

**SUPPLEMENTARY MATERIAL****Sample set**

Samples of black shales that ranged from 5 to 30 cm<sup>3</sup> and belonged to the Cenomanian sequence of ODP Sites 1260 and 1258 were collected and processed for bulk organic matter δ<sup>13</sup>C and Nd isotopes from fish debris. A vertically split portion of ~1 cm<sup>3</sup> that spanned the complete stratigraphic interval of each sample was homogenized by gently crushing in an agate mortar and pestle and used for organic carbon isotope determinations. About 6 g of the remaining portion of these samples were disaggregated individually by soaking dried samples in a 5% NaOCl solution that did not attack the bioapatite of fish debris. Disaggregated samples were washed on a 63 μm screen and fish debris were handpicked from the >125 μm size fraction of each coarse residue. These separates were then prepared for Nd isotope analyses.

**Organic carbon isotopes**

The δ<sup>13</sup>C<sub>org</sub> data derived from 95 samples analyzed for this study (42 from Site 1260, and 53 from Site 1258), along with 12 samples from MacLeod et al. (2008) (Tables DR1, DR2). These δ<sup>13</sup>C<sub>org</sub> data were plotted using the age model below (see also Fig. 2 in the main text), along with the three-point average values of the δ<sup>13</sup>C<sub>org</sub> data from Friedrich et al. (2008) (from 426.55-471.17 meter composite depth in Site 1260; and from 426.40-468.37 meter composite depth in Site 1258 of Friedrich et al., 2008). Also, our δ<sup>13</sup>C<sub>org</sub> and Nd isotopic results (Tables DR1, DR2) were plotted against depth (see Fig. DR1 below) with the OAE2 Nd isotopic data from MacLeod et al. (2008) and the OAE2 δ<sup>13</sup>C<sub>org</sub> data from Friedrich et al. (2008).

The δ<sup>13</sup>C<sub>org</sub> values were obtained from the analyses of powdered, decarbonated bulk rock samples (5-10 mg) using a Carlo Erba 1500 EA, connected through a Finnegan MAT ConFlo II to a Delta Plus XL isotope-ratio mass spectrometer, operated in continuous flow mode at the University of Missouri. Analytical precision (1 standard deviation), monitored through the determinations using acetanilide standards, is better than 0.1‰. The isotopic results are expressed in the standard δ-notation relative to the Vienna PDB standard.

## Nd isotopes

The Nd isotopic ratios of 82 separates of fish debris, weighing between ~0.05-0.4 mg, were analyzed at the University of Florida. The separates were dissolved in 200  $\mu$ l aqua regia to remove organic matter, dried and then redissolved in 1.6 N HCl. These samples were processed through two cation exchange columns. The first column separated bulk Rare Earth Elements (REEs) from other cations using Mitsubishi resin with HCl as the eluent. The bulk REE cut was then dried and loaded onto small Teflon columns packed with Ln Spec<sup>TM</sup> resin. Neodymium was eluted with 0.25 N HCl. The total procedural blank was 14 pg Nd.

Neodymium isotopes were measured on a Nu multi-collector inductively-coupled mass spectrometer (MC-ICP-MS) at the University of Florida. Neodymium fractions were dried and redissolved in 0.3 ml of 2% optima HNO<sub>3</sub>. Additional dilutions were used to bring the <sup>143</sup>Nd monitor peak to 2-5 V. Typical operating conditions are described in Chadwick et al. (2005). All samples were analyzed using a desolvating nebulizer (DS-100). Instrument settings were carefully tuned to maximize signal intensities on a daily basis. Preamplifier gain calibrations were run before the beginning of each analytical session. Samples were analyzed using a time-resolved analysis (TRA) method described by Kamenov et al. (2008). Baseline was measured for 30 sec. prior to sample introduction by electrostatic analyzer (ESA) deflection of the ion beam. Data were acquired in series of 0.2 second integrations over 1 to 3 minutes. All ratios were corrected for mass fractionation using <sup>146</sup>NdO/<sup>144</sup>NdO = 0.7219. For standardisation, JNd-1 was run five to ten times during a day of analysis and an average daily value was calculated. This average standard value and all the samples analyzed on that day were then corrected to the JNd-1 value of 0.512103 (+/-0.000014, 2 $\sigma$ ) determined on the Micromass Sector 54 thermal-ionization mass spectrometer (TIMS) at the University of Florida. External reproducibility of replicate runs of JNd-1 on the Nu MC-ICPMS is +/-0.000014, which is equivalent to +/-0.3  $\epsilon_{\text{Nd}}$  units. This external uncertainty was consistently larger than internal uncertainties and represents the error assigned to all samples.

