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Woods Hole Oceanographic Institution

Listing of Foraminiferal $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ in Cores off Southern California

by

Liang Gao

July 1985

Technical Report

*Funding was provided by the National Science Foundation
under grant No. OCE 82-17644.*

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Woods Hole, Massachusetts 02543

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Approved for Distribution:

A handwritten signature in cursive script that reads "David A. Ross".

David A. Ross, Chairman
Department of Geology and Geophysics

Listing of foraminiferal $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ in cores
off southern California

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INTRODUCTION

This report includes 6 tables of stable isotope data on 4 species of benthic and 2 species of planktonic foraminifera in 16 piston cores from basins off southern California (Table 1). Two cores (AHF 25459 and AHF 26241) were provided by Dr. D.S. Gorsline (Univ. Southern California) and the remainder were taken by Dr. K.O. Emery in 1956. The location of these cores and a discussion of the results are presented by Gao, Emery and Keigwin in a paper submitted to Deep Sea Research.

Globigerina bulloides and Globigerina (Neogloboquadrina) dutertrei were chosen as the main planktonic species and Uvigerina peregrina and Bolivina sp. were the primary benthic species for stable isotope analysis. Where the primary benthic species were too rare for analysis, U. bifurcata and Bulimina sp. were substituted. Most samples were separated by a series of sieves (0.42, 0.35, 0.3 and 0.25 mm) to study the effect of grain size on $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$.

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Basins and Cores (in order of increasing effective sill depth)

	Abbreviation	Maximum Bottom Depth (m)	Effective Sill Depth* (m)	AHF Core	Water Depth (m)	North Latitude	West Longitude
Santa Barbara	B	627	510	4701	591	34°14.3'	120°02.1'
Santa Monica	M	902	737	26241	905	33°56.7'	118°58.1'
San Pedro	P	912	750	25459	869	33°28.4'	118°20.0'
Santa Cruz	Cr	1966	980	4700	1929	33°42.7'	119°33.0'
Santa Catalina	Ca	1357	1010	4704	1134	33°10.0'	118°17.3'
" "	"	"	"	4703	1335	33°24.2'	118°49.0'
Tanner	T	1551	1060	4696	1510	32°57.4'	119°44.5'
San Nicholas	N	1833	1100	4693	1774	33°04.0'	119°05.4'
San Diego Trough	D	----	1210	4667	1210	32°35.7'	117°32.7'
West Cortes	WC	1796	1300	4674	1595	32°16.5'	119°19.5'
East Cortes	EC	1979	1370	4671	1664	32°19.0'	118°38.0'
No Name	NN	1915	1500	4673	1780	32°54.0'	118°11.0'
Long	L	1938	1640	4699	1769	31°53.5'	119°11.0'
Continental Slope	CS	----	1667	4697	1667	32°33.3'	119°57.4'
San Clemente	C1	2107	1750	4672	1940	32°07.5'	117°56.0'
" "	"	"	"	4670	2050	32°37.7'	118°07.5'

*San Diego Trough and Continental Slope have no sills, but equivalent depth is taken from core depth; West Cortes and No Name Basins have not been studied for effective sill depth, but depth is estimated by comparison with other basins.

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins.

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4667	5.1- 20.3	0.50-0.35	2.89	-0.98
		0.35-0.30	2.44	-0.90
		0.30-0.25	2.24	-1.20
		*	2.78	-0.99
		<0.25	2.36	-1.34
	25.4- 38.1	0.50-0.35	2.45	-0.77
		0.35-0.30	2.46	-0.84
		0.30-0.25	2.48	-0.92
			2.73	-0.94
	50.8- 63.5	0.50-0.35	2.51	-0.80
		0.35-0.30	2.73	-0.67
		0.30-0.25	2.58	-0.67
			2.95	-0.79
		<0.25	2.73	-1.11
	76.2- 88.9	0.50-0.35	2.75	-0.73
		0.35-0.30	2.13	-1.26
		0.30-0.25	1.64	-1.42
		<0.25	2.31	-1.64
	101.6-114.3	0.50-0.35	2.11	-1.64
		0.35-0.30	2.22	-1.70
		0.30-0.25	2.62	-1.95
		<0.25	3.25	-1.99
	127.0-139.7	0.50-0.35	3.18	-1.41
		0.35-0.30	3.07	-1.49
		0.30-0.25	3.09	-1.83
		<0.25	3.25	-1.73
	165.1-177.8	0.35-0.30	4.14	-1.81
		0.30-0.25	3.75	-1.89
		<0.25	3.85	-2.12
	190.5-203.2	0.50-0.35	4.06	-1.45
			4.39	-0.87
		0.35-0.30	3.85	-1.69
			4.31	-1.36
		0.30-0.25	4.14	-1.67
	215.9-228.6	<0.25	3.78	-1.74
		0.50-0.35	4.00	-1.28
			4.36	-0.97
		0.35-0.30	4.05	-1.34
			4.62	-1.30
		0.30-0.25	4.14	-1.56

* Where no wire fraction is designated, sample was so small that different sizes were not separated for analysis.

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4667	254.0-266.7	0.50-0.35	3.89	-0.62
		0.35-0.30	4.14	-0.87
	279.4-292.1	0.50-0.35	4.14	-0.74
		0.35-0.30	4.09	-1.00
		<0.25	4.05	-1.52
	330.2-342.9	0.50-0.35	3.77	-1.18
		0.35-0.30	3.92	-1.21
4670	0 - 15.2	0.35-0.30	2.73	-1.36
	25.4- 38.1	0.35-0.30	3.03	-0.98
	38.1- 50.8	0.35-0.30	3.00	-1.13
	63.5- 76.2	0.35-0.30	3.19	-1.05
	88.9-101.6	0.35-0.30	3.26	-1.16
	127.0-139.7	0.35-0.30	3.30	-1.25
	254.0-266.7	0.35-0.30	3.31	-1.18
			2.96	-1.29
	317.5-322.6	0.35-0.30	2.98	-1.32
4671	12.7- 25.4	0.42-0.35	2.48	-0.82
		0.35-0.30	2.70	0.72
			3.05	0.79
		0.30-0.25	2.54	-1.14
	50.8- 63.5	0.42-0.35	2.86	-0.78
		0.35-0.30	2.98	-0.88
		0.30-0.25	2.80	-0.92
	111.8-121.9	0.42-0.35	4.30	-1.08
		0.35-0.30	4.05	-1.28
			3.87	1.42
		0.30-0.25	4.37	-1.55
	160.0-172.7	0.42-0.35	4.27	-1.02
		0.35-0.30	4.16	-1.29
			4.12	-0.82
		0.30-0.25	4.42	-1.49
	191.1-210.8	0.42-0.35	4.10	-0.83
		0.35-0.30	3.95	-0.93
			4.20	-0.65
			4.18	-0.66
		0.30-0.25	4.04	-0.95

