The following supplement accompanies the article

Red-legged kittiwake feathers link food availability to environmental changes in the Bering Sea

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Table S1 Red-legged kittiwakes sampled from museum collections. ID# = the collection number. Museum acronyms: CM = Carnegie Museum of Natural History, LACM = Natural History Museum of Los Angeles County, MSB = Museum of Southwestern Biology, PSM= James R. Slater Museum, SDNHM = San Diego Natural History Museum, and UAM = University of Alaska Fairbanks' Museum of the North. "Y" indicates the feather (first primary or head) was available for that particular specimen, "N" indicates that it was not.

ID#	Source	First Primary	Head
49292	CM	Y	Y
49293	CM	N	Y
49294	CM	Y	Y
49290	CM	Y	Y
49291	CM	N	Y
90372	LACM	N	Y
90371	LACM	N	Y
90380	LACM	Y	Y
90379	LACM	Y	Y
90378	LACM	N	Y
96970	LACM	N	Y
96955	LACM	N	Y
23362	MSB	Y	N
1439	PSM	Y	N
1440	PSM	Y	N
21596	SDNHM	Y	Y
40286	SDNHM	Y	Y
43425	SDNHM	Y	Y
40285	SDNHM	Y	Y
19282	SDNHM	Y	Y
43426	SDNHM	Y	Y
2380	UAM	N	Y
2344	UAM	N	Y
4925	UAM	Y	Y
5363	UAM	Y	Y
13157	UAM	Y	Y
15035	UAM	N	Y
20204	UAM	Y	Y
20206	UAM	Y	Y
20207	UAM	Y	Y
20205	UAM	Y	Y
26857	UAM	Y	Y
26848	UAM	Y	Y
26852	UAM	Y	Y

ID#	Source	First Primary	Head
26849	UAM	Y	Y
20004	UAM	Y	N
20037	UAM	Y	N
28926	UAM	Y	N
26852	UAM	Y	N
26857	UAM	Y	N
2900	UAM	Y	N
10218	UAM	Y	N
10222	UAM	Y	N
10224	UAM	Y	N
10221	UAM	Y	N
28915	UAM	Y	N
28923	UAM	Y	N
28925	UAM	Y	N
19999	UAM	Y	N
19896	UAM	Y	N
20035	UAM	Y	N
19931	UAM	Y	N
19897	UAM	Y	N
19904	UAM	Y	N
19927	UAM	Y	N
19900	UAM	Y	N
19901	UAM	Y	N
19925	UAM	Y	N
15462	UAM	Y	N
13144	UAM	Y	N
14771	UAM	Y	N
13743	UAM	Y	N
14776	UAM	Y	N
14062	UAM	Y	N
13746	UAM	Y	N
13443	UAM	Y	N
14773	UAM	Y	N

Table S2 Sample distribution by year. The number of samples obtained by year for A) primary feather samples and B) head feather samples. Primary feathers and head feathers in 2014, 2015, and 2016 were all collected from live birds during the breeding season.

A.

Year	Number of Specimens
1912	3
1939	1
1945	2
1946	1
1973	1
1975	1
1976	3
1978	2
1980	1
1985	1
1991	1
1992	5
1993	12
1994	6
1995	5
1996	4
1997	11
1998	4
1999	7
2000	4
2001	7
2002	5
2006	4
2013	7
2014	14
2015	10

B.

Year	Number of Specimens
1913	5
1940	1
1947	1
1961	2
1976	4
1978	5
1981	2
1985	1
1986	1
1993	7
1994	11
1995	7
1996	5
1998	7
2000	2
2002	4
2005	8
2007	3
2010	24
2011	18
2013	9
2014	7
2015	9
2016	51

Candidate Models

Table S3 The all model sub-set and AICc scores for head feathers. The AIC selection criteria and weighted averages are displayed for fCORT, $\delta^{13}C$, $\delta^{15}N$, and $\delta^{34}S$. The 95% model subset, which were used to calculate the averaged model reported in the manuscript, are shaded in grey. Also reported are the variance for the random factor (Year Var) which describes the proportion of variability in the response variable that is attributed to inter-annual variability. The residual variance (Resid Var) describes the proportion of variability attributed to intra-annual variability. Values closer to zero indicate that variation is inconsistent.