Five samples from these sites were spiked and analyzed for Sm and Nd concentrations to determine <sup>147</sup>Sm/<sup>144</sup>Nd ratios. The average <sup>147</sup>Sm/<sup>144</sup>Nd value obtained is 0.125, which is similar to values reported from previous studies of fish debris and teeth that range from 0.114 to 0.134 (Martin and Hale, 2000; Thomas et al., 2003; Martin and Scher, 2004; Soudry et al., 2004; Thomas 2004; Pucéat et al., 2005). This average value was applied to all samples to correct for

ingrowth of radiogenic Nd and to calculate  $\varepsilon_{\text{Nd(t)}}$ , which represents the  $\varepsilon_{\text{Nd}}$  value at the time of deposition. Corrections from  $\varepsilon_{\text{Nd(0)}}$  to  $\varepsilon_{\text{Nd(t)}}$  ranged from 0.8 to 0.9 units.

### Age model

Sample depths (meter composite depth) from Sites 1260 and 1258 were converted into ages based on the following model. The onset of the OAE2 C-isotope excursion (426.41 m in Site 1260, and 426.33 m in Site 1258) (94.51 Ma), and the highest value of the Mid-Cenomanian Event (MCE) C-isotope excursion (449.07 m in Site 1260, and 450.27 m in Site 1258) (96.0 Ma ago) were chosen as chronostratigraphic tie points (see Fig. 2 in the main text) and provided sedimentation rates of 15.21 m/m.y. and 16.07 m/m.y. for Site 1260 and 1258, respectively, assuming no major changes in sedimentation rate for the Cenomanian sequence studied.

The age assigned to these tie points derive from the age of 93.97 Ma of Singer et al. (2009) for the Cenomanian-Turonian (C-T) boundary. That is 0.42 m.y. older than the age proposed by Sageman et al. (2006) (93.55 Ma). Accordingly, we have added 0.42 m.y. to both the age of the onset of OAE2 formerly indicated by Sageman et al. (2008) (94.09 Ma) and the age of the MCE C-isotope spike previously assigned by Jarvis et al. (2006) (95.58 Ma).

### Tables of results and figure

**Table DR1.** Labels, meter composite depth (mcd), and estimated age (Ma) of the analyzed samples from Site 1260, along with their  $\delta^{13}\text{C}_{\text{org}}$ ,  $^{143}\text{Nd}/^{144}\text{Nd}$  ratio, and Nd isotopic values.

Sample	mcd	$\delta^{13}\text{C}_{\text{org}}$	Age	$^{143}\text{Nd}/^{144}\text{Nd}$	$\varepsilon_{\text{Nd(0)}}$	$\varepsilon_{\text{Nd(t)}}$	Remarks
1260B, 35R, 5W, 75-76.5 cm	426.56		94.52	0.511804	-16.3	-15.4	
1260B, 35R, 5W, 90-92 cm	426.71		94.53	0.511807	-16.2	-15.4	
1260B, 35R, 5W, 103.5-105.5 cm	426.85		94.54	0.511812	-16.1	-15.3	
1260B, 35R, 5W, 120-122 cm	427.01		94.55	0.511792	-16.5	-15.7	
1260B, 35R, 6W, 20-22 cm	427.51		94.58	0.511880	-14.8	-13.9	Highest $\varepsilon_{\text{Nd(t)}}$ value of interval C5
1260 A 47R, 2W, 142-144 cm	430.41		94.77	0.511790	-16.5	-15.7	
1260A, 47R, 3W, 22-24 cm	430.71	-28.44	94.79	0.511780	-16.7	-15.8	
1260A, 47R, 3W, 142-144 cm	431.91	-28.24	94.87	0.511799	-16.4	-15.5	