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4671	236.2-248.9	0.42-0.35	4.13	-0.74
		0.35-0.30	4.18	-0.66
			3.86	-0.87
			3.78	-1.24
		0.30-0.25	3.71	-1.16
	261.6-274.3	0.42-0.35	3.76	-1.02
		0.35-0.30	3.82	-1.29
			3.87	-0.86
		0.30-0.25	3.82	-1.33
	287.0-299.7	0.42-0.35	3.77	-1.06
		0.35-0.30	4.09	-0.83
		0.30-0.25	3.79	-1.10
	325.1-337.8	0.42-0.35	3.94	-1.05
		0.35-0.30	3.56	-1.36
			3.84	-0.97
		0.30-0.25	3.39	-1.39
	363.2-375.9	0.42-0.35	3.79	-1.09
		0.35-0.30	3.70	-1.50
			3.84	-0.62
		0.30-0.25	3.96	-1.39
	401.3-414.0	0.42-0.35	3.86	-1.05
		0.35-0.30	3.68	-0.98
			3.56	-0.59
		0.30-0.25	3.19	-1.28
	426.7-439.4	0.42-0.35	2.98	-0.93
		0.35-0.30	3.51	-0.79
			3.15	-0.83
		0.30-0.25	3.56	-0.90
4672	0- 12.7	0.35-0.30	2.99	-1.06
	76.2- 88.9	0.35-0.30	3.13	-1.05
	101.6-114.3	0.35-0.30	3.27	-1.16
	203.2-215.9	0.35-0.30	3.27	-1.19
4673	7.6- 20.3	0.35-0.30	3.10	-0.49
			3.11	-0.99
	33.0- 45.7	0.35-0.30	3.65	-0.48
	58.4- 71.1	0.35-0.30	4.40	-0.51
			4.44	-1.04

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4673	96.5-109.2	0.35-0.30	4.37	-0.61
	134.6-147.3	0.35-0.30	4.10	-0.59
	172.7-185.4	0.35-0.30	4.11	-0.46
	210.8-223.5	0.35-0.30	4.10	-0.66
	248.9-261.6	0.35-0.30	4.20	-0.77
	287.0-299.7	0.35-0.30	4.20	-0.71
	337.8-350.5	0.35-0.30	3.75	-0.61
4674	12.7- 25.4	0.50-0.35	2.79	-1.03
		0.35-0.30	2.72	-1.01
			3.01	-1.03
		0.30-0.25	2.56	-1.14
		<0.25	2.88	-1.28
	38.1- 50.8	0.50-0.35	3.41	-0.91
		0.35-0.30	3.27	-0.95
		0.30-0.25	3.60	-1.30
		<0.25	4.13	-1.22
	76.2- 88.9	0.50-0.35	3.98	-1.33
		0.35-0.30	3.88	-1.82
		0.30-0.25	4.24	-1.51
	114.3-127.0	0.50-0.35	4.46	-1.29
		0.35-0.30	4.68	-1.30
		0.30-0.25	4.22	-1.46
	152.4-165.1	0.50-0.35	4.28	-0.88
		0.35-0.30	4.37	-0.78
		0.30-0.25	4.11	-0.92
	190.5-203.2	0.50-0.35	4.11	-1.04
		0.35-0.30	4.10	-1.17
		0.30-0.25	3.94	-1.44
	228.6-241.3	0.50-0.35	4.09	-0.95
		0.35-0.30	3.58	-1.07
			4.19	-1.31
		0.30-0.25	2.71	-1.15
	266.7-279.4	0.50-0.35	3.34	-1.15
		0.35-0.30	3.66	-1.48
		0.30-0.25	3.74	-1.36
	304.8-317.5	0.50-0.35	3.79	-0.82
			4.19	-1.09
			3.93	-0.82

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)	
4674	304.81-317.5	0.35-0.30	3.84	-0.99	
		0.30-0.25	3.57	-1.06	
			4.00	-1.17	
	355.6-368.3	0.50-0.35	3.57	-0.99	
		0.35-0.30	3.39	-1.74	
		0.30-0.25	3.10	-1.15	
	381.0-393.7	0.50-0.35	3.31	-0.99	
		0.35-0.30	3.22	-1.23	
		0.30-0.25	3.40	-1.30	
	406.4-419.1	0.50-0.35	3.43	-1.11	
		0.35-0.30	3.55	-1.21	
			3.44	-1.56	
		0.30-0.25	3.29	-1.27	
	4693	0- 2.5	0.35-0.25	2.59	-1.14
		12.7- 25.4	0.35-0.25	2.89	-1.07
38.1- 50.8		0.35-0.30	2.86	-0.89	
63.5- 76.2		0.35-0.30	2.94	-0.67	
88.9-101.6		0.35-0.30	2.82	-1.22	
114.3-127.0		0.35-0.30	2.83	-1.26	
254.0-266.7		0.35-0.30	3.24	-1.43	
292.1-304.8		0.35-0.30	4.21	-1.46	
317.5-330.2		0.35-0.30	4.09	-1.57	
			3.94	-1.62	
342.9-350.5		0.35-0.30	3.46	-1.17	
4696		38.1- 50.8	0.35-0.30	2.81	-1.07
	50.8- 63.5	0.35-0.30	2.70	-1.03	
	152.4-165.1	0.35-0.30	3.01	-1.13	
	177.8-190.5	0.35-0.30	3.59	-1.18	
	205.7-215.9	0.35-0.30	4.03	-1.41	
	228.6-241.3	0.35-0.30	4.28	-1.35	
	254.0-266.7	0.35-0.30	4.31	-1.44	
	279.4-292.1	0.35-0.30	4.06	-1.64	
4697	38.1- 50.8	0.42-0.35	3.31	-0.99	
		0.35-0.30	3.27	-1.09	
			3.46	-0.94	
		0.30-0.25	3.51	-1.11	

