

Appendix 2. Geographic occurrences of species. Superscripts 1 and 2 indicate calcareous species used in cluster analyses 1 and 2, respectively. Asterisks indicate agglutinated species conspicuous in at least one sample (<5% of the agglutinated assemblage). Species found exclusively on tubeworms (and not in sediments) in each area are indicated by "T." Census data includes the total number of individuals of each species and the number in parentheses is the number of rose-Bengal-stained individuals.

Location	Green Canyon shallow	Green Canyon deep	Garden Banks	South of Mississippi Canyon	Mississippi Canyon	De Soto Canyon	Alaminos Canyon	Farnella Canyon
Water depth	245 m	562 to 696 m	640 m	1076 m	620 m, 1067 to 1081 m	1850 m	2218 to 2227 m	2918 m
AGGLUTINATED								
<i>Adercotryma glomeratum</i>	6			4	4	48 (6)	17	
<i>Ammobaculites catenulatus</i>	12							
<i>Ammobaculites filiformis</i>				2		1	26	
<i>Ammodiscus tenuis</i> *	1	8		4	3	15	182 (5)	
<i>Ammolagena clavata</i>	1	8	1	3		4	6	2
<i>Ammoscalaria tenuimargo</i>							T	
<i>Archimerismus subnodosus</i>	1	2	1			1	10 (1)	4
<i>Barbourinella atlantica</i>	9							
<i>Buzasina ringens</i>						8	1	
<i>Cribrostomoides subglobosus</i>		1		3	1		6	
<i>Cystamina pauciloculata</i>		1					6 (1)	2
<i>Deuteramina rotaliformis</i>		T			T			
<i>Discamina compressa</i> *	1	9	1				1	
<i>Dorothia scabra</i>						1 (1)	9	
<i>Eggerella bradyi</i>		18	1	1	4	2	9	3
<i>Gaudryina minuta</i> *	6	22 (1)	4	1 (1)	6	3 (3)		
<i>Glomospira gordialis</i>		1					1	
<i>Glomospira irregularis</i>		3		1	1	3	27	
<i>Haplophragmoides</i> sp. cf. <i>H. kirki</i> *	1	18						
<i>Hormosina pilulifera</i>		6		2	1	1		
<i>Hormosinella distans</i>		2	1	2		1		
<i>Hormosinella guttifera</i> *		12	2	2	3			
<i>Hyperamina friabilis</i> *		32					3	
<i>Hyperamina laevigata</i> *		106	3	1 (1)	11	1		
<i>Hyperamina</i> sp.*	7 (7)	224	2	128	3243	179	1127 (22)	18
<i>Karrerella bradyi</i>		8		8		4 (1)		
<i>Karrerulina apicularis</i>	1	3				2	3 (1)	
<i>Lagenamina difflugiformis</i> *	47	26	1	4 (4)	32	1 (1)		
<i>Lagenamina laguncula</i>		3						
<i>Lagenamina tubulata</i> *	1 (1)	37	8		4	4 (4)	10	
<i>Lituotuba lituiformis</i>				7		5	1	
<i>Martinottiella communis</i> *	5	8	2				1	12
<i>Multifidella nodulosa</i>	6							
<i>Orectostomina camposi</i>	1							
<i>Paratrochammina challengeri</i>						1	1	
<i>Parvigerina arenacea</i>	1	1						
<i>Portatrochammina antarctica</i> *	9 (9)	124	8	40 (2)	61 (1)	8	340 (35)	3
<i>Prolixoplecta parvula</i> *		286	7		170 (2)	17	12	
