#111/04-06-87

ACCESSION NUMBER 8700128

323099 C100 A00510

DATA DOCUMENTATION FORM

NOAA FORM 24-13 (2-85)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEANOGRAPHIC DATA CENTER
RECORDS SECTION
WASHINGTON, DC 20235

FORM APPROVED
O.M.B. No. 0648-0024
EXPIRES 2/29/87

(While you are not required to use this form, it is the most desirable mechanism for providing the required ancillary information enabling the NODC and users to obtain the greatest benefit from your data.)

This form should accompany all data submissions to NODC. Section A, Originator Identification, must be completed when the data are submitted. It is highly desirable for NODC to also receive the remaining pertinent information at that time. This may be most easily accomplished by attaching reports, publications, or manuscripts which are readily available describing data collection, analysis, and format specifics. Readable, handwritten submissions are acceptable in all cases. All data shipments should be sent to the above address.

A. ORIGINATOR IDENTIFICATION

THIS SECTION MUST BE COMPLETED BY DONOR FOR ALL DATA TRANSMITTALS

1. NAME AND ADDRESS OF INSTITUTION, LABORATORY, OR ACTIVITY WITH WHICH SUBMITTED DATA ARE ASSOCIATED

Pacific Marine Environmental Laboratory
NOAA/OAR
7600 Sand Point Way NE
Seattle, Wa. 98115

2. EXPEDITION, PROJECT, OR PROGRAM DURING WHICH DATA WERE COLLECTED

Asian Dust Input to the Oceanic System (ADIOS)

3. CRUISE NUMBER(S) USED BY ORIGINATOR TO IDENTIFY DATA IN THIS SHIPMENT

ADIOS 3-18

4. PLATFORM NAME(S)	5. PLATFORM TYPE(S) (E.G., SHIP, BUOY, ETC.)	6. PLATFORM AND OPERATOR NATIONALITY(IES)		7. DATES	
		PLATFORM	OPERATOR	FROM: MO/DAY/YR	TO: MO/DAY/YR
Moana Wave	ship	U.S.	U.S.	3/25/86	4/16/86

8. ARE DATA PROPRIETARY?

[X] NO [ ] YES

IF YES, WHEN CAN THEY BE RELEASED FOR GENERAL USE? YEAR____ MONTH____

9. ARE DATA DECLARED NATIONAL PROGRAM (DNP)?
(I.E., SHOULD THEY BE INCLUDED IN WORLD DATA CENTERS HOLDINGS FOR INTERNATIONAL EXCHANGE?)

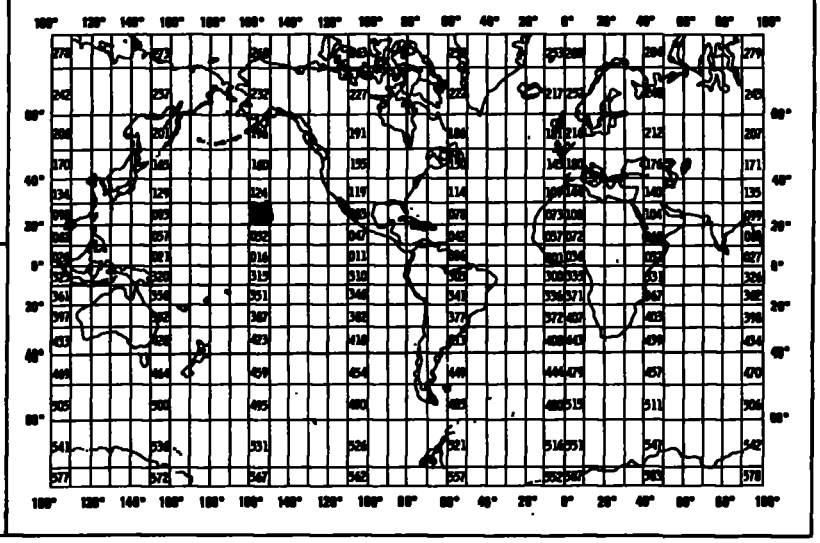
[X] NO [ ] YES [ ] PART *(SPECIFY BELOW)*

10. PERSON TO WHOM INQUIRIES CONCERNING DATA SHOULD BE ADDRESSED WITH TELEPHONE NUMBER *(AND ADDRESS IF OTHER THAN IN ITEM-1)*

Dr. Richard Feely
(206) 526-6214

11. PLEASE DARKEN ALL MARSDEN SQUARES IN WHICH ANY DATA *CONTAINED IN YOUR SUBMISSION WERE COLLECTED.*

GENERAL AREA



NOAA FORM 24-13

B. SCIENTIFIC CONTENT

Include enough information concerning manner of observation, instrumentation, analysis, and data reduction routines to make them understandable to future users. Furnish the minimum documentation considered relevant to each data type. Documentation will be retained as a permanent part of the data and will be available to future users. Equivalent information already available may be substituted for this section of the form (i.e., publications, reports, and manuscripts describing observational and analytical methods). If you do not provide equivalent information by attachment, please complete the scientific content section in a manner similar to the one shown in the following example.

EXAMPLE (HYPOTHETICAL INFORMATION)

NAME OF DATA FIELD	REPORTING UNITS OR CODE	METHODS OF OBSERVATION AND INSTRUMENTS USED (SPECIFY TYPE AND MODEL)	ANALYTICAL METHODS (INCLUDING MODIFICATIONS) AND LABORATORY PROCEDURES	DATA PROCESSING TECHNIQUES WITH FILTERING AND AVERAGING
Salinity	‰	Nansen bottles	Inductive salinometer (Hytech model S510)	N/A (Not applicable)
		STD Bissett-Berman Model 9006	N/A	Values averaged over 5-meter intervals
Water color	Forel scale	Visual comparison with Forel bottles	N/A	N/A
Sediment size	ϕ units and percent by weight	Ewing corer	Standard sieves. Carbonate fraction removed by acid treatment	Same as "Sedimentary Rock Manual," Folk '65

(SPACE IS PROVIDED ON THE FOLLOWING TWO PAGES FOR THIS INFORMATION)

B. SCIENTIFIC CONTENT

NAME OF DATA FIELD	REPORTING UNITS OR CODE	METHODS OF OBSERVATION AND INSTRUMENTS USED (SPECIFY TYPE AND MODEL)	ANALYTICAL METHODS (INCLUDING MODIFICATIONS) AND LABORATORY PROCEDURES	DATA PROCESSING TECHNIQUES WITH FILTERING AND AVERAGING

B. SCIENTIFIC CONTENT

NAME OF DATA FIELD	REPORTING UNITS OR CODE	METHODS OF OBSERVATION AND INSTRUMENTS USED (SPECIFY TYPE AND MODEL)	ANALYTICAL METHODS (INCLUDING MODIFICATIONS) AND LABORATORY PROCEDURES	DATA PROCESSING TECHNIQUES WITH FILTERING AND AVERAGING

C. DATA FORMAT

This information is requested only for data transmitted on punched cards or magnetic tape. Have one of your data processing specialists furnish answers either on the form or by attaching equivalent readily available documentation. Identify the nature and meaning of all entries and explain any codes used.

