Supplementary Materials

Estimation of ^{230}Th-normalized fluxes of biogenic components

To interpret results in terms of export production of biogenic components or the supply of lithogenic material, fluxes to the sea floor have been reconstructed by using the core age model to calculate mass accumulation rates (MARs) as follows:

$$\mathrm{MAR}_{i,j} = \rho_{i,j} \times \mathrm{LSR}_{i,j}, \quad \text{(S1)}$$

where $\rho_{i,j}$ is the dry bulk density (g cm^{-3}) of a sediment section between depths i and j, and the LSR (cm kyr^{-1}) is calculated as $(z_j - z_i)/(t_j - t_i)$, where z_j and z_I are the depths of sediment horizons j and i (cm), and t_j and t_i are the corresponding calendar ages (kyr). In contrast, the ^{230}Th-normalization method is based on the assumption that the flux of scavenged ^{230}Th (^{230}Th$^{\mathrm{scav}}$) reaching the seafloor (F_{230}) is known and equal to the rate of ^{230}Th production (P_{230}) from the decay of ^{234}U in the overlying water column. Therefore, the activity (A) of ^{230}Th in a sediment sample (dpm g^{-1}) can be expressed as:

$$\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{scav}}) = F_{230}/\mathrm{Fv}. \quad \text{(S2)}$$

F_{230} (dpm cm^{-2} kyr^{-1}) is known and is approximately equal to $\beta_{230}Z$, where β_{230} (dpm cm^{-3} kyr^{-1}) is the determined by the balance between the radioactive decay of dissolved ^{234}U and the ^{230}Th decay constant (λ_{230}) throughout the water column and Z is the water depth (m). Fv (g cm^{-2} kyr^{-1}) is the vertical flux of particulate material in the water column. β_{230} is exactly known throughout the water column (François *et al*., 2004 and references therein):

$$\beta_{230} = \lambda_{230}{}^{\mathrm{sw}} \times {}^{\mathrm{sw}}\mathrm{A}^{234}\mathrm{U}, \quad \text{(S3)}$$

where values of $\lambda_{230}{}^{\mathrm{sw}}$ (decay constant of ^{230}Th in seawater) and ${}^{\mathrm{sw}}\mathrm{A}^{234}\mathrm{U}$ (activity of ^{234}U in seawater, dpm kg^{-1}) depend on salinity. For this study, we assumed a salinity of 35 and used 2.84 dpm kg^{-1} for ${}^{\mathrm{sw}}\mathrm{A}^{234}\mathrm{U}$ (Chen *et al*., 1986). This assumption is justified *a priori* by the short residence time of ^{230}Th, which varies from a few months in surface water to about 50 years in Pacific bottom waters (Bacon and Rosholt, 1982; Bacon, 1984; François *et al*., 2004). Moreover, the validity of this assumption has been confirmed by a modeling study (Henderson *et al*., 1999) and a sediment trap investigation (Yu *et al*., 2001). Therefore, this method is useful for the estimation of the preserved vertical flux (PVF) of biogenic materials, that is, the export flux after diagenetic remineralization.

The PVF (g or mg cm^{-2} kyr^{-1}) normalized to ^{230}Th is calculated as follows (François *et al*., 2004):

$$\mathrm{PVF}(i) = (\beta_{230} \times Z \times f_{(i)})/{}^{0}\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{scav}}), \quad \text{(S4)}$$

where $f_{(i)}$ is the weight fraction of constituent i in the sediment. We corrected Z for the global sea level during each period associated with climate change (Lambeck *et al*., 2002; Yokoyama and Esat, 2011). ${}^{0}\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{scav}})$ is the initial activity of ^{230}Th$^{\mathrm{scav}}$ as defined by Eq. (S5), which corrects for the radioactive decay of ^{230}Th (half-life, 75.7 kyr):

$${}^{0}\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{scav}}) = \mathrm{A}(^{230}\mathrm{Th}^{\mathrm{scav}}) \times \exp(0.693t/75.7). \quad \text{(S5)}$$

The analysis of ^{230}Th in sediment for this study was carried out after total dissolution of the sample, yielding total sediment ^{230}Th (A[^{230}Th$^{\mathrm{meas}}$]). This was corrected for contributions from detrital ^{230}Th (^{230}Th$^{\mathrm{det}}$) and, occasionally, authigenic ^{230}Th (^{230}Th$^{\mathrm{auth}}$) by using Eq. (S6):

$$\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{scav}}) = \mathrm{A}(^{230}\mathrm{Th}^{\mathrm{meas}}) - \mathrm{A}(^{230}\mathrm{Th}^{\mathrm{det}}) - \mathrm{A}(^{230}\mathrm{Th}^{\mathrm{auth}}), \quad \text{(S6)}$$

where $\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{det}})$, which equals $\mathrm{A}(^{238}\mathrm{U}^{\mathrm{det}})$, was determined from the activity of sedimentary ^{232}Th, an isotope of Th that is found almost exclusively in the lithogenic fraction. The lithogenic $\mathrm{A}^{238}\mathrm{U}/\mathrm{A}^{232}\mathrm{Th}$ ratio is 0.75 ± 0.2 on average (Anderson, 1982), and Henderson and Anderson (2003) have reported mean $\mathrm{A}^{238}\mathrm{U}/\mathrm{A}^{232}\mathrm{Th}$ ratios for each oceanic basin (Southern Ocean, 0.4 ± 0.1; Pacific, 0.7 ± 0.1; Atlantic, 0.6 ± 0.1). In this study, we used 0.4 for the $\mathrm{A}^{238}\mathrm{U}/\mathrm{A}^{232}\mathrm{Th}$ ratio. $\mathrm{A}(^{232}\mathrm{Th})$ in sediment equals $\mathrm{A}(^{232}\mathrm{Th}^{\mathrm{det}})$ and, thus, $\mathrm{A}(^{232}\mathrm{Th}^{\mathrm{det}}) = \mathrm{A}(^{232}\mathrm{Th}^{\mathrm{meas}})$. In sediment, authigenic ^{230}Th produced from the decay of ^{234}U is calculated as follows:

$$\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{auth}}) = \mathrm{A}(^{234}\mathrm{U}^{\mathrm{auth}}) \times \{1 - \exp[-(0.693t/75.7)]\}. \quad \text{(S7)}$$

Using the ratio of $\mathrm{A}(^{234}\mathrm{U}^{\mathrm{auth}})/\mathrm{A}(^{238}\mathrm{U}^{\mathrm{auth}})$ in the water column, 1.144 (Chen *et al*., 1986), the activity of authigenic ^{230}Th was then estimated as:

$$\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{auth}}) = 1.144 \times \mathrm{A}(^{238}\mathrm{U}^{\mathrm{auth}}) \times \{1 - \exp[-(0.693t/75.7)]\}, \quad \text{(S8)}$$

where $\mathrm{A}(^{238}\mathrm{U}^{\mathrm{auth}})$ is the activity of authigenic U, determined as $\mathrm{A}(^{238}\mathrm{U}^{\mathrm{meas}})$ minus $\mathrm{A}(^{238}\mathrm{U}^{\mathrm{det}})$, which is equal to $0.4 \times \mathrm{A}(^{232}\mathrm{Th}^{\mathrm{meas}})$. The general equation for calculating scavenged ^{230}Th in the sediment then becomes:

$$\mathrm{A}(^{230}\mathrm{Th}^{\mathrm{scav}}) = \mathrm{A}(^{230}\mathrm{Th}^{\mathrm{meas}}) - [0.4 \times \mathrm{A}(^{232}\mathrm{Th}^{\mathrm{meas}})] - 1.144 \times \mathrm{A}[^{238}\mathrm{U}^{\mathrm{meas}} - 0.4 \times \mathrm{A}(^{232}\mathrm{Th}^{\mathrm{meas}})] \times \{1 - \exp[-(0.693t/75.7)]\}, \quad \text{(S9)}$$

where t is the sedimentation age (kyr) (François *et al*.,

2004). The PVF (g or mg cm^{-2} kyr^{-1}) normalized to ^{230}Th, Eq. (S4) was used to estimate the paleo-fluxes of biogenic materials in this study.

