.942	0.000	22222
153675	0.750	0.477	0.025	5.784	0.000	22222
153675	0.831	0.612	0.077	4.371	2.225	22222
153704	2.432	1.199	0.153	3.896	5.675	22222
153704	2.248	1.326	0.105	4.447	7.546	22222
153704	2.268	1.477	0.094	4.262	7.382	22222
153721	2.469	0.977	0.235	7.544	8.235	22222
153721	2.480	1.126	0.155	9.149	7.771	22222
153721	2.259	1.366	0.145	6.701	7.508	22222
153743	4.992	2.579	0.429	8.575	14.784	22222
153743	4.970	2.612	0.492	7.752	15.135	22222
153743	5.337	2.538	0.455	9.515	15.820	22222

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
153753	6.257	2.749	0.562	11.756	18.170	22332
153753	5.838	2.548	0.686	11.117	17.202	22332
153785	1.896	0.905	0.152		6.163	22252
153785	1.998	1.086	0.235	2.500	6.564	22222
153785	2.166	1.123	0.152	6.537	3.772	22222

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
153792	1.324	0.585	0.132	4.348	1.667	22222
153792	1.119	0.612	0.028	2.258	3.998	22222
153792	1.303	0.792	0.043	10.515	1.626	22232
153829	4.234	2.317	0.345	8.350	11.286	22222
153829	4.571	3.346	0.367	7.732	11.670	22222
153829	4.213	2.138	0.430	9.126	10.885	22222
153840	3.096	1.733	0.214	6.164	8.459	22222
153840	3.080	1.777	0.188	10.241	8.370	22232
153840	2.787	1.486	0.199	6.060	7.459	22222
153870	2.184	0.983	0.121	6.868	7.492	22222
153870	2.194	1.306	0.132	3.865	7.619	22222
153870	2.439	1.546	0.156	7.962	6.877	22222
153899	2.524	1.255	0.434	8.017	9.298	22222
153899	2.741	1.280	0.194	4.456	7.316	22222
153899	2.739	1.285	0.202	10.554	7.058	22232
153906	1.181	0.631	0.055	4.522	3.256	22222
153906	1.062	0.720	0.069	2.069	3.624	22222
153906	1.050	0.554	0.078	4.206	3.750	22222
153950	0.862	0.393	0.042	3.305	2.317	22222
153950	0.762	0.611	0.020	5.048	2.593	22222
153950	0.857	0.298	0.053	3.229	1.923	22222
153975	0.555	0.044	0.036	1.366	0.879	22222
153975	0.554	0.366	0.000	6.277	0.993	22222
153975	0.552	0.448	0.058	3.413	0.825	22222
154010	1.481	0.765	0.059	4.209	4.446	22222
154010	1.842	0.809	0.042	4.225	4.275	22222
154030	1.270	0.826	0.057	3.821	4.288	22222
154030	1.382	0.911	0.052	3.282	4.428	22222
154030	1.299	0.692	0.069	2.175	4.340	22222
154040	0.745	0.320	0.076	3.464	2.558	22222
154040	0.748	0.649	0.039	2.375	2.488	22222
154040	0.721	0.313	0.067	4.045	2.357	22222

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
154080	2.080	0.936	0.165	2.522	3.795	22222
154080	2.245	1.142	0.138	3.462	6.136	22222
154080	2.041	1.203	0.136	6.796	3.095	22222
154110	0.867	0.211	0.062	2.005	2.010	22222
154110	0.872	0.363	0.052	2.792	2.798	22222
154110	0.842	0.557	0.056	1.996	0.370	22222

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
154144	1.714	0.832	0.134	6.653	5.783	22222
154144	1.818	1.083	0.052	4.855	5.447	22222
154144	1.702	0.696	0.095	6.040	5.586	22222
154154	0.844	0.228	0.033	4.878	2.478	22222
154154	1.005	0.374	0.348	8.684	3.908	33333
154154	0.820	0.000	0.035	3.304	2.447	22222
154180	0.768	0.217	0.034	9.658	2.597	22222
154180	0.788	0.448	0.019	3.498	1.655	22222
154180	0.788	0.576	0.000	5.207	1.846	22222
154227	0.868	0.463	0.000	2.870	1.880	22222
154227	0.841	0.476	0.034	2.967	2.233	22222
154261	1.678	0.770	0.071	5.443	5.154	22222
154261	1.556	0.960	0.072	3.183	5.217	22222
154261	1.561	0.634	0.037	3.753	5.232	22222
154288	2.199	1.174	0.174	12.992	6.209	22232
154288	2.191	1.239	0.146	5.401	5.407	22222
154288	2.059	0.907	0.101	13.304	5.497	22232
154327	2.992	1.664	0.205	8.686	9.851	22222
154327	3.248	1.762	0.308	5.108	11.098	22222
154327	3.158	1.969	0.088	5.843	11.103	33333
154345	3.320	1.583	0.245	8.140	11.222	22222
154345	3.073	1.651	0.187	6.477	10.224	22222
154345	3.325	1.658	0.198	6.333	10.987	22222
154380	3.583	1.523	0.282	5.125	11.224	22222
154380	3.762	1.728	0.290	5.603	12.958	22222
154380	3.546	1.332	0.157	7.580	11.058	22222
154397	4.735	2.326	0.442	7.924	14.065	22222
154397	4.764	2.345	0.457	7.764	13.815	22222
154397	4.674	1.965	0.557	8.742	14.702	22322
154427	3.192	1.605	0.118	13.226	10.634	22232
154427	3.177	1.762	0.219	5.589	10.524	22222
154427	3.454	1.829	0.225	6.931	12.037	22222

