Expedition 313 Site M0027, Table T4. Distribution of calcareous nannofossils, Hole M0027A. (See table notes.)

Core, section, interval (cm)	Depth (mbsf)	Nannofossil zone (Martini, 1971)	Abundance	Preservation	*Braarudosphaera bigelowii*	*Calcidiscus leptoporus*	*Calciosolenia* spp.	*Catinaster/Discoaster* sp.	*Chiasmolithus altus*	*Chiasmolithus oamaruensis*	*Chiasmolithus* spp.	*Clausicoccus fenestratus*	*Clausicoccus obrutus*	*Clausicoccus*? sp.	*Coccolithus eopelagicus*	*Coccolithus miopelagicus*	*Coccolithus pelagicus*	*Coronocyclus nitescens*	*Cruciplacolithus* spp.	*Cyclagelosphaera*? sp.	*Cyclicargolithus abisectus*	*Cyclicargolithus floridanus*	*Dictyococcites bisectus*	*Dictyococcites* cf. *bisectus*	*Dictyococcites perplexus*	*Dictyococcites productus*	*Dictyococcites* spp. (<2 µm)	*Discoaster* cf. *adamanteus*	*Discoaster* cf. *druggii*
313-M0027A-																													
1H-1, 20	0.20		C	M–G																									
4H-1, 78	8.27		V	G	Fr						*						F									R			
5H-CC	11.14		A	G	F												R												
8H-1, 79	16.05		C	G																						R			
10H-CC	20.09	NN21	C	G		R																				F			
11H-CC	21.25		C	G																						R			
12H-1, 40	21.67		C	M–G																						R			
13H-1, 7	22.75		F	M–G																						R			
13H-1, 111	23.79		Fr	M																									
15H-1, 104	27.42	NN19?	C	M	R												R					?*							
16H-CC	28.06		R	G													R												
17H-1, 13	28.21		B																										
19H-1, 63	31.98		B																										
25X-2, 66	42.58		B																										
26X-2, 108	46.06		B																										
35X-1, 1.5	73.99		B																										
35X-1, 49	74.46		B																										
38X-1, 104	78.06		B																										
41X-CC, 15	80.21	Unzoned	B																										
42X-1, 44	80.51		B																										
50H-CC	96.10		B																										
51H-1, 9	110.66		B																										
59H-1, 25	176.81		R	P																						R			
61H-2, 27	183.17		F	P																						F	F		
64H-1, 20	192.01		C	P													R								Fr	Fr	Fr		
66X-3, 30–32	198.15		Fr	P																		?			R	F			
69X-1, 75	204.76		A	P			R										R					?			Fr	C	C		
69X-CC, 9–10	207.44		C	M–G										R			Fr	?	*						F	R	Fr		
72H-1, 20	210.67	NN6/NN7	A	M–G				R						R		R	Fr		*	R						C	C		
73X-1, 125	212.13		A	M–G	R			R								R	Fr			R						Fr	C		
75X-1, 100	217.21		A	M–G												R	C		*	R	*	F				C	C		
75X-3, 118	220.39	NN5	A	M–G												F	Fr					R				C	Fr		
81R-1, 36	228.77		C	M–G												F	Fr			R	*	F				Fr			
83R-3, 12	236.52		C	M–G	F	R										F	C			R						F			
86R-2, 130	246.46		A	M	R	F								Fr		R	C		*	R		Fr					Fr	R	
89R-1, 9	252.90		C	M	R									Fr			C			R		F					Fr	R	
92R-2, 8	262.60		C	M										R			C					R			F	R	Fr	Fr	
95R-1, 8	271.19		A	M–G							*			F		?	C		*	R		F			R	F	C	R	
98R-1, 74	281.00		C	M										F			Fr		*			R			F	F	Fr		
101R-1, 150	290.91	NN4	A	M–G	F									Fr			C		*	R		R			Fr	Fr	C	R	
