Ecography

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Supplementary material

Projected migrations of southern Indian Ocean albatrosses as a response to climate change

Appendix 1

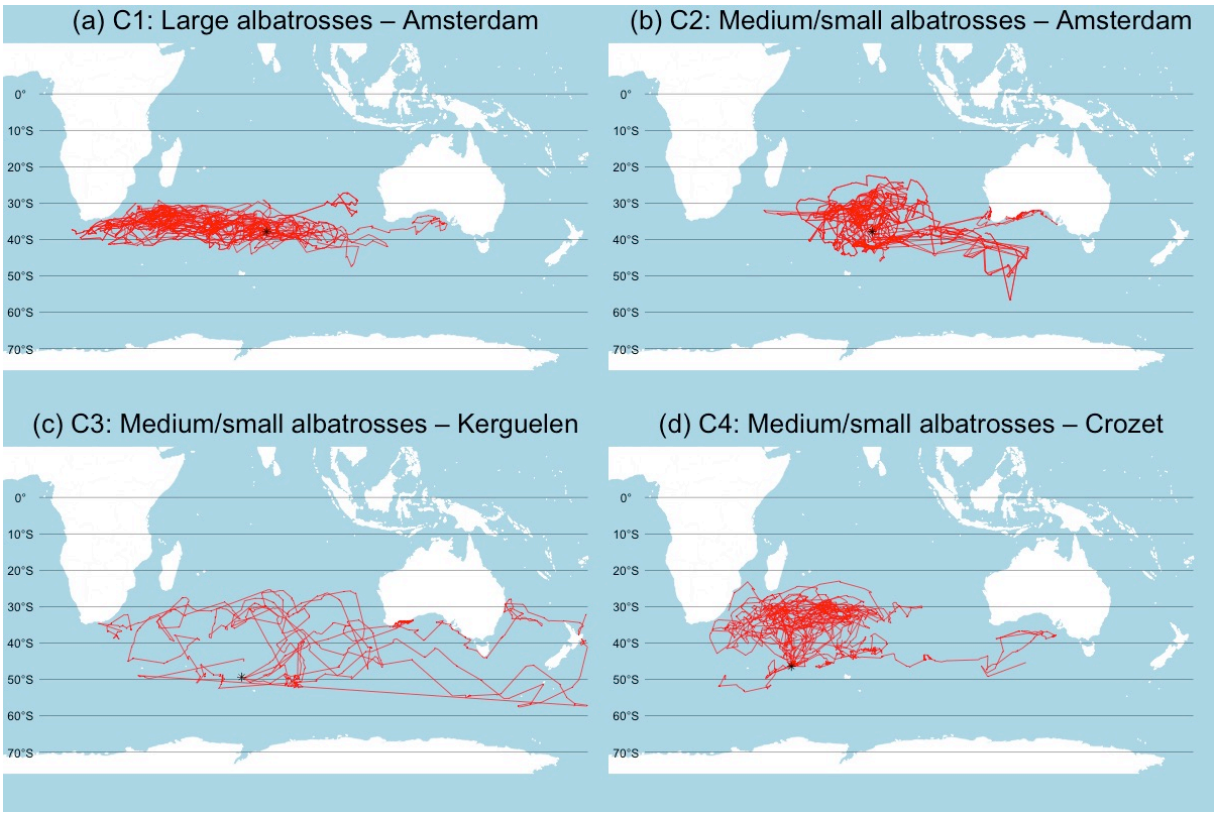

Figure A1: Empirical non-breeding migratory movement of albatrosses in the Southern Indian Ocean. Movement patterns are shown for (a) large albatrosses (Amsterdam albatross on Amsterdam Island; combination *C1*; n=14), (b) medium/small albatrosses on Amsterdam Island (Indian yellow-nosed albatross and sooty albatross; combination *C2*; n=14), (c) medium/small albatrosses on Kerguelen Islands (black-browed albatross and light-mantled albatross; combination *C3*; n=5), and (d) medium/small albatrosses on Crozet Islands (light-mantled albatross and sooty albatross; combination *C4*; n=14). Black stars indicate breeding colonies.

