

GEOSECS PACIFIC RADIOCARBON

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In the preceding paper (Stuiver and Östlund, this issue), some of the general features of the Geochemical Ocean Section Study (GEOSECS) were outlined and results were listed for the Atlantic Ocean. This paper will deal with the second major cruise, which was described by Craig and Turekian (1976), covering the Pacific Ocean in 1973-74 (*cf* fig 1).

The sampling and measurement techniques were not substantially changed from what was described in the Stuiver and Östlund paper (1980). This expedition resulted in a larger number of ^{14}C measurements than the Atlantic due to the larger size of the Pacific Ocean. The areas visited were selected for ocean-wide coverage, allowing coherent sections to be drawn. Somewhat more intensified sampling was performed in particularly interesting areas, eg, across the Equatorial Current system, and on the Antarctic leg with some emphasis on the Antarctic Circumpolar Current.

A large number of Pacific radiocarbon measurements have been made during the past 20 years at Scripps Institution of Oceanography of the University of California by H E Suess and his co-workers; a comprehensive summary was released by Linick (1978). Other Pacific data are reported by Rafter and O'Brien (1970; 1972), and by Fairhall, Young, and Bradford (1972) who measured a sizeable number of samples collected on ships of opportunity. In contrast to previous studies, the GEOSECS expedition was more of a quasi-synoptic study of the entire ocean, with a coverage dense enough and resolution good enough to describe the major water masses in some detail. The average ^{14}C levels of Pacific polar ($>50^\circ\text{S}$), gyre (50°S - 10°S and 10°N - 50°N) and tropical waters (10°S - 10°N) are given separately (Stuiver, Östlund, and McConaughy, 1980). Estimates of nuclear bomb ^{14}C inventories were made in this paper, and also by Broecker, Peng, and Engh (in press).

THE $\Delta^{14}\text{C}$ SCALE

In this paper, we have, in principle, followed the recommendations by Stuiver and Robinson (1974) which means that the ^{14}C values are recalculated to a standard wood ($\delta^{13}\text{C} = -25\text{‰}$), and they relate to activities at time of sampling — 1973-1974. $\delta^{13}\text{C}$ values are not listed since they refer to each specific CO_2 gas sample at time of counting. That value may differ slightly from the $\delta^{13}\text{C}$ of the total CO_2 in the original

GEOSECS Pacific Radiocarbon

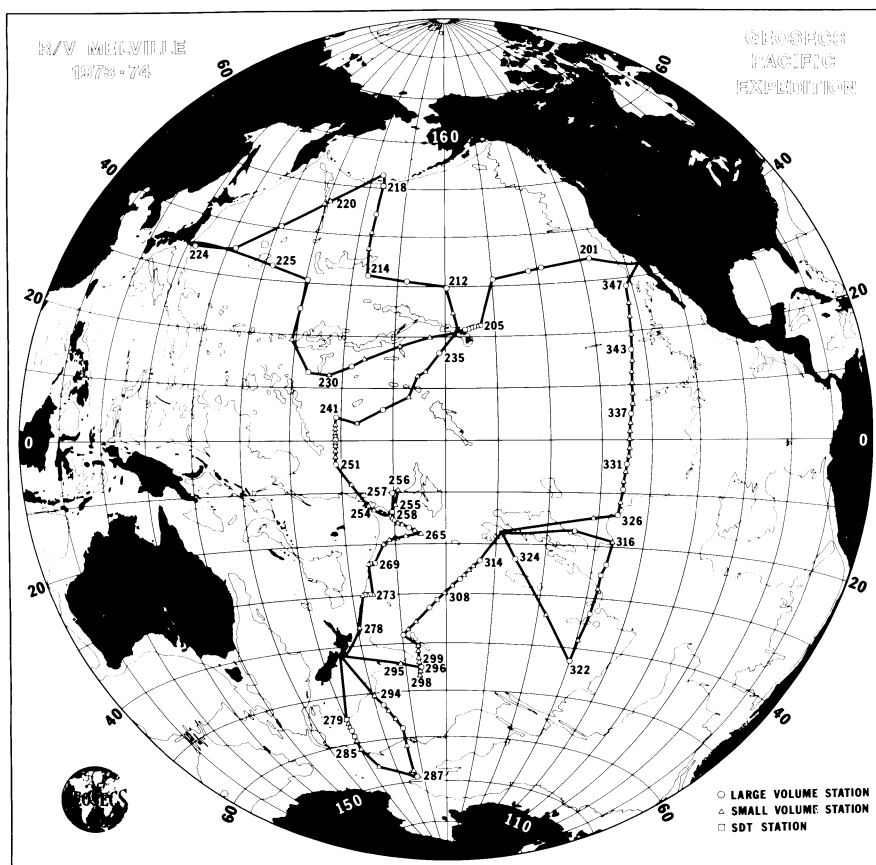


Fig 1. GEOSECS Pacific Track 1973-1974.

seawater sample, due to an albeit minor fractionation during the CO_2 extraction.* Appropriate corrections for the decay of the NBS ^{14}C standard have also been made. The $\Delta^{14}\text{C}$ scale is, for all practical purposes, the same as the one proposed by Broecker and Olson (1961).

EXPLANATION OF THE TABLES

All data on position, depths, and hydrography and total CO_2 have been furnished by the GEOSECS Operations Group (now Physical and Chemical Ocean Data Facility) at Scripps Institution of Oceanography, which handled the logistics and operations on board the ship and also serves as a temporary repository for all GEOSECS data. The following explains the column headings:

POSITION: Given in degrees and minutes. The ship frequently drifted during station time, so the position is defined to no better than $\pm$ a few minutes.

* Water samples for precision ^{13}C measurements were collected separately and are being measured by Peter Kroopnick (Univ Hawaii, pers commun).

SMPL #: This is the operational sample number, in which the two last digits indicate the Gerard barrel number and the preceding digits the case number. The first on station 201 is sample no. 1187: ie, cast #11, Gerard #87.

DEPTH M: Given in meters as calculated from density and pressure.

POT T DEG C: Potential temperature in degrees centigrade.

SAL ‰: Salinity in unit g/kg seawater.

SIGMA THETA: Deviation from unity, in per mille, of the relative density in g/ml where ml has the old value of 1.000027cm³.

TCO2 μ M: The total amount of inorganic carbon in μ -moles per kg of seawater. All TCO2 data listed are still preliminary. At time of writing, a final re-evaluation is being made on all GEOSECS oceanic CO₂ measurements. This will most likely result in minor adjustments on these numbers.

DC14 ‰: This is $\Delta^{14}\text{C}$ on the scale that was defined above. The accuracy is typically $\pm 4\text{‰}$ and precision $\pm 3.5\text{‰}$.

C14 LAB #: This column lists MI for the Miami Laboratory and QL for the Washington Laboratory with numbers referring to our laboratory journals.

THE SECTIONS

The track of the Pacific GEOSECS expedition allowed three vertical sections to be made, plates 1, 2, and 3. The horizontal scales are proportional to distances between stations along the track.

One of the striking features in the section Western Pacific (pl 1) is, for instance, that the northern part does not exhibit the deep convection and renewal of deep waters that is so prominent in the Atlantic Ocean (*cf* pl 1, Stuiver and Östlund, 1980). Furthermore, in the Pacific N-S sections (pls 1 and 2), it is seen that the *oldest* waters are at mid-depth and in the northern parts, while in the Atlantic the mid-depth tongue of North Atlantic Deep Water is *younger* than below and above. Previous attempts of using ¹⁴C measurements to estimate the time scales of the Pacific deep circulation have been made by Craig (1969; 1971) and Bien, Rakestraw, and Suess (1960, 1963a, b; 1965). A renewed effort to use the recent available data was made by Rooth, Fine, and Östlund (1980) wherein the potential density has been substituted for depth coordinate. This approach yields a more realistic estimate on the time scales of renewal and circulation of the bulk of the old Pacific deep waters. They find vertical convergence of the below-themocline waters in the North Pacific, balanced by southerly flow at mid-depth (*cf* also Reid, 1973).

ACKNOWLEDGMENTS

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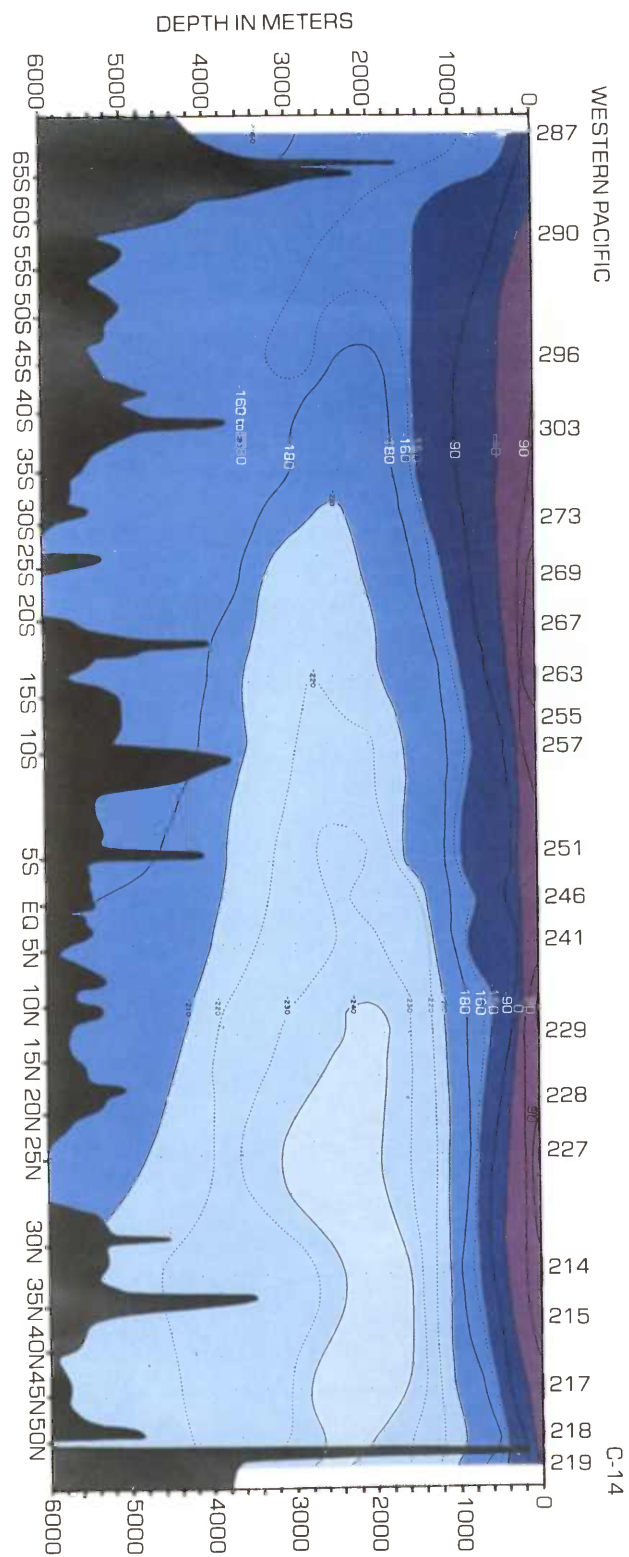


PLATE 1

Western Pacific Ocean; N-S section. Isolines are in $\Delta^{14}\text{C}$ units.