Estimation of focusing factor

The $^{230}Th^{scav}$ inventory in the sediment between core depths z_j and z_j should match the production in the overlying column (P_{230}) integrated over the time of accumulation of this depth interval, after correction for radioactive decay. Using this principle, Suman and Bacon (1989) defined a focusing factor (Ψ) that quantifies syndepositional sediment redistribution:

$$\text{Focusing factor}\,(\Psi) = \frac{\int_{z_i}^{z_j}\left({}^{0}\mathrm{A}\left({}^{230}\mathrm{Th}^{\mathrm{scav}}\right)\times\rho_{i,j}\right)dz}{\int_{t_i}^{t_j}P_{230}\,dz} \qquad \text{(S10)}$$

where r is depth (cm) in the core, $\rho_{i,j}$ is dry bulk density (g cm^{-3}) between i and j (cm), and t_i and t_j are the corresponding calendar ages (kyr) of i and j, respectively. $^{0}A(^{230}Th^{scav})$ is the initial activity of $^{230}Th^{scav}$, and P_{230} (dpm cm^{-2} kyr^{-1}) is the rate of ^{230}Th production from the decay of ^{234}U in the overlying water column (m).

Supplementary Table S1. Calculated and measured parameters for sediment core PC-1, including TOC, TN, $CaCO_3$, and Si_{OPAL} contents, C/N, opal/$CaCO_3$ ratio, and stable oxygen isotope ratio in tests of the planktic foraminifer *G.bulloides*.

Core	Depth	Age	Linear sedimentation rate	Dry bulk density	Total org. C	Total nitrogen	C/N	Si_{OPAL}	$CaCO_3$	$\delta^{18}O$
	(cm)	(cal kyr BP)	(cm kyr^{-1})	(g cm^{-3})	(wt %)	(wt %)		(wt %)	(wt %)	(‰ vs PDB)
PC1	20.9	3.0	6.9	0.89	2.0	0.23	8.7	7.3	1.2	
	23.1	3.3	7.5	0.88	2.0	0.23	8.7		0.71	
	25.3	3.6	7.5	0.89	1.8	0.22	8.5		1.4	
	27.5	3.9	7.5	0.89	1.9	0.22	8.7		1.1	
	29.7	4.2	7.5	0.88	2.0	0.22	8.9		1.0	
	31.9	4.5	7.5	0.91	1.9	0.21	8.9	6.7	1.1	
	34.1	4.8	7.5	0.89	2.0	0.22	9.1		1.2	
	36.3	5.1	7.5	0.88	1.9	0.22	9.0		0.86	
	38.5	5.4	7.5	0.86	1.9	0.22	8.6		1.4	
	40.7	5.7	7.5	0.92	1.9	0.21	9.0	6.3	1.5	
	42.9	6.0	7.5	1.0	1.9	0.21	9.1		1.3	
	45.1	6.3	7.5	1.0	1.8	0.20	8.9		1.3	
	47.3	6.6	7.5	0.92	1.9	0.21	8.9		1.3	
	49.5	6.9	7.5	0.93	1.8	0.20	8.8		0.5	
	51.7	7.1	7.5	0.92	1.8	0.20	9.0	6.9	0.7	
	53.9	7.4	7.5	0.84	1.7	0.20	8.8		1.2	
	56.1	7.7	7.5	0.86	1.8	0.21	8.8		1.5	
	58.3	8.0	7.5	0.89	1.7	0.19	9.0		1.6	
	60.5	8.3	7.5	0.84	1.8	0.20	8.8	6.2	1.9	
	62.7	8.6	7.5	0.88	1.7	0.19	8.9		2.0	
	64.9	8.9	7.5	0.92	1.6	0.18	8.9		2.0	
	67.1	9.2	7.5	1.0	1.4	0.16	8.8		2.2	
	69.3	9.5	7.5	0.90	1.8	0.20	9.0		2.0	
	71.5	9.8	7.5	0.87	1.8	0.19	9.3	6.8	1.6	
	73.7	10.1	7.5	0.87	1.8	0.20	9.2	6.0	1.7	
	75.9	10.2	26.4	0.86	1.9	0.22	8.8		1.4	
	78.1	10.2	26.4	0.83	1.9	0.20	9.3		1.7	
	80.3	10.3	26.4	0.87	1.8	0.20	9.1		1.7	
	82.5	10.4	26.4	0.84	1.7	0.20	8.8	6.6	2.3	
	84.7	10.5	26.4	0.87	1.7	0.19	8.7		2.7	
	86.9	10.6	26.4	0.83	1.7	0.20	8.7		2.6	
	89.1	10.7	26.4	0.87	1.6	0.18	9.2		3.1	
	91.3	10.7	26.4	0.84	1.6	0.19	8.6	6.2	3.3	
	93.5	10.8	26.4	0.88	1.6	0.18	8.9		3.8	
	95.7	10.9	26.4	0.85	1.6	0.18	8.8		3.4	
	97.9	11.0	26.4	0.88	1.6	0.18	8.9		3.0	
	100	11.1	26.4	0.89	1.5	0.17	8.9		3.8	
	102	11.2	26.4	0.88	1.5	0.16	9.5	6.1	2.8	
	105	11.2	26.4	0.85	1.7	0.19	9.1		2.6	
	107	11.3	26.4	1.0	1.4	0.15	9.1		3.5	
	109	11.4	26.4	0.90	1.3	0.15	9.0		3.3	
	111	11.5	26.4	0.93	1.3	0.14	9.1	7.6	3.2	
	113	11.6	26.4	0.95	1.3	0.15	9.0		3.2	
	116	11.7	26.4	1.0	1.1	0.13	8.9		3.3	
	118	11.7	26.4	1.0	1.0	0.12	8.8		3.1	1.1
	120	11.8	26.4	1.0	1.1	0.13	8.8		3.1	
	122	11.9	26.4	1.0	1.2	0.14	8.1	7.7	2.8	
	124	12.0	26.4	1.0	1.1	0.12	8.7		3.1	
	127	12.1	26.4	1.0	1.0	0.11	9.0		3.0	0.95
	129	12.2	26.4	1.0	1.1	0.12	8.7		2.7	