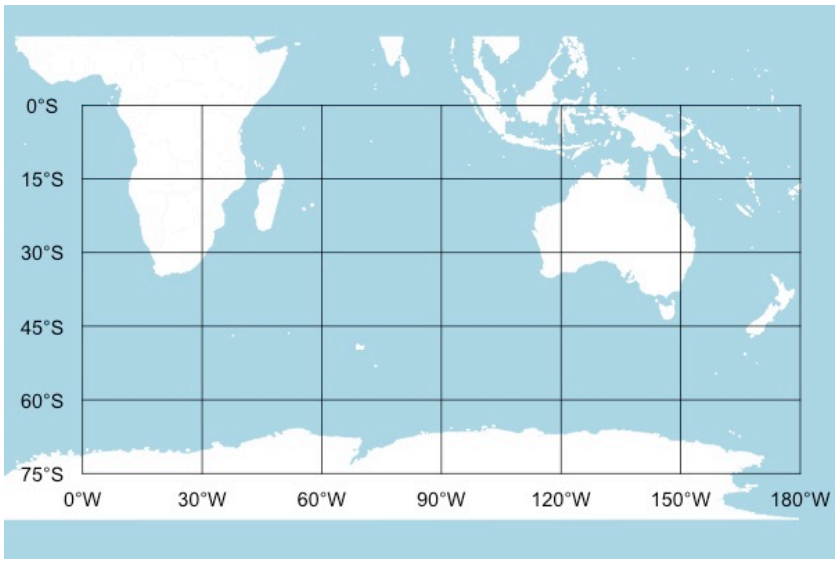

Figure A2: **Grid for model calibration**. Model calibration was conducted by computing the proportion of data points (simulated and empirical) occurring in each cell of this grid across the southern Indian Ocean (between 0° and 180°W in longitude and between 0° and 75°S in latitude). Each cell is 30° (longitude) x 15° (latitude).