102R-2, 80	294.76		A	M		R	R					R		F		?	C					R			R	F	C	R	
105R-2, 23	303.34		C	M													Fr		*	R					R		Fr		
108R-2, 5	312.31		A	M	R									Fr		R	C	R	*	R		R			R	F	F	R	
111R-1, 65	320.56		V	M	R									F		R	C	R	*	F					R	F	F	R	
114R-1, 3	329.09		A	M–G	F									F			C		*	R		R			R		F		
116R-1, 40	335.56		C	M–G													Fr									F			
117R-1, 100	339.21		Fr	M–G													Fr	R	*						F			R	
122R-1, 10	347.46		B																										
127R-1, 138	360.94	Unzoned	B																										
139R-1, 79	393.90		F	M													R									R	R		
142R-1, 15	402.41		F	P–M																						R			
144R-1, 120	409.56		C	M												R	Fr					R			R	R		R	
146R-2, 99.5	416.96		A	M		R											Fr		*			Fr			F	F	Fr	R	
148R-1, 10	420.66		A	M		R								R		R	Fr		*	F		Fr			F	F	Fr	R	R
150R-1, 45	427.11		C	M													Fr			R		F			R	F	R	R	
153R-2, 10	437.41		C	M		R											Fr		*			Fr			Fr	F	F	R	
156R-1, 14	445.10		A	M	R	R										R	C		*			F			Fr	Fr	Fr	R	
159R-1, 56	454.67	mid-NN2	C	M	R	R											Fr					Fr			C	Fr		F	R
162R-1, 12	463.38		A	M	R	R										R	C			R		Fr			C	Fr	C	F	
165R-1, 137	473.78		C	P–M													Fr					Fr			Fr	Fr	Fr		
168R-1, 77	482.33		A	M–G		R										R	C	R				Fr			Fr	F	C		
169R-1, 24	484.85		A	M												R	C					Fr			Fr	Fr	F		
171R-2, 132	492.21		C	M													Fr					F			R		F		
174R-1, 123	494.99		C	M													Fr					F			Fr	Fr	Fr	R	
177R-2, 37	504.78	?	F	P													F					F							
179R-2, 10	508.24	lower NN1	V	M												R	C	R				C						R	
183R-1, 3	515.14		V	M												?	C	R			R	C						R	
186R-1, 34	521.55	NP25	V	M					?			R					C				Fr	C		R		F		F	
189R-2, 36	532.22		V	M					F								Fr				Fr	C	R	F		F			
192R-1, 37	539.88		V	M					R			Fr					Fr	R			Fr	C	R	Fr				R	
193R-2, 70	544.76	NP24/25	Fr	P					R								F					Fr				F			
196R-1, 27	549.03		V	M								?			R	?	Fr	R		R	Fr	C		F		C		R	
199R-1, 18	554.94		V	M					F			Fr					C			R	Fr	C		F		Fr	C		
202R-1, 13	564.04		A	M					R							R	C				Fr	C		F	F	Fr			
208R-1, 30	582.51		A	P–M								R					Fr				?	C	R	F		F		R	
210R-1, 18.5	588.50	NP24	A	M			R		R								Fr				R	C	F	F					
212R-2, 75	596.68		C	M					F								Fr	R				C	R	F				R	
215R-CC, 10–12	606.37		A	M												?	Fr				R	C	R	Fr				R	
218R-2, 103–106	615.24		A	M								R					C					C	F	C				R	
220R-2, 49–52	620.80	lower NP23	A	M								R			F		Fr			R		C	Fr	C				F	
221R-2, 141–143	624.77		A	M					F	?					R		C			R		C	F	Fr	R				
222R-CC	624.97	lower NP22	A	M					F						F		Fr					C	F	Fr					
223R-1, 26	625.17		V	M						Fr		Fr	Fr				C	R		R		C	C					R	
223R-1, 146	626.37	NP21	V	M					?F	Fr		C	C		F		C					C	C						
224R-3, 13–19	631.09		V	M	R							Fr	Fr				C					C	Fr	F				R	

Core, section, interval (cm)	*Discoaster deflandrei*	*Discoaster deflandrei* (5 rays)	*Discoaster deflandrei* (7 rays)	*Discoaster druggii*	*Discoaster micros*	*Discoaster petaliformis*	*Discoaster saipanensis*	*Discoaster sanmiguelensis*	*Discoaster tanii*	*Discoaster tanii nodifer*	*Discoaster variabilis*	*Ellipsolithus* spp.	*Emiliania huxleyi*	*Ericsonia formosa*	*Gephyrocapsa caribbeanica*	*Gephyrocapsa oceanica*	*Gephyrocapsa oceanica* (>4 µm)	*Gephyrocapsa* spp. (<3 µm)	*Goniolithus fluckigeri*	*Helicosphaera ampliaperta*	*Helicosphaera bramlettei*	*Helicosphaera carteri*	*Helicosphaera* cf. *recta*	*Helicosphaera compacta*	*Helicosphaera euphratis*
