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W.H.O.I. Helium Isotope Laboratory Data Report No. 2 Tritium and ^3He data from the Beta Triangle (All-107, Oct. 1979 and OC-78, March 1980)

by

W.J. Jenkins, D.E. Lott, M.W. Davis
and R.D. Boudreau

December 1985

Technical Report

*Funding provided by the National Science Foundation
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Department of Chemistry

The data incorporated in this report consists of 509 tritium and 467 helium isotope measurements made on samples collected on two cruises to the "Beta Triangle" area, an approximately 1000 km on a side triangle centered near 27.5°N, 33.5°W in the eastern subtropical Atlantic. The first cruise (AII-107, H. Stommel, Chief Scientist) occurred in the autumn of 1979, and consisted of the Triangle survey with a short meridional section along 38.5°W (approximately 6°N to 27°N) appended. The second cruise (OC-78, H. Stommel, L. Armi, co-Chief Scientists) occurred in March, 1980 and was an abbreviated subsampling of the triangle. Approximate sampling positions are shown in Figure 1, superimposed on winter-time outcrop positions of selected density surfaces (the heavy line is the windstress curl zero line). The author is indebted to both Hank Stommel and Larry Armi for their hospitality and help, and to R. Boudreau who sampled for us on the first cruise.

Sampling was targetted at specific density horizons, as shown in Figure 2 (a plot of sample sigma theta vs. station number), which indicates the sampling carried out on the first cruise. The horizons sampled on the second cruise were slightly different. The purpose of this strategy was to enable isopycnal mapping of properties.

The samples were transferred on board from rosette niskins to copper tube samples (ca 90 g for the AII-107 samples, ca 45 g for OC-78) using the standard gravity feed technique (e.g., see Jenkins and Clarke, 1976). The helium was extracted using the in vacuo vapor-pump technique (Jenkins, 1981) and stored in aluminosilicate glass ampoules pending mass spectrometric analysis. The degassed water was stored in larger ampoules for tritium measurement by ³He regrowth (Clarke et al., 1976).

The OC-78 helium and tritium samples were analyzed using the Hg toepler pump processing (see Jenkins, 1981) and standard mass spectrometry. Half of the AII-107 tritium samples were analyzed similarly. The AII-107 heliums and the remaining tritiums were analyzed using the automated cryogenic technique (Lott and Jenkins, 1984), and most of the improvements in data uncertainties resulted from this. The improved tritium detection limit and ^3He uncertainty for the AII-107 samples, however, resulted also from the larger samples (90 g vs. 45 g). Data uncertainties are given in Table 1.

Table 1. Sample Uncertainties

Sample Type		Uncertainty
OC-78	Del- ^3He	1.80 ‰
OC-78	C (He)	0.28 ncc/g
OC-78	Tritium	2.0%, $\pm$ d.l. (listed)
AII-107	Del- ^3He	1.25 ‰
AII-107	C (He)	0.09 ncc/g
AII-107	Tritium (Hg-Toep)	2.0%, $\pm$ d.l. (listed)
AII-107	Tritium (Autocry)	0.75%, $\pm$ d.l. (listed)

NB: d.l. = detection limit

Helium isotopic ratios were measured by comparison with an atmospheric standard, the size of which depended on the size of samples being analyzed. The initial air standards were 1.569×10^{-6} and 3.581×10^{-6} cc(STP) He for the OC-78 and the AII-109 sets, respectively. The standard was acquired by filling a pre-evacuated ($P < 10^{-7}$ torr) ca 15 liter stainless steel tank with marine air. The standard He size was computed assuming 5.240 ppm by volume in dry air, measurement of barometric pressure, relative humidity and temperature; and were corrected for depletion due to pipetting during the series. The stainless steel pipetting volumes used during analysis were

calibrated against glass pipettes which were in turn calibrated gravimetrically with triple distilled Hg. Two parallel pipetting volumes were used with the standard reservoir, one being ca 10-20% of the other (dependant on the arranged standard size), and a "normal" standard consisted of one aliquot from each. Thus, a three-point standard curve (at 90%, 100% and 110% of "normal" size) was routinely generated to determine the measured $^3\text{He}/^4\text{He}$ ion current ratio as a function of sample size. There was significant dependance of the measured ratio on sample size. A quadratic correction factor was computed from this curve and applied to all the data that follows. The magnitude of such corrections is significant (Table 2), but not large, being typically of the order of 2 sigma. Since the He was cryogenically separated from ALL other gases (see Lott and Jenkins, 1984), there are no other such "matrix effects". The routine generation of the standard curve served also to build confidence in its stability, and provided an independant determination of isotopic ratio measurement precision. The estimate thus obtained was statistically identical to the estimate obtained from the interpolators.

Table 2. Linearity Curve Statistics from AII-107
 ^3He Analyses (24 May-14 July, 1983)

<u>Standard</u>	<u># Det</u>	<u>Rel. Size</u>	<u>Del-^3He (°/°°)</u>	<u>Std. Dev. (°/°°)</u>
Small	124	0.89895	-2.75 ± 0.13	$1.26 \pm .07$
Normal	1998	= 1.00000	= 0.00	$1.27 \pm .03^*$
Large	126	1.09146	2.32 ± 0.12	$1.22 \pm .08$

* estimated from polynomial interpolators

Isotopic ratio and peak-height manometric calculations were made by first least-squares fitting the parametric instrumental response as a function of time with a low order polynomial. Typically 48 standards (and 24 unknowns) were analyzed in a 24-hour period. The polynomial was then used as an interpolator to the time of unknown sample analysis, and also as an estimator of analytical precision. Experience indicates that the ultimate precision of the instrument is limited by the counting statistics associated with the ^3He ion beam, and scales as the square root of its intensity.

Tritium determinations (by ^3He regrowth) were performed in a similar spirit, except that the operating standard was ca 5×10^{-9} cc(STP)He. The standard curve used was a 10-point curve ranging from 3% to 200% of "normal" standard size. The reason for the more stringent curve was to accommodate greater sample size variability and to better document manometric nonlinearities. The latter, over the extended size range amounted to as much as 2% effects. Corrections and interpolation techniques were similar to the $^3\text{He}/^4\text{He}$ analyses. To improve statistics of instrumental standardization, polynomial interpolators were extended over several day-cycles.

The data is listed in Tables 3 and 4. Null data is indicated by a string of asterisks. The helium isotope ratio anomaly (Del^3He) is expressed relative to atmospheric standard in permil:

$$\text{Del}^3\text{He} = \delta(^3\text{He}) = 1000 (R_x/R_a - 1)$$

where

$$R_x = (^3\text{He}/^4\text{He})_x$$

and R_a is the corresponding atmospheric ratio. The excess ^3He (XS^3He) is expressed in T.U., and is calculated from

$$\text{XS}^3\text{He} = C(\text{He}) [\text{Del}^3\text{He}/1000 + (1-\alpha) C^*(\text{He})/C(\text{He})]/R_a/(1-S/1000)/F$$

where α is the helium isotopic fractionation factor in solution and is a function of temperature and salinity (Benson and Krause, 1980), $C(\text{He})$ is the concentration of helium in the water (in cc(STP)/g), $C^*(\text{He})$ is the equilibrium helium concentration in like units, computed from Weiss' equation (Weiss, 1971) as a function of salinity and potential temperature, S is the salinity, F is conversion factor between cc(STP)/g and T.U. ($= 2.503 \cdot 10^{-15}$ cc/g/T.U.). The calculation assumes that the water was initially at equilibrium with the atmosphere, except for a supersaturation induced by air injection via bubble trapping. The tritium ^3He age (Tau) is computed from

$$\text{Tau} = T^* \ln (1 + [^3\text{He}]/[^3\text{H}])$$

where T^* is the mean decay life of tritium (17.96 y), $[^3\text{He}]$ and $[^3\text{H}]$ are the excess ^3He and tritium concentrations expressed in T.U.

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The authors are indebted to Hank Stommel, whose kind encouragement and careful fieldwork made this study possible, and to Larry Armi for help in the field. The field and analytical work was supported by NSF grant OCE79-19815 but improvements implemented under NSF grant OCE81-17998 provided substantial enhancements to the measurement process. W. J. Jenkins is grateful to Tom Keffer for sharing his thoughts and computational skills, and to the Center for Analysis of Marine Systems for support for much of the computer time and graphics.

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Table 3.

Tritium, ^3He and selected hydrographic data
from the AII-107 cruise.

