Chapter 10, Table T3. Stratigraphic occurrence and relative abundance of selected Miocene diatom species, Hole 689B.

Zone (Southern Southern Ocean Diatom Zonation)	Core, section, interval (cm)	Depth (mbsf)	Preservation	*Actinocyclus fasciculatus*	*Actinocyclus ingens*	*Actinocyclus ingens* var. *nodus*	*Actinocyclus ingens* var. *ovalis*	*Actinocyclus karstenii*	*Actinoptychus senarius*	*Asteromphalus hookeri*	*Asteromphalus inaequabilis*	*Asteromphalus kennettii*	*Asteromphalus oligocenicus*	*Azpeitia tabularis*	*Cavitatus jouseanus*	*Cavitatus miocenica*	*Chaetoceros* spp.	*Corethron criophilum*	*Coscinodiscus lewisianus*	*Coscinodiscus marginatus*	*Coscinodiscus rhombicus*	*Crucidenticula kanayae*	*Crucidenticula nicobarica*
	113-689B-																						
T. inura	2H-5, 27–28	11.57	G											R				T		C			
	2H-5, 55–57	11.85	G		F															A			
	2H-5, 87–89	12.17	M		F															A			
	2H-5, 114–115	12.44	G											R						F			
	2H-6, 29–30	13.09	G					R						R				T		C			
	2H-6, 114–116	13.94	G		R		R	R												F			
	2H-7, 18–20	14.48	M		R					T										F			
	3H-1, 28–29	15.08	G		R		T							R				R		F			
H. triangularus–	3H-1, 56–58	15.36	G		R															C			
F. aurica	3H-1, 114–116	15.94	G		T									R			T			C			
	3H-1, 143–145	16.23	M		T									R						F			
	3H-2, 29–30	16.59	G		T									R			T			F			
	3H-2, 56–58	16.87	M				T							R						F			
	3H-2, 114–115	17.44	G	R	R			R		T				R						F			
	3H-3, 58–59	18.38	M	T	F			R						R			T			F			
	3H-3, 118–120	18.98	M		R		T	R				T		R				T		F			
	3H-3, 148–150	19.28	M		F									F						F			
	3H-4, 56–58	19.86	M		F		R	T				R		R			T			F			
	3H-4, 94–96	20.24	M		F		R	R				T		R						R			
F. arcula	3H-5, 28–29	21.08	G		F		T	T				T		R			R			T			
	3H-5, 80–82	21.60	M		R							R		F									
	3H-5, 114–115	21.94	M	T	F		T	T				T		F						R			
	3H-6, 28–29	22.58	M		R			T				T		F			T			F			
	3H-6, 55–57	22.85	G		R							R		C						F			
	3H-6, 113–114	23.43	G		F							R		C			R			F			
	3H-6, 148–150	23.78	M		A							R		C						F			
A. kennettii–	4H-1, 56–58	24.86	M		A			R						C						R			
F. praecurta	4H-1, 112–113	25.42	G		A							R		F						F			
	4H-2, 28–29	26.08	G		A			R				R		F			T			R			
	4H-2, 113–114	26.93	G		A							R		F						F			
	4H-3, 31–32	27.30	M		A							T		F			T			F			
	4H-3, 114–115	28.13	M		A							R		F						F			
	4H-4, 29–30	29.09	M		C									F			T			F			
	4H-4, 113–114	29.93	M		C									F			R			F			
	4H-5, 28–29	30.58	G		F									R			T			F			
	4H-5, 55–57	30.85	G		R									R						C			
	4H-5, 148–150	31.78	M		T									R						F			
	4H-6, 28–29	32.08	G		T			T		T				R						F			
	4H-6, 87–89	32.67	M											R						F			
	4H-6, 114–115	32.94	G		T			T						R						F			
F. praecurta	4H-7, 32–34	33.62	M											R						R			
	5H-1, 28–29	34.08	M		R			T						R			T			R			
	5H-1, 118–120	34.98	G		T									R						R			
	5H-2, 28–29	35.58	M		T									R						R			
	5H-2, 86–88	36.16	M																	R			
	5H-2, 114–115	36.44	G					T						R						R			
	5H-3, 28–29	37.08	M		T			T						R						R			
	5H-3, 56–58	37.36	M		T									R						T			
	5H-3, 114–115	37.94	G		T			R						T						R			
	5H-3, 145–147	38.25	M		R									T						R			
	5H-4, 27–28	38.57	G		R			T						T						R			
D. dimorpha–	5H-4, 86–88	39.16	M											R						R			
D. ovata	5H-4, 114–115	39.44	G		T									R						R			
	5H-5, 28–29	40.08	M		R									R			T			T			
	5H-5, 114–115	40.94	M		R			T						R						R			
	5H-6, 28–29	41.58	P		F									T			T			R			
	5H-6, 114–115	42.44	G		R									R						R			
D. ovata–	5H-7, 17–19	42.97	M		F									R									
N.denticuloides	6H-1, 28–29	43.58	G		R									R			T			R			
	6H-1, 114–115	44.44	G		R									R			T			R			
	6H-2, 28–29	45.08	M		F	F								R						F			
D. dimorpha	6H-2, 114–115	45.94	M	R	A	F								F			T			F			
	6H-3, 28–29	46.58	P		C	F								F			R			F			C
	6H-3, 114–115	47.44	G		A	F								F			T	T		F			F
D. praedimorpha	6H-4, 28–29	48.08	P		A	R								R			R			F			R
	6H-4, 114–115	48.94	M		C	F								F						R			T
N. denticuloides	6H-5, 28–29	49.58	M		D	C								F									T
	6H-5, 114–115	50.44	G		C	C								F			T			R			F
	6H-6, 28–29	51.08	P		A	C								F						F			R
D. simonsenii–	6H-6, 114–115	51.94	M		A	C								R						R			R
N. grossepunctata	6H-7, 28–29	52.58	M	T	A	C								F			T			F			R
	7H-1, 28–29	53.18	G		A	C								F						R			R
	7H-1, 115–116	54.05	P	R	D	C								R						R			R
A. ingens var. *nodus*	7H-2, 28–30	54.68	G		D	F					T									R			
	7H-2, 65–67	55.05	M		C	A														R			
	7H-2, 115–116	55.55	M		R								R	R	R		R			F			C
	7H-2, 144–146	55.84	P						R											F			
	7H-3, 28–29	56.18	G		R				T		T			T	R					R			
N. grossepunctata	7H-3, 86–88	56.76	M		T															R			
	7H-3, 115–116	57.05	G		T									R	F				T	R			
	7H-3, 145–147	57.35	M											R									
	7H-4, 28–29	57.68	G						T					R	F		T	T	T	R		T	
A. ingens–	7H-4, 86–88	58.26	M		T								R	F						R		R	
D. maccollumii	7H-4, 115–116	58.55	M		R									R	R				T	R		R	
C. kanayae	7H-5, 28–29	59.18	M						T		T		R		R					R		R	
	7H-5, 55–57	59.45	M										T							F			
	7H-5, 86–88	59.76	P						R					R						F			
?	7H-5, 115–116	60.05	M						F				R		R				T	F			
	7H-6, 28–29	60.68	G						F				R	F	F				R	F			
	7H-6, 115–116	61.55	M						T				T	F	F				T	F			
	7H-7, 28–29	62.18	M										R	F	F					R			