Sample ID Number	Freon 11	Freon 12	Freon 113	Carbon Tet.	Methyl Chl.	WOCE QF
154438	4.276	3.084	0.204	6.552	13.268	22222
154438	4.557	2.233	0.357	9.745	13.602	22222
154438	3.904	2.275	0.519	10.580	14.715	22332

d. Standards Used

Standardization was carried out using gas standards made up at Brookhaven National Laboratories. Standard volumes were corrected for lab temperature and pressure. Results were reported in units of pmol/kg of sea water. Clean air samples were also analyzed with each station, as a check on the standardization.

8. Reversing Thermometers — Anthony W. Isenor

a. Description of Equipment and Technique

Sensoren-Instrumente-Systeme digital reversing thermometers model RTM 4002 were used to verify CTD thermistor readings on most deep stations. The thermometers had a depth range of up to 10000 m. The pressure housing was made of a glass tube closed at the ends by metal stoppers. One end contained the platinum sensor and the other end was the battery compartment. The thermometers were placed on bottles 1 and 3 on the rosette, thus sampling temperature at the deepest and third deepest bottle trips.

The thermometers were placed in standard reversing thermometer racks on the Niskin bottles. Before deployment, a magnet was passed over the thermometers to clear the display and place the thermometer in sample mode. A new temperature was then recorded upon reversal of the thermometer.

On the deepest stations, unprotected mercury in glass thermometers were also attached to the deepest and third deepest bottle trips. The following table lists the number of readings from each thermometer. Digital thermometers are indicated with a 'T' in the serial number.

Thermometer Ser. No.	Number of Readings
000T345	72
000T347	72
000T350	11
000T352	11
000T354	55
000T881	54
0010984	84
0010986	76

b. Sampling Procedure and Data Processing Technique

The thermometers indicated the temperature reading either via a digital display or column or mercury. The temperature was read and noted on log sheets. The readings were later digitized and calibrations applied using the water sample database system.

c. Calibration Data

The digital reversing thermometers were calibrated at BIO in February 1991 while the mercury thermometers were last calibrated in March 1968. The digital thermometers were calibrated after the cruise, in March 1994, and were found to have significant drift over this period. The March 1994 calibration also improved the thermometer intercomparison and therefore was used for calibrations of this temperature dataset.

d. Replicate Analysis

A total of 135 sample id numbers had digital thermometer temperature replicates. All but two of these sample id numbers had one replicate. The remaining two sample id numbers had two replicates. The following is a statistical summary of the absolute value of the replicate differences. Only acceptable values were used in calculating the statistics.

Statistic	Value
Number of Replicate Differences	139
Minimum (°C)	0.000
Maximum (°C)	1.763
Mean (°C)	0.027
Median (°C)	0.007
Standard Deviation (°C)	0.166

All of the replicate reversing thermometer temperature values, along with the reversing thermometer pressure values are given in Table C.8.

Table C.8 Replicate Reversing Thermometer samples. Temperature is in °C and ITS-90 scale. Pressure is in dbars.

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
152925	000T345	6.415		2 9
152925	000T347	6.423		2 9
152927	000T350	6.314		2 9
152927	000T352	6.324		2 9
152949	000T345	-0.830		2 9
152949	000T347	-0.815		2 9
152951	000T350	-0.942		2 9
152951	000T352	-0.939		2 9
152959	000T345	3.007		2 9
152959	000T347	3.019		2 9
152975	000T345	2.252		2 9
152975	000T347	2.262		2 9
152998	000T345	2.215		2 9
152998	000T347	2.226		2 9
152998	0010984		3552.8	9 2
153000	000T350	2.348		2 9
153000	000T352	2.355		2 9
153022	000T345	2.234		2 9
153022	000T347	2.245		2 9
153022	0010984		3966.5	9 2
153022	0010984		3966.5	9 2
153024	000T350	2.274		2 9
153024	000T352	2.279		2 9
153024	0010986		3802.0	9 2
153024	0010986		3800.8	9 2
153046	000T345	2.177		2 9
153046	000T347	2.188		2 9
153046	0010984		4067.2	9 2
153046	0010984		4054.5	9 2
153048	000T350	2.284		2 9
153048	000T352	2.291		2 9

Table C.8 Replicate Reversing Thermometer samples. Temperature is in °C and ITS-90 scale. Pressure is in dbars.

