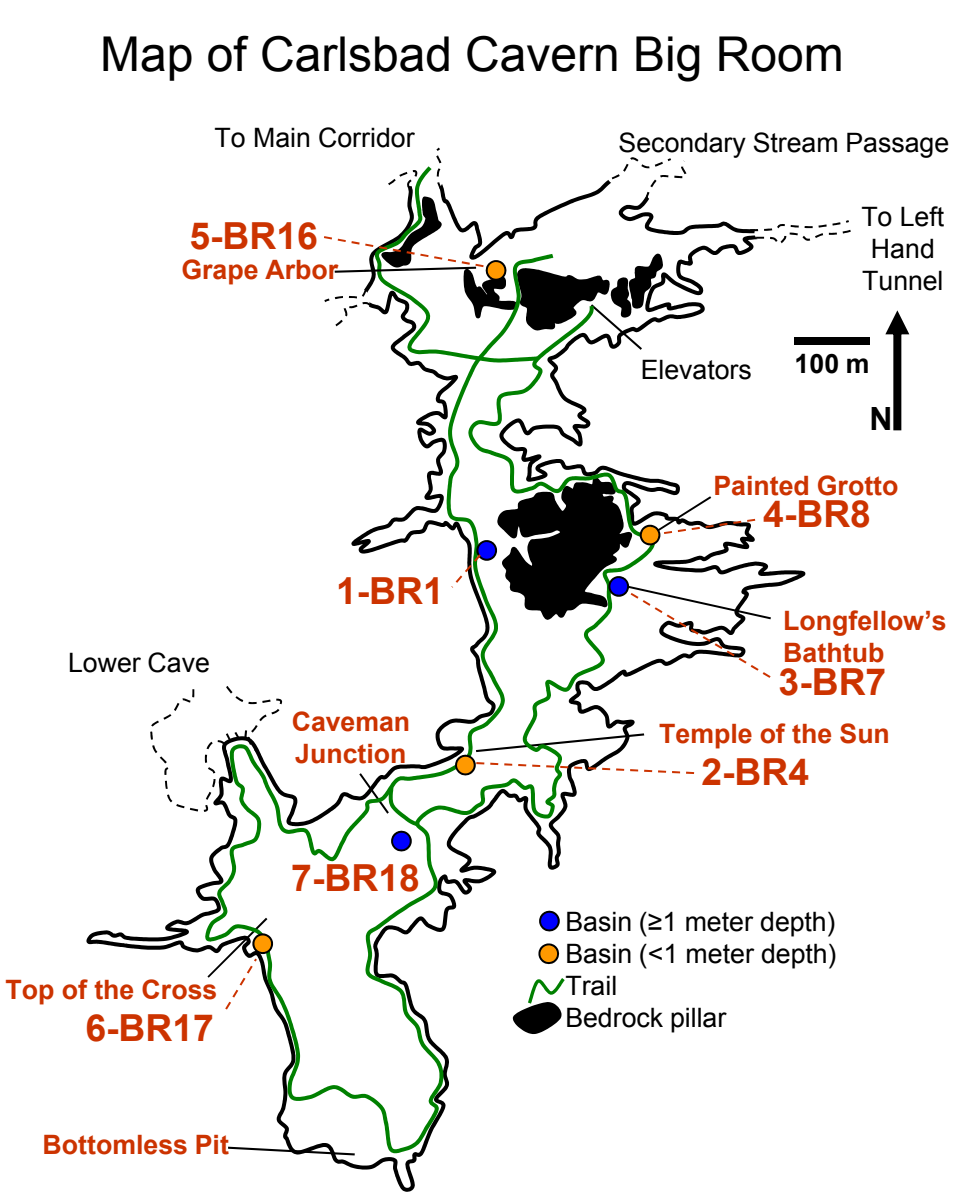
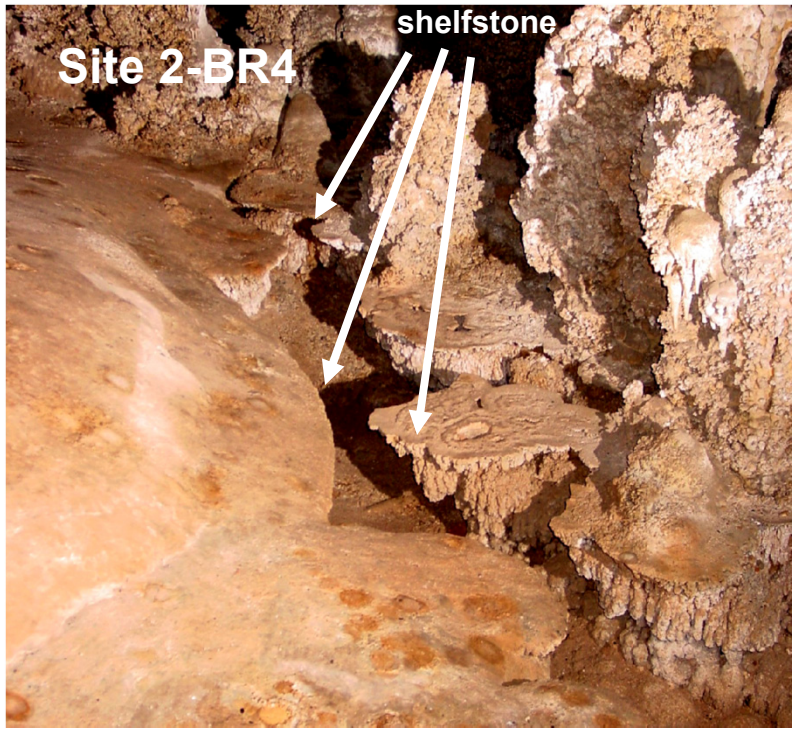
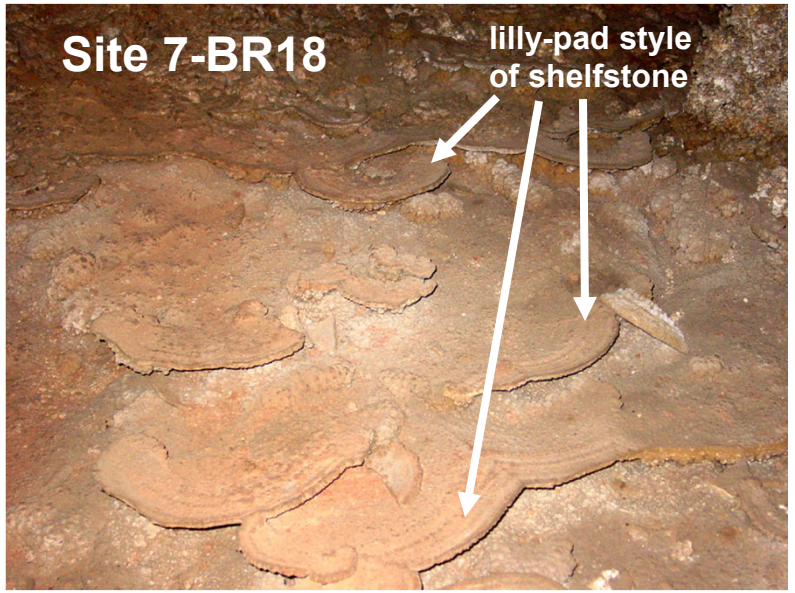


