Table S1. Contribution of individual predictor variables (wind speed, presence of conspecifics (PC) and wing loading (WL)), model coefficients and standard errors (SE) for the model-averaged proportion of time spent flapping model (n=2 models). Variables that had a significant effect are in bold ($p < 0.05$).

Variable	n containing models	Coefficient	SE	z value
Intercept	**2**	**0.7953**	**0.0409**	**18.832**
Wind speed	**2**	**–0.0945**	**0.0275**	**3.320**
PC	**2**	**–0.1694**	**0.0345**	**4.752**
WL	1	–0.0534	0.0328	1.573

Table S2. Contribution of individual predictor variables (wind speed, presence of conspecifics (PC) and wing loading (WL)) model coefficients and standard errors (SE) for the model-averaged proportion of time spent gliding model (n=2 models). Variables that had a significant effect are in bold ($p < 0.05$).

Variable	n containing models	Coefficient	SE	z value
Intercept	**2**	**0.1933**	**0.0405**	**4.621**
Wind speed	**2**	**0.0972**	**0.0272**	**3.458**
PC	**2**	**0.1747**	**0.0354**	**4.781**
WL	1	0.0540	0.0319	1.639

Table S3. Contribution of individual predictor variables (wind speed, presence of conspecifics (PC) and relative wind direction (RelDir)) and variable interactions (*), model coefficients and standard errors (SE) for the model on flight bout ground speed (n=1 model). Significance of effects was evaluated using an analysis of variance. Variables that had a significant effect are in bold ($p < 0.05$).

Variable	n containing models	Coefficient	SE	t value
Intercept	1	11.9938	1.0889	11.015
Wind speed	1	–0.9332	0.7363	–1.268
RelDir: head wind	**1**	**–0.4059**	**0.5944**	**–0.683**
RelDir: tail wind	**1**	**3.4565**	**0.5481**	**6.306**
PC	**1**	**–1.4730**	**0.6045**	**–2.437**
Wind speed*RelDir: head wind	**1**	**–0.4617**	**0.5840**	**–0.791**
Wind speed*RelDir: tail wind	**1**	**2.8194**	**0.6052**	**4.659**

Table S4. Contribution of individual predictor variables (wind speed, presence of conspecifics (PC) and relative wind direction (RelDir) and wing loading), model coefficients and standard errors (SE) for the model-averaged on the proportion of behaviour changes (from flapping to gliding and vice versa) per unit time (n=5 models). Variables that had a significant effect are in bold ($p < 0.05$).

Variable	N containing models	Coefficient	SE	z value
Intercept	**5**	**0.1082**	**0.0147**	**7.153**
Wind speed	2	0.0152	0.0093	1.589
RelDir: head wind	2	–0.0024	0.0119	0.194
RelDir: tail wind	**2**	**–0.0227**	**0.0104**	**2.104**
PC	**5**	**0.0341**	**0.0117**	**2.830**
WL	1	0.0133	0.0128	1.003

Table S5. Contribution of individual predictor variables (wind speed and wing loading), model coefficients and standard errors (SE) for the model-averaged on the average wingbeat frequency (n=3 models including the Null model). Variables that had a significant effect are in bold ($p < 0.05$).

Variable	N containing models	Coefficient	SE	z value
Intercept	**3**	**3.8412**	**0.0348**	**107.11**
Wind speed	1	0.0266	0.0285	0.903
WL	1	0.0564	0.0344	1.59

Table S6. Contribution of the individual predictor variable related to the presence of conspecifics (PC), model coefficients, standard errors (SE), Z values for the model-averaged flight bout duration model (n=2 models, including the Null model). Variables that had a significant effect are in bold ($p < 0.05$).

Variable	n containing models	Coefficient	SE	z value
Intercept	**2**	**4.2509**	**1.1047**	**3.798**
PC	**1**	**2.3140**	**0.9908**	**2.263**

Table S7. Contribution of the individual predictor variable related to the presence of conspecifics (PC), model coefficients and standard errors (SE), z-values for the model-averaged for the distance travelled within a flight bout (n=2 models including the Null model). Variables that had a significant effect are in bold ($p < 0.05$).