1. List the record types contained in your file transmittal (e.g., tape label record, master, detail, standard depth, etc.).

2. Describe briefly how your file is organized.

3-13. Self-explanatory.

14. Enter the field name as appropriate (e.g., header information, temperature, depth, salinity.

15. Enter starting position of the field.

16. Enter field length in number columns and unit of measurement (e.g., bit, byte, character, word) in unit column.

17. Enter attributes as expressed in the programming language specified in item 3 (e.g., "F 4.1," "BINARY FIXED (5.1)").

18. Describe field. If sort field, enter "SORT 1" for first, "SORT 2" for second, etc. If field is repeated, state number of times it is repeated.

C. DATA FORMAT

COMPLETE THIS SECTION FOR PUNCHED CARDS OR TAPE, MAGNETIC TAPE, OR DISC SUBMISSIONS.

1. LIST RECORD TYPES CONTAINED IN THE TRANSMITTAL OF YOUR FILE
GIVE METHOD OF IDENTIFYING EACH RECORD TYPE

2. GIVE BRIEF DESCRIPTION OF FILE ORGANIZATION

3. ATTRIBUTES AS EXPRESSED IN ☐ PL-1 ☐ ALGOL ☐ COBOL
☒ FORTRAN ☐ _____ LANGUAGE

4. RESPONSIBLE COMPUTER SPECIALIST:
NAME AND PHONE NUMBER Mr. Dan Lee, (206) 526-6889
ADDRESS NOAA/PMEL, 7600 Sand Point Way NE, Seattle, Wa. 98115

COMPLETE THIS SECTION IF DATA ARE ON MAGNETIC TAPE

5. RECORDING MODE
☐ BCD ☐ BINARY
☒ ASCII ☐ EBCDIC
☐ _____

6. NUMBER OF TRACKS (CHANNELS)
☐ SEVEN
☒ NINE
☐ _____

7. PARITY
☒ ODD
☐ EVEN

8. DENSITY
☐ 200 BPI ☒ 1600 BPI
☐ 556 BPI
☐ 800 BPI
☐ _____

9. LENGTH OF INTER-RECORD GAP (IF KNOWN) ☐ 3/4 INCH
☐ _____

10. END OF FILE MARK
☒ OCTAL 17
☐ _____

11. PASTE-ON-PAPER LABEL DESCRIPTION *(INCLUDE ORIGINATOR NAME AND SOME LAY SPECIFICATIONS OF DATA TYPE, VOLUME NUMBER)*
ADIOS 3-18, STD and nutrients data sets, field period 3/25 to 4/16/86. 9 track, ASCII, odd parity, 1600 bpi tape.

12. PHYSICAL BLOCK LENGTH IN BYTES

13. LENGTH OF BYTES IN BITS

NOAA FORM 24-13

RECORD FORMAT DESCRIPTION

RECORD NAME _____

14. FIELD NAME	15. POSITION FROM-1 MEASURED IN _____ (e.g., bits, bytes)	16. LENGTH		17. ATTRIBUTES	18. USE AND MEANING
		NUMBER	UNITS		

NOAA FORM 24-13

RECORD FORMAT DESCRIPTION

RECORD NAME _____

14. FIELD NAME	15. POSITION FROM - 1 MEASURED IN _____ (e.g., bits, bytes)	16. LENGTH		17. ATTRIBUTES	18. USE AND MEANING
		NUMBER	UNITS		

NOAA FORM-24-18

RECORD FORMAT DESCRIPTION

RECORD NAME _____

14. FIELD NAME	15. POSITION FROM - 1 MEASURED IN _____ (e.g., bits, bytes)	16. LENGTH		17. ATTRIBUTES	18. USE AND MEANING
		NUMBER	UNITS		

NOAA FORM 24-13

RECORD FORMAT DESCRIPTION

RECORD NAME _____

14. FIELD NAME	15. POSITION FROM-1 MEASURED IN _____ (e.g., bits, bytes)	16. LENGTH		17. ATTRIBUTES	18. USE AND MEANING
		NUMBER	UNITS		

NOAA FORM 24-13

D. INSTRUMENT CALIBRATION

This calibration information will be utilized by NOAA's National Oceanographic Instrumentation Center in their efforts to develop calibration standards for voluntary acceptance by the oceanographic community. Identify the instruments used by your organization to obtain the scientific content of the DDF (i.e., STD, temperature and pressure sensors, salinometers, oxygen meters, velocimeters, etc.) and furnish the calibration data requested by completing and/or checking ("✓") the appropriate spaces. Add the interval time (i.e., 3 months, 6 months, 9 months, etc.) if the fixed interval calibration cycle is checked.

INSTRUMENT TYPE (MFR., MODEL NO.)	DATE OF LAST CALIBRATION	INSTRUMENT WAS CALIBRATED BY		CHECK ONE: INSTRUMENT IS CALIBRATED					INSTRUMENT IS NOT CALIBRATED
		YOUR ORGANIZATION (√)	OTHER ORGANIZATION (GIVE NAME)	AT FIXED INTERVALS (√)	BEFORE OR AFTER USE (√)	BEFORE AND AFTER USE (√)	ONLY AFTER REPAIR (√)	ONLY WHEN NEW (√)	(√)

NOAA FORM 24-13

Unique No.: 194273 Date of Entry: 08/22/90

DATA ENTRY INFORMATION SYSTEM
(DATASET INVENTORY - DINDB)

Accession No.: 8700128 Reference No.: 323099
Former Accession No.: Former Reference No.: (Resub ONLY)

Media-In (DINDB): 09 - Digital Magnetic Tape

Exchange Format: E003 - Ocean Station Data (SD2-112 Byte)

Processing Format: C100 - Ocean Station Data (SD2 Format)

* Note * If data is F022, create an additional record for C022.

Country/Institute Code: 313F Country/Platform Code: 32MW

Platform Type (DINDB): 09 - Ship Orig. Cruise ID: ADIOS

Cruise Start Date: 03/25/86 Project Code:

Cruise End Date: 04/16/86 Data Use Code (DUC): 3

Number of Stations: 9 Number of Records: 107

If stations/records not appropriate then:

Number: Units:

Ocean Area:

Code 1: 57A Meaning: NE Pacific (limit-180)
Code 2: Meaning:
Code 3: Meaning:

DINDB Transaction Date:

CESSION NO. 8700128 FILETYPE C100 TRACK NO. 323099 PROJECT IDENTIFICATION

8700128 C100

TP	DATE	INIT.	TAPE OR DISK DSN	NO. FILES	LRECL	BLK SIZE	NO. RECORDS
G. TAPE	4/15/87	ML	A00510	10	80	3200	6-1-93
LICATE TAPE	4/14/87	ML	W04778 *		80	3200	
ORMATTED TAPE	8-17-90	R.P.S.	W14670 **	1	112	11200	107
ORMATTED DISK							
ST MULCHEK							
AL MULCHEK							
75 OR F022							
A SET FINALIZED							

ORS REPORTED TO PRINCIPAL INVESTIGATOR: * DNODC *8700128-01

** LABEL: DNODC*ADIOSSTAOUT

ITIONAL ERRORS/CORRECTIONS (NOT REPORTED TO P.I.)

