

Supplemental Material:

Table S1. Results of non-parametric pairwise tests for differences between Southern Hemisphere blue whales based on raw measurements (i.e., not log-transformed) of the dorsal surface. P-values were calculated using Kruskal-Wallis tests with Wilcoxon pairwise tests and Benjamini and Hochberg adjustments for multiple tests (W) and Dunn’s post-hoc tests (D) with a Bonferroni correction. Pairwise p-values are reported for total length (rostrum-flukes) above the diagonal. Relative head (rostrum-nostrils) and relative tail (dorsal fin-flukes) are reported below the diagonal (e.g., head p-value; tail p-value). Shading indicates p-value < 0.05.

		Chilean drone		Pygmy		Antarctic
		Below Diagonal: Head Tail		Below Diagonal: Head Tail		
Chilean drone	W	-		0.0007		8.9 x 10 ⁻¹²
	D			1.0000		8.4 x 10 ⁻⁶
Pygmy	W	0.4542	0.0989	-		2.0 x 10 ⁻¹⁶
	D	0.7227	0.7135			1.0 x 10 ⁻³³
Antarctic	W	0.1826	5.3 x 10 ⁻⁴	0.0073	3.2 x 10 ⁻¹⁴	-
	D	0.2217	0.0016	0.0023	1.9 x 10 ⁻¹⁴	

Table S2. Results of non-parametric pairwise tests for differences between Southern Hemisphere blue whales based on raw measurements (i.e., not log-transformed) of the lateral and ventral surfaces. P-values were calculated using Kruskal-Wallis tests with Wilcoxon pairwise tests and Benjamini and Hochberg adjustments for multiple tests (W), and Dunn’s post-hoc tests (D) with a Bonferroni correction. Above the diagonal are pairwise p-values are reported for relative head (rostrum-nostrils). Below the diagonal are p-values for relative tail (anus-flukes) comparisons. Shading indicates p-value < 0.05.

		Chilean (drone)	Chilean (whaling)	Pygmy	Antarctic
Chilean (drone)	W	-		0.0300	0.0480
	D			0.3002	0.3747
Chilean (whaling)	W	6.1 x 10 ⁻⁵	-	0.0480	7.3 x 10 ⁻¹¹
	D	1.9 x 10 ⁻⁵		0.3513	3.8 x 10 ⁻¹¹
Pygmy	W	0.0270	7.2 x 10 ⁻¹¹	-	5.1 x 10 ⁻⁵
	D	1.0000	2.9 x 10 ⁻¹⁵		9.6 x 10 ⁻⁵
Antarctic	W	2.2 x 10 ⁻⁵	0.0210	2.0 x 10 ⁻¹⁶	-
	D	3.4 x 10 ⁻⁴	0.2777	4.1 x 10 ⁻¹⁷	