1260A, 47R, 5W, 25-27 cm	433.72	-27.98	94.99				
1260A, 47R, 5W, 50-52 cm	433.97		95.01	0.511808	-16.2	-15.3	
1260A, 47R, 7W, 30-32 cm	436.02		95.14	0.511799	-16.4	-15.5	
1260A, 48R, 1W, 40-42 cm	437.49	-28.09	95.24				
1260A, 48R, 2W, 31.5-33 cm	438.91		95.33	0.511860	-15.2	-14.3	
1260A, 48R, 3W, 51-53 cm	440.50	-28.40	95.44	0.511838	-15.6	-14.7	
1260A, 48R, 3W, 101-102 cm	441.00	-28.33	95.47	0.511919	-14.0	-13.2	
1260A, 48R, 3W, 141-143 cm	441.40	-28.85	95.50				
1260A, 48R 4W 10-12 cm	441.57	-27.54	95.51	0.511892	-14.5	-13.7	
1260A, 48R, 4W, 18-36 cm	441.65		95.51	0.511955	-13.3	-12.5	
1260A, 48R, 4W, 70-71 cm	442.17	-28.15	95.55				
1260A, 48R, 5W, 46-49 cm	443.23	-27.56	95.62	0.512013	-12.2	-11.3	Highest $\epsilon_{Nd(t)}$ value of interval C4
1260A, 48R, 5W, 87-89 cm	443.64	-28.50	95.64	0.511975	-12.9	-12.1	
1260A, 48R, 5W, 135-136 cm	444.12	-28.89	95.67	0.511878	-14.8	-14.0	
1260A, 48R, 6W, 30-31 cm	444.57	-28.46	95.70	0.511867	-15.0	-14.2	
1260A, 48R, 6W, 80-81 cm	445.07	-28.01	95.74	0.511934	-13.7	-12.9	
1260A, 48R, CCW, 4-5 cm	445.71	-27.82	95.78	0.511889	-14.6	-13.7	
1260A, 49R, 1W, 40-41 cm	446.37	-27.46	95.82				
1260A, 49R, 1W, 82-84 cm	446.79	-25.73	95.85				
1260A, 49R, 1W, 100-101 cm	446.97	-28.06	95.86	0.512033	-11.8	-10.9	Highest $\epsilon_{Nd(t)}$ value of interval C3
1260A, 49R, 1W, 130-131	447.27	-28.52	95.88	0.511965	-13.1	-12.3	
1260A, 49R, 2W, 5-6 cm	447.45	-27.83	95.89	0.511891	-14.6	-13.7	
1260A, 49R, 2.W, 15-16 cm	447.55	-26.97	95.90				
1260A, 49R, 2W, 40-41 cm	447.80	-28.26	95.92	0.512024	-12.0	-11.1	
1260A, 49R, 2W, 60-61 cm	448.00	-28.18	95.93				
1260A, 49R, 2W, 80-81 cm	448.20	-28.35	95.94	0.511876	-14.9	-14.0	
1260A, 49R, 2W, 100-101 cm	448.40	-27.83	95.96	0.511919	-14.0	-13.2	

