Core ID and depth (cm)	Laboratory code	Sample Type	Conventional <sup>14</sup> C age (BP)	error	Calibrated age ranges at 95% confidence intervals	Age AD	Laboratory
GeoB11033-1 27 - 28 5	OS-97151	Foraminifera	2430	25	746-530	-638	National Ocean Sciences AMS - WHOI
DIVA 09GC							
3 - 4	KIA 42919	Mollusk shell	465	25	1841-1859	1864	Leibniz Labor - Kiel
48-49	OS-97148	Foraminifera	1270	25	1057-1211	1133	National Ocean Sciences AMS - WHOI
57-58	KIA 42920	Mollusk shell	1730	30	602-728	660	Leibniz Labor - Kiel
68-69	OS-97149	Foraminifera	1990	25	298-482	400	National Ocean Sciences AMS - WHOI
83 - 84	KIA 42921	Mollusk shell	2380	30	-157 -33	-60	Leibniz Labor - Kiel
101 - 102	KIA 42922	Mollusk shell	2325	30	-87 - 95	11	Leibniz Labor - Kiel
POPEI VC2B							
130.9	Beta 278216	Mollusk shell	1220	40	1080:1274	1184	Beta Analytics
200.6	OS-97152	Foraminifera	2130	25	146:326	233	National Ocean Sciences AMS - WHOI
270.3	OS-97143	Foraminifera	3020	25	-902:-783	-837	National Ocean Sciences AMS - WHOI

Table S1 – Results of <sup>14</sup>C accelerator mass spectrometry dating for cores GeoB11033-1 (Galiza), DIVA 09GC(Minho) and POPEI VC2B (Algarve). Ages were reservoir corrected by 400 yr and converted into calendar years (AD/CE).

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Figure S1 – <sup>210</sup>Pb activity downcore for the Galiza box-core (GeoB11033-1) and the Minho (DIVA09GC) and Algarve (POPEI VC2B) cores.



Figure S2. Depth *vs.* AD/CE ages (with 2σ error) for cores GeoB11033-1 and GC at the Galiza site (orange), DIVA09GC (Minho, magenta) and POPEI VC2B (Algarve, red), with a linear best fit.

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**Figure S3** – Comparison of alkenone-derived sea surface temperature (SST – black diamonds) and error bars determined in cores PO287-6B (PORTO), PO287-26B (TEJO) and POPEI (ALGARVE) with annual (open circles), four 3-month seasonal averages (JFM, AMJ, JAS, OND, see legend) and composites for the NAO winter (DJFM) and upwelling seasons (MJJAS) computed from NOAA daily Optimum Interpolation Sea Surface Temperature (OISST, V2 AVHRR-only) for the three sites location.



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Figure S4 – Comparison of SST stacks constructed using all the cores (total – black); all but the Tejo cores (effect of existing hiatus 10 - green); except the Algarve record (effect of different coccolithophores generating process - red); considering only the northern sites (Galiza, Minho and Porto - blue). First two panels depict the 30-yr bin stacks. The third panel shows the 5-yr bin stacks constructed from the Porto, Tejo and Algarve cores for >1850 CE.

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