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Core	Depth	Age	Linear sedimentation rate	Dry bulk density	Total org. C	Total nitrogen	C/N	Si_{OPAL}	$CaCO_3$	$\delta^{18}O$
	(cm)	(cal kyr BP)	(cm kyr^{-1})	(g cm^{-3})	(wt %)	(wt %)		(wt %)	(wt %)	(‰ vs PDB)
	131	12.2	26.4	1.0	1.1	0.13	8.5	5.8	2.9	
	133	12.3	26.4	1.0	1.2	0.13	8.9		2.3	
	135	12.4	26.4	1.0	1.1	0.13	8.7		2.4	1.1
	138	12.5	26.4	1.0	1.2	0.13	8.8		2.7	
	140	12.6	26.4	1.0	1.2	0.14	8.5		2.8	
	142	12.7	26.4	0.93	1.3	0.15	8.5	6.3	2.9	
	144	12.7	26.4	0.95	1.2	0.14	8.7		2.8	1.4
	146	12.8	26.4	1.0	1.1	0.12	9.0		3.1	
	149	12.9	26.4	1.0	1.1	0.12	9.0		3.4	
	151	13.0	26.4	0.68	1.1	0.12	9.6		4.3	
	152	13.0	26.4	1.0	1.1	0.13	8.9	6.9	3.2	
	154	13.1	26.4	0.88	1.2	0.14	8.7		3.3	1.2
	156	13.2	26.4	0.94	1.0	0.12	8.9		3.3	
	159	13.3	26.4	1.0	1.1	0.12	8.8		3.5	
	161	13.4	26.4	1.0	1.0	0.12	8.7		3.5	
	163	13.5	26.4	0.93	1.1	0.13	8.7	7.7	3.9	1.1
	165	13.5	26.4	1.0	1.1	0.13	8.5		3.8	
	167	13.6	26.4	0.93	1.1	0.13	8.7		3.5	
	170	13.7	26.4	0.90	1.1	0.13	8.7		2.8	
	172	13.8	26.4	0.94	1.2	0.13	9.0	9.1	2.2	
	174	13.9	26.4	0.95	1.1	0.12	8.8		3.0	
	176	14.0	26.4	0.95	1.0	0.12	8.8		3.1	
	178	14.0	26.4	1.0	1.0	0.11	8.8	7.1	2.8	
	181	14.1	26.4	0.95	1.1	0.13	8.4		2.8	
	183	14.2	26.4	0.93	1.1	0.13	8.5		2.8	
	185	14.3	26.4	0.93	1.1	0.13	8.6		3.2	
	187	14.4	26.4	0.94	1.1	0.13	8.7	6.2	3.5	
	189	14.5	26.4	1.0	1.1	0.12	8.7		3.2	1.0
	192	14.5	26.4	0.92	1.1	0.13	8.6		3.5	
	194	14.6	26.4	0.93	1.1	0.13	8.6		3.9	
	196	14.7	26.4	1.0	1.0	0.12	8.9		3.8	
	198	14.8	26.4	1.0	1.0	0.12	8.5	5.9	4.1	1.1
	200	14.9	26.4	1.0	1.0	0.12	8.6		4.1	
	203	15.0	26.4	1.0	0.95	0.11	8.8		4.0	
	205	15.0	26.4	1.0	1.0	0.11	8.9		3.6	
	207	15.1	26.4	1.0	0.87	0.11	8.1		4.0	1.4
	209	15.2	26.4	1.0	0.85	0.10	8.4	6.2	4.2	
	211	15.3	26.4	1.0	0.87	0.11	8.1		4.2	
	214	15.4	26.4	0.89	0.85	0.10	8.2		4.6	
	216	15.5	26.4	0.95	0.82	0.10	8.3		4.4	1.7
	218	15.5	26.4	1.0	0.84	0.10	8.0	7.6	4.8	
	220	15.6	26.4	0.94	0.84	0.10	8.2		4.4	
	222	15.7	26.4	1.0	0.84	0.10	8.2		4.8	
	225	15.8	26.4	1.0	0.81	0.10	8.0		4.7	1.6
	227	15.9	26.4	1.0	0.82	0.10	8.0		4.8	
	229	16.0	26.4	1.0	0.82	0.10	7.9	7.1	4.5	
	231	16.0	26.4	1.0	0.82	0.10	8.0		4.4	
	233	16.1	26.4	0.94	0.81	0.10	8.1		4.5	1.7
	236	16.2	26.4	1.0	0.82	0.11	7.7		4.1	
	238	16.3	26.4	1.0	0.78	0.10	7.9	6.4	4.2	

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Core	Depth	Age	Linear sedimentation rate	Dry bulk density	Total org. C	Total nitrogen	C/N	Si_{OPAL}	$CaCO_3$	$\delta^{18}O$
	(cm)	(cal kyr BP)	(cm kyr^{-1})	(g cm^{-3})	(wt %)	(wt %)		(wt %)	(wt %)	(‰ vs PDB)
	240	16.4	26.4	0.93	0.78	0.09	8.5		4.1	
	242	16.5	26.4	0.95	0.78	0.10	7.8		3.7	1.8
	244	16.5	26.4	1.0	0.71	0.09	7.9		3.1	
	247	16.6	26.4	0.89	0.78	0.10	7.7		3.5	
	249	16.7	26.4	1.0	0.78	0.10	7.9	7.2	4.2	1.7
	252	16.8	26.4	1.0	0.77	0.10	7.6		3.9	1.4
	254	16.9	54.6	1.0	0.85	0.10	8.5		3.0	1.8
	256	16.9	54.6	1.0	0.77	0.10	8.1		2.9	1.8
	258	16.9	54.6	0.92	0.83	0.10	8.7	6.6	2.9	1.8
	260	17.0	54.6	1.0	0.81	0.10	8.5		3.0	1.6
	263	17.0	54.6	1.0	0.80	0.09	8.6		2.7	1.6
	265	17.1	54.6	0.92	0.82	0.10	8.7		2.4	1.8
	267	17.1	54.6	0.94	0.80	0.09	8.8	6.7	2.8	1.9
	269	17.1	54.6	1.0	0.82	0.09	9.2		2.5	1.7
	271	17.2	54.6	1.0	0.81	0.10	8.4		3.0	1.9
	274	17.2	54.6	1.0	1.0	0.10	11		1.7	1.6
	276	17.3	54.6	1.0	0.79	0.09	8.4		4.0	1.9
	278	17.3	54.6	1.0	0.77	0.09	8.7	7.9	4.4	1.6
	280	17.3	54.6	1.0	0.73	0.08	8.7	7.4	4.0	2.0
	282	17.4	54.6	1.0	0.69	0.09	7.8		3.9	1.7
	285	17.4	54.6	1.0	0.83	0.10	8.7		4.6	1.9
	287	17.5	54.6	1.0	0.80	0.09	9.0		4.6	2.2
	289	17.5	54.6	0.95	0.76	0.10	7.9		5.3	1.9
	291	17.5	54.6	1.0	1.0	0.09	11.0	8.6	3.2	2.5
	293	17.6	54.6	1.0	0.87	0.10	9.1		6.7	3.5
	296	17.6	54.6	1.0	0.81	0.10	8.4		8.5	3.6
	298	17.7	54.6	0.95	0.80	0.10	8.2		7.5	3.5
	300	17.7	54.6	1.0	1.2	0.10	12.1	7.7	2.8	2.7
	302	17.7	54.6	1.0	0.88	0.09	9.6		2.5	2.2
	304	17.8	54.6	0.91	0.86	0.10	8.7		2.7	1.9
	307	17.8	54.6	0.90	0.93	0.10	9.2		2.2	2.0
	309	17.9	54.6	0.89	1.0	0.10	10.0		2.0	2.2
	311	17.9	54.6	0.93	0.85	0.10	8.4	7.4	4.1	2.3
	313	17.9	54.6	0.91	0.82	0.10	8.4		7.2	3.3
	315	18.0	54.6	0.93	0.75	0.09	8.4		13.8	3.7
	318	18.0	54.6	1.0	0.79	0.09	8.8		9.9	3.4
	320	18.1	54.6	0.92	0.81	0.09	8.8		5.3	3.4
	322	18.1	54.6	0.95	0.86	0.10	8.7	7.0	4.0	2.5
	324	18.1	220	0.95	0.89	0.10	9.2		2.9	
	326	18.1	220	0.94	0.86	0.10	9.0		3.0	
	329	18.1	220	1.0	0.80	0.09	9.3		2.8	
	331	18.2	220	1.0	0.87	0.09	10	7.8	2.3	2.4
	333	18.2	220	0.93	0.84	0.09	9.1		2.6	
	335	18.2	220	1.0	0.77	0.09	9.0		2.9	
	337	18.2	220	0.92	0.79	0.09	8.7		2.8	
	340	18.2	220	1.0	0.79	0.09	9.3		3.1	2.4
	342	18.2	220	0.92	0.80	0.10	8.3	7.9	2.9	
	344	18.2	220	0.87	0.79	0.09	8.5		2.7	
	348	18.2	220	0.91	0.81	0.10	8.4	7.6	3.2	2.4
	353	18.3	220	0.89	0.84	0.09	9.1		3.2	

Supplementary Table S1. Calculated and measured parameters for sediment core PC-1, including TOC, TN, $CaCO_3$, and Si_{OPAL} contents, C/N, opal/$CaCO_3$ ratio, and stable oxygen isotope ratio in tests of the planktic foraminifer *G.bulloides*.

