*Supplementary material*

Flexible foraging strategies of a tropical seabird in the western Atlantic Ocean

**Júlia Jacoby1,2 \*, Amédée Roy3, Sophie Lanco3, Christophe Barbraud4, Karine Delord4, Leandro Bugoni5, Guilherme T. Nunes1,2**

1Programa de Pós-Graduação em Biologia Animal,Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, Brazil

2Laboratório de Aves Costeiras e Marinhas (LACMar), Centro de Estudos Costeiros, Limnológicos e Marinhos (CECLIMAR), Universidade Federal do Rio Grande do Sul (UFRGS), Imbé, Brazil

3Institut de Recherche pour le Développement (IRD), Marbec (Université De Montpellier, IFREMER, CNRS, IRD), Sète, France

4Centre d'Etudes Biologiques de Chizé UMR7372, Centre National de la Recherche Scientifique, La Rochelle Université, Villiers en Bois, France

5Laboratório de Aves Aquáticas e Tartarugas Marinhas (LAATM), Universidade Federal do Rio Grande (FURG), Brazil

\*Corresponding author: julia.jacoby.s@gmail.com

Table S1.Mean ± standard deviation (SD), minimum and maximum values of carbon (*δ*13C) and nitrogen (*δ*15N) isotopic values from muscle samples of regurgitated prey of masked boobies (*Sula dactylatra*) from Fernando de Noronha archipelago.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | **Length (mm)** |  | ***δ*13C (‰)** |  | ***δ*15N (‰)** |
| Prey species | **n** | **Mean** |  | **Mean ± SD** | **Min** | **Max** |  | **Mean ± SD** | **Min** | **Max** |
| *Cheilopogon cyanopterus* | 4 | 250.0 |  | -17.81 ± 0.26 | -18.11 | -17.57 |  | 9.75 ± 1.55 | 7.66 | 11.06 |
| *Exocoetus volitans*  | 25 | 161.9 |  | -17.25 ± 0.43 | -18.29 | -16.76 |  | 9.33 ± 1.33 | 5.90 | 10.54 |
| *Hirundichthys affinis* | 24 | 194.2 |  | -17.13 ± 0.30 | -17.60 | -16.69 |  | 9.00 ± 0.83 | 7.90 | 10.90 |
| Hemiramphidae | 4 | 236.6 |  | -17.51 ± 0.12 | -17.63 | -17.40 |  | 8.67 ± 0.70 | 7.71 | 9.38 |
| *Oxyporhamphus micropterus* | 6 | 132.5 |  | -17.30 ± 0.49 | -17.83 | -16.63 |  | 7.66 ± 1.44 | 5.28 | 9.34 |
| *Harengula clupeola* | 3 | NA |  | -17.86 ± 0.05 | -17.90 | -17.80 |  | 8.96 ± 0.12 | 8.84 | 8.89 |

Table S2. Standard area and overlap of Bayesian ellipses of *δ*13C and *δ*15N from whole blood samples of breeding masked booby *Sula dactylatra* in the Fernando de Noronha Archipelago by year. Ellipse areas represent 95% of the data.

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Area | Overlap area | Overlap proportion (%) |
| **Female** | **Male** |
| 2017 | 0.41 | 0.27 | 0.21 | 30.88 |
| 2018 | 0.76 | 0.27 | 0.21 | 20.39 |
| 2019 | 0.59 | 0.13 | 0.12 | 16.67 |
| 2022 | 0.15 | 0.31 | 0.09 | 19.57 |

Table S3.Prey species proportions (%) of contribution to the diet of females and males ofmasked booby (*Sula dactylatra*) from Fernando de Noronha Archipelago during the breeding season estimated from mixing models of stable isotopes of carbon (*δ*13C) and nitrogen (*δ*15N), separated by sampling years.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Females** |  | **Males** |
| Prey species | **2017** | **2018** | **2019** | **2022** |  | **2017** | **2018** | **2019** | **2022** |
| *Cheilopogon cyanopterus* | 8.6 | 10.3 | 11.8 | 18.7 |  | 4.9 | 9.2 | 13.3 | 9.9 |
| *Exocoetus volitans*  | 15.7 | 14.2 | 19.9 | 14.0 |  | 13.8 | 10.4 | 17.5 | 6.5 |
| *Hirundichthys affinis* | 30.7 | 25.1 | 28.4 | 13.5 |  | 40.7 | 16.0 | 22.3 | 6.8 |
| Hemiramphidae | 17.5 | 20.9 | 15.6 | 15.7 |  | 16.3 | 23.6 | 17.4 | 10.3 |
| *Oxyporhamphus micropterus* | 14.8 | 8.9 | 12.1 | 10.2 |  | 17.6 | 12.5 | 13.6 | 5.1 |
| *Harengula cupeola* | 12.7 | 20.6 | 12.2 | 27.9 |  | 6.7 | 28.4 | 15.9 | 61.4 |

Table S4. Statistical results from Generalized Linear Mixed Models (GLMM) and Linear Mixed Models (LMM) comparing sexes ofmasked booby (*Sula dactylatra*) across sampling years. GLMM = Dtot: total distance traveled (km); Dmax: maximum distance from the colony (km); Tdur: trip duration (min); Pdiv: proportion of time diving (%); SI: straightness index.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **GLMM** | **LMM** | ***p*-value** |
| **2017** |  |  |  |
| Dtot |  | F1, 23 = 0.15 | 0.7 |
| Dmax |  | F1, 25 = 0.19 | 0.65 |
| Tdur |  | F1, 21 = 0.76 | 0.39 |
| SI | z = -1.98 | - | **0.04** |
| Pdiv | z = -0.52 | - | 0.6 |
| **2018** |  |  |  |
| Dtot |  | F1, 14 = 0.1 | 0.7 |
| Dmax |  | F1, 14 = 0.78 | 0.39 |
| Tdur |  | F1, 14 = 0.36 | 0.55 |
| SI | z = -1.4 | - | 0.15 |
| Pdiv | z = 0.94 | - | 0.34 |
| **2019** |  |  |  |
| Dtot |  | F1, 11 = 0.49 | 0.49 |
| Dmax |  | F1, 9 = 0.0079 | 0.93 |
| Tdur |  | F1, 12 = 0.1 | 0.75 |
| SI | z = -1.57 | - | 0.24 |
| Pdiv | z = 1.47 | - | 0.14 |
| **2022** |  |  |  |
| Dtot |  | F1, 113 = 0.1 | 0.75 |
| Dmax |  | F1, 35 = 1.16 | 0.28 |
| Tdur |  | F1, 27 = 0.001 | 0.97 |
| SI | z = -1.17 | - | 0.24 |
| Pdiv | z = 1.82 | - | 0.06 |

Fig. S1. Trip total distance traveled (Dtot, km), trip maximal distance from colony (Dmax, km), trip duration (Tdur, min), proportion of time diving (Pdiv, %) and straightness index (SI) of the foraging trips of male and female masked boobies (*Sula dactylatra*)during breeding seasons in the Fernando de Noronha Archipelago in 2017, 2018, 2019 and 2022.