1260A, 49R, 2W, 120-121 cm	448.60	-27.45	95.97				
1260A, 49R, 3W, 10-12 cm	448.92	-24.63	95.99	0.511888	-14.6	-13.8	
1260A, 49R, 3W, 25-26 cm	449.07	-24.42	96.00	0.511832	-15.7	-14.9	Age datum: highest $\delta^{13}\text{C}_{\text{org}}$ value of the MCE excursion
1260A, 49R, 3W, 40-41 cm	449.22	-28.50	96.01	0.511928	-13.8	-13.0	
1260A, 49R, 3W, 55-56 cm	449.37	-28.33	96.02	0.511872	-14.9	-14.1	
1260A, 49R, 3W, 70-71 cm	449.52	-28.33	96.03	0.511968	-13.1	-12.2	
1260A, 49R, 3W, 80-82 cm	449.62	-28.39	96.04	0.511937	-13.7	-12.8	
1260A, 49R, 4W, 3-4 cm	450.35	-28.48	96.08				
1260A 49R, 4W, 50-52 cm	450.82		96.12	0.511938	-13.6	-12.8	
1260A 49R, 4W, 50-52 cm	450.82		96.12	0.511902	-14.4	-13.5	
1260A, 49R, 4W, 69.5-70.5 cm	451.02	-28.26	96.13	0.511976	-12.9	-12.0	
1260A, 49R, 5W, 5-7 cm	451.87	-28.91	96.18	0.511977	-12.9	-12.0	Highest $\varepsilon_{\text{Nd(t)}}$ value of interval C2
1260A, 49R, 5W, 98-100 cm	452.80	-28.86	96.25	0.511881	-14.8	-13.9	
1260A, 49R, 6W, 30-31 cm	453.28	-28.46	96.28				
1260A, 50R, 1W, 105-107 cm	456.73		96.50	0.511904	-14.3	-13.4	
1260A, 50R, 2W 80.5-82 cm	457.99		96.59	0.511936	-13.7	-12.8	
1260A, 50R, 3W, 31-33 cm	458.99		96.65	0.511962	-13.2	-12.3	
1260A, 50R, 5W, 16-18 cm	461.84		96.84	0.511962	-13.2	-12.3	
1260A, 50R, 5W, 120-122 cm	462.88		96.91	0.511965	-13.1	-12.3	
1260A, 50R, 6W, 70-72 cm	463.88		96.97	0.511914	-14.1	-13.2	
1260A, 51R, 1W, 69-72 cm	466.34	-28.44	97.14				
1260A, 51R, 1W, 85-87 cm	466.50	-27.49	97.15	0.512028	-11.9	-11.0	Highest $\varepsilon_{\text{Nd(t)}}$ value of interval C1
1260A, 51R, 3W, 0-3 cm	468.63	-28.71	97.29				
1260A, 51R, 3W, 20-22 cm	468.83	-28.88	97.30				
1260A, 51R, 3W, 66-68 cm	469.29	-29.03	97.33				
1260A, 51R, 3W, 106-108 cm	469.69		97.36	0.511881	-14.8	-13.9	
1260A, 51R, 4W,	470.23		97.39	0.511920	-14.0	-13.1	

10-11 cm							
1260A, 51R, 5W, 136-138 cm	472.99		97.57	0.511948	-13.5	-12.6	
1260A, 52R, 1W, 75-77 cm	475.76		97.75	0.511890	-14.6	-13.7	
1260A, 52R, 4W, 130-132 cm	480.79		98.09	0.511913	-14.1	-13.3	
1260A, 52R, 4W, 130-132 cm	480.79		98.09	0.511942	-13.6	-12.7	
1260A, 52R, 4W, 130-132 cm	480.79		98.09	0.511947	-13.5	-12.6	

