Supplementary Information

***Table S1**: Statistics of each trip. From left to right: the unique trip ID, the body mass of the bird in grams, the trip duration in hours, the range (furthest straight-line distance from the nest location), and the total distance covered (sum of GPS distance covered between successive fixes).*

Trip ID	Body mass	Trip duration	Range (km)	Total distance (km)
103_1	850	5.3	54.1	142.5
109_1	780	1.3	21.8	61.0
109_2	780	2.9	47.0	99.9
110_1	720	3.2	43.1	102.6
114_1	800	1.6	19.1	55.4
114_2	800	2.8	20.3	67.4
114_3	800	1.0	13.1	28.9
114ii_1	780	2.5	16.4	52.3
114ii_2	780	2.8	16.5	66.1
114ii_3	780	1.6	15.2	39.4
120_1	740	4.3	35.2	116.0
131_1	650	7.8	94.4	274.3
131ii_1	890	3.2	39.5	96.0
132_1	870	26.1	119.6	333.5
133_1	900	1.5	24.5	62.0
137_1	720	1.0	16.3	35.0
137_2	720	3.0	16.5	68.3
137ii_1	870	4.0	27.1	57.9
141_1	860	3.9	36.9	150.7
141ii_1	890	3.9	42.7	98.1
143_1	880	5.8	42.0	96.6
146_1	830	14.1	34.4	104.2
147_1	850	0.9	7.4	20.9
149_1	800	6.5	81.1	181.9
149_2	800	19.9	53.8	135.9
149ii_1	780	6.8	53.0	137.8
149ii_2	780	16.3	43.1	116.8
150_1	760	1.6	29.3	74.1
150ii_1	880	1.0	9.4	28.8
151_1	800	1.7	20.5	48.3
155ii_1	780	2.6	10.2	43.2
155ii_2	780	1.4	4.2	14.4
23_1	700	25.4	68.2	240.0
311_1	760	0.9	13.0	29.8
314_1	730	1.1	7.9	30.7
315_1	860	2.9	12.2	78.6
316_1	770	2.1	14.4	51.5

318_1	700	2.9	21.6	70.9
319_1	880	1.9	14.9	59.0
320_1	770	2.6	17.9	77.3
320_2	770	2.0	16.9	50.4
335_1	850	7.5	37.6	146.4
349_1	830	1.8	15.9	45.4
358_1	780	4.7	64.2	176.8
36_1	790	6.1	61.6	160.3
43_1	710	1.7	23.9	58.0
46_1	730	3.9	19.6	82.3
57_1	880	2.2	21.1	49.1
652_1	810	1.1	10.9	27.8
652_2	810	5.4	25.1	136.4
664_1	780	2.4	27.5	69.4
665_1	860	5.3	86.5	198.0
665_2	860	3.7	53.5	122.6
667_1	710	1.1	17.5	40.3
667_2	710	1.3	15.5	35.7
71_1	800	1.2	9.2	25.0
71_2	800	4.4	33.6	125.7
75_1	710	7.7	67.3	182.7
75ii_1	790	3.2	33.6	74.6
80_1	780	11.0	74.5	216.8
82_1	790	0.9	10.9	24.7
82_2	790	0.9	7.9	22.3
82ii_1	920	3.2	23.6	71.3
82ii_2	920	1.5	14.7	53.3
92_1	880	0.8	17.5	30.1
92_2	880	19.8	138.9	362.5
93ii_1	840	4.5	56.9	137.2
94_1	830	1.9	17.7	48.6
94_2	830	43.5	180.3	563.1
95_1	870	39.8	70.7	233.0
96_1	840	1.5	20.8	48.6
96_2	840	1.2	12.8	32.2
96_3	840	1.9	22.5	56.1
97_1	720	5.8	67.2	168.1
97_2	720	1.3	8.8	35.7
999_1	760	1.7	22.0	49.6

***Table S2**: Bird morphometrics and their source, are given with the following flight parameters: the minimum sink rate and speed during gliding flight, and the relative cost of flapping flight, which is given as the ratio between the cost of flapping flight at the minimum power speed (V_{mp}) and the basal metabolic rate (BMR). Flight parameters were estimated using the R package afpt (Klein Heerenbrink et al., 2015) and the freeware 'Flight' (Pennycuick 2008).*

