Table T10. Calcareous nannofossil range chart, Zones NN21a–NN10a. (See table notes. Continued on next five pages.)

Epoch	Zone	Core, section, interval (cm)	Depth (mbsf)	Preservation	Abundance	*Amaurolithus amplificus*	*Amaurolithus delicatus*	*Amaurolithus primus*	*Amaurolithus* spp.	*Amaurolithus tricorniculatus*	*Braarudosphaera bigelowii*	*Calcidiscus tropicus*	*Calcidiscus leptoporus*	*Calcidiscus macintyrei*	*Ceratolithus cristatus*	*Ceratolithus cristatus* var. *telesmus*	*Coccolithus pelagicus*	*Coccolithus pelagicus* (with bar)	*Cyclolithus annulus*	*Discoaster asymmetricus*	*Discoaster bellus*	*Discoaster bergenii*	*Discoaster berggrenii*	*Discoaster braarudii*	*Discoaster brouweri*	*Discoaster challengeri*	*Discoaster exilis*	*Discoaster kugleri*	*Discoaster loeblichii*	*Discoaster pansus*	*Discoaster pentaradiatus*	*Discoaster quinqueramus*	*Discoaster* spp.	*Discoaster surculus*	*Discoaster tamalis*	*Discoaster tridiatus*	*Discoaster variabilis*	*Emiliania huxleyi*	*Florisphaera profunda*	*Gephyrocapsa muellerae*	*Gephyrocapsa oceanica*	*Gephyrocapsa* spp. (<2 µm)	*Helicosphaera carteri*	*Helicosphaera carteri* var. *wallichii*	*Helicosphaera intermedia*
		190-1178A-																																												
Pleistocene	NN21a-?20	1X-CC		G	G								C					R																				A	A	C	C	D	F	F	
	NN19	2X-CC		G	C								R					F																					C	D	C	A	F			
	NN16	3X-CC		G	C								F	R			C		R	R					F						R		R	R			R		C	A		A			
		4X-CC		G	C								C	F				R		R					F						R			R	R		F		C	C		A	F		
		5X-CC		G	C								C	R				R		R					R						C								A	A		A	R		
		6X-CC		G	C								C	C	F		R														C								A	A		A			
	NN15	7X-CC		G	C								C	F	R					F					F						C						R		A	A		D			F
		8X-CC		G	C						R		C	R	R			R							R						R			R			R		A	A		D			
		9X-CC		G	C								R	R	R			R		R					C						F						R		A	A		A		R	
		11X-CC		M	F								F	R	R					R					R						F		F				R		A	A		A			
		12X-CC		G	M								C	R											F						R	F		R			R		A	C		A			
		13X-CC		G	C						F	F	F	F			F	C		R					F						F	R		R	R		R		A	A		A	F	F	
	NN14-13	14X-4, 75-76	118.85	P	C		C					F	C	C			F			F					F						C			F					A			A	F	F	
Pliocene		14X-CC		P	F				F			C	C	C	F										F						C		C	F			F		A				C		
		15X-CC		M	C								C	F																									A	R		C	F		
		16X-CC		G	C							C	C	C	C					F											F			F			F					A			
		17X-3, 75-76	145.95	P	C					F					C										F					F	C			C					A						
		17X-CC		P	C								F		F										R						C			F					A			C			
		18X-3, 75-77	154.41	M	C		F											C							F						C			F			F		A			C	C		
		18X-CC		M	C								C				R															R	F	R			F		A			A	R		
		19X-CC		M	C				R				C	R				R							R						R			R			R		A			A			
		20X-CC		M	C		R						F	R		R				R					R						F			R		R	R		A			A			
		21X-CC		G	C		C						C	F	F			C													C			C			F						C		
		22X-3, 57-58	193.37	M	C							C	C		F																C			C			F		A				C		
		22X-CC			B																																									
		23X-CC		M	F								R												R							C		R			R		A			C	R		
		24X-CC		M	C								C	C			C											F			F	F		F			C								
		25X-CC		M	F								F				R			R					F						C	F		R			F		A				F		
late Miocene	NN11b	26X-CC		M	F						F																				C		F				F		A			C	F		
		27X-CC		M	F								C																	F		R		R			F		A			C			
		28X-CC		M	F								C																	F	F			F					A						F
		29X-3, 75-76	260.46	P	F							C																			F	C		C			F		A						
		29X-CC		P	F												F	R												R	R	R							A			C			R
		30X-CC		P	C								F				F													R	F		R	R			R					F	F		
	NN10a	31X-CC		P	F								F				C																				R		C			C			
		32X-CC		M	F		R						C				F													R			R				R		A			C	F		

Table T10 (continued).