MENTS (TRACKS DELETED, FIELDS DELETED, ETC.)

Attachment D

ADIOS-13 26 00.5N 155 01.7W 14 APR 1988

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
9	20.36	35.354	24.938	227.0		1.27		2.338	2.028	338	485	341	104
50	20.36	35.352	24.937	227.0		1.85		2.340	2.030	338	482	340	104
101	20.36	35.349	24.936	226.0		1.85		2.337	2.025	334	480	339	104
150	19.69	35.246	25.034	219.9		2.83		2.331	2.034	346	453	321	104
200	18.68	35.116	25.193	216.9		2.83		2.323	2.040	353	428	303	104
298	12.63	34.298	26.924	214.3		9.36		2.275	2.079	413	282	208	104
400	9.84	34.118	26.293	208.5		20.56		2.273	2.116	462	235	169	104
570	6.30	34.029	26.750	93.0		60.68		2.298	2.260	960	107	79	104
700	5.03	34.179	27.024	32.3		89.58		2.332	2.353	1281	78	58	104
800	4.54	34.281	27.159	23.6		102.81		2.353	2.358	1305	74	56	104
1001	3.84	34.426	27.348	43.2		115.25		2.383	2.376	1153	78	60	104

ml/l u.g. atoms/l

NOAA FORM 24-5
(8-73)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TRANSMITTAL AND RECEIPT RECORD

(Please sign and return carbon copy acknowledging receipt)

TO:	REFER TO
NOAA/NESDIS/NODC 1825 Connecticut Ave NW Washington DC 20235	ATTENTION E/OC13, Dr. Anthony R. Picciolo

THE ITEM(S) LISTED BELOW WERE FORWARDED TO YOU BY

☐ ORDINARY MAIL ☐ REGISTERED MAIL ☐ AIR MAIL ☒ CERTIFIED MAIL ☐ GOVERNMENT TRUCK ☐ BY HAND ☐ OTHER

Cert. no. 523142

Enclosed, find one (1) magnetic data tape and associated documentation. These are STD and nutrients data, collected under the Asian Dust Input to the Oceanic System (ADIOS) project. Tape has 9 stas. of data, ADIOS 3-18, see attached sheets.

** Note these data were collected under NSF grant OCE85-02474.

Tape specs: 9 track, ASCII, unlabelled, odd parity, 1600 bpi.

cc: Ms. Marilyn Roberts, PMEL

8700128
A00510

FORWARDED BY (Signature)	TITLE	DATE FORWARDED
Sid Stillwaugh	NODC Liaison Officer, Seattle	
RECEIVED BY (Signature)	**TITLE**	**DATE RECEIVED**
F MITCHELL		4-6-87

NOAA FORM 24-5 (8-73)

LEWIS, M.	6735634	EG1200BN3B39	DATE SUBMITTED 4/15/87	DATE DUE ASAP	PRI

IPMENT TO BE USED AND FUNCTION TO BE PREFORMED

Scan

UT MEDIUM APER CARD DISK (TAPE) SKETTE OTHER(SPECIFY)	OUTPUT MEDIUM CARD DISK (PRINT) TAPE PLOT DISKETTE OTHER(SPECIFY)

E/DISKETTE INFORMATION

	TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# O FIL
	A00510									
	SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF. OTHER(SPECIFY)				DATA SET NAME			PUR DAT
JT	TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# O FIL
	SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURG DATE
	TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY TYPE	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
UT	SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURG DATE

IAL INSTRUCTIONS

ESTIMATED EXECUTION TIME

USE ONLY

	DATE JOB COMPLETED	START TIME	END TIME	PRIORITY	DEVICES USED, NUMBER OF TAPE MOUNTS, LINES PRINTI DISKETTES USED, CARDS PUNCHED, CARDS KEYVERIFIEI
1045344	04/15/87	1735	1500	C	COMPLETED by: FC

MARY R. LEWIS	6735636	EG12008N3839	SUBMITTED 4/16/87	ASAP	08

IPMENT TO BE USED AND FUNCTION TO BE PERFORMED

Copy to 'W' tape and scan

INPUT MEDIUM	OUTPUT MEDIUM
APER CARD DISK (TAPE) SKETTE OTHER(SPECIFY)	CARD DISK (PRINT) (TAPE) PLOT DISKETTE OTHER(SPECIFY)

E/DISKETTE INFORMATION

	TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# O FIL
	A00510		9	1600	ODD	NL	FB	~~80~~	3200	10
	SECTOR SIZE	EXCHANGE TYPE	CODE: (ASCII) EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DAT
IT	TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# O FIL
	SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURG DATE
	TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY TYPE	LABEL TYPE	RECORD TYPE=	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
	W04778		9	1600	ODD	SL	FB	~~80~~	3200	
JT	SECTOR SIZE	EXCHANGE TYPE	CODE: (ASCII) EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME DWADX#8700128-01			PURG DATE 2047

AL INSTRUCTIONS

Send 'W' tape to asheville

ESTIMATED EXECUTION TIME

USE ONLY

	DATE JOB COMPLETED	START TIME	END TIME	PRIORITY	DEVICES USED, NUMBER OF TAPE MOUNTS, LINES PRINTE DISKETTES USED, CARDS PUNCHED, CARDS KEYVERIFIED
716/01	04/16/87	1616	1620	C	COMPLETED BY FL

