SUPPLEMENTARY INFORMATION



Supplementary Figure 1. Preparation line for purifying and separating diatom and radiolarian opal for isotope measurements.

PS1768-8 >250µm fraction, after 1. density separation and before ultrasonic treatment





PS1768-5 >250, 241.5 cm, magnification 100 fold



magnification 100 fold



PS1768-5 >250, 139.5 cm, magnification 100 fold



PS1768-8, 125-250, 241.5 cm, magnification 200 fold





PS1768-8, 125-250, 221.5 cm, magnification 200 fold



Supplementary Figure 2. Examples of different size class fractions of radiolarians

obtained through several sieving steps.



Diatom preservation after 6.5 hours ultrasonic treatment

Diatom preservation after 6.5 hours ultrasonic treatment

Supplementary Figure 3. Scanning Electron Microscope (SEM) images of pure diatom fractions. (A,B) Images from Holocene and glacial diatom fractions from core PS1778-5. The (rare) occurrence of thinly silicified but very well preserved diatom *Rhizosolenia antarctica* together with centric diatoms (A) and *Eucampia antarctica* (B) indicates excellent preservation of the purified diatom assemblages. (C, D) Images from Holocene and glacial diatom fractions from core PS1768-8. Although the samples were treated 6.5 hours in the ultrasonic bath the presevation of the diatoms is very good. (C) *Thalassiosira oliverana* and *Fragilariopsis kerguelensis* (rare occurrence), (D) *E. antarctica*.



Supplementary Figure 4. Scanning Electron Microscope (SEM) images of pure radiolarian fractions. (A, B) Images from Holocene and glacial radiolarian fractions (>125 μ m) from core PS1778-5. (C, D) Images from Holocene and glacial radiolarian fractions (125-250 μ m) from core PS1768-8 after 18 hours ultrasonic treatment. (E, F) Images from Holocene and glacial radiolarian fractions (> 250 μ m) from core PS1768-8 after 24 hours utrasonic treatment. Although the samples were treated for hours in the ultrasonic bath the presevation of the radiolarians in both cores is very good.



Supplementary Figure 5. Variations of the two most abundant diatom species in the diatom fractions used for isotopic measurements. The abundance variations in cores PS1768-8 and PS1778-5 are compared to δ^{18} O and δ^{30} Si measurements and summer sea surface temperature (SSST) changes. (a-d) Core PS1768-8 located in the GSIZ. (a) Diatom transfer-function-based estimates of summer sea-surface temperature (SSST) estimated from diatom assemblage compositions using the Imbrie and Kipp Method (IKM). The transfer function relies on a set up with 336 reference sites, 29 diatom taxa/taxa groups, logarithmictransformed diatom data, quadratic regression and a three-factor model, which results in root mean square errors of prediction (RMSEP) of 0.8°C (ref. S1). (b) δ^{18} O and (c) δ^{30} Si records measured at the diatom fraction. (d) Relative abundances of the diatom species Thalassiosira lentiginosa and Eucampia antarctica in the diatom fraction extracted for isotope measurements. (e-h) Core PS1778-5 located close to the glacial winter sea-ice edge. (e) SSST estimations based on diatom IKM transfer function^{S1}. (f) δ^{18} O and (g) δ^{30} Si records measured at the diatom fraction. (h) Relative abundances of the diatom species T. lentiginosa and E. antarctica in the diatom fraction extracted for isotope measurements. Blue-shaded area delineates MIS2 and the late part of MIS 3.



Supplementary Figure 6. Southern Ocean sea-ice distribution as reconstructed for the EPILOG-LGM time slice. Sea-ice distribution from ref. 34 including newly reconstructed winter sea-ice concentration (%) from cores PS1768-8 and PS1778-5 averaged over the EPILOG-LGM time slice (23.000-19.000 cal. yr BP). Signature legend: (1) concomitant occurrence of cold-water indicator *Fragilariopsis obliquecostata* (>1% of diatom assemblage) and summer sea ice concentration >0% interpreted to represent (sporadic) occurrence of summer sea ice; (2) presence of winter sea ice based on diatom sea ice indicators and transfer function derived winter sea-ice concentration estimates (values); (3) no sea ice. The modern maximum winter sea ice (M-WSI) is placed at the 15% September concentration according to ref. 67 and the EPILOG-LGM maximum winter sea-ice extent (E-LGM-WSI) follows this definition. This compilation shows that during the glacial site PS1768-8 was located in the northern seasonal sea-ice zone and site PS1778-5 was in the area of the sea-ice edge, where sea-ice concentration drops abruptly.



Supplementary Figure 7. Proxies of core PS1768-8 used for dating and

paleoceanographic interpretation compared to core TN057-13 and the EDML ice core. (a-g) Parameters of core PS1768-8: (a) Ice rafted debris (IRD) derived from the abundance of gravel clasts >2 mm per 10 cm³, estimated from x-radiograph^{S2}. (b) Biogenic silica percentages and biogenic silica rain rates⁵⁰. (c) Diatom transfer function-based estimates of winter sea-ice concentration³⁵. (d)) SSST estimations based on diatom IKM transfer function^{S1}. (e) Relative abundances of the diatom *Eucampia antarctica*³⁸ (f) Relative abundances of the radiolarian *Cycladophora davisiana*⁵. (g) δ^{18} O record of *Neogloboquadrina* pachyderma (sinistral)^{S3}. (h) δ^{18} O record of *N. pachyderma* (sinistral) from core TN057-13 (ref. 15). (i) $\delta^{18}O_{H2O}$ record from EDML (EPICA Dronning Maud Land) ice core⁶⁹ against AICC2012 (Antarctic Ice Core Chronology 2012)⁶². Blue-shaded area delineates MIS2 and the late part of MIS 3. Vertical black dashed line marks the onset of warming seen in East Antarctic ice $cores^{69,S4}$. Arrows in panels **e**, **f**, **g** and **h** indicate age pointer (black arrows mark AMS ¹⁴C dates^{15,38}, red arrows mark ages obtained by diatom and radiolarian stratigraphy, and by ²³⁰Th_{ex} constant flux modeling, see Supplementary Table 5). Foraminiferal-based oxygen isotope records from Quaternary records south of the Subantarctic Front generally rely on the surface-subsurface dwelling planktic foraminifer *N. pachyderma* (sinistral). Although obtained data may result in stratigraphically useful records^{15,S5,S6}, N. pachyderma (sinistral) oxygen isotope records may also display high amplitude anomalies during glacials and glacial-interglacial transitions whose nature remains difficult to be explained. Some of this may stem from contamination related to the very low carbonate record^{S7}, but the signals were also interpreted to be influenced by glacial meltwater supply^{s_8}. In PS168-8 (g) and PS1778-5 (Supplementary Fig. 8f) the δ^{18} O records of N. pachyderma (sinistral) display high amplitude signal shifts, e.g. between 18.000 and 16.000 cal. yr BP, thus are distinct from the diatom and radiolarian δ^{18} O records (Fig. 3c,g). Interestingly, the diatom and radiolarian δ^{18} O

records are similar to a *N. pachyderma* (sinistral) record reported from core TN057-13 (ref. 15) (**h**).



Supplementary Figure 8. Proxies of core PS1778-5 used for dating and

paleoceanographic interpretation compared to core TN057-13 and the EDML ice core.

(**a-f**) Parameters of Core PS1778-5: (**a**) Biogenic silica percentages, (**b**) Transfer functionbased estimates of winter sea-ice concentration³⁵. (**c**) Transfer-function based estimates of summer sea-surface temperature (SSST)^{S1}. (**d**) Relative abundances of the diatom *Eucampia antarctica*³⁸. (**e**) Relative abundances of the radiolarian *Cycladophora davisiana*^{S9}. (**f**) δ^{18} O record of *N. pachyderma* (sinistral). (**g**) δ^{18} O record of *N. pachyderma* (sinistral) from core TN057-13 (ref. 15). (**h**) δ^{18} record from EDML (EPICA Dronning Maud Land) ice core⁶⁹ against AICC2012 (Antarctic Ice Core Chronology 2012)⁶². Blue-shaded area delineates MIS2 and the late part of MIS 3. Vertical black dashed line marks the onset of warming seen in East Antarctic ice cores^{69,54}. Arrows in panels **e** and **g** indicate age pointer (black arrows mark AMS¹⁴C dates¹⁵, red arrows mark ages obtained by diatom and radiolarian stratigraphy, see Supplementary Table 6).



Supplementary Figure 9. Present day climatological mean sea ice concentration in the Atlantic sector of the Southern Ocean. Shown is the reconstructed average sea ice concentration between A.D. 1966-2000 (color-shaded area) derived from ref. S10, overlaid with contours of the climatological sea ice distribution as modeled by our AOGCM approach (contour lines).



Supplementary Figure 10. Position of the Antarctic Polar Front (PF) in the deglacial sensitivity experiments. Displayed are the relative impact of a deglacial CO₂ increase from 180 ppmv to 240 ppmv (referred to as experiment CO2) and a poleward shift of the Westerlies in the Southern Ocean by 3° in latitude (referred to as experiment WIND) on the annual cycle of the latitudinal position of the Antarctic PF at the longitudes of the core locations (upper panel PS1768-8 and lower panel PS1778-5). Additionally, the simulated pre-industrial (PI) and the LGM positions of the Antarctic PF are shown. The Antarctic PF position is defined by the 2°C-isoline of the averaged temperature between a water depth of 100-300 m. A comparison of the glacial (LGM) and interglacial (pre-industrial) position of the PF indicates a glacial northward shift of ca. 5-7°. Furthermore similar to the response in

sea-ice cover (Supplementary Fig.11), the comparison between experiments CO2 and WIND shows a relatively pronounced southward shift of the Antarctic PF in experiment CO2. This suggests that the greenhouse-gas induced southward shift of the sea ice-melting zone represents a key control on the deglacial southward migration of the Antarctic PF (see Supplementary Fig.11 and figure caption therein for further details).



Supplementary Figure 11. Mixed layer depth changes and sea-ice concentrations in the deglacial sensitivity experiments. Displayed are the relative impacts on glacial MLD (m) of a deglacial CO₂ increase from 180 ppmv to 240 ppmv (referred to as experiment CO2, upper panel) and a poleward shift of the Westerlies in the Southern Ocean by 3° in latitude (referred to as experiment WIND, lower panel). The MLD changes are shown for the month August during Austral winter conditions. In both panels the MLD changes are overlaid with the same sea ice concentration (15%) of the corresponding month for the glacial state (black line), the WIND experiment (turquoise dotted line) and the CO2 experiment (green line). Areas with a sea-ice concentration of more than 90% in the glacial state are shaded in grey. The sensitivity experiments have been initialized with a glacial equilibrium simulation (simulation LGMW in ref. 23) and integrated for 600 years. The last 100 years of model output have been averaged and are shown as climatological mean values. In both experiments a deepening of the MLD is detected. A comparison between the two sensitivity experiments shows a relatively pronounced sea ice retreat and deeper MLD in experiment CO2. In this experiment the greenhouse-gas induced warming causes the sea ice retreat (region between the black to the green line), which is accompanied by a southward shift of the sea ice melting zone and deeper MLD in this region. A similar southward shift is also detected in the APF as shown in Supplementary Fig.10. Alternative scenarios to the greenhouse-gas induced warming in experiment CO2, might relate deglacial warming in the Southern Ocean e.g. to insolation changes or changes in the Atlantic meridional overturning circulation and associated interhemispheric heat transport.



Supplementary Figure 12. Meridional depth sections of $Si(OH)_4$ concentrations at 0°. Stippled black lines indicate the locations of cores PS1768-8 and PS1778-5. The nutrient data are from ref. 33 and for imaging we used Ocean Data View^{S11}.



Supplementary Figure 13. Location of plankton stations used for determination of radiolarian depth habitats. For data see Supplementary Table 2 (from ref. 25).

<i></i>			Rad	iolarians				Diatoms	
Element	Depth (cm)	31.5	68.5	191.5	241.5	31.5	68.5	191.5	241.5
ICP-OES	7								
Al ₂ O ₃	%	0.0	0.1	0.1	0.0	0.0	0.0	0.5	0.6
CaO	%	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1
Fe ₂ O ₃	%	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
K ₂ O	%	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MgO	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
MnO	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Na ₂ O	%	0.6	0.7	0.7	0.6	0.3	0.4	0.5	0.5
P_2O_5	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TiO ₂	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUM	%	0.8	1.0	0.9	0.8	0.5	0.6	1.3	1.5
SiO ₂	%	99.2	99.0	99.1	99.2	99.5	99.4	98.7	98.5
EDe	7								
ALO	%	0.0	0.0	0.0	0.0	0.0	0.0	01	04
CaO	%	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0
Fe ₂ O ₂	%	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.2
K ₂ O	%	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1
MaO	%	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1
MnO	%	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Na ₂ O	%	0.6	0.7	0.6	0.8	0.0	0.0	0.0	0.8
CI	%	0.3	0.3	0.2	1.0	0.0	0.0	0.3	0.0
SUM		1.1	1.3	1.1	2.1	0.2	0.2	0.9	1.7
SiO ₂	%	98.9	98.7	98.9	97.9	99.8	99.8	99.1	98.3

Supplementary Table 1. ICP-OES and EDS measurements of major elements in core PS1768-8. Al₂O₃ concentrations of 0.5 and 0.6% are still in the range, which apparently do not affect the δ^{18} O signal⁴⁰. The microscopical inspection of the samples with these Al₂O₃ concentrations does not indicate contamination by minerals.