Core, section, interval (cm)	Depth (mbsf)	*Dactyliosolen antarctica*	*Denticulopsis crassa*	*Denticulopsis dimorpha*	*Denticulopsis maccollumii*	*Denticulopsis ovata*	*Denticulopsis praedimorpha*	*Denticulopsis simonsenii*	*Ethmodiscus* spp.	*Eucampia antarctica*	*Fragilaria* sp.	*Fragilariopsis arcula*	*Fragilariopsis aurica*	*Fragilariopsis barronii*	*Fragilariopsis cylindrica*	*Fragilariopsis claviceps*	*Fragilariopsis clementia*	*Fragilariopsis donahuensis*	*Fragilariopsis efferans*	*Fragilariopsis fossilis*	*Fragilariopsis maleinterpretaria*
2H-5, 27–28	11.57								X			R	C	R						R	
2H-5, 55–57	11.85												R								
2H-5, 87–89	12.17											R	C							R	
2H-5, 114–115	12.44							T		R		F	A				R				
2H-6, 29–30	13.09					R						F	F							R	
2H-6, 114–116	13.94											R	A								
2H-7, 18–20	14.48											F	A								
3H-1, 28–29	15.08			T		R			X	R		F	A					R		R	
3H-1, 56–58	15.36					R						F	A					R			
3H-1, 114–116	15.94			T		R			X			F	C					T			
3H-1, 143–145	16.23											F	A					T			
3H-2, 29–30	16.59					R			X			F	C					T		T	
3H-2, 56–58	16.87											F	C					T		R	
3H-2, 114–115	17.44					T					T	F	R					R		F	
3H-3, 58–59	18.38			R		R						C	F					R		R	
3H-3, 118–120	18.98			R		R			X		T	C	F					R		T	
3H-3, 148–150	19.28			R		R						C	F					R		R	
3H-4, 56–58	19.86		F	R		F		C				F	R					R			
3H-4, 94–96	20.24		T	R		F		C	X			C	F					R			
3H-5, 28–29	21.08		R	R		F		C	X			C	R		R			R		R	
3H-5, 80–82	21.60			R		C		A				C						R		T	
3H-5, 114–115	21.94		R			C		C				C	R					R		R	
3H-6, 28–29	22.58		R	R		F		A					F			R		R		T	
3H-6, 55–57	22.85		T	R		F		A								T					
3H-6, 113–114	23.43		R	T		F		F			R		F			R		F			
3H-6, 148–150	23.78					F		F													
4H-1, 56–58	24.86					R		C													
4H-1, 112–113	25.42					R		C								R					
4H-2, 28–29	26.08					F		C	X							R					
4H-2, 113–114	26.93		T	R		F		F					R					R			
4H-3, 31–32	27.30		T	R		F		F					R			R		R			
4H-3, 114–115	28.13		R	T		F		C					R			T		T			
4H-4, 29–30	29.09			R		F		A					R			T		F			
4H-4, 113–114	29.93		T	R		F		A					R			R		R	T		
4H-5, 28–29	30.58			R		F		A					R					F			
4H-5, 55–57	30.85			R		C		A													
4H-5, 148–150	31.78			F		A		F								T		R			
4H-6, 28–29	32.08			F		D		F													
4H-6, 87–89	32.67			F		D		F													
4H-6, 114–115	32.94			F		D		F								T					
4H-7, 32–34	33.62			F		D		F													
5H-1, 28–29	34.08			R		D		F										T			
5H-1, 118–120	34.98			F		D		F										T			
5H-2, 28–29	35.58			F		D		R								T			T		
5H-2, 86–88	36.16			F		D		R													
5H-2, 114–115	36.44			F		D	T	R													
5H-3, 28–29	37.08			C		D		F	X							R					
5H-3, 56–58	37.36			F		D		R													
5H-3, 114–115	37.94			R		D		T											T		
5H-3, 145–147	38.25			R		D		T													
5H-4, 27–28	38.57			F		D		R		T						T					
5H-4, 86–88	39.16			C		D		R													
5H-4, 114–115	39.44			C		D	R	R	X							R					
5H-5, 28–29	40.08			A		A	C	F			T								R		
5H-5, 114–115	40.94			A		F	A	R													
5H-6, 28–29	41.58			C		C	A	R										R			
5H-6, 114–115	42.44			A		F	A	R													
5H-7, 17–19	42.97			C		F	D	T													
6H-1, 28–29	43.58			F		R	D	T			T							R	R		
6H-1, 114–115	44.44			R			D	R										R	R		
6H-2, 28–29	45.08			F			A	F											R		
6H-2, 114–115	45.94			R			C	F	X							T					
6H-3, 28–29	46.58			T			C	F	X												
6H-3, 114–115	47.44						R	F	X									F	R		
6H-4, 28–29	48.08						R	C										R			
6H-4, 114–115	48.94							F										R			
6H-5, 28–29	49.58							R											T		
6H-5, 114–115	50.44							C										F	R		
6H-6, 28–29	51.08							F										T			
6H-6, 114–115	51.94							F													
6H-7, 28–29	52.58							F		T								R			
7H-1, 28–29	53.18																				
7H-1, 115–116	54.05				F																
7H-2, 28–30	54.68				R																
7H-2, 65–67	55.05				C																
7H-2, 115–116	55.55				A																
7H-2, 144–146	55.84				D																
7H-3, 28–29	56.18				D																T
7H-3, 86–88	56.76				D																T
7H-3, 115–116	57.05	T			D																T
7H-3, 145–147	57.35				D																
7H-4, 28–29	57.68				D																
7H-4, 86–88	58.26				D																
7H-4, 115–116	58.55				D																F
7H-5, 28–29	59.18	T							X												D
7H-5, 55–57	59.45																				D
7H-5, 86–88	59.76																				D
7H-5, 115–116	60.05								X												D
7H-6, 28–29	60.68								X												
7H-6, 115–116	61.55								X												D
7H-7, 28–29	62.18								X												A