Figure DR1: Map of Big Room showing public trail and sample areas. Map traced from Cave Research Foundation map of Carlsbad Cavern.





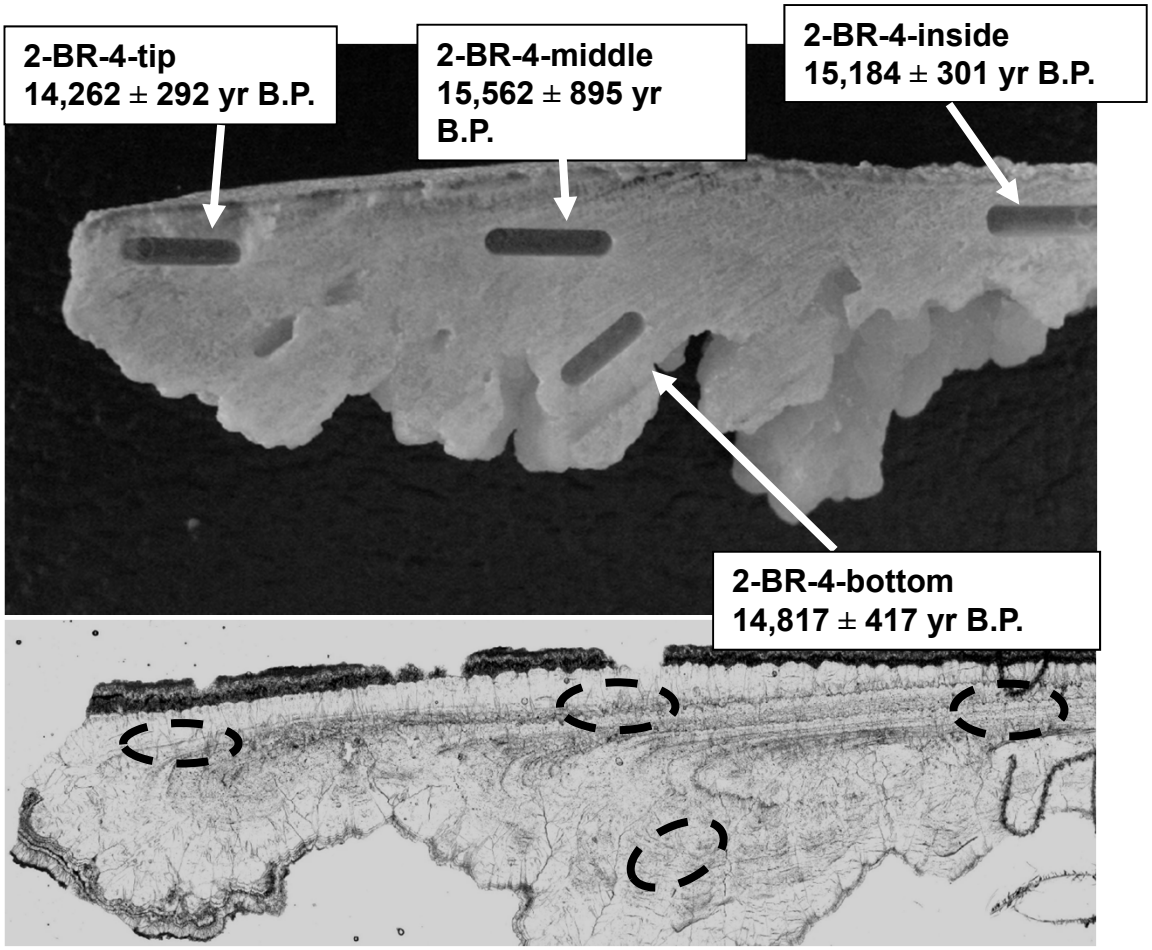


Figure DR2(A): Photograph (top image) and thin-section micrograph (bottom image) of shelfstone sample #2-BR-4 from Big Room of Carlsbad Cavern. Four U-series ages show that the shelfstone formed between 15.6 and 14.3 ky B.P. The shelfstone speleothems formed only when the pool basins were full to the brim.