Core	Depth	Age	Linear sedimentation rate	Dry bulk density	Total org. C	Total nitrogen	C/N	Si_{OPAL}	$CaCO_3$	$\delta^{18}O$
	(cm)	(cal kyr BP)	(cm kyr^{-1})	(g cm^{-3})	(wt %)	(wt %)		(wt %)	(wt %)	(‰ vs PDB)
	357	18.3	220	0.93	0.87	0.09	9.4		2.3	2.3
	362	18.3	220	0.92	0.83	0.10	8.8	7.3	3.2	
	366	18.3	220	0.94	0.77	0.09	8.8		3.0	2.5
	370	18.4	47.7	0.94	0.81	0.09	8.9	6.3	3.5	
	375	18.5	47.7	1.0	0.79	0.09	8.4		3.2	2.5
	379	18.6	47.7	0.93	0.76	0.09	8.6	8.4	3.4	
	384	18.7	47.7	1.0	0.79	0.09	8.5	6.8	3.5	2.4
	388	18.8	47.7	1.0	0.81	0.09	8.6		3.6	
	392	18.9	47.7	1.0	0.90	0.10	9.4	6.5	2.4	2.4
	397	19.0	47.7	1.0	0.78	0.09	8.5		4.1	
	401	19.0	47.7	1.0	0.77	0.09	8.3	6.9	3.7	2.4
	406	19.1	47.7	1.0	0.75	0.09	8.4		4.0	
	410	19.2	47.7	1.0	0.76	0.08	9.0		3.9	2.4
	414	19.3	47.7	1.0	0.82	0.09	9.2	7.1	3.4	
	419	19.4	47.7	1.0	0.71	0.08	8.5		3.5	2.5
	423	19.5	47.7	1.0	0.70	0.08	8.7	6.8	3.3	
	428	19.6	47.7	0.91	0.72	0.08	8.6		3.4	2.5
	432	19.7	47.7	0.94	0.77	0.09	8.5	7.1	3.2	
	436	19.8	47.7	1.0	0.74	0.09	8.7		3.7	2.5
	441	19.9	47.7	0.83	0.70	0.09	8.2	6.1	3.9	
	445	20.0	47.7	0.92	0.76	0.09	8.3		3.8	2.4
	450	20.1	47.7	0.93	0.78	0.10	7.9		3.5	
	454	20.2	47.7	0.94	0.85	0.11	7.9	7.0	3.6	2.2
	458	20.2	47.7	1.0	0.81	0.11	7.7		2.7	
	463	20.3	47.7	1.0	0.83	0.10	8.3	6.7	3.1	2.4
	467	20.4	68.2	1.0	0.81	0.10	8.0		3.1	
	472	20.5	68.2	1.0	0.75	0.10	7.9	6.8	3.7	2.4
	476	20.5	68.2	1.0	0.78	0.10	8.0		5.1	
	480	20.6	68.2	0.93	0.76	0.09	8.5		4.2	2.5
	485	20.7	68.2	1.0	0.76	0.10	7.8	6.4	4.7	
	489	20.7	68.2	1.0	0.74	0.09	8.1		3.7	2.4
	494	20.8	68.2	0.93	0.77	0.10	8.1	7.2	4.3	
	498	20.9	68.2	1.0	0.78	0.10	8.1		3.9	2.4
	502	20.9	68.2	1.0	0.77	0.10	7.7	7.0	4.6	
	507	21.0	68.2	1.0	0.76	0.09	8.3		4.3	2.5
	511	21.1	68.2	1.0	0.71	0.09	8.3	7.1	3.7	
	516	21.1	68.2	1.0	0.74	0.09	8.2		4.0	2.4
	520	21.2	68.2	1.0	0.77	0.09	8.4		4.4	
	524	21.2	68.2	1.0	0.73	0.08	8.7	5.9	4.1	2.4
	529	21.3	68.2	0.89	0.70	0.09	7.8		3.4	
	533	21.4	68.2	1.0	0.73	0.09	8.1	7.2	3.6	2.3
	538	21.4	68.2	0.92	1.0	0.09	11.3		1.0	
	542	21.5	68.2	0.89	0.80	0.10	8.0	6.8	3.1	2.3
	546	21.6	68.2	1.0	0.77	0.10	8.1		4.2	
	551	21.6	68.2	1.0	0.79	0.10	7.9		3.9	2.1
	555	21.7	68.2	1.0	0.78	0.09	9.0	7.8	4.3	
	560	21.8	68.2	1.0	0.79	0.09	8.7		3.7	2.3
	564	21.8	68.2	1.0	0.79	0.09	8.9	7.9	2.9	
	568	21.9	68.2	1.0	0.80	0.09	9.0		3.5	2.3
	573	22.0	68.2	1.0	0.80	0.09	8.9	7.1	3.9	

Supplementary Table S1. Calculated and measured parameters for sediment core PC-1, including TOC, TN, $CaCO_3$, and Si_{OPAL} contents, C/N, opal/$CaCO_3$ ratio, and stable oxygen isotope ratio in tests of the planktic foraminifer *G.bulloides*.

Core	Depth	Age	Linear sedimentation rate	Dry bulk density	Total org. C	Total nitrogen	C/N	Si_{OPAL}	$CaCO_3$	$\delta^{18}O$
	(cm)	(cal kyr BP)	(cm kyr^{-1})	(g cm^{-3})	(wt %)	(wt %)		(wt %)	(wt %)	(‰ vs PDB)
	577	22.0	68.2	1.0	0.76	0.09	8.4		3.2	2.2
	582	22.1	68.2	1.0	0.82	0.09	8.8	6.8	3.2	
	586	22.1	68.2	0.95	0.84	0.09	9.0		3.0	2.4
	590	22.2	68.2	0.90	0.85	0.09	9.4		2.5	
	595	22.3	68.2	1.0	0.82	0.10	8.3	6.4	2.5	2.2
	599	22.3	68.2	1.0	0.80	0.10	8.2		2.9	
	604	22.4	68.2	0.91	0.84	0.11	7.9	7.4	3.0	2.4
	608	22.5	68.2	1.0	0.84	0.10	8.3		2.3	
	612	22.5	68.2	0.93	0.86	0.10	8.6	6.0	2.4	2.5
	617	22.6	68.2	1.0	0.85	0.10	8.2		2.9	
	621	22.7	68.2	1.0	0.81	0.10	8.5	6.8	3.1	2.4
	626	22.7	68.2	1.0	0.79	0.10	8.2		2.8	
	630	22.8	68.2	1.0	0.78	0.09	8.4		3.1	2.2
	634	22.9	68.2	0.71	0.82	0.10	8.4	6.7	3.0	

Supplementary Table S2. Calculated and measured parameters for sediment core PC-3, including TOC, TN, and Si_{OPAL} contents, and C/N.