Core, section, interval (cm)	Depth (mbsf)	*Fragilariopsis praecurta*	*Fragilariopsis praeinterfrigidaria*	*Fragilariopsis pseudokerguelensis*	*Fragilariopsis pusilla*	*Fragilariopsis reinholdii*	*Hemidiscus cuneiformis*	*Hemidiscus triangularus*	*Katathiraia aspera*	*Mediaria splendida*	*Navicula* spp.	*Neobrunia mirabilis*	*Nitzschia denticuloides*	*Nitzchia grossepuncata*	*Paralia sulcata*	*Pleurosigma directum*	*Proboscia barboi*	*Raphidodiscus marylandicus*	*Rhizosolenia antennata*	*Rhizosolenia hebetata*	*Rouxia isopolica*
2H-5, 27–28	11.57	F	F														F			F	R
2H-5, 55–57	11.85	F	F														C			R	R
2H-5, 87–89	12.17	R	C														F			R	R
2H-5, 114–115	12.44	T	F								R						R		R	R	F
2H-6, 29–30	13.09	C	F														F			T	R
2H-6, 114–116	13.94	A	F														R		T	T	R
2H-7, 18–20	14.48	F	F														R			R	R
3H-1, 28–29	15.08	F				T				T						T	R		R	F	F
3H-1, 56–58	15.36	F															F		T	F	F
3H-1, 114–116	15.94	F	T								T						F		R	F	R
3H-1, 143–145	16.23	F					R												R	R	
3H-2, 29–30	16.59	C						T									F		T	F	T
3H-2, 56–58	16.87	C					R										F			T	
3H-2, 114–115	17.44	C						R									F		R		R
3H-3, 58–59	18.38	F					R	F									F		T	F	F
3H-3, 118–120	18.98	F					T	F									R		R	F	F
3H-3, 148–150	19.28	F						R												F	
3H-4, 56–58	19.86	R					T		T										R	F	R
3H-4, 94–96	20.24	F							T	T									R	F	R
3H-5, 28–29	21.08	R							T			X							R	F	R
3H-5, 80–82	21.60	F																		F	
3H-5, 114–115	21.94	R							T	T							T			F	R
3H-6, 28–29	22.58								T	T							T		R	F	F
3H-6, 55–57	22.85																		T	R	
3H-6, 113–114	23.43	R							T	R									R	F	F
3H-6, 148–150	23.78																		R		
4H-1, 56–58	24.86																			R	R
4H-1, 112–113	25.42	F															R		R	R	T
4H-2, 28–29	26.08	R																	F	T	R
4H-2, 113–114	26.93								T								R		R	R	R
4H-3, 31–32	27.30	R															T		R	F	R
4H-3, 114–115	28.13	T							T										R	R	R
4H-4, 29–30	29.09	R															T		R	F	R
4H-4, 113–114	29.93	R															T		R	F	F
4H-5, 28–29	30.58	F							R										R	F	F
4H-5, 55–57	30.85	F							T										R	R	R
4H-5, 148–150	31.78	T																	R	T	
4H-6, 28–29	32.08	T							T								T		T	T	T
4H-6, 87–89	32.67	R							T										T	T	
4H-6, 114–115	32.94	R							T								T		T	R	
4H-7, 32–34	33.62	R																	T	R	
5H-1, 28–29	34.08	T							T								T		T	T	
5H-1, 118–120	34.98	T							T								R		T	T	
5H-2, 28–29	35.58	R							T								T		T	R	
5H-2, 86–88	36.16	R															T		T	R	
5H-2, 114–115	36.44	R																	R	R	
5H-3, 28–29	37.08	T							T											R	
5H-3, 56–58	37.36																				
5H-3, 114–115	37.94	R															T		T		
5H-3, 145–147	38.25																				
5H-4, 27–28	38.57								T								T			T	
5H-4, 86–88	39.16																				
5H-4, 114–115	39.44																		T	T	
5H-5, 28–29	40.08																		T	R	
5H-5, 114–115	40.94																R		R	R	
5H-6, 28–29	41.58																R		R	R	
5H-6, 114–115	42.44												F				T			R	R
5H-7, 17–19	42.97																T			R	
6H-1, 28–29	43.58												F				T		T	T	
6H-1, 114–115	44.44												R				T		T	T	T
6H-2, 28–29	45.08												F						R	F	R
6H-2, 114–115	45.94												F				R		R	F	
6H-3, 28–29	46.58												F				R			R	
6H-3, 114–115	47.44												F				R			R	R
6H-4, 28–29	48.08												C	R						R	
6H-4, 114–115	48.94									T			C	R			T			R	
6H-5, 28–29	49.58												F	R						T	
6H-5, 114–115	50.44			T					R				F	F			R			F	
6H-6, 28–29	51.08			R										F						R	T
6H-6, 114–115	51.94													F			R			T	
6H-7, 28–29	52.58													F			R			R	R
7H-1, 28–29	53.18			R										R	T		R			T	F
7H-1, 115–116	54.05																T				
7H-2, 28–30	54.68									T											
7H-2, 65–67	55.05																R			R	
7H-2, 115–116	55.55									R							R				
7H-2, 144–146	55.84													R			R				
7H-3, 28–29	56.18									T				F			R			T	R
7H-3, 86–88	56.76									T											
7H-3, 115–116	57.05									T				R			R			T	
7H-3, 145–147	57.35													R			R				
7H-4, 28–29	57.68				R					R							R				
7H-4, 86–88	58.26																				
7H-4, 115–116	58.55																	F		T	
7H-5, 28–29	59.18				R					T										T	
7H-5, 55–57	59.45				F															T	
7H-5, 86–88	59.76				F															R	
7H-5, 115–116	60.05				F															T	
7H-6, 28–29	60.68				F						R						R			R	
7H-6, 115–116	61.55				R												T			R	
7H-7, 28–29	62.18				F					R							R			R	