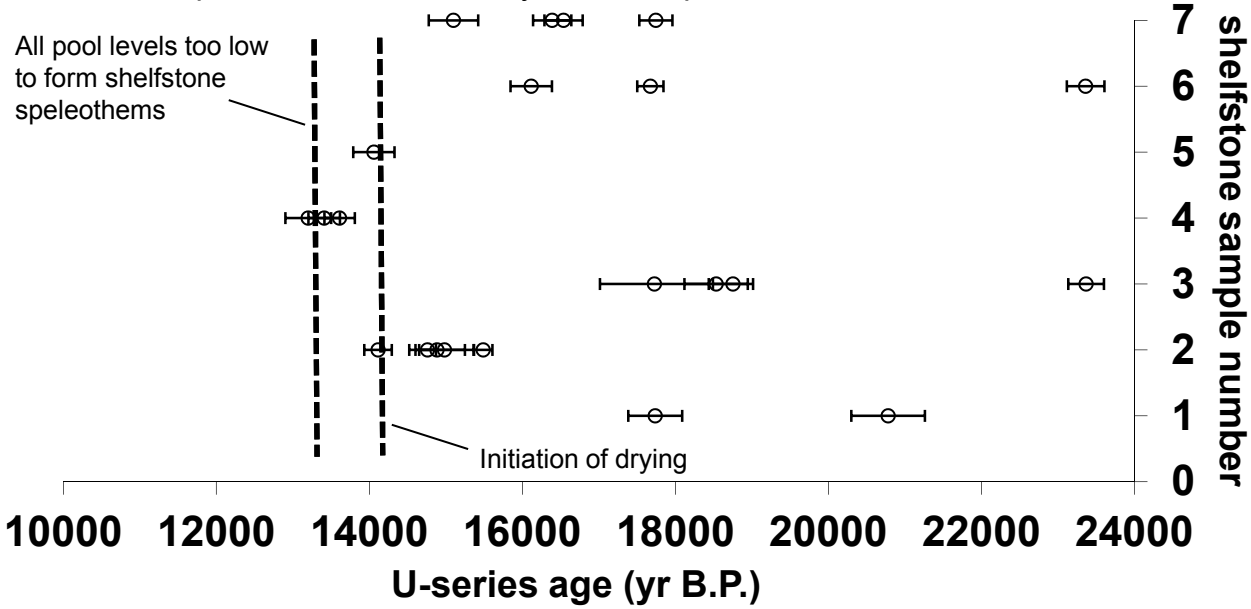


Figure DR2(B): All U-series age data for seven shelfstones (from seven pool basins in Carlsbad Cavern) indicate that termination of shelfstone growth was by 13.3 ka, supporting increasingly drier conditions beginning at ~14.5 ka.

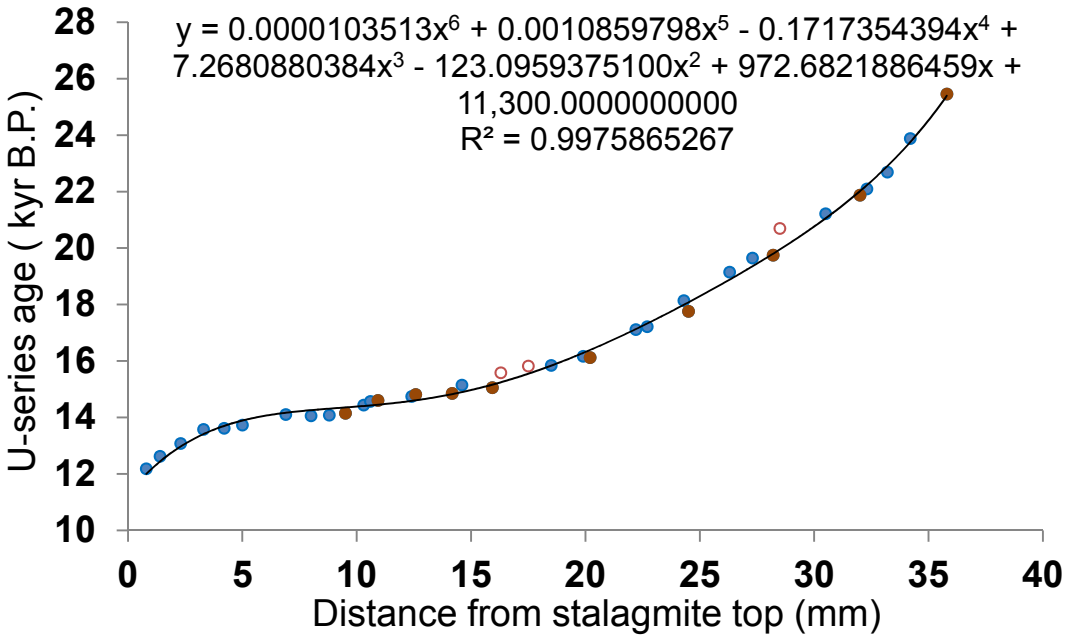


Figure DR3a. The chronology for the top 9000 years of stalagmite FS2 is based on 26 previously published U-series dates (Asmerom et al. 2010) (blue data points) three of which were rejected for the final chronology (empty red circles), and ten new U-series dates (**Table DR4**, brown data points). Top of stalagmite was set to 11,300 yr B.P. based on a polynomial curve of the youngest nine dates.

