Supplement of

Precise dating of deglacial Laptev Sea sediments via ^{14}C and authigenic ^{10}Be/^{9}Be – assessing local ^{14}C reservoir ages

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1. Comparison of age-depth models for core PS2458-4

Table S1. Radiocarbon and modelled ages from foraminifera and bivalve samples from core PS2458-4

Depth (cm)	^{14}C Age (^{14}C years)	± (years)	($\Delta R= 345 \pm 60$ ^{14}C years BP)		($\Delta R= -110 \pm 28$ ^{14}C years BP)		Modelled Age (difference) (cal BP)	Sample type
			Modelled Age (mean) (cal BP)	Modelled Age (cal BP, 2σ)	Modelled Age (mean) (cal BP)	Modelled Age (cal BP, 2σ)		
667	12600	110	13745	14089 – 13360	14452	14870 – 14009	707	mixed bivalves, benthic forams
578	12270	65	13198	13428 – 12982	13687	13931 – 13470	489	mixed benthic forams
530	11560	100	12551	12815 – 12244	12980	13199 – 12748	429	mixed benthic forams
491*	10968	159	11753	12220 – 11280	12371	12692 – 12026	618	mixed benthic forams
467	10600	75	11291	11630 – 11005	11973	12279 – 11683	682	mixed benthic forams
399	10090	65	10551	10811 – 10276	11185	11397 – 10991	634	mixed benthic forams
369	10020	70	10357	10606 – 10135	10966	11187 – 10746	609	mixed benthic forams
331.5*	9596	122	9860	10183 – 9527	10456	10757 – 10172	596	mixed benthic forams
291.5*	9089	224	9305	9711 – 8917	9890	10230 – 9529	585	mixed benthic forams
252	8830	55	8880	9129 – 8615	9432	9594 – 9258	552	mixed benthic forams
241.5*	8762	141	8762	9058 – 8448	9310	9527 – 9044	548	mixed benthic forams
141.5*	6447	158	6334	6696 – 5969	6838	7177 – 6489	504	mixed benthic forams
121.5*	6029	134	5985	6297 – 5638	6463	6790 – 6143	478	mixed benthic forams
0.5*	0		0					mixed benthic forams

Modelled ages were calculated using OxCal4.4 (Ramsey, 2009) with corresponding ΔR values. Marine ^{14}C dates were calibrated with the Marine20 curve (Heaton et al., 2020). The depth values with asterisks represent the new benthic foraminifera samples measured for ^{14}C dates. The depth values without asterisks show the ^{14}C dates published from (Spielhagen et al., 2005). The modelled age (difference) is calculated by subtracting the modelled age (mean) with ΔR= -110 ± 28 ^{14}C years BP from the modelled age (mean) with ΔR= 345 ± 60 ^{14}C years BP.

2. Concentrations of ^{9}Be, ^{10}Be and ^{10}Be/^{9}Be atomic ratios from core PS2458-4

Table S2. Mass of ^{9}Be-carrier and concentrations of ^{9}Be, ^{10}Be and ^{10}Be/^{9}Be from core PS2458-4