<i>Psamosphaera fusca</i> *		28			2			
<i>Pseudoclavulina mexicana</i>	21	1						
<i>Pseudoclavulina serventyi</i> *	3							
<i>Pseudogaudryina atlantica</i> *	23							
<i>Pseudotrochammina</i> sp.	1	1						
<i>Reophax agglutinatus</i>						3	1 (1)	
<i>Reophax scorpurus</i> *	6	7 (1)	1			4 (3)	1 (1)	
<i>Rhabdammina abyssorum</i>							18	
<i>Rhabdammina discreta</i>		7					5	
<i>Rhizammina algaeformis</i> *		11	3	30		48	101 (6)	4
<i>Rhizammina indivisa</i> *		1	5	5 (5)	3			
<i>Saccamina helenae</i>							3	
<i>Saccorhiza ramosa</i> *	4	14	2	18 (4)	2	146 (13)	1305 (55)	51 (6)
<i>Siphotextularia rolshauseni</i>						2	1	1 (1)
<i>Spiroplectammina</i> sp.	2	6	2			2 (2)	2	
<i>Subreophax monile</i>		12			1			
<i>Tetrataxiella</i> sp.*	16							
<i>Textularia foliacea occidentalis</i>	7							
<i>Textularia</i> sp. cf. <i>T. mayori</i>	2							
<i>Textularia mexicana</i>	2						1	
<i>Textulariella barrettii</i>	1							
<i>Trochaminoides coronatus</i> *	3	32		32	98	125 (4)	91 (2)	
<i>Usbekistania charoides</i> *	4	9	4	12	12	83 (4)	94	1
<i>Veleroninoides jeffreysii</i>					T			
<i>Veleroninoides wiesneri</i>	11	11	12	1	6	6	9	
PORCELANEOUS								
<i>Calcituba polymorpha</i>		T						
<i>Cornuspira foliacea</i>							T	
<i>Cornuspira involvens</i> ^{1,2}		31 (6)		2 (1)			205 (199)	

Location	Green Canyon shallow	Green Canyon deep	Garden Banks	South of Mississippi Canyon	Mississippi Canyon	De Soto Canyon	Alaminos Canyon	Farnella Canyon
Water depth	245 m	562 to 696 m	640 m	1076 m	620 m, 1067 to 1081 m	1850 m	2218 to 2227 m	2918 m
<i>Cribromiliolinella subvalvularis</i> ^{1,2}		90 (21)			17 (2)		1	
<i>Miliolinella subrotunda</i> ^{1,2}	6	12						
<i>Miliolinella warreni</i>	1							
<i>Planispirinoides bucculentus</i> var. <i>placentiformis</i> ^{1,2}		5 (3)						
<i>Pyrgo lucernula</i>		3				7	2	3
<i>Pyrgo murrhina</i>		1		1 (1)		7	1	
<i>Pyrgo nasuta</i>	6	2						
? <i>Pyrgo</i> sp.							1	
<i>Quinqueloculina boschiana</i>	1							
<i>Sigmoilinita elliptica</i> ^{1,2}	26	3 (1)		2	1			
<i>Sigmoilopsis schlumbergeri</i> ^{1,2}	8	13	1	1				3
<i>Triloculina tricarinata</i>	5	2			2		5	4
HYALINE								
<i>Abditodentrix pseudothalmanni</i> ^{1,2}		4	1	3	9		1	
<i>Amphicoryna hirsuta</i>	9	11	2					
<i>Anomalinoides globulosus</i>		T	1					
<i>Anomalinoides mexicanus</i>	1	2						
<i>Bolivina alata</i>		9	6		2			
<i>Bolivina albatrossi</i> ^{1,2}	29	129 (4)	47	10	121 (3)	3	3	4
<i>Bolivina barbata</i> ^{1,2}	26	1						
<i>Bolivina daggarius</i>	3							
<i>Bolivina goesii</i>	1							