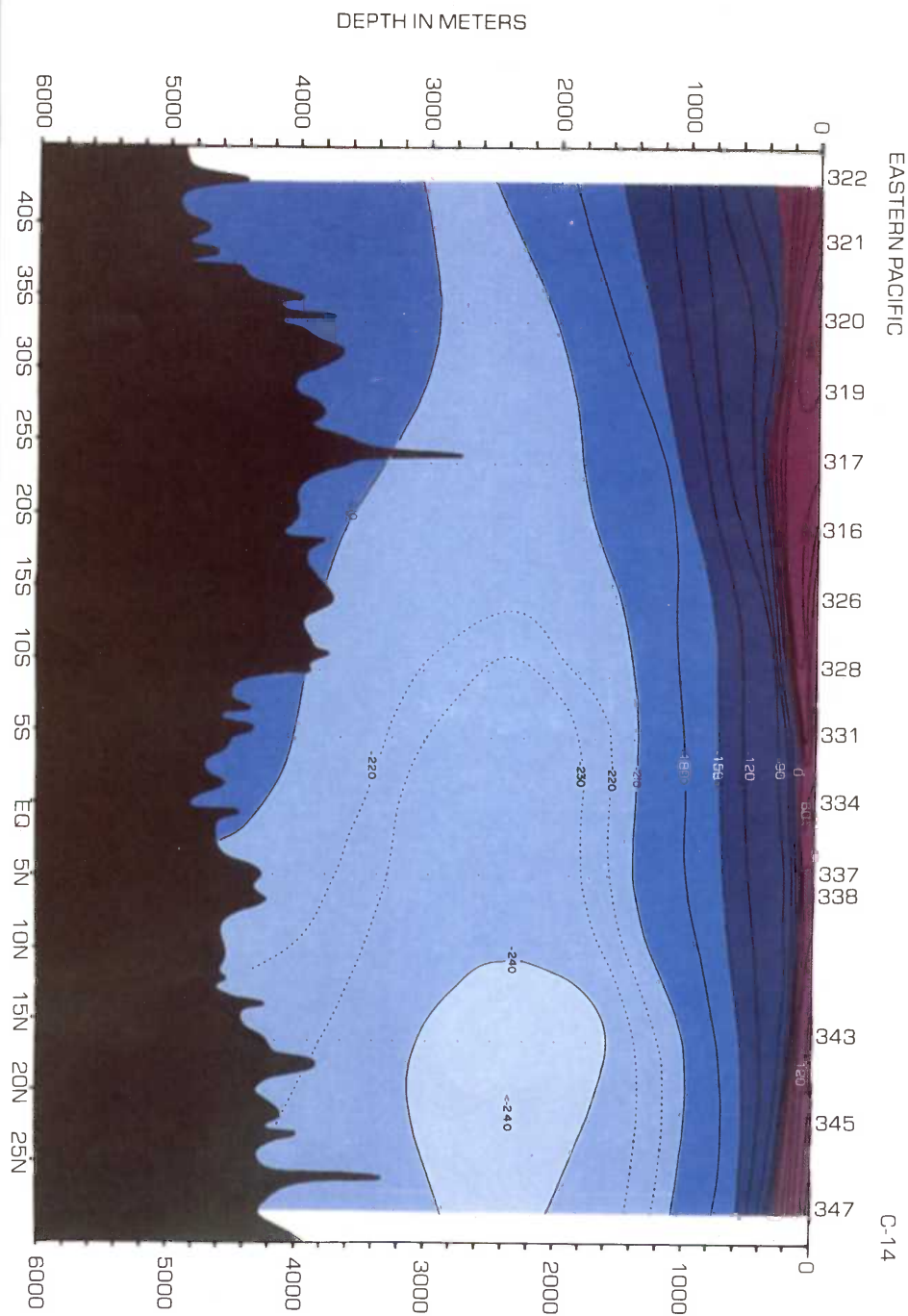
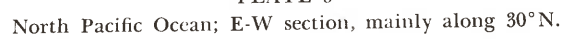


PLATE 2

Eastern Pacific Ocean; N-S section, mainly along 125°W.



STATION 201

 POSITION 34 10 N 127 53 W DATE 25 AUG 73

SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
1187	2	17.60	33.085	23.933	2000	188.6	ML 1305
1189	67	14.75	33.080	24.582	1998	190.6	ML 1304
1190	141	10.09	33.208	25.581	2052	140.2	ML 1303
1191	216	8.48	33.860	26.349	2155	1.0	ML 1302
586	295	7.54	34.025	26.618	2217	-75.4	ML 1300
587	394	6.40	34.062	26.802	2285	-120.1	ML 1298
588	493	5.30	34.095	26.963	2314	-138.0	ML 1296
589	592	4.91	34.195	27.088	2352	-156.5	ML 1299
590	741	4.54	34.328	27.232	2373	-181.9	ML 1294
591	889	4.11	34.409	27.342	2395	-198.4	ML 1293
592	1087	3.52	34.472	27.451	2387	-225.0	ML 1292
593	1286	3.04	34.516	27.531	2395	-234.6	ML 1291
594	1535	2.53	34.556	27.607	2405	-235.7	ML 1290
286	1816	2.07	34.591	27.670	2404	-244.5	ML 1283
287	2114	1.81	34.624	27.718	2398	-250.2	ML 1282
390	3073	1.33	34.662	27.784	2375	-252.1	ML 1288
391	3471	1.22	34.674	27.800	2380	-238.7	ML 1287
392	3868	1.16	34.681	27.809	2394	-230.9	ML 1286
393	4264	1.14	34.683	27.812	2358	-231.2	ML 1285
394	4707	1.13	34.684	27.814		-225.1	ML 1284

STATION 202

 POSITION 33 6 N 139 34 W DATE 30 AUG 73

SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
886	15	21.69	34.642	24.066	2018	205.7	ML 1879
887	70	17.39	34.568	25.117	2017	177.3	ML 1878
889	141	15.11	34.477	25.578	2027	142.0	ML 1876
888	240	10.63	34.152	26.222	2090	43.4	ML 1877
686	346	8.78	34.054	26.453	2133	-8.4	ML 1875
687	496	5.66	33.970	26.819	2230	-104.9	ML 1874
688	645	4.78	34.108	27.032	2333	-150.7	ML 1873
689	844	4.07	34.307	27.267	2379	-191.1	ML 1872
690	1045	3.37	34.415	27.420	2400	-209.1	ML 1871
691	1246	2.99	34.489	27.515	2404	-225.3	ML 1870
692	1446	2.63	34.533	27.580	2407	-236.7	ML 1869
693	1646	2.25	34.566	27.640	2418	-241.0	ML 1868
694	1847	1.98	34.629	27.751	2422	-246.2	ML 1867
286	2136	1.72	34.621	27.723	2401	-256.9	ML 1866
287	2437	1.55	34.640	27.750	2396	-252.4	ML 1865
394	3000	1.32	34.663	27.785	2386	-229.9	ML 1858
389	3084	1.28	34.667	27.791	2397	-242.7	ML 1863
390	3431	1.21	34.673	27.800	2383	-228.3	ML 1862
391	3776	1.16	34.676	27.806	2364	-234.8	ML 1861
392	4122	1.13	34.681	27.812	2360	-230.6	ML 1860
393	4524	1.12	34.684	27.815	2358	-222.2	ML 1859

STATION 204								

POSITION		31 22 N	150 2 W	DATE	5 SEP 73			
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 #	LAB
690	13	23.51	35.006	23.814	2011	178.4	ML	1259
691	55	19.50	34.783	24.746	2014	145.6	ML	1258
692	154	13.77	34.443	25.840	2049	98.2	ML	1257
693	304	10.54	34.230	26.299	2109	20.3	ML	1256
794	430	8.26	34.060	26.539	2168	-52.5	ML	1260
486	566	5.68	33.983	26.827	2249	-132.7	ML	1255
487	776	4.17	34.172	27.148	2287	-183.6	ML	1254
488	997	3.54	34.373	27.371	2406	-203.8	ML	1253
489	1196	3.13	34.475	27.490	2414	-224.5	ML	1252
490	1405	2.68	34.535	27.576	2410	-243.4	ML	1251
491	1544	2.44	34.558	27.616	2403	-245.8	ML	1250
492	1713	2.16	34.586	27.659	2404	-248.8	ML	1249
493	1902	1.92	34.604	27.694	2414	-247.5	ML	1248
494	2090	1.75	34.620	27.724	2422	-247.8	ML	1247
286	2398	1.55	34.640	27.750	2393	-251.9	ML	1246
287	2698	1.40	34.655	27.773	2389	-247.0	ML	1245
288	3048	1.28	34.668	27.791	2384	-242.8	ML	1244
289	3397	1.21	34.677	27.804	2374	-245.9	ML	1242
290	3746	1.15	34.682	27.809	2373	-237.0	ML	1241
291	4095	1.12	34.684	27.814	2370	-230.0	ML	1240
292	4492	1.10	34.687	27.818	2363	-227.4	ML	1239
293	4889	1.09	34.689	27.821	2352	-224.4	ML	1238
294	5292	1.08	34.689	27.821		-220.5	ML	1237