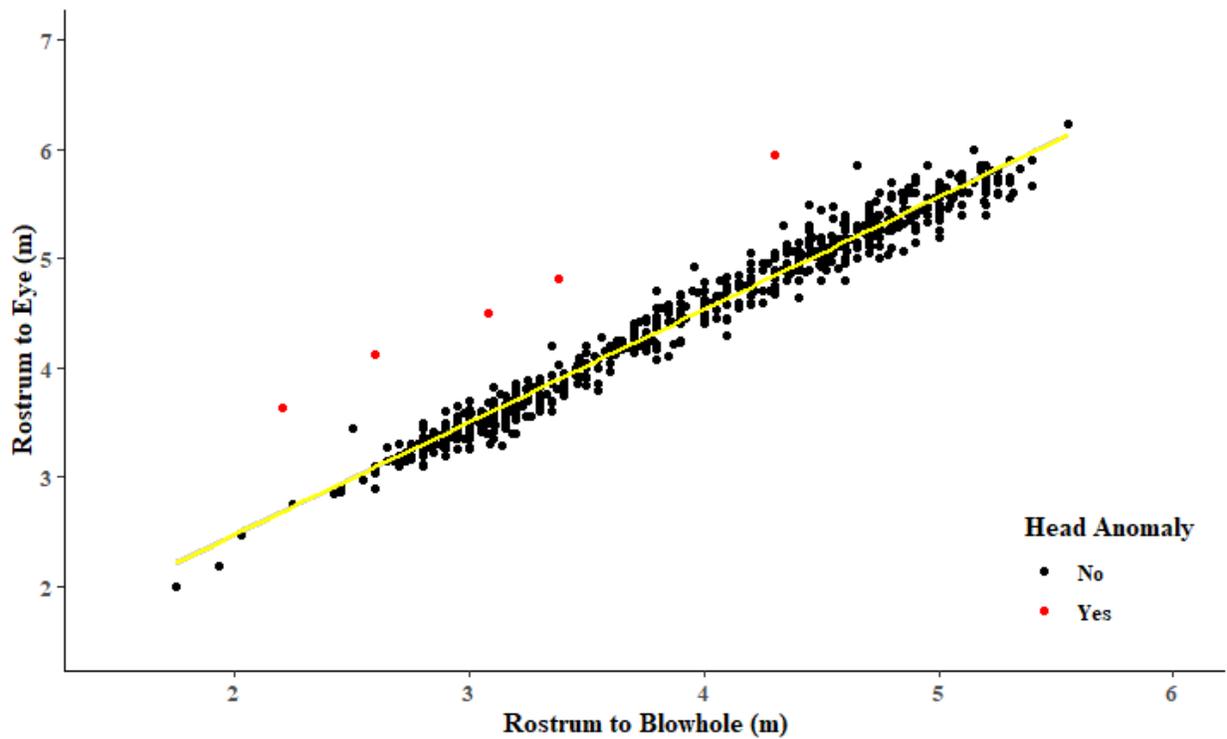


Fig. S1. The allometric relationship between two Antarctic blue whale head measurements: tip of rostrum to the nostrils (m), and tip of the rostrum to eye (m). Yellow line is the regression between these two variables. Individuals that were identified by eye as anomalies are shown in red (these were removed before creating the linear model to estimate a lateral head measurement for Chilean drone individuals).