Station 9417 Date : OCT 17, 1979 26.50N 38.52W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		y
1	1	25.590	37.410	25.000	212.	4.15 0.08	-12.6	37.52	0.07	0.30
3	126	19.628	36.778	26.233	213.	4.31 0.09	3.5	38.09	0.43	1.72
5	228	17.642	36.448	26.486	216.	4.42 0.09	24.5	37.89	0.90	3.31
6	322	16.401	36.261	26.641	203.	4.22 0.09	60.3	37.98	1.68	6.02
7	346	15.947	36.189	26.691	197.	4.26 0.09	65.4	38.18	1.80	6.34
8	393	15.090	36.056	26.783	206.	4.15 0.08	73.0	38.40	1.98	7.01
10	486	13.444	35.817	26.952	209.	3.92 0.08	86.6	38.35	2.28	8.24
11	532	12.954	35.771	27.017	204.	3.64 0.07	92.4	38.04	2.40	9.08
12	577	12.177	35.692	27.110	203.	3.15 0.06	85.2	37.98	2.24	9.64
13	625	11.688	35.597	27.130	196.	2.62 0.05	82.9	37.79	2.18	10.87
15	759	9.729	35.374	27.309	176.	0.98 0.02	37.4	38.19	1.21	14.40
16	848	8.211	35.214	27.429	185.	0.34 0.02	18.2	37.83	0.79	21.46
18	1027	6.550	35.105	27.584	197.	0.13 0.01	10.4	38.32	0.63	31.65
21	1308	5.682	35.179	27.755	****	0.11 0.01	10.7	38.35	0.64	34.14
22	1405	5.352	35.233	27.839	221.	0.37 0.02	8.9	38.18	0.60	17.17
23	1893	4.009	35.068	27.861	236.	0.08 0.01	9.3	40.34	0.62	38.47
24	2417	3.116	35.108	27.982	229.	0.32 0.02	19.8	40.77	0.87	23.84

Station 9418 Date : OCT 17, 1979 27.15N 37.72W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		y
2	94	20.605	36.910	26.073	228.	4.60 0.04	-5.6	38.26	0.23	0.89
3	118	20.133	36.919	26.207	217.	4.49 0.03	-4.0	37.94	0.27	1.05
4	147	19.149	36.769	26.351	207.	4.54 0.04	3.9	38.21	0.44	1.68
5	180	17.832	36.514	26.490	204.	4.42 0.03	27.2	38.00	0.96	3.52
6	260	16.470	36.290	26.647	197.	4.47 0.03	57.2	39.44	1.66	5.68
7	364	14.739	36.166	26.945	195.	4.32 0.03	62.4	38.07	1.74	6.07
11	568	11.711	35.597	27.126	195.	3.27 0.03	80.3	38.50	2.16	9.10
15	828	8.670	35.332	27.450	183.	0.81 0.01	33.2	38.99	1.13	15.74
19	1189	6.267	35.266	27.748	218.	0.24 0.01	15.1	39.37	0.74	25.10
22	1501	4.890	35.158	27.834	233.	0.04 0.01	5.2	39.14	0.52	47.46

Station 9419 Date : OCT 18, 1979 27.73N 36.80W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del13He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	g	
2	101	20.747	36.925	26.046	228.	****	****	-3.6	37.75	0.28
3	127	20.194	36.926	26.196	220.	4.53	0.04	-4.7	37.96	0.25
4	166	19.210	36.770	26.336	207.	4.56	0.04	6.1	38.38	0.49
5	200	17.906	36.523	26.478	198.	4.58	0.04	34.7	38.03	1.12
6	260	16.609	36.303	26.624	197.	4.47	0.03	57.3	38.23	1.63
7	357	15.063	36.140	26.853	193.	4.57	0.04	63.9	38.66	1.79
12	602	11.654	35.686	27.206	191.	3.13	0.02	69.1	38.90	1.93
15	790	8.999	35.348	27.410	169.	0.89	0.01	32.1	39.32	1.12
20	1250	5.778	35.194	27.755	215.	0.20	0.01	9.6	39.75	0.62
22	1444	5.143	35.194	27.833	234.	0.12	0.01	2.6	39.37	0.46

Station 9420 Date : OCT 18, 1979 28.37N 35.95W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del13He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	g	
2	77	20.189	36.708	26.031	240.	****	****	-6.1	38.13	0.22
3	86	19.360	36.633	26.193	227.	4.57	0.04	-3.2	38.16	0.29
4	104	18.656	36.571	26.326	217.	4.35	0.03	4.1	38.25	0.45
5	160	17.703	36.472	26.489	206.	4.62	0.04	14.2	38.06	0.67
6	264	16.501	36.283	26.634	204.	****	****	43.4	38.52	1.33
8	399	14.579	35.974	26.832	199.	4.39	0.03	63.0	38.77	1.77
13	652	11.460	35.582	27.162	188.	3.04	0.02	84.0	38.35	2.23
17	916	8.357	35.477	27.613	176.	1.26	0.01	28.0	38.72	1.01
21	1287	6.330	35.282	27.753	202.	0.18	0.01	10.9	39.83	0.65
22	1384	5.998	35.285	27.799	213.	0.17	0.01	11.4	38.53	0.65

Station 9421 Date : OCT 18, 1979 28.83N 35.10W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del13He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	g	
3	78	19.488	36.618	26.148	234.	4.48	0.03	-3.3	38.09	0.29
4	102	18.687	36.574	26.321	221.	4.25	0.03	3.2	38.26	0.43
5	164	17.713	36.469	26.485	202.	4.38	0.03	8.1	38.33	0.54
6	291	16.565	36.308	26.638	206.	****	****	28.9	38.67	1.01
9	442	14.408	35.950	26.851	198.	4.28	0.03	61.8	38.41	1.74
13	629	11.754	35.590	27.112	197.	3.71	0.03	76.9	38.99	2.10
16	871	8.660	35.327	27.448	170.	0.66	0.01	27.7	39.31	1.02
20	1264	6.229	35.262	27.750	208.	****	****	11.4	42.41	0.68
22	1461	5.389	35.210	27.816	225.	0.10	0.01	10.6	39.77	0.64

Station 9422 Date : OCT 18, 1979 29.55N 34.27W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	g	
2	78	20.131	36.747	26.076	237. 4.50 0.03	-6.0	37.91	0.23	0.88
3	94	19.621	36.707	26.181	243. 4.46 0.03	-1.6	37.95	0.32	1.26
4	128	18.719	36.609	26.340	215. 4.39 0.03	3.1	38.32	0.43	1.68
5	187	17.717	36.480	26.492	211. 4.35 0.03	6.2	38.84	0.50	1.96
6	296	16.582	36.296	26.625	209. 4.29 0.03	35.4	38.28	1.14	4.25
9	447	14.355	35.941	26.855	202. 4.30 0.03	54.2	38.72	1.58	5.61
13	642	11.784	35.603	27.116	194. 3.50 0.03	82.1	38.66	2.20	8.77
16	891	8.750	35.398	27.489	184. 1.27 0.01	49.3	39.37	1.51	14.08
19	1185	6.932	35.362	27.733	207. 0.40 0.01	19.6	40.63	0.85	20.52
22	1481	5.524	35.272	27.848	227. 0.32 0.01	10.1	39.18	0.63	19.43

Station 9423 Date : OCT 19, 1979 30.17N 33.45W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	g	
2	72	19.992	36.685	26.066	249. 4.63 0.04	-8.3	37.83	0.18	0.67
3	75	19.842	36.674	26.097	243. 4.60 0.04	-6.9	38.53	0.20	0.78
4	92	18.852	36.644	26.332	228. 4.53 0.04	-3.4	38.67	0.29	1.10
5	135	18.110	36.606	26.491	211. 4.58 0.04	6.6	38.54	0.51	1.89
6	203	16.517	36.307	26.649	203. 4.41 0.03	38.3	38.23	1.21	4.34
7	343	14.180	35.917	26.874	209. 4.15 0.03	59.3	38.16	1.67	6.08
11	545	11.839	35.619	27.118	197. 3.75 0.03	83.7	38.67	2.24	8.41
16	887	9.140	35.491	27.499	176. 1.15 0.01	43.9	39.41	1.38	14.22
19	1186	6.722	35.344	27.748	203. 0.35 0.01	18.7	39.71	0.82	21.87
22	1483	5.454	35.243	27.834	225. 0.17 0.01	7.2	39.79	0.57	26.76