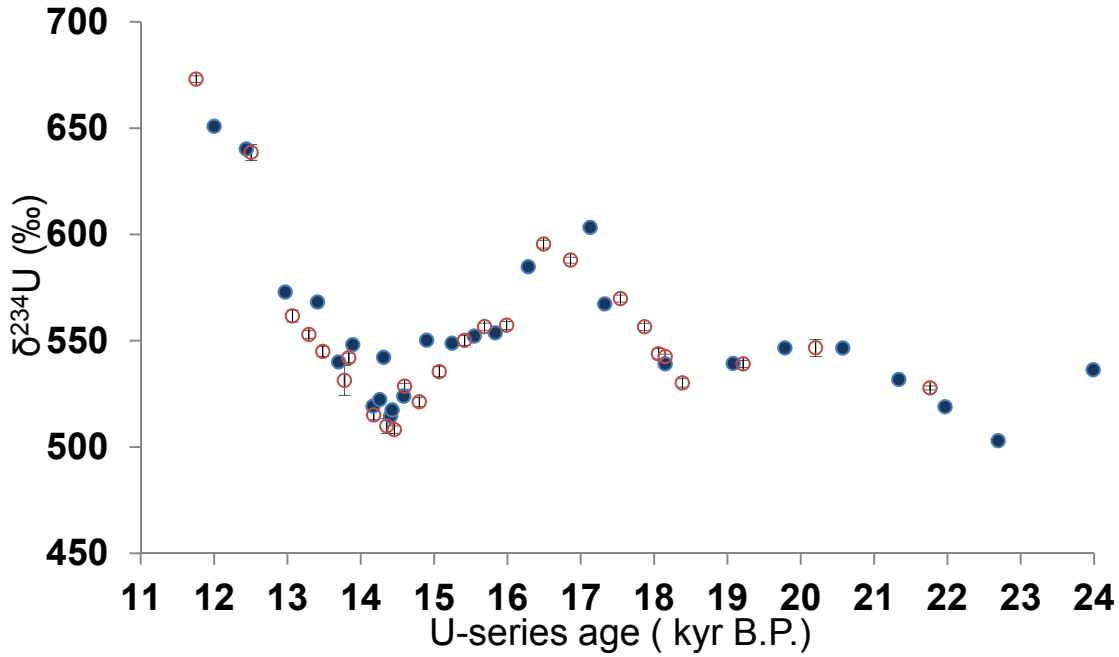


Figure DR3b. $\delta^{234}U$ data versus U-series chronology. The blue data points are from the FS2 chronology data (Asmerom et al. 2010) from relatively large powders (50-200 mg), and the brown data points represent measurements taken from a separate transect (**Table DR3**) from small powders (2-6 mg).

Table DR1. Uranium-series data for Big Room shelfstone samples, Carlsbad Cavern.

sample	^{238}U (ng/g)	^{232}Th (pg/g)	$^{230}Th/^{232}Th$ act. ratio	$^{230}Th/^{238}U$ act. ratio	measured $\delta^{234}U$ (‰)	initial $\delta^{234}U$ (‰)	uncorrected age (yrs BP)	corrected age (yrs BP)
1-BR-1-1	267.8 ± 1.4	1180 ± 53	1496 ± 72	0.399 ± 0.007	1230 ± 12	1305 ± 13	21154 ± 445	**20779 ± 481**
1-BR-1-2	327.8 ± 1.6	9334 ± 34	37 ± 0	0.348 ± 0.003	1220 ± 9	1282 ± 10	18353 ± 174	**17735 ± 352**
2-BR-4-1	713.7 ± 6.2	2116 ± 27	965 ± 24	0.173 ± 0.004	325 ± 9	339 ± 10	15211 ± 393	14917 ± 417
2-BR-4-1(2)	717.6 ± 7.6	2132 ± 34	981 ± 53	0.177 ± 0.009	321 ± 10	335 ± 11	15580 ± 897	15286 ± 906
							weight-averaged =	**14982 ± 380**
2-BR-4-tip	614.2 ± 3	1130 ± 45	1511 ± 65	0.168 ± 0.003	344 ± 6	358 ± 7	14535 ± 259	14262 ± 292
2-BR-4-tip icp	612.2 ± 1	1179 ± 45	1440 ± 55	0.168 ± 0.001	361 ± 14	376 ± 15	14302 ± 175	14028 ± 220
							weight-averaged =	**14113 ± 180**
2-BR-4-mid	703.1 ± 3	1197 ± 47	1685 ± 74	0.174 ± 0.004	337 ± 5	351 ± 5	15128 ± 344	**14884 ± 364**
2-BR-4-int	728.7 ± 4	2248 ± 34	942 ± 19	0.176 ± 0.003	325 ± 6	339 ± 6	15478 ± 264	15184 ± 301
2-BR-4-int icp	726.1 ± 3	2445 ± 34	881 ± 13	0.180 ± 0.001	323 ± 2	337 ± 2	15845 ± 126	15542 ± 197
2-BR-4-int icp2	728.6 ± 2	2570 ± 33	841 ± 11	0.180 ± 0.001	322 ± 1	337 ± 1	15850 ± 72	15542 ± 170
							weight-averaged =	**15487 ± 120**
2-BR-4-bot	615.8 ± 4	367 ± 66	4809 ± 875	0.173 ± 0.004	344 ± 9	358 ± 10	15005 ± 406	14817 ± 417
2-BR-4-bot icp	615.1 ± 3	403 ± 66	4358 ± 716	0.173 ± 0.001	332 ± 3	346 ± 3	15087 ± 122	14892 ± 159
2-BR-4-bot icp2	615.5 ± 1	533 ± 66	3244 ± 403	0.170 ± 0.001	332 ± 1	346 ± 1	14848 ± 103	14634 ± 151
							weight-averaged =	**14760 ± 110**
3-BR-7	277.1 ± 2.1	3591 ± 54	417 ± 8	0.327 ± 0.004	1011 ± 13	1066 ± 14	19117 ± 297	**18531 ± 414**
3-BR-8-bot	296.7 ± 0.8	1445 ± 54	261 ± 10	0.415 ± 0.002	1089 ± 3	1163 ± 3	23751 ± 132	**23365 ± 234**
3-BR-9-mid	355.4 ± 1.0	4236 ± 51	84 ± 1	0.329 ± 0.002	1012 ± 3	1067 ± 3	19234 ± 106	**18751 ± 263**
3-BR-10-top	475.4 ± 1.3	46987 ± 203	10 ± 0	0.326 ± 0.002	1002 ± 2	1053 ± 3	19133 ± 113	**17724 ± 711**
4-BR-8	310.2 ± 0.8	433 ± 41	399 ± 38	0.000 ± 0.000	532 ± 2	552 ± 2	13754 ± 110	**13410 ± 206**
4-BR-8-2	300.6 ± 0.8	207 ± 51	810 ± 200	0.000 ± 0.000	520 ± 2	540 ± 2	13890 ± 124	**13611 ± 199**
4-BR-8-3	318.0 ± 0.8	2060 ± 55	86 ± 2	0.002 ± 0.000	538 ± 2	558 ± 2	13201 ± 299	**13201 ± 299**
5-BR-16-1	262.1 ± 1.1	1656 ± 29	620 ± 15	0.237 ± 0.004	867 ± 6	902 ± 6	14679 ± 282	14159 ± 382
5-BR-16-1(2)	261.9 ± 1.4	1708 ± 30	598 ± 15	0.236 ± 0.004	886 ± 12	922 ± 12	14475 ± 295	13955 ± 391
							weight-averaged =	**14059 ± 270**
6-BR-17-1	499.0 ± 1.7	7775 ± 35	215 ± 3	0.203 ± 0.003	421 ± 4	441 ± 4	16697 ± 255	16093 ± 394
6-BR-17-1(2)2	499.6 ± 2.5	7760 ± 41	217 ± 3	0.204 ± 0.003	426 ± 7	446 ± 7	16738 ± 243	16137 ± 384
							weight-averaged =	**16115 ± 270**
6-BR-17-3	454.3 ± 1.2	465 ± 43	651 ± 60	0.218 ± 0.001	430 ± 2	452 ± 2	17929 ± 111	**17671 ± 171**
6-BR-17-4	460.2 ± 1.3	1924 ± 48	205 ± 5	0.280 ± 0.001	420 ± 2	448 ± 2	23768 ± 137	**23360 ± 245**
7-BR-18-1	693.7 ± 4.2	7424 ± 33	299 ± 3	0.194 ± 0.002	349 ± 6	366 ± 7	16841 ± 206	16390 ± 303
7-BR-18-1(2)	694.3 ± 5.0	7542 ± 41	295 ± 5	0.194 ± 0.004	348 ± 8	365 ± 8	16841 ± 364	16387 ± 426
							weight-averaged =	**16389 ± 250**
7-BR-18-bot	521.1 ± 1.5	1919 ± 52	173 ± 5	0.209 ± 0.001	357 ± 2	375 ± 2	18122 ± 105	**17743 ± 216**
7-BR-18-mid	523.6 ± 1.4	3478 ± 48	90 ± 1	0.196 ± 0.001	352 ± 2	369 ± 2	17001 ± 96	**16537 ± 250**
7-BR-18-top	494.2 ± 1.3	7048 ± 53	39 ± 0	0.182 ± 0.001	352 ± 2	367 ± 2	15720 ± 89	**15098 ± 323**

