

Supplementary Table 1.

Analysis	Depth	$\delta^{13}\text{C}$	1 σ	Category	Analysis (cont.)	Depth (cont.)	$\delta^{13}\text{C}$ (cont.)	1 σ (cont.)	Category (cont.)
FC_sp8A	2-4 cm	-44.5	1.9	ANME-1 rod	FC_sp30	2-4 cm	-24.8	1.8	Bacterial cluster
FC_sp8B	2-4 cm	-59.3	1.1	ANME-1 cluster	(continued)	2-4 cm	-23.7	1.6	
(continued)	2-4 cm	-56.6	1.9		(continued)	2-4 cm	-23.7	2.1	
(continued)	2-4 cm	-56.5	4.1		FC_sp31	2-4 cm	-62.6	3.4	ANME-1 rods
FC_sp8C	2-4 cm	-72.8	4.1	ANME-1 rods	(continued)	2-4 cm	-58.1	2.3	
(continued)	2-4 cm	-63.7	6.4		FC_sp16	2-4 cm	-24.3	1.8	ANME-1 rods
FC_sp26	2-4 cm	-28.5	1.7	Bacterial filament	FC_sp29B	2-4 cm	-78.5	5	ANME-1 rods
(continued)	2-4 cm	-29.1	2.2		FC_sp22	2-4 cm	-36.2	4.7	Shell
FC_sp25	2-4 cm	-19.5	2.5	Shell	(continued)	2-4 cm	-44.7	3.6	
(continued)	2-4 cm	-27.3	2.7		(continued)	2-4 cm	-40.1	5.1	
(continued)	2-4 cm	-22.0	2.4		(continued)	2-4 cm	-49.5	3.6	
(continued)	2-4 cm	-28.8	2.5		(continued)	2-4 cm	-48.7	2.6	
(continued)	2-4 cm	-43.6	1.4		FC_sp33	2-4 cm	-28.8	2.3	Mixed
(continued)	2-4 cm	-49.3	1.2		(continued)	2-4 cm	-31.9	3.6	
(continued)	2-4 cm	-54.3	1.6		(continued)	2-4 cm	-34.9	5.3	
(continued)	2-4 cm	-61.1	1.7		FC_sp33B	2-4 cm	-27.4	1.2	Mixed
(continued)	2-4 cm	-64.1	1.7		(continued)	2-4 cm	-29.0	1.7	
(continued)	2-4 cm	-63.3	2.4		(continued)	2-4 cm	-27.6	6.7	
FC_sp25ND	2-4 cm	-48.4	1.4	Shell	FF_sp14	8-10 cm	-73.8	6.3	ANME-1 rods
(continued)	2-4 cm	-56.3	0.76	connected to FC_sp25	FF_sp13	8-10 cm	-64.3	5.1	ANME-1 rods
(continued)	2-4 cm	-57.0	1.3		FF_sp12	8-10 cm	-45.0	3.9	Shell
(continued)	2-4 cm	-50.0	2.2		(continued)	8-10 cm	-59.3	2.9	
(continued)	2-4 cm	-42.7	2.6		(continued)	8-10 cm	-68.8	2.8	
(continued)	2-4 cm	-40.3	4.1		(continued)	8-10 cm	-66.2	2.2	
FC_sp28B	2-4 cm	-70.8	6.4	Sarcina (inc. ANME-2)*	(continued)	8-10 cm	-72.1	1.8	
FC_sp28C	2-4 cm	-65.7	3.6		(continued)	8-10 cm	-70.3	1.9	
(continued)	2-4 cm	-57.8	5.7		(continued)	8-10 cm	-69.6	1.9	
FC_sp27	2-4 cm	-56.7	1.4	Sarcina (inc. ANME-2)	(continued)	8-10 cm	-64.5	3.1	
(continued)	2-4 cm	-54.4	1.4		(continued)	8-10 cm	-60.8	4.1	
(continued)	2-4 cm	-50.1	2.1		(continued)	8-10 cm	-61.6	5.6	
(continued)	2-4 cm	-46.2	2.4		(continued)	8-10 cm	-44.1	8.3	
FC_sp7	2-4 cm	-56.8	2.7	Mixed	FF_sp11	8-10 cm	-73.3	3.1	ANME-1 rods
FC_sp38	2-4 cm	-23.6	3	Mixed	FF_sp8	8-10 cm	-29.2	1.6	ANME-1 rods
(continued)	2-4 cm	-29.5	3.1		(continued)	8-10 cm	-26.7	1.9	
(continued)	2-4 cm	-29.9	2		FF_sp8B	8-10 cm	-29.7	1.4	ANME-1 rods
(continued)	2-4 cm	-31.0	2.5		(continued)	8-10 cm	-28.2	1.3	
(continued)	2-4 cm	-28.8	3.1		FF_sp26	8-10 cm	-77.9	3.2	ANME-1 rods
(continued)	2-4 cm	-25.2	3.4		(continued)	8-10 cm	-77.5	5.3	
(continued)	2-4 cm	-33.3	4.1		FF_sp7	8-10 cm	-86.7	2.3	ANME-1 cluster w/ Bact.