Water	A. antarctica	A. antarctica	S. glacialis
depth (m)	% living	% juveniles	% living
PS2101-2			
0-50	17.22		0.5
50-100	22.54		
100-200	5.64		
200-400	17.63		
400-1000	1.11		
PS2103-3			
0-50	5.18	2.69	0.96
50-100	13.16	0.69	
100-300	10.21	3.4	
PS 2105-4			
0-50			16.79
50-100			29.74
100-200	1.19		9
200-400			2.43
400-1000			
PS2107-2			
0-50			1.06
50-100		1.91	
100-300	0.88	0.88	
300-400	2.19		
400-1000	1.33		

Supplementary Table 2. Vertical abundances of the radiolarian species *Actinomma antarctica* **and** *Spongotrochus glacialis* **from four plankton stations.** Data from the four stations in the Atlantic sector of the Southern Ocean are from ref. 25. Supplementary Figure 13 displays the location of the plankton stations. Both species were not encountered in the plankton hauls from the three northern station²⁵.

		surface :	sediment	stations									water sta	tions						
Surface Sediment I Samples	Latitude	Longitude	rad : size fraction	δ ³⁰ Si _{rad} [%o]	δ ³⁰ Si _{rad} [‰]	δ ³⁰ Si _{rad} [‰]	δ ³⁰ Si _{rad}	δ ³⁰ Si _{rad} V AVG V	Vater	Latitude	Longitude	Si(OH)₄ depth1 [µM l ⁻¹]	δ³0Si depth1 Δ [‰]]	(5 ³⁰ Si _{rad1} (Si(OH)4 2 tepth2 c µM l ⁻¹]	5 ³⁰ Si tepth2 [‰]	∆õ ³⁰ Si _{rad2} [‰]	Si(OH)₄ ODV annual (0-400 m) [µM l ⁻¹]	Si(OH)₄ ODV annual (0-1000 m) [µM l ⁻¹]	Si(OH) ₄ ODV jan-mar (0-400 m) [µM 1 ⁻¹]
									arde 6			31.2	2.01	0.68	42.1	1.87	-0.54			
PS63/026-2	50.5°S	01.5°E	>250 µm	1.21	1.37	1.41	1	1.33 (03/08/2008)	50.22°S	01.18°E	(3-401m)	(3-401m) (;	3-401m) (3-999m) ((m666-E	(3-999m)	30.1	45.1	29.1
PS63/035-2	55.5°S	00.5°E	>250 µm	0.74	0.85		-	0.80	-arge / 03/14/2008)	55.14°S	00.03°E	66.7 (4-300m)	1./0 (4-300m) ([,]	-0.91 4-300m) (4.1 (4.1 (1.60 4-1002m) (-0.81 (4-1002m)	67.6	79.8	6.69
PS63/042-2	58.5°S	00.5°E	>125 µm	0.74				0.74 ((Super 5 03/16/2008)	57.32°S	00.02°E	89.4 (29-400m)	1.56 (29-400m) (-0.82 29-400m) (37.96 29-1003m) (1.51 29-1003m) (-0.77 (29-1003m)	81.5	94.4	81.5
PS63/043-2 §	59.5°S	00.5°E	>125 µm	0.86	0.99	0.71	9.0	0.79	Super 5 03/16/2008)	57.32°S	00.02°E	89.4 (29-400m)	1.56 (29-400m) (;	-0.77 (29-400m)) 7.96 29-1003m) (1.51 29-1003m) (-0.72 (29-1003m)	83.9	97.3	83.6

Supplementary Table 3. δ^{30} Si_{rad} values from surface sediment samples, δ^{30} Si_{si(OH)4} and Si(OH)4 values from nearby water stations and $\Delta \delta^{30}$ Si_{rad} estimations. $\Delta \delta^{30}$ Si_{rad} values are estimated from δ^{30} Si_{rad} values obtained from multicorer surface sediments (Fig. 1) and δ^{30} Si_{si(OH)4} values measured at the nearby water stations²⁹ according to the equation: $\Delta \delta^{30}$ Si_{rad}= δ^{30} Si_{rad}- δ^{30} Si_{si(OH)4} (ref. 21). Calculations were done for two water depth intervals, the upper ~300 to 400m and ~upper 1000m to cover the depth ranges of all radiolarian species included in the fractions. Obtained $\Delta \delta^{30}$ Si_{rad} values were compared to the Si(OH)4 concentrations of both water depth intervals of each water station²⁹. In addition, annual and summer (January-March) Si(OH)4 concentrations at the surface sediment stations were averaged from two water depth intervals (0-400 m, 0-1000 m), which were taken from the Southern Ocean Atlas³³. For the depth interval 0-1000 m only summer values were available. δ^{30} Si_{rad} AVG = averaged δ^{30} Si_{rad}.

AVG δ ³⁰ Si _{diat}	δ ³⁰ Si _{rad}	δ ³⁰ Si _{rad}	δ ³⁰ Si _{rad}	∆δ ³⁰ Si	δ ³⁰ Si(OH) ₄	Si(OH) ₄		
[‰]	(>250µm) [‰]	(125-250µm) [‰]	(>125µm) [‰]	[‰]	[‰]	[µM I⁻¹]	Fractions	Core
Helesene								
Holocene					0.07	0.05	P . 4	D01700 0
1.27				-1.1	2.37	0-25	diatom	PS1768-8
1.53				-1.1	2.64	0-20	diatom	PS1778-4
	1.03			-0.8	1.83	15-65	rad >250 μm	PS1768-8
	1.03			-1.2	2.23	0-25	rad >250 µm	PS1768-8
	1.03			-1.5	2.53	0-20	rad >250 µm	PS1768-8
		-0.24		-0.8	0.56	150-175	rad 125-250 µm	PS1768-8
		-0.24		-1.2	1.04	75-130	rad 125-250 µm	PS1768-8
		-0.24		-1.5	1.26	40-140	rad 125-250 µm	PS1768-8
			0.28	-0.8	1.08	65-130	rad >125 µm	PS1778-4
			0.28	-1.2	1.48	50-130	rad >125 µm	PS1778-4
			0.28	-1.5	1.78	15-65	rad >125 µm	PS1778-4
Glacial							•	
1.15				-1.1	2.25	0-25	diatom	PS1768-8
1.64				-1.1	2.74	0-20	diatom	PS1778-4
	0.54			-0.8	1.34	60-150	rad >250 µm	PS1768-8
	0.54			-1.2	1.74	40-80	rad >250 µm	PS1768-8
	0.54			-1.5	2.04	20-40	rad >250 µm	PS1768-8
		-0.67		-0.8	0.16	>170	rad 125-250 µm	PS1768-8
		-0.67		-1.2	0.56	~170	rad 125-250 µm	PS1768-8
		-0.67		-1.5	0.86	~110-170	rad 125-250 µm	PS1768-8
			-1.06	-0.8	-0.26	>170	rad >125 µm	PS1778-4
			-1.06	-1.2	0.14	>170	rad >125 µm	PS1778-4
			-1.06	-1.5	0.44	~170	rad >125 µm	PS1778-4

Supplementary Table 4. Parameters used for the estimation of Holocene and Glacial $\delta^{30}Si_{Si(OH)4}$ values compared to Si(OH)₄ values from field data. Indicated are $\delta^{30}Si$ values from diatom and radiolarian fractions of cores PS1768-8 and PS1778-5 averaged for the early Holocene (until 12 cal. ka BP) and last glacial period (~19-29 cal. ka BP). The calculation of $\delta^{30}Si_{Si(OH)4}$ from $\delta^{30}Si_{rad}$ data was performed with different fractionation offsets ($\Delta\delta^{30}Si_{rad}= -0.8\%_0$, $\Delta\delta^{30}Si_{rad}= -1.2\%_0$, $\Delta\delta^{30}Si_{rad}= -1.5\%_0$, see Methods). For the $\delta^{30}Si_{Si(OH)4}$ estimations from $\delta^{30}Si_{diat}$ data a diatom fractionation offset of -1.1‰ (ref. 24) was used. The obtained $\delta^{30}Si_{Si(OH)4}$ values were related to $\delta^{30}Si_{Si(OH)4}$ values from water stations and to their ranges in Si(OH)₄ concentrations^{20,28,29} (Fig.4). Note that the $\delta^{30}Si_{Si(OH)4}$ values reflect a broad range in Si(OH)₄ concentrations as also indicated in Figure 4.

Depth (cm)	Age (yr)	Pointer definition
12.5	5172	²³⁰ Th _{ex} constant flux modeling
54	9896	¹⁴ C, Calib7, Marine13 (Res 800 yr)
78	11093	¹⁴ C, Calib7, Marine13 (Res 800 yr)
142	13938	¹⁴ C, Calib7, Marine13 (Res 800 yr)
200	21000	upper 2 <i>E. antarctica</i> 1 peak
260	29000	mid increase <i>C. davisiana</i> b2 peak (MIS2/3 boundary)
310	37000	upper <i>C. davisiana</i> c1 low

Supplementary Table 5. Age pointers for PS1768-8. The AMS¹⁴C dates from ref. 38 were converted to calendar years with CALIB 7.0 using the MARINE13 calibration^{S12} with a reservoir age of 800 yr according to ref. S13. Pointers based on *Eucampia antarctica* and *Cycladophora davisiana* abundance fluctuations, both presenting established stratigraphic tools for the late Quaternary SO and calibrated with oxygen isotope stratigraphy^{S5, S14-S18}, represent an abundance maximum of *E. antarctica* (upper 2Ea₁)^{S16} at 200 cm, and the midpoint of the *C. davisiana* increase to its b peak^{S15} at 260 cm, which marks the Marine Isotope Stage (MIS) 3/2 boundary^{S18,S19} and the uppermost c1 low of *C. davisiana*^{S15,S18}. For details on *E. antarctica* and *C. davisiana* abundance pattern see Supplementary Fig. 7. The pointer at 12.5 cm was defined by ²³⁰Th_{ex} constant flux modeling considering an age model frame based on a combination of AMS ¹⁴C dates and siliceous microfossil biofluctuation stratigraphies⁵⁰.

Depth (cm)	Age (yr)	Pointer definition
20	12000	upper end of <i>C. davisiana</i> b1 peak
40	14000	mid-way <i>C. davisiana</i> b-a
130	21000	mid C. davisiana b1 increase, upper E. antarctica peak
240	25000	mid <i>C. davisiana</i> b2 peak
350	29000	mid C. davisiana b2 incease (MIS2/3 boundary)

Supplementary Table 6. Age pointer for PS1778-5. Age assignments of pointers based on *E. antarctica* and *C. davisiana* abundance fluctuations^{S14-S18} are from ref. 38. For details on *E. antarctica* and *C. davisiana* abundance pattern see Supplementary Fig. 8.

Station		Latitude	Longitude	δ ³⁰ Si [‰]	δ ³⁰ Si [‰]	δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰]
PS2506-1	diatoms (10-40 μm) radiolarians (>125 μm)	47° 37.20 S 51°24.50 S	15° 25.40 W 25°42.00 E	1.61 0.84	1.64 0.9		1.63 0.87
PS63/30-3	diatoms (10-40 µm)	52° 59.55 S	0° 01.48 E	1.51	1.30	0.95	1.25

Supplementary Table 7. δ^{30} Si_{diat} and δ^{30} Si_{rad} values from surface sediments close to the core sites PS1768-8 and PS1778-5.