Core, section, interval (cm)	Depth (mbsf)	*Rouxia naviculoides*	*Rouxia peragalli*	*Rouxia* sp. 1	*Rouxia* sp. 2	*Rocella gelida*	*Thalassionema nitzschioides*	*Thalassionema nitzschioides* var. *capitulatum*	*Thalassionema nitzschioides* var. *parvum*	*Thalassiosira convexa* var. *aspinosa*	*Thalassiosira yabei*	*Thalassiosira inura*	*Thalassiosira fraga*	*Thalassiosira miocenica*	*Thalassiosira oestrupii*	*Thalassiosira oliverana* var. *sparsa*	*Thalassiosira praelineata*	*Thalassiosira spinosa*	*Thalassiosira torokina*	*Thalassiothrix longissima*	*Thalassiothrix miocenica*
2H-5, 27–28	11.57	F	R				R					F			R					R	
2H-5, 55–57	11.85	C					R								R						
2H-5, 87–89	12.17	C					R														
2H-5, 114–115	12.44	F	R				R								R					R	
2H-6, 29–30	13.09	F	R				R								R					R	
2H-6, 114–116	13.94	R	R				R										R		T	T	
2H-7, 18–20	14.48	T					F								T				T	T	
3H-1, 28–29	15.08	F	R				R								T	R			T	R	R
3H-1, 56–58	15.36	F	R													T				R	
3H-1, 114–116	15.94	F	R				T		R	R					R	T			T	R	
3H-1, 143–145	16.23	F	T													T			R	R	
3H-2, 29–30	16.59	F	R							F						T			R	R	
3H-2, 56–58	16.87	F	T							F						T			R	R	
3H-2, 114–115	17.44	F	R						R	F						R			R	T	
3H-3, 58–59	18.38	R								F						F			R	R	R
3H-3, 118–120	18.98	F												R		F	R		T	R	T
3H-3, 148–150	19.28	F												F		F				F	R
3H-4, 56–58	19.86	T												F		F			T	R	F
3H-4, 94–96	20.24													R		F			R	R	R
3H-5, 28–29	21.08	R														R	R		R	R	F
3H-5, 80–82	21.60																			F	
3H-5, 114–115	21.94	R																		R	
3H-6, 28–29	22.58	R					R										T			R	
3H-6, 55–57	22.85	T					T														
3H-6, 113–114	23.43	F					T													R	
3H-6, 148–150	23.78	F																		R	
4H-1, 56–58	24.86																				
4H-1, 112–113	25.42	R																		R	
4H-2, 28–29	26.08	R					R													T	
4H-2, 113–114	26.93																			R	
4H-3, 31–32	27.30																			R	
4H-3, 114–115	28.13																			R	
4H-4, 29–30	29.09																			R	
4H-4, 113–114	29.93	F																		R	
4H-5, 28–29	30.58	F																		R	
4H-5, 55–57	30.85																				
4H-5, 148–150	31.78																				
4H-6, 28–29	32.08										T						T			T	
4H-6, 87–89	32.67										T										
4H-6, 114–115	32.94						T				T									T	
4H-7, 32–34	33.62										T										
5H-1, 28–29	34.08	T									T						T			T	
5H-1, 118–120	34.98										T						R			T	
5H-2, 28–29	35.58										T						T			T	
5H-2, 86–88	36.16																				
5H-2, 114–115	36.44																			T	
5H-3, 28–29	37.08										R									T	
5H-3, 56–58	37.36																				
5H-3, 114–115	37.94																			T	
5H-3, 145–147	38.25																				
5H-4, 27–28	38.57																			T	
5H-4, 86–88	39.16																				
5H-4, 114–115	39.44																			R	
5H-5, 28–29	40.08						T														
5H-5, 114–115	40.94						T													R	
5H-6, 28–29	41.58																			R	
5H-6, 114–115	42.44																			R	
5H-7, 17–19	42.97																				
6H-1, 28–29	43.58							T												T	T
6H-1, 114–115	44.44	T					T													T	
6H-2, 28–29	45.08							R												R	R
6H-2, 114–115	45.94							R												R	R
6H-3, 28–29	46.58							R												F	
6H-3, 114–115	47.44	R					F													R	
6H-4, 28–29	48.08							R												F	
6H-4, 114–115	48.94	F		F																T	
6H-5, 28–29	49.58	R																		R	
6H-5, 114–115	50.44			F			T													R	
6H-6, 28–29	51.08			F																R	
6H-6, 114–115	51.94			R																T	
6H-7, 28–29	52.58			F			R													T	
7H-1, 28–29	53.18	T					R	F												T	
7H-1, 115–116	54.05						T													T	
7H-2, 28–30	54.68																			T	
7H-2, 65–67	55.05																				
7H-2, 115–116	55.55	R			F			R										F		R	
7H-2, 144–146	55.84																	R			
7H-3, 28–29	56.18						T	R												T	
7H-3, 86–88	56.76						T	R												T	
7H-3, 115–116	57.05				R		T	R										T			
7H-3, 145–147	57.35				R		T											T			
7H-4, 28–29	57.68				T			F										T			
7H-4, 86–88	58.26						T														
7H-4, 115–116	58.55				T			F										R			
7H-5, 28–29	59.18				R		T	F										R		T	
7H-5, 55–57	59.45				T			F										F			
7H-5, 86–88	59.76							F										F			
7H-5, 115–116	60.05				T			F					R					F			
7H-6, 28–29	60.68				F			F					F					A		R	
7H-6, 115–116	61.55	R			F								F					F			
7H-7, 28–29	62.18				R								F					C		R	

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: D = dominant, A = abundant, C = common, F = few, R = rare, T = trace, X = present.