	Carbon Head Feather Models					Variance			
	Model	**k**	**AIC_c**	**ΔAIC_c**	**w_i**	**Year Var**	**SD**	**Resid Var**	**Resid SD**
All Data	Year+PDO	5	129.43	0	0.61	0.008	0.090	0.103	0.321
	Year	4	130.33	0.9	0.39	0.013	0.116	0.102	0.319
	PDO	4	171.31	41.88	0	0.194	0.441	0.101	0.318
Forty-year	Year	5	102.44	0	0.42	0.002	0.043	0.097	0.312
	IceFeb	4	103.91	1.47	0.2	0.006	0.076	0.097	0.311
	Year+AO+PDO	6	104.13	1.69	0.18	0.001	0.032	0.098	0.312
	Year+PDO	7	104.14	1.7	0.18	0.000	0.000	0.097	0.312
	Year+IceFeb+PDO	6	108.11	5.67	0.02	0.006	0.076	0.097	0.311
	Year+PDO+AO+IceFeb	4	120.78	18.35	0	0.033	0.183	0.098	0.313
	IceFeb+PDO	5	122.46	20.02	0	0.031	0.177	0.098	0.313
	IceFeb+AO+PDO	4	122.66	20.22	0	0.036	0.190	0.099	0.314
	AO	4	123.55	21.11	0	0.040	0.200	0.098	0.314
	PDO	6	124.18	21.74	0	0.028	0.166	0.099	0.314
	AO+PDO	5	124.34	21.9	0	0.032	0.179	0.099	0.315

	fCORT Head Feather Models					Variance			
	Model	**k**	**AIC_c**	**ΔAIC_c**	**w_i**	**Year Var**	**SD**	**Resid Var**	**Resid SD**
All Data	Year	4	-266.9	0	0.48	0.021	0.143	0.011	0.103
	PDO	4	-266.1	0.83	0.32	0.021	0.146	0.011	0.103
	Year+PDO	5	-265.2	1.69	0.21	0.020	0.142	0.011	0.103
Forty-year	Year	4	-267.8	0	0.23	0.015	0.124	0.010	0.098
	IceFeb	4	-267.4	0.38	0.19	0.015	0.123	0.010	0.098
	Year+AO+PDO	6	-267	0.76	0.16	0.012	0.109	0.010	0.098
	Year+PDO	5	-266	1.8	0.09	0.015	0.124	0.010	0.098
	Year+IceFeb+PDO	6	-265.5	2.35	0.07	0.014	0.116	0.010	0.098
	Year+PDO+AO+IceFeb	7	-265.4	2.41	0.07	0.012	0.107	0.010	0.098
	IceFeb+PDO	5	-265.3	2.5	0.07	0.015	0.123	0.010	0.098
	IceFeb+AO+PDO	6	-265	2.86	0.05	0.013	0.114	0.010	0.098
	AO	4	-264.2	3.63	0.04	0.019	0.137	0.010	0.098
	PDO	4	-263.2	4.59	0.02	0.020	0.143	0.010	0.098
	AO+PDO	5	-262.7	5.11	0.02	0.018	0.133	0.010	0.098

	Nitrogen Head Feather Models					Variance			
	Model	k	AIC_c	ΔAIC_c	w_i	Year Var	SD	Resid Var	Resid SD
All Data	Year+PDO	5	315.21	0	0.46	0.087	0.295	0.246	0.496
	Year	4	315.39	0.18	0.42	0.104	0.323	0.246	0.496
	PDO	4	317.77	2.56	0.13	0.105	0.325	0.249	0.499
Forty-year	AO	4	260.64	0	0.4	0.037	0.191	0.227	0.476
	AO+PDO	5	261.86	1.22	0.22	0.031	0.176	0.227	0.477
	Year+AO+PDO	6	263.03	2.39	0.12	0.018	0.136	0.229	0.479
	Year+PDOa+AO+IceFeb	7	263.9	3.26	0.08	0.031	0.177	0.227	0.477
	IceFeb+AO+PDO	6	263.98	3.34	0.08	0.051	0.226	0.229	0.479
	PDO	4	265.6	4.96	0.03	0.031	0.175	0.233	0.482
	Year+PDO	5	265.64	5.01	0.03	0.023	0.152	0.235	0.484
	Year+IceFeb+PDO	6	266.97	6.33	0.02	0.023	0.152	0.235	0.484
	IceFeb+PDO	5	267.72	7.08	0.01	0.051	0.226	0.229	0.479
	Year	4	267.72	7.08	0.01	0.068	0.261	0.228	0.477
	IceFeb	4	268.58	7.94	0.01	0.076	0.276	0.227	0.477