<i>Bolivina</i> sp. cf. <i>B. hastata</i>	8	2						
<i>Bolivina lowmani</i> ^{1,2}	15	191	12	37	133 (4)	186	590	4
<i>Bolivina minima</i> ²	17		1	1				
<i>Bolivina ordinaria</i> ^{1,2}	70	442 (2)	48	13	165	5		
<i>Bolivina</i> sp. cf. <i>B. pusilla</i>						3	9	
<i>Bolivina subaenariensis</i> ^{1,2}	66	40			4			
<i>Bolivina translucens</i> ^{1,2}	2	61	11	1	43 (2)	3		
<i>Bolivinita quadrilatera</i>								1
<i>Bulimina aculeata</i> ^{1,2}	3	159 (3)	17	12	131 (1)	47 (1)	3	
<i>Bulimina alazanensis</i> ^{1,2}		42 (7)	35	10	68 (1)	1		
<i>Bulimina marginata</i> ^{1,2}	64	17	1					
<i>Bulimina mexicana</i> ^{1,2}	31	54	17	4	43 (1)	5	16	12
<i>Cassidulina carinata</i> ^{1,2}	8	232 (1)	21	2	192 (4)		15	1
<i>Cassidulina curvata</i> ^{1,2}	34	21	5		1			
<i>Cassidulina obtusa</i> ^{1,2}	44	53	4	3	11	1	10	1
<i>Cassidulinoides tenuis</i>	3	3			2			
<i>Chilostomella oolina</i>		3	1		3 (1)			2
<i>Cibicides lobatulus</i>							1	
<i>Cibicides wuellerstorffi</i> ^{1,2}						7	17 (3)	61
<i>Cibicoides pachyderma</i> ^{1,2}	14	23	5	6	15		3	1
<i>Cibicoides robertsonianus</i>	1	15 (1)	7			1	3	
<i>Dentalina</i> sp.	1		3					
<i>Epistominella exigua</i> ^{1,2}	6	139 (5)	67	22	138 (8)	37 (3)	52 (2)	2
<i>Epistominella vitrea</i> ^{1,2}	2	8	6		6		4	
<i>Eponides turgidus</i> ^{1,2}	7	157 (8)	34	61	173 (5)	369 (5)	1310 (61)	26
<i>Eubuliminella morgani</i>					2		1	
<i>Fissurina fissa</i>							4	
<i>Fissurina</i> sp. cf. <i>F. incomposita</i>		3			1			
<i>Fursenkoina seminuda</i> ^{1,2}		12	7		40 (2)	3	4	
<i>Gavelinopsis translucens</i> ^{1,2}	7	330 (3)	23	13	60 (1)			2
<i>Globocassidulina subglobosa</i> ^{1,2}	81	171 (2)	52	27	43	37	209 (2)	3
<i>Gyroidina bradyi</i> ^{1,2}	9	80 (1)	30	28	11	21 (1)	29	5
<i>Gyroidina orbicularis</i> (sensu lato) ^{1,2}	7	27 (1)	4	5	7	10	62 (2)	2
<i>Gyroidinoides</i> sp. cf. <i>G. polius</i> ^{1,2}	1	4		4	3		19 (1)	2
<i>Gyroidinoides</i> sp. cf. <i>G. regularis</i> ^{1,2}	8	56	11	3	14	7	9 (1)	
<i>Haynesina germanica</i>		2			1			
<i>Heronallenia</i> sp.					2		6	
<i>Hoeglundina elegans</i> ^{1,2}	18	6 (2)		2		3 (1)	38 (4)	35
<i>Ioanella tumidula</i> ^{1,2}		2				4	14	12
<i>Lagena chrysalis</i>							1	
<i>Lagena hispida</i>		1					3	
<i>Lagena hispidula</i>		2			1		3	
<i>Laminononion tumidum</i>		1			T			
<i>Laticarinina pauperata</i>		2	1		3	5	4 (1)	1
<i>Lenticulina calcar</i> ^{1,2}	20	1	2					
<i>Lenticulina gibba</i>	1	1						
<i>Lenticulina pliacaena</i>	2	4	1	1				
<i>Lenticulina thalmani</i>	9	2					1	
<i>Melonis affinis</i>	3		1					
<i>Melonis pompilioides</i>							3	1