Species	Common name	Mass (kg)	Wing area (m^2)	Wing loading ($kg\ m^{-2}$)	Aspect ratio	Min. sink rate ($m\ s^{-1}$)	Min. sink speed ($m\ s^{-1}$)	Cost of flapping	Source
Anous stolidus	Brown noddy	0.171	0.075	2.27	8.8	0.31	6.2	4.7	Flight (Pennycuick 2008)
Gygis alba	White tern	0.110	0.040	2.75	11.1	0.26	6.2	3.7	Hertel & Balance 1999
Sterna fuscata	Sooty tern	0.196	0.072	2.71	10.4	0.35	5.0	4.6	Flight (Pennycuick 2008)
Fratercula arctica	Atlantic puffin	0.390	0.038	10.40	8.2	0.90	9.9	16.2	Hertel & Balance 1999
Uria aalge	Common guillemot	0.970	0.054	17.86	9.2	1.00	13.50	23.4	Hertel & Balance 1999
Alca torda	Razorbill	0.662	0.046	14.33	9.4	0.93	11.3	18.1	Flight (Pennycuick 2008)
Puffinus puffinus	Manx shearwater	0.390	0.060	6.50	11.2	0.45	9.0	8.0	Flight (Pennycuick 2008)
Ardenna pacifica	Wedge-tailed shearwater	0.380	0.100	3.80	10.4	0.35	7.6	6.2	Hertel & Balance 1999
Puffinus nativitatis	Christmas shearwater	0.340	0.070	4.86	9.6	0.43	8.3	7.6	Flight (Pennycuick 2008)
Fregata magnificens	Magnificent frigatebird	1.220	0.334	3.65	13.0	0.33	5.7	5.8	Flight (Pennycuick 2008)
Sula sula	Red-footed booby	1.100	0.200	5.50	11.4	0.39	9.0	8.5	Flight (Pennycuick 2008)
Sula dactylatra	Masked booby	1.900	0.220	8.64	12.2	0.47	10.7	11.6	Flight (Pennycuick 2008)
Sula leucogaster	Brown booby	1.260	0.190	6.63	12.1	0.40	9.6	9.1	Flight (Pennycuick 2008)
Phaethon aetherius	Red-billed tropicbird	0.650	0.110	5.91	10.7	0.51	7.3	8.7	Flight (Pennycuick 2008)
Phaethon lepturus	White-tailed tropicbird	0.370	0.085	4.37	10.1	0.46	6.3	6.9	Hertel & Balance 1999
Phaethon rubricauda	Red-tailed tropicbird	0.770	0.112	6.88	14.2	0.52	7.9	8.5	Current study

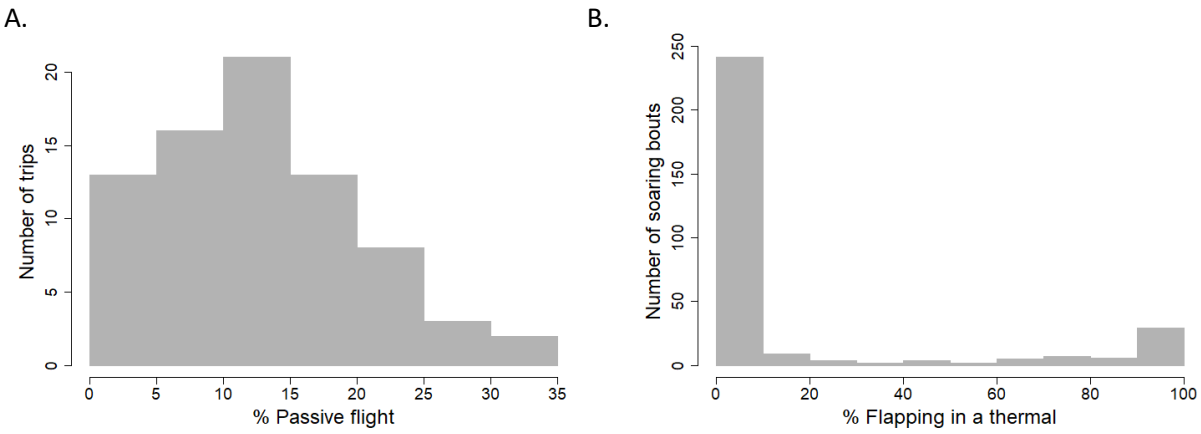

Figure S1. *(A) The proportion of time spent in non-flapping flight (soaring and gliding) across 76 different tropicbird flights. (B) The proportion of flapping across all thermal soaring bouts.*