Station 9424 Date : OCT 19, 1979 30.75N 32.60W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	g	
2	73	20.023	36.695	26.066	238. 4.58 0.04	-5.4	38.14	0.24	0.91
3	78	19.511	36.667	26.179	233. 5.04 0.04	*****	*****	****	*****
4	90	18.602	36.571	26.340	227. 4.50 0.03	-0.3	38.15	0.35	1.36
5	138	17.749	36.501	26.500	210. 4.47 0.03	12.6	38.20	0.64	2.40
6	226	16.516	36.282	26.630	**** 4.29 0.03	33.5	38.49	1.11	4.12
7	345	14.880	36.020	26.802	206. 4.36 0.03	51.4	38.53	1.51	5.34
12	593	11.947	35.626	27.103	202. 3.75 0.03	82.6	38.57	2.21	8.33
16	890	9.310	35.466	27.451	178. 1.24 0.01	46.5	39.13	1.43	13.80
19	1183	7.643	35.470	27.716	196. 0.56 0.01	27.5	39.35	1.01	18.48
22	1480	5.895	35.300	27.824	224. 0.31 0.01	12.6	39.43	0.69	20.92

Station 9425 Date : OCT 19, 1979 31.38N 31.72W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	y	
2	72	19.592	36.562	26.078	****	4.21 0.03	-4.6	38.95	0.25 1.05
3	77	18.997	36.542	26.217	****	4.28 0.03	-0.8	38.20	0.34 1.38
4	87	18.565	36.528	26.317	226.	4.41 0.03	0.4	38.22	0.37 1.44
5	127	17.788	36.473	26.469	211.	4.26 0.03	5.9	38.69	0.49 1.97
6	245	16.676	36.323	26.623	****	4.21 0.03	21.3	38.39	0.84 3.25
8	395	14.858	36.034	26.817	211.	4.46 0.03	25.0	38.65	0.93 3.39
13	643	11.409	35.536	27.135	195.	3.46 0.03	68.3	38.91	1.91 7.90
16	890	9.233	35.466	27.464	179.	1.24 0.01	48.5	39.27	1.48 14.16
19	1182	7.431	35.432	27.717	203.	0.69 0.01	34.3	39.28	1.17 17.89
22	1481	5.674	35.254	27.815	234.	0.45 0.01	18.2	39.57	0.82 18.52

Station 9426 Date : OCT 20, 1979 31.90N 30.88W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	y	
2	49	19.910	36.623	26.041	234.	4.27 0.03	-6.3	38.31	0.22 0.90
3	56	19.372	36.597	26.162	229.	4.42 0.03	-2.2	38.28	0.31 1.22
4	82	18.487	36.535	26.342	214.	4.23 0.03	1.1	38.31	0.39 1.57
6	249	16.732	36.345	26.627	212.	4.27 0.03	17.1	38.59	0.75 2.89
8	394	14.917	36.034	26.804	210.	4.42 0.03	29.9	38.91	1.04 3.79
13	644	11.686	35.576	27.114	201.	3.98 0.03	****	****	****
16	890	9.116	35.429	27.454	182.	1.60 0.01	****	****	****
19	1185	7.364	35.423	27.720	205.	0.71 0.01	****	****	****
22	1478	5.716	35.271	27.824	229.	0.44 0.01	18.0	39.50	0.81 18.85

Station 9427 Date : OCT 20,1979 32.50N 30.00W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Ks	T.U. +- permil	ncc/s	T.U.	y	
2	60	19.801	36.556	26.018	****	4.19 0.09	-3.3	38.46 0.28	1.18
3	75	19.062	36.533	26.194	223.	4.39 0.09	1.0	38.29 0.38	1.50
4	93	18.350	36.508	26.356	221.	4.39 0.09	6.3	38.62 0.50	1.94
5	121	17.580	36.435	26.491	207.	4.14 0.08	9.7	38.20 0.58	2.34
6	199	16.747	36.342	26.621	211.	4.17 0.08	14.5	38.48 0.69	2.74
7	346	14.374	35.953	26.860	210.	4.20 0.09	36.5	38.52 1.18	4.45
8	394	13.728	35.851	26.919	213.	4.33 0.09	36.8	38.81 1.19	4.37
9	444	13.116	35.757	26.973	203.	4.08 0.08	52.2	38.89 1.54	5.76
10	494	12.609	35.685	27.019	202.	4.11 0.08	51.8	38.77 1.53	5.68
12	591	11.412	35.536	27.135	199.	3.79 0.08	68.0	38.79 1.90	7.28
13	640	10.916	35.494	27.194	199.	3.33 0.07	71.3	38.96 1.98	8.37
14	691	10.220	35.443	27.278	189.	2.66 0.06	72.2	39.28 2.01	10.12
15	788	9.412	35.431	27.407	181.	1.76 0.04	*****	*****	*****
16	885	8.813	35.449	27.519	184.	1.00 0.02	43.5	39.52 1.38	15.57
17	985	8.180	35.425	27.599	191.	****	35.6	39.65 1.20	*****
19	1180	7.264	35.417	27.730	205.	0.68 0.02	33.4	39.63 1.16	17.88
20	1272	6.843	35.391	27.769	213.	0.54 0.02	27.6	39.92 1.03	19.21
22	1473	5.672	35.277	27.834	232.	0.55 0.02	18.5	39.71 0.82	16.35
23	1949	4.067	35.073	27.858	249.	0.15 0.01	11.2	40.17 0.67	30.51
24	2497	3.136	35.005	27.898	256.	0.16 0.01	8.1	41.15 0.60	27.94

Station 9428 Date : OCT 20,1979 31.53N 29.80W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Ks	T.U. +- permil	ncc/s	T.U.	y	
2	62	20.467	36.674	25.931	247.	****	-6.1	37.59 0.22	*****
3	73	19.156	36.542	26.176	231.	4.49 0.03	-6.2	37.33 0.23	0.88
4	83	18.488	36.512	26.324	230.	4.28 0.03	0.2	37.79 0.37	1.47
5	109	17.922	36.493	26.451	214.	4.39 0.03	2.8	37.74 0.42	1.65
6	221	16.519	36.289	26.634	209.	4.27 0.03	26.0	37.96 0.93	3.55
11	532	12.515	35.682	27.036	204.	4.31 0.03	61.5	37.79 1.71	6.02
13	642	11.336	35.537	27.150	200.	4.04 0.03	64.5	38.61 1.81	6.66
16	878	9.060	35.437	27.470	181.	1.44 0.01	50.4	39.31 1.53	12.97
19	1175	7.305	35.429	27.733	204.	0.69 0.01	30.9	39.51 1.10	17.03

Station 9429 Date : OCT 21,1979 30.48N 29.75W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U.	Del3He +- permil	C(He) ncc/g	XS3He T.U.	Tau y
2	86	20.246	36.717	26.023	221.	4.50 0.03	-8.1	38.12	0.18 0.70
3	103	19.347	36.716	26.259	225.	4.70 0.04	*****	*****	*****
4	118	18.914	36.646	26.318	221.	4.62 0.04	-5.2	38.20	0.25 0.93
5	177	17.887	36.514	26.476	218.	4.48 0.03	10.0	38.47	0.58 2.20
6	251	16.501	36.278	26.630	203.	4.56 0.04	40.4	38.59	1.26 4.39
8	404	14.319	35.937	26.860	206.	4.42 0.03	54.6	38.59	1.58 5.50
12	603	11.920	35.620	27.104	196.	3.96 0.03	74.8	38.87	2.05 7.50
16	905	9.223	35.476	27.473	181.	1.38 0.01	47.7	39.72	1.48 13.06
19	1204	7.456	35.455	27.732	199.	0.54 0.01	*****	*****	*****
22	1503	5.643	35.271	27.833	230.	0.32 0.01	12.0	39.64	0.67 20.44

Station 9430 Date : OCT 21,1979 29.53N 29.53W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U.	Del3He +- permil	C(He) ncc/g	XS3He T.U.	Tau y
2	82	21.116	36.994	25.997	226.	4.29 0.03	-6.6	37.98	0.21 0.85
3	101	20.181	36.905	26.183	214.	4.55 0.04	-4.4	38.29	0.26 1.00
4	125	19.096	36.738	26.341	206.	4.65 0.04	2.8	38.17	0.42 1.55
6	262	16.480	36.278	26.635	204.	4.58 0.04	33.3	38.11	1.10 3.86
7	353	15.165	36.067	26.774	200.	4.32 0.03	54.5	38.32	1.57 5.56
12	603	11.959	35.629	27.103	194.	3.62 0.03	82.1	38.64	2.20 8.53
16	904	9.028	35.416	27.458	182.	****	39.9	39.49	1.29 *****
19	1204	7.371	35.438	27.731	206.	0.72 0.01	25.7	39.63	0.98 15.36
22	1503	5.680	35.271	27.828	232.	0.23 0.01	9.1	39.26	0.61 23.28