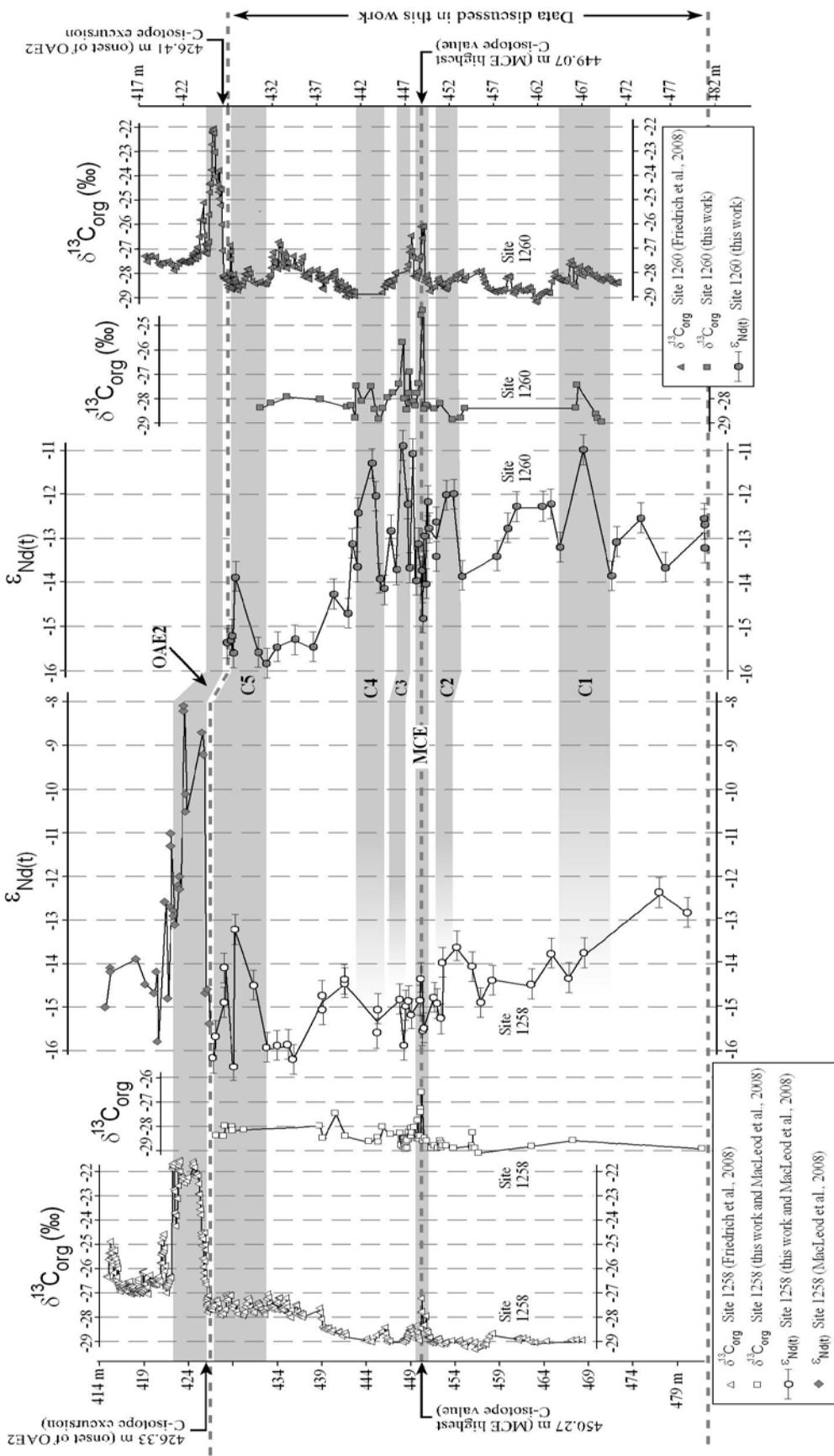
**Table DR2.** Labels, meter composite depth (mcd), and estimated age (Ma) of the analyzed samples from Site 1258, along with their  $\delta^{13}\text{C}_{\text{org}}$ ,  $^{143}\text{Nd}/^{144}\text{Nd}$  ratio, and Nd isotopic values. <sup>(+)</sup> Denotes samples that have been increased by 0.35 m in the mcd (see MacLeod et al., 2008). <sup>(\*)</sup> Denotes samples that have been increased by 2.2 m in the mcd column (see MacLeod et al., 2008).