STATION 212								

POSITION		30 0 N	159 50 W	DATE	18 SEP 73			
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 #	LAB
740	260	12.95	34.393	25.970	2054	4.1	ML	1959
486	426	9.36	34.141	26.428	2133	-38.7	ML	1958
487	595	6.02	34.006	26.804	2230	-124.8	ML	1957
488	771	4.27	34.158	27.127	2347	-152.5	ML	1956
489	956	3.62	34.318	27.319	2379	-222.9	ML	1955
590	1192	3.08	34.468	27.489	2384	-216.8	ML	1954
591	1391	2.69	34.529	27.572	2394	-232.2	ML	1953
592	1590	2.35	34.565	27.629	2383	-240.5	ML	1952
593	1790	2.09	34.589	27.668	2376	-244.6	ML	1951
594	2090	1.80	34.616	27.713	2407	-243.2	ML	1950
286	2442	1.55	34.640	27.750	2379	-241.4	ML	1949
287	2841	1.38	34.657	27.776	2370	-246.2	ML	1948
288	3241	1.27	34.668	27.792	2368	-233.6	ML	1947
289	3640	1.20	34.674	27.802	2353	-242.6	ML	1946
290	4039	1.14	34.678	27.809	2344	-223.6	ML	1945
291	4438	1.11	34.682	27.814	2349	-226.0	ML	1944
292	4836	1.08	34.685	27.818	2338	-223.2	ML	1943
293	5238	1.07	34.687	27.820	2335	-217.5	ML	1942
294	5638	1.06	34.687	27.822		-220.7	ML	1941

STATION 213							

POSITION	30 58 N	168 28 W	DATE 22 SEP 73				
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 LAB #
835	20	26.79	35.515	23.213		186.6	ML 1857
836	60	20.66	34.917	24.527	1981	141.0	ML 1856
594	95	17.07	34.753	25.334	2003	126.8	ML 1855
588	176	14.37	34.588	25.824	2028	83.9	ML 1854
589	257	12.98	34.457	26.013	2062	63.9	ML 1853
590	337	11.59	34.354	26.203	2083	24.7	ML 1852
591	448	9.47	34.167	26.432	2109	-25.1	ML 1851
592	626	6.15	34.037	26.798	2213	-117.2	ML 1850
593	831	4.37	34.138	27.102	2322	-172.1	ML 1849
587	1044	3.53	34.332	27.338	2386	-202.9	ML 1848
586	1197	3.16	34.425	27.447	2403	-219.7	ML 1847
788	1391	2.75	34.561	27.570	2400	-226.2	ML 1846
790	1590	2.39	34.611	27.526	2401	-230.7	ML 1845
794	1787	2.12	34.577	27.658	2393	-240.9	ML 1844
886	2136	1.77	34.614	27.713	2376	-244.2	ML 1841
394	2434	1.56	34.634	27.744	2388	-251.0	ML 1840
389	2823	1.41	34.654	27.771	2379	-243.9	ML 1839
194	5614	1.04	34.690	27.825	2337	-218.7	ML 1831

STATION 214							

POSITION	32 1 N	176 59 W	DATE 25 SEP 73				
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 LAB #
935	20	25.66	34.751	22.983	1958	145.2	ML 1236
936	60	18.27	34.719	25.018	1980	105.4	ML 1235
886	105	15.65	34.664	25.601	2029	99.1	ML 1234
887	155	14.50	34.579	25.789	2036	84.7	ML 1233
889	276	12.41	34.414	26.094	2054	57.1	ML 1231
890	345	11.28	34.340	26.250	2082	40.2	ML 1230
891	474	8.43	34.131	26.568	2123	-19.2	ML 1228
586	628	6.14	34.037	26.815	2227	-102.7	ML 1227
587	777	4.59	34.117	27.060	2298	-156.5	ML 1226
588	896	3.96	34.206	27.195	2357	-174.1	ML 1225
592	1191	3.08	34.400	27.435	2407	-216.0	ML 1224
593	1591	2.32	34.531	27.605	2398	-240.3	ML 1223
594	1840	2.00	34.574	27.664	2382	-244.2	ML 1222
286	2143	1.71	34.610	27.715	2383	-246.6	ML 1220
287	2542	1.48	34.640	27.755	2375	-237.4	ML 1219
288	2942	1.32	34.658	27.781	2370	-221.1	ML 1218
289	3341	1.22	34.672	27.798	2371	-221.3	ML 1217
290	3739	1.16	34.676	27.806	2376	-228.1	ML 1214
291	4136	1.12	34.682	27.813	2359	-220.4	ML 1213
292	4538	1.09	34.685	27.818	2345	-222.6	ML 1212
293	4936	1.06	34.688	27.821	2350	-211.8	ML 1211
294	5335					-211.1	ML 1210

STATION 217								

POSITION	44 36 N	176 50 W	DATE	1 OCT 73				
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 #	LAB #
335	5	11.05	33.056	25.294		79.2	ML	1164
336	5	11.05	33.056	25.294		56.5	ML	1163
1088	95	6.43	33.609	26.440	2092	56.6	ML	1172
1089	155	6.80	33.769	26.516	2093	47.2	ML	1174
1091	236	5.71	33.891	26.754	2183	-43.7	ML	1162
1092	296	4.65	33.844	26.838	2238	-50.3	ML	1167
886	500	3.96	34.041	27.066	2326	-145.2	ML	1161
887	645	3.67	34.181	27.204	2329	-172.0	ML	1160
888	795	3.29	34.269	27.312	2332	-193.9	ML	1171
889	994	2.89	34.361	27.422	2365	-204.4	ML	1173
890	1142	2.66	34.410	27.480	2394	-214.3	ML	1175
891	1292	2.46	34.454	27.532	2407	-223.5	ML	1156
892	1490	2.19	34.507	27.595	2417	-236.5	ML	1176
893	1788	1.94	34.560	27.657	2387	-244.0	ML	1168
894	2085	1.76	34.591	27.696	2390	-236.5	ML	1155
486	2556	1.51	34.632	27.746	2387	-248.1	ML	1158
487	2952	1.37	34.653	27.774	2371	-235.1	ML	1157
488	3348	1.26	34.666	27.791	2356	-222.3	ML	1170
489	3745	1.18	34.676	27.804	2350	-226.8	ML	1153
490	4142	1.13	34.680	27.811	2344	-224.7	ML	1169
491	4538	1.10	34.684	27.816	2354	-218.0	ML	1166
492	4936	1.10	34.685	27.817	2354	-218.4	ML	1154
493	5135	1.09	34.685	27.817	2363	-217.6	ML	1151
494	5534					-212.2	ML	1159

STATION 218								

POSITION	50 26 N	176 35 W	DATE	4 OCT 73				
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 #	LAB #
241	10	8.25	32.649	25.436		62.5	ML	1209
244	80	3.66	33.051	26.306	2112	52.8	ML	1208
594	144	3.52	33.415	26.609	2154	-63.2	ML	1207
590	195	3.42	33.684	26.834	2242	-77.4	ML	1204
586	344	3.49	33.968	27.053	2304	-139.7	ML	1202
587	543	3.35	34.162	27.221	2346	-181.3	ML	1201
589	742	3.08	34.287	27.345	2347	-191.0	ML	1200
591	992	2.72	34.377	27.448	2396	-216.4	ML	1199
592	1290	2.31	34.473	27.560	2398	-223.4	ML	1198
593	1589	2.03	34.529	27.627	2384	-229.8	ML	1191
588	1888	1.83	34.573	27.676	2399	-234.7	ML	1190
592	2060	1.72	34.594	27.701	2401	-240.2	ML	1181
394	2195	1.64	34.608	27.716	2397	-234.6	ML	1189
390	2533	1.45	34.638	27.756	2374	-240.0	ML	1188
386	2992	1.33	34.656	27.778	2371	-232.3	ML	1187
387	3390	1.23	34.668	27.794	2350	-226.3	ML	1186
389	3789	1.16	34.676	27.805	2330	-222.3	ML	1185
391	4187	1.11	34.682	27.813	2340	-221.9	ML	1184
392	4585	1.08	34.684	27.817	2337	-214.5	ML	1183
393	4982	1.06	34.686	27.820	2332	-212.7	ML	1182
388	5378	1.05	34.687	27.822	2326	-210.8	ML	1180
589	6031	1.04	34.689	27.824	2309	-210.3	ML	1179
591	6433	1.04	34.688	27.823	2326	-209.7	ML	1178
393	7233					-212.3	ML	1177

STATION 219								

POSITION		53	6 N	177	18 W	DATE	8 OCT 73	
SMPL	DEPTH	POT T	SAL	SIGMA	TCO2	DC14	C14	LAB
#	M	DEG C	O/00	THETA	UM	O/00	#	
136	20	7.26	33.067	25.904	2109	13.7	ML	1360
137	70	4.84	33.284	26.373	2123	-22.2	ML	1359
138	150	3.59	33.514	26.683	2230	-59.9	ML	1358
140	250	3.56	33.718	26.847	2273	-98.6	ML	1357
394	343	3.55	33.878	26.976	2340	-136.2	ML	1356
390	494	3.39	34.065	27.140	2374	-163.0	ML	1355
386	895	2.90	34.315	27.383	2413	-205.7	ML	1354
387	1244	2.47	34.428	27.510	2416	-219.8	ML	1353
389	1742	1.92	34.548	27.649	2407	-236.9	ML	1352
391	2241	1.61	34.609	27.720	2404	-230.6	ML	1351
392	2739	1.43	34.643	27.760	2406	-241.8	ML	1350
393	3236	1.34	34.659	27.780	2409	-234.4	ML	1349
388	3702	1.28	34.669	27.792	2403	-232.7	ML	1346

STATION 222								

POSITION		40	10 N	160	30 E	DATE	16 OCT 73	
SMPL	DEPTH	POT T	SAL	SIGMA	TCO2	DC14	C14	LAB
#	M	DEG C	O/00	THETA	UM	O/00	#	
436	10	15.71	33.827	24.942	1980	83.6	ML	1269
438	100	8.73	34.063	26.470	2115	25.2	ML	1266
440	180	6.86	33.891	26.605	2176	10.2	ML	1265
441	220	6.10	33.848	26.663	2196	-2.3	ML	1270
586	425	4.16	33.958	26.980	2270	-120.6	ML	1276
287	560	3.87	34.109	27.130	2336	-151.2	ML	1264
587	695	3.48	34.210	27.246	2356	-175.8	ML	1275
589	845	3.17	34.305	27.352	2373	-195.6	ML	1274
591	995	2.81	34.374	27.437	2400	-203.6	ML	1273
592	1050	2.69	34.395	27.464	2409	-215.8	ML	1272
291	1155	2.53	34.430	27.505	2405	-216.8	ML	1263
794	1810	1.93	34.571	27.666	2414	-237.5	ML	1280
588	1990	1.81	34.589	27.691	2398	-237.4	ML	1271
293	2640	1.44	34.643	27.760	2385	-242.3	ML	1262
190	3095	1.29	34.662	27.785	2371	-230.0	ML	1261
786	3760	1.17	34.677	27.805	2356	-221.7	ML	1278
789	4360	1.10	34.684	27.816	2358	-221.7	ML	1277