	Sulfur Head Feather Models					Variance			
	Model	k	AIC_c	ΔAIC_c	w_i	Year Var	SD	Resid Var	Resid SD
All Data	Year	4	492.79	0	0.7	0.675	0.822	1.360	1.166
	Year+PDO	5	494.85	2.06	0.25	0.656	0.810	1.364	1.168
	PDO	4	497.97	5.18	0.05	0.973	0.986	1.354	1.163
Forty-year	Year+PDO	5	387.02	0	0.37	0.137	0.370	1.045	1.022
	Year	4	387.6	0.58	0.28	0.194	0.440	1.045	1.022
	Year+IceFeb+PDO	6	388.22	1.2	0.2	0.130	0.360	1.040	1.020
	Year+PDO+AO+IceFeb	7	390.46	3.44	0.07	0.129	0.360	1.040	1.020
	Year+AO+PDO	6	390.9	3.88	0.05	0.188	0.434	1.038	1.019
	PDO	4	393.72	6.7	0.01	0.234	0.484	1.086	1.042
	IceFeb	4	395.03	8.01	0.01	0.301	0.548	1.076	1.037
	AO	4	395.44	8.42	0.01	0.328	0.573	1.071	1.035
	IceFeb+PDO	5	395.64	8.62	0	0.230	0.479	1.085	1.042
	AO+PDO	5	395.77	8.75	0	0.207	0.455	1.094	1.046
	IceFeb+AO+PDO	6	397.75	10.73	0	0.206	0.454	1.093	1.045

Table S4 The all model sub-set and AICc scores for head feathers. The AIC selection criteria and weighted averages are displayed for fCORT, $\delta^{13}C$, $\delta^{15}N$, and $\delta^{34}S$. The 95% model subset, which were used to calculate the averaged model reported in the manuscript, are shaded in grey. Also reported are the variance for the random factor (Year Var) and the residual variance (Resid Var).

	fCORT Primary Feather Models					Variance			
	Model	**k**	**AIC_c**	**ΔAIC_c**	**w_i**	**Year Var**	**SD**	**Resid Var**	**Resid SD**
All Data	PDO+ALow	5	-130.46	0	0.73	0.010	0.098	0.014	0.119
	Year+PDO+ALow	6	-128.32	2.14	0.25	0.010	0.098	0.014	0.119
	PDO	4	-123.11	7.35	0.02	0.016	0.127	0.014	0.119
	Year+PDO	5	-121.17	9.29	0.01	0.016	0.127	0.014	0.119
	ALow	4	-114.69	15.77	0	0.023	0.153	0.014	0.119
	Year+ALow	5	-113.79	16.67	0	0.022	0.149	0.014	0.119
	Year	4	-113.79	16.67	0	0.025	0.158	0.014	0.119
Forty-year	PDO+ALow	5	-108.98	0	0.31	0.012	0.108	0.015	0.122
	PDO+ALow+AO	6	-107.5	1.49	0.15	0.011	0.105	0.015	0.122
	Year+PDO+ALow+IceA	7	-106.88	2.11	0.11	0.010	0.098	0.015	0.122
	Year+PDO+ALow	6	-106.74	2.24	0.1	0.012	0.108	0.015	0.122
	PDO+ALow+AO+IceA	7	-106.52	2.46	0.09	0.010	0.100	0.015	0.122
	Year+PDO+ALow+AO	7	-105.21	3.77	0.05	0.011	0.105	0.015	0.122
	PDO	4	-104.99	3.99	0.04	0.019	0.138	0.015	0.121
	Year+PDO+ALow+AO+IceA	8	-104.8	4.18	0.04	0.010	0.098	0.015	0.122
	PDO+AO	5	-103.51	5.47	0.02	0.018	0.135	0.015	0.121
	PDO+IceA	5	-103.12	5.86	0.02	0.019	0.137	0.015	0.121
	Year+PDO	5	-102.98	6	0.02	0.019	0.137	0.015	0.121
	Year+PDO+IceA	6	-101.75	7.24	0.01	0.018	0.133	0.015	0.121
	Year+PDO+AO	6	-101.5	7.48	0.01	0.018	0.134	0.015	0.121
	PDO+AO+IceA	6	-101.45	7.53	0.01	0.018	0.135	0.015	0.121
	AO	4	-100.76	8.22	0.01	0.025	0.159	0.015	0.121
	ALow+AO	5	-100.48	8.51	0	0.022	0.147	0.015	0.121
	ALow	4	-100.19	8.79	0	0.026	0.160	0.015	0.121
	IceA	4	-99.73	9.25	0	0.026	0.163	0.015	0.121
	AO+IceA	5	-99.59	9.39	0	0.023	0.152	0.015	0.121
	ALow+AO+IceA	6	-99.51	9.48	0	0.019	0.138	0.015	0.122
	ALow+IceA	5	-99.22	9.76	0	0.023	0.152	0.015	0.122
	Year	4	-98.88	10.11	0	0.028	0.168	0.015	0.121
	Year+AO	5	-98.81	10.17	0	0.025	0.157	0.015	0.121
	Year+ALow+AO	6	-98.34	10.65	0	0.021	0.146	0.015	0.121
	Year+ALow	5	-98.07	10.92	0	0.026	0.160	0.015	0.121
	Year+IceA	5	-97.54	11.45	0	0.026	0.163	0.015	0.121
	Year+AO+IceA	6	-97.35	11.63	0	0.023	0.151	0.015	0.121
	Year+ALow+AO+IceA	7	-97.28	11.71	0	0.019	0.138	0.015	0.122
	Year+ALow+IceA	6	-97.07	11.92	0	0.023	0.152	0.015	0.122