313-M0027A-																									
1H-1, 20													Fr		R	C		Fr							
4H-1, 78													C			A		C							
5H-CC													C			A		C							
8H-1, 79													F		F	C		C							
10H-CC													Fr		F	Fr		C							
11H-CC													F		R	Fr		C							
12H-1, 40													Fr			F		C							
13H-1, 7																		F							
13H-1, 111													?		R	R		F							
15H-1, 104															R	Fr	R	C				R			
16H-CC																									
17H-1, 13																									
19H-1, 63																									
25X-2, 66																									
26X-2, 108																									
35X-1, 1.5																									
35X-1, 49																									
38X-1, 104																									
41X-CC, 15																									
42X-1, 44																									
50H-CC																									
51H-1, 9																									
59H-1, 25																									
61H-2, 27																									
64H-1, 20																									
66X-3, 30–32																									
69X-1, 75																						R			
69X-CC, 9–10								?														F			
72H-1, 20					?																	F			
73X-1, 125																						F			
75X-1, 100											R											Fr			
75X-3, 118					R			?			R											Fr			
81R-1, 36	R							?			F											Fr			
83R-3, 12	F					R		R														Fr			
86R-2, 130	R					F														R		Fr			
89R-1, 9	R					R					R									Fr		F			
92R-2, 8	Fr					F					Fr									F		Fr			
95R-1, 8	F					?					R									Fr		F			
98R-1, 74	R					R					R									R		R			
101R-1, 150	F										R									F		Fr			
102R-2, 80	R																			R		F			
105R-2, 23	R											*								R		F			
108R-2, 5	R										?									F		F			
111R-1, 65	F																			R		Fr			
114R-1, 3	F																			F		Fr			
116R-1, 40	R																			R		Fr			
117R-1, 100	R																					R			
122R-1, 10																									
127R-1, 138																									
139R-1, 79																									
142R-1, 15																									
144R-1, 120	F																								
146R-2, 99.5	F		R																			F			R
148R-1, 10	F	R																				F			
150R-1, 45	F																								
153R-2, 10	F																					R			
156R-1, 14	Fr	R																				Fr			
159R-1, 56	Fr										R											R			
162R-1, 12	Fr	R																				F			R
165R-1, 137	F																					R			
168R-1, 77	F																					Fr			
169R-1, 24	F																					Fr			R
171R-2, 132	Fr		R																						
174R-1, 123	R			?																		Fr			
177R-2, 37																									
179R-2, 10	F																					F	R		Fr
183R-1, 3	F				?																		R		Fr
186R-1, 34	F																								Fr