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153048	0010986		3773.8	9 2
153048	0010986		3761.1	9 2
153070	000T345	3.971		2 9
153070	000T347	2.208		2 9
153070	0010984		4006.5	9 2
153070	0010984		4041.9	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153093	000T345	2.223		2 9
153093	000T347	2.232		2 9
153093	0010984		5452.4	9 2
153093	0010984		5453.5	9 2
153095	000T350	2.257		2 9
153095	000T352	2.263		2 9
153095	0010986		4974.7	9 2
153095	0010986		4971.0	9 2
153116	000T345	2.237		2 9
153116	000T347	2.247		2 9
153116	0010984		5486.2	9 2
153116	0010984		5484.9	9 2
153118	000T350	2.267		2 9
153118	000T352	2.272		2 9
153118	0010986		5205.6	9 2
153118	0010986		5205.4	9 2
153139	000T345	2.225		2 9
153139	000T347	2.234		2 9
153139	0010984		5455.4	9 2
153141	000T350	2.256		2 9
153141	000T352	2.264		2 9
153141	0010986		5190.1	9 2
153162	000T345	2.225		2 9
153162	000T347	2.234		2 9
153162	0010984		5477.0	9 2
153164	000T350	2.256		2 9
153164	000T352	2.266		2 9
153164	0010986		4975.2	9 2
153185	000T345	2.282		2 9
153185	000T347	2.290		2 9
153185	0010984		5520.0	9 2
153185	0010984		5519.3	9 2
153187	000T350	2.256		2 9
153187	000T352	2.265		2 9
153187	0010986		5092.6	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153187	0010986		5094.6	9 2
153208	000T345	2.203		2 9
153208	000T347	2.212		2 9
153208	0010984		5504.5	9 2
153210	000T352	2.267		2 9
153210	000T354	2.101		2 9
153210	0010986		5001.6	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153232	000T345	2.203		2 9
153232	000T347	2.212		2 9
153232	0010984		5357.8	9 2
153232	0010984		5357.8	9 2
153234	000T354	2.236		2 9
153234	0010986		4799.5	9 2
153234	0010986		4799.5	9 2
153255	000T345	2.256		2 9
153255	000T347	2.264		2 9
153255	0010984	4730.8		9 2
153278	000T345	2.244		2 9
153278	000T347	2.253		2 9
153278	0010984		5374.2	9 2
153278	0010984		5374.8	9 2
153280	000T354	2.292		2 9
153280	000T881	2.294		2 9
153280	0010986		4800.5	9 2
153280	0010986		4798.4	9 2
153324	000T345	2.283		2 9
153324	000T347	2.292		2 9
153324	000T347	2.286		2 9
153324	0010984		5218.0	9 2
153324	0010984		5213.4	9 2
153326	000T354	5.349		2 9
153326	000T881	5.353		2 9
153347	000T345	2.271		2 9
153347	000T347	2.240		2 9
153347	0010984		4911.2	9 2
153347	0010984		4907.6	9 2
153349	000T354	2.227		2 9
153349	000T881	2.268		2 9
153349	0010986		5524.3	9 2
153349	0010986		5525.9	9 2
153370	000T345	2.241		2 9
153370	000T347	2.251		2 9