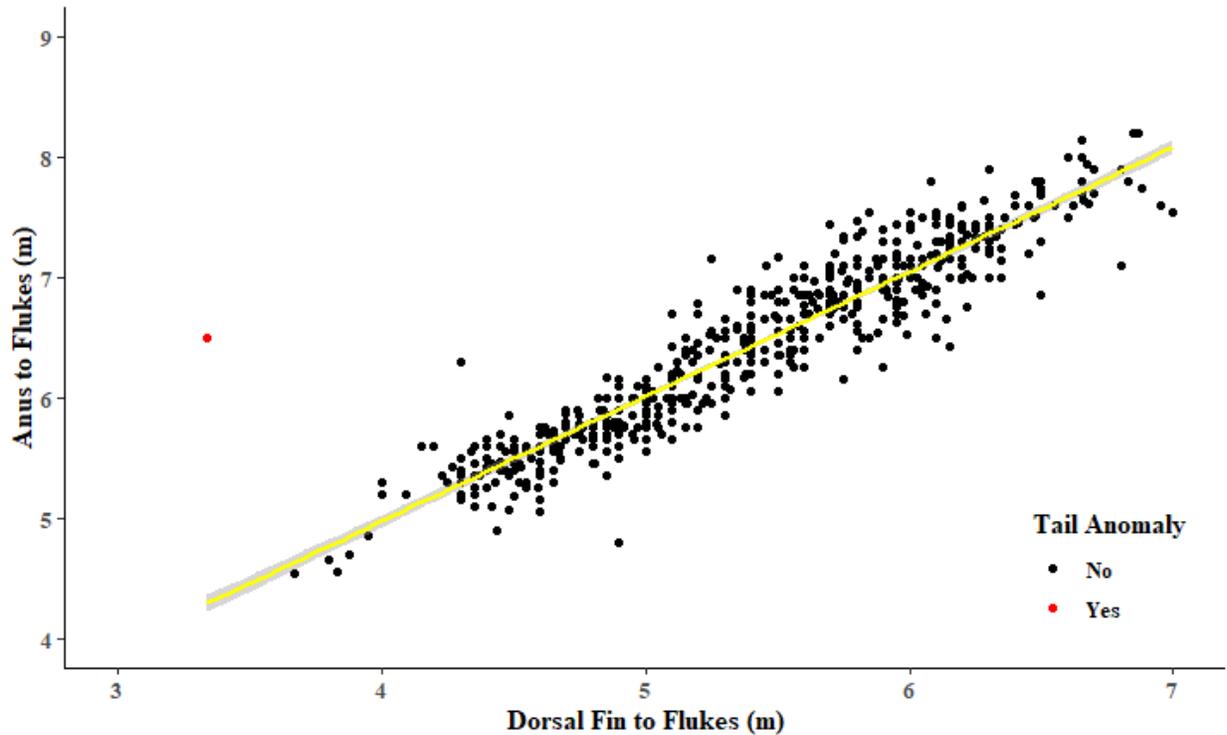


Fig. S2. The allometric relationship between two Antarctic blue whale tail measurements: dorsal fin to the notch between the tail flukes (m), and anus to the notch between the tail flukes (m). Yellow line is the regression between these two variables. One individual (red point) was identified by eye as an anomaly and was removed before creating the linear model to estimate a lateral head measurement for Chilean drone individuals.

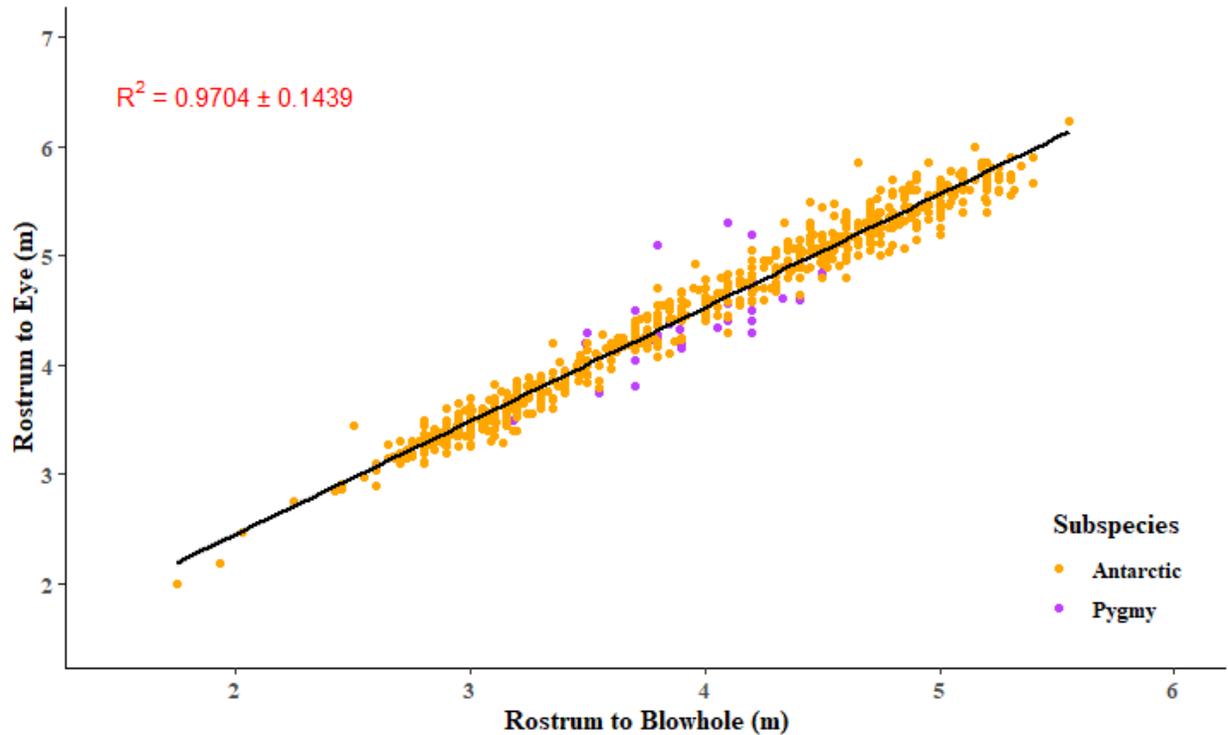


Fig. S3. Allometric relationship between two Southern Hemisphere blue whale head measurements: tip of rostrum to the nostrils (m), and tip of the rostrum to eye (m). Black line is the regression between these two variables. Antarctic individuals are shown in orange. Pygmy blue whales are shown in purple. These data were used to create the linear model to estimate a lateral head measurement for Chilean drone individuals.