189R-2, 36	F																								Fr
192R-1, 37	F																		R						Fr
193R-2, 70																									
196R-1, 27	F																						F		F
199R-1, 18	R																						R		Fr
202R-1, 13	F																								F
208R-1, 30	F						*																R		F
210R-1, 18.5	F																						R		F
212R-2, 75	F		R																						F
215R-CC, 10–12	F	R																							F
218R-2, 103–106	F																		R						
220R-2, 49–52	F																						R		
221R-2, 141–143	F		R						R																
222R-CC									R																
223R-1, 26	F		?						R												R			Fr	R
223R-1, 146	F													Fr										Fr	
224R-3, 13–19	R								R	R				Fr							F			Fr	

Core, section, interval (cm)	*Helicosphaera intermedia*	*Helicosphaera minuta*	*Helicosphaera recta*	*Helicosphaera scissura*	*Helicosphaera walbersdorfensis*	Holococcolith	*Holodiscolithus macroporus*	*Hughesius gizoensis*	*Hughesius tasmaniae*	*Isthmolithus recurvus*	*Lithostromation perderum*	*Lithostromation simplex*	*Markalius* spp.	*Nannotetrina quadrata*	*Neochiastozygus* spp.	*Orthorhabdus serratus*	*Pontosphaera* spp.	*Pseudoemiliania ovata*	*Reticulofenestra danica*	*Reticulofenestra daviesii*	*Reticulofenestra lockeri*	*Reticulofenestra minuta*	*Reticulofenestra minutula*	*Reticulofenestra pseudoumbilicus*	*Reticulofenestra pseudoumbilicus* (5–7 µm)
313-M0027A-																									
1H-1, 20																						F			
4H-1, 78																						Fr			
5H-CC																						F			
8H-1, 79																						F			
10H-CC																				*		Fr			
11H-CC																						F			
12H-1, 40																						Fr	F		
13H-1, 7																						R			
13H-1, 111																						F	Fr		
15H-1, 104																		R				Fr	F		
16H-CC																									
17H-1, 13																									
19H-1, 63																									
25X-2, 66																									
26X-2, 108																									
35X-1, 1.5																									
35X-1, 49																									
38X-1, 104																									
41X-CC, 15																									
42X-1, 44																									
50H-CC																									
51H-1, 9																									
59H-1, 25																									
61H-2, 27																									
64H-1, 20																							R		R
66X-3, 30–32											R											Fr	R		
69X-1, 75		R																				Fr	F		F
69X-CC, 9–10	R	R			R												R					Fr	Fr	Fr	Fr
72H-1, 20					F												R					C	C	R	Fr
73X-1, 125		F					R										R					C	Fr	F	Fr
75X-1, 100																	R					Fr	F		F
75X-3, 118		Fr			R						R						R					C			
81R-1, 36																	R					C	Fr		F
83R-3, 12					?						R					R	Fr					C	F		
86R-2, 130																	Fr					C	Fr		
89R-1, 9																	F					C			
92R-2, 8		Fr															R					Fr	F	F	Fr
95R-1, 8		F		F		R					R						R					C	Fr	Fr	Fr
98R-1, 74																	R					Fr		?	F
101R-1, 150		C				R					R						R					C	Fr	Fr	C
102R-2, 80		Fr		R		R											R					C	Fr	R	Fr