<i>Neoconorbina terquemii</i>		2		1			3	
<i>Neocrosbyia minuta</i>	7	12	5				6	

Location	Green Canyon shallow	Green Canyon deep	Garden Banks	South of Mississippi Canyon	Mississippi Canyon	De Soto Canyon	Alaminos Canyon	Farnella Canyon
Water depth	245 m	562 to 696 m	640 m	1076 m	620 m, 1067 to 1081 m	1850 m	2218 to 2227 m	2918 m
<i>Nonionella iridea</i> ^{1,2}		9	1	77	84	46		
<i>Nuttallides decorata</i> ^{1,2}						138 (1)	1332 (56)	39
<i>Oolina apiopleura</i>							1	
<i>Oolina globosa</i> ^{1,2}		21 (2)			2		3	
<i>Oolina ovum</i>	1	2			1		1	
<i>Oolina squamosa</i>	1							
<i>Oridorsalis umbonatus</i> ^{1,2}	5	27	4	5	5	11 (1)	68 (4)	47
<i>Osangularia culter</i> ^{1,2}		23	6	4	61 (3)	8	18	
<i>Osangularia rugosa</i> ^{1,2}	3	126 (1)	7	12	39 (2)	2	25	3
<i>Parafissurina botelliformis</i>	2	3		1			4	
<i>Parafissurina kerguelenensis</i>							3	3
<i>Parafissurina lateralis</i>		3					4	
<i>Patellina corrugata</i> ^{1,2}		1			3		9	2
<i>Planulina ariminensis</i>		14 (1)	5					
<i>Planulina foveolata</i>	18							
<i>Plectofrondicularia advena</i>			3		8			
<i>Praeglobobulimina ovata</i> ^{1,2}	2	1			16		13	102
<i>Praeglobobulimina ovula</i>	2	1						
<i>Procerolagena gracilis</i> ^{1,2}		37			9		2	
<i>Procerolagena gracillima</i>		4			1		1	
<i>Pseudoglandulina comatula</i>	3							
<i>Pullenia bulloides</i>	8	8	3			2	1	
<i>Pullenia quinqueloba</i> ^{1,2}	10	19 (1)	2	9	22	5	54 (1)	
<i>Robertina subcylindrica</i>							1	
<i>Robertinoides bradyi</i>		1		1			6	
<i>Rutherfordoides mexicanus</i> ^{1,2}	4	11	1	1	28			1
<i>Saracenaria altifrons</i>	1							
<i>Seabrookia earlandi</i> ^{1,2}	1	6	1	9	2	3	27 (1)	
<i>Siphonina pulchra</i> ^{1,2}	38 (1)	4	3					
<i>Siphonodosaria calomorpha</i>	1	2		3			4	
<i>Spirillina vivipara</i>					T	1 (1)		1
<i>Stainforthia complanata</i>	3	7	4	2	11	5	13 (1)	
<i>Stainforthia compressa</i>	2	2						
<i>Stainforthia pontoni</i>	3	4						
<i>Trifarina bradyi</i> ^{1,2}	2	34	8	1				
<i>Trifarina jamaicensis</i>		3			1			
<i>Uvigerina auberiana</i>	14	1	1					1
<i>Uvigerina bellula</i>	12							
<i>Uvigerina flintii</i> ^{1,2}	12							
<i>Uvigerina peregrina</i> ^{1,2}	28	68	49	17	140 (2)	17	10	6
<i>Vaginulinopsis subaculeata</i>	16	1	2					
<i>Valvulineria glabra</i>	17	15	6	4	11	2		
<i>Valvulineria mexicana</i> ^{1,2}		6	2				4	16
<i>Vasiglobulina reticulata</i>	2	1					1	

Appendix 3. Q-mode low-level clusters for surface-sample data: constituent samples, water depths, substrates, and important foraminiferal species (mean abundance >5% in low-level cluster).