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4697	63.5- 76.2	0.42-0.35	4.51	-1.01
		0.35-0.30	4.42	-0.92
			4.33	-1.01
		0.30-0.25	4.05	-1.46
	139.7-152.4	0.42-0.35	4.18	-1.28
		0.35-0.30	3.89	-1.08
			3.94	0.88
		0.30-0.25	4.15	-1.04
	165.1-177.8	0.42-0.35	4.01	-1.13
		0.35-0.30	4.04	-1.03
			4.22	-1.04
		0.30-0.25	3.93	-1.08
	203.2-215.9	0.42-0.35	4.18	-1.02
		0.35-0.30	3.50	-1.30
			4.07	-0.95
		0.30-0.25	3.67	-1.27
	215.9-228.6	0.42-0.35	4.07	-0.93
		0.35-0.30	3.61	-1.32
			3.91	-0.86
		0.30-0.25	4.06	-1.15
	241.3-254.0	0.42-0.35	2.93	-0.66
		0.35-0.30	2.78	-1.10
		0.30-0.25	2.76	-1.27
	266.7-279.4	0.42-0.35	2.73	-1.03
		0.35-0.30	2.79	-1.04
		0.30-0.25	3.50	-0.94
	292.1-304.8	0.42-0.35	3.66	-0.77
		0.35-0.30	3.66	-0.82
			3.71	-1.08
		0.30-0.25	3.49	-0.94
	304.8-317.5	0.42-0.35	3.52	-0.75
		0.35-0.30	3.68	-0.84
			3.47	-1.09
		0.30-0.25	3.11	-0.63
	330.2-342.9	0.42-0.35	2.90	-0.76
		0.35-0.30	2.65	-1.06
			3.13	-0.82
		0.30-0.25	3.43	-1.07

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4697	368.3-381.0	0.42-0.35	4.07	-1.31
		0.35-0.30	3.96	-1.20
			4.05	-1.22
		0.30-0.25	3.89	-1.18
4699	2.5- 12.7	0.42-0.35	2.98	-0.61
		0.35-0.30	3.25	-0.80
		0.30-0.25	3.12	-0.84
			2.95	-1.02
		<0.25	3.04	-0.85
	25.4- 38.1	0.42-0.35	3.15	-0.77
		0.35-0.30	3.05	-1.00
		0.30-0.25	2.88	-0.82
			3.19	-0.82
		<0.25	2.96	-1.20
	63.5- 76.2	0.42-0.35	4.00	-0.69
		0.35-0.30	3.93	-0.63
		0.30-0.25	3.43	-1.28
		<0.25	4.80	-0.86
	88.9-101.6	0.42-0.35	4.36	-0.84
			4.50	-0.85
			4.66	-0.79
		0.35-0.30	4.01	-1.14
		0.30-0.25	4.66	-0.94
	114.3-127.0	<0.25	4.38	-1.01
		0.42-0.35	4.63	-0.79
		0.35-0.30	4.49	-0.71
		0.30-0.25	4.53	-0.86
		<0.25	5.14	-0.80
	139.7-152.4	0.42-0.35	4.42	-0.66
		0.35-0.30	3.95	-0.86
		0.30-0.25	4.32	-0.85
		<0.25	4.48	-0.83
	177.8-190.5	0.42-0.35	4.40	-0.77
		0.35-0.30	4.30	-0.95
		0.30-0.25	3.71	-1.26
		<0.25	4.13	-1.10
	203.2-215.9	0.42-0.35	4.15	-0.83
		0.35-0.30	3.98	-0.98
		0.30-0.25	4.01	-1.03
		<0.25	4.18	-0.95

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4699	228.6-241.3	0.42-0.35	3.83	-1.02
		0.35-0.30	4.04	-1.11
		0.30-0.25	3.56	-1.17
		<0.25	3.73	-1.29
	254.0-266.7	0.42-0.35	4.06	-1.19
		0.35-0.30	3.95	-1.07
		0.30-0.25	3.80	-1.25
		<0.25	3.81	-1.45
	292.1-304.8	0.42-0.35	4.01	-0.97
		0.35-0.30	4.00	-0.90
			4.16	-0.92
		0.30-0.25	4.08	-1.11
	330.2-342.9	0.42-0.35	4.11	-0.86
		0.35-0.30	3.71	-0.93
			3.78	-0.78
		0.30-0.25	3.73	-0.93
		<0.25	3.64	-1.04
4700	2.5- 12.7	0.35-0.30	2.91	-0.94
	38.1- 50.8	0.35-0.30	2.70	-0.86
	63.5- 76.2	0.35-0.30	2.41	-0.92
	114.3-127.0	0.35-0.30	2.65	-0.89
	127.0-139.7	0.35-0.30	2.89	-0.92
	254.0-266.7	0.35-0.30	2.79	-1.03
	266.7-279.4	0.35-0.30	2.83	-0.98
	292.1-304.8	0.35-0.30	2.53	-1.19
	330.2-342.9	0.35-0.30	2.77	-1.11
4703	2.5- 12.7	0.35-0.30	2.78	-0.89
	25.4- 38.1	0.35-0.30	2.60	-0.87
	50.8- 63.5	0.35-0.30	2.76	-0.70
	76.2- 88.9	0.35-0.30	2.73	-0.81
	101.6-114.3	0.35-0.30	3.15	-0.62
	127.0-139.7	0.35-0.30	2.87	-0.82
	203.2-215.9	0.35-0.30	2.84	-1.25
	241.3-254.0	0.35-0.30	2.87	-1.14
	279.4-292.1	0.35-0.30	2.69	-1.39
	292.1-304.8	0.35-0.30	2.88	-0.89
4704	25.4- 38.1	0.35-0.30	2.93	0.84
			2.56	-1.07