105R-2, 23				R													R					Fr	F	Fr	Fr
108R-2, 5				F		R					R			*			Fr					C	F		Fr
111R-1, 65				F							R						F					A	F	F	Fr
114R-1, 3				Fr										*			R					A	F	Fr	Fr
116R-1, 40																	R					C	F	R	Fr
117R-1, 100																	R				*		R		F
122R-1, 10																									
127R-1, 138																									
139R-1, 79																						R	R		
142R-1, 15																							F		
144R-1, 120																	R					Fr	F		Fr
146R-2, 99.5													*				Fr					A	Fr		C
148R-1, 10													*				Fr					C	C		Fr
150R-1, 45																						F	Fr		Fr
153R-2, 10																	F					Fr	Fr		Fr
156R-1, 14											R			*	*		Fr				R	A	Fr		F
159R-1, 56																	F					C	C		Fr
162R-1, 12											R						F					Fr	Fr		C
165R-1, 137																					R	C	Fr		Fr
168R-1, 77																	Fr					C	Fr		Fr
169R-1, 24																	F					C	C		C
171R-2, 132																						Fr	Fr		Fr
174R-1, 123																	Fr				R	C	Fr		Fr
177R-2, 37																						R	R		
179R-2, 10			R					Fr	F						*		Fr				C	A	C		Fr
183R-1, 3								F									C				Fr	A	Fr		Fr
186R-1, 34			R													?	C				Fr	A	Fr		
189R-2, 36																?	C		C		C	V	Fr		
192R-1, 37									R			R				?	Fr		C		C	V	C		
193R-2, 70															*		R		F		R	Fr			
196R-1, 27			F				R		F			R	*		*		C		C			V	Fr		
199R-1, 18			R						F				*			?	Fr		C		Fr	A	C		
202R-1, 13																	Fr		C		Fr	C	C		
208R-1, 30																	R		Fr		Fr	C	C		
210R-1, 18.5									R								Fr		C		C	A	C		
212R-2, 75																	F		C		Fr	C	Fr		
215R-CC, 10–12									R								Fr		Fr		C	A	C		
218R-2, 103–106																	R		C		C	C	C		
220R-2, 49–52									F								F		A			C	A		
221R-2, 141–143																	F		C	Fr		C	A		
222R-CC										Fr							R		Fr	Fr		Fr	C		
223R-1, 26										Fr							F			C		A	A		
223R-1, 146										Fr							Fr		Fr	C		A	A		
224R-3, 13–19										C							F		Fr	C		C	A		

Core, section, interval (cm)	*Reticulofenestra samodurovii*	*Reticulofenestra umbilicus*	*Rhabdosphaera* spp.	*Sphenolithus* cf. *distentus*	*Sphenolithus ciperoensis*	*Sphenolithus compactus*	*Sphenolithus delphix*	*Sphenolithus dissimilis*	*Sphenolithus distentus*	*Sphenolithus heteromorphus*	*Sphenolithus moriformis*	*Sphenolithus predistentus*	*Syracosphaera* spp.	*Thoracosphaera* spp.	*Transversopontis pulcher*	*Triquetrorhabdulus carinatus*	*Umbilicosphaera jafari*	*Umbilicosphaera rotula*	*Zygrhablithus bijugatus*	Reworked Cretaceous	Comments
313-M0027A-																					
1H-1, 20																					NN21 (<250 ka)
4H-1, 78														R							
5H-CC														R							*Emiliania huxleyi* acme (<90 ka)
8H-1, 79														R				R			Possible small *Gephyrocapsa* acme (125–250 ka)
10H-CC														R							
11H-CC																					
12H-1, 40														R				R			
13H-1, 7																					
13H-1, 111																					FO *Emiliania huxleyi* (250 ka)
15H-1, 104													R	F							Likely NN19 (definitely Pleistocene)
16H-CC														?							