Station 9431 Date : OCT 21,1979 28.55N 29.35W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U.	Del3He +- permil	C(He) ncc/g	XS3He T.U.	Tau y
2	81	20.508	36.841	26.047	232.	4.62 0.09	-8.3	37.46	0.18 0.67
3	90	20.040	36.819	26.156	231.	4.60 0.09	*****	*****	*****
4	119	19.215	36.766	26.332	214.	4.73 0.10	-0.7	37.48	0.34 1.26
5	182	17.997	36.566	26.489	212.	5.00 0.10	10.8	38.06	0.60 2.03
6	262	16.533	36.297	26.637	200.	4.53 0.09	45.4	38.09	1.36 4.72
8	394	14.572	35.974	26.834	192.	****	72.0	38.50	1.96 *****
12	590	12.034	35.648	27.103	183.	3.54 0.07	98.9	38.35	2.56 9.77
16	890	8.760	35.361	27.458	169.	****	31.4	39.54	1.10 *****
20	1290	6.586	35.321	27.749	203.	0.24 0.02	14.5	39.28	0.72 24.82
22	1489	5.727	35.264	27.817	221.	0.16 0.02	8.2	40.47	0.59 27.54

Figure 1. Station positions for the AII-107 Cruise (Oct.-Nov. 1979). Stations for the OC-78 cruise (Mar. 1980) were a subset of these.

Figure 2. Density distribution of samples obtained during the AII-107 cruise. Horizontal coordinate is station number. Samples from the OC-78 cruise were a subset of these, aimed at three density horizons.

Station 9432 Date : OCT 22,1979 27.55N 29.27W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.		y
2	82	20.602	36.874	26.046	235. 4.72 0.10	-8.2	37.45	0.18	0.67
3	98	19.890	36.816	26.193	229. 4.94 0.10	*****	*****	****	*****
4	127	19.110	36.747	26.345	223. 4.81 0.10	-4.2	37.67	0.27	0.98
5	181	18.091	36.599	26.490	214. 4.96 0.10	*****	*****	****	*****
6	254	16.658	36.314	26.621	200. 4.58 0.09	43.0	38.29	1.31	4.53
7	344	14.899	36.030	26.805	199. 4.58 0.09	62.8	38.12	1.75	5.80
12	598	11.840	35.632	27.128	193. 3.75 0.08	97.7	38.43	2.54	9.28
16	887	8.782	35.377	27.467	164. 0.64 0.02	28.2	39.23	1.03	17.16
20	1278	6.879	35.373	27.749	206. 0.35 0.02	16.9	39.46	0.78	20.94

Station 9433 Date : OCT 22,1979 26.57N 29.12W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.		y
2	89	20.853	36.976	26.056	229. 4.63 0.09	-8.0	37.66	0.18	0.69
3	104	20.189	36.917	26.190	227. 4.93 0.10	-7.1	37.82	0.20	0.72
4	136	19.235	36.789	26.344	211. 5.08 0.10	3.4	37.83	0.43	1.47
5	165	18.071	36.575	26.477	199. 4.61 0.09	22.5	37.87	0.85	3.05
6	224	16.600	36.307	26.629	193. 4.76 0.10	47.0	38.21	1.40	4.63
7	318	14.920	36.039	26.807	193. 4.46 0.09	63.9	37.96	1.76	5.98
12	546	11.999	35.651	27.112	189. 3.72 0.08	129.5	38.28	3.23	11.21
16	835	8.754	35.358	27.457	157. 0.64 0.02	23.1	38.78	0.90	15.86
20	1211	6.931	35.363	27.734	197. 0.35 0.02	18.3	39.19	0.81	21.46
22	1404	5.716	35.249	27.806	212. 0.11 0.02	7.1	39.45	0.56	32.65

Station 9434 Date : OCT 22,1979 25.58N 28.87W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.		y
2	80	20.932	36.990	26.045	227. 4.73 0.10	*****	*****	****	*****
3	95	20.310	36.937	26.173	222. 4.90 0.10	*****	*****	****	*****
4	127	19.079	36.736	26.344	213. 4.61 0.09	0.3	37.78	0.37	1.37
5	186	17.907	36.527	26.481	204. 4.59 0.09	21.8	38.14	0.84	3.02
6	271	16.413	36.271	26.646	196. 4.74 0.10	52.7	38.16	1.52	5.01
7	348	14.829	36.029	26.820	194. 4.74 0.10	69.8	38.23	1.90	6.07
11	547	12.079	35.660	27.104	182. 3.43 0.07	100.1	39.04	2.62	10.21
15	796	9.035	35.346	27.402	153. 0.61 0.02	22.3	38.72	0.89	16.13
20	1292	6.316	35.298	27.767	201. 0.25 0.02	8.6	39.94	0.60	21.80
21	1393	5.860	35.270	27.805	211. 0.18 0.02	12.0	39.36	0.67	28.01

Station 9435 Date : OCT 22,1979 24.55N 28.78W

Depth	PoTemp	Salnty	Sigtha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		
2	82	21.168	37.029	26.010	229. 4.84 0.10	-7.4	37.78	0.19	0.70
3	112	20.216	36.946	26.205	216. 5.03 0.10	*****	*****	****	*****
4	150	19.283	36.792	26.334	209. 4.71 0.10	2.3	38.13	0.41	1.50
5	204	17.834	36.526	26.498	202. 4.61 0.09	25.8	37.82	0.92	3.28
6	253	16.449	36.268	26.635	199. 4.46 0.09	55.7	38.13	1.59	5.47
7	333	14.865	36.029	26.812	180. 4.52 0.09	74.2	38.18	2.00	6.57
12	540	11.963	35.644	27.114	172. 3.03 0.06	96.4	38.04	2.49	10.76
16	803	8.492	35.243	27.409	144. 0.32 0.02	*****	*****	****	*****
21	1284	5.617	35.130	27.725	186. 0.15 0.02	7.3	39.32	0.57	27.92

Station 9436 Date : OCT 23,1979 23.55N 28.65W

Depth	PoTemp	Salnty	Sigtha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		
2	98	21.063	37.040	26.047	225. 4.68 0.09	-6.5	37.54	0.21	0.80
3	117	20.319	36.974	26.199	**** 4.82 0.10	*****	*****	****	*****
4	151	19.300	36.828	26.357	**** 4.79 0.10	1.8	37.55	0.40	1.44
5	193	17.946	36.564	26.500	191. ****	26.5	37.74	0.94	*****
6	247	16.502	36.301	26.648	185. 4.35 0.09	51.8	37.99	1.50	5.32
7	367	14.145	35.928	26.890	171. 3.95 0.08	87.4	38.09	2.28	8.19
11	546	11.805	35.622	27.127	169. 2.66 0.06	91.1	38.21	2.38	11.47
14	689	9.737	35.367	27.302	151. 2.09 0.09	9.6	43.41	0.63	4.72
15	779	8.562	35.243	27.397	123. 0.21 0.02	12.0	38.89	0.66	25.67
21	1340	5.445	35.127	27.743	****	7.4	39.55	0.57	*****
22	1446	5.159	35.123	27.775	203. 0.06 0.02	4.8	40.22	0.52	41.71

