

Text S1: Modified Discrete von Bertalanffy Equation

Discrete von Bertalanffy equation (Hall-Aspland et al. 2005).

$$(T_p - T_{p-1}) = (L_p - L_{p-1})k(L_a - L_{p-1})$$

where $(T_p - T_{p-1})$ denotes the time in days represented between points p and $p-1$; $(L_p - L_{p-1})$ is the length of a segment between points p and $p-1$; k is the growth coefficient; and L_a is the asymptotic length, calculated from maximum whisker length of the population plus 1%.

The growth coefficient k was calculated using the following equation (Hall-Aspland et al. 2005):

$$k = -\ln[1 - l(t)L_a] / t(l)$$

where $l(t)$ is the population's maximum whisker length in millimetres; and $t(l)$ is the maximum period of time a whisker could represent (365 days) (Lübcker et al. 2016).

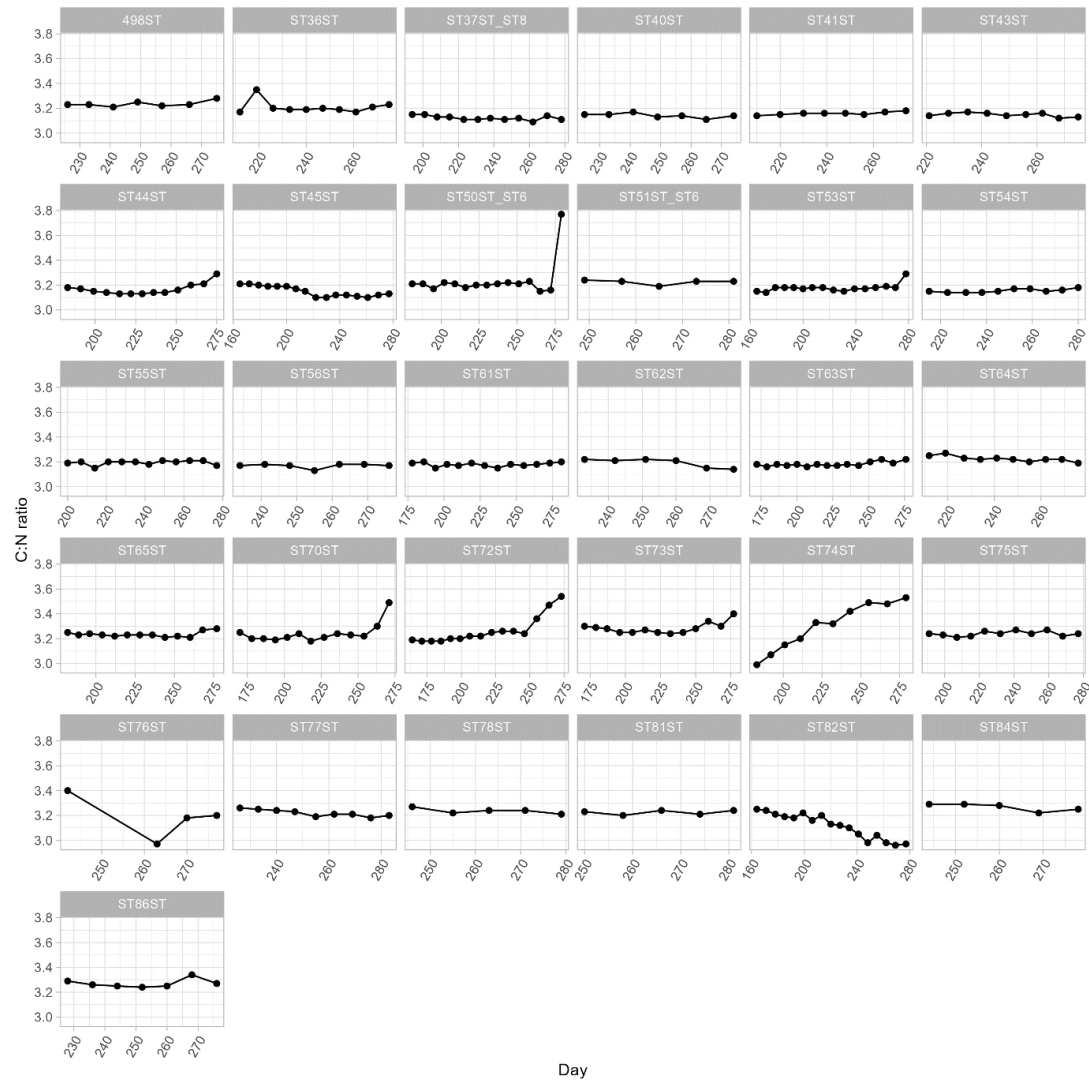


Fig. S1. Atomic C:N ratio per seal. X axis represents days (along the length of each seals whisker). Y axis represents the carbon:nitrogen ratio.

Table S1. Summary table of individual seals.

Seal brand	Seal ID	Year	Nitrogen mean (‰)	Nitrogen sd	Carbon mean (‰)	Carbon sd	Specialisation classification	Specialisation ratio	Standard length (m)	Girth (m)	Whisker segment count
ST36ST	SES06-02	2007	13.99	1.15	-20.68	0.69	Specialist	0.31	4.12	3.68	10