TTC

ADIOS-3 26 04.1N 155 01.9W 25 MAR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
9	20.84	35.360	24.815	5.17	0.06 .06	1.46 1.50	0.00 0		2.038	328	512	361	84
49	20.45	35.313	24.885	5.12 223.1	0.01 .01	1.46 1.50	0.00 0	2.342	2.032	340	518	340	84
99	19.53	35.290	25.108	5.15 224.5	0.00 0	1.46 1.50	0.10 0.10	2.339	2.033	333	505	332	84
150	18.70	35.123	25.195	4.92 214.2	0.12 0.12	2.83 2.90	0.88 0.90	2.329	2.050	362	459	301	84
201	16.86	34.792	25.389	4.69 204.2	0.24 0.25	4.10 4.20	3.51 3.60	2.307	2.064	392	398	261	84
299	12.22	34.271	25.983	4.88 212.7	0.67 0.69	11.21 11.50	9.84 10.10	2.283	2.094	425	308	202	84
399	9.01	34.076	26.396	4.42 192.2	1.29 1.32	26.11 26.80	18.90 19.40		2.164	521	232	152	84
499	6.84	34.010	26.664	3.10 134.9	1.96 2.01	50.45 51.80	31.75 32.60	2.297	2.200	621	180	119	84
600	5.49	34.054	26.870	1.57 68.1	2.52 2.59	74.69 76.70	41.19 42.30	2.315	2.275	920	121	80	84
900	4.18	34.320	27.229	0.87 38.0	2.83 2.91	103.58 106.40	42.25 43.40	2.372	2.370	1204	88	59	84

ml/L umol/L umol/L umol/L

ADIOS-6 26 04.6N 154 56.5W 28 MAR 1988

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
12	20.37	35.339	24.926	5.19 225.6	0.00 0	1.45 1.48	0.00 0	2.344	2.030	333	491	346	87
1000	3.97	34.442	27.348	0.77 42.3	2.91 2.97	113.79 116.90	43.32 44.50	2.387	2.355				87
1251	3.30	34.504	27.463										87
1501	2.82	34.562	27.553	1.60 69.5	2.89 2.97	138.98 142.84	41.56 42.71	2.424	2.400	978	94	63	87
1999	2.13	34.609	27.650	1.95 84.7	2.69 2.76	134.97 138.70	41.55 42.70	2.440	2.390	775	103	70	87
3000	1.58	34.663	27.735	2.94 126.8	2.47 2.54	169.11 173.80	39.70 40.80	2.451	2.386	670	95	66	87
3502	1.51	34.675	27.750	3.21 139.5	2.42 2.49	164.83 169.40	37.56 38.60	2.455	2.383	631	91	64	87
4005	1.49	34.683	27.758	3.48 149.0	2.40 2.47	158.69 163.09	38.34 39.40	2.450	2.369	584	88	63	87
4493	1.49	34.687	27.761		2.36 2.43	153.44 157.70	36.58 37.60	2.443	2.360	571	81	58	87
4988	1.53	34.689	27.760	3.74 162.5	2.43 2.50	149.55 153.70	36.58 37.60	2.442	2.354	548	78	56	87

ml/L μM/L μM/L μM/L

ADIOS-7 26 10.1N 155 01.3W 30 MAR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)		PO4 (uM/kg)		SiO4 (uM/kg)		NO3 (uM/kg)		TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
9	20.36	35.340	24.929	5.26	227.8	0.00	0	0.98	1.00	0.00	0	2.344	2.027	333	532	349	89
50	20.27	35.339	24.951	5.32	231.7	0.01	0.01	0.98	1.00	0.00	0	2.342	2.028	331	523	344	89
100	20.12	35.313	24.972	5.31	231.3	0.13	0.13	0.98	1.00	0.00	0	2.342	2.029	330	518	340	89
150	19.19	35.200	25.128	5.17	225.4	0.10	0.10	1.85	1.90	0.39	0.40	2.333	2.033	335	491	323	89
201	18.31	35.109	25.280	5.22	227.2	0.13	0.13	1.85	1.90	0.88	0.90	2.332	2.050	362	459	302	89
544	6.98	34.020	26.852	3.38	147.2	1.92	1.97	47.83	48.90	28.44	29.20	2.294	2.212	697	162	107	89
599	5.59	34.036	26.844	1.82	79.1	2.62	2.69	70.99	72.90	36.91	37.90	2.312	2.289	1059	107	70	89
701	5.02	34.194	27.036	0.71	31.0	3.05	3.13	90.55	93.00	41.97	43.10	2.338	2.343	1303	86	57	89
800	4.35	34.278	27.177	0.56	24.6	3.21	3.30	106.41	109.30	44.10	45.30	2.363	2.373	1350	81	54	89
903	4.17	34.389	27.285	0.89	38.6	3.14	3.23	109.22	112.20	42.64	43.80	2.380	2.372	1160	92	61	89
998	3.92	34.436	27.348	0.97	42.2	3.03	3.11	114.76	117.90	43.02	44.20	2.386	2.374	1114	82	62	89

ML/L UM/L UM/L UM/L

ADIOS-8 26 01.5N 155 01.1W 1 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)		PO4 (uM/kg)		SiO4 (uM/kg)		NO3 (uM/kg)		TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
12	20.38	35.345	24.927	5.28	229.5	0.10	0.10	0.98	1.00	0.00	0	2.348	2.032	332	530	348	91
52	20.35	35.349	24.937	5.28	230.1	0.00	0	0.98	1.00	0.00	0	2.345	2.031	333	523	344	91
102	20.08	35.308	24.978	5.23	227.8	0.00	0	0.98	1.00	0.00	0	2.344	2.033	334	515	338	91
152	19.13	35.202	25.146	5.15	224.3	0.06	0.06	1.85	1.90	0.68	0.70	2.335	2.035	335	491	323	91
203	18.44	35.132	25.266	5.23	227.9	0.10	0.10	1.85	1.90	0.68	0.70	2.329	2.036	334	475	313	91
401	9.75	34.131	26.318	4.73	206.1	1.16	1.19	22.41	23.00	17.44	17.90	2.283	2.135	491	246	162	91
999	3.88	34.443	27.358	1.01	43.8	3.03	3.11	114.76	117.90	43.31	44.49	2.389	2.369	1045	99	66	91
1251	3.31	34.525	27.479	1.37	59.6	2.96	3.04	125.94	129.40	41.95	43.10	2.408	2.382	979	99	67	91
1500	2.83	34.559	27.550	1.58	68.9	2.98	3.06	139.46	143.30	41.94	43.10	2.420	2.392	946	96	65	91
1750	2.43	34.586	27.607	1.81	78.5	2.89	2.97	150.93	155.10	41.55	42.70	2.431	2.387	822	86	70	91
2498	1.71	34.648	27.713	2.45	106.5	2.71	2.79	170.77	175.50	40.48	41.60	2.439	2.392	775	91	63	91
				ml/L		uM/L		uM/L		uM/L							