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4704	50.8- 63.5	0.35-0.30	3.04	-0.96
	88.9-101.6	0.35-0.30	3.11	-0.84
	127.0-139.7	0.35-0.30	3.32	-0.91
	165.1-177.8	0.35-0.30	3.49	-0.97
	215.9-228.6	0.35-0.30	3.30	-0.91
			3.54	1.27
	254.0-266.7	0.35-0.30	4.20	-1.40
	317.5-330.2	0.35-0.30	4.10	-1.14
	342.9-355.6	0.35-0.30	4.18	-1.34
	368.3-381.0	0.35-0.30	4.34	-0.86
	393.7-406.4	0.35-0.30	4.29	-0.71
	419.1-434.3	0.35-0.30	4.09	-1.00
AHF 25459	0- 2		2.32	-0.68
	2- 4		2.59	-0.56
	4- 6		2.53	-0.52
	6- 8		2.34	-0.71
	8- 10		2.39	-0.64
	10- 12		2.45	-0.74
	12- 14		2.25	-0.88
	14- 16		2.52	-0.57
	16- 18		2.29	-0.71
	18- 20		2.58	-0.65
	20- 22		2.58	-0.66
	22- 24		2.44	-0.56
	24- 26		2.21	-0.46
	26- 28		2.12	-0.74
	32- 34		2.59	-0.78
	34- 36		2.52	-0.51
	36- 38		2.50	-0.63
	38- 40		2.15	-0.56
	40- 42		2.45	-0.77
	42- 44		2.53	-0.60
	44- 46		2.35	-0.75
	46- 48		2.35	-0.58
	48- 50		2.48	-0.73
	52- 54		2.12	-0.97
	54- 56		2.58	-0.70
	56- 58		2.37	-0.77
	56- 80		2.66	-0.67
	60- 62		2.30	-0.75
	66- 68		2.40	-0.69
	68- 70		2.69	-0.65
	70- 72		2.25	-0.79
	72- 74		2.32	-0.67
	74- 76		2.64	-0.68

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}O$ (PDB o/oo)	$\delta^{13}C$ (PDB o/oo)
AHF 25459	76- 78		2.55	-0.52
	78- 80		2.00	-0.73
	82- 84		2.46	-0.76
	84- 86		2.62	-0.53
	86- 88		2.23	-0.78
	88- 90		2.28	-0.70
	92- 94		2.41	-0.74
	94- 96		2.68	-0.52
	96- 98		2.66	-0.51
	98-100		1.92	-0.98
			2.55	-0.55
			2.74	-0.65
	100-102		2.44	-0.80
	102-104		2.71	-0.65
	104-106		2.42	-0.71
	106-108		2.44	-0.72
	108-110		2.70	-0.65
	110-112		2.59	-0.78
	112-114		2.17	-0.69
	118-120		2.51	-0.76
	122-124		2.74	-0.77
	128-130		2.51	-0.59
	130-132		2.41	-0.63
	132-134		2.47	-0.73
	136-138		2.20	-0.76
	138-140		2.37	-0.54
	142-144		2.45	-0.78
	144-146		2.40	-0.67
	146-148		2.65	-0.76
	148-150		2.25	-0.89
	150-152		2.60	-0.76
	152-154		2.51	-0.71
	154-156		2.48	-0.79
	156-158		2.61	-0.68
	158-160		2.56	-0.82
	160-162		2.36	-0.82
	162-164		2.18	-1.00
	164-166		2.39	-0.96
	166-168		2.60	-0.57
	168-170		2.80	-0.58
	172-174		2.73	-0.67
	174-176		2.67	-0.70
	176-178		2.42	-0.73
	178-180		2.72	-0.53
	180-182		2.23	-0.81
	182-184		2.70	-0.64
	184-186		2.67	-0.62
	194-196		2.67	-0.57
	196-198		2.56	-0.88

Table 1. Oxygen and carbon isotopic results of Uvigerina peregrina from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
AHF 26241	0- 2	0.42-0.30	2.65	-0.38
	10- 12	0.42-0.35	2.65	-0.42
	20- 22	0.42-0.35	2.73	-0.52
	30- 32	0.42-0.30	2.69	-0.38
	50- 52	0.42-0.35	2.87	-0.25
	60- 62	0.42-0.35	2.56	-0.42
	70- 72	0.42-0.35	2.75	-0.27
	80- 82	0.42-0.35	2.61	-0.38
	90- 92	0.42-0.35	2.63	-0.26
	100-102	0.50-0.35	2.77	-0.32
	110-112	0.42-0.30	2.75	-0.33
	120-122	0.42-0.35	2.67	-0.38
	130-132	0.42-0.35	2.76	-0.18
	140-142	0.35-0.25	2.70	-0.61
	160-162	0.42-0.35	2.69	-0.22
	172-174	0.42-0.35	2.64	-0.25
	180-182	0.42-0.35	2.77	-0.18
	190-192	0.42-0.35	2.23	-0.45
	200-202	0.42-0.35	1.57	-0.66
	210-212	0.42-0.35	2.52	-0.34
	220-222	0.42-0.30	2.40	-0.32
	232-234	0.42-0.35	2.71	-0.23
	240-242	0.42-0.35	2.60	-0.24
	250-252	0.42-0.35	2.59	-0.33
	260-262	0.42-0.35	2.53	-0.17
	270-272	0.42-0.35	2.53	-0.20
	280-282	0.42-0.35	2.44	-0.19
	290-292	0.42-0.35	2.62	-0.24
	302-304	0.42-0.35	2.37	-0.26
	310-312	0.42-0.35	2.49	-0.20
	320-322	0.42-0.35	2.53	-0.20
	330-332	0.42-0.35	2.17	-0.27
	336-338	0.42-0.35	2.46	-0.21

Table 2. Oxygen and carbon isotopic results of Uvigerina bifurcata from southern California basins.

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4667	101.6-114.3	0.30-0.25	3.23	-1.53
	165.1-177.8	0.50-0.35	4.07	-1.64
	190.5-203.2	0.30-0.25	4.28	-1.53
	215.9-228.6	0.50-0.35	4.54	-1.41
		0.35-0.30	4.54	-1.39
		0.30-0.25	4.37	-1.51
			4.53	-1.37
			4.33	-1.32
		<0.25	4.45	-1.74
	254.0-266.7	0.30-0.25	4.14	-1.29
			4.19	-1.26
	279.4-292.1	0.30-0.25	4.12	-1.32
			4.32	-1.27
			4.13	-1.10
	330.2-342.9	0.30-0.25	3.99	-1.32
			4.06	-1.27
4671	111.8-121.9	0.35-0.30	4.17	-1.74
		0.30-0.25	4.24	-1.81
		<0.25	3.72	-2.25
	160.0-172.7	0.35-0.30	4.40	-1.49
		0.30-0.25	4.04	-1.81
		<0.25	4.22	-1.78
	198.1-210.8	0.42-0.35	4.30	-1.36
		0.35-0.30	4.35	-1.26
		0.30-0.25	4.36	-1.38
	236.2-248.9	0.35-0.30	4.08	-1.34
		0.30-0.25	4.16	-1.45
	261.6-274.3	0.35-0.30	4.13	-1.28
		0.30-0.25	4.12	-1.45
	287.0-299.7	0.35-0.30	3.60	-1.41
		0.30-0.25	3.58	-1.50
		<0.25	3.62	-1.78
	325.1-337.8	0.35-0.30	4.03	-1.40
		0.30-0.25	3.78	-1.60
	363.2-375.9	0.35-0.30	3.65	-1.72
		0.30-0.25	3.79	-1.78
		<0.25	3.77	-1.84