Low-level cluster	Samples	Depth (m)	Substrate	Important species	%
A1	ACP04a	2227	White mud mound	<i>Eponides turgidus</i>	33
	ACP05a	2225	Mud	<i>Nuttallides decorata</i>	26
	ACB19a	2219	Non-seep gray mud	<i>Bolivina lowmani</i>	16
	DCB-S36	1848	Non-seep		
A2	ACB07a	2227	Gray bacterial mat	<i>Nuttallides decorata</i>	22
	ACP13a	2221	White bacterial mat	<i>Cibicides wuellerstorfi</i>	14
	FCP61a	2918	Tubeworm clump	<i>Praeglobbulimina ovata</i>	9
				<i>Hoeglundina elegans</i>	8
B1	MCP08a	1071	Gray bacterial mat	<i>Bolivina ordinaria</i>	19
	MCP73a	1070	Bacterial mat	<i>Cassidulina carinata</i>	12
	GCP12a	569	White bacterial mat	<i>Gavelinopsis translucens</i>	10
	GCP33a	664	White bacterial mat	<i>Epistominella exigua</i>	6
	GCP51a	696	Bacterial mat on mound with clams	<i>Bolivina albatrossi</i>	5
B2.1	MCP02a	1067	Mud from ridge top	<i>Eponides turgidus</i>	14
	MCP69a	1081	Bacterial mat	<i>Nonionella iridea</i>	10
	MCB-C7	1076	Non-seep	<i>Bolivina lowmani</i>	9
				<i>Bulimina aculeata</i>	7
				<i>Uvigerina peregrina</i>	7
				<i>Epistominella exigua</i>	6
B2.2	MCP04a	1072	Gray bacterial mat	<i>Bolivina ordinaria</i>	9
	GBP08a	640	Non-seep gray mud	<i>Bolivina lowmani</i>	7
	GCP15a	245	Non-seep gray mud	<i>Globocassidulina subglobosa</i>	6
	GCP55a	689	Non-seep mud	<i>Epistominella exigua</i>	
	GCP57a	675	Sand	<i>Bolivina albatrossi</i>	6
				<i>Cassidulina carinata</i>	5
B3	GCP54a	675	White bacterial mat	<i>Cribromiliolinella subvalvularis</i>	24
				<i>Miliolinella subrotunda</i>	8
				<i>Bulimina marginata</i>	8
				<i>Osangularia rugosa</i>	7
				<i>Cassidulina carinata</i>	6
				<i>Bolivina ordinaria</i>	6
				<i>Cornuspira involvens</i>	4
C (outlier)	ACP15a	2221	Orange bacterial mat	<i>Cornuspira involvens</i>	100

Appendix 4. Q-mode low-level clusters for combined surface- and near-surface-sample data: constituent samples, water depths, substrates, and important foraminiferal species (mean abundance >5% in low-level cluster).