Station 9437 Date : OCT 23,1979 22.50N 28.52W

Depth m	PoTemp deg-C	Salnty permil	Sigtha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
2	96	21.101	37.083	26.069	215. 4.34 0.09	-6.4	37.71	0.22	0.87
3	121	20.416	36.998	26.191	210. 4.24 0.09	-4.0	37.72	0.27	1.10
4	157	19.342	36.764	26.297	194. 4.45 0.09	7.3	37.76	0.52	1.97
5	194	17.768	36.497	26.493	185. 4.16 0.08	23.7	37.57	0.88	3.43
6	245	16.369	36.249	26.639	130. 4.45 0.09	46.7	38.49	1.40	4.92
7	343	13.986	35.868	26.878	128. 3.62 0.07	80.6	38.31	2.15	8.36
8	392	13.125	35.757	26.971	138. 3.12 0.06	88.6	38.46	2.33	10.04
9	442	12.475	35.682	27.044	139. 2.96 0.06	94.5	38.60	2.47	10.91
10	492	11.985	35.631	27.100	132. 2.68 0.06	91.4	38.80	2.42	11.55
13	642	9.928	35.344	27.252	129. 0.63 0.02	27.9	38.28	1.00	17.11
16	889	7.202	35.051	27.451	133. 0.16 0.02	5.0	39.00	0.51	25.85
17	988	6.607	35.030	27.517	146. 0.12 0.01	9.9	39.29	0.62	33.21
18	1084	6.211	35.055	27.589	163. 0.20 0.02	*****	*****	*****	*****
20	1280	5.584	35.095	27.701	**** 0.06 0.01	7.0	39.32	0.56	41.96
21	1375	5.320	35.104	27.740	198. 0.11 0.01	*****	*****	*****	*****
22	1464	5.105	35.105	27.767	194. 0.08 0.01	7.9	39.04	0.58	38.95
23	1965	3.798	35.030	27.852	227. 0.05 0.01	11.5	40.00	0.67	47.02
24	2460	3.100	34.984	27.884	226. 0.06 0.01	17.0	39.66	0.80	48.36

Station 9438 Date : OCT 23,1979 22.88N 29.55W

Depth m	PoTemp deg-C	Salnty permil	Sigtha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
2	107	21.192	37.042	26.013	224. 4.59 0.09	-6.3	37.72	0.22	0.83
3	134	20.305	36.951	26.185	216. 4.91 0.10	-2.4	37.59	0.30	1.08
4	168	19.346	36.805	26.328	214. 4.92 0.10	-3.7	37.55	0.28	0.99
5	220	17.773	36.500	26.494	189. ****	28.2	37.74	0.97	*****
6	268	16.425	36.264	26.637	169. 4.38 0.09	46.0	38.13	1.37	4.90
8	378	14.329	35.960	26.875	176. 4.20 0.09	88.8	38.30	2.33	7.92
12	575	11.738	35.620	27.139	168. 2.91 0.06	94.5	38.33	2.46	10.99
16	825	7.703	35.102	27.418	129. 0.20 0.02	*****	*****	*****	*****
21	1319	5.318	35.081	27.723	202. 0.17 0.02	5.9	39.35	0.54	25.82
22	1421	5.113	35.109	27.769	212. 0.12 0.02	6.3	39.65	0.55	31.42

Station 9439 Date : OCT 28, 1979 25.72N 36.50W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.	y	
2	141	20.948	37.069	26.100	206. 4.69 0.10	-3.5	37.55	0.28	1.04
3	173	20.178	36.929	26.202	196. 4.99 0.10	*****	*****	****	*****
4	202	18.816	36.681	26.370	191. 4.54 0.09	34.4	38.11	1.11	3.94
5	238	17.755	36.491	26.491	**** 4.36 0.09	63.7	38.45	1.77	6.12
6	297	16.402	36.259	26.639	**** 4.54 0.09	*****	*****	****	*****
7	322	15.406	36.111	26.754	163. 3.39 0.07	105.2	43.06	2.97	11.29
11	533	12.264	35.681	27.084	168. 1.42 0.03	73.4	43.18	2.20	16.83
15	752	9.231	35.299	27.334	134. 0.17 0.02	9.9	39.28	0.61	27.58
20	1287	6.076	35.200	27.721	191. 0.05 0.02	8.6	39.66	0.60	44.68
21	1331	5.316	35.081	27.723	202. 0.13 0.02	7.7	40.15	0.58	30.30

Station 9440 Date : OCT 24, 1979 23.73N 31.52W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.	y	
2	121	20.222	36.924	26.187	200. 4.88 0.10	1.0	38.05	0.38	1.34
3	145	19.051	36.736	26.352	190. 4.89 0.10	*****	*****	****	*****
4	183	17.969	36.539	26.475	182. 4.51 0.09	25.3	37.99	0.92	3.32
6	352	14.644	36.005	26.842	172. ****	81.3	38.46	2.17	*****
11	594	11.340	35.575	27.179	169. 2.44 0.05	*****	*****	****	*****
16	981	7.057	35.154	27.552	162. 0.21 0.02	7.3	39.27	0.56	23.42
22	1904	3.877	35.061	27.869	234. 0.11 0.02	18.4	40.18	0.83	38.14

Station 9441 Date : OCT 24, 1979 24.13N 32.52W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.	y	
2	123	20.267	36.956	26.199	216. 4.90 0.10	-3.6	37.85	0.28	0.99
4	266	17.727	36.495	26.501	182. 4.68 0.10	21.8	34.54	0.80	2.82
5	285	16.494	36.276	26.630	178. 4.28 0.09	61.6	37.41	1.69	5.98
6	341	15.351	36.108	26.764	155. 4.40 0.09	70.7	38.58	1.94	6.55
7	400	14.024	35.917	26.908	179. 4.29 0.09	83.9	38.37	2.22	7.49
11	604	11.512	35.589	27.157	161. 2.69 0.06	84.2	38.49	2.24	10.89
15	897	7.888	35.219	27.482	133. 0.41 0.02	8.7	45.77	0.62	16.57
20	1395	5.065	35.111	27.777	209. 0.07 0.02	4.6	39.81	0.51	37.93
22	1961	3.822	35.053	27.868	229. 0.17 0.02	6.6	40.32	0.56	26.45

Station 9442 Date : OCT 24,1979 24.52N 33.53W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	y	
24	123	21.111	37.028	26.024	224.	4.46 0.09	*****	*****	****	*****
2	181	18.988	36.721	26.356	202.	4.66 0.09	12.3	37.79	0.63	2.26
3	222	17.874	36.518	26.482	192.	4.72 0.10	34.5	38.12	1.12	3.82
4	284	16.558	36.292	26.627	182.	4.63 0.09	59.6	38.30	1.68	5.55
6	397	14.457	35.984	26.866	183.	4.32 0.09	91.9	38.15	2.39	7.91
10	601	11.671	35.610	27.143	172.	2.68 0.06	89.5	38.47	2.36	11.34
14	894	8.031	35.219	27.461	149.	0.34 0.02	9.9	39.30	0.62	18.54
18	1289	5.999	35.194	27.727	195.	0.09 0.02	5.1	39.01	0.52	35.12
20	1483	5.286	35.076	27.722	229.	0.14 0.02	3.9	39.88	0.49	26.82

Station 9443 Date : OCT 25,1979 25.53N 32.05W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	y	
2	102	21.140	37.049	26.033	224.	4.25 0.03	-5.6	37.66	0.23	0.95
3	125	20.340	36.972	26.192	218.	4.65 0.04	-10.5	37.65	0.13	0.49
5	222	17.882	36.514	26.477	201.	4.48 0.03	24.5	37.93	0.90	3.28
6	287	16.511	36.282	26.631	190.	4.55 0.04	52.4	38.21	1.52	5.17
8	396	14.543	35.993	26.855	184.	4.91 0.10	88.1	38.17	2.30	6.90
12	593	11.841	35.626	27.123	158.	3.45 0.07	*****	*****	****	*****
16	888	8.174	35.203	27.426	141.	0.21 0.01	12.1	38.93	0.66	25.95
21	1384	5.693	35.181	27.755	204.	0.07 0.01	7.5	39.73	0.57	40.29
22	1491	5.394	35.181	27.792	211.	0.11 0.01	5.8	38.83	0.53	31.29

Station 9444 Date : OCT 25,1979 26.53N 30.68W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	y	
2	92	20.687	36.905	26.047	228.	4.45 0.03	-5.2	37.84	0.24	0.95
3	111	19.908	36.839	26.206	218.	4.56 0.04	-3.4	37.93	0.28	1.08
4	134	19.108	36.722	26.326	209.	4.66 0.04	2.8	37.78	0.42	1.55
5	188	17.865	36.508	26.477	205.	3.80 0.03	20.7	37.56	0.81	3.47
6	272	16.508	36.268	26.621	201.	4.42 0.03	43.0	37.80	1.30	4.63
8	399	14.387	35.951	26.856	191.	4.36 0.03	84.4	38.30	2.23	7.42
12	593	11.970	35.553	27.042	174.	2.29 0.02	81.9	38.41	2.19	12.02
15	794	9.266	35.365	27.380	159.	0.64 0.01	26.4	38.92	0.98	16.62
20	1253	6.367	35.248	27.721	195.	0.11 0.01	6.7	39.73	0.55	32.91
22	1371	5.970	35.257	27.780	191.	0.07 0.01	4.1	39.20	0.49	36.99