ADIOS-9 26 09.3N 155 06.8W 3 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)		SiO4 (uM/kg)		NO3 (uM/kg)		TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
10	20.49	35.349	24.900	5.19	225.7	0.00		0.98	1.00	0.00	0 2.345	2.028	331	532	349	93
50	20.33	35.347	24.941	5.20	226.5	0.00		0.98	1.00	0.00	0 2.346	2.028	327	530	348	93
100	20.01	35.296	24.988	5.18	225.9	0.08	0.08	1.17	1.20	0.00	0 2.344	2.031	329	518	340	93
150	18.81	35.165	25.198	5.18	225.7	0.05	0.05	1.66	1.70	0.49	0.50 2.337	2.035	328	494	325	93
198	18.47	35.142	25.266	5.19	226.1	0.07	0.07	1.66	1.70	0.49	0.50 2.333	2.034	326	485	319	93
300	13.24	34.372	25.859	4.55	198.4	0.55	0.56	8.19	8.40	8.38	8.60 2.287	2.081	404	333	218	93
402	10.09	34.155	26.279	4.87	211.9	1.02	1.05	18.71	19.20	15.59	16.00 2.281	2.120	458	240	173	93
550	6.86	34.010	26.661	3.18	138.2	1.92	1.97	49.48	50.80	27.95	28.70 2.299	2.222	722	157	104	93
600	5.88	34.023	26.799	2.10	91.5	2.53	2.60	66.32	68.10	33.79	34.70 2.304	2.268	961	117	77	93
795	4.43	34.226	27.128	0.55	24.0	3.03	3.11	102.62	105.[illegible]	43.03	[illegible] 2.352	2.362	1349	81	54	93
997	3.90	34.446	27.358	0.98	42.5	2.99	3.07	114.76	117.90	42.24	43.40 2.387	2.378	1141	80	61	93

uM/L uM/L uM/L uM/L

ADIOS-11 26 21.1N 155 06.7W 5 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
10	20.48	35.344	24.900	5.27 228.9	0.02 0.02	1.85 1.90	0.00 0	2.343	2.029	335	492	346	95
49	20.44	35.348	24.913	5.26 229.1	0.00 0	0.98 1.00	0.00 0	2.341	2.026	332	489	345	95
98	20.34	35.347	24.939	5.23 228.0	0.00 0	0.98 1.00	0.00 0	2.341	2.024	327	487	345	95
150	19.43	35.228	25.088	5.05 219.9	0.06 0.05	1.85 1.90	0.68 0.70	2.332	2.032	338	457	323	95
200	18.31	35.091	25.267	5.13 223.5		1.85 1.90	0.98 1.00	2.324	2.037	341	433	306	95
300	12.67	34.346	25.954	5.00 217.8		9.38 9.60	9.36 9.60	2.277	2.077	405	297	212	95
400	10.36	34.162	26.238	4.89 212.8	0.92 0.94	17.73 18.20	14.52 14.90	2.275	2.107	442	249	179	95
567	6.31	34.003	26.728	2.75 119.5	2.23 2.29	57.85 59.40	30.97 31.80	2.300	2.235	775	130	95	95
648	5.23	34.060	26.906	1.51 65.9	2.74 2.81	79.36 81.50	39.05 40.10	2.320	2.309	1153	86	64	95
800	4.54	34.278	27.157	0.53 23.1	3.22 3.31	102.32 105.10	42.64 43.80	2.356	2.362	1316	74	56	95
1000	3.85	34.426	27.347	0.80 34.7	3.01 3.09	114.86 118.00	43.32 44.50	2.382	2.379	1204	76	58	95

ml/L μM/L μM/L μM/L

ADIOS-12 26 00.0N 155 00.0W 7 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)		PO4 (uM/kg)		SiO4 (uM/kg)		NO3 (uM/kg)		TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
8	20.44	35.354	24.918	5.14	227.7	0.00	0	1.85	1.90	0.00	0	2.342	2.028	334	491	346	97
50	20.41	35.352	24.924	5.24	228.3	0.05	0.05	1.46	1.50	0.00	0	2.340	2.030	339	482	340	97
100	20.40	35.348	24.925	5.24	228.1	0.05	0.05	0.00	0	0.00	0	2.341	2.032	340	477	337	97
151	19.44	35.248	25.100	5.10	222.3	0.00	0	0.98	1.00	0.29	0.30	2.334	2.031	334	462	326	97
203	16.70	34.799	25.432	4.79	208.6	0.25	0.26	2.83	2.90	3.51	3.60	2.304	2.054	376	378	267	97
303	12.60	34.296	25.929	4.99	217.1	0.66	0.68	8.97	9.20	9.18	9.40	2.274	2.080	416	290	206	97
399	9.63	34.115	26.325	4.76	207.1	1.00	1.03	20.56	21.10	15.98	16.40	2.276	2.125	477	228	164	97
568	6.53	34.021	26.713	2.59	112.7	2.28	2.34	58.00	59.50	32.14	33.00	2.298	2.247	886	116	85	97
700	5.03	34.139	26.992	0.96	41.8	2.94	3.02	86.76	89.10	41.09	42.20	2.330	2.344	1395	72	54	97
829	4.48	34.283	27.167	0.56	24.2	3.01	3.09	103.59	106.40	42.64	43.80	2.356	2.370	1388	70	52	97
1006	3.92	34.412	27.329	0.76	33.0			115.74	118.90	42.63	43.80	2.383	2.383	1236	74	57	97

ml/L μM/L μM/L μM/L

ADIOS-13 26 00.6N 155 01.7W 14 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
9	20.36	35.354	24.938	5.22 227.0		1.27	1.30	2.338	2.028	338	485	341	104
50	20.36	35.352	24.937	5.21 227.0		1.85	1.90	2.340	2.030	338	482	340	104
101	20.36	35.349	24.936	5.19 226.0		1.85	1.90	2.337	2.025	334	480	339	104
150	19.69	35.246	25.034	5.05 219.9		2.83	2.90	2.331	2.034	346	453	321	104
200	18.88	35.116	25.193	4.98 216.9		2.83	2.90	2.323	2.040	353	428	303	104
298	12.63	34.298	25.924	4.92 214.3		9.38	9.60	2.275	2.079	413	292	208	104
400	9.84	34.118	26.293	4.79 208.5		20.56	21.10	2.273	2.116	462	235	169	104
570	6.30	34.028	26.750	2.14 93.0		60.68	62.30	2.298	2.260	960	107	78	104
700	5.03	34.179	27.024	0.74 32.3		89.58	92.00	2.332	2.353	1281	78	58	104
800	4.54	34.281	27.159	0.54 23.6		102.61	105.40	2.353	2.358	1305	74	56	104
1001	3.84	34.426	27.348	0.99 43.2		115.25	118.40	2.383	2.376	1153	78	60	104

uM/L mM/L

ADIOS-18 25 59.7N 154 59.8W 16 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	O.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
10	20.32	35.360	24.954	5.16 224.3	0.00 0	1.17 1.20	0.00 0	2.337	2.030	342	515	338	106
50	20.31	35.360	24.957	5.17 224.8	0.01 0.01	1.17 1.20	0.00 0	2.341	2.027	332	523	344	106
100	20.29	35.357	24.960	~~224.8~~	0.00 0	1.17 1.20	0.00 0	2.339	2.026	332	518	340	106
150	19.17	35.218	25.147	5.07 220.9	0.07 0.07	1.56 1.60	0.49 0.50	2.328	2.031	338	486	320	106
200	18.04	35.034	25.291	4.93 214.8	0.11 0.11	2.05 2.10	1.85 1.90	2.317	2.043	357	446	293	106
300	12.77	34.325	25.918	4.85 211.2	0.56 0.57	8.77 9.00	9.45 9.69	2.275	2.074	403	324	213	106
400	9.89	34.158	26.315	4.79 208.5	0.96 0.99	19.88 20.20	15.49 15.90	2.276	2.115	452	262	173	106
530	6.81	34.013	26.670	3.00 130.5	2.00 2.05	52.21 53.60	28.83 29.60	2.289	2.223	781	146	96	106
700	5.03	34.197	27.038	0.77 33.5	2.95 3.03	89.38 91.80	40.89 42.00	2.337	2.347	1377	82	54	106
800	4.44	34.278	27.168	0.45 19.6	3.07 3.15	104.17 107.00	42.45 43.60	2.355	2.362	1321	83	55	106
1000	3.85	34.425	27.346	0.82 35.7	3.05 3.13	116.22 119.40	41.88 43.00	2.380	2.379	1203	88	58	106