Table 2. Oxygen and carbon isotopic results of Uvigerina bifurcata from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4671	401.3-414.0	0.35-0.30	3.75	-1.29
		0.30-0.25	3.87	-1.34
	426.7-439.4	0.35-0.30	3.77	-1.37
		0.30-0.25	3.44	-1.41
4674	38.1- 50.8	0.30-0.25	3.62	-1.72
		0.35-0.30	4.90	-1.62
	76.2- 88.9	0.30-0.25	4.68	-1.49
		<0.25	3.94	-1.44
	114.3-127.0	<0.25	4.53	-1.71
		0.30-0.25	4.57	-1.59
		<0.25	4.04	-1.57
	152.4-165.1	<0.25	4.36	-1.74
		0.30-0.25	4.09	-1.56
		<0.25	4.01	-1.42
	190.5-203.2	<0.25	4.16	-1.68
		0.30-0.25	4.01	-1.52
		<0.25	3.96	-1.43
	228.6-241.3	<0.25	3.74	-1.73
		0.35-0.30	3.75	-1.48
		0.30-0.25	3.57	-1.36
		<0.25	3.91	-1.36
		<0.25	3.95	-1.36
	266.7-279.4	<0.25	2.97	-1.81
		0.35-0.30	3.71	-1.50
		0.30-0.25	3.64	-1.65
		<0.25	3.87	-1.53
	304.8-317.5	<0.25	3.69	-1.76
		0.35-0.30	4.02	-1.54
		0.30-0.25	4.24	-1.48
		<0.25	4.05	-1.70
	355.6-368.3	0.35-0.30	3.00	-1.04
		0.30-0.25	3.05	-1.20
		<0.25	3.38	-1.26
		<0.25	3.43	-1.21
		<0.25	2.90	-1.44
	381.0-393.7	0.30-0.25	3.66	-1.47
		0.30-0.25	3.66	-1.47
		<0.25	3.11	-1.75

Table 2. Oxygen and carbon isotopic results of Uvigerina bifurcata from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4674	406.4-419.1	0.30-0.25	3.50	-1.36
			3.68	-1.36
		<0.25	3.83	-1.49
4701	292.1-304.8	0.30-0.25	2.34	-0.68

Table 3. Oxygen and carbon isotopic results of Bolivina sp. from southern California basins.

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB ‰)	$\delta^{13}\text{C}$ (PDB ‰)
4670	63.5- 76.2		2.77	-0.77
	88.9-101.6		3.06	-0.71
4700	266.7-279.4		3.52	-0.77
4701	17.8- 33.0		1.83	-0.91
	25.4- 61.0		2.06	-0.76
	76.2- 88.9		2.05	-0.99
	116.8-127.0		2.46	-0.85
			2.19	-0.84
	152.4-165.1		2.14	-0.76
			1.98	-0.66
	190.5-203.2		2.30	-0.69
	241.3-254.0		2.40	-0.84
	292.1-304.8		2.16	-0.80
	330.2-342.9		2.50	-0.87
	368.3-381.0		2.35	-1.04
	431.8-444.5		2.46	-0.69
AHF 25459	0- 2		2.16	-0.73
	2- 4		2.36	-0.65
	4- 6		2.33	-0.67
	6- 8		2.68	-0.55
	8-10		2.54	-0.69
	10-12		2.44	-0.63
	12-14		2.33	-0.78
	14-16		2.66	-0.59
	16-18		2.55	-0.67
	18-20		2.36	-0.83
	20-22		2.25	-0.81
	22-24		2.30	-0.78
	24-26		2.12	-0.83
	32-34		1.65	-0.94
	40-42		2.05	-1.01
	42-44		2.13	-0.72
	44-46		2.60	-0.46
	46-48		2.60	-0.60
	48-50		2.65	-0.83
	52-54		2.33	-1.11
	54-56		2.53	-0.81
	56-58		2.33	-0.98
	58-60		2.04	-1.20
	60-62		2.54	-0.83

Table 3. Oxygen and carbon isotopic results of Bolivina sp. from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
AHF 25459	66- 68		2.52	-0.89
	68- 70		2.28	-1.02
	70- 72		2.24	-1.03
	72- 74		2.26	-1.01
	74- 76		2.27	-1.04
	76- 78		2.10	-0.80
	78- 80		1.67	-1.21
	80- 82		1.69	-1.16
	82- 84		2.56	-0.55
	84- 86		1.99	-0.72
	88- 90		2.97	-0.52
	90- 92		2.43	-0.71
	92- 94		2.57	-0.72
	94- 96		2.53	-0.75
	96- 98		2.51	-0.84
	98-100		2.66	-0.55
	100-102		1.95	-0.95
	104-106		2.78	-0.84
	106-108		2.67	-0.87
	108-110		2.70	-0.65
	110-112		2.26	-0.98
	112-114		2.60	-0.78
	114-116		2.70	-0.62
	132-134		2.22	-0.90
	136-138		2.60	-0.65
	138-140		2.31	-0.80
	146-148		2.69	-0.75
	148-150		2.78	-0.76
	150-152		2.30	-0.88
	152-154		2.51	-0.84
	154-156		2.66	-0.69
	156-158		2.20	-1.02
	158-160		2.61	-0.77
	160-162		2.62	-0.72
	162-164		2.54	-0.72
	164-166		2.75	-0.72
	166-168		2.82	-0.70
	168-170		2.82	-0.65
	170-172		2.77	-0.72
	172-174		2.73	-0.68
	174-176		2.45	-0.88
	176-178		2.33	-0.89
	178-180		2.68	-0.67
	180-182		1.95	-1.03
	182-184		2.42	-0.75
	186-188		2.80	-0.55
	194-196		2.69	-0.55
	196-198		2.68	-0.88

Table 4. Oxygen and carbon isotopic results of Bulimina sp. from southern California basins.