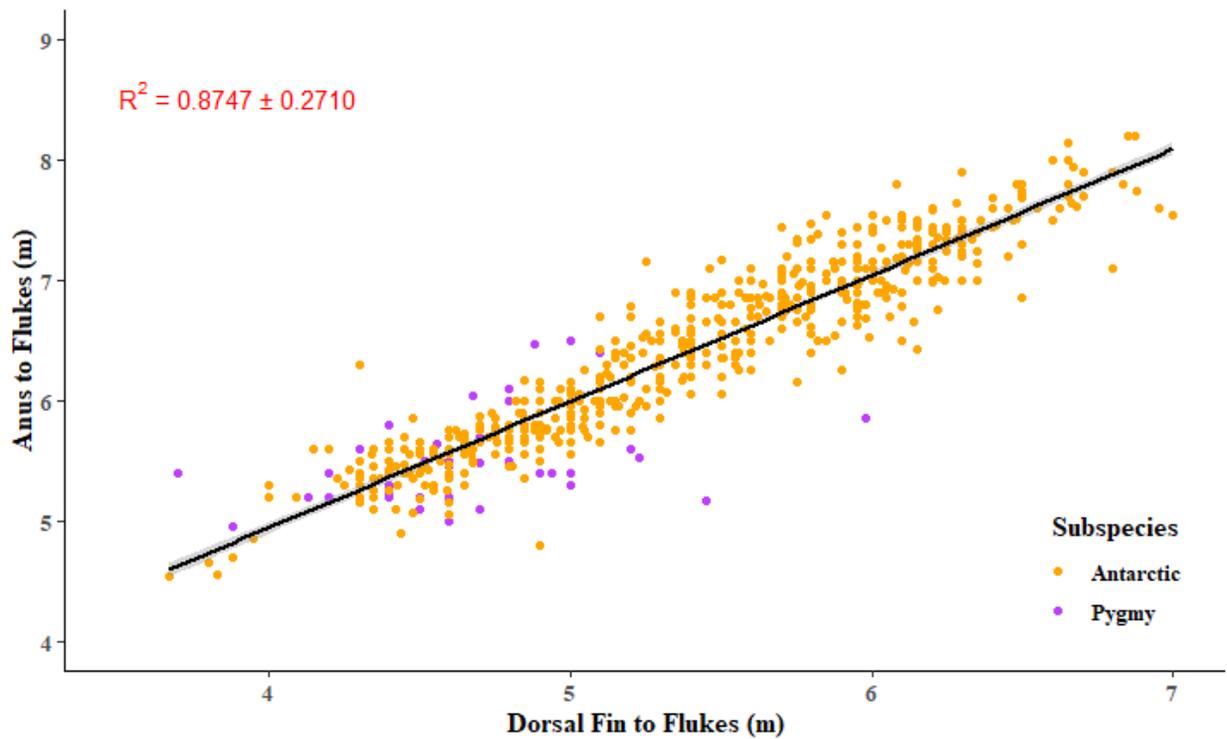


Fig. S4. Allometric relationship between two Southern Hemisphere blue whale head measurements: dorsal fin to the notch between the tail flukes (m), and anus to the notch between the tail flukes (m). Black line is the regression between these two variables. Antarctic individuals are shown in orange. Pygmy blue whales are shown in purple. These data were used to create the linear model to estimate a lateral head measurement for contemporary Chilean individuals.