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153370	0010984		4707.6	9 2
153370	0010984		4707.6	9 2
153372	000T354	2.297		2 9
153372	000T881	2.297		2 9
153372	0010986		4076.8	9 2
153372	0010986		4072.8	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153393	000T345	2.240		2 9
153393	000T347	2.251		2 9
153393	0010984		4768.5	9 2
153393	0010984		4769.7	9 2
153395	000T354	2.283		2 9
153395	000T881	2.283		2 9
153395	0010986		4294.7	9 2
153395	0010986		4295.7	9 2
153416	000T345	2.244		2 9
153416	000T347	2.254		2 9
153416	0010984		4428.9	9 2
153418	000T354	2.345		2 9
153418	000T881	2.347		2 9
153418	0010986		3840.9	9 2
153439	000T345	2.289		2 9
153439	000T347	2.297		2 9
153439	0010984		4519.3	9 2
153439	0010984		4519.0	9 2
153441	000T354	2.323		2 9
153441	000T881	2.324		2 9
153441	0010986		3989.5	9 2
153441	0010986		3990.7	9 2
153462	000T345	2.265		2 9
153462	000T347	2.274		2 9
153462	0010984		4666.4	9 2
153464	000T354	2.352		2 9
153464	000T881	2.353		2 9
153464	0010986		4038.5	9 2
153485	000T345	2.281		2 9
153485	000T347	2.289		2 9
153485	0010984		4433.5	9 2
153485	0010984		4433.5	9 2
153487	000T354	2.407		2 9
153487	000T881	2.408		2 9
153487	0010986		3901.2	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153487	0010986		3900.7	9 2
153508	000T345	2.294		2 9
153508	000T347	2.301		2 9
153508	0010984		4893.7	9 2
153508	0010984		4892.5	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153510	000T354	2.348		2 9
153510	000T881	2.349		2 9
153510	0010986		4402.9	9 2
153510	0010986		4403.4	9 2
153531	000T345	2.290		2 9
153531	000T347	2.299		2 9
153531	0010984		4894.2	9 2
153531	0010984		4893.7	9 2
153533	000T354	2.328		2 9
153533	000T881	2.330		2 9
153533	0010986		4410.9	9 2
153533	0010986		4409.4	9 2
153554	000T345	2.305		2 9
153554	000T347	2.313		2 9
153554	0010984		4916.8	9 2
153554	0010984		4907.9	9 2
153556	000T354	2.386		2 9
153556	000T881	2.387		2 9
153556	0010986		4297.1	9 2
153556	0010986		4283.1	9 2
153577	000T345	2.312		2 9
153577	000T347	2.319		2 9
153577	0010984		4766.8	9 2
153600	000T345	2.298		2 9
153600	000T347	2.306		2 9
153600	0010984		4909.8	9 2
153600	0010984	4907.7		9 2
153602	000T354	2.316		2 9
153602	000T881	2.316		2 9
153602	0010986		4377.8	9 2
153602	0010986		4383.7	9 2
153623	000T345	2.291		2 9
153623	000T347	2.299		2 9
153623	0010984		4808.2	9 2
153623	0010984		4810.8	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153625	000T354	2.377		2 9
153625	000T881	2.378		2 9
153625	0010986		4217.7	9 2
153625	0010986		4207.5	9 2
153646	000T345	2.264		2 9
153646	000T347	2.272		2 9
153646	0010984		4746.9	9 2
153646	0010984		4734.9	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153648	000T354	2.346		2 9
153648	000T881	2.347		2 9
153648	0010986		4193.2	9 2
153648	0010986		4200.9	9 2
153669	000T345	2.267		2 9
153669	000T347	2.274		2 9
153669	0010984		4604.6	9 2
153671	000T354	2.357		2 9
153671	000T881	2.358		2 9
153671	0010986		3973.7	9 2
153692	000T345	2.227		2 9
153692	000T347	2.235		2 9
153692	0010984		4114.0	9 2
153692	0010984		4113.8	9 2
153694	000T354	2.316		2 9
153694	000T881	2.317		2 9
153694	0010986		3784.0	9 2
153694	0010986		3782.5	9 2
153715	000T345	3.046		2 9
153715	000T347	3.054		2 9
153717	000T354	3.095		2 9
153717	000T881	3.097		2 9
153735	000T345	3.334		2 9
153735	000T347	3.341		2 9
153737	000T354	3.495		2 9
153737	000T881	3.500		2 9
153747	000T345	3.452		2 9
153747	000T347	3.459		2 9
153749	000T354	3.582		2 9
153749	000T881	3.586		2 9
153755	000T345	3.235		2 9
153755	000T347	3.245		2 9

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153757	000T354	3.344		2 9
153757	000T881	3.350		2 9
153766	000T345	2.299		2 9
153766	000T347	2.307		2 9
153768	000T354	2.595		2 9
153768	000T881	2.597		2 9