Station 9445 Date : OCT 26,1979 28.23N 30.92W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau g
2	99	20.370	36.755	26.018	231. 4.44 0.03	-7.2	37.81	0.20	0.79
3	106	19.619	36.620	26.115	229. 4.63 0.04	*****	*****	****	*****
4	111	19.202	36.589	26.200	224. 4.36 0.03	-3.9	37.83	0.27	1.10
6	274	16.552	36.290	26.627	209. 5.29 0.04	*****	*****	****	*****
16	902	8.221	35.278	27.478	159. 0.53 0.01	19.4	39.87	0.84	17.09
20	1282	6.232	35.252	27.742	201. 0.14 0.01	12.2	39.36	0.68	31.33
22	1445	5.828	35.264	27.804	219. 0.12 0.01	9.6	40.03	0.62	32.59

Station 9446 Date : OCT 26,1979 28.88N 32.60W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau g
2	119	19.830	36.758	26.165	222. 4.45 0.09	-1.9	37.82	0.32	1.23
3	138	18.919	36.675	26.339	205. 4.54 0.09	5.6	37.87	0.48	1.81
4	188	17.727	36.487	26.495	199. 4.47 0.09	12.3	39.41	0.64	2.41
5	274	16.493	36.271	26.627	184. 4.44 0.09	53.7	36.75	1.50	5.23
7	449	14.715	36.000	26.823	186. 4.11 0.08	74.6	38.79	2.03	7.22
12	645	11.584	35.585	27.140	184. 3.00 0.06	*****	*****	****	*****
15	888	8.570	35.299	27.440	158. 0.57 0.02	21.1	38.73	0.86	16.58
20	1369	5.641	35.168	27.752	199. 0.09 0.02	5.3	39.76	0.52	35.30
21	1442	5.477	35.187	27.787	210. 0.23 0.02	7.0	40.79	0.57	22.59

Station 9447 Date : OCT 27,1979 27.90N 34.03W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau g
2	86	20.522	36.754	25.977	235. 4.56 0.09	-7.0	37.93	0.20	0.78
5	192	17.768	36.493	26.490	206. 4.65 0.09	*****	*****	****	*****
6	282	16.553	36.279	26.619	180. 4.28 0.09	54.6	38.16	1.56	5.60
8	400	14.857	36.018	26.805	197. 4.36 0.09	73.2	38.17	1.98	6.71
13	634	11.325	35.563	27.172	176. 2.73 0.06	80.8	38.60	2.17	10.50
16	890	8.110	35.256	27.478	169. 0.40 0.02	33.1	37.79	1.11	23.73
20	1278	5.786	35.182	27.744	206. 0.23 0.02	5.4	39.63	0.52	21.49
22	1490	5.154	35.164	27.808	215. 0.23 0.02	*****	*****	****	*****

Station 9448 Date : OCT 27,1979 26.20N 33.73W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		
2	103	20.490	36.844	26.054	222. 4.26 0.09	-3.2	37.86	0.29	1.16
3	125	19.840	36.819	26.208	207. 4.58 0.09	0.1	37.92	0.36	1.36
4	152	18.929	36.681	26.341	199. 4.61 0.09	*****	*****	*****	*****
5	194	17.896	36.504	26.466	199. 4.41 0.09	19.0	37.57	0.77	2.90
6	297	16.612	36.289	26.613	193. 4.31 0.09	45.8	37.92	1.36	4.94
8	399	14.527	35.974	26.843	190. 4.37 0.09	*****	*****	*****	*****
12	596	11.707	35.612	27.138	177. 2.87 0.06	93.3	38.45	2.44	11.05
16	892	8.050	35.208	27.449	156. 0.28 0.02	14.8	39.08	0.73	23.11
22	1480	5.434	35.198	27.801	207. 0.11 0.02	7.4	38.98	0.57	32.38

Station 9449 Date : OCT 28,1979 24.92N 34.50W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		
2	98	21.031	37.033	26.050	218. 4.50 0.09	-2.9	38.46	0.29	1.12
3	116	19.900	36.860	26.224	209. 4.60 0.09	0.3	38.24	0.36	1.37
4	151	18.808	36.643	26.343	202. 4.60 0.09	13.8	38.85	0.67	2.44
5	206	17.746	36.478	26.483	197. 4.62 0.09	35.5	38.24	1.14	3.97
6	289	16.492	36.277	26.632	186. 4.18 0.09	*****	*****	*****	*****
8	406	14.477	35.965	26.847	186. 4.38 0.09	85.7	37.43	2.21	7.35
16	904	7.789	35.167	27.456	133. ****	5.1	39.55	0.51	*****
21	1377	5.641	35.174	27.756	201. 0.13 0.02	*****	*****	*****	*****
22	1476	5.445	35.192	27.795	208. 0.11 0.02	4.3	48.76	0.52	32.15

Station 9450 Date : OCT 28,1979 25.33N 35.55W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		
2	131	20.899	37.056	26.104	216. 4.36 0.09	-5.5	38.81	0.23	0.93
3	146	20.138	36.896	26.188	210. 4.37 0.09	*****	*****	*****	*****
4	181	19.188	36.740	26.319	199. 4.49 0.09	13.7	38.08	0.66	2.46
5	230	17.805	36.486	26.475	197. 4.59 0.09	*****	*****	*****	*****
6	293	16.562	36.285	26.621	178. 4.66 0.09	*****	*****	*****	*****
8	403	14.647	35.998	26.836	165. 4.12 0.08	*****	*****	*****	*****
12	596	11.847	35.618	27.116	156. 2.54 0.05	*****	*****	*****	*****
16	905	7.939	35.185	27.448	122. 0.28 0.02	9.3	39.62	0.60	20.75
21	1345	5.753	35.176	27.744	182. 0.16 0.02	9.5	40.24	0.62	28.83
22	1412	5.579	35.176	27.766	205. 0.17 0.02	*****	*****	*****	*****

Station 9451 Date : OCT 28,1979 25.72N 36.50W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		y
2	141	20.948	37.069	26.100	206.	4.63 0.09	-2.7	37.51	0.30	1.11
3	173	20.178	36.929	26.202	196.	4.48 0.09	5.8	37.62	0.48	1.83
4	202	18.816	36.681	26.370	191.	4.95 0.10	21.5	37.78	0.83	2.78
5	238	17.755	36.491	26.491	****	4.98 0.10	35.9	37.90	1.14	3.71
8	390	14.817	36.020	26.815	162.	3.99 0.08	82.2	38.22	2.18	7.82
13	639	11.575	35.589	27.145	160.	2.36 0.05	81.3	38.65	2.18	11.78
16	895	8.490	35.294	27.449	132.	0.37 0.02	15.5	39.18	0.74	19.75
20	1287	6.076	35.200	27.721	191.	0.15 0.02	8.6	39.55	0.60	28.42
22	1452	5.446	35.171	27.778	208.	0.06 0.02	6.3	40.02	0.55	42.98

Station 9452 Date : OCT 28,1979 26.12N 37.52W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		y
2	107	20.910	36.988	26.049	227.	4.63 0.09	-3.4	37.48	0.28	1.06
3	133	20.020	36.870	26.200	205.	4.84 0.10	2.7	37.62	0.42	1.48
4	162	18.788	36.629	26.337	200.	4.47 0.09	7.6	37.69	0.53	1.99
5	226	17.686	36.450	26.477	197.	4.56 0.09	*****	*****	*****	*****
6	320	16.592	36.291	26.619	173.	4.32 0.09	61.2	38.01	1.70	5.96
8	396	15.117	36.061	26.781	175.	****	83.3	38.12	2.19	*****
13	647	11.744	35.620	27.137	158.	2.97 0.06	91.9	38.69	2.42	10.71
16	893	8.400	35.255	27.432	143.	0.33 0.02	12.9	39.05	0.68	20.09
20	1286	5.906	35.182	27.729	201.	0.37 0.02	14.4	39.97	0.73	19.52
22	1492	4.993	35.124	27.795	223.	0.10 0.02	5.1	39.25	0.52	32.45

