

# **APPENDIX II**

**IMAGES core MD97-2141:  
Mg/Ca and Sr/Ca data from  
*Globigerinoides ruber***

Sample (depth, cm)	Age <sup>s</sup> (kyr)	average shell mass ( $\mu$ g)	Mg/Ca (mmol/mol)	Sr/Ca (mmol/mol)	SST <sup>†</sup> (°C)	$\delta^{18}\text{O}_{\text{seawater}}$ <sup>a</sup> (‰)
421	27.23	7.10	3.656	1.437	28.09	0.64
423	27.74	6.60	3.694	1.430	28.21	0.26
427	28.77	6.30	3.559	1.430	27.79	0.63
430	29.54	6.60	3.806	1.425	28.55	0.64
433	30.31	6.90	3.780	1.440	28.47	0.45
436	31.08	6.40	3.698	1.431	28.22	0.67
439	31.84	6.40	3.663	1.429	28.12	0.46
441	32.16	6.40	3.653	1.423	28.08	0.53
443	32.29	7.30	3.691	1.433	28.20	0.74
445	32.42	6.40	3.669	1.435	28.13	0.54
450	32.75	6.60	3.471	1.438	27.51	0.36
453	32.94	6.80	3.557	1.431	27.79	0.14
455	33.07	6.70	3.685	1.446	28.18	0.30
459	33.33	6.60	3.561	1.432	27.80	0.49
462	33.53	6.30	3.834	1.444	28.63	0.31
464	33.66	6.80	3.733	1.434	28.33	0.14
469	33.98	6.40	3.813	1.438	28.57	0.47
471	34.11	6.30	3.563	1.435	27.80	0.17
474	34.31	7.20	3.690	1.431	28.20	0.47
477	34.50	7.00	3.700	1.442	28.23	0.59
479	34.63	7.00	3.838	1.441	28.64	0.37
481	34.76	7.10	3.698	1.442	28.22	0.60
484	34.96	7.90	3.728	1.436	28.31	0.34
486	35.09	7.30	3.650	1.443	28.08	0.49
489	35.26	7.40	3.845	1.437	28.66	0.32
492	35.43	7.40	3.565	1.428	27.81	0.21
494	35.54	7.80	3.799	1.441	28.52	0.49
496	35.65	6.80	3.632	1.425	28.02	0.19
498	35.76	7.10	3.821	1.444	28.59	0.63
500	35.87	7.10	3.704	1.451	28.24	0.64
505	36.14	7.00	3.848	1.440	28.67	0.47
508	36.31	7.30	3.871	1.433	28.74	0.38
510	36.42	7.30	3.812	1.441	28.56	0.64
511	36.47	7.70	3.874	1.440	28.74	0.56
512	36.53	7.60	3.712	1.421	28.26	0.25
514	36.64	7.50	3.843	1.434	28.65	0.66
515	36.69	7.00	3.611	1.432	27.95	0.30
518	36.86	6.00	3.744	1.433	28.36	0.67
520	36.97	7.20	3.841	1.443	28.65	0.58
522	37.08	7.00	3.808	1.435	28.55	0.81
525	37.25	7.10	3.634	1.433	28.03	0.56
527	37.36	7.50	3.682	1.429	28.17	0.80
529	37.47	7.00	3.621	1.432	27.99	0.91
531	37.58	7.30	3.632	1.416	28.02	0.89
533	37.69	7.50	3.809	1.433	28.55	0.78
535	37.80	7.30	3.640	1.426	28.04	0.77
540	38.07	7.40	3.896	1.425	28.81	0.94