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153789	000T345	2.141		2 9
153789	000T347	2.148		2 9
153789	0010984		3740.5	9 2
153789	0010984		3740.5	9 2
153791	000T354	2.473		2 9
153791	000T881	2.491		2 9
153812	000T345	2.997		2 9
153812	000T347	3.005		2 9
153814	000T354	2.976		2 9
153814	000T881	2.977		2 9
153832	000T345	2.197		2 9
153832	000T347	2.205		2 9
153834	000T354	2.693		2 9
153834	000T881	2.694		2 9
153855	000T345	2.217		2 9
153855	000T347	2.225		2 9
153855	0010984		3478.6	9 2
153857	000T354	2.595		2 9
153857	000T881	2.597		2 9
153878	000T345	2.203		2 9
153878	000T347	3.080		2 9
153878	0010984		3916.7	9 2
153880	000T354	2.424		2 9
153880	000T881	2.426		2 9
153901	000T345	2.191		2 9
153901	000T347	2.199		2 9
153901	0010984		4301.6	9 2
153901	0010984		4302.4	9 2
153902	000T354	2.296		2 9
153902	000T881	2.297		2 9
153902	0010986		3869.9	9 2
153902	0010986		3869.0	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153924	000T345	2.320		2 9
153924	000T347	2.328		2 9
153924	0010984		4661.1	9 2
153926	000T354	2.295		2 9
153926	000T881	2.297		2 9
153926	0010986		4130.9	9 2
153926	0010986		4131.4	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
153947	000T345	2.259		2 9
153947	000T347	2.265		2 9
153947	0010984		4835.5	9 2
153947	0010984		4838.7	9 2
153949	000T354	2.336		2 9
153949	000T881	2.338		2 9
153949	0010986		4298.8	9 2
153949	0010986		4301.4	9 2
153970	000T345	2.289		2 9
153970	000T347	2.296		2 9
153970	0010984		4795.8	9 2
153970	0010984		4794.0	9 2
153972	000T354	2.327		2 9
153972	000T881	2.328		2 9
153972	0010986		4194.5	9 2
153972	0010986		4194.0	9 2
153993	000T345	2.298		2 9
153993	000T347	2.305		2 9
153993	0010984		4793.2	9 2
153995	000T354	2.334		2 9
153995	000T881	2.336		2 9
153995	0010986		4199.0	9 2
153995	0010986		4201.2	9 2
154016	000T345	2.305		2 9
154016	000T347	2.313		2 9
154016	0010984		4902.1	9 2
154016	0010984		4902.3	9 2
154018	000T354	2.353		2 9
154018	000T881	2.355		2 9
154018	0010986		4300.0	9 2
154018	0010986		4301.3	9 2
154039	000T345	2.290		2 9
154039	000T347	2.297		2 9
154039	0010984		4892.8	9 2
154041	000T354	2.329		2 9

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
154041	000T881	2.330		2 9
154041	0010986		4380.6	9 2
154062	000T345	2.304		2 9
154062	000T347	2.311		2 9
154062	0010984		5157.2	9 2
154064	000T354	2.378		2 9
154064	000T881	2.380		2 9
154064	0010986	4294.4		9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
154085	000T345	2.295		2 9
154085	000T347	2.302		2 9
154085	0010984		4830.1	9 2
154087	000T354	2.344		2 9
154087	000T881	2.344		2 9
154087	0010986		4411.0	9 2
154108	000T345	2.286		2 9
154108	000T347	2.294		2 9
154108	0010984		4802.7	9 2
154110	000T354	2.370		2 9
154110	000T881	2.371		2 9
154110	0010986		4189.3	9 2
154131	000T345	2.300		2 9
154131	000T347	2.308		2 9
154131	0010984		4755.1	9 2
154131	0010984		4754.8	9 2
154133	000T354	2.350		2 9
154133	000T881	2.351		2 9
154133	0010986		4296.1	9 2
154133	0010986		4297.1	9 2
154154	000T345	2.295		2 9
154154	000T347	2.303		2 9
154154	0010984		4725.6	9 2
154154	0010984		4724.8	9 2
154156	000T354	2.366		2 9
154156	000T881	2.367		2 9
154156	0010986		4189.8	9 2
154156	0010986		4190.0	9 2
154200	000T345	2.289		2 9
154200	000T347	2.296		2 9
154200	0010984		4512.0	9 2
154200	0010984		4512.3	9 2
154202	000T354	2.414		2 9
154202	000T881	2.414		2 9
154202	0010986		3895.1	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
154202	0010986		3906.8	9 2
154223	000T345	2.282		2 9
154223	000T347	2.289		2 9
154223	0010984		4563.4	9 2
154223	0010984		4560.4	9 2

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
154225	000T354	2.359		2 9
154225	000T881	2.361		2 9
154225	0010986		4155.7	9 2
154225	0010986		4155.3	9 2
154246	000T345	2.293		2 9
154246	000T347	2.300		2 9
154246	0010984		4692.0	9 2
154248	000T354	2.335		2 9
154248	000T881	2.336		2 9
154248	0010986		4303.1	9 2
154269	000T345	2.266		2 9
154269	000T347	2.273		2 9
154269	0010984		4651.7	9 2
154271	000T354	2.345		2 9
154271	000T881	2.348		2 9
154271	0010986		4019.8	9 2
154292	000T345	2.181		2 9
154292	000T347	2.188		2 9
154292	000T881	2.239		2 9
154292	0010984		3932.6	9 2
154292	0010984		3930.6	9 2
154292	0010986		3713.3	9 2
154292	0010986		3715.1	9 2
154315	000T345	2.097		2 9
154315	000T347	2.104		2 9
154315	0010984		3844.9	9 2
154317	000T345	2.307		2 9
154317	000T881	2.306		2 9
154338	000T345	2.759		2 9
154338	000T347	2.767		2 9
154340	000T354	2.871		2 9
154340	000T881	2.874		2 9
154359	000T345	2.587		2 9
154359	000T347	2.594		2 9