Variable	n containing models	Coefficient	SE	z value
Intercept	**2**	**3244.7**	**956.2**	**3.347**
PC	**1**	**2034.2**	**881.6**	**2.236**

Table S8. The flight characteristics of flight bouts for each of the relative wind directions (head-, cross- and tailwind) included in the models used to study the flight dynamics during the flight bouts of the Cape gannets *Morus capensis*.

		average ± 95% CI (min.–max.)	n
Flight bout duration (s)	Head	715.22 ± 6.18 (92.46–113.50)	9
	Cross	350.80 ± 124.46 (93.00–1281.00)	30
	Tail	415.47 ± 428.00 (91.00–3155.00)	15
Proportion of time spent flapping (%)	Head	58.89 ± 13.95 (28.73–92.48)	9
	Cross	66.36 ± 9.36 (4.05–97.37)	30
	Tail	62.84 ± 18.14 (7.90–100.00)	15
Proportion of time spent gliding (%)	Head	40.22 ± 14.48 (6.70–71.27)	9
	Cross	32.89 ± 9.46 (2.63–95.95)	30
	Tail	33.54 ± 17.46 (0.00–92.10)	15
Number of Behaviour changes	Head	109.33 ± 73.22 (9.00–270.00)	9
	Cross	41.10 ± 16.02 (2.00–148.00)	30
	Tail	33.20 ± 27.24 (1.00–194.00)	15
Wingbeat Frequency ($N.m^{-2}$)	Head	3.90 ± 0.06 (3.76–4.00)	9
	Cross	3.84 ± 0.05 (3.64–4.11)	30
	Tail	3.86 ± 0.10 (3.70 ± 4.42)	15
Distance Travelled (m)	Head	7226.00 ± 4988.97 (991.46–18747.82)	9
	Cross	4499.03 ± 1704 (991.88–16718.42)	30
	Tail	7826.68 ± 9638.93 (1178.84–69914.65)	15
Flight bout speed ($m.s^{-1}$)	Head	9.97 ± 1.24 (7.40–12.58)	9
	Cross	12.36 ± 0.86 (7.15–19.39)	30
	Tail	15.40 ± 2.12 (7.21–22.16)	15
Flight bout bearing (°)	Head	126.03 ± 58.44 (52.10–244.31)	9
	Cross	173.28 ± 23.90 (17.30–317.61)	30
	Tail	230.68 ± 55.06 (2.63–335.80)	15

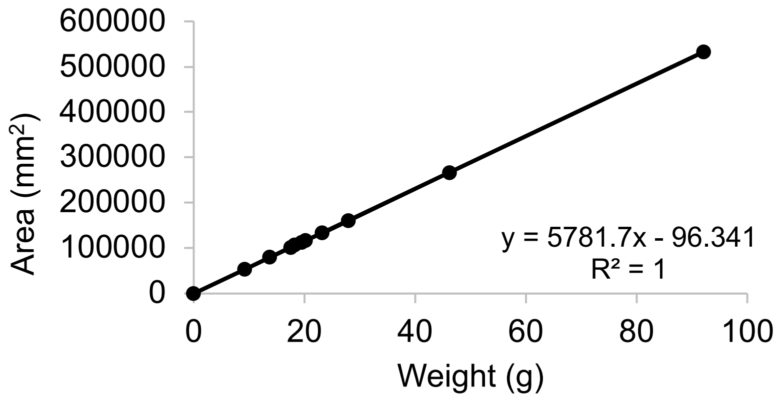

Figure S1. The wing area was estimated based on the mass-to-area linear regression of the trace paper. The known masses and surface areas of 10 different sizes of trace paper (to the nearest 0.01 g and 1 mm^2 respectively) were plotted to generate the straight-line equation: $y = 5781.7x - 96.341$; where y represents the wing area and x represents the mass of the trace paper.

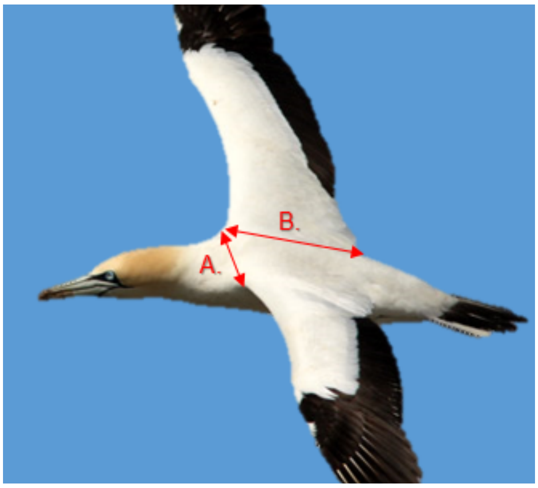

Figure S2. Image of a gannet illustrating the length between the shoulders (A) and wing width (B) used to estimate the back area.