Corrected ages use a calculated initial $^{230}Th/^{232}Th$ atomic ratio X, where X = 0.0033 x $(^{232}Th\ ppt)^{-0.6664}$ ±50%. Years before present = cal. yr B.P., where present is AD 2006. All errors are absolute 2σ. Subsample sizes ranged from 50 to 250 mg. Some subsamples were multiple runs on TIMS or runs on both TIMS and ICP and were weight-averaged.

Table DR2: Carbon and oxygen stable isotope data for Stalagmite FS2 from 25 to 11 kyr B.P.

Age	$\delta^{18}O$	$\delta^{13}C$	Age	$\delta^{18}O$	$\delta^{13}C$	Age	$\delta^{18}O$	$\delta^{13}C$	Age	$\delta^{18}O$	$\delta^{13}C$	Age	$\delta^{18}O$	$\delta^{13}C$
11396	-2.05	-6.28	14196	-6.64	-5.96	14847	-7.60	-11.27	16823	-5.39	-8.92	20575	-5.09	-7.17
11490	-1.79	-6.30	14205	-6.58	-5.88	14864	-6.94	-9.39	16860	-5.26	-8.87	20630	-5.01	-7.22
11581	-1.91	-6.39	14213	-6.52	-5.86	14881	-6.26	-9.59	16898	-5.04	-9.08	20684	-5.27	-7.11
11670	-2.06	-7.29	14221	-6.58	-5.96	14899	-6.93	-8.79	16936	-5.04	-9.22	20736	-5.12	-7.18
11756	-2.02	-7.91	14229	-6.55	-6.04	14917	-6.91	-8.61	16974	-5.00	-9.39	20786	-5.13	-7.74
11841	-1.77	-7.65	14237	-6.62	-6.25	14935	-6.78	-8.64	17013	-4.77	-9.68	20833	-5.14	-7.80
11923	-1.68	-8.00	14245	-6.63	-6.30	14953	-6.82	-8.66	17051	-4.74	-9.09	20879	-5.39	-8.29
12003	-1.63	-8.22	14252	-6.65	-6.29	14972	-6.74	-8.43	17090	-4.74	-8.72	20923	-5.24	-8.14
12081	-1.65	-8.29	14259	-6.75	-6.16	14991	-6.80	-8.68	17129	-4.57	-8.18	20964	-5.28	-9.03
12157	-1.63	-8.03	14267	-6.86	-6.13	15010	-6.60	-8.54	17169	-4.49	-7.85	21004	-5.25	-9.66
12230	-1.40	-7.31	14273	-6.94	-6.17	15030	-6.77	-8.89	17208	-4.50	-7.80	21041	-5.25	-9.82
12302	-1.94	-8.47	14280	-6.99	-6.22	15050	-6.59	-8.58	17248	-4.50	-7.58	21077	-4.94	-8.93
12372	-2.24	-8.53	14287	-6.87	-6.32	15071	-6.62	-8.51	17287	-4.38	-7.37	21111	-4.91	-8.35
12440	-2.36	-8.48	14293	-6.87	-6.40	15091	-6.53	-8.13	17327	-4.39	-7.53	21144	-5.00	-7.77
12506	-2.46	-8.74	14300	-6.85	-6.55	15113	-6.53	-7.85	17338	-4.46	-8.07	21175	-5.16	-8.03
12570	-2.55	-8.83	14306	-7.07	-6.81	15134	-6.50	-7.42	17446	-4.53	-9.12	21204	-5.16	-8.41
12632	-2.79	-8.33	14312	-7.09	-6.91	15156	-6.62	-7.32	17541	-4.68	-9.66	21233	-5.12	-8.62
12693	-3.06	-7.40	14319	-6.96	-7.06	15178	-6.65	-7.35	17624	-4.74	-9.67	21260	-4.90	-8.74
12751	-3.28	-6.89	14325	-6.87	-6.96	15200	-6.24	-7.80	17698	-4.76	-9.45	21286	-4.81	-8.52
12808	-3.48	-6.78	14331	-6.81	-6.83	15223	-6.46	-7.74	17762	-4.82	-8.90	21312	-4.70	-8.19
12864	-3.70	-6.55	14337	-6.75	-6.70	15246	-6.43	-7.69	17820	-4.78	-8.34	21337	-4.61	-7.88
12918	-3.98	-7.02	14343	-6.71	-6.43	15270	-6.41	-7.40	17871	-4.81	-8.26	21362	-4.65	-7.62
12970	-4.12	-7.20	14349	-6.72	-6.29	15293	-6.39	-7.36	17916	-4.79	-8.75	21386	-4.80	-7.82
13020	-4.26	-7.15	14355	-6.66	-6.13	15318	-6.66	-8.51	17957	-4.82	-9.69	21411	-4.82	-8.14
13069	-4.38	-6.89	14362	-6.76	-6.04	15342	-6.40	-7.39	17995	-4.83	-9.36	21436	-4.91	-8.76
13117	-4.54	-6.74	14368	-6.79	-6.15	15367	-6.53	-7.61	18029	-4.86	-9.04	21462	-4.90	-9.30
13163	-4.63	-6.41	14374	-6.79	-5.97	15392	-6.41	-7.41	18062	-4.91	-8.57	21488	-4.85	-9.17
13208	-4.72	-6.64	14380	-6.94	-5.89	15417	-6.46	-7.39	18093	-5.03	-8.60	21516	-4.80	-9.24
13251	-4.63	-6.49	14387	-7.02	-6.02	15443	-7.38	-9.14	18123	-5.11	-8.01	21545	-4.63	-9.12
13293	-4.63	-6.54	14393	-6.97	-6.14	15469	-6.53	-7.20	18153	-5.11	-8.39	21576	-4.64	-9.11
13333	-4.68	-6.39	14400	-6.90	-5.71	15495	-6.78	-7.47	18183	-5.09	-8.47	21608	-4.73	-9.37