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
154361	000T354	4.845		2 9
154361	000T881	4.846		2 9
154380	000T345	3.248		2 9
154380	000T347	3.258		2 9
154382	000T354	4.453		2 9
154382	000T881	4.460		2 9

Sample ID Number	Thermometer Serial Number	Main Corrected	Thermometer Pressure	WOCE QF
154399	000T345	3.679		2 9
154399	000T347	3.686		2 9
154401	000T354	4.339		2 9
154401	000T881	4.378		2 9
154417	000T345	3.190		2 9
154417	000T347	3.198		2 9
154419	000T354	3.599		2 9
154419	000T881	3.603		2 9
154434	000T345	3.300		2 9
154434	000T347	3.307		2 9
154436	000T354	3.355		2 9
154436	000T881	3.356		2 9
154446	000T345	-1.648		2 9
154446	000T347	-1.638		2 9
154448	000T354	-0.959		2 9
154448	000T881	-0.953		2 9
154455	000T345	3.128		2 9
154455	000T347	3.136		2 9
154457	000T354	3.441		2 9
154457	000T881	3.442		2 9
154477	000T345	0.911		2 9
154477	000T347	0.920		2 9
154479	000T354	2.367		2 9
154479	000T881	2.370		2 9

D. MOORED MEASUREMENTS - DESCRIPTIONS, TECHNIQUES AND CALIBRATIONS

1. Current Meter Moorings — Allyn Clarke

a. Description of the Equipment and Technique

The BIO deep sea moorings recovered consisted of a large streamlined subsurface buoyancy package supporting one or more Aanderaa Current Meters, back up buoyancy packages and an acoustic release. The subsurface buoyancy packages (i.e. Braincon main floats) were either constructed using 10″ glass balls supported in a fibreglass structure or using deep sea syntactic foam formed in the same streamlined shape as the older glass floats. All of the moorings recovered on 95003 were constructed using jacketed 1/4″ wire and 5/16″ or 1/4″ kevlar. Stainless steel shackles and swivels were used to connect the instruments and backup buoyancy packages to the wire lengths. All shackles were secured with a piece of wire (jacketed or kevlar) as the mooring was assembled and deployed. The acoustic releases were 723A EG&G DAC model releases. The moorings were designed for a 22 month deployment.

The back-up buoyancy packages consisted of two 17″ glass balls contained in plastic hard hats and fastened to a stainless steel tension bar one metre in length. These backup buoyancy packages were shackled together to form doubles and triples before they are shackled into the mooring line.

b. Sampling Procedure and Data Processing Techniques

The recovered Aanderaa current meters were set with a sampling interval of three hours. The data will be processed using standard software packages within the BIO Oceans suite of programs.

c. Calibration Data

The temperature, pressure, conductivity and direction sensors of the Aanderaa current meters were calibrated in the laboratory prior to deployment. These calibrations were not included in this cruise report.

d. Deployment and Recovery logs

Recovery

Mooring No: **1121**
Ship: Hudson
Cruise No: 95003
Date: 04/05/95
Mooring Tech: d'Entremont / Boyce
Type of Nav: GPS
Sea State: 2 m swell, moderate sea
Weather Conditions: 20 kt winds 060^{o}T, gusty, rain showers

Recovery Log

Time (Z)	Instrument	Remarks
1024	release	3 cables to go, enable command, 1 /2 sec for 1 min, transpond echo hidden in bottom echo
1029		release command, 1 /sec for 1 min, on its way up
1034		beacon heard off starboard, buoy spotted 2 cables off port beam
1040		approaching buoy upwind, 2 bb packages on surface
1102		hooked tag line, buoy moved under port bow
1113		could not move vessel back up into the wind, attached floats to the end of the grapnel line and let go of float. manoeuvring vessel to try to pickup with head to wind.
1125		pick up tag line again, buoy against starboard side
1130		line over the block, light working
1135	ACM 7136	buoy and ACM out of water, rotor spinning, bb packages leading abaft the port beam
1150	2 bb	out of water
1201	ACM 8696	out of water, rotor spinning
1212	2 bb	out of water in wire tangle
1244	ACM 7012	out of water, rotor spinning, loop of wire loosely across ACM
1248	2 bb, release	out of water, recovery complete

Recovery

Mooring No: **1122**
Ship: Hudson
Cruise No: 95003
Dates: 03/05/95, 04/05/95 and 14/05/95
Mooring Tech: d'Entremont / Boyce
Type of Nav: GPS
Sea State: 3 May, small sea, 4 May, building sea, 14 May, small sea
Weather Conditions: 3 May, light winds, fog, 4 May, winds 30-35, increasing, 14 May, light winds, fog