	Carbon Primary Feather Models					Variance			
	Model	**k**	**AIC_c**	**ΔAIC_c**	**w_i**	**Year Var**	**SD**	**Resid Var**	**Resid SD**
All Data	PDO+ALow	4	37.46	0	0.33	0.024	0.154	0.061	0.247
	Year+PDO+ALow	5	37.74	0.29	0.29	0.019	0.136	0.062	0.249
	PDO	6	38.31	0.85	0.22	0.010	0.098	0.014	0.119
	Year+PDO	5	38.9	1.44	0.16	0.022	0.148	0.061	0.248
	ALow	4	72.16	34.7	0	0.192	0.439	0.058	0.240
	Year+ALow	5	73.49	36.03	0	0.184	0.429	0.058	0.240
	Year	4	74.8	37.34	0	0.216	0.465	0.058	0.240
Forty-year	Year	4	28.21	0	0.13	0.011	0.106	0.063	0.251
	Year+PDO	5	28.53	0.33	0.11	0.008	0.092	0.063	0.251
	Year+PDO+ALow	6	29.24	1.03	0.08	0.008	0.087	0.063	0.250
	Year+ALow	5	29.67	1.47	0.06	0.011	0.104	0.063	0.250
	Year+PDO+IceA	6	29.86	1.65	0.06	0.008	0.090	0.063	0.250
	Year+PDO+ALow+IceA	7	30.21	2	0.05	0.007	0.083	0.062	0.249
	Year+IceA	5	30.27	2.06	0.05	0.011	0.103	0.063	0.251
	Year+AO	5	30.39	2.19	0.05	0.011	0.106	0.063	0.251
	Year+PDO+AO	6	30.57	2.37	0.04	0.009	0.093	0.063	0.251
	PDO	4	30.9	2.7	0.03	0.022	0.148	0.060	0.246
	PDO+ALow	5	30.93	2.73	0.03	0.017	0.132	0.061	0.246
	ALow	4	31.16	2.95	0.03	0.022	0.147	0.061	0.246
	Year+PDO+ALow+AO	7	31.21	3	0.03	0.008	0.088	0.062	0.249
	Year+PDO+ALow+AO+IceA	8	31.23	3.03	0.03	0.006	0.079	0.062	0.248
	IceA	4	31.54	3.33	0.03	0.022	0.147	0.061	0.247
	Year+ALow+IceA	6	31.7	3.49	0.02	0.010	0.099	0.063	0.251
	Year+ALow+AO	6	31.9	3.69	0.02	0.010	0.102	0.063	0.250
	AO	4	32.29	4.08	0.02	0.025	0.158	0.060	0.246
	ALow+IceA	5	32.42	4.21	0.02	0.018	0.135	0.061	0.247
	Year+AO+IceA	6	32.5	4.29	0.02	0.010	0.102	0.063	0.251
	PDO+ALow+AO	6	32.52	4.31	0.02	0.016	0.127	0.061	0.246
	PDO+AO	5	32.65	4.45	0.01	0.021	0.144	0.060	0.246
	PDO+IceA	5	33.09	4.88	0.01	0.022	0.147	0.061	0.246
	ALow+AO	5	33.34	5.14	0.01	0.022	0.147	0.061	0.246
	AO+IceA	5	33.7	5.49	0.01	0.021	0.147	0.061	0.247
	Year+ALow+AO+IceA	7	33.97	5.77	0.01	0.010	0.099	0.063	0.251
	PDO+ALow+AO+IceA	7	34.61	6.4	0.01	0.016	0.127	0.060	0.246
	ALow+AO+IceA	6	34.64	6.43	0.01	0.018	0.135	0.061	0.247
	PDO+AO+IceA	6	34.89	6.68	0	0.021	0.145	0.060	0.246