Sample	mcd	$\delta^{13}\text{C}_{\text{org}}$	Age	$^{143}\text{Nd}/^{144}\text{Nd}$	$\varepsilon_{\text{Nd}(0)}$	$\varepsilon_{\text{Nd}(t)}$	Remarks
1258C, 17X, 2W, 70-71.5 cm	426.88 <sup>(+)</sup>		94.54	0.511766	-17.0	-16.2	$\varepsilon_{\text{Nd}(0)}$ and $\varepsilon_{\text{Nd}(t)}$ from MacLeod et al. (2008)
1258A 43R, 1W 66-68 cm	427.14 <sup>(*)</sup>	-28.48	94.56	0.511791	-16.5	-15.7	$\delta^{13}\text{C}_{\text{org}}$ from MacLeod et al. (2008)
1258A, 43R, 2W, 42-44 cm	428.02 <sup>(*)</sup>	-28.09	94.62	0.511831	-15.7	-14.9	$\delta^{13}\text{C}_{\text{org}}$ from MacLeod et al. (2008)
1258A, 43R, 2W, 42-44 cm	428.18 <sup>(*)</sup>		94.63	0.511872	-14.9	-14.1	
1258A, 43R, 2W, 124-126 cm	429.00 <sup>(*)</sup>	-28.12	94.68	0.511754	-17.2	-16.4	$\delta^{13}\text{C}_{\text{org}}$ from MacLeod et al. (2008)
1258A, 43R, 3W, 4-7 cm	429.06 <sup>(*)</sup>	-28.27	94.68				$\delta^{13}\text{C}_{\text{org}}$ from MacLeod et al. (2008)
1258B, 47R, 1W, 23-24.5 cm	429.39		94.70	0.511917	-14.0	-13.2	$\varepsilon_{\text{Nd}(0)}$ and $\varepsilon_{\text{Nd}(t)}$ from MacLeod et al. (2008); Highest $\varepsilon_{\text{Nd}(t)}$ value of interval C5
1258A, 43R, 4W, 23-25 cm	430.30 <sup>(*)</sup>	-28.24	94.76				$\delta^{13}\text{C}_{\text{org}}$ from MacLeod et al. (2008)
1258B, 47R, 2W, 116-117.5 cm	431.51		94.83	0.511851	-15.3	-14.5	
1258B, 47R, 3W, 124.5-126 cm	432.91		94.92	0.511778	-16.8	-15.9	
1258B, 47R, 4W, 102.5-104 cm	434.13		95.00	0.511780	-16.7	-15.9	
1258A, 44R, 2W, 7-9 cm	435.29		95.07	0.511781	-16.7	-15.9	
1258B, 48R, 1W, 111-113 cm	435.87		95.10	0.511764	-17.0	-16.2	$\varepsilon_{\text{Nd}(0)}$ and $\varepsilon_{\text{Nd}(t)}$ from MacLeod et al. (2008)
1258B, 49R, 1W, 7-8 cm	438.83	-28.09	95.29				
1258B, 49R-1, 45- 47 cm	439.20	-28.59	95.31	0.511822	-15.9	-15.1	$\varepsilon_{\text{Nd}(0)}$ and $\varepsilon_{\text{Nd}(t)}$ from MacLeod et al. (2008)
1258B 49R-1,	439.20		95.31	0.511840	-15.6	-14.7	