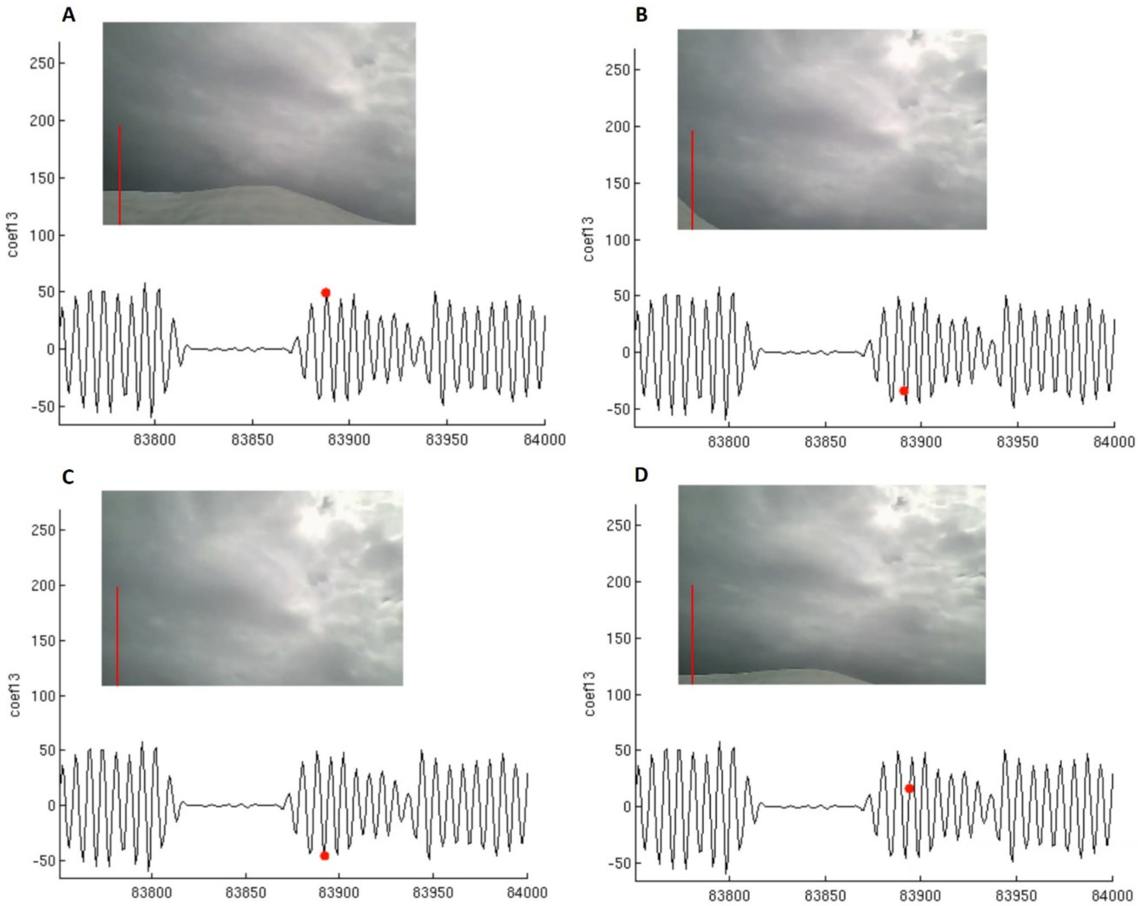

Figure S3. Each panel shows an image extracted from the camera onboard a Cape gannet, together with the oscillatory signal resulting from the analysis of the position of the wing along the red vertical line (on the left of each image) and representing the gannets' left wing up and down movement during flapping. The red dot oscillates along the signal between peaks and troughs as the bird flaps its wings. The pixel values (see red dot along the signal) are at a peak (A) when the bird reaches the maximum upstroke, and then decrease (B) as the bird starts the downstroke. It reaches the lowest point at the trough (C), after which the bird will start moving its wings upwards again (D). The location and length of the vertical line was adapted for each flight.

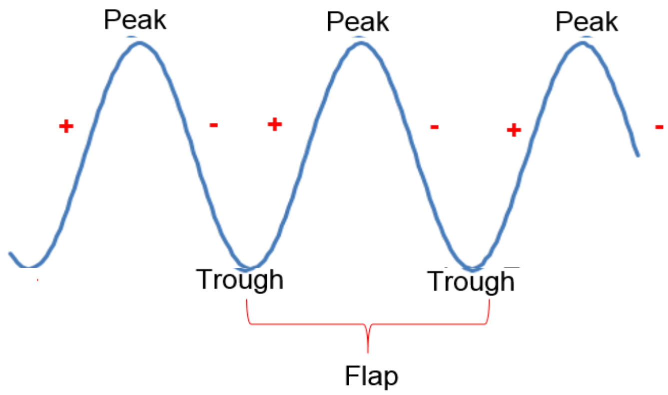

Figure S4. A simplified diagram of the signal generated on MATLAB, indicating the troughs and peaks for each flap and the relative sign changes.