PS1768-8	Diatoms (1	0-40 µm)	δ ^{1°} O (‰ v	vs. SMOW)	
Depth (cm)	Age [yrs]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο _{ΑVG} [‰]
12.5	5172	43.64	43.18		43.41
23.5	6424	43.72	43.30		43.51
31.5	7335	43.72	43.23		43.48
38.5	8132	43.55	43.51		43.53
47.5	9156	43.76	43.65		43.71
58.5	10120	43.85	43.90		43.88
68.5	10619	43.67	43.90		43.79
91.5	11693	43.95	44.00		43.98
101.5	12138	43.29	44.12	44.95	44.12
112.5	12627	44.44	44.61		44.53
119.5	12938	44.06	44.18		44.12
129.5	13382	44.54	44.42		44.48
139.5	13827	44.57	44.23		44.40
149.5	14851	44.54	44.45		44.50
159.5	16069	44.67	44.13		44.40
169.5	17286	44.37	44.74		44.56
179.5	18504	44.73			44.73
191.5	19965	44.12	44.23		44.18
200.5	21067				
211.5	22533				
221.5	23867	44.19	44.69		44.44
231.5	25200	44.60	45.06		44.83
241.5	26533	43.83	43.82		43.83
251.5	27867	44.04	45.09		44.57
261.5	29240	44.57	44.50		44.54
271.5	30840	44.07	44.29		44.18

PS1768-8 Diatoms (10-40 μm) δ³⁰Si (‰ vs. NBS)

Depth (cm)	Age [yrs]	δ ³⁰ Si [‰]	δ ³⁰ Si [‰]	δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰]
12.5	5172	1.19	1.33		1.26
23.5	6424	1.37	1.34		1.36
31.5	7335	1.27	1.19		1.23
38.5	8132	1.18	1.25		1.22
47.5	9156	1.43	1.39		1.41
58.5	10120	1.06	1.03		1.05
68.5	10619	1.15	1.25		1.20
91.5	11693	1.38	1.48		1.43
101.5	12138	1.15	1.18		1.17
112.5	12627	0.63	0.45		0.54
119.5	12938	0.83	0.99		0.91
129.5	13382	0.99	1.04		1.02
139.5	13827	0.77	1.01	0.40	0.73
149.5	14851	1.20	1.06		1.13
159.5	16069	1.06	1.53	1.23	1.27
169.5	17286	1.08	1.18	1.00	1.09
179.5	18504	0.78	0.70		0.74
191.5	19965	1.18	1.05		1.12
200.5	21067				
211.5	22533				
221.5	23867	1.17	1.03		1.10
231.5	25200	1.27	1.05		1.16
241.5	26533	1.31	1.10		1.21
251.5	27867	1.09	0.82		0.96
261.5	29240	0.70	0.68		0.69
271.5	30840	0.93			0.93

Supplementary Table. 8. Oxygen and silicon isotope data from diatom opal (10-40 μm fraction) in core PS1768-8.

	s. SMOW)	δ ¹⁸ Ο (‰ vs	>250 µm	Radiolarians	PS1768-8
_	10	19	10		7.
δ ¹⁸ Ο _{ΑVG} [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ¹ ⁸ Ο [‰]	Age [yrs]	Depth [cm]
42.85		42.64	43.06	5172	12.5
				6424	23.5
43.69	43.74	43.84	43.49	7335	31.5
43.68		43.91	43.45	8132	38.5
43.88		44.42	43.34	9156	47.5
43.62		43.95	43.29	10120	58.5
43.77	43.79	43.71	43.80	10619	68.5
43.98		44.17	43.78	11693	91.5
				12138	101.5
44.15	44.13	44.26	44.06	12627	112.5
44.25		44.38	44.12	12938	119.5
				13382	129.5
44.01			44.01	13827	139.5
44.18		44.39	43.96	14851	149.5
44.42		44.42		16069	159.5
44.15		44.28	44.02	17286	169.5
44.14	43.93	44.34	43.25	18504	179.5
44.24		44.23	44.24	19965	191.5
43.74		43.89	43.59	21067	200.5
44.30		44.41	44.19	22533	211.5
43.89		43.90	43.87	23867	221.5
43.89	43.92	44.14	43.61	25200	231.5
44.59		44.58	44.59	26533	241.5
44.67		44.74	44.59	27867	251.5
45.12		45.30	44.93	29240	261.5
44.50		44.66	44.33	30840	271.5

Supplementary Table 9. Oxygen isotope data from radiolarian opal of the >250 $\,\mu m$ fraction from core PS1768-8.

PS1768-8	Radiolarians	; >250 µm		δ ³⁰ Si (‰ v	s. NBS)
		- 30 -	- 30 -	- 30 -	
Depth [cm]	Age [yrs]	δ ³⁰ Si [‰]	δ ³⁰ Si [‰]	δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰]
12.5	5172	1.03	1.28		1.16
23.5	6424				
31.5	7335	1.30	0.99	1.10	1.13
38.5	8132	1.19	1.15		1.17
47.5	9156				
58.5	10120	0.90	0.75	0.88	0.84
68.5	10619	0.90	0.87		0.89
91.5	11693	1.04	1.00		1.02
101.5	12138				
112.5	12627	0.90	0.88		0.89
119.5	12938	0.85	0.92		0.89
129.5	13382				
139.5	13827	0.67			0.67
149.5	14851				
159.5	16069				
169.5	17286				
179.5	18504	0.46	0.50		0.48
191.5	19965	0.50	0.38		0.44
200.5	21067	0.64	0.51		0.57
211.5	22533	0.51	0.50	0.57	0.53
221.5	23867	0.22	0.45	0.71	0.46
231.5	25200	0.58	0.53	0.76	0.62
241.5	26533	0.53	0.44	0.57	0.51
251.5	27867	0.62	0.69		0.66
261.5	29240	0.47	0.36		0.42
271.5	30840	0.53	0.37		0.45

. NBS)	5 ³⁰ Si (‰ vs	n ð	125-250 µr	Radiolarians	PS1768-8
δ ³⁰ Si _{AVG} [‰]	δ ³⁰ Si [‰]	δ ³⁰ Si [‰]	δ ³⁰ Si [‰]	Age [yrs]	Depth [cm]
-0.45		-0.47	-0.42	5172	12.5
				6424	23.5
-0.42	-0.46	-0.46	-0.33	7335	31.5
-0.41		-0.44	-0.38	8132	38.5
				9156	47.5
0.07		0.11	0.03	10120	58.5
-0.34		-0.27	-0.40	10619	68.5
0.07			0.07	11693	91.5
				12138	101.5
				12627	112.5
				12938	119.5
				13382	129.5
				13827	139.5
				14851	149.5
				16069	159.5
				17286	169.5
-0.60		-0.80	-0.40	18504	179.5
-0.47		-0.48	-0.46	19965	191.5
-0.43	-0.54	-0.32	-0.42	21067	200.5
-0.62		-0.70	-0.54	22533	211.5
-0.62			-0.62	23867	221.5
-0.75		-0.73	-0.76	25200	231.5
-0.71		-0.74	-0.67	26533	241.5
-0.90			-0.90	27867	251.5
-0.89		-0.80	-0.97	29240	261.5
-0.74		-0.91	-0.56	30840	271.5

Supplementary Table 10. Silicon isotope data from radiolarian opal of the >250 μ m and 125-250 μ m fractions from core PS1768-8.