Station 9453 Date : OCT 29,1979 24.07N 37.53W

	Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
	m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.		y
4	70	22.731	37.169	25.675	225.	4.30 0.09	-8.3	39.88	0.16	0.65
7	128	20.719	37.005	26.114	208.	4.61 0.09	1.9	37.83	0.40	1.48
9	165	19.359	36.776	26.302	193.	4.72 0.10	19.1	37.65	0.77	2.72
10	186	18.897	36.692	26.358	186.	4.38 0.09	27.3	37.73	0.95	3.53
12	220	17.766	36.490	26.488	185.	4.73 0.10	44.1	38.18	1.33	4.45
14	284	16.343	36.264	26.656	182.	4.89 0.10	71.2	38.36	1.94	5.99
16	371	14.718	36.015	26.833	175.	4.44 0.09	91.3	38.34	2.38	7.72
23	859	7.992	35.200	27.452	146.	0.28 0.02	11.8	39.05	0.66	21.92
24	972	6.504	35.085	27.574	157.	0.20 0.02	6.2	43.33	0.55	23.64

Station 9454 Date : OCT 29,1979 21.97N 37.55W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	y	
3	50	26.051	37.630	25.022	204.	3.34 0.07	-13.9	37.16	0.04 0.23
6	110	21.681	37.160	25.967	203.	4.61 0.09	-3.1	37.57	0.29 1.08
8	151	20.189	36.924	26.196	198.	4.27 0.09	8.0	38.07	0.53 2.10
9	171	19.157	36.761	26.343	190.	4.59 0.09	23.1	37.77	0.86 3.09
11	211	17.687	36.390	26.431	174.	4.59 0.09	55.6	37.69	1.57 5.27
13	248	16.814	36.337	26.601	180.	4.19 0.09	63.6	37.87	1.75 6.26
15	350	14.719	36.012	26.831	158.	4.07 0.08	87.7	38.27	2.30 8.05
19	545	12.009	35.640	27.102	153.	2.46 0.05	90.0	38.47	2.37 12.11
22	793	8.335	35.187	27.389	146.	0.24 0.02	*****	*****	****
24	993	5.913	34.967	27.558	165.	0.10 0.02	3.8	44.18	0.50 31.82

Station 9455 Date : OCT 30,1979 19.75N 37.70W

Depth	PoTemp	Salnty	Sigtha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau		
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	y			
5	88	24.681	37.119	25.060	220.	3.20	0.07	-11.0	37.41	0.11	0.60
8	142	20.279	36.833	26.102	176.	3.85	0.08	10.5	37.80	0.58	2.54
9	157	19.439	36.715	26.235	166.	4.25	0.09	*****	*****	****	*****
10	173	18.037	36.507	26.433	151.	3.90	0.08	34.1	37.89	1.11	4.48
11	187	17.507	36.409	26.489	146.	3.85	0.08	*****	*****	****	*****
13	215	16.607	36.271	26.600	146.	3.75	0.08	*****	*****	****	*****
15	347	13.713	35.769	26.859	102.	2.63	0.06	70.6	38.23	1.93	9.86
17	390	13.287	35.752	26.934	116.	****	****	86.4	38.30	2.28	*****
20	519	11.195	35.444	27.104	****	1.42	0.03	52.3	38.52	1.54	13.18
24	933	6.187	34.891	27.463	137.	0.04	0.02	2.0	45.06	0.45	43.46

Station 9456 Date : OCT 30,1979 17.53N 37.78W

Depth	PoTemp	Salnty	Sigtha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau		
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/g	T.U.	y			
4	72	25.370	37.039	24.788	214.	2.68	0.06	-11.4	37.44	0.10	0.64
5	93	23.761	37.120	25.336	216.	3.01	0.06	-8.7	37.38	0.16	0.93
7	132	20.559	36.867	26.053	177.	4.18	0.09	5.4	39.00	0.48	1.94
8	152	18.588	36.535	26.316	149.	3.99	0.08	*****	*****	****	*****
10	192	16.317	36.171	26.591	120.	****	****	47.0	38.07	1.40	*****
14	297	14.502	35.951	26.831	137.	3.59	0.07	*****	*****	****	*****
16	395	12.567	35.657	27.006	127.	2.34	0.05	80.5	38.29	2.15	11.69
18	499	10.192	35.299	27.171	107.	0.57	0.02	*****	*****	****	*****
23	852	6.111	34.839	27.432	133.	0.07	0.01	9.9	39.80	0.63	41.05
24	938	5.816	34.849	27.478	142.	0.11	0.02	2.9	43.82	0.48	29.77

Station 9457 Date : OCT 31,1979 15.28N 37.80W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.		y
4	67	23.942	37.122	25.284	231.	3.32	0.07	-7.7	38.07
7	126	21.090	37.001	26.010	183.	4.29	0.09	*****	*****
8	146	19.648	36.745	26.203	171.	4.41	0.09	14.7	37.86
9	167	18.429	36.528	26.351	158.	4.11	0.08	*****	*****
10	187	17.407	36.352	26.470	139.	3.74	0.08	31.5	37.81
11	211	16.066	36.131	26.619	122.	3.34	0.07	*****	*****
13	271	13.633	35.729	26.845	95.	2.44	0.05	62.3	35.99
17	483	9.432	35.089	27.136	81.	0.34	0.02	*****	*****
21	744	6.778	34.837	27.342	106.	0.09	0.02	12.4	39.59
24	903	6.088	34.828	27.426	126.	0.07	0.02	6.4	40.41

Station 9458 Date : OCT 31,1979 13.12N 37.90W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.		y
5	86	22.092	36.770	25.555	194.	3.37	0.07	7.5	37.65
7	122	18.800	36.551	26.275	148.	4.21	0.09	*****	*****
8	140	17.379	36.354	26.478	135.	3.83	0.08	41.3	37.90
9	155	16.539	36.214	26.572	127.	3.61	0.07	*****	*****
10	172	15.748	36.095	26.664	118.	3.42	0.07	57.1	37.70
13	222	14.126	35.838	26.825	113.	2.91	0.06	68.3	37.74
16	350	10.419	35.215	27.065	95.	0.79	0.02	*****	*****
18	439	9.195	35.042	27.139	98.	0.41	0.02	*****	*****
23	835	5.852	34.778	27.417	117.	0.13	0.02	9.5	39.20
24	944	5.536	34.794	27.469	126.	0.09	0.02	5.1	45.18

Station 9459 Date : NOV 1,1979 11.57N 37.97W

Depth	PoTemp	Salnty	Sistha	Oxygen	Tritium	Del3He	C(He)	XS3He	Tau
m	deg-C	permil		uM/Kg	T.U. +- permil	ncc/s	T.U.		y
4	65	22.002	36.220	25.163	197.	2.37	0.05	*****	*****
6	99	15.141	35.834	26.600	108.	2.27	0.05	33.6	38.08
9	152	12.489	35.416	26.835	101.	1.38	0.03	27.5	38.50
18	444	9.214	35.025	27.122	76.	0.21	0.02	2.6	40.16

Station 9460 Date : NOV 1, 1979 10.17N 38.05W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
3	45	20.764	36.181	25.475	189. 2.32 0.05	12.0	38.26	0.62	4.24
4	65	15.093	35.657	26.475	103. 1.46 0.03	25.2	38.82	0.93	8.85
5	85	13.223	35.458	26.720	103. 1.11 0.03	*****	*****	****	*****
6	105	12.252	35.311	26.800	101. 0.98 0.02	19.5	40.31	0.83	11.08
7	123	11.421	35.188	26.863	103. 0.64 0.02	16.8	38.72	0.76	14.08
12	221	9.566	34.926	26.987	117. 0.23 0.01	7.6	38.98	0.56	22.36
16	388	8.337	34.842	27.118	81. 0.07 0.01	4.2	39.40	0.49	37.77
20	566	6.918	34.750	27.254	95. 0.06 0.01	5.8	39.87	0.53	42.22
23	870	5.260	34.710	27.436	127. 0.06 0.01	11.3	39.83	0.66	43.90
24	971	5.044	34.741	27.486	143. 0.00 0.01	7.5	45.95	0.60	90.18

Station 9461 Date : NOV 1, 1979 8.92N 38.05W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
5	86	18.352	35.994	25.962	129. 1.96 0.04	22.9	38.31	0.87	6.56
6	100	15.591	35.750	26.435	118. 1.65 0.04	25.7	38.47	0.94	8.07
7	116	14.151	35.548	26.596	120. 1.36 0.03	23.1	38.91	0.89	9.03
8	131	13.460	35.467	26.678	123. 1.29 0.03	22.1	38.48	0.86	9.22
10	161	11.559	35.198	26.845	126. 1.00 0.02	*****	*****	****	*****
13	226	10.076	34.995	26.954	120. 0.39 0.02	10.8	39.00	0.63	17.38
17	443	8.074	34.797	27.123	99. 0.08 0.01	7.3	38.70	0.56	37.26
20	575	6.967	34.709	27.215	110. 0.04 0.01	10.1	39.32	0.63	49.27
23	868	5.310	34.679	27.406	126. 0.10 0.01	16.6	39.62	0.78	39.91
24	958	5.165	34.709	27.447	134. 0.04 0.01	1.8	44.08	0.45	44.97