Low-level cluster	Samples	Depth (m)	Substrate	Important species	%
X1.1	ACP05a	2225	Mud	<i>Eponides turgidus</i>	31
	ACP05b	2225	Mud	<i>Nuttallides decorata</i>	23
	ACB19a	2219	Non-seep gray mud	<i>Bolivina lowmani</i>	21
	DCB-S36	1848	Non-seep		
X1.2	ACP01b	2226	White mud mound	<i>Nuttallides decorata</i>	33
	ACP04a	2227	White mud mound	<i>Eponides turgidus</i>	24
	ACP04b	2227	White mud mound	<i>Hoeglundina elegans</i>	5
	ACP13a	2221	White bacterial mat	<i>Globocassidulina subglobosa</i>	5
	ACP13b	2221	White bacterial mat		
X2	ACB07a	2227	Gray bacterial mat	<i>Nuttallides decorata</i>	16
	ACP15b	2221	Orange bacterial mat	<i>Cornuspira involvens</i>	16
	FCP61a	2918	Tubeworm clump	<i>Cibicides wuellerstorfi</i>	14
				<i>Bolivina lowmani</i>	11
X3	ACP15a	2221	Orange bacterial mat	<i>Praeglobobulimina ovata</i>	8
				<i>Cornuspira involvens</i>	100
Y1.1	GCP12a	569	White bacterial mat	<i>Bolivina ordinaria</i>	23
	GCP12b	569	White bacterial mat	<i>Gavelinopsis translucens</i>	19
				<i>Cassidulina carinata</i>	10
Y1.2	MCP08a	1071	Gray bacterial mat	<i>Bolivina ordinaria</i>	21
	MCP08b	1071	Gray bacterial mat	<i>Cassidulina carinata</i>	20
	MCP73a	1070	Bacterial mat	<i>Epistominella exigua</i>	9
	MCP73b	1070	Bacterial mat	<i>Gavelinopsis translucens</i>	8
Y2.1	MCP02a	1067	Mud from ridge top	<i>Bolivina albatrossi</i>	7
	MCP02b	1067	Mud from ridge top	<i>Osangularia culter</i>	7
	MCP69a	1081	Bacterial mat	<i>Bulimina alazanensis</i>	6
	MCP69b	1081	Bacterial mat	<i>Osangularia rugosa</i>	6
	MCB-C7	1076	Non-seep	<i>Eponides turgidus</i>	13
				<i>Uvigerina peregrina</i>	9
				<i>Nonionella iridea</i>	8
				<i>Bolivina lowmani</i>	8
				<i>Bulimina aculeata</i>	8
				<i>Epistominella exigua</i>	6
Y2.2	GCP54a	675	White bacterial mat	<i>Bolivina albatrossi</i>	5
	GCP54b	675	White bacterial mat	<i>Cribromiliolinella subvalvularis</i>	22
				<i>Bolivina ordinaria</i>	9
Y2.3	MCP04a	1072	Gray bacterial mat	<i>Cornuspira involvens</i>	6
	MCP04b	1072	Gray bacterial mat	<i>Procerolagena gracilis</i>	5
	GCP33a	664	White bacterial mat	<i>Bolivina lowmani</i>	5
	GCP33b	664	White bacterial mat	<i>Bolivina ordinaria</i>	15
	GCP51a	696	Bacterial mat on mound with clams	<i>Bulimina aculeata</i>	8
	GCP51b	696	Bacterial mat on mound with clams	<i>Bolivina lowmani</i>	6
				<i>Epistominella exigua</i>	6
Y2.4	GCP15a	245	Non-seep gray mud	<i>Cassidulina carinata</i>	5
	GCP15b	245	Non-seep gray mud	<i>Gavelinopsis translucens</i>	5
				<i>Cribromiliolinella subvalvularis</i>	5
Y2.5	GBP08a	640	Non-seep gray mud	<i>Globocassidulina subglobosa</i>	8
	GBP08b	640	Non-seep gray mud	<i>Bolivina ordinaria</i>	8
	GCP55a	689	Non-seep mud	<i>Bulimina marginata</i>	6
	GCP55b	689	Non-seep mud	<i>Bolivina ordinaria</i>	6
	GCP57a	675	Sand	<i>Globocassidulina subglobosa</i>	8
	GCP57b	675	Sand	<i>Bolivina subaenariensis</i>	6
				<i>Bulimina marginata</i>	6
				<i>Bolivina ordinaria</i>	6
			<i>Globocassidulina subglobosa</i>	8	
			<i>Bolivina ordinaria</i>	8	
			<i>Epistominella exigua</i>	7	
			<i>Eponides turgidus</i>	6	
			<i>Bolivina lowmani</i>	6	
			<i>Gavelinopsis translucens</i>	6	
			<i>Bolivina albatrossi</i>	6	
			<i>Cassidulina carinata</i>	5	
			<i>Cibicoides bradyi</i>	5	
			<i>Uvigerina peregrina</i>	5	