$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth (cm)	Age[yrs]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ O _{AVG} [‰]	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.5	10050	41.95	41.66	41.52			41.71	
	7.0	10/00	41.99	42.23	41.85			42.02	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	17.0	11/00	42.78	42.58				42.68	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	27.0	12700	42.99	42.71				42.85	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	37.0	13/00	43.47	43.84				43.00	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	40.5	14506	43.51	43.53				43.52	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	50.5	15265	43.42	43.03				43.23	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	77.0	16061	44.23	44.13				44.19	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	77.0	108/8	44.28	43.99				44.14	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	07.0	10422	44.30	44.51	42 74			44.34	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	97.0	18433	43.65	43.60	43.74			43.73	
$ \frac{112}{117}, 0 2005, 141, 0 41, 0 41, 0 41, 1 41, 1 41, 1 41, 1 44, 1 41, 1 44, 1 41, 1 44, 1 41, 1 44, 1 44, 1 41, 1 44, 1$	117.0	10080	43.03	44.00				43.95	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	117.0	19909	43.49	43.39				43.44	
	127.0	20707	44.09	43.90				44.04	
$ \frac{157}{157} 0 22962 + 42.26 + 42.86 + 43.84 + 33.47 + 43.56 + 43.56 + 43.56 + 43.69 + 44.13 + 43.47 + 44.14 + 44.16 + 24.14 + 44.28 + 43.08 + 43.66 + 24.56 + 25.257.3 + 44.20 + 44.13 + 43.55 + 44.54 + 25.75 + 256.00 + 44.4 + 43.32 + 44.46 + 44.43 + 26.75 + 26.75 + 26.75 + 44.46 + 44.43 + 26.75 + 26.75 + 26.75 + 44.46 + 44.43 + 26.75 + 26.75 + 26.75 + 44.46 + 44.43 + 26.75 + 26.75 + 26.75 + 44.46 + 44.43 + 26.75 + 26.75 + 26.75 + 44.46 + 44.43 + 26.75 + 26$	147.0	21255	44.20	44.17				44.19	
	147.0	21010	44.03	43.93	42 54			43.90	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	167.0	21902	43.60	44.13	43.34			43.09	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	190.5	22345	43.09	44.15	45.47			43.70	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	187.5	22030	44.14	44.14	44 11			44.14	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	107.5	23091	44.01	44.21	44.11			44.11	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	207.5	23430	43.75	43.01	45.67			43.81	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	207.5	23010	44.00	44.20	42 42	44.30	42.00	44.10	
2238.0 24327 43.26 44.19 43.35 43.86 247.5 25273 44.20 44.13 44.17 257.5 25600 44.40 43.32 44.46 44.43 2207.5 26600 44.40 43.32 44.46 44.43 2807.5 2677.7 43.47 43.67 43.57 297.5 2703 44.47 44.69 43.58 307.0 27436 43.54 43.37 43.62 44.00 337.0 28527 44.02 44.02 43.88 33.70 243.46 337.0 26518 44.05 44.33 43.62 44.03 357.0 26518 44.05 43.67 43.81 44.22 970 70700 1.56 1.57 1.65 1.62 381.0 30127 43.89 $5^{39}51 (%_0$ $5^{39}51 (\%_0$ $5^{39}51 (\%_0$ $5^{39}51 (\%_0$ $5^{39}5$	210.0	24200	43.44	44.07	43.42	44.28	45.08	43.00	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	228.0	24504	43.91	43.00	43.35	13 05		43.62	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	230.0	2492/	43.78	43.00	44.19	43.05		43.80	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	247.5	252/3	44.20	44.13				44.1/	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	237.3	25030	44.40	44.08	11 16			44.54	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	207.5	26000	44.40	43.32	44.40			44.43	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	280.5	26777	44.30	43.02	44.40			44.55	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	207.5	27001	43.47	44.60				43.37	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	297.5	27091	44.4/	44.09	43 75			44.58	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	319.0	27936	43.50	44.20	44.02			43.00	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	327.5	27030	43.04	44.29	44.02			43.90	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	337.0	28527	44 00	44 30	43.62			44.00	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	347.0	28901	44.00	44.35	44.03			44.00	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	357.0	20091	44.26	44 18	44.05			44.03	
381.0 301.27 43.89 43.67 43.81 43.79 PS1778-5 Diatoms (10-40 μ m) δ^{30} Si (%oo vs. NBS) Depth (cm) Age δ^{30} Si (%oo δ^{30} Si (%oo vs. NBS) 0.5 10050 1.41 1.47 1.44 7.0 10700 1.56 1.52 1.45 1.65 1.55 17.0 11700 1.56 1.57 1.56 1.57 1.56 1.57 37.0 13700 1.56 1.71 1.47 1.66 1.60 77.0 16878 1.63 1.69 1.60 1.64 76.5 15283 1.59 1.72 1.62 1.57 1.63 70.0 16878 1.63 1.69 1.60 1.64 77.0 16878 1.63 1.59 1.58 1.59 107.0 19211 1.56 1.60 1.64 1.65 107.0 21282 1.68 1.64 1.65 1.60 107.0	367.0	29618	44.05	44.05				44.05	
15.02 15.02 15.02 PS1778-5 Diatoms (10-40 μ m) $\delta^{30}Si$ (%00 VS.02 PS1778-5 Diatoms (10-40 μ m) $\delta^{30}Si$ (%00 VS.052 Depth (cm) Age $\delta^{30}Si$ (%00 <th colspan<="" td=""><td>381.0</td><td>30127</td><td>43.89</td><td>43.67</td><td>43.81</td><td></td><td></td><td>43 79</td></th>	<td>381.0</td> <td>30127</td> <td>43.89</td> <td>43.67</td> <td>43.81</td> <td></td> <td></td> <td>43 79</td>	381.0	30127	43.89	43.67	43.81			43 79
Depth (cm) Age $\delta^{39}S_1 [\%_0]$ $\delta^{30}S_1 [\%_0]$ <	DC1779_E		0222420020 853		20				
Depth (cm) Age δ^{34} Si [$\%_{60}$] δ^{34} Si [$\%^{34}$ Si [$\%$	P31//0-5	Diaton	ns (10-4	0 µm)	δ ³⁰ Si (%	o vs. NB	S)		
	P31/78-5	Diaton	ns (10-4)	0 µm)	δ ³⁰ Si (%	o vs. NB	S)	-30	
7.0 10700 1.56 1.52 1.48 1.65 1.55 17.0 11700 1.57 1.57 1.68 1.59 1.60 27.0 12700 1.57 1.56 1.57 1.66 1.60 46.5 14506 1.63 1.69 1.64 1.66 1.64 56.5 15283 1.59 1.72 1.62 1.57 1.63 66.5 16061 1.61 1.62 1.56 1.64 1.64 87.0 17656 1.68 1.78 1.52 1.64 97.0 18433 1.59 1.58 1.59 1.66 117.0 19289 1.60 1.59 1.60 1.58 117.0 19289 1.60 1.59 1.60 1.57 127.0 20767 1.74 1.61 1.62 1.66 157.0 21982 1.63 1.65 1.66 1.64 167.0 22345 1.69 1.65 1.60 1.77 1.68 187.5 23091 1.60 <td>Depth (cm) Ag</td> <td>Diaton</td> <td>ns (10-4) δ³⁰Si [‰]</td> <td>Ο μm) δ³⁰Si [‰]</td> <td>δ³⁰Si (%</td> <td>δ³⁰Si [‰]</td> <td>S) δ³⁰Si [‰]</td> <td>δ³⁰Si_{AVG} [‰]</td>	Depth (cm) Ag	Diaton	ns (10-4) δ ³⁰ Si [‰]	Ο μm) δ ³⁰ Si [‰]	δ ³⁰ Si (%	δ ³⁰ Si [‰]	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰]	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Diaton le 10050	ns (10-4) δ ³⁰ Si [‰] 1.41	Ο μm) δ ³⁰ Si [‰] 1.47	δ ³⁰ Si (%	δ ³⁰ Si [‰]	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰] 1.44	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0	10050 10700	<u>δ³⁰Si [‰]</u> 1.41 1.56	Ο μm) δ ³⁰ Si [‰] 1.47 1.52	δ ³⁰ Si (%) δ ³⁰ Si [‰] 1.45	δ ³⁰ Si [‰]	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰] 1.44 1.55	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		10050 10700 11700	<u>δ³⁰Si [‰]</u> 1.41 1.56 1.57	<mark>0 μm)</mark> δ ³⁰ Si [‰] 1.47 1.52 1.57	δ ³⁰ Si (%) δ ³⁰ Si [‰] 1.45 1.68	δ ³⁰ Si [‰] 1.65 1.59	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60	
46.5 14506 1.63 1.69 1.60 1.64 56.5 15283 1.59 1.72 1.62 1.57 1.63 66.5 16061 1.61 1.62 1.56 1.60 1.61 77.0 16878 1.63 1.69 1.59 1.66 87.0 17656 1.68 1.73 1.52 1.66 97.0 18433 1.59 1.58 1.59 107.0 19211 1.56 1.60 1.59 117.0 19899 1.60 1.59 1.60 127.0 20767 1.74 1.71 1.64 1.70 137.0 21628 1.63 1.63 1.65 1.63 147.0 21618 1.68 1.53 1.70 1.66 1.64 167.0 22836 1.61 1.80 1.57 1.76 1.68 180.5 22836 1.61 1.80 1.57 1.76 1.68 197.0 23436 1.78 1.65 1.67 1.66 218.0<	Depth (cm) Ag 0.5 7.0 17.0 27.0	10050 10700 11700 12700	<u>δ³⁰Si [‰]</u> 1.41 1.56 1.57 1.57	<mark>0 μm)</mark> δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56	δ ³⁰ Si (%) δ ³⁰ Si [‰] 1.45 1.68	δ ³⁰ Si [‰] 1.65 1.59	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰] 1.44 1.55 1.60 1.57	
56.5 15283 1.59 1.72 1.62 1.57 1.63 66.5 16061 1.61 1.62 1.56 1.60 77.0 16878 1.63 1.69 1.59 1.64 87.0 17656 1.68 1.78 1.52 1.66 97.0 18433 1.59 1.58 1.59 1.66 107.0 19211 1.56 1.60 1.58 1.60 127.0 20767 1.74 1.71 1.64 1.60 127.0 20767 1.74 1.71 1.64 1.67 137.0 21255 1.63 1.63 1.65 1.66 157.0 21982 1.68 1.65 1.66 1.77 1.68 167.0 22345 1.69 1.65 1.60 1.77 1.68 180.5 22836 1.61 1.80 1.57 1.76 1.69 207.5 23091 1.60 1.51 1.72 1.60	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0	10050 10700 11700 12700 13700	<u>δ³⁰Si [‰]</u> 1.41 1.56 1.57 1.57 1.57	0 μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71	δ ³⁰ Si (%) δ ³⁰ Si [‰] 1.45 1.68 1.47	δ ³⁰ Si [‰] 1.65 1.59 1.66	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%) 1.44 1.55 1.60 1.57 1.60	
66.5 16061 1.61 1.62 1.56 1.60 77.0 16878 1.63 1.69 1.59 1.64 87.0 17656 1.68 1.78 1.52 1.66 97.0 18433 1.59 1.58 1.59 107.0 19211 1.56 1.60 1.59 1.60 127.0 20767 1.74 1.71 1.64 1.65 147.0 21255 1.63 1.63 1.66 1.66 157.0 21285 1.68 1.53 1.70 1.66 1.64 167.0 22345 1.69 1.65 1.66 1.64 1.65 1.68 180.5 22336 1.61 1.80 1.57 1.76 1.68 197.0 23436 1.78 1.68 1.65 1.66 197.0 23436 1.78 1.63 1.65 1.66 218.0 24564 1.58 1.60 1.51 1.72 1.60 238.0 24927 1.57 1.56	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5	10050 10700 11700 12700 13700 14506	<u>δ³⁰Si [‰]</u> 1.41 1.56 1.57 1.57 1.56 1.63	0 μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69	δ ³⁰ Si (%) δ ³⁰ Si [‰] 1.45 1.68 1.47 1.60	δ ³⁰ Si [‰] 1.65 1.59 1.66	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5	e 10050 10700 11700 13700 13700 14506 15283	$\frac{\delta^{30}\text{Si} [\%]}{1.41}$ 1.56 1.57 1.56 1.63 1.59	0 μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.56 1.71 1.69 1.72	δ ³⁰ Si (%) ^{δ³⁰Si [‰] 1.45 1.68 1.47 1.60 1.62}	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰] 1.44 1.55 1.60 1.57 1.60 1.64 1.63	