	Nitrogen Primary Feather Models					Variance			
	Model	**k**	**AIC_c**	**ΔAIC_c**	**w_i**	**Year Var**	**SD**	**Resid Var**	**Resid SD**
All Data	Year	4	167.77	0	0.47	0.057	0.238	0.182	0.427
	Year+PDO	5	169.24	1.47	0.22	0.049	0.220	0.184	0.429
	Year+ALow	5	169.39	1.62	0.21	0.051	0.225	0.184	0.429
	Year+PDO+ALow	6	171.07	3.3	0.09	0.044	0.211	0.186	0.431
	ALow	4	176.74	8.97	0.01	0.098	0.313	0.184	0.429
	PDO	4	177.07	9.31	0	0.105	0.325	0.182	0.427
	PDO+ALow	5	178.84	11.07	0	0.099	0.315	0.183	0.428
Forty-year	Year+IceA	5	143.7	0	0.23	0.017	0.131	0.187	0.433
	Year+ALow+IceA	6	144.6	0.9	0.15	0.011	0.105	0.189	0.435
	Year+AO+IceA	6	145.23	1.53	0.11	0.018	0.134	0.186	0.431
	Year+PDO+IceA	6	145.84	2.14	0.08	0.017	0.131	0.187	0.433
	Year+ALow+AO+IceA	7	146.2	2.5	0.07	0.013	0.112	0.187	0.432
	Year+PDO+ALow+AO+IceA	8	146.4	2.7	0.06	0.006	0.074	0.188	0.434
	Year+PDO+ALow+IceA	7	146.46	2.76	0.06	0.009	0.096	0.190	0.435
	Year+PDO	5	147.66	3.96	0.03	0.028	0.169	0.188	0.434
	Year	4	148.1	4.4	0.03	0.046	0.214	0.185	0.431
	IceA	4	149.04	5.34	0.02	0.066	0.258	0.180	0.424
	Year+ALow	5	149.05	5.35	0.02	0.039	0.196	0.186	0.432
	ALow	4	149.15	5.45	0.02	0.060	0.244	0.182	0.427
	Year+PDO+ALow	6	149.15	5.45	0.02	0.025	0.158	0.189	0.435
	PDO	4	149.24	5.54	0.01	0.063	0.251	0.181	0.426
	Year+AO	5	149.31	5.61	0.01	0.043	0.207	0.185	0.430
	ALow+IceA	5	149.47	5.78	0.01	0.053	0.229	0.181	0.426
	AO	4	149.68	5.98	0.01	0.066	0.258	0.181	0.426
	Year+PDO+AO	6	149.76	6.06	0.01	0.030	0.173	0.187	0.433
	AO+IceA	5	150.18	6.49	0.01	0.060	0.245	0.180	0.424
	ALow+AO	5	150.23	6.53	0.01	0.054	0.232	0.182	0.427
	PDO+ALow	5	150.26	6.56	0.01	0.053	0.230	0.183	0.428
	Year+ALow+AO	6	150.28	6.58	0.01	0.036	0.190	0.185	0.431
	ALow+AO+IceA	6	150.61	6.91	0.01	0.047	0.217	0.181	0.426
	PDO+AO	5	151.01	7.31	0.01	0.061	0.247	0.181	0.426
	PDO+IceA	5	151.02	7.32	0.01	0.064	0.253	0.180	0.425
	Year+PDO+ALow+AO	7	151.25	7.55	0.01	0.027	0.163	0.188	0.433
	PDO+ALow+AO	6	151.97	8.27	0	0.051	0.226	0.183	0.427
	PDO+AO+IceA	6	152.43	8.73	0	0.060	0.245	0.180	0.424
	PDO+ALow+AO+IceA	7	152.66	8.96	0	0.046	0.214	0.181	0.426