Supplementary Table 1 (continued).

Analysis	Depth	$\delta^{13}\text{C}$	1 σ	Category	Analysis (cont.)	Depth (cont.)	$\delta^{13}\text{C}$ (cont.)	1 σ (cont.)	Category (cont.)
FF_sp7 (cont.)	8-10 cm	-78.0	1.1		(continued)	14-16 cm	-65.8	3.9	
(continued)	8-10 cm	-81.4	1.3		FB_sp20b	14-16 cm	-63.2	2.3	Sarcina (inc. ANME-2)*
(continued)	8-10 cm	-76.6	1.3		FB_sp12	14-16 cm	-86.7	9.0	ANME-1 rod
(continued)	8-10 cm	-77.6	1.6		(continued)	14-16 cm	-61.6	18.1	ANME-1 rod
FF_sp27	8-10 cm	-37.0	2.4	Sarcina (inc. ANME-2), plus Bacteria	FB_sp11	14-16 cm	-46.4	2.9	ANME-1 cluster
(continued)	8-10 cm	-49.9	1.9		(continued)	14-16 cm	-67.5	1.1	
(continued)	8-10 cm	-58.0	1.2		(continued)	14-16 cm	-70.7	1.0	
(continued)	8-10 cm	-62.3	1.4		(continued)	14-16 cm	-73.9	1.3	
(continued)	8-10 cm	-63.9	1.1		(continued)	14-16 cm	-65.1	1.7	
(continued)	8-10 cm	-66.1	1.5		(continued)	14-16 cm	-70.6	1.6	
(continued)	8-10 cm	-66.7	1.2		(continued)	14-16 cm	-71.5	1.6	
(continued)	8-10 cm	-65.9	1		(continued)	14-16 cm	-71.1	1.5	
(continued)	8-10 cm	-67.4	1.2		(continued)	14-16 cm	-70.7	1.4	
(continued)	8-10 cm	-69.3	1.5		(continued)	14-16 cm	-71.5	1.1	
(continued)	8-10 cm	-66.5	1.3		(continued)	14-16 cm	-69.8	1.1	
(continued)	8-10 cm	-65.5	1.1		(continued)	14-16 cm	-69.9	1.3	
(continued)	8-10 cm	-63.6	1.2		(continued)	14-16 cm	-68.8	1.1	
(continued)	8-10 cm	-60.4	2.1		FB_sp27	14-16 cm	-76.7	2.4	ANME-1 cluster
FF_sp20	8-10 cm	-44.6	3.1	ANME-1 rods, plus Bacteria	FB_sp28	14-16 cm	-25.6	0.7	Sarcina (inc. ANME-2)
(continued)	8-10 cm	-45.1	3		(continued)	14-16 cm	-23.0	0.8	
(continued)	8-10 cm	-47.7	3.8		FB_sp25	14-16 cm	-28.8	6.4	ANME-1 rod
(continued)	8-10 cm	-45.9	3.9		FB_sp26	14-16 cm	-29.5	2.3	Sarcina (inc. ANME-2)
FF_sp20B	8-10 cm	-41.5	1.7		FB_sp22	14-16 cm	-40.4	2.5	ANME-1 cluster
(continued)	8-10 cm	-46.3	2.2		(continued)	14-16 cm	-51.8	2.4	
(continued)	8-10 cm	-39.6	1.7		(continued)	14-16 cm	-59.7	1.9	
(continued)	8-10 cm	-37.3	3.0		(continued)	14-16 cm	-60.4	2.6	
FF_sp22	8-10 cm	-62.2	2.6	ANME-1 rods	(continued)	14-16 cm	-58.7	2.2	
FF_sp16	8-10 cm	-54.3	9.3	ANME-1 rods	(continued)	14-16 cm	-54.1	2.6	
FB_sp8	14-16 cm	-25.6	2.1	ANME-1 rod	FB_sp14	14-16 cm	-18.1	2.5	sarcina
FB_sp9	14-16 cm	-32.8	2.6	ANME-1 rod	FD_pt14	4-6 cm	-65.7	8.6	ANME-1 rod
FB_sp16	14-16 cm	-49.3	3.0	ANME-1 cluster	FD_pt10	4-6 cm	-57.6	6.2	Shell
(continued)	14-16 cm	-37.3	3.4		(continued)	4-6 cm	-73.3	4.8	
FB_sp17	14-16 cm	-31.4	4.2	Bacterial cluster	(continued)	4-6 cm	-61.7	5.3	
(continued)	14-16 cm	-31.1	3.2		(continued)	4-6 cm	-67.3	6.5	
FB_sp19	14-16 cm	-75.5	9.8	ANME-1 rod	(continued)	4-6 cm	-60.3	8.8	
(continued)	14-16 cm	-79.1	23.8		FD_pt16	4-6 cm	-53.7	3.3	Shell
FB_sp19b	14-16 cm	-30.6	9.8	particle	(continued)	4-6 cm	-61.0	2.4	
FB_sp20	14-16 cm	-75.0	2.4	Sarcina (inc. ANME-2)*	(continued)	4-6 cm	-67.3	2.1	
(continued)	14-16 cm	-67.4	2.5		(continued)	4-6 cm	-68.8	1.8	

Supplementary Table 1 (continued).