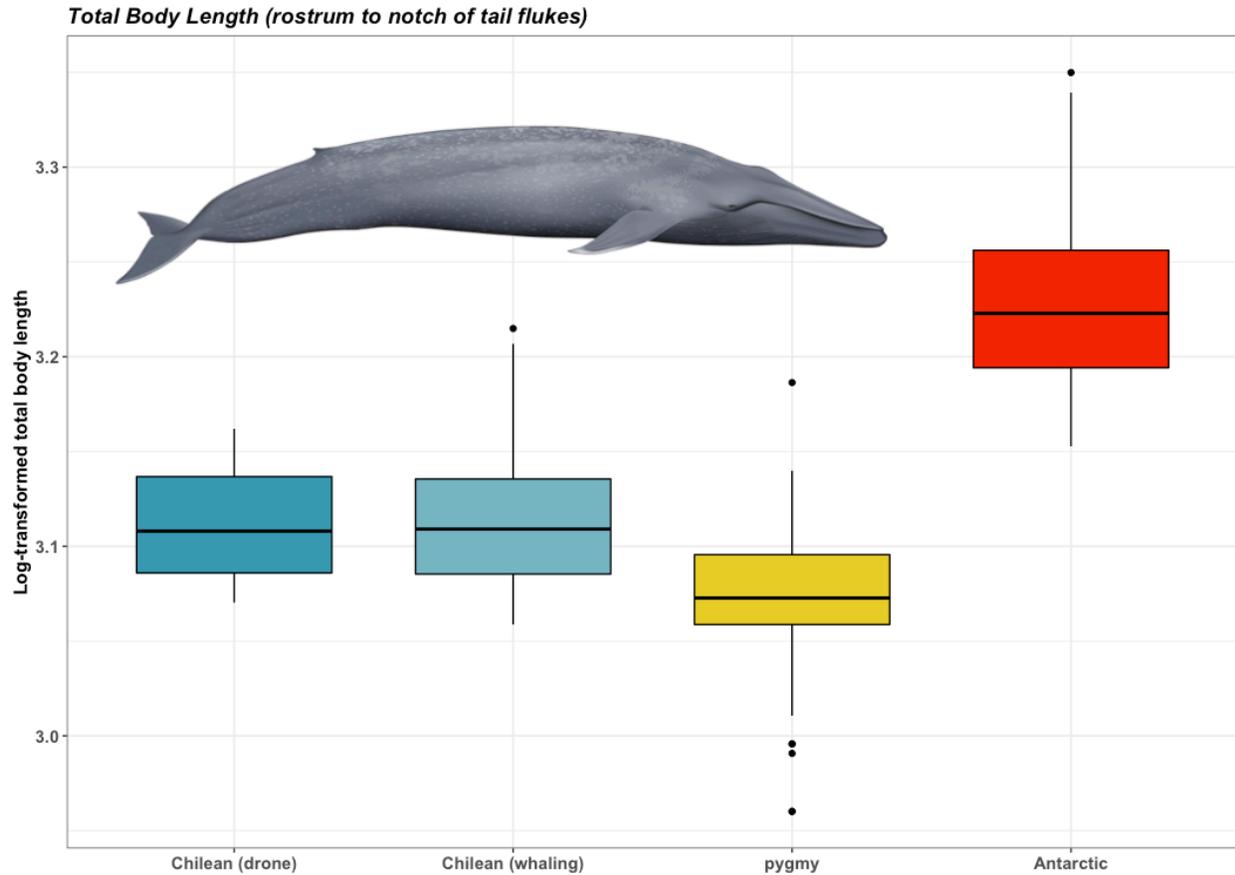


Fig. S5. Boxplots of log-transformed total body length measured from the tip of the rostrum to the notch between the tail flukes for blue whales from each of the three Southern Hemisphere subspecies. The Chilean (drone) data is from 2015 and 2017 while the Chilean whaling), pygmy, and Antarctic, are from historical whaling records. The horizontal lines in the colored boxes indicate the median of their respective group, while the colored boxes indicate the first and third quartile. Black vertical whiskers extend from the hinge to the largest and smallest value no further than 1.5 times the inter-quartile range from the box. Data beyond the point of the whiskers are shown as black dots. Blue whale illustration by Uko Gorter (<http://www.ukogorter.com>).