mg/L µM/L µM/L µM/L

#111/04-0687

Reading additional parameters on this tape

TALK = total alkalinity

TCO2 = total CO_2

pCO2 = partial pressure of CO_2

% Cal = percent calcite

% Arg = percent aragonite

JD = Julian Day

#111/00-06-87

✓ ADIOS-3 26 04.1N 155 01.9W 25 MAR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
9	20.84	35.360	24.815		0.06	1.46	0.00		2.038	328	512	361	84
49	20.45	35.313	24.885	223.1	0.01	1.46	0.00	2.342	2.032	340	518	340	84
99	19.53	35.290	25.108	224.5	0.00	1.46	0.10	2.339	2.033	333	505	332	84
150	18.70	35.123	25.195	214.2	0.12	2.83	0.88	2.329	2.050	362	459	301	84
201	16.86	34.792	25.389	204.2	0.24	4.10	3.51	2.307	2.064	392	398	261	84
299	12.22	34.271	25.983	212.7	0.67	11.21	9.84	2.283	2.094	425	308	202	84
399	9.01	34.076	26.396	192.2	1.29	26.11	18.90		2.164	521	232	152	84
499	6.84	34.010	26.664	134.9	1.96	50.45	31.75	2.297	2.200	621	180	119	84
600	5.49	34.054	26.870	68.1	2.52	74.69	41.19	2.315	2.275	920	121	80	84
900	4.18	34.320	27.229	38.0	2.83	103.58	42.25	2.372	2.370	1204	88	59	84

3-31-87

Tape output should print out similar to this paper copy of the data - Have included a key to reading the additional parameters (ex: TALK, TCO2 etc.)

ADIOS-6 26 04.6N 154 56.5W 28 MAR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
12	20.37	35.339	24.926	225.6	0.00	1.45	0.00	2.344	2.030	333	491	346	87
1000	3.97	34.442	27.348	42.3	2.91	113.79	43.32	2.387	2.355				87
1251	3.30	34.504	27.463										87
1501	2.82	34.562	27.553	69.5	2.89	138.98	41.56	2.424	2.400	978	94	63	87
1999	2.13	34.609	27.650	84.7	2.69	134.97	41.55	2.440	2.390	775	103	70	87
3000	1.58	34.663	27.735	126.8	2.47	169.11	39.70	2.451	2.386	670	95	66	87
3502	1.51	34.675	27.750	139.5	2.42	164.83	37.56	2.455	2.383	631	91	64	87
4005	1.49	34.683	27.758	149.0	2.40	158.69	38.34	2.450	2.369	584	88	63	87
4493	1.49	34.687	27.761		2.38	153.44	36.58	2.443	2.360	571	81	58	87
4988	1.53	34.689	27.760	162.5	2.43	149.55	36.58	2.442	2.354	548	76	56	87

ADIOS-7 26 10.1N 155 01.3W 30 MAR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
9	20.36	35.340	24.929	227.8	0.00	0.98	0.00	2.344	2.027	333	532	349	89
50	20.27	35.339	24.951	231.7	0.01	0.98	0.00	2.342	2.028	331	523	344	89
100	20.12	35.313	24.972	231.3	0.13	0.98	0.00	2.342	2.029	330	518	340	89
150	19.19	35.200	25.128	225.4	0.10	1.85	0.39	2.333	2.033	335	491	323	89
201	18.31	35.109	25.280	227.2	0.13	1.85	0.88	2.332	2.050	352	459	302	89
544	6.98	34.020	26.652	147.2	1.92	47.63	28.44	2.294	2.212	697	162	107	89
599	5.59	34.036	26.844	79.1	2.62	70.99	36.91	2.312	2.289	1059	107	70	89
701	5.02	34.194	27.036	31.0	3.05	90.55	41.97	2.338	2.343	1303	86	57	89
800	4.35	34.278	27.177	24.6	3.21	106.41	44.10	2.363	2.373	1350	81	54	89
903	4.17	34.389	27.285	38.6	3.14	109.22	42.64	2.380	2.372	1160	92	61	89
998	3.92	34.436	27.348	42.2	3.03	114.76	43.02	2.386	2.374	1114	82	62	89

ADIOS-8 26 01.5N 155 01.1W 1 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
12	20.38	35.345	24.927	229.5	0.10	0.98	0.00	2.348	2.032	332	530	348	91
52	20.35	35.349	24.937	230.1	0.00	0.98	0.00	2.345	2.031	333	523	344	91
102	20.08	35.308	24.978	227.8	0.00	0.98	0.00	2.344	2.033	334	515	338	91
152	19.13	35.202	25.146	224.3	0.06	1.85	0.68	2.335	2.035	335	491	323	91
203	18.44	35.132	25.266	227.9	0.10	1.85	0.68	2.329	2.036	334	475	313	91
401	9.75	34.131	26.318	206.1	1.16	22.41	17.44	2.283	2.135	491	246	162	91
999	3.88	34.443	27.358	43.8	3.03	114.76	43.31	2.389	2.369	1045	99	66	91
1251	3.31	34.525	27.479	59.6	2.96	125.94	41.95	2.408	2.382	979	99	67	91
1500	2.83	34.559	27.550	68.9	2.98	139.46	41.94	2.420	2.392	946	96	65	91
1750	2.43	34.586	27.607	78.5	2.89	150.93	41.55	2.431	2.387	822	86	70	91
2498	1.71	34.648	27.713	106.5	2.71	170.77	40.48	2.439	2.392	775	91	63	91