STATION 223

POSITION 34 58 N 151 50 E DATE 20 OCT 73

SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
335	10	22.47	34.524	23.747	1943	163.2	ML 1810
336	70	20.56	34.777	24.465	1994	140.3	ML 1807
337	125	18.54	34.783	24.997	2017	124.5	ML 1809
338	200	17.24	34.763	25.303	2016	122.9	ML 1808
339	300	16.62	34.742	25.435	2036	111.3	ML 1806
494	397	15.54	34.687	25.641	2061	66.8	ML 1805
490	547	11.90	34.431	26.204	2114	-20.1	ML 1804
486	697	7.99	34.210	26.695	2212	-86.4	ML 1803
487	897	4.50	34.109	27.069	2302	-130.4	ML 1802
489	1097	3.61	34.262	27.276	2364	-184.8	ML 1801
491	1296	3.09	34.376	27.415	2391	-204.3	ML 1800
493	1495	2.64	34.446	27.510	2409	-217.2	ML 1799
495	1744	2.25	34.515	27.597	2415	-232.7	ML 1798
492	2091	1.91	34.575	27.671	2399	-241.1	ML 1797
194	2405	1.66	34.615	27.722	2402	-242.1	ML 1796
190	2805	1.46	34.644	27.759	2388	-242.0	ML 1795
186	3205	1.33	34.660	27.782	2367	-242.4	ML 1793
187	3606	1.23	34.671	27.797	2368	-231.1	ML 1792
189	4107	1.15	34.681	27.810	2359	-220.1	ML 1791
191	4610	1.10	34.684	27.816	2350	-215.5	ML 1790
193	5113	1.06	34.687	27.821	2344	-211.1	ML 1789
195	5618	1.03	34.691	27.826	2336	-207.9	ML 1788

STATION 224

POSITION 34 15 N 141 58 E DATE 24 OCT 73

SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
435	20	23.84	34.503	23.339	1939	131.7	ML 1912
436	80	21.58	34.703	24.125	1950	153.6	ML 1918
437	150	18.65	34.774	24.962	1964	134.5	ML 1917
438	250	17.07	34.763	25.343	1987	116.6	ML 1916
391	400	15.69	34.692	25.612	2034	64.1	ML 1914
389	505	13.57	34.539	25.956	2081	20.0	ML 1915
393	800	6.73	34.193	26.861	2255	-122.2	ML 1913
294	997	4.29	34.208	27.156	2313	-161.3	ML 1911
290	1345	3.07	34.415	27.447	2374	-210.6	ML 1910
286	1745	2.23	34.519	27.602	2412	-232.5	ML 1909
287	2243	1.77	34.601	27.702	2399	-241.8	ML 1908
289	2988	1.39	34.654	27.772	2373	-231.7	ML 1907
291	3729	1.21	34.675	27.802	2348	-225.0	ML 1906
293	4471	1.11	34.685	27.816	2342	-216.7	ML 1905
295	5211	1.06	34.688	27.822	2348	-214.6	ML 1904
292	5950	1.04	34.694	27.827	2336	-213.0	ML 1903

STATION 225								

POSITION			32 37 N	161 55 E	DATE	5 NOV 73		
SMPL	DEPTH	POT T	SAL	SIGMA	TCO2	DC14	C14	LAB
#	M	DEG C	0/00	THETA	UM	0/00	#	
136	50	22.37	34.613	23.842	1954	150.4	ML	1829
137	90	18.18	34.744	25.000	1996	121.7	ML	1828
138	130	17.02	34.732	25.332	2008	115.1	ML	1827
139	180	16.32	34.696	25.469	2020	114.1	ML	1826
140	250	15.64	34.671	25.608	2032	93.9	ML	1825
141	350	13.88	34.542	25.892	2048	31.4	ML	1824
789	399	13.03	34.483	26.022	2063	32.1	ML	1823
790	599	7.83	34.093	26.629	2159	-37.6	ML	1822
791	895	4.04	34.170	27.160	2332	-158.3	ML	1821
792	1191	3.06	34.371	27.415	2379	-203.3	ML	1820
793	1488	2.42	34.480	27.555	2401	-230.1	ML	1819
794	1989	1.85	34.583	27.683	2392	-243.2	ML	1818
795	2487	1.51	34.632	27.746	2361	-239.1	ML	1817
389	2692	1.42	34.647	27.765	2381	-237.1	ML	1816
390	3187	1.28	34.664	27.788	2359	-230.7	ML	1815
391	3684	1.20	34.674	27.802	2345	-223.7	ML	1814
392	4180	1.13	34.681	27.812	2334	-222.1	ML	1813
393	4679	1.08	34.686	27.819	2336	-218.5	ML	1812
394	5177	1.02	34.690	27.826	2331	-210.2	ML	1972
395	5608	0.99	34.693	27.830	2332	-205.8	ML	1811

STATION 226								

POSITION			30 34 N	170 38 E	DATE	9 NOV 73		
SMPL	DEPTH	POT T	SAL	SIGMA	TCO2	DC14	C14	LAB
#	M	DEG C	0/00	THETA	UM	0/00	#	
135	10	24.73	35.055	23.494	1954	160.4	ML	1321
136	40	24.72	35.046	23.489	1965	168.3	ML	1319
137	80	23.65	35.006	23.774	1956	135.6	ML	1318
138	150	16.29	34.705	25.482	2005	100.9	ML	1317
139	250	14.47	34.572	25.790	2032	54.2	ML	1316
140	350	12.58	34.465	26.100	2058	11.9	ML	1315
389	452	10.43	34.283	26.359	2103	-14.7	ML	1323
390	533	8.42	34.138	26.574	2134	-50.3	ML	1325
391	645	6.26	34.031	26.795	2208	-95.7	ML	1326
392	904	3.91	34.194	27.192	2329	-182.8	ML	1327
393	1192	3.04	34.406	27.443	2377	-211.5	ML	1328
394	1480	2.47	34.501	27.569	2377	-225.7	ML	1329
589	2499	1.46	34.641	27.758	2367	-238.8	ML	1337
590	2999	1.29	34.662	27.786	2351	-233.4	ML	1336
591	3495	1.18	34.675	27.803	2343	-220.8	ML	1334
893	3980	1.12	34.682	27.813	2328	-217.4	ML	1338
593	4499	1.06	34.687	27.821	2324	-211.5	ML	1333
594	4901	1.01	34.691	27.827	2320	-207.3	ML	1332
595	5434	0.96	33.984	28.000	2311	-203.7	ML	1331

STATION 227								

POSITION		24 59 N	170 5 E	DATE 12 NOV 73				
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 #	LAB
135	10	26.60	35.212	23.042		185.3	ML	1345
136	50	26.60	35.210	23.042	1952	173.4	ML	1344
137	75	24.44	35.160	23.657	1965	161.0	ML	1343
139	250	15.70	34.691	25.609	2010	69.3	ML	1341
140	350	13.02	34.465	26.010	2058	24.4	ML	1339
392	450	10.62	34.274	26.317	2073	-21.6	ML	1368
394	619	6.39	34.072	26.807	2228	-108.5	ML	1366
387	897	3.92	34.280	27.259	2339	-185.7	ML	1365
389	1196	3.04	34.480	27.502	2361	-218.0	ML	1364
390	1593	2.31	34.567	27.635	2374	-229.7	ML	1363
393	1991	1.85	34.613	27.706	2383	-240.6	ML	1362
395	2490	1.53	34.646	27.756	2378	-240.2	ML	1361
592	3137	1.31	34.666	27.788	2356	-240.2	ML	1375
594	3630	1.21	34.676	27.802	2341	-230.5	ML	1374
587	4133	1.12	34.684	27.814	2333	-214.0	ML	1373
589	4630	1.04	34.690	27.825	2309	-212.7	ML	1372
590	5128	0.98	34.694	27.831	2302	-205.5	ML	1371
593	5629	0.94	34.697	27.837	2318	-199.6	ML	1370
595	5957					-196.9	ML	1369

STATION 229								

POSITION		12 53 N	173 28 E	DATE 18 NOV 73				
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 #	LAB
135	10	27.98	34.432	22.025		132.8	ML	1940
136	50	27.94	34.437	22.040	1918	130.8	ML	1939
289	70	27.95	34.523	22.097	1927	129.2	ML	1938
290	96	27.00	34.849	22.653	1954	142.3	ML	1937
291	172	20.76	34.916	24.550	2018	152.8	ML	1936
293	249	13.32	34.416	25.911	2124	26.0	ML	1935
295	345	9.12	34.331	26.619	2233	-87.9	ML	1934
492	444	7.14	34.336	26.918	2291	-133.8	ML	1933
486	693	5.43	34.489	27.259	2328	-163.4	ML	1932
489	993	4.22	34.544	27.438	2342	-200.8	ML	1931
490	1291	3.29	34.578	27.557	2357	-219.0	ML	1930
491	1590	2.50	34.606	27.649	2373	-230.6	ML	1929
493	1888	2.17	34.624	27.691	2358	-242.2	ML	1927
495	2286	1.77	34.647	27.740	2367	-240.9	ML	1926
692	2684	1.55	34.659	27.765	2348	-232.2	ML	1925
687	3184	1.34	34.672	27.790	2358	-229.3	ML	1924
689	3684	1.19	34.679	27.806	2352	-225.9	ML	1923
690	4186	1.05	34.688	27.822	2287	-214.6	ML	1922
691	4686	0.94	34.694	27.834	2319	-197.8	ML	1921
693	5188	0.87	34.700	27.843	2307	-193.5	ML	1920
695	5689	0.86	34.700	27.844	2314	-183.2	ML	1919

