Supplementary Information:

Holocene melting of the West Antarctic Ice Sheet driven by tropical Pacific warming

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Depth (cm)	Mid-depth (cm)	Calendar age (cal yr BP)	$[^{10}Be]_{reactive}$ (10^8 atoms g^{-1})	2σ	$[^{9}Be]_{reactive}$ (10^{16} atoms g^{-1})	2σ	$^{10}Be/^{9}Be$ (10^{-8})	2σ
KC-15								
0-2	1	61^{+140}_{-104}	8.05	0.71	3.16	0.19	2.55	0.37
10-12	11	750^{+183}_{-205}	7.61	0.51	3.14	0.05	2.43	0.20
20-22	21	1403^{+367}_{-152}	5.75	1.07	3.30	0.07	1.74	0.36
30-32	31	2332^{+274}_{-331}	6.27	0.50	2.53	0.11	2.48	0.31
40-42	41	3153^{+475}_{-460}	6.14	0.56	2.50	0.01	2.46	0.23
50-52	51	3964^{+631}_{-323}	5.59	1.11	2.78	0.08	2.01	0.46
60-62	61	4941^{+514}_{-502}	5.73	0.61	2.40	0.01	2.38	0.26
70-72	71	5898^{+748}_{-521}	5.23	0.39	2.24	0.14	2.33	0.32
80-82	81	6852^{+1024}_{-742}	4.77	0.43	2.36	0.01	2.02	0.19
90-92	91	7813^{+978}_{-986}	3.78	0.60	2.51	0.02	1.51	0.25
100-102	101	8804^{+589}_{-1173}	2.68	0.44	2.46	0.05	1.09	0.20
110-112	111	9784^{+335}_{-1197}	0.86	0.28	1.88	0.02	0.46	0.15
120-122	121	10274^{+247}_{-578}	0.75	0.31	1.98	0.01	0.38	0.16

Table S1. Depth, calendar age, and beryllium isotope measurements for KC-15.

Depth (cm)	Mid-depth (cm)	$[^{10}Be]_{reactive}$ (10^8 atoms g^{-1})	2σ	$[^{9}Be]_{reactive}$ (10^{16} atoms g^{-1})	2σ	$^{10}Be/^{9}Be$ (10^{-8})	2σ
KC-16							
0-2	1	5.08	0.72	2.10	0.07	2.42	0.43
10-12	11	3.06	0.89	1.73	0.01	1.77	0.53
20-22	21	3.05	0.75	1.94	0.01	1.57	0.39
30-32	31	1.46	0.56	1.88	0.02	0.78	0.31
50-52	51	6.59	0.97	2.78	0.06	2.37	0.40
KC-17							
0-2	1	7.82	1.05	2.27	0.19	3.45	0.75
10-12	11	7.52	0.99	2.98	0.12	2.52	0.43
20-22	21	6.59	0.96	2.81	0.02	2.35	0.36
30-32	31	6.81	0.83	2.86	0.04	2.38	0.33
40-42	41	5.49	0.74	2.71	0.03	2.03	0.29
50-52	51	5.19	0.73	2.83	0.01	1.84	0.26
60-62	61	4.25	1.02	2.81	0.04	1.51	0.38
70-72	71	4.38	0.87	2.64	0.02	1.66	0.34
80-82	81	2.54	0.76	2.12	0.03	1.20	0.37
90-92	91	1.01	0.44	1.75	0.01	0.58	0.25
100-102	101	1.62	0.56	2.02	0.05	0.80	0.30
110-112	111	0.22	0.23	1.13	0.02	0.19	0.21
120-122	121	0.11	0.20	1.83	0.02	0.06	0.11
140-142	141	0.27	0.24	2.15	0.05	0.13	0.12

Table S2. Depth and beryllium isotope measurements for KC-16 and KC-17.

	$[^{9}Be]_{reac}$	$[^{10}Be]_{reac}$	$^{10}Be/^{9}Be$	TN	TOC	Diatom abundance	MS	n
$[^{9}Be]_{reac}$	1							13
$[^{10}Be]_{reac}$	0.79	1						13
$^{10}Be/^{9}Be$	0.57	0.95	1					13
TN	0.82	0.97	0.87	1				13
TOC	0.73	0.89	0.77	0.94	1			13
Diatom	0.96	0.77	0.55	0.83	0.81	1		6
MS	-0.71	-0.91	-0.89	-0.89	-0.71	-0.78	1	13

Table S3. Pearson (*r*) correlation coefficients for KC-15.

	$[^{9}Be]_{reac}$	$[^{10}Be]_{reac}$	$^{10}Be/^{9}Be$	TN	TOC	MS	n
$[^{9}Be]_{reac}$	1						4
$[^{10}Be]_{reac}$	0.63	1					4
$^{10}Be/^{9}Be$	0.48	0.98	1				4
TN	0.50	0.98	0.99	1			4
TOC	0.60	0.99	0.98	0.99	1		4
MS	-0.74	-0.98	-0.93	-0.92	-0.95	1	4

Table S4. Pearson (*r*) correlation coefficients for KC-16.