87.0 17656 1.68 1.78 1.52 1.666 97.0 19433 1.59 1.58 1.59 107.0 19211 1.56 1.60 1.58 117.0 19989 1.60 1.59 1.60 127.0 20767 1.74 1.71 1.64 1.67 137.0 21255 1.63 1.63 1.63 1.63 147.0 21618 1.68 1.64 1.65 1.66 157.0 21982 1.68 1.53 1.70 1.66 167.0 22345 1.69 1.65 1.60 1.77 1.68 180.5 22836 1.61 1.80 1.57 1.76 1.69 187.5 23091 1.60 1.78 1.65 1.62 1.70 1.64 207.5 23818 1.65 1.64 1.52 1.70 1.64 228.0 24564 1.58 1.60 1.51 1.72	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5	e 10050 10700 11700 12700 13700 14506 15283 16061	$\frac{\delta^{30}\text{Si} [\%]}{1.41}$ 1.56 1.57 1.57 1.56 1.63 1.59 1.61	0 μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62	δ ³⁰ Si (%) 1.45 1.68 1.47 1.60 1.62 1.56	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.63	
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 66.5 77.0 87.0	10050 10700 11700 12700 13700 14506 15283 16061 16878 17656	$\frac{\delta^{30}\text{Si} [\%]}{1.41}$ 1.56 1.57 1.57 1.57 1.56 1.63 1.59 1.61 1.63 1.63 1.63	δ μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.72 1.69 1.72 1.69	δ ³⁰ Si (%) δ ³⁰ Si [‰] 1.45 1.68 1.47 1.60 1.62 1.56 1.59 1.52	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.64	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 66.5 66.5 77.0 87.0 97.0	10050 10700 11700 12700 14506 15283 16061 16878 17656 18433	$\frac{\delta^{30}\text{Si} [\%]}{1.41}$ 1.56 1.57 1.56 1.63 1.63 1.63 1.63 1.68 1.59	δ μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.57 1.57 1.69 1.72 1.62 1.69 1.78 1.58 1.58	δ³⁰Si (%) 1.45 1.68 1.47 1.60 1.62 1.56 1.59 1.52	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.66 1.59	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0	10050 10700 11700 12700 14506 15283 16061 16878 17656 18433 19211	$\frac{\delta^{30}\text{Si} [\%]}{1.41}$ 1.56 1.57 1.56 1.63 1.59 1.61 1.63 1.59 1.56 1.63	0 μm) δ ³⁰ Si [‰] 1.47 1.52 1.56 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.58 1.58 1.58	δ³⁰Si (%) 1.45 1.68 1.47 1.60 1.62 1.56 1.59 1.52	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57	S)	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.66 1.59 1.58	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0	e 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 19211 19989	$\begin{array}{c} & \delta^{30} \text{Si} \left[\% \right] \\ \hline & \delta^{30} \text{Si} \left[\% \right] \\ \hline & 1.41 \\ 1.56 \\ 1.57 \\ 1.56 \\ 1.63 \\ 1.63 \\ 1.63 \\ 1.63 \\ 1.68 \\ 1.59 \\ 1.56 \\ 1.56 \\ 1.56 \\ 1.60 \\ 4.7 \end{array}$	Ο μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.60 1.59 1.59 1.72 1.62 1.69 1.78 1.58 1.69 1.78 1.58 1.69 1.78 1.57 1.78 1.57 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.75 1.77 1.65 1.77 1.72 1.69 1.78 1.79 1.79 1.78 1.78 1.78 1.79 1.79 1.79 1.78	δ³⁰Si (%) 1.45 1.68 1.47 1.60 1.62 1.56 1.59 1.52	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [‰] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.66 1.59 1.58 1.58 1.58	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0	10050 10700 11700 13700 13700 13700 14506 15283 16061 16878 17656 18433 19211 19889 20767	$\frac{\delta^{30}\text{Si}[\%]}{1.41}$ 1.56 1.57 1.56 1.63 1.63 1.63 1.68 1.59 1.56 1.60 1.74 .74	Ο μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.60 1.59 1.71	δ³⁰Si (%) 1.45 1.68 1.47 1.60 1.62 1.56 1.59 1.52 1.64	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.67 1.63 1.63 1.60 1.64 1.66 1.59 1.58 1.60 1.59 1.58 1.60 1.70	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0	e 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 19211 19989 20767 21255	$\begin{array}{c} \underline{\delta^{30}\text{Si}} \left[9\text{60} \right] \\ \hline \\ \underline{\delta^{30}\text{Si}} \left[9\text{60} \right] \\ \hline \\ 1.41 \\ 1.56 \\ 1.57 \\ 1.57 \\ 1.56 \\ 1.63 \\ 1.64$	Ο μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.60 1.59 1.71 1.63 1.59 1.71	δ³⁰Si (%) <u>δ³⁰Si [‰]</u> 1.45 1.68 1.47 1.60 1.62 1.56 1.59 1.52 1.64	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57	S)	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.64 1.63 1.60 1.64 1.66 1.59 1.58 1.60 1.70 1.63	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0	e 10050 10700 11700 12700 13700 14506 15283 16061 15283 16061 15283 16061 15878 16678 19211 19989 20767 21255 21618	$\begin{array}{c} \underline{\delta^{30}\text{Si}} \left[\begin{array}{c} 9 \\ 6 \end{array} \right] \\ \hline 1.41 \\ 1.56 \\ 1.57 \\ 1.56 \\ 1.63 \\ 1.63 \\ 1.63 \\ 1.63 \\ 1.63 \\ 1.68 \\ 1.59 \\ 1.56 \\ 1.60 \\ 1.74 \\ 1.63 \\ 1.63 \\ 1.68 \\ 1.68 \\ 1.56 \\ 1.60 \\ 1.74 \\ 1.63 \\ 1.68 \\ 1.68 \\ 1.68 \\ 1.56 \\ 1.60 \\ 1.74 \\ 1.63 \\ 1.68 \\ 1.68 \\ 1.68 \\ 1.59 \\ 1.56 \\ 1.56 \\ 1.56 \\ 1.56 \\ 1.56 \\ 1.56 \\ 1.56 \\ 1.57 \\$	δ μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.60 1.59 1.71 1.63 1.64 1.63 1.64	δ³⁰Si (%) 1.45 1.68 1.47 1.60 1.62 1.52 1.52 1.64 1.65	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57	S)	δ ³⁰ Si _{AVG} [‰] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.59 1.58 1.58 1.58 1.60 1.70 1.63 1.63 1.64	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 157.0	10050 10700 11700 13700 13700 13700 14506 15283 16061 16878 17656 18433 19211 19889 20767 21255 21618 21982 20767	$\frac{\delta^{30}\text{Si}}{1.41}$ 1.56 1.57 1.56 1.63 1.63 1.63 1.68 1.59 1.56 1.60 1.74 1.63 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68	δ μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.57 1.69 1.72 1.62 1.69 1.78 1.58 1.60 1.59 1.71 1.63 1.64 1.59 1.71 1.63 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.65 1.64 1.65 1.65 1.75 1.55 1.55 1.55 1.55 1.55 1.75 1.55 1.75 1.75 1.75 1.65 1.75 1.65 1.75 1.75 1.75 1.65 1.75 1.75 1.75 1.75 1.65 1.75 1.75 1.65 1.75 1.75 1.65 1.75 1.75 1.65 1.75 1.75 1.75 1.75 1.65 1.75 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.55 1.55 1.64 1.55 1.55 1.64 1.55 1.55 1.64 1.55 1.55 1.64 1.55 1	δ ³⁰ Si (%) 1.45 1.68 1.47 1.60 1.62 1.56 1.59 1.52 1.64 1.64 1.65 1.70	δ ³⁰ Si [‰] 1.65 1.59 1.66 1.57 1.66	S)	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.67 1.63 1.63 1.60 1.64 1.66 1.59 1.58 1.60 1.64 1.66 1.69 1.59 1.58 1.60 1.64 1.64 1.65 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.65 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.65 1.60 1.64 1.63 1.60 1.64 1.65 1.60 1.64 1.63 1.60 1.64 1.66 1.65 1.60 1.64 1.66 1.65 1.60 1.64 1.66 1.65 1.66 1.66 1.65 1.66 1.66 1.65 1.66 1.59 1.58 1.60 1.66 1.66 1.59 1.58 1.60 1.60 1.64 1.66 1.59 1.58 1.60 1.60 1.64 1.60 1.66	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 147.0 157.0 167.0 167.0	le 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 19211 19989 20767 21255 21618 21982 20252 21618	$\begin{array}{c} & \delta^{30} \text{Si} \left[\% \right] \\ & \delta^{30} \text{Si} \left[\% \right] \\ & 1.41 \\ & 1.56 \\ & 1.57 \\ & 1.57 \\ & 1.56 \\ & 1.63 \\ & 1.63 \\ & 1.63 \\ & 1.68 \\ & 1.59 \\ & 1.56 \\ & 1.60 \\ & 1.74 \\ & 1.63 \\ & 1.68 \\ & 1.68 \\ & 1.68 \\ & 1.68 \\ & 1.68 \\ & 1.69 \\ & & & \\ \end{array}$	Ο μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.58 1.58 1.59 1.59 1.59 1.59 1.57 1.52 1.55 1	δ³⁰Si (%) 1.45 1.68 1.47 1.60 1.62 1.59 1.52 1.64 1.65 1.59 1.52	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57 1.66 1.57	S)	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.69 1.58 1.60 1.70 1.63 1.66 1.59 1.58 1.60 1.70 1.63 1.66 1.63 1.66 1.57 1.64 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.57 1.60 1.64 1.66 1.65 1.66 1.56 1.66 1.56 1.66 1.56 1.66 1.56 1.66 1.56 1.66 1.66 1.66 1.56 1.66	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 157.0 167.0 180.5	e 10050 10700 11700 12700 13700 15283 16061 15283 16061 16878 17656 18433 19989 20767 21255 21618 21982 22345 22836 22345	$\frac{\delta^{30}\text{Si}}{1.41}$ $\frac{\delta^{30}\text{Si}}{1.57}$ $\frac{1.57}{1.56}$ 1.63 1.63 1.63 1.68 1.59 1.61 1.64 1.54 1.66 1.66 1.74 1.63 1.68 1	δ μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.60 1.59 1.71 1.63 1.64 1.53 1.64 1.53 1.65 1.80 1.65 1.80 1.65 1.65 1.57 1.58 1.59 1.71 1.69 1.72 1.58 1.69 1.72 1.58 1.69 1.72 1.58 1.69 1.72 1.64 1.53 1.65 1.65 1.80 1.65 1.80 1.85 1	δ ³⁰ Si (%) ³⁰ Si [%) 1.45 1.68 1.47 1.60 1.62 1.52 1.52 1.64 1.65 1.70 1.64 1.65 1.70 1.64	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.77 1.76	S)	δ ³⁰ Si _{AVG} [‰] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.58 1.60 1.70 1.63 1.60 1.70 1.63 1.66 1.58 1.60 1.77 1.60 1.77 1.60 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.65 1.64 1.65 1.64 1.65 1.66 1.65 1.66 1.57 1.66 1.66 1.57 1.66 1.66 1.57 1.60 1.64 1.66 1.58 1.60 1.66 1.58 1.60 1.66 1.58 1.60 1.66 1.58 1.60 1.66 1.58 1.60 1.66 1.58 1.60 1.66 1.58 1.60 1.66 1.58 1.60 1.66 1.65 1.66 1.58 1.60 1.66 1.65 1.66 1.66 1.59 1.66 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.69 1.68 1.68 1.68 1.68 1.68 1.68 1.69 1.68 1.68 1.68 1.68 1.69 1.68 1.68 1.68 1.69 1.68 1.68 1.69 1.68 1.68 1.69 1.68 1.68 1.69 1.68 1.68 1.69 1.69 1.68 1.68 1.68 1.69 1.69 1.68 1.68 1.69 1.69 1.68 1.68 1.69 1.69 1.68 1.68 1.68 1.69 1.68 1.68 1.69 1.69 1.68 1.68 1.69 1.68 1.68 1.68 1.69 1.68 1.68 1.68 1.69 1.68 1.68 1.68 1.69 1.68 1.68 1.68 1.68 1.68 1.69 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.69 1.68 1.	