Analysis	Depth	$\delta^{13}\text{C}$	1 σ	Category	Analysis (cont.)	Depth (cont.)	$\delta^{13}\text{C}$ (cont.)	1 σ (cont.)	Category (cont.)
(continued)	4-6 cm	-67.6	1.8		(continued)	4-6 cm	-46.6	1.2	
(continued)	4-6 cm	-70.7	1.9		(continued)	4-6 cm	-47.3	1.2	
(continued)	4-6 cm	-68.9	2.0		(continued)	4-6 cm	-52.1	1.2	
(continued)	4-6 cm	-72.6	1.7		(continued)	4-6 cm	-52.6	1.1	
(continued)	4-6 cm	-69.7	1.7		(continued)	4-6 cm	-50.7	1.1	
(continued)	4-6 cm	-72.5	2.0		(continued)	4-6 cm	-50.1	1.2	
(continued)	4-6 cm	-68.9	2.1		(continued)	4-6 cm	-48.5	1.3	
(continued)	4-6 cm	-68.2	1.6		(continued)	4-6 cm	-49.0	1.3	
(continued)	4-6 cm	-69.8	2.1		(continued)	4-6 cm	-50.4	1.3	
(continued)	4-6 cm	-72.0	1.8		(continued)	4-6 cm	-56.2	1.1	
(continued)	4-6 cm	-70.9	2.1		(continued)	4-6 cm	-56.1	1.2	
(continued)	4-6 cm	-65.7	1.9		(continued)	4-6 cm	-42.5	1.1	
(continued)	4-6 cm	-67.7	2.4		(continued)	4-6 cm	-47.8	0.9	
(continued)	4-6 cm	-68.8	2.3		(continued)	4-6 cm	-47.7	1.1	
(continued)	4-6 cm	-70.0	2.1		(continued)	4-6 cm	-51.9	1.5	
(continued)	4-6 cm	-67.1	2.4		FD_sp32	4-6 cm	-44.9	21.6	ANME-1 filament
(continued)	4-6 cm	-70.4	2.3		FD_pt28	4-6 cm	-37.5	2.1	Sarcina (inc. ANME-2)
(continued)	4-6 cm	-71.0	2.6		FD_pt21	4-6 cm	-60.1	10.8	ANME-1 cluster
(continued)	4-6 cm	-64.1	2.4		FD_pt15	4-6 cm	-25.6	4.1	Bacterial filament
(continued)	4-6 cm	-66.8	2.6		(continued)	4-6 cm	-16.3	5.1	
(continued)	4-6 cm	-65.8	3.3		FD_pt35	4-6 cm	-22.0	1.4	Shell
(continued)	4-6 cm	-62.5	3.1		(continued)	4-6 cm	-20.5	1.8	
(continued)	4-6 cm	-66.6	3.2		(continued)	4-6 cm	-22.8	2.7	
(continued)	4-6 cm	-67.8	3.3		(continued)	4-6 cm	-17.9	3.5	
(continued)	4-6 cm	-66.9	1.4		FD_pt27	4-6 cm	-26.5	1.5	Shell
(continued)	4-6 cm	-67.1	1.9		(continued)	4-6 cm	-31.8	2.2	
(continued)	4-6 cm	-67.1	2.1		(continued)	4-6 cm	-37.7	1.3	
(continued)	4-6 cm	-62.9	2.5		(continued)	4-6 cm	-43.6	2.1	
FD_pt7	4-6 cm	-50.2	8.0	ANME-1 rod	(continued)	4-6 cm	-40.8	3.6	
FD_pt26	4-6 cm	-28.4	2.1	Mixed	(continued)	4-6 cm	-39.0	2.4	
(continued)	4-6 cm	-25.4	1.3		(continued)	4-6 cm	-43.8	1.9	
(continued)	4-6 cm	-23.6	1.3		(continued)	4-6 cm	-43.5	2.0	
(continued)	4-6 cm	-23.3	1.4		(continued)	4-6 cm	-47.5	2.2	
(continued)	4-6 cm	-23.1	1.7		(continued)	4-6 cm	-42.7	1.9	
(continued)	4-6 cm	-26.8	1.5		(continued)	4-6 cm	-45.3	2.0	
(continued)	4-6 cm	-29.3	1.6		(continued)	4-6 cm	-48.1	2.1	
(continued)	4-6 cm	-32.9	1.5		(continued)	4-6 cm	-42.9	2.2	
(continued)	4-6 cm	-41.3	1.2		(continued)	4-6 cm	-43.1	2.5	
(continued)	4-6 cm	-44.7	1.4						

Note: **"String of pearls" sarcina morphology.