Sample (depth, cm)	Age <sup>‡</sup> (kyr)	average shell mass ( $\mu\text{g}$ )	Mg/Ca (mmol/mol)	Sr/Ca (mmol/mol)	SST <sup>†</sup> ( $^{\circ}\text{C}$ )	$\delta^{18}\text{O}_{\text{seawater}}$ <sup>a</sup> ( $\text{‰}$ )
541	38.13	7.70	3.446	1.426	27.43	0.57
544	38.29	7.40	3.599	1.419	27.92	0.89
545	38.35	7.10	3.600	1.410	27.92	0.77
546	38.40	7.10	3.607	1.433	27.94	0.71
547	38.46	7.60	3.876	1.430	28.75	0.65
550	38.62	7.30	3.673	1.428	28.15	0.61
552	38.73	7.10	3.648	1.440	28.07	0.43
555	38.90	7.30	3.643	1.420	28.05	0.52
556	38.96	6.60	3.574	1.422	27.84	0.35
557	39.02	7.10	3.734	1.420	28.33	0.63
560	39.19	6.70	3.868	1.419	28.73	0.47
563	39.36	7.20	3.599	1.429	27.92	0.48
566	39.53	8.50	3.547	1.411	27.75	0.48
568	39.65	6.60	3.435	1.414	27.39	0.34
570	39.76	8.50	3.702	1.421	28.23	0.25
575	40.05	7.60	3.577	1.413	27.85	0.42
579	40.27	7.90	3.847	1.423	28.67	0.39
581	40.39	7.90	3.605	1.425	27.94	0.51
586	40.67	7.10	3.556	1.444	27.78	0.45
588	40.79	8.00	3.548	1.436	27.76	0.31
590	40.90	7.30	3.752	1.430	28.38	0.61
591	40.96	7.60	3.749	1.440	28.38	0.45
593	41.07	7.10	3.526	1.439	27.69	0.51
597	41.24	7.40	3.876	1.428	28.75	0.52
600	41.47	7.70	3.943	1.438	28.94	0.66
602	41.59	7.00	3.929	1.434	28.90	0.45
604	41.70	7.10	3.992	1.431	29.08	0.63
610	42.05	7.80	3.903	1.425	28.83	0.64
614	42.28	7.90	3.861	1.439	28.71	0.25
616	42.39	8.20	3.760	1.440	28.41	0.41
618	42.51	8.20	3.777	1.428	28.46	0.44
620	42.62	7.70	3.986	1.429	29.06	0.64
622	42.74	8.50	3.692	1.428	28.20	0.51
624	42.85	7.50	3.787	1.418	28.49	0.48
628	43.08	6.90	3.490	1.410	27.57	0.58
636	43.54	6.80	3.480	1.430	27.54	0.36
640	43.77	7.50	3.750	1.420	28.38	0.55
644	44.00	7.60	3.590	1.410	27.89	0.41
650	44.35	6.50	3.820	1.410	28.59	0.39
654	44.58	7.00	3.840	1.410	28.65	0.57
656	44.69	7.00	3.630	1.420	28.01	0.05
658	44.81	7.20	3.750	1.430	28.38	0.31
660	44.92	7.20	3.770	1.430	28.44	0.36
675	45.15	6.80	3.740	1.430	28.35	0.43
677	45.27	7.50	3.860	1.420	28.70	0.24
681	45.50	6.80	3.890	1.440	28.79	0.27
684	45.67	7.40	3.840	1.421	28.65	0.29

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688	45.90	7.10	4.090	1.414	29.35	0.59
689	45.96	7.50	3.750	1.440	28.38	0.41
690	46.01	7.30	4.098	1.421	29.38	0.74
694	46.24	7.90	4.070	1.420	29.30	0.90
697	46.42	7.00	3.810	1.430	28.56	0.52
700	46.59	7.50	3.740	1.420	28.35	0.37
703	46.76	7.80	3.660	1.440	28.11	0.56
709	47.11	8.20	3.770	1.440	28.44	0.47
710	47.16	7.30	4.049	1.435	29.24	0.99
713	47.34	7.60	3.809	1.420	28.55	0.51
716	47.51	7.40	4.049	1.423	29.24	0.67
718	47.62	8.00	3.899	1.416	28.82	0.85
721	47.80	7.30	3.709	1.421	28.26	0.31
724	47.97	7.10	3.991	1.405	29.08	0.44
729	48.26	7.30	3.990	1.405	29.08	0.48
732	48.43	7.70	4.040	1.417	29.22	0.80
734	48.54	7.60	3.732	1.407	28.32	0.18
738	48.77	8.20	3.673	1.414	28.15	0.10
741	48.95	7.90	3.695	1.417	28.21	0.35
743	49.06	7.00	3.695	1.423	28.21	0.21
746	49.23	7.30	3.845	1.417	28.66	0.27
748	49.35	7.80	3.653	1.412	28.08	0.13
750	49.46	7.90	3.783	1.415	28.48	0.47
753	49.64	7.20	3.940	1.426	28.93	0.27
756	49.81	7.30	3.684	1.422	28.18	-0.04
758	49.92	7.70	3.610	1.404	27.95	0.15
761	50.10	8.00	3.586	1.403	27.88	0.22
764	50.27	8.10	3.704	1.420	28.24	0.04
768	50.50	8.10	3.562	1.401	27.80	0.29
771	50.67	7.50	3.634	1.399	28.03	-0.02
775	50.90	7.00	4.100	1.404	29.38	0.64
777	51.01	8.00	3.787	1.417	28.49	0.06
781	51.24	6.30	3.926	1.415	28.89	0.36
783	51.36	7.10	4.334	1.416	30.01	0.43
784	51.42	7.10	4.101	1.432	29.38	0.75
787	51.59	7.10	3.916	1.431	28.87	0.50
791	51.82	7.10	4.080	1.422	29.33	0.61
793	51.93	7.50	3.850	1.421	28.67	0.24
795	52.05	8.40	4.158	1.423	29.54	0.86
797	52.16	7.40	3.801	1.415	28.53	0.16
799	52.28	7.90	3.928	1.442	28.90	0.40
801	52.39	7.40	4.308	1.426	29.94	0.93
804	52.57	8.40	4.071	1.424	29.30	0.31
806	52.68	8.60	4.076	1.412	29.32	0.77
808	52.80	7.80	4.130	1.443	29.46	0.38
809	52.85	7.10	4.011	1.426	29.13	0.70
811	52.97	8.90	3.771	1.429	28.44	0.65