STATION 231							

POSITION	14	6 N	178 38 W	DATE	21 NOV 73		
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
135	10	27.22	34.634	22.416	1923	145.1	ML 1787
136	50	27.20	34.653	22.437	1938	144.9	ML 1786
137	140	23.10	35.066	23.981	1979	173.5	ML 1785
890	195	18.59	34.888	25.065	2041	161.6	ML 1784
891	285	11.27	34.355	26.256	2153	-41.4	ML 1783
893	345	9.50	34.411	26.602	2213	-102.2	ML 1782
492	446	8.15	34.466	26.880	2258	-121.3	ML 1779
487	796	5.31	34.515	27.296	2351	-172.1	ML 1778
489	1141	3.78	34.551	27.489	2342	-211.0	ML 1777
491	1984	2.00	34.630	27.709	2368	-242.4	ML 1775
493	2379	1.68	34.647	27.746	2375	-241.7	ML 1774
495	2574	1.58	34.655	27.760	2358	-237.2	ML 1772
895	2775	1.47	34.662	27.773	2342	-235.4	ML 1780
687	3597	1.19	34.678	27.805	2347	-232.2	ML 1770
689	3995	1.10	34.684	27.816	2343	-218.8	ML 1769
690	4393	0.97	34.693	27.831	2321	-202.3	ML 1768
691	4795	0.88	34.698	27.841	2304	-188.6	ML 1767
693	5194	0.85	34.700	27.845	2310	-183.3	ML 1766
695	5596	0.85	34.700	27.845	2284	-186.6	ML 1765

STATION 235							

POSITION	16 45 N	161 19 W	DATE	6 DEC 73			
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
135	10	25.83	34.262	22.563	1928	144.7	ML 1902
136	40	25.85	34.383	22.631	1924	149.3	ML 1901
137	70	25.71	34.776	23.002	1964	151.0	ML 1900
138	130	21.76	34.905	24.238	1995	159.9	ML 1899
786	275	11.23	34.225	26.170	2130	-43.4	ML 1898
787	314	10.00	34.213	26.377	2174	-81.8	ML 1897
793	354	8.81	34.191	26.555	2199	-101.8	ML 1896
794	495	7.05	34.382	26.968	2296	-139.6	ML 1895
589	586	6.34	34.455	27.118	2313	-144.6	ML 1893
795	592	6.29	34.457	27.125	2314	-150.3	ML 1894
590	696	5.69	34.463	27.208	2323	-158.1	ML 1892
591	1080	4.03	34.527	27.444	2358	-204.4	ML 1891
592	1496	2.81	34.584	27.606	2366	-234.7	ML 1890
593	1894	2.14	34.618	27.689	2371	-237.4	ML 1889
594	2293	1.72	34.646	27.743	2368	-243.1	ML 1888
595	2690	1.50	34.660	27.769	2367	-250.2	ML 1887
387	3105	1.35	34.669	27.787	2363	-246.0	ML 1886
389	3505	1.23	34.677	27.802	2355	-231.5	ML 1885
390	3905	1.14	34.683	27.813	2350	-221.2	ML 1884
391	4305	1.07	34.687	27.821	2333	-211.3	ML 1883
392	4707	0.99	34.693	27.830	2322	-207.8	ML 1882
393	5108	0.95	34.695	27.835	2322	-198.5	ML 1881
394	5510	0.92	34.696	27.837	2308	-200.3	ML 1880

STATION 239							

POSITION		5 53 N	172 0 W	DATE 12 DEC 73			
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 LAB #
836	10					83.9	ML 1762
837	50	25.56	35.039	23.232	2017	78.8	ML 1764
689	80	25.28	35.104	23.365	2023	70.0	ML 1763
690	125	25.43	35.303	23.464	2038	74.7	ML 1761
691	205	21.78	34.938	24.257	2071	52.8	ML 1760
692	293	10.19	34.659	26.696	2249	-96.1	ML 1759
693	440	8.47	34.624	26.949	2266	-101.3	ML 1758
694	637	6.90	34.569	27.134	2311	-136.9	ML 1757
489	865	5.06	34.548	27.349	2326	-165.8	ML 1755
695	1044	4.21	34.562	27.454	2352	-189.5	ML 1756
491	1693	2.60	34.612	27.646	2364	-221.3	ML 1753
492	2092	2.07	34.639	27.711	2369	-237.8	ML 1752
493	2491	1.72	34.657	27.751	2380	-240.8	ML 1751
494	2890	1.53	34.666	27.772	2365	-236.5	ML 1750
289	3290	1.34	34.674	27.792	2355	-228.9	ML 1748
290	3490	1.28	34.678	27.799	2357	-227.4	ML 1747
291	3690	1.20	34.704	27.824	2369	-217.7	ML 1746
495	3839	1.09	34.686	27.818	2334	-203.6	ML 1749
292	4140	0.97	34.692	27.831	2327	-202.7	ML 1745
293	4591	0.85	34.699	27.844	2333	-192.5	ML 1744
294	5041	0.83	34.700	27.846	2312	-187.2	ML 1743
295	5491	0.83	34.701	27.847	2312	-176.9	ML 1742

STATION 241							

POSITION		4 33 N	179 0 E	DATE 17 DEC 73			
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 LAB #
887	5	27.18	35.123	22.796	1996	87.4	QL 627
889	50	27.15	35.131	22.809	2003	89.2	QL 628
890	150	26.05	35.218	23.218	2038	81.8	QL 629
891	230	16.08	34.696	25.520	2122	0.4	QL 630
892	295	9.93	34.640	26.725	2252	-102.7	QL 631
893	425	8.31	34.610	26.961	2253	-112.1	QL 632
894	549	7.45	34.587	27.072	2282	-121.1	QL 633
895	674	6.50	34.563	27.183	2306	-134.3	QL 634
886	947	4.92	34.542	27.362	2317	-164.4	QL 635
691	1102	4.28	34.554	27.442	2342	-189.8	QL 636
692	1501	2.94	34.599	27.606	2370	-226.8	QL 637
693	1898	2.20	34.631	27.693	2393	-229.0	QL 638
694	2247	1.80	34.651	27.740	2381	-234.3	QL 639
686	2990	1.43	34.669	27.781	2380	-227.7	QL 641
286	3359	1.29	34.675	27.797	2360	-222.9	QL 642
287	3658	1.18	34.681	27.808	2349	-216.5	QL 644
289	3858	1.10	34.685	27.819	2351	-216.8	QL 643
290	4058	1.01	34.694	27.827	2336	-202.8	QL 645
291	4264	0.90	34.696	27.836	2330	-194.6	QL 640
292	4563	0.85	34.698	27.843	2334	-181.0	QL 647
293	4958	0.83	34.700	27.846	2308	-187.2	QL 648
294	5359	0.82	34.701	27.847	2307	-187.5	QL 649
295	5670	0.81	34.575	27.940	2321	-185.0	QL 650

STATION 269

 POSITION 23 57 S 174 31 W DATE 18 JAN 74

SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 #	LAB #
135	5					124.4	QL	737
136	10	27.18	35.426	23.026	1967	150.7	QL	738
140	100	22.46	35.623	24.590	2019	125.9	QL	739
141	150	21.12	35.639	24.969	2027	113.1	QL	740
1089	201	19.71	35.634	25.344	2047	101.4	QL	741
1090	302	17.55	35.579	25.850	2060	69.9	QL	742
1091	456	13.25	35.129	26.476	2117	8.3	QL	743
1092	559	10.25	34.751	26.753	2135	-29.5	QL	744
1093	758	6.50	34.376	27.036	2170	-84.0	QL	745
1087	863	5.62	34.340	27.118	2189	-99.7	QL	746
1095	1153	3.79	34.429	27.390	2250	-150.2	QL	747
889	1252	3.31	34.474	27.472	2269	-153.7	QL	748
890	1551	2.68	34.560	27.597	2297	-185.0	QL	749
891	1852	2.34	34.604	27.661	2320	-204.3	QL	750
892	2152	2.11	34.624	27.696	2338	-209.8	QL	751
893	2451	1.87	34.643	27.729	2345	-215.5	QL	752
887	2900	1.62	34.660	27.761	2349	-217.2	QL	753
895	3350	1.40	34.673	27.791	2342	-209.5	QL	754
490	3678	1.21	34.723	27.832	2298	-168.2	QL	755
491	4079	0.83	34.712	27.846	2286	-163.3	QL	756
492	4482	0.70	34.707	27.859	2287	-164.7	QL	757
493	4985	0.62	34.706	27.864	2280	-162.9	QL	758
487	5487	0.59	34.705	27.864	2296	-160.9	QL	759
495	5890	0.59	34.704	27.864	2293	-158.4	QL	760

STATION 282

 POSITION 57 31 S 169 47 E DATE 10 FEB 74

SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 #	LAB #
136	10	5.58	33.881	26.761	2115	44.7	ML	1741
894	62	5.59	33.883	26.761	2128	45.7	ML	1740
886	127	5.37	34.029	26.904	2131	32.1	ML	1739
889	204	4.77	34.075	27.008	2140	7.4	ML	1738
890	308	4.46	34.172	27.118	2176	-24.5	ML	1736
891	412	4.01	34.226	27.208	2187	-62.0	ML	1735
892	619	3.06	34.299	27.352	2229	-95.2	ML	1734
887	824	2.63	34.406	27.486	2258	-120.2	ML	1733
1687	999	2.46	34.501	27.569	2267	-139.3	ML	1732
1694	1262	2.27	34.612	27.673	2279	-142.7	ML	1730
1686	1511	2.13	34.682	27.739	2287	-149.7	ML	1731
1689	1784	1.97	34.718	27.781	2289	-153.1	ML	1729
1294	2118	1.72	34.737	27.816	2262	-149.7	ML	1728
1286	2435	1.47	34.738	27.834	2281	-157.4	ML	1727
1289	2653	1.30	34.733	27.842	2271	-159.6	ML	1726
1290	3174	0.95	34.720	27.854	2283	-162.7	ML	1725
1291	3690	0.63	34.708	27.863	2284	-163.8	ML	1724
489	4000	0.55	34.704	27.866	2285	-165.9	ML	1720
1292	4204	0.49	34.701	27.866	2274	-160.3	ML	1723
490	4250	0.48	34.700	27.867	2273	-167.5	ML	1719
491	4500	0.44	34.699	27.868	2276	-165.1	ML	1718
492	4750	0.41	34.699	27.870	2298	-168.0	ML	1717
1487	5194					-163.3	ML	1721