	Sulfur Primary Feather Models					Variance			
	Model	**k**	**AIC_c**	**ΔAIC_c**	**w_i**	**Year Var**	**SD**	**Resid Var**	**Resid SD**
All Data	PDO	4	442.31	0	0.28	0.846	0.920	1.626	1.275
	ALow	4	443.53	1.22	0.15	1.056	1.028	1.588	1.260
	Year	4	443.55	1.24	0.15	1.066	1.032	1.586	1.259
	PDO+ALow	5	443.64	1.33	0.14	0.773	0.879	1.635	1.279
	Year+PDO	5	443.71	1.4	0.14	0.805	0.897	1.626	1.275
	Year+PDO+ALow	6	444.86	2.56	0.08	0.719	0.848	1.637	1.279
	Year+ALow	5	445.4	3.09	0.06	1.047	1.023	1.586	1.259
Forty-year	Year+PDO+ALow	6	375.26	0	0.23	0.128	0.358	1.576	1.256
	PDO+ALow	5	375.5	0.24	0.21	0.228	0.477	1.557	1.248
	PDO+ALow+AO	6	377.24	1.98	0.09	0.214	0.462	1.556	1.248
	Year+PDO+ALow+AO	7	377.35	2.09	0.08	0.130	0.360	1.572	1.254
	Year+PDO+ALow+IceA	7	377.41	2.15	0.08	0.112	0.334	1.585	1.259
	Year+PDO	5	378.48	3.22	0.05	0.189	0.435	1.625	1.275
	ALow+IceA	5	379.06	3.81	0.03	0.389	0.624	1.539	1.241
	Year+PDO+ALow+AO+IceA	8	379.26	4	0.03	0.094	0.306	1.590	1.261
	PDO+ALow+AO+IceA	7	379.49	4.23	0.03	0.220	0.469	1.553	1.246
	PDO	4	380.11	4.85	0.02	0.385	0.620	1.593	1.262
	IceA	4	380.23	4.97	0.02	0.467	0.683	1.563	1.250
	Year+PDO+AO	6	380.67	5.41	0.02	0.191	0.437	1.623	1.274
	Year+PDO+IceA	6	380.72	5.46	0.02	0.191	0.438	1.623	1.274
	Year+Alow+IceA	6	380.98	5.72	0.01	0.358	0.598	1.547	1.244
	ALow+AO+IceA	6	380.99	5.73	0.01	0.362	0.602	1.545	1.243
	PDO+IceA	5	381.18	5.92	0.01	0.376	0.613	1.578	1.256
	Year+IceA	5	381.55	6.3	0.01	0.395	0.629	1.576	1.256
	PDO+AO	5	382.07	6.81	0.01	0.372	0.610	1.594	1.263
	AO+IceA	5	382.24	6.98	0.01	0.444	0.667	1.569	1.253
	ALow	4	382.62	7.36	0.01	0.664	0.815	1.539	1.241
	Year+ALow+AO+IceA	7	382.8	7.54	0.01	0.314	0.560	1.559	1.248
	Year	4	382.83	7.58	0.01	0.589	0.768	1.565	1.251
	Year+ALow	5	383.02	7.76	0	0.550	0.742	1.545	1.243
	Year+AO+IceA	6	383.4	8.14	0	0.347	0.589	1.590	1.261
	PDO+AO+IceA	6	383.41	8.15	0	0.375	0.612	1.578	1.256
	ALow+AO	5	384.6	9.34	0	0.641	0.801	1.542	1.242
	Year+AO	5	384.68	9.42	0	0.541	0.736	1.574	1.255
	Year+ALow+AO	6	384.84	9.58	0	0.503	0.709	1.553	1.246
	AO	4	385.24	9.98	0	0.751	0.867	1.558	1.248

