Table S1: Suess-adjusted $\delta^{13}C_{SC}$ and $\delta^{18}O_P$ of dentine of belugas from three management stocks ('Stock') in the eastern Canadian Arctic: Western Hudson Bay (WHB), Cumberland Sound (CS), and Eastern High Arctic-Baffin Bay (EHA-BB). A linear discriminant analysis (LDA) model fit to a training subset comprising 60 % of the dataset ('TRAIN') was used to classify each whale's stock based on its Suess-adjusted $\delta^{13}C_{SC}$ and $\delta^{18}O_P$ (posterior probabilities that a whale belongs to a particular stock: post.WHB, post.CS, and post.EHA-BB). Misclassified whales are shaded gray and summarized in Table 2. Mitochondrial DNA haplotype provided for CS belugas is categorized as private (unique to CS belugas) or shared (common with at least one other population). Asterisks in the 'Haplotype' column indicate CS whales whose nuclear DNA showed they were more genetically similar to WHB whales (data were only available for four whales; see Discussion). Beluga age was estimated from counts of annual growth layer groups in dentine, and sex was determined genetically.

Whale ID	$\delta^{13}C_{SC}$	$\delta^{18}O_P$	Data	Stock	Predicted Stock	post. WHB	post. CS	post. EHA-BB	Haplotype	Age	Sex
ARAR-XX-1013	−12.02	+16.71	TRAIN	WHB	WHB	0.44	0.33	0.23		33	Male
ARAR-XX-1024	−11.71	+14.94	TRAIN	WHB	WHB	0.83	0.16	0.01		26	Male
ARAR-XX-1037	−11.67	+16.46	TRAIN	WHB	WHB	0.80	0.12	0.07		26	Male
ARAR-XX-1051	−11.68	+17.49	TRAIN	WHB	WHB	0.60	0.09	0.32		20	Male
ARAR-XX-1059	−11.23	+17.90	TRAIN	WHB	WHB	0.83	0.01	0.15		11	Male
ARAR-XX-1060	−11.50	+16.13	TRAIN	WHB	WHB	0.91	0.06	0.03		15	Female
ARAR-XX-1071	−11.47	+16.04	TRAIN	WHB	WHB	0.93	0.05	0.02		27	Male
ARAR-XX-1075	−11.84	+16.37	TRAIN	WHB	WHB	0.67	0.22	0.10		15	Female
ARAR-XX-1131	−11.76	+16.65	TRAIN	WHB	WHB	0.71	0.16	0.13		29	Female
ARAR-XX-1148	−11.88	+15.78	TRAIN	WHB	WHB	0.68	0.28	0.04		31	Male
ARAR-XX-1188	−11.97	+15.28	TRAIN	WHB	WHB	0.59	0.38	0.02		30	Male
ARAR-XX-1190	−11.93	+16.73	TRAIN	WHB	WHB	0.54	0.26	0.20		11	Male
ARAR-XX-1121	−12.47	+16.45	TRAIN	WHB	CS	0.11	0.69	0.20		33	Female
ARAR-XX-1177	−12.18	+15.76	TRAIN	WHB	CS	0.35	0.59	0.07		14	Male
