Supplementary material for

An absolutely dated English yew chronology for the mid-Holocene offers new opportunities for archaeological and paleoenvironmental research

Table S1. Cross-dating statistics for 100 yew tree-ring width measurement series. The series highlighted are the samples for which $\delta^{18}O$ were analysed. The eight (four) series in green (yellow) passed (did not pass) statistical thresholds set by the ISODATE software for consideration.

Seq	Series	Time_span		620–694	640–714	660–734	680–754	700–774	720–794	740–814	760–834	780–854	800–874	820–894	840–914	860–934	880–954	900–974	920–994	940–1014	960–1034	980–1054	1000–1074
1	F1TB375M	611	863	.33	.42	.59	.62	.64	.65	.58	.56	.40	.39										
2	F1TB351M	630	799	.34	.44	.45	.36	.44	.45	.44													
3	F2TB011m	635	861	.39	.38	.30	.35	.45	.49	.58	.58	.58	.38										
4	F1TB009m	636	764	.37	.37	.52	.47	.42															
5	F1TB369M	639	862	.35	.46	.51	.48	.48	.38	.46	.42	.55	.51										
6	F2TB021m	640	772		.23A	.56	.61	.52															
7	F2TB028m	646	799		.51	.45	.44	.40	.26A	.28													
8	F1TB074M	659	828		.43	.44	.40	.47	.51	.53	.61												
9	F1TB096m	659	809		.48	.48	.58	.60	.53	.54													
10	F1TB338N	660	899			.50	.52	.54	.48	.43	.38	.39	.41	.32	.31								
11	F1TB478M	660	933			.31	.33	.48	.47	.56	.55	.49	.37	.26A	.35	.34							
12	F1TB075m	661	900			.40	.30B	.29B	.34	.26A	.47	.45	.43	.43	.41								
13	F1TB448M	662	864			.62	.70	.74	.79	.62	.54	.39	.37										
14	F1TB028m	663	732			.52																	
15	F1TB479M	668	924			.46	.53	.52	.50	.50	.56	.63	.57	.55	.44	.40							
16	F1TB463M	669	889			.52	.64	.70	.43	.41	.35	.36	.40	.31									
17	F1TB368M	670	879			.61	.66	.60	.63	.59	.56	.52	.43	.41									
18	F1TB404N	673	855			.46	.53	.54	.55	.47	.49	.34	.35										
19	F1TB323M	674	886			.60	.59	.70	.73	.70	.73	.74	.64	.55									
20	F1TB089m	675	770			.46	.49	.51															
21	F1TB091B	676	814			.60	.63	.62	.63	.54													
22	F1TB063m	677	837			.37	.37	.38	.50	.35	.36	.30											
23	F1TB358N	680	919				.59	.64	.58	.54	.54	.62	.58	.51	.38	.33							
24	F1TB326M	682	956				.52	.60	.67	.73	.77	.66	.53	.61	.55	.56	.47	.46					
25	F1TB081m	686	796				.57	.54	.55	.55													
26	F1TB056M	687	940				.44	.59	.58	.52	.59	.63	.58	.58	.46	.37	.37						
27	F1TB366M	690	857				.43	.47	.52	.49	.52	.48	.46										
28	F1TB344M	695	859				.58	.62	.52	.36	.16B	.33	.34										
29	F1TB355M	695	975				.69	.74	.74	.71	.73	.78	.74	.75	.72	.65	.55	.47	.46				
30	F1TB012m	696	877				.47	.46	.49	.51	.56	.62	.58	.54									
31	F1TB321A	699	896				.47	.46	.46	.34	.39	.45	.50	.54	.52								
32	F1TB328M	700	907					.42	.62	.75	.73	.74	.64	.62	.52								
33	F1TB437M	703	859					.63	.62	.64	.53	.30B	.31B										
34	F1TB076m	704	794					.57	.55														
35	F1TB002m	705	915					.69	.76	.62	.64	.59	.43	.37	.28	.27A							
36	F1TB412N	706	899					.45	.53	.69	.71	.69	.63	.52	.45								
37	F1TB023m	711	881					.65	.74	.76	.64	.67	.44	.45									
38	F1TB100m	712	854					.40	.45	.59	.69	.60											
39	F1TB360M	712	923					.60	.60	.68	.79	.80	.73	.72	.53	.49							
40	F2TB001m	713	859					.43	.51	.53	.54	.42	.38										
41	F1TB373M	716	887					.44	.50	.62	.69	.63	.58	.63									
42	F1TB457N	716	950					.42	.45	.60	.45	.41	.24A	.31	.35	.41	.48						
43	F1TB445M	723	949						.52	.52	.50	.48	.51	.60	.58	.60	.63						
44	F1TB325N	727	1059						.51	.61	.62	.57	.56	.60	.73	.75	.77	.67	.67	.61	.40	.26B	.20B
45	F1TB057m	729	893						.50	.42	.42	.42	.38	.48									
46	F2TB002m	731	913						.56	.64	.67	.60	.67	.58	.55								
47	F2TB005m	733	904						.62	.65	.71	.75	.64	.66	.64								
48	F1TB043C	735	907						.46	.48	.51	.48	.37	.51	.55								
49	F1TB203M	735	947						.35	.50	.62	.51	.50	.46	.42	.40	.40						
50	F1TB353M	736	906						.64	.72	.77	.66	.64	.45	.34								
51	F1TB354M	738	942						.56	.56	.57	.61	.62	.66	.61	.56	.53						
52	F1TB451M	739	1015						.50	.50	.69	.73	.73	.68	.59	.58	.61	.60	.56	.52	.50		
53	F1TB004m	740	968							.57	.54	.48	.42	.41	.50	.52	.37	.43					
54	F1TB035M	740	945							.13B	.47	.45	.60	.61	.62	.70	.68						
55	F1TB306M	740	971							.62	.75	.77	.77	.76	.53	.56	.48	.33					
56	F1TB339N	742	929							.64	.63	.56	.46	.32	.31	.39							
57	F1TB335m	748	969							.57	.61	.55	.40	.42	.40	.42	.49	.40					
58	F1TB372M	750	929							.47	.55	.60	.54	.53	.44	.39							
59	F1TB007m	753	949							.64	.66	.56	.39	.31B	.26B	.34	.38						
60	F1TB336M	755	989							.55	.57	.51	.47	.39	.34	.48	.46	.40	.32				
61	F1TB310M	758	971							.62	.61	.54	.50	.53	.46	.46	.46	.36					
62	F1TB077m	760	944								.47	.53	.47	.42	.34B	.40	.35						
63	F1TB017m	761	911								.55	.62	.62	.50	.32								
64	F1TB003m	762	939								.55	.69	.64	.65	.68	.52	.50						
65	F1TB038m	765	934								.48	.59	.60	.60	.63	.50							
66	F1TB020M	766	907								.42	.65	.64	.62	.57								
67	F1TB008M	768	1025								.59	.65	.70	.72	.73	.73	.64	.59	.54	.34	.35		
68	F1TB026M	772	909								.55	.57	.55	.55	.38								
69	F1TB349C	773	929								.45	.49	.40	.48	.46	.35							