17H-1, 13																					
19H-1, 63																					
25X-2, 66																					
26X-2, 108																					
35X-1, 1.5																					
35X-1, 49																					
38X-1, 104																					
41X-CC, 15																					
42X-1, 44																					
50H-CC																					
51H-1, 9																					
59H-1, 25																					
61H-2, 27											F										Lots of calcite pieces
64H-1, 20										?	Fr			R							Lots of calcite pieces
66X-3, 30–32											Fr										Really poor preservation
69X-1, 75											Fr										Some unidentifiable placoliths
69X-CC, 9–10											Fr			R			Fr				Mixed preservation; some coccospheres
72H-1, 20														F			Fr	R			LO *Coccolithus miopelagicus* (>11.0 Ma)
73X-1, 125													R	F			Fr			*	
75X-1, 100										R			R	Fr			Fr			*	LO *Sphenolithus heteromorphus* (>13.6 Ma)
75X-3, 118										R	R			Fr			Fr	R		*	
81R-1, 36										R			R	F			Fr	R			
83R-3, 12										F	R		F	F			Fr	F			
86R-2, 130										F			R	F			C	R			LO *Helicosphaera ampliaperta* (15.6 Ma)
89R-1, 9										R	R			Fr			Fr				
92R-2, 8										F	R			Fr			F				Possible LO *Discoaster deflandrei* (16.21 Ma)
95R-1, 8										R				F			Fr	R			
98R-1, 74														F				R			Possible FO *Discoaster petaliformis*
101R-1, 150										R				Fr			Fr				
102R-2, 80										R	R		R	F			F	R			
105R-2, 23		*												F			F	R			
108R-2, 5		*												Fr			Fr	R			
111R-1, 65		*									R			Fr			Fr	R			
114R-1, 3		*								R				Fr			Fr	F			
116R-1, 40		*								R				F				R			
117R-1, 100		*				R								R				R			
122R-1, 10																					
127R-1, 138																					Possible foraminifer
139R-1, 79																					
142R-1, 15																					
144R-1, 120		*									R			F		R					LO *Triquetrorhabdulus carinatus* (>19.6 Ma); below FO of *Helicosphaera ampliaperta*
146R-2, 99.5														F		?	C				Probable broken *Triquetrorhabdulus carinatus*
148R-1, 10											R			Fr		?	C				Probable broken *Triquetrorhabdulus carinatus*
150R-1, 45														F							
153R-2, 10						R								F		R	Fr	R			
156R-1, 14											R			F			C				
159R-1, 56													R	Fr			Fr				
162R-1, 12								R			R			F		R	C				
165R-1, 137											R			Fr			Fr				
168R-1, 77								?			R			Fr			C				
169R-1, 24								R						F							
171R-2, 132						R		R			R			F		R					
174R-1, 123											R			Fr		R	F				
177R-2, 37																	R				
179R-2, 10								R			R			F		Fr	C		R		
183R-1, 3							?	Fr			Fr			Fr		C	C		F		
186R-1, 34					R			F			Fr			Fr		Fr	C		F		LO *Sphenolithus ciperoensis* (24.75 Ma)
189R-2, 36					F			F			Fr			Fr		F	C		R		
192R-1, 37					R			F	?		F	?		Fr		?	C	?	Fr		
193R-2, 70														F							
196R-1, 27				R				F			F			Fr		?	C	?	Fr		
199R-1, 18				R	?				R		F			Fr			C		Fr		LO *Sphenolithus distentus* (27.5 Ma)
202R-1, 13					?						F			Fr			F		F		
208R-1, 30									R		R			F			F				
210R-1, 18.5					R				R		Fr			F			Fr				
212R-2, 75	R				R			F	R		F			Fr							
215R-CC, 10–12					R			F	?		Fr			Fr							
218R-2, 103–106	R	*			R			F			F	R		F			Fr				FO *Sphenolithus ciperoensis* (29.9 Ma)
220R-2, 49–52	F							C			C	F		Fr			F				
221R-2, 141–143	F							Fr			F	F		F			Fr				
222R-CC	Fr	F						F								F	Fr				LO *Reticulofenestra umbilicus* (32.3 Ma); LO *Isthmolithus recurvus* (32.46 Ma)
223R-1, 26	F	F						Fr			F	F		F			F		R		
223R-1, 146	C	C						F			Fr	F		F	Fr				F		LO *Ericsonia formosa* (32.8 Ma)
224R-3, 13–19	C	C	Fr					F			Fr				F				Fr		

Notes: Abundance: V = very abundant, A = abundant, C = common, Fr = frequent, F = few, R = rare, B = barren, ? = questionable, * = reworked. Preservation: G = good, M = moderate, P = poor. FO = first occurrence, LO = last occurrence.