STATION 287							

POSITION	69 18 S	173 30 W	DATE	19 FEB 74			
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
135	5	-1.20	33.377	26.873	2137	-76.4	ML 1438
894	66	-1.61	34.277	27.613	2198	-93.6	ML 1437
886	183	0.56	34.570	27.758	2246	-128.3	ML 1436
890	318	1.41	34.707	27.813	2256	-152.9	ML 1435
891	537	1.29	34.725	27.837	2271	-159.0	ML 1434
892	780	1.09	34.724	27.849	2277	-156.1	ML 1433
889	1004	0.91	34.718	27.855	2279	-161.6	ML 1432
694	1620	0.54	34.705	27.867	2282	-162.6	ML 1426
686	1951	0.39	34.701	27.873	2282	-161.1	ML 1425
690	2282	0.24	34.698	27.879	2283	-162.5	ML 1424
691	2590	0.11	34.700	27.887	2284	-163.5	ML 1423
692	2908	0.01	34.698	27.891	2284	-159.9	ML 1422
689	3228	-0.08	34.700	27.897	2273	-155.5	ML 1421
1187	3233	-0.09	34.700	27.897	2273	-148.6	ML 1431
487	3237	-0.09	34.700	27.897	2273	-159.7	ML 1420
494	3452	-0.15	34.702	27.900	2274	-150.9	ML 1419
1186	3460	-0.15	34.702	27.901	2274	-159.9	ML 1430
486	3614	-0.18	34.768	27.903	2273	-155.0	ML 1418
1190	3681	-0.18	34.771	27.904	2273	-154.2	ML 1429
490	3774	-0.19	34.704	27.904	2274	-144.6	ML 1417
1191	3902	-0.21	34.705	27.905	2282	-160.1	ML 1428
491	3941	-0.21	34.703	27.905	2284	-153.1	ML 1416
492	4080		34.705		2274	-151.0	ML 1415
1192	4093		34.705		2274	-151.7	ML 1427

STATION 290							

POSITION	58 1 S	174 0 W	DATE	25 FEB 74			
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
836	10	4.53	33.958	26.941		16.1	ML 1716
587	125	3.73	34.036	27.085	2157	8.8	ML 1715
594	200	3.24	34.065	27.154	2161	-6.3	ML 1713
586	241	3.10	34.078	27.176	2166	-14.4	ML 1714
590	321	3.28	34.184	27.244	2183	-60.4	ML 1712
591	402	3.07	34.243	27.311	2212	-85.6	ML 1711
592	500	2.85	34.308	27.381	2226	-94.4	ML 1710
589	596	2.65	34.359	27.440	2238	-114.1	ML 1709
387	704	2.49	34.417	27.500	2249	-131.3	ML 1708
394	905	2.34	34.530	27.602	2272	-146.6	ML 1707
386	1203	2.20	34.647	27.707	2276	-140.6	ML 1706
390	1499	2.04	34.704	27.765	2268	-153.1	ML 1705
187	2307	1.42	34.736	27.836	2265	-156.6	ML 1703
194	2704	1.10	34.726	27.850	2279	-163.3	ML 1702
186	3202	0.82	34.715	27.859	2276	-161.7	ML 1701
190	3699	0.60	34.709	27.867	2282	-160.1	ML 1700
191	4197	0.50	34.703	27.868	2294	-169.3	ML 1699
192	4594	0.49	34.703	27.869	2291	-161.6	ML 1698
189	4793	0.48	34.701	27.868	2289	-164.5	ML 1697

STATION 293								

POSITION	52 35 S	178 2 W	DATE	1 MAR 74				
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 #	LAB #
1036	10	11.40	34.420	26.290	2057	56.2	ML	1393
1037	50	10.17	34.483	26.559	2078	56.9	ML	1392
587	101	8.49	34.642	26.825	2095	39.3	ML	1391
589	200	7.88	34.462	26.914	2106	26.6	ML	1390
590	302	7.20	34.411	26.969	2100	24.9	ML	1389
591	401	6.84	34.377	26.991	2107	19.3	ML	1388
592	501	6.30	34.334	27.029	2122	-7.0	ML	1387
593	599	6.01	34.324	27.060	2137	-33.0	ML	1386
594	695	5.22	34.270	27.108	2146	-33.4	ML	1385
187	793	4.95	34.296	27.162	2148	-58.6	ML	1384
194	992	3.93	34.316	27.289	2165	-100.8	ML	1383
186	1191	3.11	34.359	27.398	2210	-116.6	ML	1382
190	1589	2.45	34.525	27.589	2231	-144.0	ML	1611
191	1987	2.21	34.651	27.709	2245	-164.3	ML	1381
192	2384	1.98	34.716	27.777	2247	-154.1	ML	1610
189	2778	1.64	34.736	27.820	2260	-155.3	ML	1380
387	3230	1.29	34.731	27.842	2271	-166.2	ML	1609
389	3726	0.92	34.719	27.855	2268	-156.1	ML	1379
390	4223	0.67	34.709	27.863	2260	-165.5	ML	1608
391	4620	0.54	34.702	27.865	2255	-161.3	ML	1378
392	4919	0.48	34.700	27.867	2255	-164.4	ML	1377
393	5168	0.45	34.699	27.868	2262	-168.4	ML	1376

STATION 296								

POSITION	44 56 S	166 39 W	DATE	16 MAR 74				
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 #	LAB #
886	10	13.25	34.708	26.152		79.5	ML	1461
889	99	10.95	34.900	26.729	2107	50.4	ML	1459
890	200	9.82	34.760	26.835	2111	47.6	ML	1458
892	400	8.36	34.571	26.924	2128	9.8	ML	1457
893	601	7.45	34.491	26.998	2149	-56.9	ML	1456
895	803	6.44	34.418	27.077	2173	-81.4	ML	1455
586	1002	5.38	34.398	27.194	2195	-92.9	ML	1454
589	1252	4.17	34.416	27.340	2223	-126.6	ML	1453
590	1503	3.14	34.465	27.485	2265	-153.1	ML	1452
592	1754	2.72	34.561	27.595	2298	-172.2	ML	1451
593	2004	2.34	34.609	27.664	2272	-189.2	ML	1450
595	2254	2.13	34.644	27.710	2305	-192.3	ML	1449
386	2493	1.98	34.684	27.755	2287	-175.0	ML	1448
389	2742	1.79	34.705	27.784	2283	-156.6	ML	1447
390	2991	1.64	34.732	27.818	2264	-160.7	ML	1446
392	3241	1.41	34.731	27.829	2268	-160.0	ML	1445
394	3560	1.11	34.725	27.848	2276	-166.0	ML	1444
187	3959	0.82	34.715	27.858	2273	-166.4	ML	1443
189	4285	0.64	34.707	27.863	2292	-166.5	ML	1442
191	4610	0.56	34.704	27.865	2274	-169.0	ML	1441
193	4932	0.52	34.703	27.867	2271	-167.5	ML	1440
194	5252	0.50	34.523	27.803	2257	-163.2	ML	1439

STATION 303

POSITION 38 22 S 170 4 W DATE 23 MAR 74

SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 LAB #
690	21	18.25	34.930	25.183	2058	109.7	ML 1561
691	100	12.89	35.059	26.496	2102	73.4	ML 1560
692	201	11.47	34.977	26.709	2120	63.3	ML 1559
693	351	9.93	34.768	26.823	2146	21.3	ML 1558
694	501	8.49	34.588	26.917	2159	-8.0	ML 1557
695	702	7.22	34.449	26.996	2172	-53.3	ML 1556
287	898	6.38	34.399	27.070	2183	-85.6	ML 1555
289	1097	5.26	34.389	27.199	2212	-111.0	ML 1554
290	1348	3.83	34.420	27.379	2242	-143.4	ML 1553
291	1598	3.01	34.513	27.533	2304	-164.6	ML 1552
292	1850	2.53	34.584	27.631	2303	-192.0	ML 1551
293	2102	2.26	34.614	27.678	2308	-206.9	ML 1550
294	2355	2.08	34.635	27.707	2316	-204.9	ML 1549
295	2508	1.96	34.646	27.724	2336	-201.4	ML 1548
487	2742	1.83	34.673	27.758	2329	-185.1	ML 1547
489	2993	1.66	34.710	27.799	2304	-179.3	ML 1546
490	3295	1.40	34.744	27.831	2379	-162.4	ML 1545
491	3596	1.13	34.726	27.848	2288	-166.6	ML 1544
492	3898	0.89	34.716	27.856	2293	-171.4	ML 1543
493	4198	0.70	34.709	27.862	2282	-165.5	ML 1542
494	4500	0.60	34.705	27.864	2311	-165.5	ML 1541
495	4800	0.52	34.703	27.867		-163.6	ML 1540

STATION 306

POSITION 32 50 S 163 38 W DATE 27 MAR 74

SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 LAB #
1386	10					139.2	ML 1667
1389	101	15.51	35.393	26.201	2049	101.4	ML 1666
1390	202	12.52	35.108	26.608	2095	54.7	ML 1664
1391	302	10.97	34.899	26.741	2120	21.4	ML 1663
1393	454	8.43	34.586	26.925	2143	-32.3	ML 1662
1394	602	7.18	34.445	26.997	2148	-60.4	ML 1661
1187	799	6.11	34.364	27.078	2125	-91.4	ML 1660
1189	999	4.93	34.357	27.214	2202	-105.8	ML 1659
1191	1198	3.81	34.386	27.354	2259	-132.2	ML 1658
1193	1399	2.97	34.475	27.506	2298	-154.1	ML 1657
1194	1651	2.51	34.560	27.612	2283	-185.2	ML 1656
887	1901	2.18	34.614	27.682	2300	-207.3	ML 1655
890	2150	1.97	34.634	27.714	2322	-215.8	ML 1654
891	2402	1.83	34.646	27.735	2417	-214.5	ML 1653
893	2652	1.70	34.656	27.752	2370	-217.7	ML 1652
894	2901	1.60	34.663	27.765	2339	-222.4	ML 1651
287	3141	1.50	34.674	27.781	2341	-210.3	ML 1650
289	3392	1.40	34.687	27.798	2323	-208.7	ML 1649
291	3624	1.30	34.701	27.816	2303	-187.5	ML 1648
293	3868	1.14	34.728	27.831	2299	-170.4	ML 1647
294	4102	0.97	34.714	27.848	2297	-166.4	ML 1646
587	4387	0.76	34.710	27.858	2286	-159.8	ML 1645
590	4686	0.66	34.707	27.862	2278	-166.1	ML 1644
591	4985	0.62	34.706	27.864	2275	-168.0	ML 1643
593	5283	0.60	34.705	27.864	2272	-172.1	ML 1642
594	5581	0.59	34.705	27.864		-163.4	ML 1641