70	F1TB045m	776	994							.58	.62	.59	.42	.33	.27	.23A	.28	.34B								
71	F1TB426N	776	999							.61	.61	.56	.65	.66	.64	.64	.67	.55	.51							
72	F1TB329M	777	989							.73	.76	.71	.63	.52	.53	.47	.43	.40								
73	F1TB359M	789	989								.75	.68	.58	.53	.53	.50	.45	.38								
74	F1TB332M	790	1066								.35	.27	.46	.48	.63	.73	.75	.63	.44	.22B	.25A	.28				
75	F1TB315M	792	919								.37	.46	.63	.56	.59											
76	F1TB060m	793	939								.63	.62	.59	.49	.56	.54										
77	F1TB423B	793	1019								.40	.38	.44	.56	.55	.56	.44	.52	.45	.42						
78	F1TB314m	794	1009								.36	.42	.60	.59	.63	.62	.64	.55	.40							
79	F1TB095m	797	967								.43	.50	.57	.50	.50	.44	.39									
80	F1TB308M	801	940									.40	.51	.49	.55	.50										
81	F1TB334M	803	1003									.33	.45	.56	.51	.43	.38	.42	.36							
82	F1TB066m	805	929									.67	.63	.59	.61											
83	F2TB020M	805	1029									.53	.50	.47	.47	.50	.55	.54	.54	.52						
84	F1TB313M	807	987									.49	.50	.42	.53	.53	.55	.50								
85	F1TB367M	815	1023									.52	.58	.61	.63	.61	.58	.59	.53	.54						
86	F1TB383M	817	1039									.62	.66	.59	.56	.50	.41	.39	.39	.34	.29B					
87	F1TB496M	817	1011									.42	.42	.46	.57	.62	.66	.60	.55							
88	F1TB048m	819	1011									.41	.42	.42	.52	.61	.70	.61	.53							
89	F1TB361M	836	993										.29	.41	.54	.56	.45	.49								
90	F1TB333N	845	989											.41	.48	.59	.52	.37								
91	F1TB050m	847	1035											.47	.51	.55	.37	.40	.39	.34	.36					
92	F2TB031m	847	976											.42	.58	.61	.54	.56								
93	F1TB086m	850	1028											.61	.73	.73	.69	.73	.64	.55						
94	F1TB381M	850	1007											.28	.43	.56	.54	.54	.45							
95	F1TB085m	854	1020											.45	.44	.50	.54	.64	.64	.66						
96	F1TB341M	856	1022											.32	.33	.49	.54	.58	.42	.40						
97	F1TB311M	871	1067												.38	.47	.55	.66	.46	.28	.15B	.31				
98	F1TB054m	886	1035													.62	.60	.60	.55	.42	.43					
99	BFTB002N	935	1020															.52	.57	.51						
100	F1TB319A	990	1067																		.45	.52				
Av segment correlation				.36	.42	.49	.51	.53	.54	.54	.57	.55	.51	.52	.48	.50	.53	.51	.52	.49	.43	.31	.33				