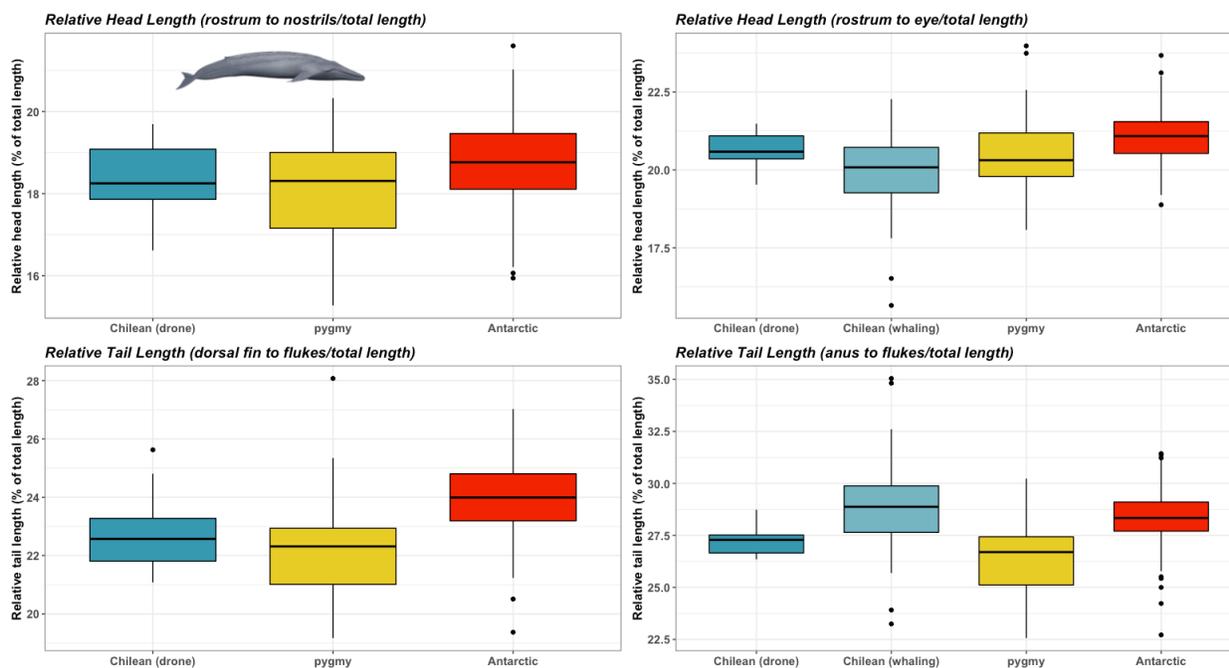


Fig. S6. Boxplots of log-transformed relative head and tail lengths of Southern Hemisphere blue whale groups. Upper left: Relative head length measured along the dorsal surface from tip of the rostrum to the midpoint of the nostrils (m) divided by total body length (m) for the three Southern Hemisphere blue whale groups. Upper right: Relative head length of Southern Hemisphere blue whales measured from tip of the rostrum to the midpoint of the eye (m) divided by total body length (m), and multiplied by 100. Chilean (drone) data are estimated from tip of rostrum-nostrils using a linear model of head proportions built using all available data (excluding outliers) from Southern Hemisphere whaling. Lower left: Relative tail length for the three Southern Hemisphere blue whale groups measured along the dorsal surface from posterior insertion of the divided by total body length (m). Lower right: Relative tail length of Southern Hemisphere blue whales measured from the anus to the notch between the tail flukes (m) divided by total body length (m) and multiplied by 100. Chilean drone data are estimated from the dorsal fin to the notch between the tail flukes (m) using a linear model of tail proportions built using all available data (excluding outliers) from Southern Hemisphere whaling. The Chilean drone data is from 2015 and 2017 aerial photogrammetry, Chilean whaling, pygmy, and Antarctic, blue whale data are from historical whaling records. The horizontal lines in the colored boxes indicate the median of their respective group, while the colored boxes indicate the first and third quartile. Black vertical whiskers extend from the hinge to the largest and smallest value no further than 1.5 times the inter-quartile range from the box. Data beyond the point of the whiskers are shown as black dots. Blue whale illustration by Uko Gorter (<http://www.ukogorter.com>).