Core	Depth (cm)	Age (cal kyr BP)	Linear sedimentation rate (cm kyr^{-1})	Dry bulk density (g cm^{-3})	Total org. C (wt %)	Total nitrogen (wt %)	C/N	Si_{OPAL} (wt %)
PC3	21.4	2.6	36.7	0.9	1.6	0.20	13	1.7
	23.6	2.6	36.7	0.95	1.5	0.18	11	
	25.9	2.7	36.7	0.93	1.5	0.20	11	
	28.1	2.8	36.7	1.0	1.4	0.17	13	
	30.4	2.8	36.7	1.0	1.4	0.19	11	1.6
	32.6	2.9	36.7	1.0	1.3	0.16	9.1	
	34.9	2.9	36.7	1.0	1.2	0.18	8.3	
	37.1	3.0	36.7	1.0	1.4	0.17	12	
	39.4	3.1	36.7	0.95	1.3	0.16	9.6	
	41.6	3.1	36.7	0.89	1.4	0.17	11	1.6
	43.9	3.2	36.7	0.91	1.4	0.18	9.2	
	46.1	3.3	36.7	1.0	1.4	0.18	10	
	48.4	3.3	36.7	1.0	1.3	0.16	11	
	50.6	3.4	36.7	1.0	1.3	0.17	11	1.2
	52.9	3.4	36.7	1.0	1.3	0.16	13	
	55.1	3.5	36.7	0.94	1.3	0.16	13	
	57.4	3.6	36.7	1.0	1.2	0.16	13	
	59.6	3.6	36.7	1.0	1.3	0.16	12	
	61.9	3.7	36.7	1.0	1.2	0.16	13	1.4
	64.1	3.7	36.7	0.93	1.3	0.17	11	
	66.4	3.8	36.7	1.0	1.3	0.16	11	
	68.6	3.9	36.7	1.0	1.3	0.17	10	
	70.9	3.9	36.7	1.0	1.3	0.18	9.7	1.7
	73.1	4.0	36.7	—	—	—	—	1.8
	75.4	4.0	36.7	—	—	—	—	
	76.0	4.1	36.7	1.0	1.4	0.17	8.7	
	78.2	4.1	36.7	0.92	1.4	0.18	9.8	
	80.5	4.2	36.7	0.95	1.5	0.18	9.4	
	82.7	4.2	36.7	1.0	1.4	0.17	12	2.2
	85.0	4.3	36.7	1.0	1.4	0.18	9.2	
	87.2	4.4	36.7	1.0	1.4	0.18	12	
	89.5	4.4	36.7	1.0	1.3	0.17	12	
	91.7	4.5	36.7	0.95	1.4	0.18	11	
	94.0	4.6	36.7	1.0	1.4	0.18	10	
	96.2	4.6	41.9	0.92	1.4	0.19	9.8	2.1
	98.5	4.7	41.9	1.0	1.4	0.18	14	
	101	4.7	41.9	1.0	1.4	0.18	9.6	
	103	4.8	41.9	0.94	1.4	0.19	11	1.9
	105	4.8	41.9	0.89	1.5	0.19	11	
	107	4.9	41.9	1.0	1.5	0.19	10	
	110	4.9	41.9	1.0	1.4	0.17	13	
	112	5.0	41.9	1.0	1.3	0.18	9.6	1.6
	114	5.0	41.9	0.95	1.4	0.17	9.9	
	116	5.1	41.9	1.0	1.3	0.17	13	
	119	5.2	41.9	1.0	1.3	0.18	12	
	121	5.2	41.9	1.0	1.3	0.17	8.6	1.8
	123	5.3	41.9	1.0	1.2	0.17	10	
	125	5.3	41.9	1.1	1.1	0.16	11	
	128	5.4	41.9	1.0	1.2	0.15	15	
	130	5.4	41.9	1.0	1.2	0.17	14	
	132	5.5	41.9	1.0	1.2	0.14	13	1.8
	134	5.5	41.9	1.0	1.2	0.15	13	
	137	5.6	41.9	1.0	1.2	0.14	13	
	139	5.6	41.9	1.1	1.3	0.15	13	

Supplementary Table S2. Calculated and measured parameters for sediment core PC-3, including TOC, TN, and Si_{OPAL} contents, and C/N.

Core	Depth (cm)	Age (cal kyr BP)	Linear sedimentation rate (cm kyr^{-1})	Dry bulk density (g cm^{-3})	Total org. C (wt %)	Total nitrogen (wt %)	C/N	Si_{OPAL} (wt %)
	141	5.7	41.9	1.0	1.4	0.17	16	1.8
	143	5.7	36.9	1.0	1.1	0.12	15	
	146	5.8	36.9	1.0	1.2	0.14	14	
	148	5.9	36.9	1.1	1.1	0.13	13	
	150	5.9	36.9	1.1	1.2	0.14	17	
	152	6.0	36.9	1.1	1.1	0.14	14	1.4
	155	6.1	36.9	1.2	1.1	0.14	10	
	157	6.1	36.9	1.0	1.2	0.15	12	
	159	6.2	36.9	1.0	1.2	0.15	14	
	161	6.2	36.9	1.0	1.2	0.16	13	1.7
	164	6.3	36.9	1.0	1.2	0.15	13	
	166	6.4	36.9	1.1	1.2	0.14	14	
	168	6.4	36.9	1.0	1.3	0.16	10	
	170	6.5	36.9	1.0	1.4	0.18	13	
	173	6.5	36.9	1.1	1.2	0.15	12	1.8
	175	6.6	36.9	1.0	1.4	0.17	11	
	177	6.7	36.9	1.1	1.3	0.15	11	
	178	6.7	36.9	1.1	1.2	0.14	11	1.9
	180	6.7	36.9	1.1	1.2	0.14	9.8	
	182	6.8	36.9	1.1	1.1	0.12	11	
	185	6.9	36.9	1.1	1.1	0.12	15	
	187	6.9	36.9	1.1	1.2	0.13	15	1.5
	189	7.0	36.9	1.1	1.3	0.14	11	
	191	7.0	36.9	1.2	1.2	0.14	10	
	194	7.1	36.9	1.1	1.0	0.15	11	
	196	7.2	36.9	1.1	1.1	0.14	9.0	
	198	7.2	36.9	1.1	1.2	0.15	11	2.2
	200	7.3	36.9	1.1	1.2	0.14	11	
	203	7.4	36.9	1.1	1.2	0.14	12	
	205	7.4	36.9	1.1	1.1	0.13	11	
	207	7.5	60.0	1.1	1.1	0.13	16	2.0
	209	7.5	60.0	1.0	1.1	0.12	11	
	212	7.5	60.0	1.1	1.1	0.12	15	
	214	7.6	60.0	1.1	1.0	0.12	15	
	216	7.6	60.0	1.1	1.1	0.12	14	
	218	7.7	60.0	1.1	1.0	0.11	9.6	1.8
	221	7.7	60.0	1.1	1.1	0.12	11	
	223	7.7	60.0	1.2	1.0	0.11	13	
	225	7.8	60.0	1.2	1.1	0.12	12	
	227	7.8	60.0	1.1	1.0	0.11	13	2.0
	230	7.8	60.0	1.1	1.0	0.13	11	
	232	7.9	60.0	1.1	1.0	0.11	18	
	234	7.9	60.0	1.2	1.0	0.11	14	
	236	8.0	60.0	1.1	0.91	0.09	16	
	239	8.0	60.0	1.1	1.0	0.11	14	2.2
	241	8.0	60.0	1.1	0.94	0.11	10	
	243	8.1	60.0	1.1	0.91	0.11	17	
	245	8.1	60.0	1.1	0.89	0.11	15	
	248	8.1	60.0	1.1	1.0	0.11	13	1.8
	250	8.2	60.0	1.2	0.93	0.10	17	
	252	8.2	60.0	1.3	0.90	0.14	7.9	
	254	8.3	60.0	1.2	0.83	0.092	18	
	257	8.3	60.0	1.5	0.78	0.089	10	
	259	8.3	60.0	1.4	0.69	0.076	15	2.7

Supplementary Table S2. Calculated and measured parameters for sediment core PC-3, including TOC, TN, and Si_{OPAL} contents, and C/N.