Depth	Sample Mass	9Be-Carrier	Authigenic ^{9}Be	sigma	Be^{10}/Be^9	sigma	Authigenic ^{10}Be	sigma	Authigenic ^{10}Be/^{9}Be	sigma
(cm)	(g)	(µg)	(at/g)	(%)	(at/at)	(%)	(at/g)	(%)	(at/at)	(%)
			[x10^{16}]		[x10^{-12}]		[x10^8]		[x10^{-8}]	
30	1.00	505	1.10	5.0	2.84	2.0	1.95	2.0	1.77	5.4
70	1.01	504	1.06	5.0	2.63	1.9	1.76	1.9	1.67	5.3
190	1.00	206	2.07	5.5	9.81	2.1	2.06	2.1	0.99	5.9
198	1.00	504	1.14	5.0	1.66	2.4	1.13	2.4	1.00	5.5
200	1.00	204	1.42	5.0	7.19	2.0	1.50	2.0	1.06	5.4
210	1.00	504	1.12	5.0	1.73	1.9	1.17	1.9	1.04	5.4
220	1.00	205	1.34	5.0	6.27	2.0	1.32	2.0	0.99	5.4
230	1.00	208	1.87	5.0	8.30	2.1	1.77	2.1	0.94	5.4
240	1.00	304	1.23	5.0	3.98	2.1	1.24	2.1	1.01	5.4
250	1.00	306	1.43	5.2	4.31	2.0	1.36	2.0	0.95	5.6
260	1.00	306	1.19	7.6	4.10	2.0	1.28	2.0	1.08	7.9
260	1.00	505	0.98	6.0	1.50	2.1	1.02	2.1	1.04	6.3
270	1.00	307	1.26	6.6	3.98	2.0	1.25	2.0	0.99	6.9
280	1.00	306	1.30	5.0	3.85	2.0	1.23	2.0	0.95	5.4
287	1.00	306	1.32	5.0	4.11	2.0	1.27	2.0	0.96	5.4
290	1.00	307	1.41	5.0	4.16	2.0	1.30	2.0	0.93	5.4
300	1.00	505	1.00	5.0	1.36	2.1	0.91	2.1	0.91	5.4
310	1.00	503	1.06	5.0	1.39	1.9	0.93	1.9	0.88	5.4
320	1.00	309	1.19	5.0	3.28	2.2	1.01	2.2	0.85	5.5
320	1.01	500	1.07	5.0	1.42	1.9	0.95	1.9	0.88	5.4
330	1.00	304	1.26	7.0	3.59	2.0	1.10	2.0	0.87	7.3
340	1.00	304	1.38	5.0	3.75	2.1	1.14	2.1	0.83	5.4
350	1.00	304	1.40	5.0	3.60	2.0	1.10	2.0	0.78	5.4
360	1.00	307	1.37	5.0	3.30	2.1	1.01	2.1	0.74	5.4
360	1.00	506	1.02	5.4	1.14	2.0	0.79	2.0	0.78	5.8
370	1.00	302	1.30	5.0	3.23	2.1	0.99	2.1	0.76	5.4
377	1.01	308	1.39	5.0	3.21	2.0	0.98	2.0	0.71	5.4
380	1.00	309	1.38	5.0	3.35	2.0	1.04	2.0	0.76	5.4
390	1.01	308	1.28	5.0	3.02	2.0	0.92	2.0	0.72	5.4
390	1.01	508	1.15	5.0	1.23	1.9	0.83	1.9	0.73	5.4
400	1.00	316	1.29	5.0	2.91	2.1	0.92	2.1	0.71	5.4
405	1.01	313	1.36	10.8	3.29	2.0	1.02	2.0	0.75	11.0
410	1.01	311	0.91	5.0	2.15	2.0	0.66	2.0	0.73	5.4
420	1.00	504	1.12	5.0	1.21	2.0	0.85	2.0	0.76	5.4
430	1.00	509	1.16	5.0	1.24	1.9	0.85	1.9	0.73	5.4
440	1.01	507	1.18	5.0	1.22	2.0	0.82	2.0	0.70	5.4
447	1.01	504	0.98	5.8	1.09	2.0	0.75	2.0	0.76	6.1
450	1.00	507	1.13	5.0	1.10	2.2	0.80	2.2	0.71	5.5
460	1.01	506	1.19	5.0	1.19	2.0	0.80	2.0	0.67	5.4