Recovery Log

Time (Z)	Instrument	Remarks
3/5 1957	release	enable command sent, no reply
1959		enable command sent, no reply
2000		enable command sent, no reply
2003		enable command sent, no reply/no transpond
2006		enable command sent, no reply
2008		enable command sent, no reply
2010		over the side transducer, enable command, no reply
2012		over the side transducer, enable command, no reply
2014		enable command sent, no reply
2016		enable command sent, no reply, going to exact site to see if we can see Braincon float on sounder
2018		enable command sent, no reply
2020		enable command sent, no reply, passed over site twice using sounder, got probable echo from Braincon both times at a minimum range of 170 fathoms
2045		fog bank rolled in, sent disable, will try again tomorrow
4/5 1526		enable command sent, no reply
1539		disable command sent, abandon recovery attempt due to weather
14/5 0900		enable command sent, no reply
0915		saw float? on sounder, manouvering to return to site.
0925		saw float? on sounder, release command sent, no reply

0937		high flyer deployed 1 cable south of site
0955		returned to original site, spotted buoyancy on sounder
0958		release command sent, still see float on sounder, no release.
1005		saw float on sounder
1006		disable command sent, end mooring recovery operation

Recovery

Mooring No: **1123**
Ship: Hudson
Cruise No: 95003
Date: 03/05/95
Mooring Tech: d'Entremont / Boyce
Type of Nav: GPS
Sea State: 1 m swell
Weather Conditions: light breeze

Recovery Log

Time (Z)	Instrument	Remarks
1537	release	enable command, 1/2 sec for 1 min
1600		4.3 cables acoustics, 1.8 cables from anchor site, release command sent, 1/sec for 1 min
1605		float spotted, beacon working but direction 180^{o} off
1621		2 sets of bb on surface
1629		hooked tag line
1634	ACM 5578	buoy, ACM out of water, light flashing, antenna intact, rotor spinning
1640		hauling wire, removing fairing
1650		join in wire, continuing recovering fairing
1707	ACM 4603	fairing complete, ACM out of water, rotor spinning
1714	3 bb	out of water
1722	ACM 820	out of water, rotor spinning
1730	3 bb	out of water, tangle with Kevlar
1744	ACM 5032	out of water, tangle with Kevlar
1750	2 bb	out of water, in a tangle of Kevlar
1805	ACM 828	out of water, rotor spinning
1807	2 bb, release	out of water, mooring recovery complete

Recovery

Mooring No: **1124**
Ship: Hudson
Cruise No: 95003
Date: 3/05/95
Mooring Tech: d'Entremont / Boyce
Type of Nav: GPS
Sea State:
Weather Conditions: 25 kt winds

Recovery Log

Time (Z)	Instrument	Remarks
1131	release	enable command, 1/2 sec for 1 min
1144	release	4 cables from site, release command, 1/2 sec for 1 min. no release
1148		release command, 1/2 sec for 1 min, no release
1150		disable command, no transpond
1151		enable command, 1/2 sec for 1 min, transponding
1154		release command, 1/2 sec for 1 min, no release
1156		release command, 1/2 sec for 1 min, no release
1200		release command, 1/2 sec for 1 min
1205		transducer over side, release command, 1/2 sec for 1 min, no release
1207		transducer over side, release command, 1/2 sec for 1 min
1223		ram transducer, release command, 1/2 sec for 1 min, 3 cables from site
1225		release command, 1/2 sec for 1 min
1227		release command, 1/2 sec for 1 min, no release
1229		release command, 1/2 sec for 1 min, no release
1232		release command, 1/2 sec for 1 min, no release
1235		disable command, release disabled, finished with recovery operation

Recovery

Mooring No: **1125**
Ship: Hudson
Cruise No: 95003
Date: 02/05/95
Mooring Tech: d'Entremont / Boyce
Type of Nav: GPS
Sea State: 1 m swell
Weather Conditions: overcast, calm

Recovery Log

Time (Z)	Instrument	Remarks
1639	release	send wake up call, no reply
1640		send enable, no reply
1642		ram down, send wake up, weak 1/2 sec for 1 min, not transponding
1649		send enable, weak 1/2 sec for 1 min
1651		send enable, weak 1/2 sec for 1 min
1703		still not transponding, send enable, no clear reply
1706		send release command, weak 1/sec for 1 min; however transponder is working and release is rising.
1749		no sign of Braincon at surface, release has stopped rising at about 330 ft from surface. (this distance from surface was subsequently seen to be an incorrect interpretation of the sounder traces)
1814		4 bb packages sighted on surface
1836	3 bb	hooked 3 bb package, probably topmost package
1842	3 bb	on board - both Kevlar and jacketed wire attached. hauling jacketed wire first.
1850	ACM 4154	out of water, rotor spinning, tangled in Kevlar
1853		hauling jacketed wire
1859	3 bb	these packages were submerged, out of water
1905	ACM 3196	out of water, snarled in faired jacketed cable
1934	ACM 4349	out of water, rotor spinning, short length of wire to Braincon was broken off at the thimble.