Core	Depth (cm)	Age (cal kyr BP)	Linear sedimentation rate (cm kyr^{-1})	Dry bulk density (g cm^{-3})	Total org. C (wt %)	Total nitrogen (wt %)	C/N	Si_{OPAL} (wt %)
	261	8.4	60.0	1.5	0.51	0.054	10	
	263	8.4	60.0	1.2	0.55	0.059	14	
	266	8.4	60.0	1.4	0.48	0.040	21	
	268	8.5	60.0	1.4	0.48	0.041	20	1.4
	270	8.5	60.0	1.4	0.47	0.051	14	
	272	8.6	60.0	1.4	0.54	0.064	8.8	1.3
	275	8.6	60.0	1.4	0.51	0.052	15	
	277	8.6	60.0	1.4	0.52	0.054	11	1.2
	279	8.7	60.0	—	—	—	—	
	280	8.7	60.0	1.4	0.56	0.07	11	1.2
	282	8.7	60.0	1.4	0.55	0.07	12	
	285	8.8	60.0	1.5	0.55	0.08	9.3	
	287	8.8	60.0	1.5	0.43	0.043	16	
	289	8.8	60.0	1.5	0.55	0.043	11	
	291	8.9	60.0	1.4	0.55	0.08	9	1.2
	294	8.9	60.0	1.4	0.58	0.08	10	
	296	9.0	60.0	1.4	0.57	0.07	11	
	298	9.0	60.0	1.4	0.55	0.07	16	
	300	9.0	60.0	1.4	0.52	0.07	11	1.5
	303	9.1	147	1.5	0.49	0.05	16	
	305	9.1	147	1.4	0.52	0.06	16	
	307	9.1	147	1.5	0.51	0.06	15	
	309	9.1	147	1.5	0.50	0.06	10	
	312	9.1	147	1.4	0.53	0.05	11	1.5
	314	9.1	147	1.5	0.46	0.043	15	
	316	9.2	147	1.4	0.50	0.06	14	
	318	9.2	147	1.4	0.50	0.05	19	
	321	9.2	147	1.4	0.43	0.05	17	1.7
	323	9.2	147	1.4	0.55	0.06	16	
	325	9.2	147	1.4	0.60	0.07	10	
	327	9.2	147	1.4	0.56	0.06	14	
	330	9.3	147	1.4	0.53	0.06	10	
	332	9.3	147	1.4	0.58	0.08	7.9	1.4
	334	9.3	147	1.4	0.53	0.05	13	
	336	9.3	147	1.5	0.53	0.06	16	
	339	9.3	147	1.4	0.65	0.07	11	
	341	9.3	147	1.4	0.61	0.06	12	1.7
	343	9.3	147	1.4	0.53	0.05	14	
	345	9.4	147	1.4	0.55	0.05	16	
	348	9.4	147	1.4	0.54	0.047	13	
	350	9.4	147	1.4	0.56	0.053	12	1.4
	352	9.4	147	1.4	0.52	0.046	22	
	354	9.4	147	1.4	0.53	0.060	14	
	357	9.4	147	1.3	0.61	0.063	14	
	359	9.4	147	1.4	0.53	0.056	16	
	361	9.5	147	1.3	0.68	0.059	14	1.3
	363	9.5	147	1.3	0.73	0.075	13	
	366	9.5	147	1.2	0.79	0.077	17	
	368	9.5	147	1.3	0.69	0.070	14	
	370	9.5	147	1.3	0.78	0.085	16	1.5
	372	9.5	147	1.3	0.75	0.085	11	
	375	9.6	147	1.3	0.59	0.069	17	
	377	9.6	147	1.2	0.72	0.083	13	
	379	9.6	147	1.2	0.84	0.10	11	1.7

Supplementary Table S2. Calculated and measured parameters for sediment core PC-3, including TOC, TN, and Si_{OPAL} contents, and C/N.

Core	Depth (cm)	Age (cal kyr BP)	Linear sedimentation rate (cm kyr^{-1})	Dry bulk density (g cm^{-3})	Total org. C (wt %)	Total nitrogen (wt %)	C/N	Si_{OPAL} (wt %)
	380	9.6	147	1.3	0.74	0.085	16	
	383	9.6	147	1.2	0.78	0.093	12	1.7
	385	9.6	147	1.2	0.75	0.080	19	
	387	9.6	147	1.2	0.77	0.082	10	
	389	9.7	147	1.3	0.67	0.076	17	
	392	9.7	147	1.3	0.66	0.073	12	
	394	9.7	147	1.3	0.59	0.067	15	2.0
	396	9.7	147	1.3	0.66	0.075	10	
	398	9.7	147	1.3	0.72	0.076	11	
	401	9.7	147	1.2	0.86	0.087	12	
	403	9.8	166	1.2	0.81	0.086	14	1.9
	405	9.8	166	1.3	0.75	0.078	11	
	407	9.8	166	1.3	0.66	0.066	13	
	410	9.8	166	1.3	0.59	0.062	19	
	412	9.8	166	1.3	0.69	0.070	12	1.7
	414	9.8	166	1.4	0.68	0.071	12	
	416	9.8	166	1.3	0.76	0.081	11	
	419	9.8	166	1.3	0.57	0.062	18	
	421	9.9	166	1.3	0.73	0.079	13	
	423	9.9	166	1.3	0.60	0.066	13	2.5
	425	9.9	166	1.3	0.68	0.077	16	
	428	9.9	166	1.3	0.61	0.069	15	
	430	9.9	166	1.4	0.60	0.068	15	
	432	9.9	166	1.3	0.72	0.078	12	2.2
	434	9.9	166	1.3	0.66	0.067	11	
	437	10.0	166	1.4	0.64	0.070	16	
	439	10.0	166	1.3	0.62	0.069	11	
	441	10.0	166	1.3	0.66	0.077	11	
	443	10.0	166	1.3	0.70	0.086	14	1.6
	446	10.0	166	1.2	0.68	0.077	13	
	448	10.0	166	1.3	0.74	0.081	14	
	450	10.0	166	1.3	0.71	0.079	12	
	452	10.0	166	1.3	0.69	0.078	9.5	2.1
	455	10.1	166	1.2	0.69	0.076	10	
	457	10.1	166	1.3	0.69	0.10	7.5	
	459	10.1	166	1.3	0.65	0.089	11	
	461	10.1	166	1.3	0.69	0.088	11	
	464	10.1	166	1.3	0.75	0.10	10	1.7
	466	10.1	166	1.3	0.67	0.082	12	
	468	10.1	166	1.3	0.62	0.074	11	
	470	10.2	166	1.3	0.67	0.080	10	
	473	10.2	166	1.4	0.64	0.076	12	2.1
	475	10.2	166	1.4	0.65	0.077	13	
	477	10.2	166	1.4	0.61	0.069	13	
	479	10.2	166	1.5	0.70	0.081	16	
	482	10.2	166	1.4	0.67	0.081	15	
	484	10.2	166	1.4	0.67	0.082	10	1.8
	486	10.3	166	1.3	0.72	0.090	9.4	
	488	10.3	166	1.3	0.70	0.087	11	
	491	10.3	166	1.4	0.72	0.087	10	
	493	10.3	166	1.3	0.61	0.075	15	2.0
	495	10.3	166	1.4	0.65	0.080	13	
	497	10.3	166	1.3	0.64	0.081	11	
	500	10.3	166	1.3	0.64	0.079	13	

Supplementary Table S2. Calculated and measured parameters for sediment core PC-3, including TOC, TN, and Si_{OPAL} contents, and C/N.