468	1.01	506	1.41	5.0	1.32	2.0	0.89	2.0	0.63	5.4
487	1.00	508	1.09	5.0	1.08	2.0	0.74	2.0	0.68	5.4
500	1.01	505	1.34	5.0	1.35	2.0	0.91	2.0	0.68	5.4
514	1.00	505	1.12	5.0	1.18	2.0	0.80	2.0	0.72	5.4
514	1.00	505	1.20	5.0	1.25	2.0	0.84	2.0	0.70	5.4
520	1.01	506	1.56	5.0	1.53	2.0	1.03	2.0	0.66	5.4
533	1.00	505	1.17	5.3	1.19	1.9	0.79	1.9	0.67	5.6
550	1.01	506	1.63	5.0	1.57	2.0	1.05	2.0	0.65	5.4
560	1.01	505	1.32	5.0	1.45	2.0	0.97	2.0	0.74	5.4
580	1.01	506	1.50	5.0	1.44	2.0	0.97	2.0	0.64	5.4
600	1.01	505	1.45	5.0	1.33	1.9	0.89	1.9	0.61	5.4
620	1.01	506	1.45	5.0	1.33	2.0	0.89	2.0	0.61	5.4
630	1.00	505	1.24	5.0	1.19	1.9	0.81	1.9	0.65	5.4
640	1.00	506	1.42	5.0	1.24	2.0	0.84	2.0	0.59	5.4
660	1.01	506	1.44	5.0	1.28	2.0	0.86	2.0	0.60	5.4
670	1.01	505	1.54	5.0	1.24	2.0	0.83	2.0	0.54	5.4
680	1.01	505	1.55	5.0	1.29	2.0	0.86	2.0	0.55	5.4
700	1.00	504	1.49	5.0	1.18	2.0	0.80	2.0	0.53	5.4
790	1.00	505	1.15	5.0	1.00	2.0	0.67	2.0	0.59	5.4

3. Updated age-depth model for core PS2458-4
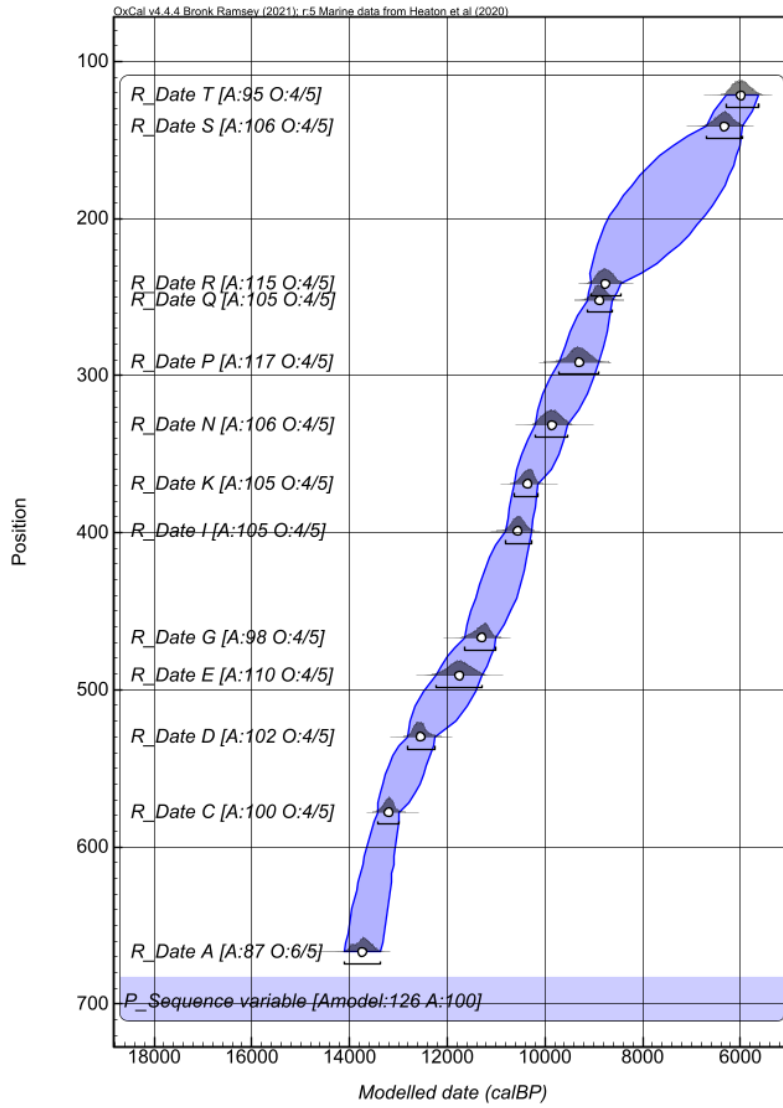
Figure S1. Age-depth model for core PS2458-4 using ΔR value of 345 ± 60 ^{14}C years BP