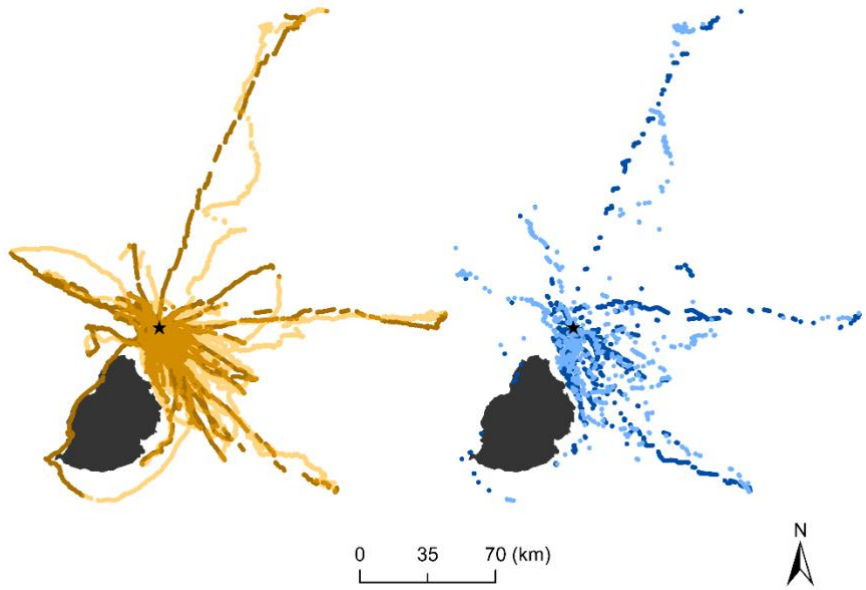

Figure S2. *GPS locations of foraging red-tailed tropicbirds. Maps are split into flapping flight (left panel) and non-flapping flight (right panel) with darker colours indicating the inbound phase and light colours the outbound. The prevailing wind direction was south-easterly.*

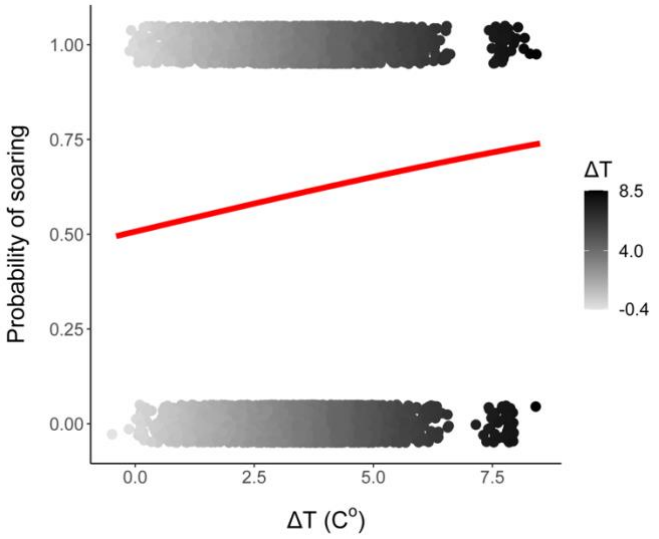

***Figure S3**. Logistic (binomial) regression of the probability of observing soaring in a bout as a function of difference in temperature between the air and the sea (ΔT). Darker points correspond to higher ΔT.*

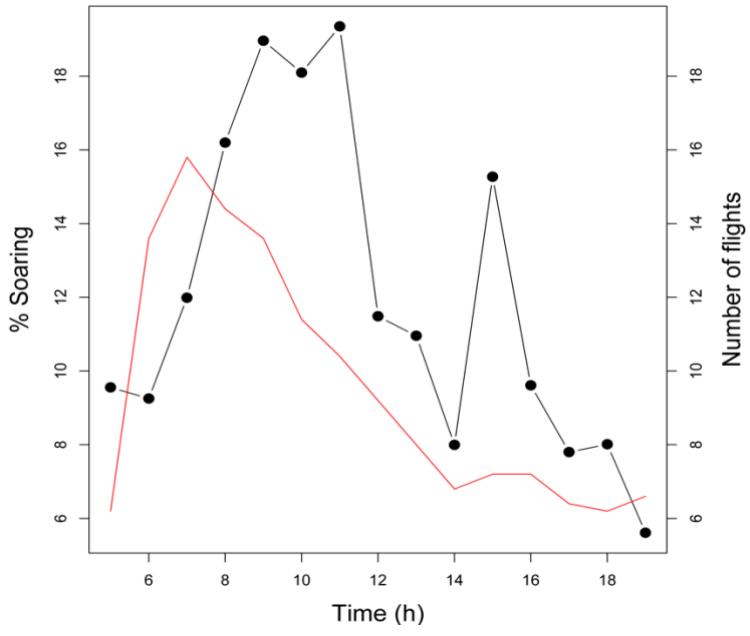

***Figure S4**. Proportion of soaring flight (black – left y-axis) and number of flights performed (red – right y-axis) according to the time of day (in hours). The proportion of soaring peaked after the morning hours when most flights took place and may be influenced by the fact that most birds foraged to the southeast and experienced a tailwind when returning to the colony.*