ST37ST_ST8	SES06-03	2006	11.70	0.58	-19.89	1.04	Specialist	0.23	4.36	3.09	12
ST40ST	SES06-06	2007	14.59	0.33	-21.13	0.49	Extreme Specialist	0.02	4.12	3.68	7
ST41ST	SES06-07	2007	11.21	1.22	-21.92	0.43	Generalist	0.55	4.43	3.49	8
ST43ST	SES06-09	2006	14.58	0.98	-21.46	0.45	Specialist	0.47	4.51	3.9	9
ST44ST	SES06-10	2006	13.17	0.53	-21.21	0.61	Extreme Specialist	0.17	4.4	3.865	13
ST45ST	SES06-11	2007	12.34	0.56	-21.09	0.52	Extreme Specialist	0.08	4.06	3.4	16
ST50ST_ST6	SES06-18	2006	13.52	0.71	-21.06	0.99	Specialist	0.30	4.21	3.34	15
ST51ST_ST6	SES06-20	2006	12.38	0.29	-21.28	0.36	Extreme Specialist	0.05	3.99	3.465	5
ST53ST	SES06-22	2006	11.95	0.57	-21.13	0.38	Specialist	0.31	4.15	3.14	16
ST54ST	SES06-23	2006	11.43	0.67	-21.34	0.87	Specialist	0.30	3.84	3.67	10
ST55ST	SES06-24	2007	12.04	0.79	-22.24	0.32	Extreme Specialist	0.18	4.03	3.47	12
ST56ST	SES06-25	2007	12.24	0.50	-22.11	0.44	Extreme Specialist	0.08	4.23	3.6	7
ST61ST	SES06-30	2007	15.04	0.49	-21.15	0.25	Extreme Specialist	0.06	4.4	4.19	13
ST62ST	SES07-01	2007	12.61	0.96	-21.88	0.49	Specialist	0.26	4.32	3.78	6
ST63ST	SES07-02	2007	11.78	0.51	-21.28	0.64	Extreme Specialist	0.10	4.31	3.39	15
ST64ST	SES07-03	2007	16.60	0.54	-21.28	0.36	Extreme Specialist	0.07	4.76	4.01	10