44.45.5 Nu							
1258B, 49R, 2W, 35-36 cm	440.61	-27.57	95.40				
1258B, 49R, 3W, 30-31 cm	441.73	-28.50	95.47	0.511853	-15.3	-14.5	$\varepsilon_{\text{Nd}(0)}$ and $\varepsilon_{\text{Nd}(t)}$ from MacLeod et al. (2008)
1258B 49R-3, 30- 31.5 Nu	441.73		95.47	0.511859	-15.2	-14.3	
1258A, 45R, 1W, 81-83 cm	444.39	-28.73	95.63				
1258A 45R, 2W, 51-53 cm	445.37	-28.56	95.70	0.511795	-16.4	-15.6	
1258A, 45R, 2W, 57-59 cm	445.43	-28.75	95.70	0.511822	-15.9	-15.1	$\delta^{13}\text{C}_{\text{org}}$ from MacLeod et al. (2008)
1258A, 45R, 2W, 105.5-106.5 cm	445.92	-28.13	95.73				
1258A, 45R, 3W, 60-62 cm	446.82	-28.43	95.79				
1258C, 22R, 1W, 5-6 cm	447.91	-28.38	95.85	0.511834	-15.7	-14.8	
1258C, 22R, 1W, 15-16 cm	448.01	-28.88	95.86				
1258C, 22R, 1W, 25-26 cm	448.11	-28.64	95.87				
1258A, 46R, 1W, 3-4 cm	448.21	-28.94	95.87				
1258C, 22R, 1W, 35-36 cm	448.21	-28.59	95.87				
1258A, 46R, 1W, 7.5-8.5 cm	448.26	-28.88	95.87				
1258A, 46R, 1W, 12-13 cm	448.30	-28.65	95.88				
1258C, 22R, 1W, 45-46 cm	448.31	-28.67	95.88				
1258A, 46R, 1W, 17.5-18.5 cm	448.36	-28.61	95.88				
1258A, 46R, 1W, 22-24 cm	448.40	-28.65	95.88				
1258A, 46R, 1W, 22-24 cm	448.40	-28.77	95.88	0.511780	-16.7	-15.9	
1258C, 22R, 1W, 56-57 cm	448.42	-28.84	95.88				
1258C, 22R, 1W, 65-67 cm	448.51	-29.04	95.89				
1258A, 46R, 1W, 41-43 cm	448.59	-28.74	95.90	0.511826	-15.8	-15.0	
1258C, 22R, 1W, 81-83 cm	448.67	-29.00	95.90				
1258C, 22R, 1W, 81-83 cm	448.67	-28.69	95.90				
1258C, 22R, 1W, 98-100 cm	448.84	-28.65	95.91				
1258A, 46R, 1W, 70-72 cm	448.88	-28.34	95.91	0.511832	-15.7	-14.9	
1258C, 22R, 2W,	449.17	-28.50	95.93				

18-20 cm							
1258C, 22R, 2W, 18-20 cm	449.17	-28.19	95.93				
1258A, 46R, 1W, 100-102 cm	449.18	-28.36	95.93	0.511816	-16.0	-15.2	
1258C, 22R, 2W, 50-52 cm	449.49	-28.15	95.95				
1258A, 46R, 2W, 30.5-31.5 cm	449.85	-28.60	95.97				
1258C, 22R, 2W, 88-90 cm	449.87	-27.86	95.98				
1258A, 46R, 2W, 40.5-41.5 cm	449.95	-28.50	95.98				
1258A, 46R, 2W, 51-53 cm	450.05	-28.51	95.99				
1258A, 46R, 2W, 51-53 cm	450.05	-28.63	95.99				
1258A, 46R, 2W, 61-62 cm	450.15	-28.50	95.99				
1258A, 46R, 2W, 68-70 cm	450.22	-27.39	96.00	0.511833	-15.7	-14.8	From MacLeod et al. (2008)
1258C, 22R, 3W, 20-22 cm	450.22	-27.52	96.00				
1258A, 46R, 2W, 73-74 cm	450.27	-26.70	96.00	0.511858	-15.2	-14.4	Age datum: highest $\delta^{13}\text{C}_{\text{org}}$ value of the MCE excursion
1258A, 46R, 2W, 95.5-96.5 cm	450.50	-28.70	96.01	0.511797	-16.4	-15.5	
1258A, 46R, 2W, 111-112 cm	450.65	-28.58	96.02	0.511800	-16.3	-15.5	
1258A, 46R, 2W, 134-135 cm	450.88	-28.70	96.04				
1258A, 46R, 3W, 40-41.5 cm	451.40	-29.01	96.07				
1258A, 46R, 3W, 72.5-73.5 cm	451.73	-28.90	96.09	0.511836	-15.6	-14.8	
1258A, 46R, 3W, 110-111 cm	452.10	-29.00	96.11	0.511829	-15.8	-14.9	
1258A, 46R, 4W, 21.5-22.5 cm	452.42	-28.70	96.13				
1258A, 46R, 4W, 31.5-32.5 cm	452.52	-28.80	96.14				
1258A, 46R, 4W, 33-35 cm	452.53	-28.97	96.14	0.511812	-16.1	-15.2	From MacLeod et al. (2008)
1258A, 46R, 4W, 49.5-50.5 cm	452.70	-28.90	96.15	0.511877	-14.8	-14.0	
1258A, 46R, 4W, 89-90 cm	453.09	-28.90	96.18				
1258A, 46R, 5W, 30-32 cm	453.90	-29.00	96.23				
1258B, 51R, 3W, 103-104 cm	454.31		96.25	0.511895	-14.5	-13.6	$\varepsilon_{\text{Nd}(0)}$ and $\varepsilon_{\text{Nd}(t)}$ from MacLeod et al. (2008)
1258A, 47R, 1W, 4-5 cm	455.96	-28.90	96.35				