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 137.0 147.0 157.0 167.0 187.5 197.0 207.5 218.0 228.0 238.0 247.5 57.5	le 10050 10700 11700 12700 13700 14506 15283 16061 15283 16061 15878 17656 18433 19211 1989 20767 21255 21618 21982 22345 22836 23091 23436 23917 24257 23572 2391 23456 23917 24257 23572 2572 2572 2572 2572 2572 2572	$\begin{array}{c} \underline{\delta^{30}\text{Si}} \left[9\text{60} \right] \\ \hline \\ \underline{\delta^{30}\text{Si}} \left[9\text{60} \right] \\ \hline \\ 1.41 \\ 1.56 \\ 1.57 \\ 1.57 \\ 1.56 \\ 1.63 \\ 1.63 \\ 1.68 \\ 1.69 \\ 1.59 \\ 1.56 \\ 1.60 \\ 1.74 \\ 1.63 \\ 1.68 \\ 1.68 \\ 1.68 \\ 1.68 \\ 1.68 \\ 1.68 \\ 1.68 \\ 1.68 \\ 1.61 \\ 1.61 \\ 1.60 \\ 1.78 \\ 1.63 \\ 1.57 \\ 1.57 \\ 1.52 \\ 1.57 \\ 1.62 \\ 1.77 \\ 1.77$	Ο μm) $\delta^{30}Si [‰]$ 1.47 1.52 1.57 1.56 1.71 1.69 1.69 1.69 1.69 1.63 1.64 1.53 1.65 1.60 1.59 1.71 1.63 1.64 1.53 1.65 1.69 1.65 1.69 1.69 1.69 1.56 1.57 1.58 1.59 1.57 1.63 1.64 1.59 1.59 1.57 1.65 1.69 1.59 1.57 1.65 1.69 1.59 1.57 1.65 1.69 1.59 1.57 1.65 1.69 1.59 1.59 1.57 1.65 1.69 1.59 1.59 1.57 1.65 1.65 1.66 1.59 1.59 1.59 1.57 1.63 1.65 1.69 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.59 1.69 1.5	δ ³⁰ Si (%) ³⁰ Si [%)] 1.45 1.68 1.47 1.60 1.62 1.59 1.52 1.64 1.65 1.6	<u>δ³⁰Si [%0]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.57 1.66 1.57 1.66 1.57 1.65 1.52 1.65	S) δ ³⁰ Si [‰] 1.70	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.63 1.63 1.63 1.64 1.66 1.59 1.58 1.60 1.70 1.63 1.66 1.64 1.66 1.64 1.68 1.70 1.65 1.64 1.60 1.62 1.64 1.60 1.65 1.64 1.60 1.65 1.64 1.60 1.65 1.64 1.60 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.65 1.66 1.68 1.69 1.68 1.77 1.60 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.65 1.64 1.65 1.66	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 147.0 137.0 147.0 137.0 147.0 137.0 207.5 218.0 228.0 238.0 247.5 257.5 267.5	e 10050 10700 11700 12700 13700 14506 15283 16061 15283 16061 16878 17656 18433 19211 19989 20767 21255 21618 21982 22345 22357 22573 25525 25536 25573 25536 25573 25575 255777 255777 255777 25777 25777 25777 257777 25777777 257777	$\begin{array}{c} \underline{\delta^{30}\text{Si}} \left[9 \\ 6 \\ \hline \delta^{30} \\ \hline \\ \hline \\ 1.41 \\ 1.56 \\ 1.57 \\ 1.56 \\ 1.63 \\ 1.63 \\ 1.63 \\ 1.63 \\ 1.63 \\ 1.68 \\ 1.59 \\ 1.56 \\ 1.63 \\ 1.64 \\ 1.63 \\ 1.64 \\ 1.63 \\ 1.64 \\ 1.64 \\ 1.61 \\ 1.61 \\ 1.61 \\ 1.61 \\ 1.61 \\ 1.62 \\ 1.63 \\ 1.58 \\ 1.57 \\ 1.62 \\ 1.72 \\ 1.54 \\ 1.57 \\ 1.62 \\ 1.72 \\ 1.54 \\ 1.57 \\$	Ο μm) $\delta^{30}Si [%]$ 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.68 1.60 1.59 1.71 1.63 1.64 1.53 1.65 1.80 1.88 1.66 1.59 1.71 1.63 1.64 1.53 1.65 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.69 1.68 1.65 1.65 1.55 1.57 1.62 1.62 1.63 1.64 1.53 1.65 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.58 1.66 1.66 1.58 1.66 1.66 1.58 1.66 1.66 1.58 1.66 1.58 1.66 1.66 1.58 1.66 1.58 1.66 1.66 1.58 1.66 1.66 1.58 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.56 1.66 1.66 1.56 1.66 1.66 1.56 1.66 1.56 1.66 1.66 1.56 1.66 1.56 1.66 1.56 1.66 1.56 1.66 1.56 1.56 1.66 1.56 1.66 1.56 1.56 1.66 1.56 1.56 1.56 1.66 1.57 1.57 1.57 1.56 1.56 1.56 1.56 1.56 1.56 1.57 1.5	δ³⁰Si (%) 1.45 1.68 1.47 1.60 1.59 1.52 1.64 1.65 1.70 1.60 1.57 1.63 1.64 1.65 1.63 1.64 1.65	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.57 1.52 1.72 1.65	S) δ ³⁰ Si [‰] 1.70	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.69 1.59 1.64 1.64 1.69 1.58 1.60 1.64 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.65 1.64 1.68 1.69 1.65 1.64 1.57 1.60 1.57 1.60 1.64 1.57 1.60 1.64 1.57 1.60 1.64 1.57 1.60 1.64 1.57 1.60 1.64 1.57 1.60 1.64 1.64 1.59 1.64 1.64 1.59 1.64 1.64 1.65 1.64 1.64 1.66 1.59 1.64 1.66 1.64 1.59 1.60 1.64 1.64 1.66 1.64 1.66 1.59 1.60 1.64 1.66 1.64 1.66 1.65 1.66 1.64 1.66 1.66 1.66 1.64 1.66 1.67 1.65 1.64 1.66	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 157.0 167.0 180.5 187.5 197.0 207.5 218.0 228.0 238.0 247.5 257.5 267.5 275.5	e 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 1989 20767 21255 21618 21982 22345 22836 23911 24346 23818 24200 24564 24927 25273 25566 25666 26000 24564 24927 25273 25566 25666 26000 2457 25676 257777 257777 257777 257777 257777 2577777 2577777 257777777777	$\frac{\delta^{30}\text{Si}}{1.41}$ $\frac{\delta^{30}\text{Si}}{1.57}$ $\frac{1.57}{1.56}$ $\frac{1.63}{1.63}$ $\frac{1.68}{1.69}$ $\frac{1.68}{1.69}$ $\frac{1.68}{1.69}$ $\frac{1.68}{1.69}$ $\frac{1.61}{1.63}$ $\frac{1.68}{1.68}$ $\frac{1.69}{1.61}$ $\frac{1.63}{1.58}$ $\frac{1.57}{1.62}$ $\frac{1.58}{1.57}$ $\frac{1.58}{1.57}$ $\frac{1.58}{1.52}$ $\frac{1.57}{1.62}$ $\frac{1.58}{1.57}$	Ο μm) $\delta^{30}Si [‰]$ 1.47 1.52 1.57 1.57 1.57 1.69 1.72 1.62 1.69 1.78 1.68 1.60 1.63 1.64 1.53 1.65 1.80 1.78 1.68 1.65 1.69 1.64 1.55 1.69 1.64 1.55 1.66 1.65 1.66 1.65 1.66 1.65 1.69 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.71 1.65 1.72 1.65 1.72 1.62 1.55 1.55 1.55 1.55 1.65 1.65 1.72 1.62 1.65 1.66 1.55 1.65 1.65 1.66 1.55 1.65 1.65 1.66 1.55 1.65 1.66 1.55 1.65 1.65 1.66 1.55 1.66 1.55 1.65 1.65 1.66 1.55 1.66 1.55 1.66 1.55 1.66 1.55 1.66 1.65 1.65 1.66 1.65 1.60 1.55 1.60 1.55 1.65 1.66 1.65 1.60 1.55 1.65 1.60 1.55 1.55 1.60 1.55 1.55 1.60 1.55 1.55 1.55 1.60 1.55 1.55 1.55 1.55 1.60 1.55 1.55 1.55 1.55 1.60 1.55 1.55 1.55 1.55 1.60 1.55 1.5	δ ³⁰ Si (%) ³⁰ Si [%) 1.45 1.68 1.47 1.60 1.52 1.64 1.65 1.52 1.64 1.65 1.65 1.65 1.65 1.65 1.64 1.62 1.63 1.64 1.62 1.63 1.64 1.62 1.63 1.64 1.63 1.64 1.65	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.57 1.66 1.77 1.76 1.52 1.65	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.64 1.63 1.60 1.64 1.66 1.59 1.58 1.60 1.70 1.63 1.66 1.64 1.64 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.77 1.60 1.65 1.66 1.64 1.69 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.60 1.66 1.65 1.60 1.65 1.60 1.64 1.57 1.60 1.65 1.60 1.64 1.57 1.60 1.64 1.58 1.60 1.66 1.59 1.66 1.66 1.59 1.66	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 157.0 167.0 180.5 187.5 197.0 228.0 228.0 228.0 247.5 267.5 267.5 280.5 285.5	e 10050 10700 11700 12700 13700 14506 15283 16061 15283 16061 16878 17656 18433 19211 19989 20767 21255 21618 21982 22345 2257 2257 2257 2257 2257 2257 2257 2257 2257 2257 2257 2257 2257 2257 2257 2257 2257 257	$\begin{array}{c} & & 5^{30} \mathbf{5i} \left[9 60 \right] \\ & & 5^{30} \mathbf{5i} \left[9 60 \right] \\ & & 1.41 \\ & & 1.56 \\ & & 1.57 \\ & & 1.57 \\ & & 1.57 \\ & & 1.57 \\ & & 1.56 \\ & & 1.63 \\ & & 1.63 \\ & & 1.63 \\ & & 1.63 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.68 \\ & & 1.63 \\ & & 1.57 \\ & & 1.54 \\ & & 1.54 \\ & & 1.54 \\ \end{array}$	Ο μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.58 1.58 1.58 1.58 1.53 1.63 1.64 1.53 1.63 1.64 1.53 1.65 1.80 1.57 1.63 1.64 1.53 1.65 1.80 1.57 1.63 1.64 1.53 1.65 1.80 1.57 1.56 1.71 1.63 1.64 1.57 1.57 1.57 1.57 1.56 1.71 1.62 1.57 1.50 1.59 1.50 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1	δ ³⁰ Si (%) 1.45 1.68 1.47 1.60 1.59 1.52 1.64 1.65 1.55 1.55 1.55 1.55 1.55 1.55 1.55 1.55 1.55 1.55 1.55 1.55 1.55	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.57 1.56 1.52 1.72 1.65	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.63 1.60 1.64 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.64 1.60 1.62 1.64 1.60 1.62 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.65 1.64 1.65 1.65 1.65 1.64 1.65 1.64 1.65 1.65 1.64 1.65 1.65 1.64 1.65 1.65 1.64 1.65 1.65 1.64 1.65 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.65 1.64 1.65 1.55	
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347.0 28891 1.52 1.57 1.60 1.61 1.60 357.0 29255 1.62 1.60 1.50 1.57 367.0 29618 1.71 1.64 1.62 1.66 381.0 30127 1.58 1.56 1.57	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 127.0 137.0 147.0 157.0 167.0 180.5 187.5 197.0 207.5 218.0 228.0 247.5 257.5 267.5 267.5 280.5 287.5 297.5 307.0 318.0 327.5	e 10050 10700 11700 12700 13700 14506 15283 16061 15283 16061 15283 16061 16878 17656 18433 19211 19989 20767 21255 21618 21982 22345 22836 23918 23436 23818 24200 24564 24927 25273 25636 26473 26227 27091 24466 26473 26727 27091 27436 26727 27091 27436 26727 27091 27436 26727 27091 27436 27436 27436 27436 27436 27436 27436 27436 27436 27436 27436 27436 27436 27436 27446 274 274 274 274 274 274 274 274 274 274	ns (10-4) δ ³⁰ Si [‰] 1.41 1.56 1.57 1.56 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.68 1.59 1.61 1.63 1.57 1.57 1.57 1.56 1.63 1.58 1.57 1.57 1.58 1.62 1.57 1.58 1.62 1.58 1.65 1.62 1.57 1.58 1.65 1.62 1.75 1.58 1.65 1.57 1.58 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.57 1.58 1.65	Ο μm) δ^{30} Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.68 1.63 1.64 1.53 1.64 1.53 1.64 1.53 1.65 1.80 1.65 1.69 1.68 1.68 1.65 1.69 1.68 1.68 1.65 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.69 1.60 1.56 1.60 1.50 1.60 1.56 1.60 1.50 1.60 1.50 1.60 1.56 1.60 1.50 1.60 1.50 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.57 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.66 1.56 1.66 1.56 1.66 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.56 1.60 1.60 1.61 1.60 1.61 1.60 1.60 1.61 1.60 1.61 1.60 1.61 1.60 1.61 1.60 1.61 1.60 1.61 1.61 1.61 1.62 1.61 1.62 1.61 1.62 1.62 1.62 1.61 1.62 1.6	δ ³⁰ Si (%)	<u>δ³⁰Si [%0]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.57 1.66 1.57 1.66 1.52 1.65 1.65 1.64 1.86	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.60 1.64 1.69 1.58 1.60 1.70 1.63 1.66 1.64 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.70 1.65 1.64 1.65 1.64 1.65 1.64 1.59 1.65 1.64 1.57 1.60 1.65 1.65 1.66 1.57 1.60 1.65 1.65 1.66 1.57 1.60 1.65	