1943		hauling Kevlar, problems with the winch, switched to the Pengo
2026	ACM 2037, ACM 1039	both tangled together, out of water
2037	2 bb	out of water in a loop
2108	ACM 8695	out of water, rotor is broken
2112	2 bb, 2 bb, release	out of water and on board
2118		all wire now on board, recovery complete

Recovery

Mooring No: **1126**
Ship: Hudson
Cruise No: 95003
Date: 02/05/95
Mooring Tech: d'Entremont / Boyce
Type of Nav: GPS
Sea State: 1-2 m swell, light sea
Weather Conditions: light breeze, NW

Recovery Log

Time (Z)	Instrument	Remarks
1151	release	send wakeup call, 2/sec for 1 min
1208	release	5 cables away, release command, 1/sec for 1 min
1213		buoy sighted on starboard beam
1230	buoyancy	hooked tag line, 42° 27.218 N 45° 59.802 W
1233	ACM 1283	buoy, ACM out of water, rotor spinning, light working, beacon antennae on, beacon not working
1245	ACM 786	ACM out of water, rotor spinning, vane may be bent
1251	2 bb	out of water, note these bb were not at surface
1259	ACM 9261	out of water, rotor spinning
1308	2 bb	out of water, Kevlar jacket off 1 m from splice
1316	ACM 217	out of water, rotor spinning, radio beacon now working
1324	ACM 1277	out of water, rotor spinning
1337	ACM 4209	out of water, rotor spinning
1343	2 bb	out of water, in separate loop, single line leading to ACM
1349	ACM 7524	out of water, rotor spinning
1352	2 bb, release	out of water, recovery complete

Recovery

Mooring No:	**1127**
Ship:	Hudson
Cruise No:	95003
Date:	01/05/95
Mooring Tech:	d'Entremont / Boyce
Type of Nav:	GPS
Sea State:	2-3 m swell and sea
Weather Conditions:	15 -20 kt winds, rain squalls

Recovery Log

Time (Z)	Instrument	Remarks
1622	release	sent wakeup command, reply 2/sec for 1 min, range .75 nm, transponder working, range to site closing to .6 nm.
1626	release	sent release command. 1/sec for 1 min
1908		no sign of surface float or beacons. Did search on release using range on transponder. Finally spotted bb at range of 300 fathoms
1925	2 bb, release	2 bb hooked with light grapnel, trying to get heavier grapnel hooked for recovery
1935	2 bb, release	2bb, release out of water and on board. Wire leading under bow of Hudson. Rotating vessel to get ship off wire.
1947		start hauling in wire
1949	ACM 6187	ACM out of water, rotor spinning
1952		hauling, problems with winch
1956		end of 100 m length
2002	2 bb	out of water
2010	ACM 6402	out of water, rotor spinning
2023	ACM 9324	out of water, rotor spinning
2044	ACM 9267	out of water, rotor spinning when not shielded by the rotor shield
2057	2 bb	out of water, switch to wire lengths
2059		change spools
2110	ACM 9592	out of water, rotor spinning, back end cap missing
2118	2 bb	out of water
2124	ACM 5002	out of water, rotor spinning, wire tangled around CM, meter is flooded, tension rod of its spindle

2141	ACM 4351	ACM out of water, rotor spinning, spindle broken, rotor bottom pivot broken, only the thimble left on bottom of ACM, mooring recovery complete

Recovery

Mooring No: **1128**
Ship: Hudson
Cruise No: 95003
Date: 01/05/95
Mooring Tech: d'Entremont / Boyce
Type of Nav: GPS
Sea State: 2-3 m swell, _ m sea
Weather Conditions: overcast, 15 kt winds, rain squalls

Recovery Log

Time (Z)	Instrument	Remarks
1012	release	sent wake up command, 2/sec reply for 1 min
1015	release	release transponding, ranging with sounder
1030	release	release command sent, 1/sec for 1 min, 664 ft slant range
1036	buoyancy	main buoyancy package on surface, beacon not working, waiting for bb to appear
1104		along side, light working, beacon working
1105		buoy recovery loop hooked on
1108	ACM 5395	ACM 5395 out of water, rotor spinning
1110	ACM 5395	buoyancy and ACM 5395 on board, antenna on beacon is broken
1131	ACM 1607	out of water, rotor spinning
1141	2 bb	out of water
1153	ACM 9269	out of water, rotor spinning
1203	2 bb	out of water, start hauling Kevlar
1212	ACM 9687	ACM out of water, rotor spinning
1227	ACM 9591	out of water, rotor spinning
1233		changed the spool on the winch after the end of the 984 m length
1244	ACM 4201	ACM out of water, rotor spinning
1252	2 bb	wire snarled around bb, appears to be 300 m length
1259	ACM 5572	ACM out of water, rotor spinning

1303	2 bb, release	out of water, recovery complete

E. ACKNOWLEDGEMENTS

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