	$[^{9}Be]_{reac}$	$[^{10}Be]_{reac}$	$^{10}Be/^{9}Be$	TN	TOC	Diatom abundance	MS	n
$[^{9}Be]_{reac}$	1							14
$[^{10}Be]_{reac}$	0.80	1						14
$^{10}Be/^{9}Be$	0.71	0.98	1					14
TN	0.70	0.97	0.99	1				14
TOC	0.75	0.97	0.98	0.99	1			14
Diatom	0.19	0.80	0.84	0.82	0.77	1		5
MS	-0.62	-0.75	-0.72	-0.72	-0.69	-0.74	1	14

Table S5. Pearson (*r*) correlation coefficients for KC-17.

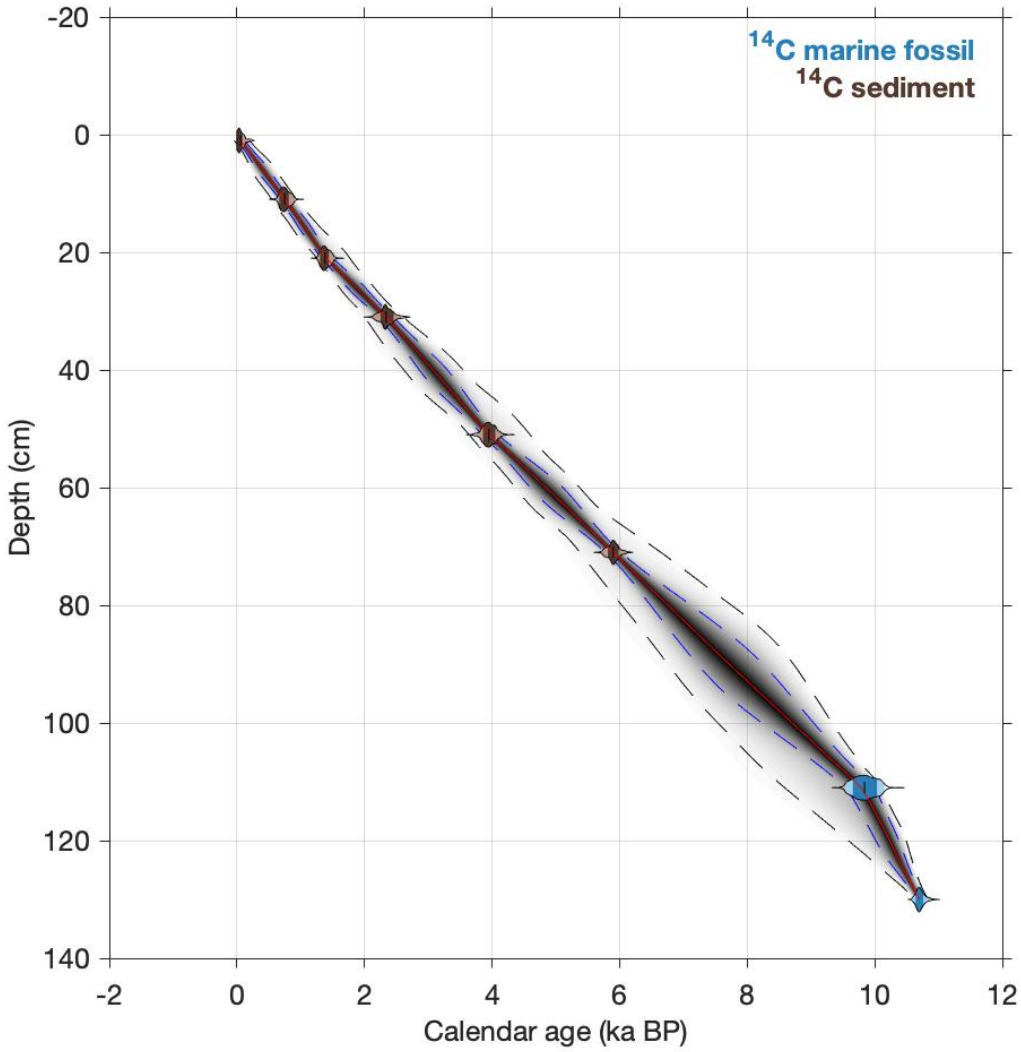

Figure S1. *Undatable* age-depth model for KC-15 based on organic carbon and marine carbonate ^{14}C dates from Minzoni *et al.*[1] and Kirshner *et al.*[2], respectively. The red line, blue broken line, and black broken line represents the median, 1σ confidence, and 2σ confidence intervals, respectively.

Supplementary References

1 Minzoni, R. T. *et al.* Oceanographic influences on the stability of the Cosgrove Ice Shelf, Antarctica. *The Holocene* **27**, 1645-1658, doi:10.1177/0959683617702226 (2017).

2 Kirshner, A. E. *et al.* Post-LGM deglaciation in Pine island Bay, west Antarctica. *Quaternary Science Reviews* **38**, 11-26 (2012).