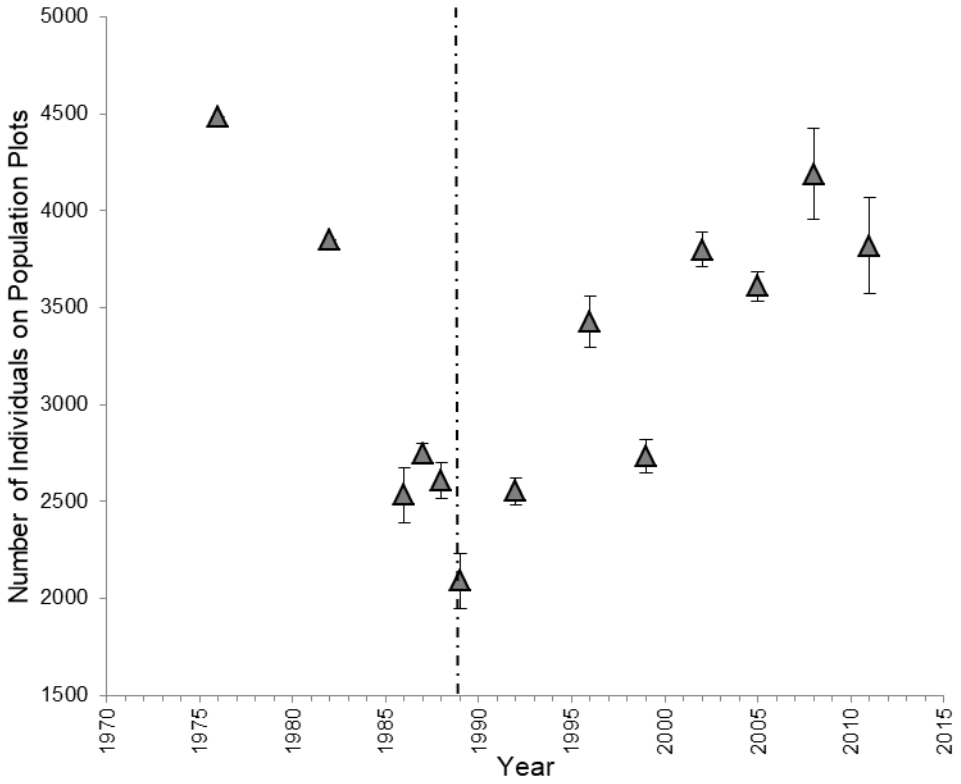

Figure S1 Population trajectory of red-legged kittiwakes on St. George Island. Population counts (shown are annual mean ± SE) conducted by the USFWS (Tappa & Romano 2017). The dashed line separates the period of population decline (1976-1989) and that of population increase (1990-2014).