ARAR-XX-1080	−12.42	+17.53	TRAIN	WHB	EHABB	0.07	0.31	0.62		45	Male
ARAR-XX-1179	−12.01	+17.52	TRAIN	WHB	EHABB	0.27	0.19	0.54		36	Female
ARPG-XX-1220	−11.81	+16.46	TRAIN	CS	WHB	0.70	0.19	0.11	Shared*	24	Male
ARPG-XX-1225	−12.07	+16.12	TRAIN	CS	WHB	0.45	0.44	0.11	Shared*	22	Male
ARPG-XX-1281	−11.86	+14.61	TRAIN	CS	WHB	0.71	0.28	0.01	Shared*	14	Male
ARPG 85-05	−12.96	+14.63	TRAIN	CS	CS	0.01	0.98	0.01	Shared	19	Male
ARPG 86-01	−12.53	+16.20	TRAIN	CS	CS	0.09	0.77	0.14	Private	9	Male
ARPG 86-02	−12.79	+16.17	TRAIN	CS	CS	0.03	0.86	0.12	Private	12	Male
ARPG 86-04	−12.78	+16.29	TRAIN	CS	CS	0.03	0.83	0.14		11	Male
ARPG 86-13	−12.38	+15.20	TRAIN	CS	CS	0.18	0.80	0.03	Private	10	Female
ARPG 86-15	−12.42	+16.46	TRAIN	CS	CS	0.13	0.66	0.21	Shared	10	Male
ARPG 86-17	−12.40	+17.04	TRAIN	CS	CS	0.11	0.48	0.42	Private	6	Male
ARPG 86-19	−12.42	+15.26	TRAIN	CS	CS	0.15	0.82	0.03	Shared	10	Male

ARPG-XX-1075	−12.22	+15.51	TRAIN	CS	CS	0.31	0.64	0.05	Shared	26	Male
ARPG-XX-1232	−12.70	+16.79	TRAIN	CS	CS	0.04	0.67	0.29	Shared*	31	Male
ARPG-XX-1233	−12.53	+17.04	TRAIN	CS	CS	0.06	0.53	0.41		34	Female
ARPG-XX-1255	−12.12	+16.38	TRAIN	CS	CS	0.38	0.46	0.17	Private	17	Male
ARPG-XX-1265	−12.68	+15.35	TRAIN	CS	CS	0.05	0.92	0.03	Shared	40	Male
ARPG-XX-1314	−12.31	+14.83	TRAIN	CS	CS	0.22	0.76	0.02	Private	26	Female
ARPG-XX-1317	−12.63	+16.96	TRAIN	CS	CS	0.04	0.59	0.36	Shared	11	Female
B95-24	−12.49	+15.29	TRAIN	CS	CS	0.11	0.85	0.03	Shared	13	Female
B95-542	−13.50	+16.19	TRAIN	CS	CS	0.00	0.93	0.07		31	Male
B96-155	−12.80	+15.60	TRAIN	CS	CS	0.03	0.93	0.05		42	Male
ARPG-XX-1034	−12.79	+17.34	TRAIN	CS	EHABB	0.02	0.49	0.50	Shared	38	Male
ARPG-XX-1040	−12.11	+18.04	TRAIN	CS	EHABB	0.11	0.12	0.77	Shared	19	Female
ARPG-XX-1226	−11.80	+17.94	TRAIN	CS	EHABB	0.33	0.08	0.58	Shared	20	Male
ARGF-XX-1077	−11.59	+17.77	TRAIN	EHABB	WHB	0.59	0.05	0.35		12	Male
ARGF-XX-1039	−12.31	+16.82	TRAIN	EHABB	CS	0.17	0.51	0.33		19	Male
ARGF-XX-1044	−12.25	+16.87	TRAIN	EHABB	CS	0.21	0.45	0.34		15	Female
ARGF-XX-1050	−12.48	+17.02	TRAIN	EHABB	CS	0.08	0.52	0.40		11	Female
ARGF-XX-1053	−12.41	+16.19	TRAIN	EHABB	CS	0.14	0.71	0.14		25	Male