Table T3. Stratigraphic occurrence and relative abundance of selected Miocene diatom species, Hole 689B. (Continued on next 5 pages.)

Zone (Southern Southern Ocean Diatom Zonation)	Core, section, interval (cm)	Depth (mbsf)	Preservation	*Actinocyclus fasciculatus*	*Actinocyclus ingens*	*Actinocyclus ingens* var. *nodus*	*Actinocyclus ingens* var. *ovalis*	*Actinocyclus karstenii*	*Actinoptychus senarius*	*Asteromphalus hookeri*	*Asteromphalus inaequabilis*	*Asteromphalus kennettii*	*Asteromphalus oligocenicus*	*Azpeitia tabularis*	*Cavitatus jouseanus*	*Cavitatus miocenica*	*Chaetoceros* spp.	*Corethron criophilum*	*Coscinodiscus lewisianus*	*Coscinodiscus marginatus*	*Coscinodiscus rhombicus*	*Crucidenticula kanayae*	*Crucidenticula nicobarica*	*Dactyliosolen antarctica*	*Denticulopsis crassa*	*Denticulopsis dimorpha*	*Denticulopsis maccollumii*	*Denticulopsis ovata*
T. inura	113-689B- 2H-5, 27–28	11.57	G											R				T		C								
	2H-5, 55–57	11.85	G		F															A								
	2H-5, 87–89	12.17	M		F															A								
	2H-5, 114–115	12.44	G											R						F								
	2H-6, 29–30	13.09	G					R						R				T		C								R
	2H-6, 114–116	13.94	G		R		R	R												F								
	2H-7, 18–20	14.48	M		R					T										F								
	3H-1, 28–29	15.08	G		R		T							R				R		F						T		R
H. triangularus–	3H-1, 56–58	15.36	G		R															C								R
F. aurica	3H-1, 114–116	15.94	G		T									R			T			C						T		R
	3H-1, 143–145	16.23	M		T									R						F								
	3H-2, 29–30	16.59	G		T									R			T			F								R
	3H-2, 56–58	16.87	M				T							R						F								
	3H-2, 114–115	17.44	G	R	R			R		T				R						F								T
	3H-3, 58–59	18.38	M	T	F			R						R			T			F						R		R
	3H-3, 118–120	18.98	M		R		T	R				T		R				T		F						R		R
	3H-3, 148–150	19.28	M		F									F						F						R		R
	3H-4, 56–58	19.86	M		F		R	T				R		R			T			F					F	R		F
	3H-4, 94–96	20.24	M		F		R	R				T		R						R					T	R		F
F. arcula	3H-5, 28–29	21.08	G		F		T	T				T		R			R			T					R	R		F
	3H-5, 80–82	21.60	M		R							R		F												R		C
	3H-5, 114–115	21.94	M	T	F		T	T				T		F						R					R			C
	3H-6, 28–29	22.58	M		R			T				T		F			T			F					R	R		F
	3H-6, 55–57	22.85	G		R							R		C						F					T	R		F
	3H-6, 113–114	23.43	G		F							R		C			R			F					R	T		F
	3H-6, 148–150	23.78	M		A							R		C						F								F
A. kennettii–	4H-1, 56–58	24.86	M		A			R						C						R								R
F. praecurta	4H-1, 112–113	25.42	G		A							R		F						F								R
	4H-2, 28–29	26.08	G		A			R				R		F			T			R								F
	4H-2, 113–114	26.93	G		A							R		F						F					T	R		F
	4H-3, 31–32	27.30	M		A							T		F			T			F					T	R		F
	4H-3, 114–115	28.13	M		A							R		F						F					R	T		F
	4H-4, 29–30	29.09	M		C									F			T			F						R		F
	4H-4, 113–114	29.93	M		C									F			R			F					T	R		F
	4H-5, 28–29	30.58	G		F									R			T			F						R		F
	4H-5, 55–57	30.85	G		R									R						C						R		C
	4H-5, 148–150	31.78	M		T									R						F						F		A
	4H-6, 28–29	32.08	G		T			T		T				R						F						F		D
	4H-6, 87–89	32.67	M											R						F						F		D
	4H-6, 114–115	32.94	G		T			T						R						F						F		D
F. praecurta	4H-7, 32–34	33.62	M											R						R						F		D
	5H-1, 28–29	34.08	M		R			T						R			T			R						R		D
	5H-1, 118–120	34.98	G		T									R						R						F		D
	5H-2, 28–29	35.58	M		T									R						R						F		D
	5H-2, 86–88	36.16	M																	R						F		D
	5H-2, 114–115	36.44	G					T						R						R						F		D
	5H-3, 28–29	37.08	M		T			T						R						R						C		D
	5H-3, 56–58	37.36	M		T									R						T						F		D
	5H-3, 114–115	37.94	G		T			R						T						R						R		D

Table T3 (continued).