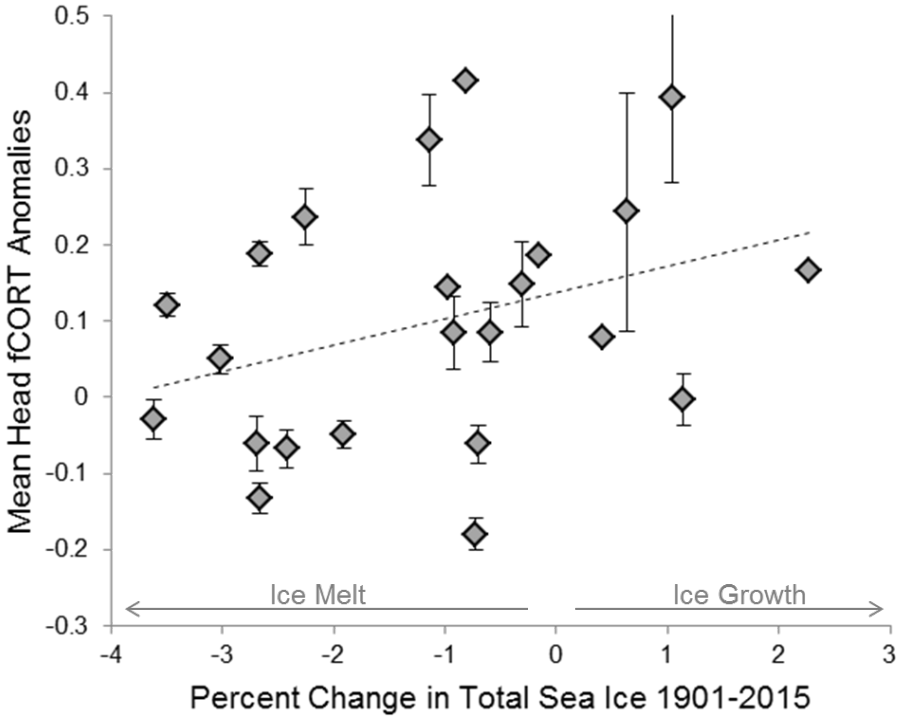

Figure S2 Mean head fCORT anomalies and pan-Arctic changes in sea ice coverage. Plotted are the mean fCORT anomalies for the entire data set ± SE against the percent change in total winter sea ice. Ice coverage values were obtained from Connolly et al. (2017); these were normalized to the long-term average, and are expressed above as a percent. Negative values indicate years when sea ice was lower than average, positive values indicate years when sea ice was more extensive ($r^2 = 0.1143$).

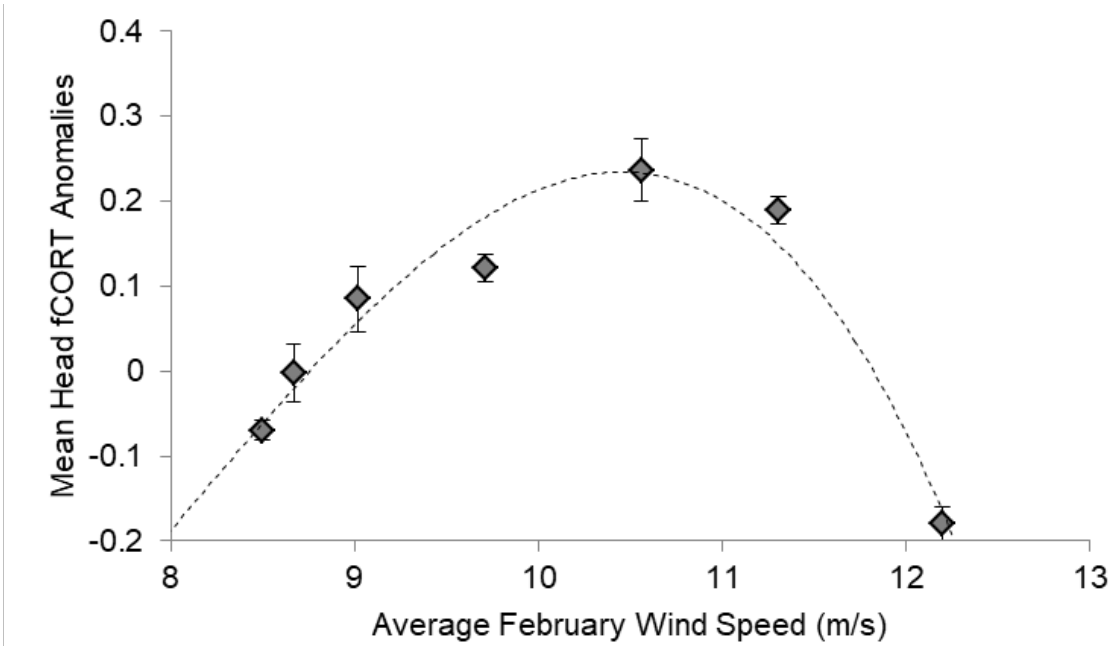

Figure S3 Average February wind speeds (m/s) compared to fCORT concentrations in head feathers, displayed as deviations from the long-term mean. Continuous wind speeds (the average speed at 10 min intervals) were downloaded from http://www.ndbc.noaa.gov/historical_data.shtml#cwind for NOAA buoy 46035 (57°1'33" N 177°44'16" W). Dashed line is a third order polynomial ($r^2 = 0.95$).

References

Connolly R, Connolly M, Soon W (2017) Re-calibration of Arctic sea ice extent datasets using Arctic surface air temperature records. Hydrological Sciences Journal http://dx.doi.org/10.1080/02626667.2017.1324974