Epoch	Zone	Core, section, interval (cm)	Depth (mbsf)	Preservation	Abundance	*Helicosphaera orientalis*	*Helicosphaera sellii*	*Helicosphaera stalis*	*Minylitha convallis*	*Neosphaera coccolithomorpha*	*Pontosphaera discopora*	*Pontosphaera japonica*	*Pontosphaera multipora*	*Pseudoemiliania lacunosa*	*Pseudoemiliania ovata*	*Reticulofenestra haqii*	*Reticulofenestra minuta*	*Reticulofenestra minutula*	*Reticulofenestra pseudoumbilicus* (>7 µm)	*Reticulofenestra pseudoumbilicus* (5-7 µm)	*Reticulofenestra* with 'pseudobar'	*Rhabdosphaera clavigera*	*Rhabdosphaera clavigera* var. *stylifera*	*Scapholithus fossilis*	*Scyphosphaera* spp.	*Sphenolithus abies*	*Sphenolithus grandis*	*Sphenolithus moriformis*	*Sphenolithus* spp.	*Syracosphaera pulchra*	*Syracosphaera* spp.	*Triquetrorhabdulus rioi*	*Triquetrorhabdulus rugosus*	*Umbellosphaera irregularis*	*Umbellosphaera tenuis*	*Umbilicosphaera hulburtiana*	*Umbilicosphaera jafari*	*Umbilicosphaera rotula*	*Umbilicosphaera sibogae* var. *foliosa*	*Umbilicosphaera sibogae* var. *sibogae*
		190-1178A-																																					
Pleistocene	NN21a-?20	1X-CC		G	G					R	R	R										R	R	C						R	C			F	C				F
	NN19	2X-CC		G	C									F															R	R	R							R	R
	NN16	3X-CC		G	C										C		A	A																					
		4X-CC		G	C		F					R		R	C		D	C		F																	R		C
		5X-CC		G	C		R				R	R		F	F		C	F				C													F		F		
		6X-CC		G	C		R					F	F		C			C			C			F					C		F						R		
	NN15	7X-CC		G	C									F	C				C			R															C		C
		8X-CC		G	C												F		F										C								R		
		9X-CC		G	C							R		C	A				R	F									C								C		
		11X-CC		M	F									C	C	C	C		C	F									C		R						C		
		12X-CC		G	M							R		C	C														R										
		13X-CC		G	C		R						F		C	F			R							R											C		
Pliocene	NN14-13	14X-4, 75-76	118.85	P	C											A	A			C					C														
		14X-CC		P	F										C	A	A		C	C																			
		15X-CC		M	C										C		A	C	C	F		F							C		C						F	R	C
		16X-CC		G	C										C	C	A	A	C										C										
		17X-3, 75-76	145.95	P	C											A	D		F	C																			
		17X-CC		P	C							F				C	A	C	C										C										C
		18X-3, 75-77	154.41	M	C							C				A	A			F					C											C	C		
		18X-CC		M	C											A	A		C	C									C								R		F
		19X-CC		M	C							R	R			C	A	C	C	F									R										R
		20X-CC		M	C								F			A	A		F										F						R		R		
		21X-CC		G	C								F			A	D		F			F				F	F										F		
		22X-3, 57-58	193.37	M	C											C	A		F	C							C												
		22X-CC			B																																		
		23X-CC		M	F											C	D		F		C					C					F						C		
		24X-CC		M	C								F			A	A		C	A	C					C			A				F						
		25X-CC		M	F						R						D	C		C	C								C		F					C	R		
	NN11b	26X-CC		M	F											C	D				R					C													
		27X-CC		M	F											A	D				C			F		F										F	F		
late Miocene		28X-CC		M	F							F				C	D		F	C	C				C	C				C	F								
		29X-3, 75-76	260.46	P	F											C	D		F	C								C									F		
		29X-CC		P	F										F	C	D		R	F	C				C											R			
		30X-CC		P	C						F				C	C	D	A	F	F	C				C				F										
	NN10a	31X-CC		P	F		R									C	D		C						C				F								C		
		32X-CC		M	F										C	A	A		C	C					C						R		R			C	C		

Table T10 (continued).