ST65ST	SES07-04	2007	11.92	0.48	-21.40	0.43	Extreme Specialist	0.12	4.05	3.285	13
ST70ST	CAR2013_sel_m_03	2013	12.44	0.73	-22.16	0.93	Specialist	0.42	4.43	4.25	13
ST72ST	CAR2013_sel_m_05	2013	11.57	0.61	-21.19	0.60	Specialist	0.33	4.28	3.84	15
ST73ST	CAR2013_sel_m_08	2013	13.16	0.53	-21.43	0.60	Extreme Specialist	0.14	4.18	3.83	13
ST74ST	CAR2013_sel_m_09	2013	16.52	0.36	-22.73	0.67	Extreme Specialist	0.08	4.2	3.84	10
ST75ST	CAR2013_sel_m_10	2013	13.33	0.54	-21.11	0.44	Extreme Specialist	0.12	3.89	3.35	11
ST76ST	CAR2013_sel_m_11	2013	12.54	0.38	-21.70	0.25	Extreme Specialist	0.07	4.19	3.94	4
498ST	CAR2013_sel_m_12	2013	12.36	0.44	-20.46	1.09	Extreme Specialist	0.11	4.06	3.34	7
ST77ST	CAR2013_sel_m_13	2013	13.08	0.66	-19.22	0.45	Extreme Specialist	0.20	4.02	2.94	9
ST78ST	CAR2013_sel_m_14*	2013	13.24	0.53	-21.68	0.60	Extreme Specialist	0.13	4.29	3.57	5
ST81ST	CAR2013_sel_m_19*	2013	13.54	0.72	-21.61	0.71	Specialist	0.23	4.2	3.32	5
ST82ST	CAR2013_sel_m_20	2013	13.31	0.40	-21.98	0.48	Extreme Specialist	0.04	4.36	3.27	17
ST84ST	CAR2013_sel_m_22	2013	13.23	0.42	-20.95	0.42	Extreme Specialist	0.08	4.32	3.39	5
ST86ST	CAR2013_sel_m_24*	2013	15.57	0.56	-20.43	0.60	Extreme Specialist	0.11	4.69	3.9	7

Text S2. Model response and explanatory variables for the GAMLSS mu model to test the mean.

GAMLSS Mu link function:

```
Nitrogen ( $\delta^{15}\text{n}$ ) ~ log(length) +
log(girth) +
sin (2 * date * pi/365) +
cos (2 * date * pi/365) +
year +
random (seal ID) + re (random = ~1 | seal ID,
correlation = corExp (form = ~date | seal ID),
control = lmeControl (return Object = TRUE),
family = LOGNO())
```

Table S2. Table summarising the results of the GAMLSS model for mean. Bold with asterisks (*) indicates significance.

GAMLSS Mu Coefficients:				
	Estimate	Std. Error	t value	P.value
(Intercept)	1.141	0.065	17.587	< 0.001 *
Log Length	0.614	0.046	13.249	< 0.001 *
Log Girth	0.395	0.024	16.638	< 0.001 *
Sin	0.007	0.014	0.503	0.615
Cos	-0.020	0.014	-1.49	0.138
Year2007	0.028	0.006	4.32	< 0.001 *
Year2013	0.051	0.006	8.953	< 0.001 *