STATION 310							

POSITION		26 57 S	157 9 W	DATE	3 APR 74		
SMPL	DEPTH	POT T	SAL	SIGMA	TCO2	DC14	C14 LAB
#	M	DEG C	0/00	THETA	UM	0/00	#
687	10					159.3	ML 1692
689	75	21.86	35.657	24.776	2024	137.0	ML 1691
690	135	19.68	35.598	25.325	2043	120.1	ML 1690
691	230	17.20	35.471	25.854	2071	88.9	ML 1689
692	330	14.45	35.198	26.276	2095	40.5	ML 1688
693	460	10.55	34.776	26.720	2126	-17.5	ML 1687
694	600	7.49	34.459	26.966	2148	-56.8	ML 1686
695	750	6.20	34.358	27.061	2159	-90.2	ML 1685
487	953	5.09	34.332	27.174	2187	-101.6	ML 1684
489	1156	3.86	34.386	27.350	2228	-139.4	ML 1683
490	1357	3.03	34.482	27.505	2267	-164.8	ML 1682
491	1559	2.58	34.547	27.596	2293	-175.9	ML 1681
492	1759	2.28	34.593	27.657	2316	-200.7	ML 1680
493	1958	2.07	34.622	27.697	2346	-208.1	ML 1679
494	2205	1.89	34.641	27.727	2334	-217.8	ML 1678
495	2447	1.76	34.651	27.744	2354	-219.7	ML 1677
286	2682	1.65	34.659	27.758	2341	-221.2	ML 1676
287	2983	1.53	34.668	27.774	2332	-213.1	ML 1675
289	3281	1.43	34.677	27.789	2324	-219.0	ML 1674
290	3580	1.25	34.687	27.814	2304	-200.5	ML 1673
291	3880	1.10	34.702	27.831	2293	-180.2	ML 1672
292	4179	0.94	34.710	27.847	2293	-175.3	ML 1671
293	4577	0.75	34.710	27.859	2295	-166.8	ML 1670
294	4976	0.68	34.710	27.863	2285	-167.4	ML 1669
295	5379					-165.6	ML 1668

STATION 317							

POSITION		23 38 S	127 9 W	DATE	20 APR 74		
SMPL	DEPTH	POT T	SAL	SIGMA	TCO2	DC14	C14 LAB
#	M	DEG C	0/00	THETA	UM	0/00	#
587	50	25.92	36.555	24.265	2051	141.4	ML 1607
589	150	22.62	36.014	24.833	2043	140.1	ML 1606
590	249	18.63	35.484	25.511	2058	124.8	ML 1605
591	350	15.58	35.149	25.987	2072	49.6	ML 1604
592	452	11.07	34.631	26.515	2128	-41.1	ML 1603
593	543	8.20	34.410	26.823	2158	-77.6	ML 1602
594	603	6.84	34.354	26.974	2170	-80.5	ML 1601
595	703	5.86	34.317	27.071	2179	-89.8	ML 1600
187	804	5.10	34.310	27.152	2200	-107.3	ML 1599
189	1002	3.99	34.385	27.335	2249	-135.9	ML 1598
190	1202	3.17	34.498	27.505	2287	-181.5	ML 1596
191	1400	2.66	34.556	27.596	2307	-188.7	ML 1597
192	1597	2.28	34.598	27.662	2324	-204.7	ML 1595
193	1794	2.04	34.625	27.704	2333	-209.5	ML 1594
387	1898	1.95	34.632	27.717	2342	-217.9	ML 1593
389	2096	1.83	34.648	27.736	2373	-228.0	ML 1592
390	2295	1.74	34.657	27.750	2353	-218.8	ML 1591
391	2492	1.66	34.664	27.761	2339	-212.5	ML 1590
392	2790	1.53	34.674	27.778	2339	-213.0	ML 1589
393	2988	1.49	34.674	27.781	2340	-214.9	ML 1588
395	3436	1.44	34.679	27.789		-209.4	ML 1586

STATION 320							

POSITION		33 20 S	128 24 W	DATE 24 APR 74			
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
887	3	19.67	34.657	24.609	2040	171.1	ML 1585
889	59	19.05	34.795	24.869	2029	170.1	ML 1584
890	103	14.70	34.752	25.884	2032	151.9	ML 1583
891	163	12.92	34.649	26.173	2079	136.4	ML 1582
892	223	11.44	34.632	26.447	2105	77.3	ML 1581
893	303	9.42	34.542	26.731	2127	-12.8	ML 1580
894	403	7.62	34.429	26.923	2180	-54.8	ML 1579
895	504	6.81	34.382	27.000	2165	-58.7	ML 1578
187	606	6.34	34.351	27.038	2150	-76.3	ML 1577
189	804	5.33	34.305	27.126	2178	-87.9	ML 1576
190	1002	4.28	34.328	27.261	2213	-115.2	ML 1575
191	1201	3.37	34.401	27.409	2261	-143.7	ML 1574
192	1398	2.74	34.497	27.542	2297	-162.1	ML 1573
193	1598	2.37	34.575	27.636	2304	-182.8	ML 1572
194	1798	2.12	34.620	27.692	2309	-192.2	ML 1571
195	2000	1.94	34.637	27.719	2324	-208.7	ML 1570
487	2251	1.73	34.657	27.750	2323	-217.2	ML 1569
489	2502	1.59	34.666	27.768	2326	-212.7	ML 1568
490	2753	1.49	34.674	27.781	2325	-217.2	ML 1567
491	3002	1.41	34.679	27.791	2329	-205.6	ML 1566
492	3252	1.35	34.683	27.799	2316	-212.3	ML 1565
493	3502	1.31	34.686	27.804	2328	-207.5	ML 1564
494	3949	1.20	34.693	27.816	2328	-199.3	ML 1563
495	4098	1.16	34.656	27.821	2312	-195.5	ML 1562

STATION 322							

POSITION		43 0 S	129 56 W	DATE 29 APR 74			
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
1087	10	12.80	34.202	25.853	2060	110.3	ML 1486
1089	100	10.09	34.299	26.428	2091	90.1	ML 1485
1090	149	8.54	34.334	26.712	2114	64.2	ML 1484
1091	199	7.87	34.390	26.856	2137	28.2	ML 1483
1092	274	7.30	34.425	26.965	2138	9.7	ML 1482
1093	349	7.00	34.408	26.994	2134	-1.3	ML 1481
1094	451	6.67	34.381	27.018	2148	-10.2	ML 1480
1095	503	6.54	34.371	27.026	2144	-12.4	ML 1479
289	804	5.51	34.307	27.106	2176	-61.9	ML 1468
586	816	5.45	34.305	27.111	2178	-63.7	ML 1478
290	934	4.87	34.310	27.181	2196	-88.7	ML 1467
291	954	4.76	34.312	27.194	2200	-87.7	ML 1466
292	1204	3.54	34.364	27.363	2225	-122.7	ML 1465
293	1403	2.94	34.435	27.475	2261	-142.6	ML 1464
294	1601	2.58	34.522	27.575	2276	-155.5	ML 1463
295	1800	2.36	34.589	27.648	2310	-169.6	ML 1462
487	1999	2.16	34.631	27.698	2312	-192.3	ML 1473
489	2248	1.93	34.654	27.735	2331	-204.8	ML 1472
490	2498	1.77	34.666	27.755	2359	-209.8	ML 1471
491	2799	1.60	34.676	27.775	2324	-215.8	ML 1470
592	3100	1.46	34.686	27.793	2327	-209.7	ML 1477
593	3599	1.21	34.700	27.822	2312	-200.3	ML 1476
594	4094	0.96	34.708	27.844	2308	-181.0	ML 1475
595	4307	0.90	34.733	27.850	2315	-180.2	ML 1474

STATION 324							

POSITION		23	0 S	146	4 W	DATE 7 MAY 74	
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
236	10	26.57	35.942	23.601	1998	155.2	ML 1630
237	100	23.33	35.944	24.593	2012	134.2	ML 1629
238	150	20.83	35.682	25.091	2024	132.7	ML 1628
490	240	18.27	35.506	25.617	2050	98.1	ML 1627
491	349	14.13	35.092	26.238	2089	34.4	ML 1626
492	448	11.70	34.819	26.543	2129	-47.3	ML 1625
493	547	7.80	34.456	26.918	2159	-70.9	ML 1624
494	696	6.07	34.342	27.064	2170	-86.5	ML 1623
495	826	5.19	34.322	27.148	2201	-107.6	ML 1622
186	1085	3.73	34.426	27.395	2253	-149.1	ML 1621
187	1585	2.32	34.594	27.655	2320	-196.7	ML 1620
189	2083	1.93	34.638	27.721	2338	-212.8	ML 1618
190	2582	1.66	34.659	27.757	2339	-223.2	ML 1617
191	3081	1.41	34.676	27.789	2329	-204.4	ML 1616
192	3580	1.22	34.689	27.812	2326	-202.2	ML 1615
193	4082	1.09	34.695	27.826	2305	-195.8	ML 1614
194	4581	1.04	34.698	27.831	2319	-197.4	ML 1613
195	4982	1.03	34.699	27.833		-188.6	ML 1612

STATION 326							

POSITION		14	3 S	126	15 W	DATE 20 MAY 74	
SMPL #	DEPTH M	POT T DEG C	SAL O/00	SIGMA THETA	TCO2 UM	DC14 O/00	C14 LAB #
536	10	25.74	35.696	23.660	2038	45.1	ML 1496
537	110	24.35	36.423	24.662	2048	131.8	ML 1495
289	197	19.76	35.665	25.355	2085	139.1	ML 1493
538	300	12.58	34.692	26.267	2160	-13.4	ML 1494
290	399	8.39	34.573	26.924	2252	-95.4	ML 1492
291	599	6.26	34.516	27.178	2250	-118.0	ML 1491
292	799	5.03	34.507	27.320	2280	-150.0	ML 1490
293	1047	3.98	34.532	27.453	2300	-176.2	ML 1489
294	1295	3.23	34.564	27.553	2312	-202.2	ML 1488
295	1546	2.67	34.594	27.626	2319	-212.2	ML 1487

STATION 328

POSITION			9 16 S	125 32 W	DATE 21 MAY 74			
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 #	LAB
286	1830	2.31	34.626	27.682	2332	-216.9	ML	1640
287	2028	2.06	34.640	27.712	2339	-224.1	ML	1639
289	2277	1.81	34.657	27.745	2340	-233.2	ML	1638
290	2527	1.67	34.667	27.763	2344	-230.4	ML	1637
291	2776	1.58	34.673	27.774	2340	-227.4	ML	1636
292	3026	1.46	34.679	27.788	2335	-221.3	ML	1635
293	3276	1.33	34.687	27.803	2338	-209.4	ML	1634
294	3527	1.24	34.687	27.809	2337	-211.4	ML	1633
295	3829	1.18	34.691	27.817	2329	-211.0	ML	1631

