

Ecography

ECOG-01182

Ropert-Coudert, Y., Kato, A., Meyer, X., Pellé, M., Macintosh, A. J. J., Angelier, F., Chastel, O., Widmann, M., Arthur, B., Raymond, B. and Raclot, T. 2014. A complete breeding failure in an Adélie penguin colony correlates with unusual and extreme environmental events. – Ecography doi: 10.1111/ecog.01182

Supplementary material

1 **Appendix 1**

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3 A sub-colony of 105 pairs of Adélie penguins was surveyed 6 to 14 times a day
4 between 18 November 2013 and mid-February 2014 on Pétrel Island, Antarctica
5 (66°40'S, 140°01'E). Reproductive activity (laying date, clutch size, hatching
6 success, etc.) was assessed visually. Occasional visits to the other Adélie penguin
7 colonies of the Island were conducted throughout this period until no more chicks
8 could be found alive on the entire island. During the chick-rearing phase 43 birds
9 were captured when leaving their nest, weighed to the nearest 10g with a spring
10 balance, and instrumented with 25g GPS devices CatLogTM from Catnip Technologies
11 (see Cottin et al. 2012 for technical details). Devices were specifically customized for
12 deployment on penguins by M. Bruecker, N. Chatelain and F. Crenner at the Institut
13 Pluridisciplinaire Hubert Curien, CNRS UMR7178, Strasbourg, France. The GPS
14 devices were streamlined and attached to the lower back of the birds using marine
15 tape allowing for quick attachment and removal of the devices (Wilson et al. 1997).
16 GPS were set to record a position every 3 minutes. Although the return rate of birds
17 was 90.5%, reliable tracks were obtained for only 35 of them. Spatial analyses and
18 statistics were conducted using R 3.0.1 software (R Development Core Team;
19 www.R-project.org). This study was approved by the ethics committee of the French
20 Polar Institute (IPEV) and the Terres Australes et Antarctiques Françaises (TAAF)
21 through the Arrêté n° 2013-79 from the 29/10/2013.

22 Monthly data on temperature, wind speed and direction at Dumont d'Urville,
23 measured over 1956-2013 (Fig. A1), were obtained from the meteorological team,
24 especially D. Lacoste, of mission TA64 at Dumont d'Urville station
25 (www.antarctica.ac.uk/met/READER/).

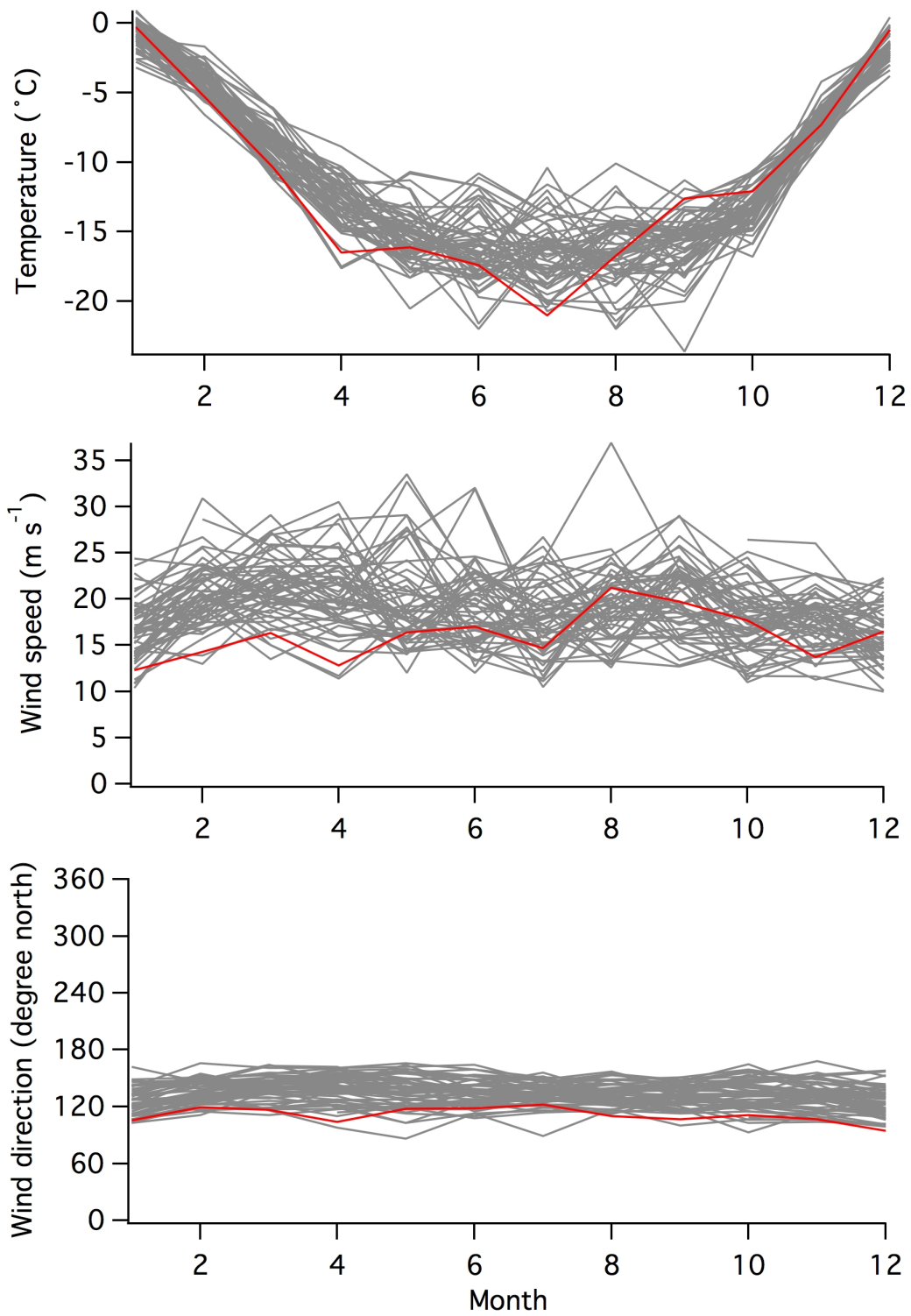
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27 **References**

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29 Fenzi, B., Meijers, A., and Ropert-Coudert, Y. 2012. Foraging strategies of male
30 Adélie penguins during their first incubation trip in relation to environmental
31 condition. – *Marine Biology* 159: 1843-1852.

32 Wilson, R.P., Pütz, K., Peters, G., Culik, B.M., Sclaro, J.A., Charrassin, J.-B., and
33 Ropert-Coudert, Y. 1997. Long-term attachment of transmitting and recording
34 devices to penguins and other seabirds. – *Wildlife Society Bulletin* 25: 101-106.

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38 Fig. A1. Monthly temperature, wind speed and direction at Dumont d'Urville station

39 measured over 1956-2012 (grey lines) and in 2013 (red line).

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