Core	Depth (cm)	Age (cal kyr BP)	Linear sedimentation rate (cm kyr^{-1})	Dry bulk density (g cm^{-3})	Total org. C (wt %)	Total nitrogen (wt %)	C/N	Si_{OPAL} (wt %)
	502	10.3	166	1.4	0.56	0.067	10	2.0
	504	10.4	166	1.4	0.63	0.078	9.3	
	506	10.4	166	1.3	0.65	0.075	11	
	509	10.4	166	1.3	0.66	0.083	14	
	511	10.4	166	1.4	0.69	0.086	12	
	513	10.4	166	1.4	0.56	0.076	8.5	2.1
	515	10.4	166	1.4	0.46	0.062	8.0	
	518	10.4	166	1.6	0.14	0.024	11	
	520	10.5	166	1.6	0.15	0.022	14	
	522	10.5	166	1.4	0.52	0.063	14	1.4
	524	10.5	166	1.3	0.68	0.083	16	
	527	10.5	166	1.3	0.68	0.078	9.2	
	529	10.5	166	1.3	0.69	0.083	11	
	531	10.5	166	1.3	0.58	0.067	11	
	533	10.5	166	1.3	0.68	0.071	20	1.7
	536	10.6	166	1.3	0.63	0.072	11	
	538	10.6	166	1.3	0.67	0.078	12	
	540	10.6	166	1.3	0.67	0.079	11	
	542	10.6	166	1.3	0.68	0.080	11	2.5
	545	10.6	166	1.3	0.69	0.080	13	
	547	10.6	166	1.3	0.67	0.078	15	
	549	10.6	166	1.3	0.68	0.081	9.7	
	551	10.6	166	1.3	0.58	0.070	10	
	554	10.7	166	1.4	0.48	0.058	15	2.0
	556	10.7	166	1.3	0.63	0.077	13	
	558	10.7	166	1.4	0.63	0.073	13	
	560	10.7	166	1.3	0.87	0.094	17	
	563	10.7	166	1.3	0.75	0.085	14	2.1
	565	10.7	166	1.3	0.72	0.072	14	
	567	10.7	166	1.3	0.74	0.077	11	
	569	10.8	166	1.2	0.81	0.084	10	
	572	10.8	166	1.3	0.76	0.078	12	
	574	10.8	166	1.3	0.85	0.080	12	2.2
	576	10.8	166	1.3	0.78	0.077	13	
	578	10.8	166	—	—	—	—	
	580	10.8	166	1.3	0.75	0.080	11	
	582	10.8	166	1.5	0.70	0.083	12	2.4
	584	10.8	166	1.3	0.73	0.083	13	
	586	10.9	166	1.3	0.73	0.081	15	
	589	10.9	166	1.3	0.77	0.084	10	
	591	10.9	166	1.3	0.75	0.080	11	
	593	10.9	166	1.3	0.74	0.080	10	2.5
	595	10.9	166	1.3	0.77	0.086	13	
	598	10.9	166	1.3	0.64	0.069	17	
	600	10.9	166	1.3	0.65	0.074	17	
	602	11.0	182	1.3	0.66	0.072	16	1.8
	604	11.0	182	1.3	0.74	0.084	12	
	607	11.0	182	1.3	0.68	0.076	14	
	609	11.0	182	1.3	0.68	0.077	12	
	611	11.0	182	1.3	0.70	0.076	13	
	613	11.0	182	1.3	0.75	0.080	10	2.2
	616	11.0	182	1.2	0.78	0.087	10	
	618	11.0	182	1.3	0.75	0.081	11	
	620	11.1	182	1.2	0.82	0.090	12	

Supplementary Table S2. Calculated and measured parameters for sediment core PC-3, including TOC, TN, and Si_{OPAL} contents, and C/N.

Core	Depth (cm)	Age (cal kyr BP)	Linear sedimentation rate (cm kyr^{-1})	Dry bulk density (g cm^{-3})	Total org. C (wt %)	Total nitrogen (wt %)	C/N	Si_{OPAL} (wt %)
	622	11.1	182	1.3	0.79	0.091	13	2.5
	625	11.1	182	1.3	0.76	0.085	14	
	627	11.1	182	1.3	0.66	0.077	13	
	629	11.1	182	1.3	0.66	0.076	11	
	631	11.1	182	1.3	0.71	0.082	13	
	634	11.1	182	1.3	0.66	0.077	13	2.1
	636	11.1	182	1.3	0.68	0.075	9.9	
	638	11.2	182	1.3	0.70	0.080	15	
	640	11.2	182	1.3	0.72	0.085	12	
	643	11.2	182	1.3	0.77	0.090	12	2.7
	645	11.2	182	1.3	0.69	0.079	14	
	647	11.2	182	1.3	0.69	0.082	13	
	649	11.2	182	1.3	0.67	0.081	16	
	652	11.2	182	1.3	0.67	0.078	10	
	654	11.2	182	1.3	0.67	0.080	12	2.4
	656	11.3	182	1.3	0.66	0.077	14	
	658	11.3	182	1.3	0.64	0.076	13	
	661	11.3	182	1.3	0.74	0.085	11	
	663	11.3	182	1.3	0.70	0.084	12	1.9
	665	11.3	182	1.3	0.73	0.085	12	
	667	11.3	182	1.2	0.76	0.091	17	
	670	11.3	182	1.3	0.69	0.077	11	
	672	11.3	182	1.3	0.74	0.088	13	2.4
	674	11.3	182	1.4	0.68	0.076	12	
	676	11.4	182	1.3	0.73	0.086	16	
	679	11.4	182	1.3	0.73	0.088	17	
	681	11.4	182	1.3	0.68	0.080	10	2.4
	683	11.4	182	1.3	0.71	0.081	10	
	685	11.4	182	1.3	0.74	0.088	14	
	688	11.4	182	1.3	0.68	0.083	14	
	690	11.4	182	1.3	0.68	0.079	12	2.3
	692	11.4	182	1.3	0.70	0.083	11	
	694	11.5	182	1.3	0.78	0.094	9.6	
	697	11.5	182	1.3	0.76	0.089	10	
	699	11.5	182	1.3	0.81	0.091	11	2.6
	701	11.5	182	1.3	0.72	0.085	14	
	703	11.5	182	1.3	0.73	0.087	9.3	
	706	11.5	182	1.3	0.73	0.088	14	
	708	11.5	182	1.3	0.74	0.087	14	
	710	11.5	182	1.3	0.66	0.080	15	
	712	11.6	182	1.3	0.63	0.076	13	
	715	11.6	182	1.3	0.68	0.082	12	
	717	11.6	182	1.3	0.73	0.094	9.2	
	719	11.6	182	1.3	0.70	0.090	14	2.2
	721	11.6	182	1.3	0.69	0.086	13	
	724	11.6	182	1.3	0.67	0.085	12	
	726	11.6	182	1.3	0.66	0.084	14	
	728	11.6	182	1.2	0.68	0.087	11	
	730	11.7	182	1.3	0.69	0.087	13	2.4
	733	11.7	182	1.3	0.68	0.082	16	
	735	11.7	182	1.3	0.71	0.089	11	
	737	11.7	182	1.3	0.71	0.093	11	
	739	11.7	182	1.3	0.70	0.090	9.0	
	742	11.7	182	1.3	0.65	0.082	10	2.3

Supplementary Table S2. Calculated and measured parameters for sediment core PC-3, including TOC, TN, and Si_{OPAL} contents, and C/N.