ADIOS-9 26 09.3N 155 06.8W 3 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 . (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
10	20.49	35.349	24.900	225.7	0.00	0.98	0.00	2.345	2.028	331	532	349	93
50	20.33	35.347	24.941	226.5	0.00	0.98	0.00	2.346	2.028	327	530	348	93
100	20.01	35.296	24.988	225.9	0.08	1.17	0.00	2.344	2.031	329	518	340	93
150	18.81	35.165	25.198	225.7	0.05	1.66	0.49	2.337	2.035	328	494	325	93
198	18.47	35.142	25.266	226.1	0.07	1.66	0.49	2.333	2.034	326	485	319	93
300	13.24	34.372	25.859	198.4	0.55	8.19	8.38	2.287	2.081	404	333	218	93
402	10.09	34.155	26.279	211.9	1.02	18.71	15.59	2.281	2.120	458	240	173	93
550	6.86	34.010	26.661	138.2	1.92	49.48	27.95	2.299	2.222	722	157	104	93
600	5.88	34.023	26.799	91.5	2.53	66.32	33.79	2.304	2.268	961	117	77	93
795	4.43	34.226	27.128	24.0	3.03	102.62	43.03	2.352	2.362	1349	81	54	93
997	3.90	34.446	27.358	42.5	2.99	114.76	42.24	2.387	2.378	1141	80	61	93

ADIOS-11 26 21.1N 155 06.7W 5 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
10	20.48	35.344	24.900	228.9	0.02	1.85	0.00	2.343	2.029	335	492	346	95
49	20.44	35.348	24.913	229.1	0.00	0.98	0.00	2.341	2.026	332	489	345	95
98	20.34	35.347	24.939	228.0	0.00	0.98	0.00	2.341	2.024	327	487	345	95
150	19.43	35.228	25.088	219.9	0.05	1.85	0.68	2.332	2.032	338	457	323	95
200	18.31	35.091	25.267	223.5		1.85	0.98	2.324	2.037	341	433	306	95
300	12.67	34.346	25.954	217.8		9.36	9.36	2.277	2.077	405	297	212	95
400	10.36	34.162	26.238	212.8	0.92	17.73	14.52	2.275	2.107	442	249	179	95
567	6.31	34.003	26.728	119.5	2.23	57.85	30.97	2.300	2.235	775	130	95	95
648	5.23	34.060	26.906	65.9	2.74	79.36	39.05	2.320	2.309	1153	86	64	95
800	4.54	34.278	27.157	23.1	3.22	102.32	42.64	2.356	2.362	1316	74	56	95
1000	3.85	34.426	27.347	34.7	3.01	114.86	43.32	2.382	2.379	1204	76	58	95

ADIOS-12 26 00.0N 155 00.0W 7 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
8	20.44	35.354	24.918	227.7	0.00	1.85	0.00	2.342	2.028	334	491	346	97
50	20.41	35.352	24.924	228.3	0.05	1.46	0.00	2.340	2.030	339	482	340	97
100	20.40	35.348	24.925	228.1	0.05	0.00	0.00	2.341	2.032	340	477	337	97
151	19.44	35.248	25.100	222.3	0.00	0.98	0.29	2.334	2.031	334	462	326	97
203	16.70	34.799	25.432	208.6	0.25	2.83	3.51	2.304	2.054	376	378	267	97
303	12.60	34.296	25.929	217.1	0.66	8.97	9.16	2.274	2.080	416	290	206	97
399	9.63	34.115	26.325	207.1	1.00	20.56	15.98	2.276	2.125	477	228	164	97
568	6.53	34.021	26.713	112.7	2.28	56.00	32.14	2.296	2.247	886	116	85	97
700	5.03	34.139	26.992	41.8	2.94	86.76	41.09	2.330	2.344	1395	72	54	97
829	4.49	34.283	27.167	24.2	3.01	103.59	42.64	2.356	2.370	1388	70	52	97
1006	3.92	34.412	27.329	33.0		115.74	42.63	2.383	2.383	1236	74	57	97

ADIOS-13 26 00.5N 155 01.7W 14 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
9	20.36	35.354	24.938	227.0		1.27		2.338	2.028	338	485	341	104
50	20.36	35.352	24.937	227.0		1.85		2.340	2.030	338	482	340	104
101	20.36	35.349	24.936	226.0		1.85		2.337	2.025	334	480	339	104
150	19.69	35.246	25.034	219.9		2.83		2.331	2.034	346	453	321	104
200	18.68	35.116	25.193	216.9		2.83		2.323	2.040	353	428	303	104
298	12.63	34.298	25.924	214.3		9.36		2.275	2.079	413	292	208	104
400	9.84	34.118	26.293	208.5		20.56		2.273	2.116	462	235	169	104
570	6.30	34.029	26.750	93.0		60.68		2.298	2.260	960	107	79	104
700	5.03	34.179	27.024	32.3		89.58		2.332	2.353	1281	78	58	104
800	4.54	34.281	27.159	23.6		102.61		2.353	2.358	1305	74	56	104
1001	3.84	34.426	27.348	43.2		115.25		2.383	2.376	1153	78	60	104

ADIOS-18 25 59.7N 154 59.8W 16 APR 1986

Depth (m)	Temp (C)	Salinity (g/kg)	Sigma-t	D.O. (uM/kg)	PO4 (uM/kg)	SiO4 (uM/kg)	NO3 (uM/kg)	TALK (meq/kg)	TCO2 (mM/kg)	pCO2 (uATM)	% Cal	% Arg	JD
10	20.32	35.360	24.954	224.3	0.00	1.17	0.00	2.337	2.030	342	515	338	106
50	20.31	35.360	24.957	224.8	0.01	1.17	0.00	2.341	2.027	332	523	344	106
100	20.29	35.357	24.960	224.8	0.00	1.17	0.00	2.339	2.026	332	518	340	106
150	19.17	35.218	25.147	220.9	0.07	1.56	0.49	2.328	2.031	338	486	320	106
200	18.04	35.034	25.291	214.8	0.11	2.05	1.85	2.317	2.043	357	446	293	106
300	12.77	34.325	25.918	211.2	0.56	8.77	9.45	2.275	2.074	403	324	213	106
400	9.89	34.158	26.315	208.5	0.96	19.68	15.49	2.276	2.115	452	262	173	106
530	6.81	34.013	26.670	130.5	2.00	52.21	28.83	2.289	2.223	781	146	96	106
700	5.03	34.197	27.038	33.5	2.95	89.38	40.89	2.337	2.347	1377	82	54	106
800	4.44	34.278	27.168	19.6	3.07	104.17	42.45	2.355	2.362	1321	83	55	106
1000	3.85	34.425	27.346	35.7	3.05	116.22	41.86	2.380	2.379	1203	86	58	106

```
Password:
 accNo   fleA refNo  proj inst ship    startDate  cruise   catId
 ------- ---- ------ ---- ---- ------- ---------- -------- ----------
 8700128 C100 323099 9999 313F 32MW    1986/03/25 ADIOS        169221

(1 row affected)
```

```
Password:
 accNo   fleA refNo  ship staCnt recCnt startDate  endDate
 ------- ---- ------ ---- ------ ------ ---------- ----------
 8700128 C100 323099 32MW 9      9      86/03/25   86/04/16

(1 row affected)
```

did

for nutrients (PO_4, SiO_4, NO_3)

to go from $\frac{uM}{Kg}$ to $\frac{ug\text{-}at}{L}$

$$\frac{\frac{uM}{kg}}{sig\text{-}t \times 10^{-3} + 1} = \frac{ug\text{-}at}{L}$$

for oxygen to go from $\frac{uM}{kg}$

reverse this process

```
procedure(conv_do);
        cruise_tab=gettable('enter cruise table name');
        do I = 1 to lastrow(cruise_tab);
            set sta = row I col 1 of table(cruise_tab);
            do J = 1 to lastrow(sta);
            o2= row J col 5 of table(sta);
            o22= o2*(1/22393)*(1/(1+(sig/1000)))*1000000;
            sig = row J col 4 of table(sta);
            set row J col 5  of table(sta) to o22;
```