Epoch	Zone	Core, section, interval (cm)	Depth (mbsf)	Preservation	Abundance	*Amaurolithus amplificus*	*Amaurolithus delicatus*	*Amaurolithus primus*	*Amaurolithus* spp.	*Amaurolithus tricorniculatus*	*Braarudosphaera bigelowii*	*Calcidiscus tropicus*	*Calcidiscus leptoporus*	*Calcidiscus macintyrei*	*Ceratolithus cristatus*	*Ceratolithus cristatus* var. *telesmus*	*Coccolithus pelagicus*	*Coccolithus pelagicus* (with bar)	*Cyclolithus annulus*	*Discoaster asymmetricus*	*Discoaster bellus*	*Discoaster bergenii*	*Discoaster berggrenii*	*Discoaster braarudii*	*Discoaster brouweri*	*Discoaster challengeri*	*Discoaster exilis*	*Discoaster kugleri*	*Discoaster loeblichii*	*Discoaster pansus*	*Discoaster pentaradiatus*	*Discoaster quinqueramus*	*Discoaster* spp.	*Discoaster surculus*	*Discoaster tamalis*	*Discoaster tridiatus*	*Discoaster variabilis*	*Emiliania huxleyi*	*Florisphaera profunda*	*Gephyrocapsa muellerae*	*Gephyrocapsa oceanica*	*Gephyrocapsa* spp. (<2 µm)	*Helicosphaera carteri*	*Helicosphaera carteri* var. *wallichii*	*Helicosphaera intermedia*
		33X-CC		M	F							F	C	F			F								F								F	R				A							
		34X-3, 75-76	308.85	M	F					F							F													R			F	C											
		34X-CC		M	F												C								F						F		C				C		C						C
	NN10a	35X-CC		P	F	F		C					C																				R	R									F		
		36X-CC		M	F								C												F								C				C	C							
		37X-CC		P	F				R									R							R					R	F		R												
		38X-2, 69-70	345.79	P	F								C										F										C					C							
		38X-CC		M	F			C	F								F								F					F	C			F			C	A							
		39X-1, 19-20	353.39	P	F												F								F				F					C			C						F		
		39X-CC		P	F								C												F												F								
		40X-CC		M	F								F				C						F							C	F	F					C	A					F		
		41X-1, 67-68	373.17	P	R							F	C										C									C		C											
		41X-CC		P	R																												C												
		42X-2, 31-32	383.91	P	C							F	C													C	F																		
		42X-CC		P	R								C				C						C							F			C												
	NN11a	43X-2, 109-110	394.19	P	C								F				C					F	F			R	R			R		F					F						R		
		43X-CC		P	R																																								
		44X-4, 79-80	405.81	P	C								F				F				R		F			F				R				F											
late Miocene		44X-CC			B																																								
		190-1178B-																																											
		2R-CC		P	F								C				F								C					F							F								
		3R-CC		P	R																																								
		4R-3, 75-76	413.35	P	C								F										R			R					F							C							
		4R-CC		P	C								F	R			F															R	R				F	A					R	
		5R-3, 12-13	422.42	P	C					R			F				F						R						R		C	F		F			R	C			R				
		5R-CC		P	F							F					C								F		F			F	F					F	C	A							
		6R-3, 70-71	432.7	P	R																											A													
		6R-CC		P	R								C												F						F	C	C				F	A							
		7R-4, 69-70	443.79		B																																								
		7R-CC		P	C								C	C																	F	F		F			F						F		F
	NN11b	8R-3, 70-71	451.9	P	R							F					F													C			F												
		8R-CC		P	F		R		R				C	F			F								F					R		R		R			F	A							
		9R-CC		P	C									C				R															R												
		10R-CC		P	F								C												C							F	F	F				A							
		11R-3, 74-75	480.84		B																																								
		11R-CC		P	R				F				F	F			F								F		F					F	F				F								
		12R-CC		P	R				F				C				F														F	C				F	A					F		

Table T10 (continued).