Zone (Southern Southern Ocean Diatom Zonation)	Core, section, interval (cm)	*Denticulopsis praedimorpha*	*Denticulopsis simonsenii*	*Ethmodiscus* spp.	*Eucampia antarctica*	*Fragilaria* sp.	*Fragilariopsis arcula*	*Fragilariopsis aurica*	*Fragilariopsis barronii*	*Fragilariopsis cylindrica*	*Fragilariopsis claviceps*	*Fragilariopsis clementia*	*Fragilariopsis donahuensis*	*Fragilariopsis efferans*	*Fragilariopsis fossilis*	*Fragilariopsis maleinterpretaria*	*Fragilariopsis praecurta*	*Fragilariopsis praeinterfrigidaria*	*Fragilariopsis pseudokerguelensis*	*Fragilariopsis pusilla*	*Fragilariopsis reinholdii*	*Hemidiscus cuneiformis*	*Hemidiscus triangularus*	*Katathiraia aspera*	*Mediaria splendida*	*Navicula* spp.	*Neobrunia mirabilis*	*Nitzschia denticuloides*	*Nitzchia grossepuncata*	*Paralia sulcata*	*Pleurosigma directum*
T. inura	113-689B- 2H-5, 27–28			X			R	C	R						R		F	F													
	2H-5, 55–57							R									F	F													
	2H-5, 87–89						R	C							R		R	C													
	2H-5, 114–115		T		R		F	A				R					T	F								R					
	2H-6, 29–30						F	F							R		C	F													
	2H-6, 114–116						R	A									A	F													
	2H-7, 18–20						F	A									F	F													
	3H-1, 28–29			X	R		F	A					R		R		F				T				T						T
H. triangularus–	3H-1, 56–58						F	A					R				F														
F. aurica	3H-1, 114–116			X			F	C					T				F	T								T					
	3H-1, 143–145						F	A					T				F					R									
	3H-2, 29–30			X			F	C					T		T		C						T								
	3H-2, 56–58						F	C					T		R		C					R									
	3H-2, 114–115					T	F	R					R		F		C						R								
	3H-3, 58–59						C	F					R		R		F					R	F								
	3H-3, 118–120			X		T	C	F					R		T		F					T	F								
	3H-3, 148–150						C	F					R		R		F						R								
	3H-4, 56–58		C				F	R					R				R					T		T							
	3H-4, 94–96		C	X			C	F					R				F							T	T						
F. arcula	3H-5, 28–29		C	X			C	R		R			R		R		R							T			X				
	3H-5, 80–82		A				C						R		T		F														
	3H-5, 114–115		C				C	R					R		R		R							T	T						
	3H-6, 28–29		A					F			R		R		T									T	T						
	3H-6, 55–57		A								T																				
	3H-6, 113–114		F			R		F			R		F				R							T	R						
	3H-6, 148–150		F																												
A. kennettii–	4H-1, 56–58		C																												
F. praecurta	4H-1, 112–113		C								R						F														
	4H-2, 28–29		C	X							R						R														
	4H-2, 113–114		F					R					R											T							
	4H-3, 31–32		F					R			R		R				R														
	4H-3, 114–115		C					R			T		T				T							T							
	4H-4, 29–30		A					R			T		F				R														
	4H-4, 113–114		A					R			R		R	T			R														
	4H-5, 28–29		A					R					F				F							R							
	4H-5, 55–57		A														F							T							
	4H-5, 148–150		F								T		R				T														
	4H-6, 28–29		F														T							T							
	4H-6, 87–89		F														R							T							
	4H-6, 114–115		F								T						R							T							
F. praecurta	4H-7, 32–34		F														R														
	5H-1, 28–29		F										T				T							T							
	5H-1, 118–120		F										T				T							T							
	5H-2, 28–29		R								T			T			R							T							
	5H-2, 86–88		R														R														
	5H-2, 114–115	T	R														R														
	5H-3, 28–29		F	X							R						T							T							
	5H-3, 56–58		R																												
	5H-3, 114–115		T											T			R														

Table T3 (continued).

Zone (Southern Southern Ocean Diatom Zonation)	Core, section, interval (cm)	*Proboscia barboi*	*Raphidodiscus marylandicus*	*Rhizosolenia antennata*	*Rhizosolenia hebetata*	*Rouxia isopolica*	*Rouxia naviculoides*	*Rouxia peragalli*	*Rouxia* sp. 1	*Rouxia* sp. 2	*Rocella gelida*	*Thalassionema nitzschioides*	*Thalassionema nitzschioides* var. *capitulatum*	*Thalassionema nitzschioides* var. *parvum*	*Thalassiosira convexa* var. *aspinosa*	*Thalassiosira yabei*	*Thalassiosira inura*	*Thalassiosira fraga*	*Thalassiosira miocenica*	*Thalassiosira oestrupii*	*Thalassiosira oliverana* var. *sparsa*	*Thalassiosira praelineata*	*Thalassiosira spinosa*	*Thalassiosira torokina*	*Thalassiothrix longissima*	*Thalassiothrix miocenica*
	113-689B-																									
T. inura	2H-5, 27–28	F			F	R	F	R				R					F			R					R	
	2H-5, 55–57	C			R	R	C					R								R						
	2H-5, 87–89	F			R	R	C					R														
	2H-5, 114–115	R		R	R	F	F	R				R								R					R	
	2H-6, 29–30	F			T	R	F	R				R								R					R	
	2H-6, 114–116	R		T	T	R	R	R				R										R		T	T	
	2H-7, 18–20	R			R	R	T					F								T				T	T	
	3H-1, 28–29	R		R	F	F	F	R				R								T	R			T	R	R
H. triangularus–	3H-1, 56–58	F		T	F	F	F	R													T				R	
F. aurica	3H-1, 114–116	F		R	F	R	F	R				T		R	R					R	T			T	R	
	3H-1, 143–145			R	R		F	T													T			R	R	
	3H-2, 29–30	F		T	F	T	F	R							F						T			R	R	
	3H-2, 56–58	F			T		F	T							F						T			R	R	
	3H-2, 114–115	F		R		R	F	R						R	F						R			R	T	
	3H-3, 58–59	F		T	F	F	R								F						F			R	R	R
	3H-3, 118–120	R		R	F	F	F												R		F	R		T	R	T
	3H-3, 148–150				F		F												F		F				F	R
	3H-4, 56–58			R	F	R	T												F		F			T	R	F
	3H-4, 94–96			R	F	R													R		F			R	R	R
F. arcula	3H-5, 28–29			R	F	R	R														R	R		R	R	F
	3H-5, 80–82				F																				F	
	3H-5, 114–115	T			F	R	R																		R	
	3H-6, 28–29	T		R	F	F	R					R										T			R	
	3H-6, 55–57			T	R		T					T														
	3H-6, 113–114			R	F	F	F					T													R	
	3H-6, 148–150			R			F																		R	
A. kennettii–	4H-1, 56–58				R	R																				
F. praecurta	4H-1, 112–113	R		R	R	T	R																		R	
	4H-2, 28–29			F	T	R	R					R													T	
	4H-2, 113–114	R		R	R	R																			R	
	4H-3, 31–32	T		R	F	R																			R	
	4H-3, 114–115			R	R	R																			R	
	4H-4, 29–30	T		R	F	R																			R	
	4H-4, 113–114	T		R	F	F	F																		R	
	4H-5, 28–29			R	F	F	F																		R	
	4H-5, 55–57			R	R	R																				
	4H-5, 148–150			R	T																					
	4H-6, 28–29	T		T	T	T										T						T			T	
	4H-6, 87–89			T	T											T										
	4H-6, 114–115	T		T	R							T				T									T	
F. praecurta	4H-7, 32–34			T	R											T										
	5H-1, 28–29	T		T	T		T									T						T			T	
	5H-1, 118–120	R		T	T											T						R			T	
	5H-2, 28–29	T		T	R											T						T			T	
	5H-2, 86–88	T		T	R																					
	5H-2, 114–115			R	R																				T	
	5H-3, 28–29				R											R									T	
	5H-3, 56–58																									
	5H-3, 114–115	T		T																					T	