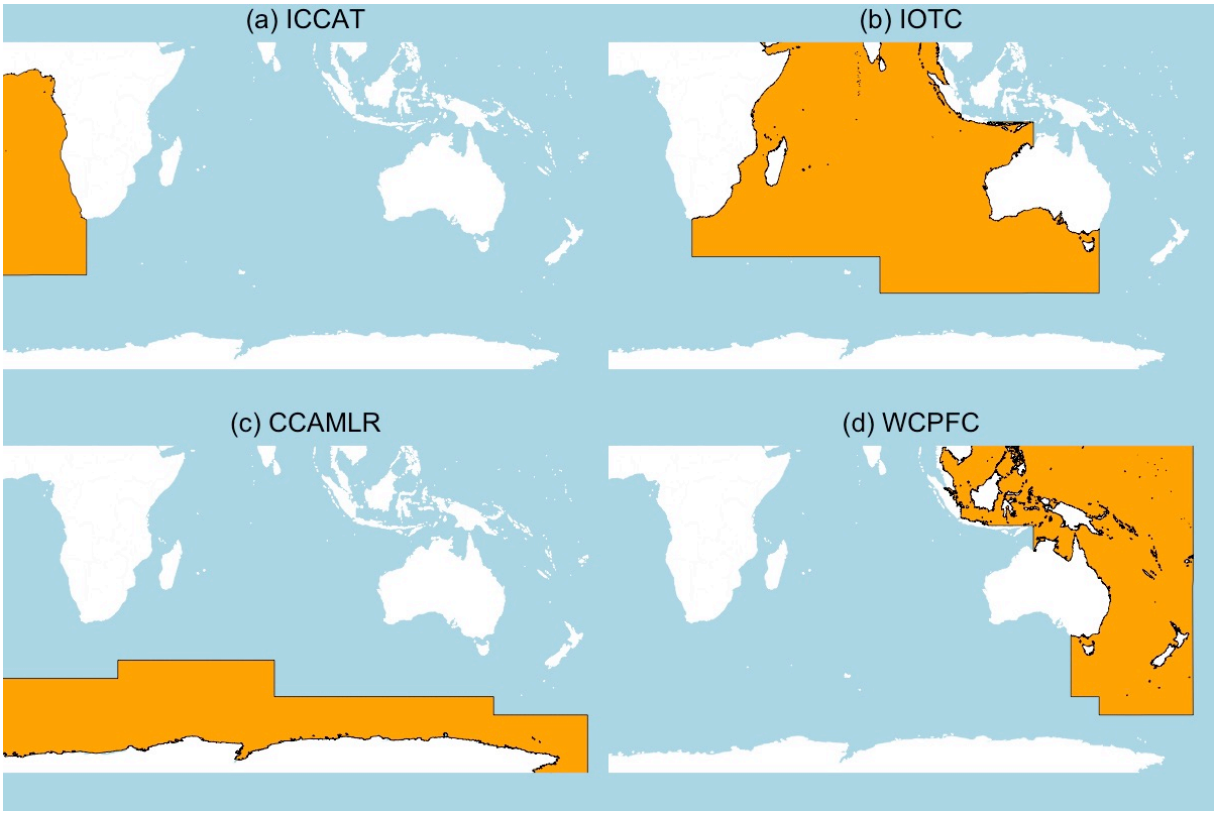

Figure A3: **Geographical boundaries of the Regional Fisheries Management Organisations (RFMOs) used in the analysis**. ICCAT: International Commission for the Conservation of Atlantic Tunas; IOTC: Indian Ocean Tuna Commission; CCAMLR:

Commission for the Conservation of Antarctic Marine Living Resources; WCPFC: Western and Central Pacific Fisheries Commission.

Table A1: **Results of model calibration.** Model simulations were run for different combination of values for alpha and beta, and the goodness-of-fit between simulated data and empirical tracking data is presented in this table. The goodness-of-fit between simulated at present and simulated in the future (2100) is also presented. Rows in blue indicate the best-fit parameter values for each colony-grouping combination.

Colony	Flight/Size grouping	Alpha	Beta	R^2 against empirical	R^2 against future
Amsterdam	Large	1e-02	1e-01	0.012	0.813
Amsterdam	Large	1e-02	1e-02	<0.001	0.993
Amsterdam	Large	1e-02	1e-03	0.056	0.051
Amsterdam	Large	1e-03	1e-01	0.447	0.788
Amsterdam	Large	1e-03	1e-02	0.789	0.245
Amsterdam	Large	1e-03	1e-03	0.047	0.968
Amsterdam	Large	1e-04	1e-01	0.544	0.960
Amsterdam	Large	1e-04	1e-02	0.115	0.857
Amsterdam	Large	1e-04	1e-03	0.616	0.550
Amsterdam	Medium-small	1e-03	1e-01	0.037	0.863
Amsterdam	Medium-small	1e-03	1e-02	0.008	0.828
Amsterdam	Medium-small	1e-03	1e-03	0.008	0.934
Amsterdam	Medium-small	1e-04	1e-01	0.928	0.974
Amsterdam	Medium-small	1e-04	1e-02	0.605	0.938
Amsterdam	Medium-small	1e-04	1e-03	0.029	0.912
Amsterdam	Medium-small	1e-05	1e-01	0.922	0.997
Amsterdam	Medium-small	1e-05	1e-02	0.702	0.727
Amsterdam	Medium-small	1e-05	1e-03	0.713	0.889
Kerguelen	Medium-small	1e-03	1e-01	0.306	0.782
Kerguelen	Medium-small	1e-03	1e-02	0.074	0.924
Kerguelen	Medium-small	1e-03	1e-03	0.019	0.942
Kerguelen	Medium-small	1e-04	1e-01	0.222	0.913
Kerguelen	Medium-small	1e-04	1e-02	0.286	0.798
Kerguelen	Medium-small	1e-04	1e-03	0.083	0.978
Kerguelen	Medium-small	1e-05	1e-01	0.265	0.989
Kerguelen	Medium-small	1e-05	1e-02	0.282	0.983
Kerguelen	Medium-small	1e-05	1e-03	0.428	0.791
Crozet	Medium-small	1e-03	1e-01	0.099	0.765

Crozet	Medium-small	1e-03	1e-02	<0.001	0.695
Crozet	Medium-small	1e-03	1e-03	0.011	0.665
Crozet	Medium-small	1e-04	1e-01	0.248	0.725
Crozet	Medium-small	1e-04	1e-02	0.222	0.929
Crozet	Medium-small	1e-04	1e-03	0.002	0.969
Crozet	Medium-small	1e-05	1e-01	0.442	0.918
Crozet	Medium-small	1e-05	1e-02	0.313	0.936
Crozet	Medium-small	1e-05	1e-03	0.063	0.609