STATION 331

POSITION			4 38 S	125 8 W	DATE 23 MAY 74			
SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 #	LAB
236	10	26.43	35.137	23.040	2018	40.6	ML	1530
237	80	20.52	35.460	24.996	2096	92.0	ML	1529
238	90	18.37	35.393	25.507	2116	65.0	ML	1528
239	100	16.59	35.284	25.857	2138	22.5	ML	1527
240	240	11.99	34.875	26.532	2250	-77.2	ML	1526
489	302	11.03	34.820	26.668	2271	-92.1	ML	1525
491	382	9.66	34.748	26.854	2262	-102.6	ML	1524
492	503	8.00	34.630	27.025	2250	-108.5	ML	1523
494	632	6.69	34.574	27.165	2272	-130.0	ML	1522
886	798	5.20	34.540	27.327	2286	-156.1	ML	1539
887	1099	4.11	34.561	27.463	2319	-187.3	ML	1538
889	1400	3.21	34.588	27.573	2334	-211.0	ML	1537
890	1701	2.52	34.617	27.657	2347	-228.5	ML	1536
891	2002	2.11	34.639	27.707	2343	-235.8	ML	1535
892	2252	1.86	34.653	27.738	2353	-231.6	ML	1534
893	2502	1.68	34.664	27.760	2355	-241.7	ML	1533
894	2702	1.57	34.670	27.773	2350	-235.2	ML	1532
895	3000	1.41	34.677	27.790	2345	-229.9	ML	1531
190	3265	1.28	34.683	27.803	2337	-220.3	ML	1521
191	3667	1.12	34.690	27.819	2335	-213.6	ML	1520
193	4066	1.10	34.690	27.821	2327	-209.8	ML	1519
195	4467					-207.8	ML	1518

STATION 334							

POSITION	0	3	N	124	34	W	DATE 27 MAY 74
SMPL DEPTH POT T SAL SIGMA TCO2 DC14 C14 LAB	#	M	DEG C	0/00	THETA	UM	0/00 #
236	10	24.87	35.179	23.546	2039	72.6	ML 1696
237	110	19.03	34.845	24.919	2092	47.5	ML 1695
238	160	14.00	34.746	26.022	2141	-19.5	ML 1694
239	195	12.99	34.852	26.316	2155	-45.6	ML 1693

STATION 337							

POSITION	4	50	N	124	5	W	DATE 29 MAY 74
SMPL DEPTH POT T SAL SIGMA TCO2 DC14 C14 LAB	#	M	DEG C	0/00	THETA	UM	0/00 #
735	5	27.01	34.607	22.460	1973	61.2	ML 1517
586	80	25.04	34.793	23.203	2008	68.4	ML 1516
587	130	15.36	34.711	25.697	2175	-30.2	ML 1515
589	190	10.99	34.631	26.528	2190	-75.5	ML 1514
590	250	10.05	34.673	26.731	2211	-94.8	ML 1513
591	375	9.10	34.663	26.879	2244	-103.6	ML 1510
592	500	8.09	34.625	27.006	2288	-117.2	ML 1509
593	649	6.35	34.564	27.204	2313	-148.5	ML 1508
594	798	5.47	34.549	27.302	2315	-153.9	ML 1507
595	1047	4.40	34.563	27.433	2336	-184.8	ML 1506
286	1299	3.58	34.584	27.534	2357	-206.3	ML 1505
287	1596	2.85	34.610	27.623	2358	-221.3	ML 1504
289	1892	2.39	34.629	27.677	2366	-232.5	ML 1503
291	2584	1.70	34.663	27.758	2360	-233.4	ML 1501
292	2980	1.56	34.670	27.774	2376	-235.8	ML 1500
293	3378	1.30	34.682	27.801	2358	-228.8	ML 1499
294	3777	1.16	34.687	27.814	2342	-218.6	ML 1498
295	4178	1.13	34.686	27.820	2340	-219.1	ML 1497

STATION 343

POSITION 16 31 N 122 59 W DATE 3 JUN 74

SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 LAB #
336	10					130.3	ML 1401
337	120	15.04	34.139	25.252	2077	85.8	ML 1400
338	200	12.10	34.701	26.382	2257	-80.4	ML 1399
339	300	10.29	34.664	26.681	2296	-97.8	ML 1398
489	450	7.98	34.525	26.944	2316	-130.3	ML 1405
491	628	6.19	34.507	27.179	2347	-164.8	ML 1404
493	797	5.09	34.514	27.320	2347	-192.4	ML 1403
494	995	4.21	34.539	27.436	2364	-209.8	ML 1402
686	1251	3.38	34.568	27.541	2375	-224.0	ML 1414
687	1499	2.87	34.591	27.606	2382	-238.0	ML 1413
689	1746	2.33	34.622	27.674	2380	-242.3	ML 1412
690	1993	1.99	34.639	27.717	2383	-249.8	ML 1411
691	2240	1.75	34.650	27.743	2384	-250.8	ML 1410
692	2489	1.60	34.658	27.761	2372	-244.3	ML 1409
693	2738	1.47	34.666	27.776	2376	-244.5	ML 1408
694	2989	1.38	34.671	27.787	2369	-243.5	ML 1407
695	3241	1.30	34.676	27.796	2366	-236.1	ML 1406
190	3403	1.27	34.677	27.799	2373	-235.1	ML 1397
192	3653	1.24	34.679	27.803	2375	-236.0	ML 1396
193	3903	1.19	34.683	27.809	2374	-226.8	ML 1395
195	4153	1.15	34.616	27.787	2358	-223.7	ML 1394

STATION 347

POSITION 28 30 N 121 29 W DATE 8 JUN 74

SMPL #	DEPTH M	POT T DEG C	SAL 0/00	SIGMA THETA	TCO2 UM	DC14 0/00	C14 LAB #
435	5	17.12	33.649	24.479		194.6	ML 1314
286	599	5.94	34.403	27.126	2340	-159.2	ML 1313
287	1501	2.80	34.573	27.597	2393	-236.4	ML 1312
289	2003	1.98	34.631	27.712	2385	-239.2	ML 1311
290	2304	1.73	34.652	27.746	2376	-247.2	ML 1310
292	2705	1.51	34.666	27.774	2370	-244.6	ML 1309
293	3005	1.42	34.673	27.786	2374	-236.1	ML 1308
294	3502	1.28	34.680	27.800	2363	-241.0	ML 1307
295	4001	1.22	34.684	27.808	2361	-232.4	ML 1306

BIRBAL SAHNI INSTITUTE RADIOCARBON MEASUREMENTS II

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The radiocarbon dates covered in this list were measured during 1978. Chemical and counting procedures are as reported previously (R, 1978, v 20, p 398-404). Age calculations are based on the conventional ^{14}C half-life (5570 yr) and on the contemporary value of 95% of the activity of NBS oxalic acid. Errors quoted correspond to 1σ value which takes into account the counting statistics, the uncertainty in the half-life, and the instability of the counting system. The ages are not corrected for isotopic fractionation in nature.

ACKNOWLEDGMENTS

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A new set of electronics constructed by O Fernandes of Hydrology group, Tata Institute of Fundamental Research, Bombay were used for about 50% of the measurements reported in this list. We are indebted to Rama, Head of the Hydrology group, for making the facilities available and to O Fernandes for the construction and testing of these units.

SAMPLE DESCRIPTIONS

QUATERNARY SAMPLES

Himachal Pradesh series

Varved clay samples from Leedong ($32^{\circ} 28' \text{ N}$, $77^{\circ} 54' \text{ E}$), Dist Lahul and Spiti. Samples coll from natural exposure and subm by A Bhattacharya, Birbal Sahni Inst Palaeobotany (BSIP), Lucknow to date late Quaternary vegetational changes.

BS-73. Varved clay **28,310 $\pm$ 3070**
Depth 43 to 77cm.

BS-74. Varved clay **24,030 $\pm$ 580**
Depth 179 to 220cm. *Comment:* BS-73 most likely contaminated with coal particles. Samples found devoid of pollen.

Three profiles of black silt samples from Mari ($32^{\circ} 15' \text{ N}$, $77^{\circ} 15' \text{ E}$), Dist Kulu. Samples coll from trial trenches and subm by A Bhattacharya to date past vegetational changes of the region.

Profile 1

BS-85. Black silt **Modern**
Depth 5 to 7cm.

BS-86. Black silt **1975 $\pm$ 110**
Depth 17cm.

Profile 2

BS-87. Black-brown clay **7985 ± 110**
Depth 40 to 44cm.

Profile 3

Black brown humus, depth 65cm.

BS-71a. Lumps of organic matter **870 ± 110**

BS-71b. Clay fraction **1345 ± 110**

Comment: BS-71a indicates incorporation of humus of later origin. Pollen analysis of profiles is in progress.

Clay samples from Chottodara (32° 18' N, 77° 33' E), Dist Lahul and Spiti. Sample coll and subm by A Bhattacharya to date past vegetational changes.

BS-89. Carbonaceous clay **Modern**
Depth 5 to 8cm.

BS-99a. Carbonaceous clay **Modern**
Depth 38cm.

Comment: carbon content found insufficient in 5 deeper samples of 2.35m profile. Pollen analysis of profile in progress.

BS-82. Monali **Modern**
Clay sample from Monali (32° 15' N, 77° 10' E), Dist Kulu. Depth 15cm. Coll and subm by A Bhattacharya to date vegetational sequence.

BS-84. Chandratal Lake **1220 ± 350**
Carbonaceous sediments, depth 127 to 132cm from Chandratal lake (32° 28' N, 77° 40' E), Dist Lahul and Spiti. Coll and subm by A Bhattacharya to date vegetational changes. Uppermost two samples of the profile had insufficient carbon.

BS-55. Batal **Modern**
Varved silty clay, depth 26 to 43cm from Batal (32° 14' 30" N, 77° 33' 40" E), Dist Lahul and Spiti. Coll and subm by A Bhattacharya. *Comment:* top and bottom samples of the profile, BS-54 and BS-60, are dated at 495 ± 90 and 1370 ± 135 (R, 1978, v 20, p 398-404). Pollen analysis of the profile is in progress.

Nilgiris series

Samples from bore hole in peat deposits from Upper Bhawani (11° 21' N, 76° 45' E), Dist Nilgiris, Tamil Nadu. Coll and subm by H P Gupta and K Prasad, BSIP. Samples date pollen diagram.

BS-76. Peaty clay **280 ± 100**
Depth 0 to 5cm.