13373	-4.69	-6.34	14407	-7.00	-5.82	15522	-6.71	-7.44	18214	-5.07	-8.17	21643	-4.63	-9.65
13411	-4.73	-6.39	14414	-7.04	-5.89	15549	-6.69	-7.24	18245	-5.02	-7.80	21680	-4.56	-10.23
13447	-4.84	-6.42	14421	-7.08	-5.68	15576	-6.72	-6.94	18278	-5.04	-7.18	21720	-4.42	-10.09
13483	-5.13	-6.54	14428	-7.06	-5.81	15604	-6.81	-7.25	18313	-5.06	-7.05	21763	-4.72	-10.53
13517	-5.29	-6.89	14435	-7.06	-5.81	15632	-6.90	-7.71	18349	-4.99	-6.94	21809	-4.55	-9.84
13550	-5.36	-6.78	14442	-7.05	-5.78	15660	-6.81	-7.60	18387	-4.92	-7.02	21858	-4.49	-10.02
13583	-5.35	-6.52	14450	-7.08	-5.79	15689	-6.88	-7.44	18427	-4.94	-7.54	21912	-4.41	-9.92
13614	-5.58	-6.44	14458	-7.00	-5.63	15717	-6.98	-7.20	18469	-4.93	-8.23	21969	-4.41	-9.81
13644	-5.55	-6.29	14465	-7.16	-5.61	15747	-6.87	-6.87	18514	-5.00	-8.01	22030	-4.40	-9.77
13672	-5.61	-6.25	14474	-7.14	-5.64	15776	-7.06	-7.40	18560	-5.02	-7.09	22096	-4.49	-9.19
13700	-5.63	-6.21	14482	-7.29	-5.94	15806	-6.99	-7.34	18609	-4.99	-7.37	22166	-4.44	-8.54
13727	-5.61	-6.16	14490	-7.38	-6.01	15836	-6.96	-7.43	18661	-4.99	-6.57	22241	-4.48	-8.55
13753	-5.71	-6.49	14499	-7.45	-6.51	15866	-7.02	-6.94	18714	-5.03	-6.53	22321	-4.36	-8.74
13778	-5.72	-6.22	14508	-7.45	-6.73	15897	-7.27	-7.06	18770	-5.05	-6.85	22406	-4.40	-8.94
13803	-5.88	-6.84	14517	-7.59	-6.76	15928	-7.47	-7.24	18828	-4.94	-6.84	22497	-4.37	-9.19
13826	-5.91	-6.72	14526	-7.53	-6.98	15959	-7.30	-6.95	18888	-4.86	-7.27	22592	-4.53	-9.82
13848	-5.93	-6.63	14536	-7.46	-6.99	15990	-7.16	-6.78	18950	-4.79	-7.49	22693	-4.49	-9.93
13870	-5.95	-6.67	14546	-7.37	-6.79	16022	-7.24	-6.96	19014	-4.82	-7.49	22799	-4.54	-10.27
13891	-6.06	-6.67	14556	-7.20	-6.36	16054	-7.59	-8.01	19079	-4.92	-7.44	22911	-5.00	-9.98
13911	-6.13	-6.70	14566	-7.22	-6.42	16086	-7.07	-6.89	19146	-4.93	-7.28	23028	-4.43	-10.72
13930	-6.21	-6.71	14577	-7.28	-5.98	16119	-6.96	-6.78	19214	-4.98	-7.11	23151	-4.41	-10.20
13949	-6.26	-6.72	14587	-7.16	-5.62	16152	-7.19	-7.57	19283	-5.00	-7.11	23278	-4.39	-9.49
13967	-6.27	-6.69	14598	-7.07	-5.50	16185	-6.96	-7.34	19353	-5.03	-7.61	23411	-4.46	-9.64
13984	-6.33	-6.68	14610	-6.99	-5.55	16218	-6.73	-7.21	19424	-5.02	-8.35	23549	-4.36	-9.13
14001	-6.40	-6.40	14621	-7.13	-5.69	16252	-6.64	-7.24	19496	-5.01	-8.48	23691	-4.38	-9.15
14017	-6.49	-6.31	14633	-7.11	-5.85	16286	-6.44	-6.65	19568	-4.96	-7.79	23837	-4.41	-9.47
14032	-6.52	-6.43	14645	-7.12	-6.11	16320	-6.33	-6.56	19640	-4.91	-7.40	23988	-4.44	-9.20
14047	-6.52	-6.39	14658	-7.16	-6.32	16354	-6.00	-7.38	19712	-4.87	-7.36	24143	-4.63	-9.31
14061	-6.52	-6.21	14671	-7.04	-6.47	16389	-5.99	-7.56	19784	-4.88	-7.67	24300	-4.60	-10.01
14075	-6.50	-6.18	14684	-6.86	-6.47	16424	-5.96	-7.92	19855	-4.84	-7.97	24461	-4.21	-9.80
14088	-6.18	-5.96	14697	-6.94	-7.12	16459	-5.84	-7.89	19927	-4.78	-8.33	24623	-4.56	-9.30
14101	-6.45	-6.05	14711	-6.94	-7.32	16494	-5.80	-8.17	19997	-4.74	-8.54	24787	-3.85	-9.17
14113	-6.50	-6.23	14725	-7.10	-7.75	16530	-5.59	-8.27	20066	-4.78	-7.98	24952	-3.19	-9.06
14124	-6.55	-6.22	14739	-7.00	-7.84	16566	-5.64	-8.82	20135	-4.88	-7.59			
14136	-6.57	-5.96	14753	-7.08	-8.34	16602	-5.47	-9.00	20202	-4.86	-7.18			
14147	-6.67	-6.13	14768	-6.90	-8.92	16638	-5.43	-9.26	20268	-4.89	-6.92			
14157	-6.70	-5.80	14783	-6.89	-9.27	16675	-5.34	-9.15	20333	-4.92	-6.89			
14167	-6.33	-5.77	14799	-6.74	-9.51	16711	-5.48	-9.29	20396	-4.92	-6.98			
14177	-6.69	-6.20	14815	-6.48	-9.68	16748	-5.29	-8.83	20457	-4.97	-7.32			
14187	-6.68	-6.23	14831	-6.85	-9.49	16785	-5.36	-8.68	20517	-5.08	-7.16			

