

Table S1. Detailed alkenone concentration ($\text{ng}\cdot\text{g}^{-1}$), U_{37}^{k} and estimated temperature ($^{\circ}\text{C}$) in each analysed sample. Other sample data provided are the location, year and day of year (DoY) on which the whale was captured, and the length and sex of the whale. Krill samples were obtained from the stomach content of captured whales (see methods), and therefore the DoY, whale age, length and sex factors refer to the whale in which the krill was found.

Location	Sample type	Year	DoY	Whale age	Length	Sex	$C_{37:3}$	$C_{37:2}$	Sum	U_{37}^{k}	Estimated temperature
NW Spain	Krill	1985	226	NA	19.3	M	190.44	361.02	551.45	0.65	19.99
NW Spain	Krill	1985	215	NA	20	F	314.32	489.80	804.12	0.61	19.10
NW Spain	Krill	1985	221	NA	19.5	F	3051.47	3304.25	6355.72	0.52	17.27
NW Spain	Krill	1985	225	9	18.5	F	447.25	554.90	1002.15	0.55	17.98
NW Spain	Krill	1985	240	NA	16.4	F	143.58	211.35	354.92	0.60	18.83
NW Spain	Krill	1985	242	NA	19.2	F	1353.28	2460.86	3814.13	0.65	19.81
NW Spain	Krill	1985	240	NA	17.4	F	489.86	821.99	1311.84	0.63	19.44
NW Spain	Krill	1985	279	7	18.7	F	826.48	1989.97	2816.46	0.71	21.01
NW Spain	Krill	1985	246	NA	18.4	F	1590.52	2611.10	4201.63	0.62	19.34
NW Spain	Krill	1985	253	NA	17.3	F	39.08	130.25	169.33	0.77	22.31
NW Spain	Krill	1985	262	NA	18	M	456.75	976.84	1433.60	0.68	20.51
NW Spain	Krill	1985	262	NA	16.5	M	1664.69	5345.69	7010.37	0.76	22.16
NW Spain	Blubber	1985	253	NA	17	F	25.09	51.15	76.25	0.67	20.31
NW Spain	Blubber	1984	180	9	20.3	F	41.11	69.68	110.79	0.63	19.46
NW Spain	Blubber	1984	204	6	17.6	F	73.37	64.41	137.78	0.47	16.06
NW Spain	Blubber	1984	185	12	20.7	F	9.92	38.20	48.12	0.79	22.85
NW Spain	Blubber	1984	300	6	18.5	F	1.86	23.29	25.15	0.93	26.33
NW Spain	Blubber	1984	213	12	18.7	M	75.74	77.07	152.81	0.50	16.92
NW Spain	Blubber	1984	197	14	18.9	M	31.50	89.16	120.67	0.74	21.67
NW Spain	Blubber	1984	194	9	19.4	F	4.90	89.84	94.74	0.95	27.03
NW Spain	Blubber	1984	239	35	20.7	F	963.93	1287.61	2251.55	0.71	21.16
NW Spain	Blubber	1984	281	8	19.4	F	6.95	15.86	22.81	0.70	20.81
NW Spain	Blubber	1984	238	84	18.9	M	579.57	438.27	1017.84	0.43	15.13
NW Spain	Blubber	1984	214	6	18	F	139.13	154.23	293.35	0.53	17.39
NW Spain	Blubber	1984	214	12	17.4	M	155.89	122.50	278.39	0.44	15.30
NW Spain	Blubber	1984	197	17	19.4	M	128.07	120.61	248.68	0.46	15.95
NW Spain	Blubber	1984	226	28	18.7	F	55.65	78.23	133.88	0.58	18.61
NW Spain	Blubber	1984	246	7	18.8	F	15.83	55.82	71.66	0.68	20.71
NW Spain	Blubber	1984	213	12	18.7	M	163.94	174.15	338.09	0.52	17.16
NW Spain	Blubber	1985	221	NA	19.5	F	49.09	93.00	142.09	0.65	19.99
NW Spain	Blubber	1985	273	NA	18.8	F	60.01	152.49	212.50	0.72	21.23
NW Spain	Blubber	1985	274	NA	19.3	M	43.75	150.24	193.99	0.77	22.42
NW Spain	Blubber	1985	285	NA	16.9	M	21.12	50.12	71.24	0.70	20.95
NW Spain	Blubber	1985	240	NA	17.4	F	48.50	61.97	110.47	0.56	18.13
NW Spain	Blubber	1985	235	NA	19.6	F	104.25	208.83	313.08	0.67	20.23
NW Spain	Blubber	1985	262	NA	15	M	85.84	158.01	243.85	0.65	19.86
NW Spain	Blubber	1985	215	NA	20	F	213.64	362.85	576.49	0.63	19.50
NW Spain	Blubber	1985	208	10	19	M	55.13	144.42	199.55	0.72	21.36
NW Spain	Blubber	1985	268	NA	18.7	M	34.98	60.05	95.03	0.63	19.55
NW Spain	Blubber	1985	284	NA	19.5	M	126.92	216.61	343.53	0.63	19.52
NW Spain	Blubber	1985	230	NA	18.8	M	72.41	137.02	209.43	0.65	19.98