Table T3 (continued).

Zone (Southern Southern Ocean Diatom Zonation)	Core, section, interval (cm)	Depth (mbsf)	Preservation	*Actinocyclus fasciculatus*	*Actinocyclus ingens*	*Actinocyclus ingens* var. *nodus*	*Actinocyclus ingens* var. *ovalis*	*Actinocyclus karstenii*	*Actinoptychus senarius*	*Asteromphalus hookeri*	*Asteromphalus inaequabilis*	*Asteromphalus kennettii*	*Asteromphalus oligocenicus*	*Azpeitia tabularis*	*Cavitatus jouseanus*	*Cavitatus miocenica*	*Chaetoceros* spp.	*Corethron criophilum*	*Coscinodiscus lewisianus*	*Coscinodiscus marginatus*	*Coscinodiscus rhombicus*	*Crucidenticula kanayae*	*Crucidenticula nicobarica*	*Dactyliosolen antarctica*	*Denticulopsis crassa*	*Denticulopsis dimorpha*	*Denticulopsis maccollumii*	*Denticulopsis ovata*
	5H-3, 145–147	38.25	M		R									T						R						R		D
	5H-4, 27–28	38.57	G		R			T						T						R						F		D
D. dimorpha–	5H-4, 86–88	39.16	M											R						R						C		D
D. ovata	5H-4, 114–115	39.44	G		T									R						R						C		D
	5H-5, 28–29	40.08	M		R									R			T			T						A		A
	5H-5, 114–115	40.94	M		R			T						R						R						A		F
	5H-6, 28–29	41.58	P		F									T			T			R						C		C
	5H-6, 114–115	42.44	G		R									R						R						A		F
D. ovata–	5H-7, 17–19	42.97	M		F									R												C		F
N.denticuloides	6H-1, 28–29	43.58	G		R									R			T			R						F		R
	6H-1, 114–115	44.44	G		R									R			T			R						R		
	6H-2, 28–29	45.08	M		F	F								R						F						F		
D. dimorpha	6H-2, 114–115	45.94	M	R	A	F								F			T			F						R		
	6H-3, 28–29	46.58	P		C	F								F			R			F				C		T		
	6H-3, 114–115	47.44	G		A	F								F			T	T		F				F				
D. praedimorpha	6H-4, 28–29	48.08	P		A	R								R			R			F				R				
	6H-4, 114–115	48.94	M		C	F								F						R				T				
N. denticuloides	6H-5, 28–29	49.58	M		D	C								F										T				
	6H-5, 114–115	50.44	G		C	C								F			T			R				F				
	6H-6, 28–29	51.08	P		A	C								F						F				R				
D. simonsenii–	6H-6, 114–115	51.94	M		A	C								R						R				R				
N. grossepunctata	6H-7, 28–29	52.58	M	T	A	C								F			T			F				R				
	7H-1, 28–29	53.18	G		A	C								F						R				R				
	7H-1, 115–116	54.05	P	R	D	C								R						R				R			F	
A. ingens var. *nodus*	7H-2, 28–30	54.68	G		D	F					T									R							R	
	7H-2, 65–67	55.05	M		C	A														R							C	
	7H-2, 115–116	55.55	M		R								R	R	R		R			F				C			A	
	7H-2, 144–146	55.84	P						R											F							D	
	7H-3, 28–29	56.18	G		R				T		T			T	R					R							D	
N. grossepunctata	7H-3, 86–88	56.76	M		T															R							D	
	7H-3, 115–116	57.05	G		T									R	F				T	R					T		D	
	7H-3, 145–147	57.35	M											R													D	
	7H-4, 28–29	57.68	G						T					R	F		T	T	T	R		T					D	
A. ingens–	7H-4, 86–88	58.26	M		T								R	F						R		R					D	
D. maccollumii	7H-4, 115–116	58.55	M		R									R	R				T	R		R					D	
C. kanayae	7H-5, 28–29	59.18	M						T		T		R		R					R		R			T			
	7H-5, 55–57	59.45	M										T							F								
	7H-5, 86–88	59.76	P						R					R						F								
?	7H-5, 115–116	60.05	M						F				R		R				T	F								
	7H-6, 28–29	60.68	G						F				R	F	F				R	F								
	7H-6, 115–116	61.55	M						T				T	F	F				T	F								
	7H-7, 28–29	62.18	M										R	F	F					R								

Table T3 (continued).