Carbon and oxygen stable isotope values in ‰, VPDB.

Table DR3: $\delta^{234}U$ values for stalagmite FS2 from 20 to 11.5 kyr B.P.

Sub-sample	Dist (mm)	Age (calc)	$^{234}U/^{238}U$ (activity)	$\delta^{234}U$ (‰, meas)	$\delta^{234}U$ (calc)
FS2-0.5	0.5	11848	0.01249 ± 0.047	651 + 2	**673**
FS2-1.5	1.5	12715	0.01223 ± 0.117	616 + 4	**639**
FS2-2.5	2.5	13234	0.01166 ± 0.090	541 + 3	**562**
FS2-3	3	13404	0.01160 ± 0.058	532 + 2	**553**
FS2-3.5	3.5	13532	0.01154 ± 0.079	525 + 2	**545**
FS2-4.5	4.5	13706	0.01144 ± 0.075	511 + 2	**531**
FS2-5	5	13768	0.01151 ± 0.229	521 + 7	**542**
FS2-7	7	13971	0.01131 ± 0.076	495 + 2	**515**
FS2-9.5	9.5	14304	0.01127 ± 0.118	490 + 4	**510**
FS2-11	11	14559	0.01126 ± 0.060	488 + 2	**508**
FS2-12.5	12.5	14832	0.01140 ± 0.072	507 + 2	**529**
FS2-14	14	15100	0.01135 ± 0.046	499 + 1	**521**
FS2-15.5	15.5	15358	0.01145 ± 0.078	513 + 2	**535**
FS2-17	17	15618	0.01155 ± 0.077	526 + 2	**550**
FS2-18	18	15808	0.01160 ± 0.056	532 + 2	**557**
FS2-19	19	16025	0.01160 ± 0.061	533 + 2	**557**
FS2-20.5	20.5	16434	0.01187 ± 0.058	568 + 2	**595**
FS2-21.5	21.5	16779	0.01181 ± 0.044	561 + 1	**588**
FS2-23	23	17423	0.01167 ± 0.053	542 + 2	**570**
FS2-23.5	23.5	17669	0.01157 ± 0.056	529 + 2	**557**
FS2-24	24	17928	0.01148 ± 0.080	517 + 2	**544**
FS2-25	25	18472	0.01138 ± 0.065	503 + 2	**530**
FS2-26.5	26.5	19264	0.01143 ± 0.055	511 + 2	**539**
d234U values along a growth layer transect 6.5 mm from the stalagmite top					
FS2-7.0 L2	6.5	13920	0.01138 ± 0.078	503 + 2	**524**
FS2-7.0 L1	6.5	13920	0.01141 ± 0.081	508 + 2	**528**
FS2-7.0 C	6.5	13920	0.01136 ± 0.065	501 + 2	**521**
FS2-7.0R1	6.5	13920	0.01134 ± 0.079	499 + 2	**519**
FS2-7.0 R2	6.5	13920	0.01139 ± 0.084	504 + 3	**525**