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4699	2.5-12.7	>0.42	3.24	-0.45
		0.42-0.35	3.22	-0.58
		0.35-0.30	2.38	-0.52
		0.30-0.25	3.34	-0.49
4667	215.9-224.6	>0.50	4.60	-.29
		0.50-0.35	4.45	-.57
		0.35-0.30	4.40	-.84
		0.30-0.25	4.33	-.97

Table 5. Oxygen and carbon isotopic results of Globigerina bulloides from southern California basins.

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4667	25.4- 38.1	0.30-0.25	-1.06	-0.48
	50.8- 63.5	0.30-0.25	-0.21	-0.37
		<0.25	-0.58	-0.66
	76.2- 88.9	0.30-0.25	-0.40	-1.18
		<0.25	-1.16	-1.09
	101.6-114.3	0.30-0.25	-0.81	-1.03
		<0.25	-0.56	-1.06
	127.0-139.7	0.35-0.25	0.58	-0.57
	165.1-177.8	0.30-0.25	1.55	-0.65
	190.5-203.2	0.42-0.35	2.16	-0.13
		0.35-0.30	2.28	-0.34
		0.30-0.25	2.55	-0.36
	215.9-228.6	0.42-0.35	1.71	-0.32
		0.35-0.30	1.85	-0.45
		0.30-0.25	2.44	-0.33
4671	254.0-266.7	0.30-0.25	1.64	-0.44
		<0.25	1.72	-0.75
	279.4-292.1	0.30-0.25	1.52	-0.47
	330.2-342.9	0.30-0.25	1.40	-0.23
	12.7- 25.4	0.30-0.25	-0.32	-0.80
	50.8- 63.5	0.30-0.25	-0.10	-0.67
	113.0-123.2	0.30-0.25	1.62	-0.67
	161.3-174.0	0.30-0.25	1.83	-0.41
	199.4-212.1	0.30-0.25	1.85	-0.25
	337.5-250.2	0.30-0.25	1.49	0.09
	288.3-301.0	0.30-0.25	1.33	-0.13
	326.4-339.1	0.30-0.25	1.58	-0.20
	364.5-377.2	0.30-0.25	2.25	-0.001
	33.0- 45.7	0.30-0.25	0.14	-0.67
		<0.25	0.24	-1.01
4673	58.4- 71.1	0.30-0.25	1.88	-0.50
			2.17	-0.18
	96.5-109.2	0.30-0.25	1.46	-0.42

Table 5. Oxygen and carbon isotopic results of Globigerina bulloides from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4673	134.6-147.3	0.35-0.30	1.33	-0.09
		0.30-0.25	1.33	-0.43
	172.7-185.4	0.42-0.35	1.39	-0.23
		0.35-0.30	1.13	0.05
		0.30-0.25	1.48	-0.24
	210.8-223.5	0.35-0.30	0.95	-0.19
		0.30-0.25	1.21	-0.40
	248.9-261.6	0.30-0.25	1.79	-0.32
	287.0-299.7	0.30-0.25	1.60	-0.27
	426.7-429.3	0.30-0.25	1.49	-0.24
4674	12.7- 25.4		-0.38	-0.97
	38.1- 50.8	0.30-0.25	0.07	-0.96
			0.19	-0.89
	76.2- 88.9		1.70	-0.39
			1.92	-0.53
			2.04	-0.33
	114.3-127.0	0.35-0.25	1.37	-0.53
			1.34	-0.84
	152.4-165.1	0.30-0.25	1.07	-1.02
	190.5-203.2	0.35-0.30	0.41	-1.05
	228.6-241.3	0.30-0.25	-0.02	-1.20
	266.7-279.4	0.30-0.25	0.68	-1.11
	304.8-317.5	0.30-0.25	-0.02	-1.04
	355.6-368.3	0.30-0.25	0.39	-1.19
	381.0-393.7	0.30-0.25	0.49	-0.87
4696	38.1- 50.8	0.30-0.25	0.02	-0.88
		<0.25	0.13	-0.84
	50.8- 63.5	0.30-0.25	0.26	-0.63
		<0.25	-0.09	-0.67
	152.4-165.1	0.30-0.25	0.11	-0.63
		<0.25	0.20	-1.06
	177.8-190.5	0.30-0.25	0.22	-0.91
		<0.25	0.44	-1.17
	205.7-215.9	0.30-0.25	0.75	-0.33
		<0.25	0.41	-0.72

Table 5. Oxygen and carbon isotopic results of Globigerina bulloides from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4696	228.6-241.3	0.30-0.25	1.71	-0.50
	254.0-266.7	0.42-0.35	1.87	-0.32
		0.35-0.30	1.84	-0.46
		0.30-0.25	2.23	-0.46
	279.4-292.1	0.35-0.30	1.21	-0.68
		0.30-0.25	1.70	-0.64
	38.1- 50.8 63.5- 76.2 139.7-152.4 165.1-177.8 203.2-215.9 215.9-228.6 241.3-254.0 266.7-279.4 304.8-317.5 330.2-342.9 368.3-381.0	0.30-0.25	0.60	-0.77
		0.30-0.25	1.72	-0.45
		0.30-0.25	1.17	0.16
		0.30-0.25	1.35	-0.10
		0.30-0.25	1.61	0.01
		0.30-0.25	1.31	0.009
		0.30-0.25	0.80	0.07
		0.30-0.25	0.96	-0.05
		0.30-0.25	1.25	0.0004
		0.30-0.25	1.04	-0.34
		0.30-0.25	1.42	-0.11
4699	25.4- 38.1	0.30-0.25	-0.21	-0.93
		<0.25	0.04	-0.63
	63.5- 76.2	0.35-0.30	0.33	-0.75
		0.30-0.25	0.39	-0.89
			1.07	-0.54
		<0.25	0.80	-0.87
	88.9-101.6	0.35-0.30	1.79	-0.34
		0.30-0.25	1.85	-0.32
	114.3-127.0	0.35-0.30	1.82	-0.18
		0.30-0.25	1.63	-0.36
	139.7-152.4	0.35-0.30	1.67	0.007
		0.30-0.25	1.68	-0.30
	177.8-190.5	0.42-0.35	1.24	-0.05
		0.35-0.30	0.69	-0.59
		0.30-0.25	1.01	-0.24
	203.2-215.9	0.35-0.30	0.68	0.09
		0.30-0.25	1.24	0.007
			1.33	0.02