Zone (Southern Southern Ocean Diatom Zonation)	Core, section, interval (cm)	*Denticulopsis praedimorpha*	*Denticulopsis simonsenii*	*Ethmodiscus* spp.	*Eucampia antarctica*	*Fragilaria* sp.	*Fragilariopsis arcula*	*Fragilariopsis aurica*	*Fragilariopsis barronii*	*Fragilariopsis cylindrica*	*Fragilariopsis claviceps*	*Fragilariopsis clementia*	*Fragilariopsis donahuensis*	*Fragilariopsis efferans*	*Fragilariopsis fossilis*	*Fragilariopsis maleinterpretaria*	*Fragilariopsis praecurta*	*Fragilariopsis praeinterfrigidaria*	*Fragilariopsis pseudokerguelensis*	*Fragilariopsis pusilla*	*Fragilariopsis reinholdii*	*Hemidiscus cuneiformis*	*Hemidiscus triangularus*	*Katathiraia aspera*	*Mediaria splendida*	*Navicula* spp.	*Neobrunia mirabilis*	*Nitzschia denticuloides*	*Nitzchia grossepuncata*	*Paralia sulcata*	*Pleurosigma directum*
	5H-3, 145–147		T																												
	5H-4, 27–28		R		T						T													T							
D. dimorpha–	5H-4, 86–88		R																												
D. ovata	5H-4, 114–115	R	R	X							R																				
	5H-5, 28–29	C	F			T								R																	
	5H-5, 114–115	A	R																												
	5H-6, 28–29	A	R										R																		
	5H-6, 114–115	A	R																									F			
D. ovata–	5H-7, 17–19	D	T																												
N.denticuloides	6H-1, 28–29	D	T			T							R	R														F			
	6H-1, 114–115	D	R										R	R														R			
	6H-2, 28–29	A	F											R														F			
D. dimorpha	6H-2, 114–115	C	F	X							T																	F			
	6H-3, 28–29	C	F	X																								F			
	6H-3, 114–115	R	F	X									F	R														F			
D. praedimorpha	6H-4, 28–29	R	C										R															C	R		
	6H-4, 114–115		F										R													T		C	R		
N. denticuloides	6H-5, 28–29		R											T														F	R		
	6H-5, 114–115		C										F	R					T						R			F	F		
	6H-6, 28–29		F										T						R										F		
D. simonsenii–	6H-6, 114–115		F																										F		
N. grossepunctata	6H-7, 28–29		F		T								R																F		
	7H-1, 28–29																		R										R	T	
	7H-1, 115–116																														
A. ingens var. *nodus*	7H-2, 28–30																									T					
	7H-2, 65–67																														
	7H-2, 115–116																									R					
	7H-2, 144–146																												R		
	7H-3, 28–29															T										T			F		
N. grossepunctata	7H-3, 86–88															T										T					
	7H-3, 115–116															T										T			R		
	7H-3, 145–147																												R		
	7H-4, 28–29																			R						R					
A. ingens–	7H-4, 86–88																														
D. maccollumii	7H-4, 115–116															F															
C. kanayae	7H-5, 28–29			X												D				R						T					
	7H-5, 55–57															D				F											
	7H-5, 86–88															D				F											
?	7H-5, 115–116			X												D				F											
	7H-6, 28–29			X																F							R				
	7H-6, 115–116			X												D				R											
	7H-7, 28–29			X												A				F						R					

Table T3 (continued).

Zone (Southern Southern Ocean Diatom Zonation)	Core, section, interval (cm)	*Proboscia barboi*	*Raphidodiscus marylandicus*	*Rhizosolenia antennata*	*Rhizosolenia hebetata*	*Rouxia isopolica*	*Rouxia naviculoides*	*Rouxia peragalli*	*Rouxia* sp. 1	*Rouxia* sp. 2	*Rocella gelida*	*Thalassionema nitzschioides*	*Thalassionema nitzschioides* var. *capitulatum*	*Thalassionema nitzschioides* var. *parvum*	*Thalassiosira convexa* var. *aspinosa*	*Thalassiosira yabei*	*Thalassiosira inura*	*Thalassiosira fraga*	*Thalassiosira miocenica*	*Thalassiosira oestrupii*	*Thalassiosira oliverana* var. *sparsa*	*Thalassiosira praelineata*	*Thalassiosira spinosa*	*Thalassiosira torokina*	*Thalassiothrix longissima*	*Thalassiothrix miocenica*
	5H-3, 145–147																									
	5H-4, 27–28	T			T																				T	
D. dimorpha–	5H-4, 86–88																									
D. ovata	5H-4, 114–115			T	T																				R	
	5H-5, 28–29			T	R							T														
	5H-5, 114–115	R		R	R							T													R	
	5H-6, 28–29	R		R	R																				R	
	5H-6, 114–115	T			R	R																			R	
D. ovata–	5H-7, 17–19	T			R																					
N.denticuloides	6H-1, 28–29	T		T	T								T												T	T
	6H-1, 114–115	T		T	T	T	T					T													T	
	6H-2, 28–29			R	F	R							R												R	R
D. dimorpha	6H-2, 114–115	R		R	F								R												R	R
	6H-3, 28–29	R			R								R												F	
	6H-3, 114–115	R			R	R	R					F													R	
D. praedimorpha	6H-4, 28–29				R								R												F	
	6H-4, 114–115	T			R		F		F																T	
N. denticuloides	6H-5, 28–29				T		R																		R	
	6H-5, 114–115	R			F				F			T													R	
	6H-6, 28–29				R	T			F																R	
D. simonsenii–	6H-6, 114–115	R			T				R																T	
N. grossepunctata	6H-7, 28–29	R			R	R			F			R													T	
	7H-1, 28–29	R			T	F	T					R	F												T	
	7H-1, 115–116	T										T													T	
A. ingens var. *nodus*	7H-2, 28–30																								T	
	7H-2, 65–67	R			R																					
	7H-2, 115–116	R					R			F			R										F		R	
	7H-2, 144–146	R																					R			
	7H-3, 28–29	R			T	R						T	R												T	
N. grossepunctata	7H-3, 86–88											T	R												T	
	7H-3, 115–116	R			T					R		T	R										T			
	7H-3, 145–147	R								R		T											T			
	7H-4, 28–29	R								T			F										T			
A. ingens–	7H-4, 86–88											T														
D. maccollumii	7H-4, 115–116		F		T					T			F										R			
C. kanayae	7H-5, 28–29				T					R		T	F										R		T	
	7H-5, 55–57				T					T			F										F			
	7H-5, 86–88				R								F										F			
?	7H-5, 115–116				T					T			F					R					F			
	7H-6, 28–29	R			R					F			F					F					A		R	
	7H-6, 115–116	T			R		R			F								F					F			
	7H-7, 28–29	R			R					R								F					C		R	