Table S2. Stable oxygen isotope cross-dating results of the 4 additional oak samples against a reference chronology built using only precisely dated timbers from the English bog oak chronology constructed at Queen's University Belfast. Match is the astronomical year of the most probable match, *n* is the number of data pairs (i.e., the overlap length), *r* is the Pearson's correlation coefficient, *df* is the corrected degrees of freedom, *t* is the Student's *t*-value, 1/*p* is the probability of error, IF is the Isolation Factor, and Pass indicates whether a match passes the statistical thresholds (1/*p* ≥ 100 and IF ≥ 10) for consideration. A minimum overlap of 20 pairs of data was set. Cross-dating was performed using the ISODATE software (Davies et al., 2025).

Sample	Match	*n*	*r*	*df*	*t*	1/*p*	IF	Pass
FEN_01	-2640	86	0.70	74	8.53	≥ 10^6	≥ 1000	TRUE
FEN_04	-2819	90	0.69	77	8.37	≥ 10^6	≥ 1000	TRUE
JOMF_2	-2638	110	0.63	95	7.88	≥ 10^6	≥ 1000	TRUE
LNWD_01	-2837	49	0.73	41	6.91	83844	≥ 1000	TRUE

Table S3. Statistical parameters of the eight individual yew $\delta^{18}O$ series cross-dated against each other and their mean (Yew_8) cross-dated against the reference oak chronology: *n* is the number of data pairs (i.e., the overlap length), *r* is the Pearson's correlation coefficient, *df* is the corrected degree of freedom, *t* is the Student's *t*-value, 1/*p* is the probability of error, IF is the Isolation Factor, and Pass indicates whether a match passes the statistical thresholds (1/*p* ≥ 100 and IF ≥ 10) to be indicated for consideration.

Sample	Reference	*n*	*r*	*df*	*t*	1/*p*	IF	Pass
1	2	119	0.46	103	5.27	10546	≥1000	TRUE
3	1_2	93	0.46	80	4.68	748	425	TRUE
4	1_2_3	111	0.45	96	5	2732	≥1000	TRUE

5	1_2_3_4	70	0.49	60	4.36	145	15	TRUE
6	1_2_3_4_5	159	0.4	137	5.12	5565	18	TRUE
7	1_2_3_4_5_6	74	0.56	60	5.3	3218	60	TRUE
8	1_2_3_4_5_6_7	123	0.42	106	4.8	958	≥1000	TRUE
Yew_8	Oak	311	0.37	273	6.64	$\geq 10^6$	≥1000	TRUE

Table S4. Raw radiocarbon (^{14}C) dates reported in age Before Present (BP) and calendar dates derived via $\delta^{18}O$ dating reported in years Before Common Era (BCE; datum includes the year zero).

Lab code	$\delta^{13}C$ (‰)	Raw ^{14}C age BP	^{14}C age σ	Year BCE
ETH 111184.1.1	-23.5	4,012	17	2539
54891	-22.2	3,998	18	2533
ETH 111180.1.1	-21.3	4,001	17	2523
ETH 111179.1.1	-25.2	3,983	17	2466
ETH 111182.1.1	-21.7	3,917	17	2437
ETH 111172.1.1	-21.5	3,928	17	2394
ETH 111174.1.1	-22.8	3,898	17	2377
ETH 111183.1.1	-20.9	3,886	17	2373
ETH 111177.1.1	-21.4	3,907	17	2368
ETH 111173.1.1	-24.0	3,905	17	2367
ETH 111178.1.1	-21.8	3,909	17	2336