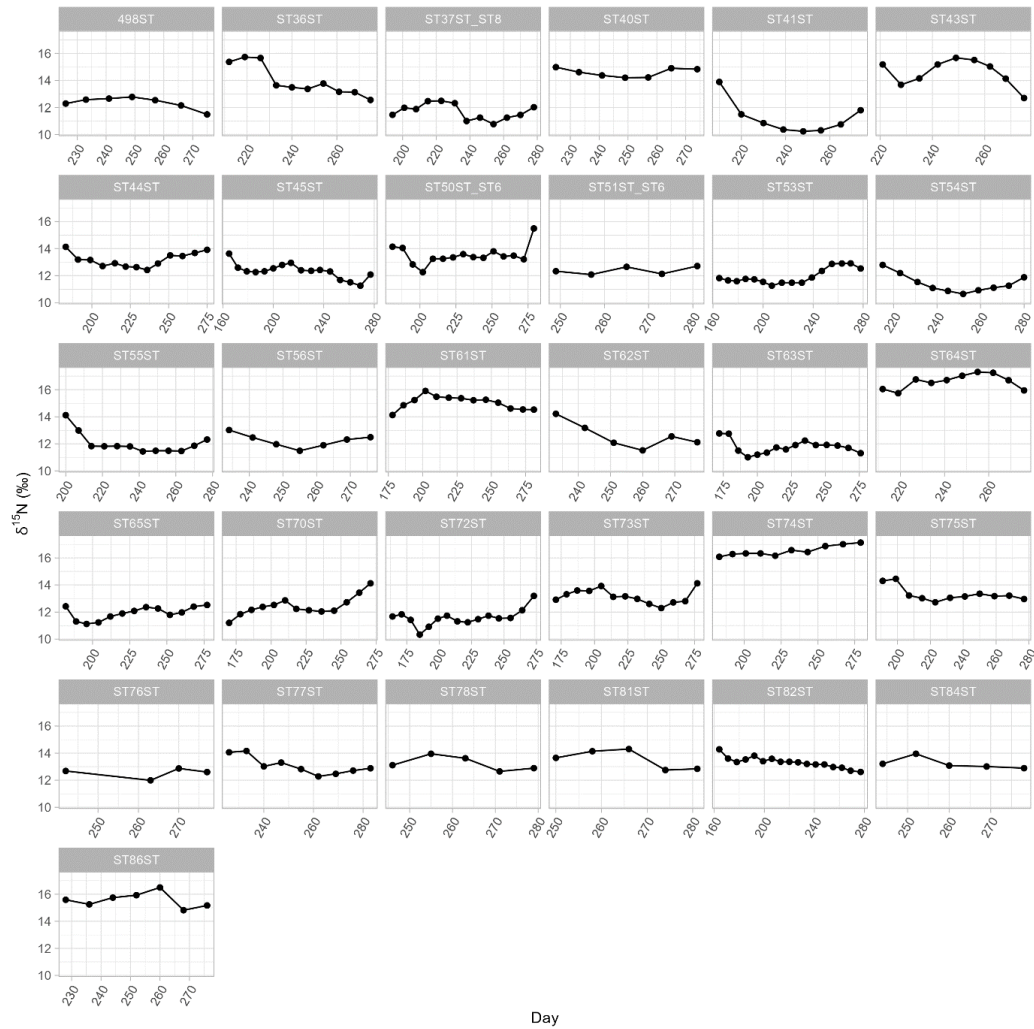


Fig. S2. Stable isotope nitrogen ($\delta^{15}\text{N}$) whisker plot. Each plot represents an individual seal with day on the x axis and nitrogen ($\delta^{15}\text{N}$) on the y axis.

Text S3. Model response and explanatory variables for the GAMLSS sigma link model to test variance.

A) GAMLSS Sigma link function

Nitrogen ($\delta^{15}\text{n}$) ~ log(length) +
 log(girth) +
 sin (2 * date * pi/365) +
 cos (2 * date * pi/365) +
 year +
 random (seal ID) +
 family = LOGNO()

Table S3. Table summarising the results of the GAMLSS model for variance. Bold with asterisks (*) indicates significance.

B) GAMLSS Sigma

Coefficients:

	Estimate	Std. Error	t value	P.value
(Intercept)	-1.305	1.291	-1.011	0.313
Log length	0.008	0.957	0.008	0.993
Log Girth	0.060	0.511	0.117	0.907
Sin	1.528	0.263	5.821	< 0.001 *
Cos	1.468	0.251	5.843	< 0.001 *
Year2007	-0.036	0.110	-0.328	0.744
Year2013	-0.392	0.108	-3.622	< 0.001 *