Table 5. Oxygen and carbon isotopic results of Globigerina bulloides from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4699	228.6-241.3	0.35-0.30	0.81	-0.30
		0.30-0.25	0.89	-0.52
	254.0-266.7	0.42-0.35	1.11	0.28
		0.35-0.30	1.42	0.18
		0.30-0.25	1.58	-0.00009
	330.2-342.9	0.30-0.25	1.42	-0.07
4700	254.0-266.7	0.30-0.25	0.08	-0.69
	266.7-279.4	0.30-0.25	0.04	-0.88
4704	50.8- 63.5	<0.25	-0.57	-0.92
	393.7-406.4	0.30-0.25	1.76	-0.65

Table 6. Oxygen and carbon isotopic results of Globoquadrina dutertrei from southern California basins.

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4667	5.1- 20.3	0.35-0.25	0.22	1.80
		<0.25	0.44	1.00
	25.4- 38.1	0.42-0.35	0.23	2.11
		0.35-0.30	-0.28	1.30
		0.30-0.25	0.15	1.17
	50.8- 63.5	>0.42	-0.25	2.38
		0.42-0.35	0.15	1.62
			0.47	2.13
		0.35-0.30	0.61	1.51
			0.80	1.72
		0.30-0.25	0.48	1.51
	76.2- 88.9		0.54	1.56
		>0.42	0.15	2.28
		0.42-0.35	0.48	1.96
			0.56	1.89
		0.35-0.30	0.58	1.47
	101.6-114.3	0.30-0.25	0.49	1.09
		>0.42	-0.23	2.08
		0.42-0.35	0.41	1.89
			0.44	1.95
		0.35-0.30	0.14	1.46
	127.0-139.7	0.30-0.25	0.74	1.02
		0.42-0.35	0.72	1.94
		0.35-0.30	0.95	1.63
	165.1-177.8	0.30-0.25	0.91	1.02
		0.42-0.35	0.78	1.97
	190.5-203.2	0.30-0.25	1.29	0.92
		0.42-0.35	1.26	2.16
	215.9-228.6	0.42-0.35	1.00	1.98
		0.35-0.30	0.86	1.50
		0.30-0.25	1.43	1.09
	330.2-342.9	0.30-0.25	1.04	0.84
4670	0- 15.2	0.35-0.25	0.36	1.98
			0.41	1.54
	127.0-139.7	0.35-0.30	0.60	1.86
	317.5-322.6	0.35-0.30	0.83	1.43

Table 6. Oxygen and carbon isotopic results of Globoquadrina dutertrei from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4671	12.7- 25.4	0.35-0.30	0.62	1.43
	50.8- 63.5	0.35-0.30	0.77	1.49
	113.0-123.2	0.35-0.30	0.55	1.60
			0.57	1.43
		0.30-0.25	1.94	0.68
	161.3-174.0	0.30-0.25	1.12	1.04
	199.4-212.1	0.35-0.30	0.60	1.63
		0.30-0.25	3.17	0.48
	237.5-248.9	0.30-0.25	1.35	0.87
4671	263.0-275.6	0.35-0.30	1.11	1.44
	288.3-301.0	0.35-0.30	0.90	1.74
	326.4-339.1	0.35-0.30	1.00	1.34
		0.30-0.25	1.19	1.02
	428.0-440.7	0.35-0.30	0.63	1.64
		0.30-0.25	1.94	0.68
4672	0- 12.7	0.35-0.25	0.36	1.98
		0.35-0.30	0.55	1.59
	25.4- 38.1	0.35-0.30	-0.42	1.48
	76.2- 88.9	0.35-0.30	0.29	1.51
	101.6-114.3	0.35-0.30	0.45	1.61
	203.2-215.9	0.35-0.30	0.69	1.35
4673	7.6- 20.3	>0.42	-0.11	2.94
		0.42-0.35	0.46	1.83
		0.35-0.30	0.75	1.59
			0.72	1.65
			0.39	1.75
		0.30-0.25	-0.11	1.49
	33.0- 45.7	>0.50	0.03	2.35
		0.50-0.42	0.48	2.34
		0.42-0.35	0.37	2.02
		0.35-0.30	0.95	1.40
		0.30-0.25	1.25	1.30
			1.03	0.93

Table 6. Oxygen and carbon isotopic results of *Globoquadrina dutertrei* from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4673	58.4- 71.1	0.30-0.25	1.56	1.25
	96.5-109.2	0.30-0.25	1.25	1.13
	134.6-147.3	0.30-0.25	0.89	0.85
	172.7-185.4	0.42-0.35	1.00	2.04
		0.35-0.30	1.04	1.68
		0.30-0.25	1.25	0.94
	210.8-223.5	0.42-0.35	0.91	1.91
		0.30-0.25	1.17	0.78
	337.8-350.5	0.42-0.35	0.77	2.34
		0.35-0.30	1.85	2.51
		0.30-0.25	1.38	1.48
	426.7-429.3	0.42-0.35	3.76	3.92
		0.30-0.25	1.07	0.89
4674	12.7- 25.4	>0.42	0.25	2.45
		0.42-0.35	0.23	1.72
			0.25	2.02
			0.22	1.52
		0.35-0.30	1.07	1.80
			0.70	1.84
			0.76	1.51
			0.52	1.50
		0.30-0.25	0.44	1.17
			0.48	1.49
			0.75	1.38
	38.1- 50.8	>0.42	-0.17	2.06
		0.42-0.35	0.84	1.58
		0.35-0.30	0.53	1.50
		0.30-0.25	0.21	1.08
	76.2- 88.9	0.30-0.25	0.81	1.11
	114.3-127.0	0.42-0.35	-0.33	1.52
		0.35-0.30	0.33	1.89
		0.30-0.25	0.85	1.21
4693	0- 2.5	0.35-0.25	0.52	1.55
	114.3-127.0	0.35-0.30	0.42	1.44
	254.0-266.7	0.35-0.30	0.65	1.39
	292.1-304.8	0.30-0.25	1.38	1.12
	317.5-330.2	0.35-0.30	0.64	1.95
	342.9-350.5	0.35-0.30	0.70	1.64