Epoch	Zone	Core, section, interval (cm)	Depth (mbsf)	Preservation	Abundance	*Helicosphaera orientalis*	*Helicosphaera sellii*	*Helicosphaera stalis*	*Minylitha convallis*	*Neosphaera coccolithomorpha*	*Pontosphaera discopora*	*Pontosphaera japonica*	*Pontosphaera multipora*	*Pseudoemiliania lacunosa*	*Pseudoemiliania ovata*	*Reticulofenestra haqii*	*Reticulofenestra minuta*	*Reticulofenestra minutula*	*Reticulofenestra pseudoumbilicus* (>7 µm)	*Reticulofenestra pseudoumbilicus* (5-7 µm)	*Reticulofenestra* with 'pseudobar'	*Rhabdosphaera clavigera*	*Rhabdosphaera clavigera* var. *stylifera*	*Scapholithus fossilis*	*Scyphosphaera* spp.	*Sphenolithus abies*	*Sphenolithus grandis*	*Sphenolithus moriformis*	*Sphenolithus* spp.	*Syracosphaera pulchra*	*Syracosphaera* spp.	*Triquetrorhabdulus riol*	*Triquetrorhabdulus rugosus*	*Umbellosphaera irregularis*	*Umbellosphaera tenuis*	*Umbilicosphaera hulburtiana*	*Umbilicosphaera jafari*	*Umbilicosphaera rotula*	*Umbilicosphaera sibogae* var. *foliosa*	*Umbilicosphaera sibogae* var. *sibogae*
		33X-CC		M	F											A	D		C	F	C					C							R				F			
		34X-3, 75-76	308.85	M	F											C	D		R	C						C														
		34X-CC		M	F								F			A	D		C		F									C			F					C		
		35X-CC		P	F											C	D		C	C						C														
	NN10a	36X-CC		M	F											A	D		F							C												C		
		37X-CC		P	F											C	D		C	C						R														
		38X-2, 69-70	345.79	P	F												D		C	C							F		C								F	C		
		38X-CC		M	F											A	D		C	C						F							F					F		
		39X-1, 19-20	353.39	P	F											A	A		F	A									C									F		
		39X-CC		P	F											A	D			C						C				C										
		40X-CC		M	F				F							C	D		F	C	C					C														
		41X-1, 67-68	373.17	P	R	F		F								C	D												C											
		41X-CC		P	R												D																							
		42X-2, 31-32	383.91	P	C	F										A	C			A						C			C								C			
		42X-CC		P	R											C	D													C										
	NN11a	43X-2, 109-110	394.19	P	C											C	D		R	C						C											R			
		43X-CC		P	R											A	D																							
		44X-4, 79-80	405.81	P	C											A	A		A							A			C								F	C		
late Miocene		44X-CC			B																																			
		190-1178B-																																						
		2R-CC		P	F											C	D			C	C									C	C									
		3R-CC		P	R											A	D			C						C														
		4R-3, 75-76	413.35	P	C												D			C						A				C							F			
		4R-CC		P	C				F							C	D			R	C					C														
		5R-3, 12-13	422.42	P	C											A	D		C	A				R	F		F													
		5R-CC		P	F							F	F			A			F		C					C														
		6R-3, 70-71	432.7	P	R														C																		A			
		6R-CC		P	R											A	A		C	C	C					C											F	F		
		7R-4, 69-70	443.79		B																																			
	NN11b	7R-CC		P	C						F					A	D		F	C	C					A							F					F		
		8R-3, 70-71	451.9	P	R	C		F								A	D		F	C								F												
		8R-CC		P	F											A	A		F	R	C					C										F	F	F		
		9R-CC		P	C								R			A	D		C	C	C					C						C					F			
		10R-CC		P	F											A	A		C	C	C									A								F		
		11R-3, 74-75	480.84		B																																			
		11R-CC		P	R											A	D		F	F	C									F								F		
		12R-CC		P	R											A	A			C	F					C														

Table T10 (continued).