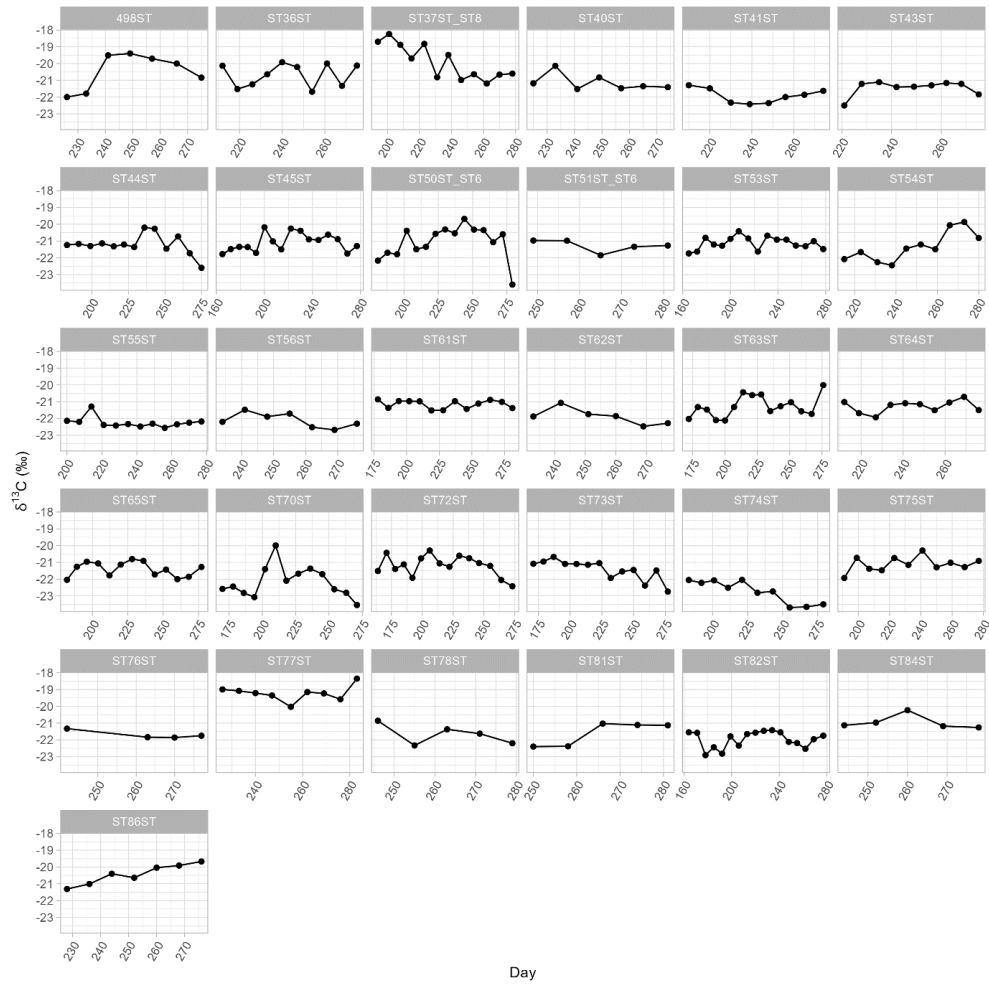


Fig. S3. Stable carbon isotope ($\delta^{13}\text{C}$) whisker plot. Each plot represents an individual seal with day on the x axis and carbon ($\delta^{13}\text{C}$) on the y axis.

Table S4. Individual specialisation generalised linear model. Bold with asterisks (*) indicates significance.

Specialisation GLM

Coefficients:

	Estimate	Std. Error	t value	P.value
(Intercept)	0.4827	0.7413	0.651	0.5204
Log Nitrogen	-0.6734	0.2558	-2.633	0.0138*
Log Girth	0.2115	0.2986	0.709	0.4847
Log Length	0.8055	0.5511	1.462	0.1554

