Ecography

ECOG-05407
Roland, J., Filazzola, A. and Matter, S. F. 2020. Spatial variation in early-winter snow cover determines local dynamics in a network of alpine butterfly populations. – Ecography doi: 10.1111/ecog.05407

Supplementary material

Supporting information Appendix 1

Table A1. Satellite images used in the analyses.

Year	Date	Platform
2008	November 29	Quickbird
2009	November 6	WorldView1
2011	November 16	WorldView1
2012	November 25	WorldView1
2013	November 22	WorldView1

Table A2. Generalized additive model (GAM, Model 1) analysis of effects of population size ($\log N_t$), percent snow cover (%), and meadow size (ha) on rate of population growth (R_t). Snow cover and meadow size have additional non-linear effects, as identified by significant ($P < 0.05$) for the effective degrees of freedom (edf) values near 2 (i.e. equivalent to adding a quadratic term in the parametric model).

Variable	edf	F	p
log*Nt*	1.000	15.32	0.0002
snowcover	1.838	16.96	<0.0001
meadow size	1.951	19.12	<0.0001
AIC=39.93			

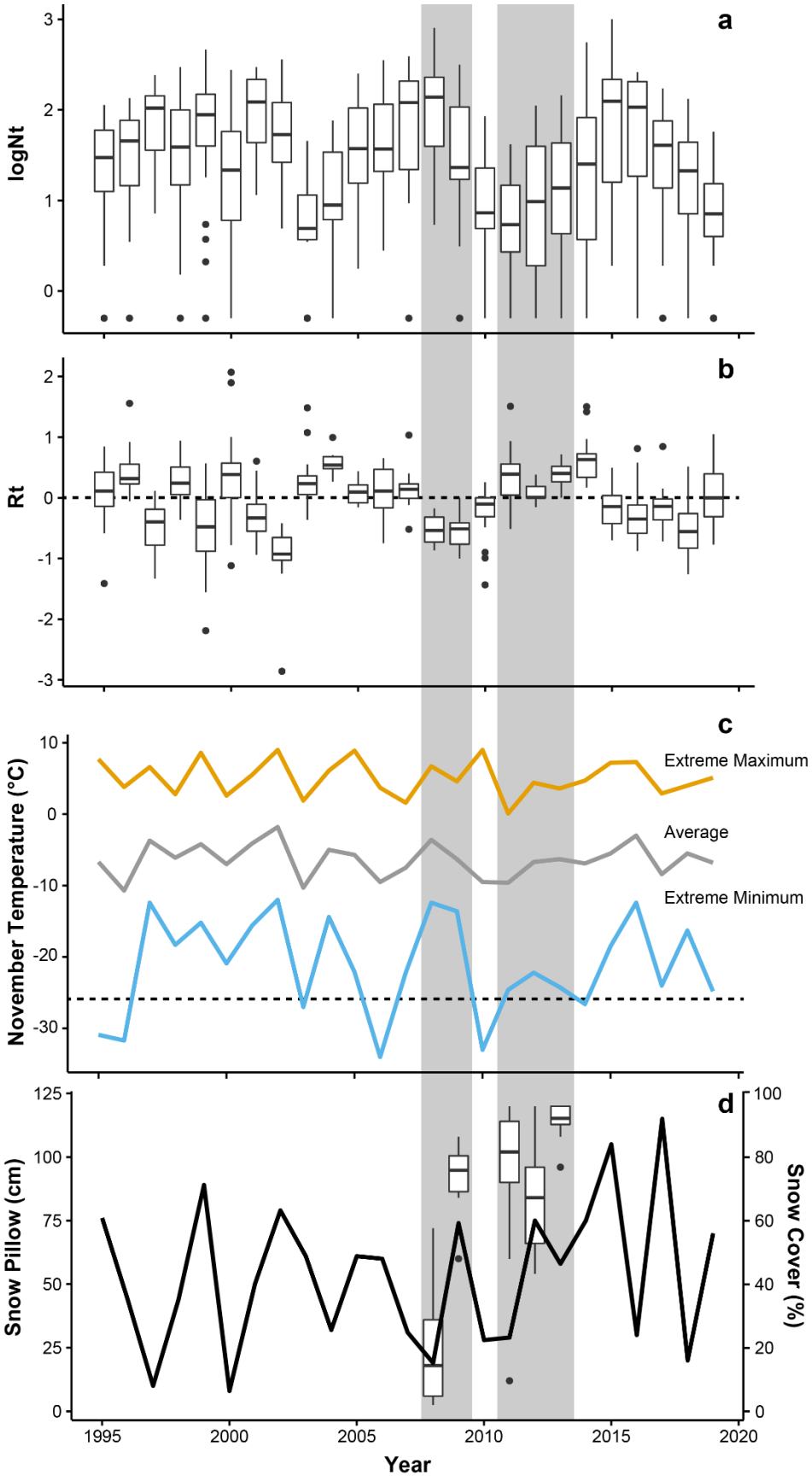
a
logNt
3
2
1
0
b
Rt
2
1
0
-1
-2
-3
c
November Temperature (°C)
10
0
-10
-20
-30
Extreme Maximum
Average
Extreme Minimum
d
Snow Pillow (cm)
125
100
75
50
25
0
Snow Cover (%)
100
80
60
40
20
0
1995
2000
2005
2010
2015
2020
Year

Figure A1. Time series from 1995 - 2019 of a) populations size ($\log N_t$), b) annual rate of population change (R_t), c) November extreme maximum, mean, and extreme minimum temperatures (°C), and d) snow amount at Jumpingpound Ridge, Alberta, Canada. Snow amount includes both snow pillow data (lines and left scale, from Roland and Matter 2016), and from satellite imagery (box plots and right scale, this study). Years for which suitable satellite imagery was available for the current study are indicated by grey shading.