357.0 29255 1.62 1.50 1.57 367.0 29258 1.71 1.64 1.62 1.66 381.0 30127 1.58 1.56 1.57	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 127.0 137.0 147.0 157.0 167.0 167.0 167.0 187.5 197.0 207.5 218.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 267.5 27.5 267.5 27.5 267.5 27.5 267.5 27.5 267.5 27.5 267.5 27.5	le 10050 10700 12700 12700 13700 14506 15283 16061 15283 16061 15283 16071 14506 15283 16071 14506 14533 16071 16878 17556 16878 17556 16878 19211 19989 20767 21255 21618 21982 22345 22836 22836 24200 24546 228316 24927 25536 26000 24547 25733 25636 26000 24547 25733 25636 26000 24547 25733 25636 26000 24547 25733 25636 26000 2473 25733 25733 25735 26000 2473 2573 25733 25733 25735 26000 2473 25733 25733 25735 26000 2473 25733 270911 27735 277951 27735 277951 27735 277951 27735 277951 27735 277951 27735 27755 27755 27755 27755 27755 27755 27755 27755 27755 277	$\frac{\delta^{30}\text{Si}[9\%]}{1.41}$ $\frac{\delta^{30}\text{Si}[9\%]}{1.41}$ $\frac{1.56}{1.57}$ $\frac{1.57}{1.56}$ $\frac{1.63}{1.63}$ $\frac{1.63}{1.63}$ $\frac{1.668}{1.669}$ $\frac{1.66}{1.64}$ $\frac{1.68}{1.68}$ $\frac{1.68}{1.68}$ $\frac{1.68}{1.68}$ $\frac{1.68}{1.68}$ $\frac{1.68}{1.68}$ $\frac{1.68}{1.58}$ $\frac{1.65}{1.63}$ $\frac{1.57}{1.62}$ $\frac{1.58}{1.58}$ $\frac{1.57}{1.62}$ $\frac{1.54}{1.75}$ $\frac{1.58}{1.58}$ $\frac{1.52}{1.58}$ $1.$	Ο μm) δ^{30} Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.62 1.62 1.69 1.78 1.68 1.60 1.59 1.71 1.63 1.65 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.62 1.72 1.62 1.72 1.62 1.65 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.72 1.62 1.75 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.60 1.59 1.60 1.59 1.60 1.59 1.60 1.59 1.60 1.59 1.60 1.59 1.60 1.59 1.60 1.65 1.65 1.60 1.65 1.60 1.65 1.60 1.59 1.60 1.65 1.60 1.66 1.65 1.60 1.59 1.60 1.59 1.60 1.65 1.60 1.59 1.60 1.59 1.60 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.60 1.59 1.60 1.59 1.60 1.59 1.60 1.59 1.60 1.59 1.60 1.59 1.61 1.59 1.61 1.59 1.61 1.59 1.50 1.51 1.55 1.51 1.55 1.5	δ ³⁰ Si (%) ³⁰ Si [%) 1.45 1.68 1.47 1.60 1.62 1.52 1.64 1.65 1.59 1.52 1.64 1.65 1.85	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.77 1.76 1.52 1.65 1.65 1.64 1.86 1.64 1.86 1.61	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.63 1.60 1.64 1.66 1.59 1.58 1.60 1.60 1.64 1.66 1.64 1.66 1.64 1.66 1.64 1.66 1.64 1.66 1.64 1.66 1.64 1.66 1.64 1.66 1.64 1.65 1.66 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.60 1.63 1.69 1.65 1.65 1.65 1.65 1.65 1.66 1.63 1.69 1.65 1.65 1.65 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.65 1.65 1.66 1.65 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.54 1.54 1.58 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.54 1.68	
367.0 29618 1.71 1.64 1.62 1.66 381.0 30127 1.58 1.56 1.56	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 157.0 167.0 180.5 187.5 197.0 207.5 218.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.0 228.5 267.5 267.5 280.5 287.5	le 10050 10700 11700 12700 13700 14506 15283 16061 15283 16061 14528 17656 18438 17656 18438 17656 18438 17656 18438 17656 18438 12211 19989 20767 21255 21618 21982 22345 22345 22345 22345 22345 22345 22345 22345 22345 22457 25273 25563 26473 26472 25273 255636 26473 26727 25273 255636 26472 27091 27436 26602 26473 26727 27291 27436 26602 27436 27437 27436 27436 27437 27436 27437 27436 27437 27436 27437 27437 27437 27437 27437 27457 27437 27457 27457 27457 27457 27457 27457 27457 27457 27457 27457 27477 2757 275	ns (10-4) δ^{30} Si [%] 1.41 1.56 1.57 1.56 1.63 1.63 1.63 1.63 1.63 1.68 1.59 1.56 1.60 1.74 1.63 1.68 1.68 1.68 1.69 1.56 1.63 1.64 1.63 1.64 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.66 1.65 1.65 1.65 1.66 1.65 1.65 1.66 1.65 1.66 1.66 1.74 1.66 1.65 1.66 1.65 1.66 1.65 1.66 1.65 1.65 1.66 1.65 1.65 1.66 1.65 1.55 1.	Ο μm) δ ³⁰ Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.60 1.59 1.71 1.63 1.64 1.53 1.65 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.69 1.60 1.55 1.60 1.55 1.69 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.60 1.55 1.61 1.50 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.52 1.57 1.61 1.62 1.57 1.61 1.62 1.52 1.57 1.61 1.62 1.52 1.57 1.61 1.62 1.52 1.57 1.61 1.62 1.52 1.57 1.61 1.62 1.52 1.57 1.61 1.62 1.52 1.57 1.61 1.62 1.52 1.57 1.61 1.62 1.54 1.57 1.61 1.62 1.54 1.57 1.61 1.62 1.54 1.57 1.61 1.62 1.54 1.57 1.61 1.62 1.54 1.57 1.61 1.52 1.54 1.57 1.61 1.62 1.54 1.57 1.52 1.54 1.55 1.57 1.61 1.52 1.54 1.55 1.55 1.55 1.55 1.55 1.55 1.61 1.55 1	δ ³⁰ Si (%) 1.45 1.68 1.47 1.60 1.52 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.62 1.64 1.62 1.64 1.62 1.64 1.63 1.64 1.51 1.63 1.64 1.51 1.63 1.64 1.62 1.65 1.64 1.62 1.65 1.64 1.62 1.65 1.50 1.50 1.50 1.58	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.57 1.52 1.72 1.65 1.64 1.64 1.64 1.61	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.57 1.60 1.64 1.63 1.64 1.64 1.64 1.64 1.66 1.58 1.60 1.63 1.66 1.64 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.64 1.68 1.69 1.68 1.64 1.68 1.58 1.60 1.64 1.58 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.57 1.60 1.58 1.60 1.58 1.60 1.58 1.60 1.58 1.60 1.58 1.60 1.58 1.60 1.58 1.66 1.64 1.58 1.66 1.58 1.66 1.58 1.66 1.68 1.58 1.66 1.64 1.68 1.58 1.66 1.64 1.66 1.64 1.66 1.64 1.66 1.64 1.66 1.65 1.66 1.64 1.66 1.64 1.66 1.66 1.64 1.66 1.66 1.64 1.66 1.56 1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.63 1.65 1.63 1.65 1.63 1.58 1.58 1.63 1.65 1.63 1.65 1.58	
381.0 30127 1.58 1.56 1.57	Depth (cm) Ag 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 127.0 137.0 147.0 157.0 167.0 180.5 187.5 197.0 207.5 218.0 228.0 228.0 228.0 228.0 228.0 228.5 267.5 267.5 267.5 267.5 267.5 267.5 27	e 10050 10700 11700 12700 13700 14506 15283 16061 15283 16061 15283 16061 16878 17656 18433 19211 19989 20767 21255 21618 21982 22345 22836 2391 23436 23818 24200 24564 24927 25273 25636 26073 26727 27091 2454 24927 25273 25636 2602 26473 26227 27036 2647 27036 2647 2706 2647 2706 2647 2706 2647 2706 2647 2706 264 265 270 2647 2706 264 270 2706 264 270 270 270 270 270 270 270 270 270 270	ns (10-4) δ ³⁰ Si [‰] 1.41 1.56 1.57 1.56 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.66 1.60 1.60 1.60 1.64 1.63 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.69 1.61 1.63 1.57 1.57 1.57 1.56 1.63 1.63 1.63 1.63 1.57 1.57 1.57 1.58 1.63 1.57 1.57 1.58 1.63 1.57 1.57 1.58 1.63 1.57 1.57 1.58 1.63 1.57 1.57 1.55 1.63 1.63 1.57 1.57 1.55 1.63 1.63 1.58 1.57 1.57 1.55 1.63 1.58 1.57 1.57 1.58 1.65 1.63 1.75 1.57 1.58 1.65 1.65 1.65 1.65 1.57 1.57 1.58 1.65 1.65 1.65 1.65 1.65 1.65 1.57 1.57 1.58 1.65 1.65 1.65 1.65 1.65 1.57 1.58 1.65 1.65 1.65 1.57 1.58 1.65 1.65 1.65 1.57 1.58 1.65 1.65 1.65 1.65 1.57 1.58 1.65 1.65 1.65 1.65 1.57 1.58 1.65 1.68 1.65 1.68 1.65 1.68 1.65 1.57 1.58 1.65 1.68 1.65 1.68 1.65 1.68 1.65 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.68 1.57 1.58 1.62 1.68	Ο μm) δ^{30} Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.72 1.62 1.69 1.78 1.58 1.69 1.71 1.63 1.64 1.53 1.64 1.53 1.65 1.69 1.61 1.68 1.69 1.69 1.60 1.58 1.69 1.60 1.58 1.69 1.60 1.58 1.69 1.60 1.58 1.69 1.60 1.58 1.69 1.60 1.58 1.69 1.60 1.58 1.65 1.69 1.60 1.58 1.65 1.69 1.60 1.58 1.69 1.60 1.59 1.61 1.66 1.59 1.62 1.62 1.62 1.69 1.62 1.69 1.60 1.56 1.66 1.59 1.62 1.62 1.69 1.62 1.62 1.62 1.62 1.62 1.69 1.60 1.58 1.65 1.60 1.56 1.60 1.55 1.60 1.50 1.60 1.56 1.60 1.55 1.60 1.56 1.66 1.57 1.62 1.65 1.65 1.60 1.65 1.60 1.65 1.61 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.64 1.50 1.61 1.62 1.62 1.64 1.50 1.61 1.62 1.62 1.54 1.55 1.62 1.54 1.55 1.64 1.66 1.62 1.54 1.55 1.64 1.55 1.64 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.66 1.54 1.55 1.64 1.55 1.64 1.66 1.66 1.66 1.55 1.64 1.66 1.66 1.66 1.66 1.66 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.65 1.5	δ ³⁰ Si (%) 1.45 1.68 1.47 1.60 1.62 1.56 1.52 1.52 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.65 1.64 1.62 1.69 1.53 1.64 1.62 1.69 1.53 1.53 1.53 1.54 1.64 1.62 1.69 1.53 1.54 1.53 1.53 1.54 1.53 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.53 1.54 1.54 1.53 1.54 1.53 1.54 1.54 1.53 1.54	<u>δ³⁰Si [%0]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.57 1.66 1.57 1.66 1.61	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.64 1.63 1.60 1.64 1.69 1.59 1.68 1.60 1.64 1.64 1.69 1.68 1.69 1.68 1.69 1.68 1.60 1.60 1.60 1.62 1.64 1.55 1.64 1.55 1.64 1.55 1.64 1.55 1.65 1.65 1.64 1.55 1.65 1.57	
	Depth (cm) Aq 0.5 7.0 17.0 27.0 37.0 46.5 56.5 66.5 77.0 87.0 97.0 107.0 117.0 127.0 137.0 147.0 157.0 147.0 147.0 157.0 167.0 167.0 167.0 187.5 197.0 207.5 218.0 228.0 238.0 247.5 267.5 275.5 267.5 267.5 275.5 267.5 275.5 267.5 275.5	I0050 10050 10700 11700 12700 13700 14506 15283 16061 15283 16061 12700 14506 12205 21618 22345 22836 23091 23418 24200 24527 25273 26000 26473 26727 27091 27436 28182 28581 28891 29255 29618	ns (10-4) δ^{30} Si [%] 1.41 1.56 1.57 1.57 1.56 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.64 1.63 1.68 1.69 1.61 1.63 1.68 1.69 1.61 1.63 1.68 1.69 1.61 1.63 1.68 1.69 1.61 1.57 1.56 1.63 1.68 1.63 1.68 1.68 1.69 1.61 1.57 1.57 1.56 1.63 1.59 1.56 1.63 1.59 1.56 1.63 1.59 1.56 1.63 1.59 1.56 1.63 1.68 1.68 1.68 1.68 1.68 1.68 1.63 1.58 1.57 1.56 1.63 1.58 1.63 1.58 1.57 1.56 1.63 1.58 1.63 1.58 1.57 1.55 1.63 1.58 1.57 1.55 1.52 1.58 1.62 1.58 1.55	Ο μm) δ^{30} Si [‰] 1.47 1.52 1.57 1.56 1.71 1.69 1.62 1.62 1.62 1.62 1.62 1.63 1.63 1.63 1.65 1.64 1.55 1.60 1.64 1.55 1.66 1.65 1.66 1.65 1.66 1.66 1.66 1.66 1.66 1.59 1.61 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.62 1.62 1.72 1.62 1.62 1.72 1.62 1.62 1.72 1.62 1.62 1.72 1.62 1.64 1.55 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.66 1.65 1.60 1.66 1.66 1.66 1.66 1.66 1.60 1.59 1.61 1.65 1.60 1.66 1.65 1.60 1.66 1.59 1.61 1.65 1.60 1.65 1.60 1.65 1.60 1.65 1.60 1.65 1.60 1.65 1.60 1.65 1.60 1.65 1.60 1.65 1.60 1.65 1.60 1.65 1.60 1.59 1.61 1.50 1.61 1.50 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.62 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.61 1.57 1.64 1.57 1.54 1.57 1.64 1.55 1.54 1.54 1.55 1.54 1.55 1.54 1.55 1.55 1.55 1.55 1.55 1.55 1.55	δ ³⁰ Si (%) 1.45 1.68 1.47 1.60 1.62 1.52 1.64 1.65 1.59 1.52 1.64 1.65 1.65 1.65 1.64 1.65 1.65 1.65 1.64 1.62 1.63 1.64 1.65	<u>δ³⁰Si [‰]</u> 1.65 1.59 1.66 1.57 1.66 1.57 1.66 1.77 1.76 1.52 1.65 1.65 1.64 1.61	S) δ ³⁰ Si [‰]	δ ³⁰ Si _{AVG} [%0] 1.44 1.55 1.60 1.63 1.60 1.64 1.66 1.59 1.58 1.60 1.70 1.63 1.66 1.64 1.64 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.68 1.69 1.65 1.64 1.65 1.64 1.55 1.60 1.63 1.66 1.63 1.65 1.66 1.66 1.65 1.66 1.65 1.66 1.66 1.66 1.65 1.66 1.66 1.65 1.66 1.66 1.65 1.66 1.66 1.65 1.66	

