

Supplementary Material

Large-scale seabird community structure along oceanographic gradients in the Scotia Sea and northern Antarctic Peninsula

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1 Supplementary Figures



Pairs plot with Pearson's correlation coefficient, whole study area

Supplementary Figure S1. Pair plot with Pearson's correlation coefficients between distance to coast, bathymetric slope (Slope), sea surface temperature (SST), the SST gradient (TG), vessel speed,

species richness and total seabird density. Data aggregated on a scale of 100 km. The red lines represent LOESS fit.



Pairs plot with Spearman's correlation coefficient, whole study area

Supplementary Figure S2. Pair plot with Spearman's correlation coefficients between distance to coast, bathymetric slope (Slope), sea surface temperature (SST), the SST gradient (TG), vessel speed, species richness and total seabird density. Data aggregated on a scale of 100 km. The red lines represent LOESS fit.



Supplementary Figure S3. Species richness (number of taxonomic groups) in each strip-transect (individual observation). Strip-transects are shown as dots, and the size and colour of the dots correspond to the number of taxonomic groups observed. Map produced using Quantarctica (Matsuoka et al. 2021) and datasets therein (Orsi et al. 1995, Amante & Eakins 2009, NOAA National Geophysical Data Center 2009, Arndt et al. 2013, Liu et al. 2015, SCAR Antarctic Digital Database) in QGIS (QGIS.org 2019).



Supplementary Figure S4. Total seabird density (number of birds km⁻²) in each strip-transect (individual observation). Strip-transects are shown as dots, and the size of the dots correspond to the seabird densities observed. Densities were truncated at 200 birds km⁻² (which truncates four observations: two with over 1000 birds km⁻² in South Georgia, one with 219 birds km⁻² in South Georgia, and one with 210 birds km⁻² northwest of South Georgia). Note that species-specific biases have not been accounted for in the calculated total densities, leaving total density biased by the behaviour of species found in the community. Map produced using Quantarctica (Matsuoka et al. 2021) and datasets therein (Orsi et al. 1995, Amante & Eakins 2009, NOAA National Geophysical Data Center 2009, Arndt et al. 2013, Liu et al. 2015, SCAR Antarctic Digital Database) in QGIS (QGIS.org 2019).



Supplementary Figure S5. Diagnostic plots for the fitted Generalized Additive Model (GAM) of species richness: Q-Q residual plot (topleft panel), residuals vs linear predictor (topright panel), residual distribution (bottomleft panel), and response vs fitted values (bottomright panel).



Residual autocorrelation of GAM for species richness

Supplementary Figure S6. Autocorrelation function (ACF) of residuals in the Generalized Additive Model (GAM) for species richness.

2 2 deviance residuals <u>_</u> residuals 0 0 7 7 P Ņ 1.5 -2 -1 0 2 2.0 2.5 3.0 1 theoretical quantiles linear predictor Histogram of residuals Response vs. Fitted Values 0 30 100 25 8 Response Frequency 20 00 15 4 9 20 S 0 0 -2 -1 Ó 1 2 3 20 25 5 10 15 Residuals Fitted Values

Resids vs. linear pred.

Supplementary Figure S7. Diagnostic plots for the fitted Generalized Additive Model (GAM) of total seabird densities: Q-Q residual plot (topleft panel), residuals vs linear predictor (topright panel), residual distribution (bottomleft panel), and response vs fitted values (bottomright panel).



Residual autocorrelation of GAM for total seabird density

Supplementary Figure S8. Autocorrelation function (ACF) of residuals in the Generalized Additive Model (GAM) for total seabird density.

2 References

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