Location	Sample type	Year	DoY	Whale age	Length	Sex	C _{37:3}	C _{37:2}	Sum	U ^k ₃₇	Estimated temperature
NW Spain	Blubber	1985	233	NA	20.5	F	320.18	296.82	617.00	0.48	16.39
NW Spain	Blubber	1985	237	NA	17.1	F	66.15	72.53	138.68	0.62	19.21
Iceland	Krill	1986	175	16	19.8	M	268.02	107.26	375.28	0.29	10.50
Iceland	Krill	1986	176	NA	18.6	F	554.35	261.12	815.46	0.32	11.77
Iceland	Krill	1986	176	8	17.7	M	470.13	208.26	678.39	0.31	11.30
Iceland	Krill	1986	177	20	18.3	M	416.75	205.10	621.85	0.33	12.10
Iceland	Krill	1986	180	7	17.4	F	464.34	194.52	658.87	0.30	10.86
Iceland	Krill	1986	169	10	19.81	F	25.41	26.51	51.92	0.51	17.06
Iceland	Krill	1986	189	11	18	F	33.63	18.41	52.04	0.35	12.89
Iceland	Krill	1986	187	9	19.2	F	37.42	29.94	67.36	0.44	15.49
Iceland	Krill	1986	190	17	20.1	F	5.55	3.05	8.60	0.36	12.94
Iceland	Krill	1986	188	11	18	F	63.52	32.25	95.77	0.34	12.34
Iceland	Krill	1986	184	7	18	F	6.85	5.69	12.54	0.45	15.72
Iceland	Krill	1986	169	10	19.81	F	504.53	243.86	748.39	0.33	11.97
Iceland	Blubber	1986	265	36	18.28	M	25.93	16.03	41.96	0.38	13.82
Iceland	Blubber	1986	172	9	18.89	F	611.12	240.53	851.64	0.28	10.37
Iceland	Blubber	1986	269	6	17.67	M	117.68	95.24	212.92	0.45	15.56
Iceland	Blubber	1986	253	12	19.2	F	67.95	52.89	120.84	0.44	15.32
Iceland	Blubber	1986	169	10	19.81	F	316.64	145.65	462.29	0.32	11.59
Iceland	Blubber	1986	166	7	17.98	F	193.21	43.15	236.35	0.18	5.90
Iceland	Blubber	1986	251	4	17.06	F	114.74	28.33	143.07	0.20	6.68
Iceland	Blubber	1986	249	9	20.11	F	109.23	68.12	177.35	0.38	13.83
Iceland	Blubber	1986	174	8	17.67	M	126.35	111.34	237.69	0.47	16.08
Iceland	Blubber	1986	263	4	17.06	F	42.26	50.43	92.69	0.54	17.78
Iceland	Blubber	1986	174	NA	18.59	F	67.61	63.98	131.58	0.49	16.51
Iceland	Blubber	1986	166	7	17.67	M	119.11	104.33	223.44	0.52	17.17
Iceland	Blubber	1986	249	70	21.03	F	140.15	36.65	176.80	0.21	7.12
Iceland	Blubber	1986	249	66	18.59	M	308.90	129.69	438.59	0.30	10.88
Iceland	Blubber	1986	194	10	17.98	M	68.30	33.15	101.44	0.33	12.00