4. Modelled ice core ¹⁰Be time series with a tau value of 200 years
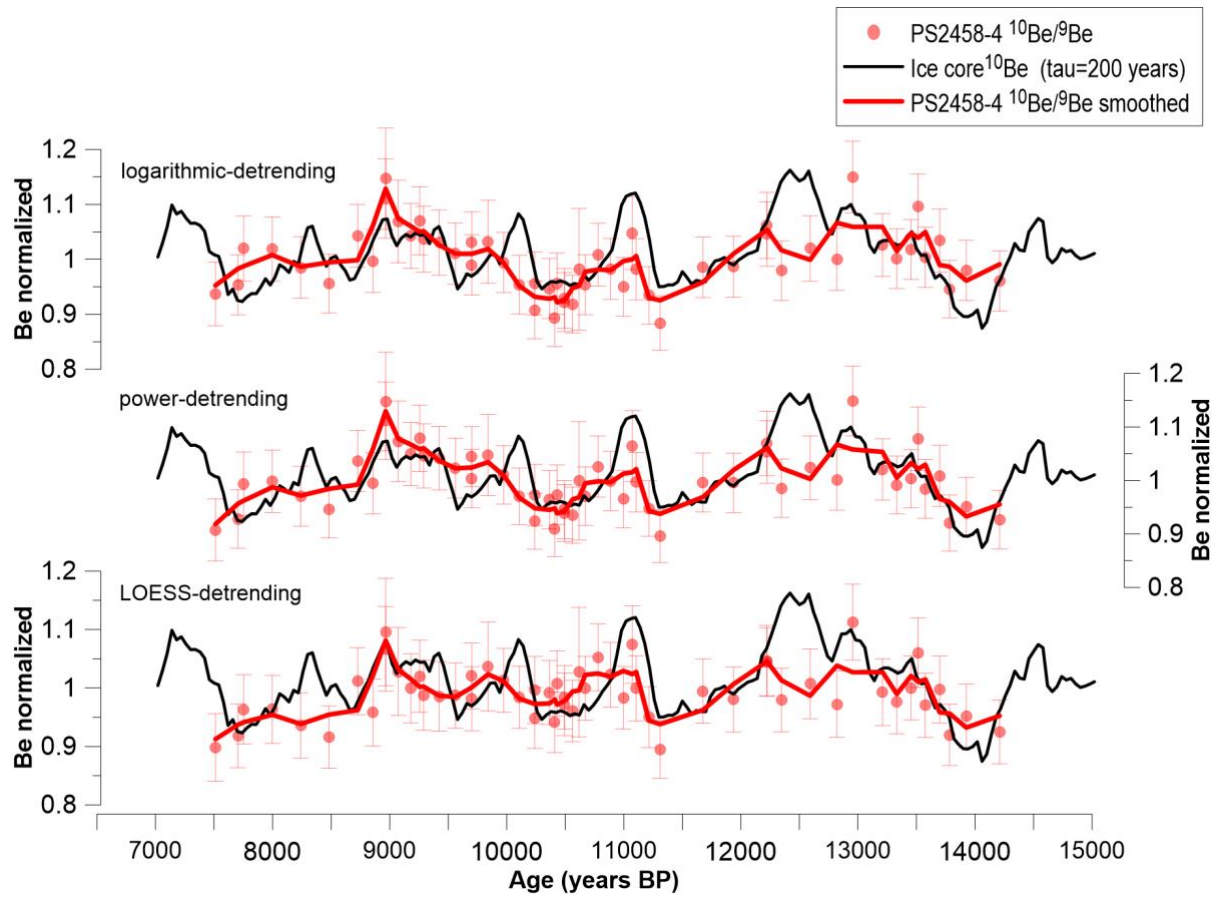
Figure S2. Ice core ¹⁰Be record with tau= 200 years (black) with PS2458-4 ¹⁰Be/⁹Be and PS2458-4 ¹⁰Be/⁹Be smoothed data (red) plotted based on logarithmic (upper), power (middle) and LOESS (lower) detrending techniques.