Table 6. Oxygen and carbon isotopic results of Globoquadrina dutertrei from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4696	38.1- 50.8	0.42-0.35	0.56	1.96
		0.35-0.30	0.74	1.41
		0.30-0.25	0.59	1.20
	50.8- 63.5	0.42-0.35	0.36	1.55
		0.35-0.30	1.43	2.08
		0.30-0.25	0.62	1.20
	152.4-165.1	0.42-0.35	0.51	2.01
		0.35-0.30	0.77	1.27
		0.30-0.25	0.97	1.00
	177.8-190.5	>0.42	0.53	1.85
		0.42-0.35	0.75	1.93
		0.35-0.30	1.32	1.36
		0.30-0.25	0.87	0.57
	205.7-215.9	0.42-0.35	0.70	1.66
		0.35-0.30	0.75	1.30
		0.30-0.25	0.95	0.89
	228.6-241.3	0.30-0.25	1.47	0.89
	254.0-266.7	0.30-0.25	1.23	0.65
	279.4-292.1	0.30-0.25	1.15	0.73
4697	38.1- 50.8	0.35-0.30	0.90	1.64
		0.30-0.25	0.62	0.91
	63.5- 76.2	0.20-0.25	1.60	1.10
	139.7-152.4	0.30-0.25	1.31	1.11
	165.1-177.8	0.30-0.25	1.22	0.91
	241.3-254.0	0.35-0.30	0.65	1.31
	266.7-279.4	0.35-0.30	0.87	1.45
	292.1-304.8	0.35-0.30	0.92	1.16
	304.8-317.8	0.35-0.30	0.73	1.04
	330.2-342.9	0.35-0.30	0.97	1.24
	368.3-381.0	0.35-0.30	0.60	1.36
4699	2.5- 12.7	0.42-0.35	0.07	2.49
			0.64	1.38
		0.35-0.30	0.35	1.86
		0.30-0.25	0.52	1.81
	25.4- 38.1	0.42-0.35	0.50	2.25
			0.38	1.82
		0.35-0.30	0.50	1.63
		0.30-0.25	0.45	1.50

Table 6. Oxygen and carbon isotopic results of Globoquadrina dutertrei from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}\text{O}$ (PDB o/oo)	$\delta^{13}\text{C}$ (PDB o/oo)
4699	63.5- 76.2	0.42-0.35	0.64	2.34
		0.35-0.30	0.93	1.36
		0.30-0.25	1.25	1.33
	88.9-101.6	0.42-0.35	1.39	1.95
		0.35-0.30	1.01	1.48
		0.30-0.25	1.37	1.28
	114.3-127.0	0.30-0.25	1.32	0.98
	139.7-152.4	0.30-0.25	1.18	1.08
	177.8-190.5	0.30-0.25	0.30	0.73
	203.2-215.9	0.42-0.35	0.85	2.07
		0.35-0.30	1.00	1.26
		0.30-0.25	0.90	1.13
	228.6-241.3	0.35-0.30	1.44	1.88
		0.30-0.25	1.01	1.11
	254.0-266.7	0.30-0.25	0.90	0.77
	292.1-304.8	0.35-0.25	1.08	1.39
	330.2-342.9	0.42-0.35	0.73	1.89
		0.35-0.30	1.11	1.61
		0.30-0.25	1.31	0.87
4700	38.1- 50.8	0.35-0.30	0.44	1.33
	114.3-127.0	0.35-0.25	0.41	1.28
	127.0-139.7	0.30	0.86	1.18
	254.0-266.7	0.35-0.25	0.30	1.14
	266.7-279.4	0.35-0.30	0.48	1.14
	292.1-304.8	0.35-0.30	0.51	1.30
	330.2-342.9	0.35-0.30	0.46	1.34
4701	25.4- 61.0	0.35-0.30	0.02	1.69
	431.8-444.5	0.35-0.30	0.12	1.37
4753	2.5- 12.7	0.35-0.25	0.46	1.55
	203.2-215.9	0.35-0.30	0.23	1.72
	241.3-254.0	0.35-0.30	0.29	1.41
4704	25.4- 38.1	0.35-0.25	0.03	1.21
	50.8- 63.5	0.35-0.25	0.31	1.31
	88.9-101.6	0.35-0.25	0.67	1.30
	127.0-139.7	0.35-0.25	0.50	1.39
	165.1-177.8	0.35-0.30	0.45	1.35

Table 6. Oxygen and carbon isotopic results of Globoquadrina dutertrei from southern California basins. (Cont'd)

Core	Depth (cm)	Size (mm)	$\delta^{18}O$ (PDB o/oo)	$\delta^{13}C$ (PDB o/oo)
4704	215.9-228.6	0.35-0.25	0.78	1.31
	317.5-330.2	0.35-0.25	0.89	1.24
	342.9-355.6	0.30-0.25	0.48	0.57
	419.1-434.3	0.30-0.25	0.43	1.41
AHF 25459	0-2	0.35-0.25	0.54 0.80	1.53 1.38
	194-196	0.35-0.30	0.68	1.77
AHF 26241	0-2	0.35-0.25	0.38	1.36
	336-338	0.35-0.30	0.03	1.21

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16. Abstract (Limit: 200 words) This report includes 6 tables of stable isotope data on 4 species of benthic and 2 species of planktonic foraminifera in 16 piston cores from basins off southern California (Table 1). Two cores (AHF 25459 and AHF 26241) were provided by Dr. D.S. Gorsline (Univ. Southern California) and the remainder were taken by Dr. K.O. Emery in 1956. The location of these cores and a discussion of the results are presented by Gao, Emery and Keigwin in a paper submitted to <u>Deep Sea Research</u> . <u>Globigerina bulloides</u> and <u>Globigerina (Neoglobobadrina dutertrei)</u> were chosen as the main planktonic species and <u>Uvigerina peregrina</u> and <u>Bolivina</u> sp. were the primary benthic species for stable isotope analysis. Where the primary benthic species were too rare for analysis, <u>U. bifurcata</u> and <u>Bulimina</u> sp. were substituted. Most samples were separated by a series of sieves (0.42, 0.35, 0.3 and 0.25 mm) to study the effect of grain size on $\delta^{18}O$ and $\delta^{13}C$.			
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