ARGF-XX-1061	−12.88	+17.31	TRAIN	EHABB	CS	0.01	0.52	0.47		7	Female
ARRE-XX-1061	−12.83	+17.13	TRAIN	EHABB	CS	0.02	0.58	0.40		40	Male
ARGF-XX-1024	−12.05	+17.79	TRAIN	EHABB	EHABB	0.18	0.15	0.66		9	Male
ARGF-XX-1033	−12.13	+17.65	TRAIN	EHABB	EHABB	0.16	0.20	0.64		26	Male
ARGF-XX-1034	−12.37	+18.00	TRAIN	EHABB	EHABB	0.05	0.17	0.79		17	Female
ARGF-XX-1042	−12.27	+21.03	TRAIN	EHABB	EHABB	0.00	0.00	1.00		11	Male
ARGF-XX-1059	−12.62	+17.53	TRAIN	EHABB	EHABB	0.03	0.37	0.60		11	Female
ARRE-XX-1049	−11.90	+18.98	TRAIN	EHABB	EHABB	0.06	0.02	0.91		40	Male
ARRE-XX-1074	−12.16	+18.28	TRAIN	EHABB	EHABB	0.07	0.09	0.84		20	Male
ARRE-XX-1087	−12.10	+17.87	TRAIN	EHABB	EHABB	0.14	0.15	0.71		9	Male
ARRE-XX-1089	−11.87	+18.57	TRAIN	EHABB	EHABB	0.13	0.04	0.83		18	Male
ARRE-XX-1109	−12.26	+17.26	TRAIN	EHABB	EHABB	0.15	0.35	0.50		29	Male
ARRE-XX-1174	−12.20	+17.66	TRAIN	EHABB	EHABB	0.13	0.22	0.66		25	Female
ARRE-XX-1182	−11.97	+17.87	TRAIN	EHABB	EHABB	0.22	0.12	0.66		11	Female
ARAR-XX-1025	−11.22	+15.41	TEST	WHB	WHB	0.98	0.02	0.00		28	Male
ARAR-XX-1031	−11.16	+16.13	TEST	WHB	WHB	0.98	0.01	0.01		21	Male
ARAR-XX-1038	−11.95	+16.64	TEST	WHB	WHB	0.52	0.29	0.19		27	Male
ARAR-XX-1050	−11.40	+16.23	TEST	WHB	WHB	0.94	0.04	0.02		7	Female
ARAR-XX-1057	−11.73	+16.42	TEST	WHB	WHB	0.77	0.15	0.08		14	Female
ARAR-XX-1067	−11.66	+15.70	TEST	WHB	WHB	0.85	0.12	0.02		29	Female
ARAR-XX-1162	−11.58	+15.15	TEST	WHB	WHB	0.90	0.09	0.01		13	Male

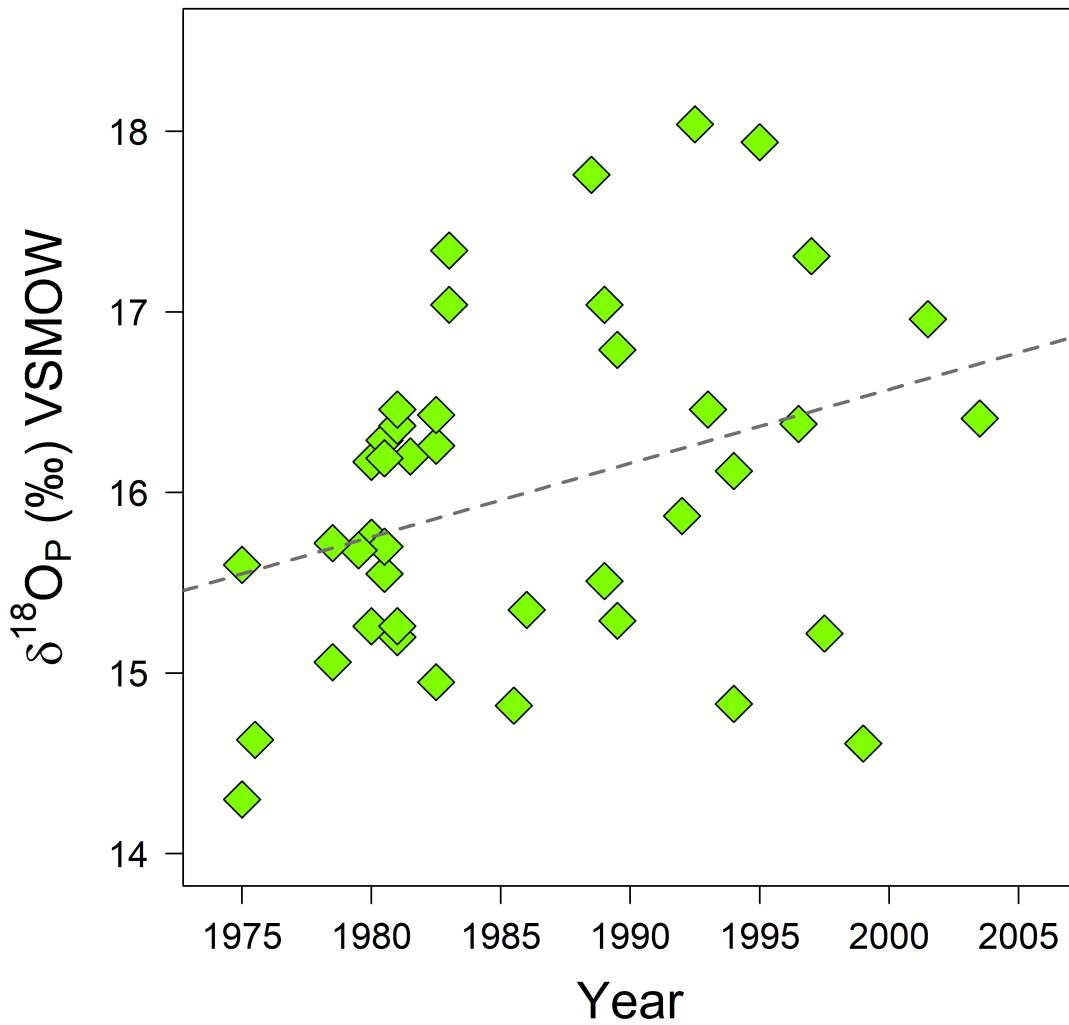|											
ARAR-XX-1165	−11.90	+14.83	TEST	WHB	WHB	0.67	0.32	0.01		17	Male
ARAR-XX-1166	−11.92	+16.65	TEST	WHB	WHB	0.55	0.27	0.18		31	Male
ARAR-XX-1180	−11.64	+16.83	TEST	WHB	WHB	0.78	0.10	0.12			
ARAR-XX-1181	−10.82	+16.65	TEST	WHB	WHB	0.99	0.00	0.00		26	Male
ARAR-XX-1183	−11.56	+16.31	TEST	WHB	WHB	0.88	0.08	0.04		9	Female
ARAR-XX-1072	−12.44	+16.08	TEST	WHB	CS	0.13	0.75	0.12		24	Male
ARAR-XX-1149	−12.52	+16.15	TEST	WHB	CS	0.09	0.78	0.13		54	Male
ARPG-XX-1382	−11.52	+16.58	TEST	CS	WHB	0.88	0.06	0.06			
ARPG 86-03	−12.42	+15.75	TEST	CS	CS	0.15	0.78	0.07	Shared	12	Male
ARPG 86-05	−12.49	+16.26	TEST	CS	CS	0.10	0.74	0.15	Shared	7	Male
ARPG 86-07	−12.51	+16.37	TEST	CS	CS	0.09	0.73	0.18	Shared	10	Male