Core	Depth (cm)	Age (cal kyr BP)	Linear sedimentation rate (cm kyr^{-1})	Dry bulk density (g cm^{-3})	Total org. C (wt %)	Total nitrogen (wt %)	C/N	Si_{OPAL} (wt %)
	744	11.7	182	1.3	0.65	0.080	9.1	
	746	11.7	182	1.3	0.67	0.088	8.3	
	748	11.8	182	1.3	0.62	0.078	12	
	751	11.8	182	1.3	0.65	0.081	13	2.5
	753	11.8	182	1.3	0.67	0.087	13	
	755	11.8	182	1.3	0.65	0.085	13	
	757	11.8	182	1.3	0.66	0.084	10	
	760	11.8	182	1.3	0.65	0.085	11	2.1
	762	11.8	182	1.3	0.60	0.075	10	
	764	11.8	182	1.4	0.65	0.083	17	
	766	11.9	182	1.3	0.71	0.088	10	
	769	11.9	182	1.3	0.70	0.084	9.1	
	771	11.9	182	1.3	0.71	0.087	14	2.7
	773	11.9	182	1.3	0.85	0.105	9.3	
	775	11.9	182	1.3	0.63	0.078	14	
	778	11.9	182	1.4	0.60	0.077	14	
	780	11.9	182	1.4	0.60	0.077	13	2.3
	782	11.9	182	1.4	0.62	0.077	12	
	784	12.0	182	1.3	0.64	0.082	11	
	787	12.0	182	1.3	0.67	0.086	8.6	
	789	12.0	182	1.3	0.76	0.096	11	
	791	12.0	182	1.3	0.70	0.087	14	2.4
	793	12.0	182	1.3	0.70	0.087	12	
	796	12.0	182	1.3	0.74	0.090	12	
	798	12.0	182	1.3	0.71	0.093	10	
	800	12.0	182	1.3	0.68	0.084	14	2.5
	802	12.1	182	1.4	0.69	0.086	12	
	805	12.1	182	1.3	0.66	0.084	11	
	807	12.1	182	1.3	0.67	0.085	12	
	809	12.1	182	1.3	0.67	0.087	16	
	811	12.1	182	1.3	0.68	0.087	14	2.3
	814	12.1	182	1.3	0.64	0.085	12	
	816	12.1	182	1.3	0.70	0.092	8.3	
	818	12.1	182	1.4	0.67	0.083	10	
	820	12.2	182	1.3	0.68	0.084	9.4	2.3
	823	12.2	182	1.3	0.67	0.082	13	
	825	12.2	182	1.3	0.74	0.083	12	
	827	12.2	182	1.3	0.75	0.086	13	
	829	12.2	182	1.3	0.69	0.079	17	
	832	12.2	182	1.4	0.70	0.080	15	2.6
	834	12.2	182	1.3	0.68	0.079	10	
	836	12.2	182	1.3	0.67	0.077	16	
	838	12.3	182	1.3	0.65	0.070	11	
	841	12.3	182	1.3	0.63	0.069	12	2.3
	843	12.3	182	1.4	0.61	0.073	16	
	845	12.3	182	1.3	0.64	0.077	14	
	847	12.3	182	1.4	0.54	0.061	18	
	850	12.3	182	1.3	0.69	0.082	9.7	
	852	12.3	182	1.3	0.67	0.076	18	
	854	12.3	182	1.4	0.65	0.075	13	2.0
	856	12.4	182	1.4	0.63	0.070	15	
	859	12.4	182	1.3	0.70	0.073	11	
	861	12.4	182	1.3	0.69	0.074	12	2.0
	863	12.4	182	1.4	0.57	0.062	12	

Supplementary Table S2. Calculated and measured parameters for sediment core PC-3, including TOC, TN, and Si_{OPAL} contents, and C/N.

Core	Depth (cm)	Age (cal kyr BP)	Linear sedimentation rate (cm kyr^{-1})	Dry bulk density (g cm^{-3})	Total org. C (wt %)	Total nitrogen (wt %)	C/N	Si_{OPAL} (wt %)
	865	12.4	182	1.4	0.60	0.069	16	
	868	12.4	182	1.4	0.58	0.062	12	
	870	12.4	182	1.5	0.54	0.059	18	2.3
	872	12.4	182	1.4	0.60	0.067	15	
	874	12.5	182	1.4	0.66	0.073	12	
	876	12.5	182	1.4	0.71	0.075	19	
	878	12.5	182	1.4	0.65	0.074	12	
	880	12.5	182	1.4	0.65	0.073	14	
	882	12.5	182	1.4	0.64	0.074	13	1.9
	885	12.5	182	1.3	0.65	0.074	12	2.2
	887	12.5	182	1.3	0.67	0.086	11	
	889	12.5	182	1.3	0.71	0.087	10	
	891	12.5	182	1.3	0.69	0.082	13	
	894	12.6	182	1.3	0.66	0.078	10	1.9
	896	12.6	182	1.4	0.69	0.083	12	
	898	12.6	182	1.4	0.70	0.081	11	
	900	12.6	182	1.3	0.70	0.087	11	
	903	12.6	182	1.3	0.73	0.082	11	2.0
	905	12.6	182	1.3	0.78	0.097	14	
	907	12.6	182	1.4	0.73	0.089	12	
	909	12.6	182	1.3	0.70	0.100	12	
	912	12.7	182	1.3	0.65	0.087	11	
	914	12.7	182	1.4	0.61	0.078	9.5	2.2
	916	12.7	182	1.4	0.63	0.081	10	
	918	12.7	182	1.4	0.64	0.083	13	
	921	12.7	182	1.5	0.63	0.083	11	
	923	12.7	182	1.4	0.58	0.078	15	1.3
	925	12.7	182	1.4	0.57	0.076	8.7	
	927	12.7	182	1.4	0.60	0.080	13	
	930	12.8	182	1.4	0.61	0.079	11	
	932	12.8	182	1.5	0.63	0.091	8.1	2.4
	934	12.8	182	1.4	0.63	0.086	8.0	
	936	12.8	182	1.4	0.63	0.084	8.9	
	939	12.8	182	1.4	0.61	0.079	8.8	
	941	12.8	182	1.4	0.64	0.083	12	
	943	12.8	182	1.4	0.63	0.085	13	2.0
	945	12.8	182	1.4	0.64	0.086	8.8	
	948	12.9	182	1.4	0.62	0.084	8.9	
	950	12.9	182	1.4	0.62	0.086	8.8	
	952	12.9	182	1.4	0.63	0.086	10	1.6
	954	12.9	182	1.4	0.64	0.090	9.9	
	957	12.9	182	1.4	0.56	0.077	13	
	959	12.9	182	1.4	0.62	0.086	7.9	
	961	12.9	182	1.4	0.63	0.085	8.4	1.7