1258A, 47R, 1W, 12-14 cm	456.04	-28.36	96.36	0.511873	-14.9	-14.1	From MacLeod et al. (2008)
1258A, 47R, 1W, 14-15 cm	456.06	-29.00	96.36				
1258A, 47R, 1W, 40-41 cm	456.32	-29.00	96.38				
1258A, 47R, 1W, 80-81 cm	456.72	-29.20	96.40				
1258A, 47R, 1W, 112-114 cm	457.04		96.42	0.511830	-15.8	-14.9	
1258A, 47R, 2W, 88-90 cm	458.30		96.50	0.511856	-15.2	-14.4	
1258A, 48R, 2W, 47-49 cm	462.68	-28.92	96.77	0.511851	-15.3	-14.5	From MacLeod et al. (2008)
1258A, 48R, 3W, 123-125 cm	464.94		96.91	0.511887	-14.6	-13.8	
1258A, 49R, 1W, 108-110 cm	466.90		97.03	0.511858	-15.2	-14.3	
1258A, 49R, 2W, 3-5 cm	467.33	-28.68	97.06				$\delta^{13}\text{C}_{\text{org}}$ from MacLeod et al. (2008)
1258A, 49R, 2W, 133-135 cm	468.63		97.14	0.511888	-14.6	-13.8	
1258B, 56R, 2W, 23-29 cm	477.07		97.67	0.511959	-13.2	-12.4	
1258C, 27R, 2W, 0-1 cm	480.29		97.87	0.511935	-13.7	-12.8	
1258A, 50R, 2W, 132-134 cm	481.87	-29.02	97.97				$\delta^{13}\text{C}_{\text{org}}$ from MacLeod et al. (2008)



**Figure DRI1.** Profiles of  $\varepsilon_{\text{Nd}(t)}$  and  $\delta^{13}\text{C}_{\text{Org}}$  versus depth (meter composite depth) of Sites 1258 and 1260. Friedrich et al. (2008) data are three-point average values. Horizontal lines in  $\varepsilon_{\text{Nd}(t)}$  symbols indicate  $\pm 0.3 \varepsilon_{\text{Nd}}$  unit analytical errors. Horizontal, gray bars denote intervals C1-C4 (positive  $\varepsilon_{\text{Nd}(t)}$  excursions in Site 1260), C5 (positive  $\varepsilon_{\text{Nd}(t)}$  excursions in both sites), and the MCE with positive  $\delta^{13}\text{C}_{\text{Org}}$  excursions in the two sites. The onset of OAE2 (94.51 Ma; 426.33 m at Site 1258 and 426.41 m at Site 1260) and the MCE  $\delta^{13}\text{C}_{\text{Org}}$  spike (96 Ma; 450.27 m at Site 1258 and 449.07 m at Site 1260) are used to construct the age model (see Fig. 2 in the main text).

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