$\delta^{234}U$ data added to data from the age data transect offered in Asmerom et al.(2010). Each subsample weight varied from 2-6 mg. Dist = distance from stalagmite top that sample was taken. Age was calculated using the age equation in **Figure DR3**. Errors on measured $^{234}U/^{238}U$ activity and $\delta^{234}U$ measured are percent 1σ, and absolute 2σ, respectively. Last five values were sampled along a single growth layer to test variation in values related to horizontal distance from stalagmite vertical center. The set of $\delta^{234}U$ values in **Table DR3**, independent of those values previously reported (Asmerom et al., 2010) were derived from significantly smaller powders (2-6 mg) that were dissolved in 7N HNO_3, unspiked, and put through anion resin to separate the U fraction. The U isotopes were measured on the Thermo Neptune multicollector ICPMS. The final $^{234}U/^{235}U$ measured values were age-corrected to obtain initial $^{234}U/^{235}U$ values using the age/depth equation in **Fig. DR3**. Comparison to values measured during U-series age determinations are shown in **Fig. DR3**. Conversions from ^{14}C to calendar ages are from the radiocarbon age to calendar age conversion database (Fairbanks et al., 2005).

Table DR4. Ten additional uranium-series dates for stalagmite FS2, Fort Stanton Cave.

Sample /	dist.	^{238}U (ng/g)	^{232}Th (pg/g)	$^{230}Th/^{232}Th$ act. ratio	$^{230}Th/^{238}U$ act. ratio	measured $\delta^{234}U$ (‰)	initial $\delta^{234}U$ (‰)	uncorrected age (yrs BP)	corrected age (yrs BP)
FS2-9_3mm	9.5	929 ± 2	58 ± 95	9017 ± 14682	0.1843 ± 0.0010	502 ± 2	522 ± 2	14151 ± 83	**14149 ± 83**
FS2-10_7mm	10.9	901 ± 2	58 ± 91	8899 ± 13943	0.1877 ± 0.0017	485 ± 2	506 ± 2	14603 ± 143	**14600 ± 143**
FS2-12_4mm	12.6	927 ± 2	27 ± 87	19818 ± 62585	0.1920 ± 0.0022	499 ± 2	520 ± 2	14815 ± 185	**14813 ± 185**
FS2-14_2mm	14.2	861 ± 2	22 ± 108	23392 ± 115396	0.1940 ± 0.0010	510 ± 2	532 ± 2	14853 ± 81	**14852 ± 81**
FS2-16_0mm	15.9	1026 ± 3	37 ± 90	16767 ± 40958	0.1965 ± 0.0009	510 ± 2	532 ± 2	15058 ± 74	**15057 ± 74**
FS2-19_7mm	20.2	1039 ± 3	27 ± 52	25314 ± 48974	0.2125 ± 0.0010	531 ± 2	556 ± 2	16122 ± 81	**16121 ± 81**
FS2-24_2mm	24.5	1010 ± 3	513 ± 49	1384 ± 133	0.2300 ± 0.0009	514 ± 1	540 ± 1	17779 ± 77	**17760 ± 78**
FS2-27_8mm	28.2	1025 ± 3	686 ± 60	1160 ± 101	0.2540 ± 0.0014	515 ± 4	544 ± 4	19773 ± 129	**19748 ± 130**
FS2-31_8mm	32.0	1101 ± 3	41 ± 62	22534 ± 34299	0.2748 ± 0.0011	494 ± 1	525 ± 1	21878 ± 96	**21877 ± 96**
FS2-35_3mm	35.8	1058 ± 3	76 ± 66	13651 ± 11854	0.3208 ± 0.0014	520 ± 3	558 ± 3	25459 ± 132	**25457 ± 132**

Corrected ages use a calculated initial $^{230}Th/^{232}Th$ atomic ratio = 8.8 ppm ±50%. Years before present = yr B.P., where present is AD 2010. All errors are absolute 2σ. Subsample sizes ranged from 40 to 100 mg. Dist. = distance in mm from stalagmite top.

Due to age anomalies from physical distance measurements and larger drill-hole sizes, 10 additional subsample powders were drilled and analyzed producing 10 new U-series dates (Table DR4). Five of these drilled in the stalagmite area representing 14 to 15 ka supplement four previously published dates (Asmerom et al., 2010) in that area to more accurately establish the $\delta^{18}O$ excursion interpreted to be the initiation of the Bølling oscillation in GICC05. Five additional new U-series dates lie on the originally published growth curve between 25 and 16 kyr BP. A new polynomial curve was generated for the growth history from all but three data points shown as empty red circles (Figure DR3).