ARPG 86-11	−12.73	+15.06	TEST	CS	CS	0.04	0.94	0.02	Private	15	Male
ARPG 86-12	−12.49	+15.26	TEST	CS	CS	0.11	0.86	0.03	Private	12	Male
ARPG 86-18	−12.35	+15.55	TEST	CS	CS	0.19	0.76	0.05	Private	11	Male
ARPG 86-20	−12.51	+15.70	TEST	CS	CS	0.10	0.84	0.06	Private	11	Male
ARPG-XX-1036	−12.45	+15.87	TEST	CS	CS	0.13	0.78	0.09	Shared	20	Female
ARPG-XX-1054	−12.12	+14.95	TEST	CS	CS	0.42	0.56	0.02	Shared	39	Female
ARPG-XX-1059	−12.86	+15.22	TEST	CS	CS	0.02	0.95	0.02		9	Female
ARPG-XX-1077	−12.68	+16.42	TEST	CS	CS	0.04	0.78	0.18	Private		
ARPG-XX-1238	−12.33	+14.82	TEST	CS	CS	0.21	0.78	0.02		39	Female
ARPG-XX-1328	−12.80	+17.31	TEST	CS	CS	0.02	0.50	0.48	Private	20	Male
ARPG-XX-1543	−12.70	+16.41	TEST	CS	CS	0.04	0.79	0.17	Shared	25	Female
B95-539	−12.42	+15.68	TEST	CS	CS	0.15	0.79	0.06	Private	33	Female
B95-546	−12.49	+15.72	TEST	CS	CS	0.11	0.82	0.07		35	Female
B95-547	−12.49	+16.43	TEST	CS	CS	0.10	0.70	0.20		27	Female
B95-549	−12.41	+14.30	TEST	CS	CS	0.15	0.85	0.01		42	Male
ARPG-XX-1037	−13.32	+17.76	TEST	CS	EHABB	0.00	0.44	0.56		27	Male
ARGF-XX-1035	−11.32	+18.42	TEST	EHABB	WHB	0.61	0.01	0.38		8	Male
ARGF-XX-1062	−11.77	+15.40	TEST	EHABB	WHB	0.78	0.20	0.02		7	Male
ARGF-XX-1081	−12.47	+16.06	TEST	EHABB	CS	0.11	0.77	0.12		9	Male
ARGF-XX-1032	−12.28	+18.06	TEST	EHABB	EHABB	0.06	0.14	0.80		23	Female
ARGF-XX-1036	−12.48	+18.42	TEST	EHABB	EHABB	0.02	0.10	0.88		13	Male
ARGF-XX-1040	−12.03	+18.53	TEST	EHABB	EHABB	0.08	0.05	0.87		15	Male
ARRE-XX-1085	−11.80	+18.53	TEST	EHABB	EHABB	0.17	0.04	0.79		42	Female
ARRE-XX-1096	−12.29	+18.34	TEST	EHABB	EHABB	0.04	0.10	0.87		17	Male
ARRE-XX-1167	−11.91	+17.92	TEST	EHABB	EHABB	0.25	0.10	0.64			
ARRE-XX-1175	−12.67	+18.01	TEST	EHABB	EHABB	0.01	0.21	0.77			

Figure S1: Whole-tooth dentine $\delta^{18}O_P$ of Cumberland Sound (CS) belugas against calendar year of formation. Since dentine was drilled across all annual growth layer groups (GLGs), calendar year was calculated as the year of death – estimated whale age/2 (see Methods). Multiple linear regression (grey dashed line) revealed a significant increase in $\delta^{18}O_P$ across the study period (see Table 3).