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813	53.08	6.30	3.962	1.418	29.00	0.82
816	53.26	7.90	3.904	1.419	28.83	1.05
817	53.31	7.50	4.056	1.429	29.26	0.53
818	53.37	8.00	3.805	1.440	28.54	0.52
821	53.54	8.20	3.956	1.434	28.98	0.63
825	53.77	7.00	3.840	1.426	28.65	0.85
829	54.00	7.80	4.031	1.426	29.19	0.68
831	54.12	6.40	3.770	1.421	28.44	0.72
836	54.41	5.90	3.870	1.427	28.73	0.74
838	54.52	5.90	3.827	1.422	28.61	0.79
840	54.64	7.10	4.064	1.422	29.28	0.55
842	54.75	7.20	4.178	1.434	29.59	0.20
844	54.87	6.50	3.667	1.423	28.13	0.04
847	55.04	6.60	3.610	1.426	27.95	-0.01
848	55.10	7.50	3.908	1.446	28.84	0.03
850	55.21	8.00	4.170	1.431	29.57	0.54
853	55.38	7.30	3.886	1.416	28.78	0.33
855	55.50	6.30	3.394	1.405	27.26	-0.31
857	55.61	8.80	3.757	1.427	28.40	0.15
859	55.73	8.20	3.586	1.418	27.88	0.29
860	55.78	6.60	3.905	1.427	28.83	0.64
861	55.84	8.80	3.673	1.438	28.15	0.00
863	55.96	7.70	3.812	1.426	28.56	0.35
866	56.13	6.40	3.885	1.443	28.78	0.43
869	56.30	7.90	3.666	1.449	28.12	0.47
871	56.42	6.10	3.647	1.453	28.07	0.16
874	56.59	7.90	3.687	1.459	28.19	0.26
876	56.70	7.90	3.788	1.436	28.49	0.47
880	56.93	8.10	3.523	1.411	27.68	0.30
881	56.99	7.70	3.801	1.427	28.53	0.65
883	57.11	8.20	3.795	1.430	28.51	0.45
884	57.16	6.90	3.574	1.425	27.84	0.21
887	57.34	8.30	3.773	1.427	28.45	0.42
890	57.51	8.00	3.665	1.428	28.12	0.43
891	57.57	8.10	3.678	1.416	28.16	0.19
892	57.62	8.30	3.900	1.433	28.82	0.12
894	57.74	7.30	3.842	1.438	28.65	0.32
896	57.85	8.10	3.886	1.424	28.78	0.54
898	57.97	7.90	3.676	1.430	28.16	0.05
902	58.20	8.20	3.994	1.430	29.09	0.43
906	58.43	7.70	3.785	1.433	28.48	0.10
911	58.72	6.40	4.113	1.427	29.42	0.34
913	58.83	8.90	3.930	1.427	28.91	0.54
915	58.95	7.20	3.883	1.438	28.77	0.36
917	59.06	7.00	4.025	1.435	29.17	0.52
919	59.18	7.60	3.895	1.434	28.81	0.76
920	59.23	7.40	3.718	1.431	28.28	0.54

Sample (depth, cm)	Age <sup>§</sup> (kyr)	average shell mass ( $\mu\text{g}$ )	Mg/Ca (mmol/mol)	Sr/Ca (mmol/mol)	SST <sup>†</sup> ( $^{\circ}\text{C}$ )	$\delta^{18}\text{O}_{\text{seawater}}$ <sup>a</sup> ( $\text{‰}$ )
921	59.29	7.60	3.862	1.435	28.71	0.26
923	59.41	7.30	3.923	1.421	28.89	0.58
925	59.52	7.60	4.031	1.436	29.19	0.31
926	59.58	8.20	3.767	1.427	28.43	0.05
928	59.69	7.40	3.925	1.436	28.89	0.53
931	59.87	8.00	4.021	1.426	29.16	0.61
936	60.15	9.10	4.195	1.430	29.64	0.82
941	60.44	7.70	4.171	1.421	29.57	0.83
945	60.81	7.10	3.868	1.435	28.73	1.02
948	61.10	10.31	3.889	1.414	28.79	1.08

Note:

<sup>§</sup> see Table 1 for age model

<sup>†</sup> SST = sea surface temperature based on equation by *Lea et al.*, [2000]

<sup>a</sup>  $\delta^{18}\text{O}_{\text{seawater}}$  = based on *Erez and Luz* [1983]