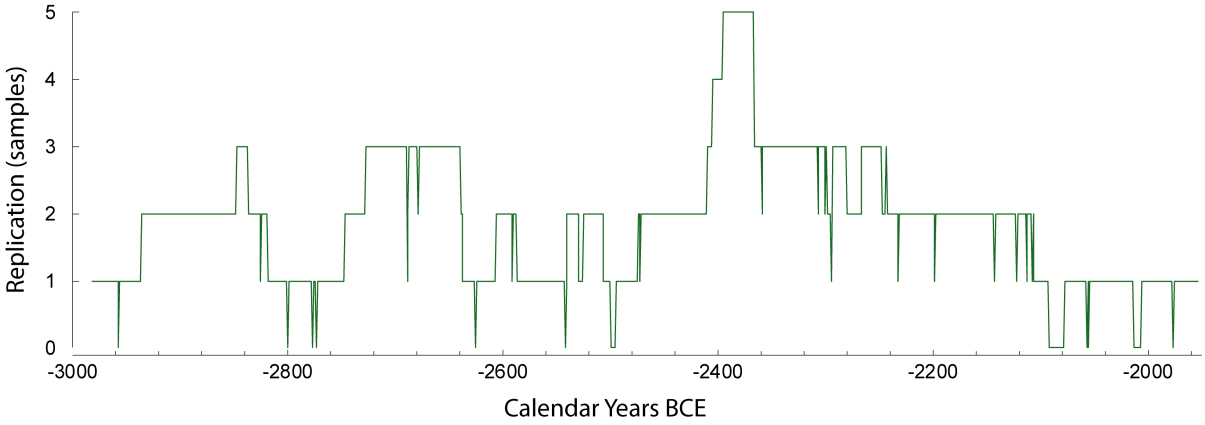

Figure S1. Sample replication of the reference oak stable oxygen isotope chronology used in this study and currently in development at Swansea University, UK.

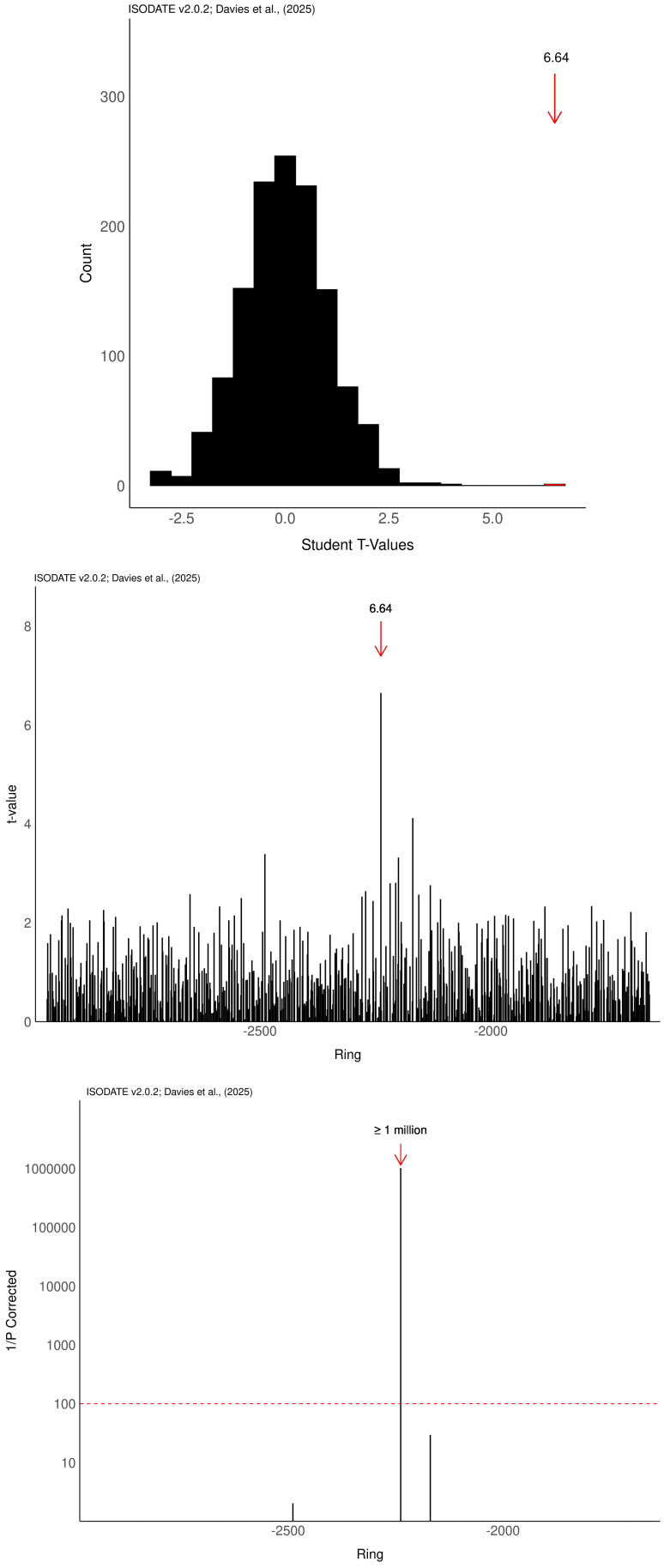

Figure S2. Statistical comparison of the mean of the eight cross-dated yew $\delta^{18}O$ series against the oak $\delta^{18}O$ reference chronology, produced using ISODATE (Davies et al., 2025).