Station 9462 Date : NOV 2, 1979 6.70N 38.02W

Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
4	71	18.412	36.102	26.030	132. 2.16 0.05	26.0	38.21	0.93	6.44
7	129	11.811	35.229	26.821	151. 0.86 0.02	19.8	38.98	0.82	12.11
10	178	10.458	35.021	26.908	142. 0.62 0.02	13.7	38.94	0.69	13.50
13	227	9.646	34.891	26.946	137. 0.37 0.02	9.2	39.24	0.60	17.36
15	320	8.921	34.818	27.008	135. 0.31 0.01	7.2	39.19	0.55	18.34
18	466	7.603	34.713	27.127	110. 0.12 0.01	4.2	42.07	0.50	29.06
19	512	7.151	34.671	27.159	121. 0.07 0.01	*****	*****	****	*****
21	652	6.273	34.618	27.237	123. 0.25 0.01	*****	*****	****	*****
23	843	5.202	34.601	27.357	137. 0.07 0.01	15.5	40.61	0.77	44.09
24	943	4.896	34.641	27.424	144. 0.04 0.01	10.8	46.37	0.69	54.48

Table 4.

Tritium, ^3He and selected hydrographic data
from the OC-78 cruise.

Station 0002 Date : MAR 17,1980 24.92N 34.50W

	Depth m	PoTemp deg-C	Salnty permil	Sigtha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
3	229	18.188	36.587	26.457	202.	4.57 0.11	36.7	37.02	1.14	4.00
4	288	16.740	36.328	26.612	196.	4.18 0.10	54.7	37.82	1.55	5.68
7	374	15.050	36.046	26.784	184.	3.85 0.10	73.6	38.24	1.99	7.48

Station 0004 Date : MAR 18,1980 24.72N 36.50W

	Depth m	PoTemp deg-C	Salnty permil	Sigtha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
6	222	18.211	36.592	26.455	192.	4.76 0.11	20.3	38.80	0.81	2.84
7	286	16.954	36.368	26.592	183.	4.50 0.11	*****	*****	****	*****
9	396	15.012	36.058	26.802	184.	4.04 0.10	72.9	38.43	1.98	7.17

Station 0006 Date : MAR 18,1980 26.50N 38.50W

	Depth m	PoTemp deg-C	Salnty permil	Sigtha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
4	145	21.360	37.341	26.194	213.	3.98 0.10	*****	*****	****	*****
5	214	17.968	36.490	26.438	201.	4.20 0.10	25.9	39.40	0.95	3.66
6	264	17.476	36.430	26.513	202.	4.09 0.10	23.0	38.67	0.87	3.48
7	296	17.027	36.373	26.578	187.	3.92 0.10	55.9	38.09	1.59	6.11
8	351	15.682	36.168	26.735	183.	4.48 0.11	62.2	37.51	1.71	5.80
9	401	15.021	36.053	26.796	190.	4.61 0.11	68.6	39.11	1.91	6.23
10	450	14.218	35.952	26.893	173.	3.66 0.09	106.3	38.66	2.73	10.02
12	551	12.731	35.747	27.043	182.	3.47 0.09	101.8	38.94	2.65	10.20
14	702	10.928	35.535	27.223	162.	1.70 0.07	64.8	39.95	1.87	13.34
16	903	8.435	35.266	27.435	151.	0.48 0.06	9.4	40.95	0.61	14.82
23	4000	2.212	34.917	27.909	250.	0.39 0.06	28.5	43.62	1.13	24.48

Station 0008 Date : MAR 19,1980 27.67N 36.83W

	Depth m	PoTemp deg-C	Salnty permil	Sigtha	Oxygen uM/Kg	Tritium T.U. +- permil	Del3He ncc/g	C(He) T.U.	XS3He T.U.	Tau y
5	254	18.122	36.546	26.442	198.	4.54 0.11	15.4	40.34	0.72	2.64
7	337	16.849	36.342	26.597	197.	4.15 0.10	53.2	40.27	1.60	5.84
9	436	15.018	36.060	26.802	188.	4.16 0.10	69.1	40.66	1.98	7.00

Station 0010 Date : MAR 20,1980 28.83N 35.08W

	Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U.	Del3He +- permil	C(He) ncc/g	XS3He T.U.	Tau y
4	206	17.996	36.527	26.459	199.	4.30	0.10	44.6	39.47	1.37 4.98
6	284	16.959	36.356	26.581	202.	3.79	0.10	*****	*****	**** *****
9	399	15.082	36.063	26.790	195.	3.87	0.10	85.2	38.71	2.27 8.28

Station 0012 Date : MAR 21,1980 30.00N 33.42W

	Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U.	Del3He +- permil	C(He) ncc/g	XS3He T.U.	Tau y
3	118	17.869	36.476	26.452	209.	3.84	0.10	22.9	38.70	0.87 3.67
5	185	16.949	36.379	26.601	211.	4.40	0.11	28.5	38.88	1.00 3.69
8	349	15.116	36.068	26.786	207.	3.96	0.10	46.8	38.88	1.42 5.49

Station 0014 Date : MAR 21,1980 31.33N 31.53W

	Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U.	Del3He +- permil	C(He) ncc/g	XS3He T.U.	Tau y
1	146	18.079	36.500	26.418	214.	4.50	0.11	5.8	38.70	0.49 1.86
2	166	17.500	36.437	26.512	207.	4.17	0.10	17.2	38.32	0.74 2.95
3	215	16.861	36.345	26.596	212.	4.04	0.10	22.8	38.43	0.87 3.50
4	255	16.220	36.227	26.657	209.	4.56	0.11	30.0	38.84	1.04 3.68
5	305	15.357	36.096	26.754	208.	4.44	0.11	38.4	40.78	1.27 4.52
6	335	14.946	36.042	26.804	206.	4.53	0.11	56.0	40.07	1.66 5.61
7	352	14.589	35.974	26.830	209.	4.06	0.10	45.2	37.68	1.35 5.16
9	449	13.363	35.791	26.949	206.	4.53	0.11	63.8	41.09	1.88 6.24
11	551	12.202	35.636	27.061	201.	3.66	0.09	66.3	39.78	1.89 7.50
13	701	10.770	35.490	27.217	197.	2.94	0.08	85.4	39.32	2.31 10.42
15	904	8.868	35.451	27.512	186.	****	****	44.9	40.04	1.42 *****
22	4009	2.263	34.908	27.898	250.	0.07	0.06	16.4	43.50	0.82 46.98

Station 0015 Date : MAR 21,1980 31.92N 30.75W

	Depth m	PoTemp deg-C	Salnty permil	Sistha	Oxygen uM/Kg	Tritium T.U.	Del3He +- permil	C(He) ncc/g	XS3He T.U.	Tau y
4	76	17.850	36.477	26.457	226.	4.56	0.11	-5.0	38.69	0.25 0.97
5	139	16.877	36.348	26.595	214.	3.94	0.10	22.7	38.10	0.86 3.56
8	294	15.022	36.061	26.802	220.	4.32	0.10	29.6	38.73	1.03 3.84

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16. Abstract (Limit: 200 words) This report contains data from approximately 500 tritium and helium isotope measurements made on seawater samples collected on two cruises to the "Beta Triangle Area" in the eastern subtropical North Atlantic in 1979 and 1980. The Beta Triangle is a 1000 km on-a-side triangular area centered on 28.5°N, 33.5°W. The samples from the earlier cruise were targetted at 10 standard isopycnal levels, and were taken at all 36 triangle stations, plus an appended meridional section along 38.5°W extending to 6°N. The later cruise was a much reduced subset sampling (alternate stations only, no meridional section) aimed at only three horizons, except for the corner stations which were more completely sampled. The data presented includes the standard hydrographic information (depth, temperature, salinity and dissolved oxygen) plus the measured quantities (tritium, $\delta(^3\text{He})$ and C(He)). In addition, the computed excess ^3He (in T.U.) and tritium ^3He age (in years) are included. Some analytical details are discussed.			
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