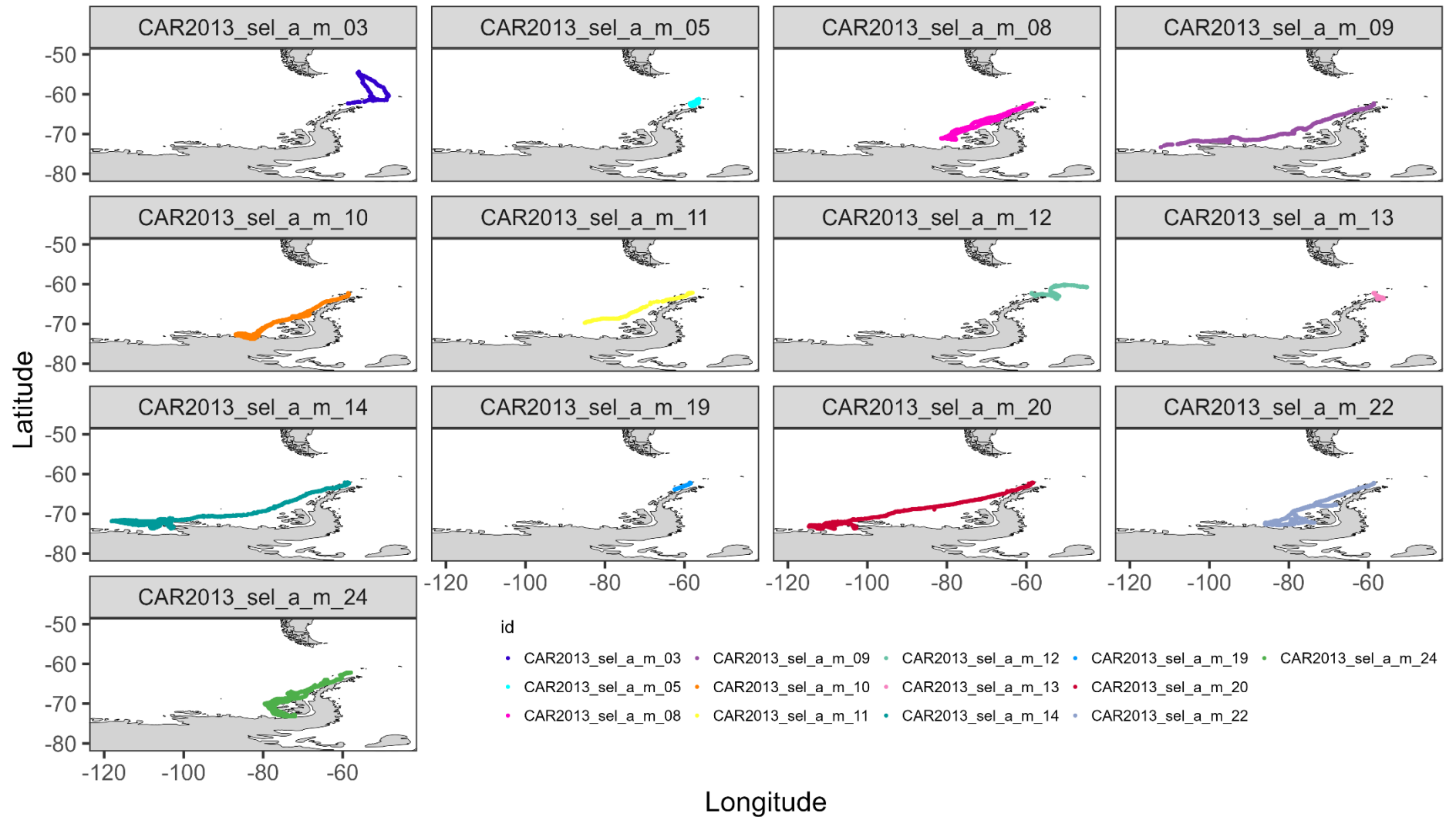


Fig. S4. Map showing the tracks of the 13 seals sampled in 2013 after breeding season (id represents the seals individual identification number). See table S9.2 for links to each individual's metadata.

Table S5. The citation and metadata for the 13 seals tracked after breeding season in 2013.

Seal ID	Citation and link to individual seal specific metadata
CAR2013_sel_a_m_03	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_03 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833592
CAR2013_sel_a_m_05	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_05 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833593
CAR2013_sel_a_m_08	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_08 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833594
CAR2013_sel_a_m_09	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_09 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833595
CAR2013_sel_a_m_10	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_10 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833596
CAR2013_sel_a_m_11	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_11 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833601
CAR2013_sel_a_m_12	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_12 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833597
CAR2013_sel_a_m_14	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_14 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833599
CAR2013_sel_a_m_13	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_13 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833598
CAR2013_sel_a_m_15	Bornemann, Horst; Schröder, Michael; Hellmer, Hartmut H; Márquez, María Elba Isabel; Rogers, Tracey; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_15 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833600
CAR2013_sel_a_m_16	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_16 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833602
CAR2013_sel_a_m_17	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_17 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833603
CAR2013_sel_a_m_18	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_18 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833604
CAR2013_sel_a_m_19	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_19 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833605

CAR2013_sel_a_m_20	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_20 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833606
CAR2013_sel_a_m_21	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_21 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833607
CAR2013_sel_a_m_22	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_22 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833608
CAR2013_sel_a_m_23	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_23 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833609
CAR2013_sel_a_m_24	Bornemann, Horst; Rogers, Tracey; Márquez, María Elba Isabel; Daneri, Gustavo Adolfo; Mennucci, Jorge Augusto; Bester, Marthán Nieuwoudt (2014): At surface behaviour at location on spot of southern elephant seal CAR2013_sel_a_m_24 from King George Island. Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, PANGAEA, https://doi.org/10.1594/PANGAEA.833610

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