DATE: 8-14-90

TRANSMITTAL COVER SHEET

ADDRESSEE Sid Stillwaugh

ROUTING CODE

TELEPHONE NUMBER 206 526-6263

RAPICOM NUMBER 206 526 6025

ORIGINATOR Bob Stein

TELEPHONE NUMBER 673-5643

RAPICOM NUMBER 673-5586 (fts) 202/673-5586 (comm)

COMMENTS

Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, & Information Service
National Oceanographic Data Center

* Conversion Factor for Dissolved Oxygen (DO): From $\mu M/kg$ to ml/l.

This conversion involves three steps:

(1) Calculate the molar volume (i.e., volume for one mole) for DO at specific conditions;

(2) Convert Kg of seawater (=SW) to l of SW; and

(3) Combine results from (1) and (2) above to establish the conversion factor.

A. Step (1): Calculate the volume (l) of one (1) μM of DO at a specific condition:

The equation (Eqn.) of state of ideal gas follows:

$$\frac{P_1 \cdot V_1}{T_1} = \frac{P_2 \cdot V_2}{T_2}$$

where: P_i = Pressure in atm.

V_i = Volume in l (or ml)

T_i = Absolute temperature in °K, and

$$°K = °C + 273.15 \quad (1$$

For the purpose of comparison (or, calculation), we define case 1 in Eqn. 1 as the standard condition (STP: T = 0°C, P = 1atm). Therefore,

$T_1 = 273.15$ °K. (3

$P_1 = 1$ atm and assume that (4

V_1 = the molar volume of DO at STP = 0.022385 m^3/M (5.

In case 2, T_2 can be calculated from Eqn 2. V_2 is the molar volume of

at a specific condition (i.e, not at STP). P_2 is related to the dive depth (Z) as follows:

$$1 \text{ bar} = 10^6 \text{ dyne/cm}^2$$

$$1 \text{ decibar (dbar)} = 10^5 \text{ dyne/cm}^2 = 0.1 \text{ bar}$$

For each meter increase in Z the P will increase about 1 dbar.

Since, $1 \text{ atm} = 1.013 \text{ bar} = 10.13 \text{ dbar}$

This means that for each 10.13 m increase in Z the P will increase 1 atm.

$$P_2 = \frac{Z \text{ (m)}}{10.13 \text{ (m/atm)}} \qquad \text{(in atm)} \qquad (6)$$

By rearranging Eqn 1, we obtain:

$$V_2 = \frac{P_1 \cdot V_1 \cdot T_2}{T_1 \cdot P_2}$$

From Eqn's 3, 4, 5, and 6 above eqn. becomes:

$$V_2 = \frac{1 \times 0.022385 \times (°C + 273.15) \times 10.13}{273.15 \times Z} \qquad \text{(in ml)} \qquad (7)$$

This eqn gives the volume of one (1) mole DO at a specific condition

B. Step (2): Converting kg SW to l SW:

The attachments reports sigma-t (σ_t) values. Knowing that

$$\sigma_t = (\rho - 1) \times 1000$$

where ρ is the specific density. By rearranging this eqn one obtains:

$$\rho = \frac{(\sigma_t + 1000)}{1000} \qquad (8)$$

Also,

$$\rho = \frac{\text{mass in gm}}{\text{volume in ml}} = \frac{m}{V}$$

$$\therefore \quad V = \frac{m}{\rho}$$

The attachment reports mass (m) in Kg (i.e., 1000 gm). therefore,

$$V = \frac{1000\ (gm)}{\frac{(\sigma_t + 1000)}{1000}} = \frac{1000 \times 1000}{(\sigma_t + 1000)}\ (in\ ml) = \frac{1000}{(\sigma_t + 1000)}\ (in\ l) \qquad (9$$

C. The Conversion Factor :

By dividing Eqn (7) by Eqn (9) we obtain the conversion factor as :

$$\frac{0.022385 \times (°C + 273.15) \times 10.13 \times (\sigma_t + 1000)}{273.15 \times S \times 1000}$$

→ this is the conversion factor for DO (the C.F.)

D. Example :

The first station in the attachment gives :

$S = 9\ ppm$; $T = 20.36\ °C$; $\sigma_t = 24.928$; and By substituting these values into the C.F. one obtains :

$$\frac{0.022385 \times (20.36 + 273.15) \times 10.13 \times (24.928 + 1000)}{273.15 \times 9 \times 1000} = 0.027749$$

The DO content at this station is 227.0 uM/kg.

$\therefore 227.0 \times 0.027749 = 6.299\ ml/l\ DO$ ★

This is the same DO content at this station in the units of ml/l

Note : You have to do this kind of calculation for every stations because each station has its own values of °C, σ_t, and S.

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* Conversion Factor for PO_4^{3-}, SiO_4^{4-}, NO_3^-:

This is relatively simpler than for DO because:

(1) Knowing that these nutrients all contain one atom per mole, so, the numbers reported as μM are also the numbers for μg. atom;

(2) The only change is to convert Kg sw to L of SW_t which has been done and produced Eqn 7. Therefore the conversion factor for nutrients is

$$\boxed{\frac{(\nabla_x + 1000)}{1000}} \Rightarrow \text{the Conversion Factor} = \text{the C.F.}$$

Example:

The first station (attachment) gives

$\nabla_x = 24.938$

∴ the C.F. is $\frac{(24.938 + 1000)}{1000} = 1.0249$

SiO_4 was reported as 1.27 μM/Kg

∴ $1.27 \times 1.0249 = 1.30$ μg. atom/L *

You have to

Again, do this kind of calculation for each station because each station has its own ∇_x value.

$Z = 9$, $T = 20.84$, $\delta T = 24.815$

$$\frac{0.022385 \times (20.84 + 273.15) \times 10.13 \times (24.815 + 1000)}{273.15 \times 9 \times 1000} =$$

(293.99; 1024.815)

$$\frac{68060.3212}{2458350.0} = .0277 \qquad 6.28$$

.2294

→ when using the calculation for the D.O. conversion

* both temperature and standard atmosphere disappear
and divide by 1000 on the bottom
(I lose the std Temp. and depth)

* were field calcs. - std. pres and Temp. were accounted for

$$\frac{.022385 \times (27.229 + 1000)}{1000}$$