Epoch	Zone	Core, section, interval (cm)	Depth (mbsf)	Preservation	Abundance	*Amaurolithus amplificus*	*Amaurolithus delicatus*	*Amaurolithus primus*	*Amaurolithus* spp.	*Amaurolithus tricorniculatus*	*Braarudosphaera bigelowii*	*Calcidiscus tropicus*	*Calcidiscus leptoporus*	*Calcidiscus macintyrei*	*Ceratolithus cristatus*	*Ceratolithus cristatus* var. *telesmus*	*Coccolithus pelagicus*	*Coccolithus pelagicus* (with bar)	*Cyclolithus annulus*	*Discoaster asymmetricus*	*Discoaster bellus*	*Discoaster bergenii*	*Discoaster berggrenii*	*Discoaster braarudii*	*Discoaster brouweri*	*Discoaster challengeri*	*Discoaster exilis*	*Discoaster kugleri*	*Discoaster loeblichii*	*Discoaster pansus*	*Discoaster pentaradiatus*	*Discoaster quinqueramus*	*Discoaster* spp.	*Discoaster surculus*	*Discoaster tamalis*	*Discoaster tridiatus*	*Discoaster variabilis*	*Emiliania huxleyi*	*Florisphaera profunda*	*Gephyrocapsa muellerae*	*Gephyrocapsa oceanica*	*Gephyrocapsa* spp. (<2µm)	*Helicosphaera carteri*	*Helicosphaera carteri* var. *wallichii*	*Helicosphaera intermedia*
late Miocene	NN11b	13R-CC		M	R								C	C									C				F	F				F					F		D						F
		14R-CC		M	F								C	C											F	F					F	F					F		A						
		15R-CC		M	C		R						F				R									R	R			R	R		R	R			R						R		F
		16R-CC		P	R									A																															
		17R-CC		P	R						F		C	F			R							R	R			R			R		F				R	A							R
		18R-CC		P	F						R		C				R					R									R		F	R			R	C					R		
		19R-CC		M	C						R		R	R			R							F	R	R											R	A							
		20R-CC		P	F								C												R	R					C		F				R	A							
		21R-CC			B																																								
	NN10a	22R-CC		P	R								C																				C	F			A								
		23R-CC		P	R								C									F			F						F		C				A								
		24R-CC		P	R																										F														
		25R-CC		P	R												C	C				F					F										C								
		26R-CC		P	R								C				C																												
		27R-CC		P	F								C											F																			F		
		28R-CC		P	R												C								F								F												
		29R-CC		P	F												F																										F		
	NN11b	30R-CC		M	C		R	F					C	F			F	R				R	C		R		R					C				R	C					R		
		31R-CC		P	C												C						F		R		R	F		R	F	C	F	R		R								

Notes: Abundance: D = dominant, A = abundant, C = common, F = few, R = rare. Preservation: P = poor, M = moderate, G = good. See "Biostratigraphy," p. 9, in the "Explanatory Notes" chapter. This table is also available in ASCII format.

Table T10 (continued).

Epoch	Zone	Core, section, interval (cm)	Depth (mbsf)	Preservation	Abundance	*Helicosphaera orientalis*	*Helicosphaera sellii*	*Helicosphaera stalis*	*Minylitha convallis*	*Neosphaera coccolithomorpha*	*Pontosphaera discopora*	*Pontosphaera japonica*	*Pontosphaera multipora*	*Pseudoemiliania lacunosa*	*Pseudoemiliania ovata*	*Reticulofenestra haqii*	*Reticulofenestra minuta*	*Reticulofenestra minutula*	*Reticulofenestra pseudoumbilicus* (>7 µm)	*Reticulofenestra pseudoumbilicus* (5-7 µm)	*Reticulofenestra* with 'pseudobar'	*Rhabdosphaera clavigera*	*Rhabdosphaera clavigera* var. *stylifera*	*Scapholithus fossilis*	*Scyphosphaera* spp.	*Sphenolithus abies*	*Sphenolithus grandis*	*Sphenolithus moriformis*	*Sphenolithus* spp.	*Syracosphaera pulchra*	*Syracosphaera* spp.	*Triquetrorhabdulus rioi*	*Triquetrorhabdulus rugosus*	*Umbellosphaera irregularis*	*Umbellosphaera tenuis*	*Umbilicosphaera hulburtiana*	*Umbilicosphaera jafari*	*Umbilicosphaera rotula*	*Umbilicosphaera sibogae* var. *foliosa*	*Umbilicosphaera sibogae* var. *sibogae*
late Miocene	NN11b	13R-CC		M	R											C	A			C	C					C		C												
		14R-CC		M	F											A	A				A					C					C					F				
		15R-CC		M	C											A	D		R	F	C					C		C									F			
		16R-CC		P	R												A																							
		17R-CC		P	R								R			C	D			R	C									F						C				
		18R-CC		P	F											A	D			R	C	R				C		F				C	R					C		
		19R-CC		M	C											A	D		R		F					C				F		R				F	F			
		20R-CC		P	F											A	D		F	R	F					C				R										
		21R-CC			B																																			
	NN10a	22R-CC		P	R											A	D		F	F	C																C			
		23R-CC		P	R											C	D		C		C						C			C										
		24R-CC		P	R											A	D		C	C	C															C				
		25R-CC		P	R											A	D		F		C								C							F	F			
		26R-CC		P	R												D		F							C				C										
		27R-CC		P	F											A	D		C	C						C			C								C			
		28R-CC		P	R	F										A	D		F		F					F														
		29R-CC		P	F											A	D		F	F	C					C	F													
	NN11b	30R-CC		M	C	F										A	A		F	C	C					C						F				F	C			
		31R-CC		P	C											A	D		C		F					A											F			