PS1778-5 Diatoms (10-40 μ m) δ^{18} O (‰ vs. SMOW)

Supplementary Table 11. Oxygen and silicon isotope data from diatom opal (10-40 µm fraction) in core PS1778-5.

	5**0 (‰) (•125 µm	arians (>	5 Radiola	PS1778-5
δ ¹⁸ Ο _{AVG} [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	δ ¹⁸ Ο [‰]	Age[yrs]	Depth (cm)
42 43		42.46	42 41	47 47	10050	0.50
42.96		42.73	42.94	43.21	10700	7.00
43.46	43.23	42.87	43.75	44.00	11700	17.00
43.82		43.69	43.71	44.06	12700	27.00
43.52		42 56	43.53	43.50	13700	37.00
44.02		43.50	43.87	44.64	14506	46.50
43.00		45.50	42.77	43.22	16061	66.50
44.04				44.04	16878	77.00
44.03			44.60	43.46	17656	87.00
43.78		101010100	43.95	43.60	18433	97.00
44.11		44.10	44.38	43.86	19211	107.00
44.04		44.19	43.79	44.13	19989	127.00
43.80		45.71	44.27	43.33	21255	137.00
43.65			43.27	44.02	21618	147.00
44.26		43.70	44.72	44.36	21982	157.00
44.77			44.67	44.87	22345	167.00
44.36			44.70	44.02	22836	180.50
44.69			44.94	44.43	23091	187.50
45.14			44.99	45.29	23436	207.50
43.53			43.35	43.70	23818	218.00
44.68	44.42	44.68	44.76	44.85	24564	228.00
44.15		44.10	44.23	44.12	24927	238.00
44.59		44.70	44.02	45.05	25273	247.50
44.27		44.00	44.26	44.56	25636	257.50
44.52		44.22	44.44	44.91	26000	267.50
44.41			44.82	44.00	264/3	280.50
44.05			44.12	43.97	20/2/	207.50
44.48		44.24	44.34	44.85	27436	307.00
44.46		44.15	44.51	44.73	27836	318.00
44.10		43.70	44.09	44.52	28182	327.50
44.66			44.57	44.74	28527	337.00
44.44			44.36	44.51	28891	347.00
44.05			43.82	44.28	29255	357.00
43.91			44.12	43.69	30127	381.00
VE NRS)	30 ci / 0/00	\	125 um	ariane (>	- Padiola	S1778-
vs. NBS) δ ³⁰ si _{AVG} [‰]	δ ³⁰ Si (‰)) δ ³⁰ Si [‰]	• 125 μm δ ³⁰ Si [‰]	arians (> δ ³⁰ Si [‰]	5 Radiola	S1778-
vs. NBS) δ ³⁰ Si _{AVG} [‰]	δ ³⁰ Si (‰ δ ³⁰ Si [‰]) δ ³⁰ Si [‰]	• 125 μm δ ³⁰ Si [‰]	a rians (> δ ³⁰ Si [‰]	5 Radiola	51778-5
vs. NBS) δ ³⁰ Si _{AVG} [‰] 0.18	δ ³⁰ Si (‰ δ ³⁰ Si [‰]	δ ³⁰ Si [‰] 0.16	•125 μm δ ³⁰ Si [‰] 0.28	arians (> δ ³⁰ Si [‰]	5 Radiola Age[yrs]	S1778-S
vs. NBS) δ ³⁰ Si _{AVG} [‰] 0.18 0.69	δ ³⁰ Si (‰) δ ³⁰ Si [‰]	δ ³⁰ Si [‰] 0.16	 125 μm δ³⁰Si [‰] 0.28 0.64 0.16 	arians (> δ ³⁰ Si [‰] 0.09 0.74 0.74	5 Radiola Age[yrs] 10050 10700	S1778-S Depth (cm) 0.50 7.00
vs. NBS) δ ³⁰ Si _{AVG} [%) 0.18 0.69 -0.04 0.30	δ ³⁰ Si (‰) δ ³⁰ Si [‰]	δ ³⁰ Si [‰] 0.16 0.13 -0.05	 125 μm δ³⁰Si [‰] 0.28 0.64 -0.16 0.82 	δ ³⁰ Si [‰] 0.09 0.74 0.09 0.74 0.09	5 Radiola Age[yrs] 10050 10700 11700 12700	0.50 7.00 17.00 27.00
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.60	δ ³⁰ Si (‰) δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05	125 μm δ ³⁰ Si [‰] 0.28 0.64 -0.16 0.82 -0.56	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63	5 Radiola Age[yrs] 10050 10700 11700 12700 13700	S1778-S 0.50 7.00 17.00 27.00 37.00
vs. NBS) δ ³⁰ Si _{AVG} [%0. 0.18 0.69 -0.04 0.30 -0.60 -1.51	δ ³⁰ Si (‱ δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	125 μm δ ³⁰ Si [‰] 0.28 0.64 -0.16 0.82 -0.56 -1.66	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63 -1.40	5 Radiola Age[yrs] 10050 10700 11700 12700 13700 14506	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50
vs. NBS) δ ³⁰ Si _{AVG} [%00] 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57	δ ³⁰ Si (‱) δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	 125 μm δ³⁰Si [‰] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -1.60	Age[yrs] 10050 10700 11700 12700 13700 14506 15283	S1778-S Depth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 56.50
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32	δ ³⁰ Si (‱ δ ³⁰ Si (‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	125 μm δ ³⁰ Si [‰] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -1.60 -0.37	Age[yrs] 10050 10700 11700 12700 13700 14506 15283 16061	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 56.50 66.50
vs. NBS) δ ³⁰ Si _{AVG} [%0. 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -0.32 -0.34	δ ³⁰ Si (‱) δ ³⁰ Si (‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	125 μm δ ³⁰ Si [‰] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -1.60 -0.37 -0.34	Age[yrs] 10050 10700 11700 12700 13700 14506 15283 16061 16878 16878	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 56.50 66.50 77.00
vs. NBS) δ ³⁰ Si _{AVG} [%0) 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.73 0.92	5 ³⁰ Si (‱) δ ³⁰ Si (‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	125 μm δ ³⁰ Si [‰] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -1.60 -0.37 -0.34 -1.73 -0.93	Age[yrs] 10050 10700 11700 12700 14506 15283 16061 16878 17655 19433	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 56.50 66.50 77.00 87.00 87.00
vs. NBS) δ ³⁰ Si _{AVG} [%0) 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.73 -0.33 -1.87	5 ³⁰ Si (‰) δ ³⁰ Si (‰] -0.36 0.50	δ ³⁰ Si [%o] 0.16 0.13 -0.05 -1.47	 125 μm δ³⁰Si [‰] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 	δ ³⁰ Si [%] 0.09 0.74 0.24 -0.63 -1.40 -1.60 -0.34 -1.73 -0.53 -1.64	Age[yrs] 10050 10700 11700 12700 13700 14506 15283 16051 16878 16878 16878 17656 18433 19211	st778-s epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 56.50 66.50 66.50 66.50 77.00 87.00 97.00
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.73 -0.32 -0.34 -1.73 -0.93 -1.87 -1.73 -0.93 -1.87 -1.12	5 ³⁰ Si (‰) δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	 λ³⁰Si [‰] δ³⁰Si [‰] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 -1.13 	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -1.40 -1.60 -0.37 -0.37 -0.34 -1.73 -0.93 -1.64	Age[yrs] 10050 10700 11700 12700 14506 15283 16061 16878 17656 18433 19211 19989	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 66.50 77.00 66.50 77.00 97.00 107.00 107.00 117.00
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.73 -0.32 -0.34 -1.73 -0.93 -1.87 -1.12 -1.41	5 ³⁰ Si (‰) δ ³⁰ Si (‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47 -1.76	 125 μm δ³⁰Si [%0] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 -1.13 -1.41 	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -1.60 -0.37 -0.33 -1.64 -0.44 -1.64 -0.47	Age[yrs] 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 19211 19989 20767	epth (cm) 0.50 7.00 17.00 27.00 46.50 56.50 66.50 66.50 77.00 87.00 97.00 107.00 117.00
vs. NBS) δ ³⁰ Si _{AVG} [%0) 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.73 -0.33 -0.34 -1.73 -0.32 -0.34 -1.73 -1.87 -1.12 -1.41 -1.01	5 ³⁰ Si (‱) δ ³⁰ Si (‰] -0.36 0.50	δ ³⁰ Si [%0] 0.16 0.13 -0.05 -1.47 -1.76	 125 μm δ³⁰Si [%₀] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 -1.13 -1.41 -1.15 	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.99 -0.63 -1.40 -1.60 -0.34 -1.73 -0.93 -1.64 -0.47 -1.40 -0.647	Age[yrs] 10050 10700 11700 12700 14506 15283 16061 16878 17656 18433 19211 19889 20767 21255	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 56.50 66.50 66.50 77.00 87.00 97.00 107.00 107.00 117.00 127.00
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.73 -0.93 -1.73 -0.93 -1.73 -0.93 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.73 -0.94 -1.57 -1.12 -1.12 -1.12 -1.12 -1.47 -1.12 -1.47 -1.57 -1.	5 ³⁰ Si (‰) δ ³⁰ Si (‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	 125 μm δ³⁰Si [%₀] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 -1.13 -1.41 -1.15 -0.21 	δ ³⁰ Si [%₀] 0.09 0.74 0.24 -0.063 -1.40 -0.37 -0.33 -1.64 -0.47 -1.40 -0.21	Age[yrs] 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 19211 19989 20767 21255 21618	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 56.50 66.50 77.00 87.00 97.00 107.00 117.00 117.00 117.00 147.00 147.00
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.30 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -1.57 -0.32 -0.34 -1.57 -1.57 -0.32 -0.34 -1.57 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -1.57 -1.57 -0.32 -0.34 -1.57 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -0.30 -0.59 -0.30 -0.30 -0.30 -0.32 -0.34 -0.32 -0.34 -0.32 -0.34 -0.32 -0.34 -0.32 -0.32 -0.34 -0.32 -0.32 -0.32 -0.34 -0.32 -0.	5 ³⁰ Si (‰) δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	 125 μm δ³⁰Si [%e] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 -1.13 -1.41 -1.15 -0.94 -0.94 	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -1.40 -1.60 -1.61 -0.33 -1.64 -0.93 -1.40 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.31 -0.65 -0.66 -0.67 -1.40 -0.87 -0.21 -0.65 -0.66	Age[yrs] 10050 10700 11700 12700 14506 15283 16061 16878 17655 18433 19211 19989 20767 21255 21618 21982 202345	epth (cm) 0.50 7.00 17.00 27.00 46.50 56.50 77.00 87.00 97.00 107.00 107.00 117.00 127.00 107.00
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.73 -0.32 -0.34 -1.73 -0.32 -0.34 -1.73 -0.32 -0.34 -1.73 -0.93 -1.87 -1.12 -1.41 -0.61 -0.21 -0.80 -0.71 -1.13	5 ³⁰ Si (‰) δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47 -1.76	 λ³⁰Si [%e] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 -1.13 -1.41 -1.15 -0.94 -0.71 -1.17 	δ ³⁰ Si [%0] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -1.60 -0.37 -0.33 -1.64 -0.47 -0.47 -0.53 -0.53 -0.34 -1.73 -0.37 -0.34 -1.64 -0.47 -0.47 -0.87 0.21 -0.66 -0.77 -1.06	Age[yrs] 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 19211 19889 20767 21255 21618 21982 22345 22345	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 66.50 77.00 87.00 97.00 107.00 127.00 137.00 127.00 137.00 146.50 165.50
vs. NBS) δ ³⁰ Si _{AVG} [%0) 0.18 0.69 -0.04 0.30 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.73 -0.32 -0.34 -1.73 -0.32 -0.34 -1.73 -0.32 -0.34 -1.71 -0.93 -1.87 -1.12 -0.93 -1.41 -1.01 0.21 -0.80 -0.74 -1.131 -0.80 -0.74 -1.68 -0.74 -1.68 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.75 -0.7	δ ³⁰ Si (‱ δ ³⁰ Si (‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47 -1.76	λ λ	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -1.60 -0.37 -0.34 -1.73 -0.34 -1.73 -0.64 -0.47 -1.64 -0.87 0.21 -0.66 -0.77 -1.09 -0.67	Age[yrs] 10050 10700 11700 12700 14506 15283 16063 16878 17656 18433 19211 19889 20767 21255 21618 21982 22345 22345 22345 22345 23991	epth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 56.50 56.50 77.00 87.00 97.00 107.00 117.00 107.00
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -0.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -1.57 -1.12 -1.47 -1.12 -1.41 -1.41 -1.41 -1.57 -0.57 -1.57 -1.12 -1.41 -1.41 -1.57 -0.57 -1.57 -1.12 -1.41 -1.41 -1.57 -0.57 -1.12 -1.41 -1.57 -0.57 -1.12 -1.41 -1.57 -0.57 -0.57 -1.12 -1.41 -1.57 -0.57 -1.12 -1.41 -1.57 -0.57 -1.24 -1.12 -1.24 -1.	5 ³⁰ Si (‰) δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	 λ³⁰Si [%e] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.65 -0.27 -2.09 -1.13 -1.41 -1.15 -0.94 -0.71 -1.17 	δ ³⁰ Si [%₀] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -0.37 -0.34 -0.73 -0.34 -0.37 -0.34 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.37 -0.44 -0.47 -1.40 -0.87 0.21 -0.667 -0.67 -1.24	Age[yrs] 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 19211 19989 20767 21255 21618 21982 22345 22345 22345 22391 23436	S1778-S Depth (cm) 0.50 7.00 17.00 37.00 37.00 46.50 66.50 66.50 66.50 66.50 66.50 77.00 87.00 97.00 117.00 117.00 127.00 147.00 157.00 180.50 187.50 197.00
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -0.32 -0.34 -1.57 -1.57 -0.32 -0.34 -1.57 -1.12 -1.12 -1.12 -1.13 -0.67 -1.12 -1.12 -1.13 -0.57 -0.74 -1.12 -1.	5 ³⁰ Si (‰) δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47	 λ³⁰Si [%e] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 -1.13 -1.41 -1.15 -0.94 -0.71 -1.17 	δ ³⁰ Si [‰] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -0.37 -0.33 -1.64 -0.93 -1.40 -0.47 -1.40 -0.87 -0.47 -1.40 -0.87 -0.14 -0.77 -1.09 -0.677 -1.224 -1.12	Age[yrs] 10050 10700 11700 12700 14506 15283 16061 16878 17656 18433 19211 19989 20767 21255 21618 21982 22345 22836 23091 23436 23818	S1778-5 hepth (cm) 0.50 7.00 17.00 27.00 37.00 46.50 66.50 77.00 97.00 107.00 107.00 117.00 127.00 137.00 147.00 147.00 157.00 167.00 167.00 180.50 187.50 197.00 207.50
vs. NBS) δ ³⁰ Si _{AVG} [%0] 0.18 0.69 -0.04 0.30 -0.60 -1.51 -1.57 -0.32 -0.33 -0.34 -1.73 -0.93 -1.87 -1.12 -1.41 -1.01 -0.21 -0.80 -0.74 -1.13 -0.67 -1.24 -1.12	5 ³⁰ Si (‰o δ ³⁰ Si [‰] -0.36 0.50	δ ³⁰ Si [‰] 0.16 0.13 -0.05 -1.47 -1.76	 125 μm δ³⁰Si [%e] 0.28 0.64 -0.16 0.82 -0.56 -1.66 -1.53 -0.27 -2.09 -1.13 -1.41 -1.15 -0.94 -0.71 -1.17 -0.58 	δ ³⁰ Si [%0] 0.09 0.74 0.24 -0.09 -0.63 -1.40 -1.60 -0.37 -0.33 -0.63 -0.37 -0.34 -1.73 -0.34 -1.73 -0.63 -0.64 -0.47 -0.47 -0.47 -0.47 -0.47 -0.53 -1.64 -0.47 -0.47 -0.53 -1.40 -0.66 -0.77 -1.09 -0.67 -1.24 -1.25	Age[yrs] 10050 10050 10700 11700 12700 13700 14506 15283 16061 16878 17656 18433 19211 19889 20767 21255 21618 21982 22345 22836 23091 23436 23818 24200	epth (cm) 0.50 7.00 17.00 27.00 46.50 56.50 66.50 66.50 77.00 87.00 107.00 107.00 117.00 127.00 127.00 147.00 147.00 147.00 147.00 147.00 147.00 127.00
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Supplementary Table 12. Oxygen and silicon isotope data from radiolarian opal of the >125 μ m fraction from core PS1778-5.

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