

Extreme weather affects the Peregrine Falcon's breeding success on South Greenland

In order to understand the effects of climate change on the Peregrine's future prospects, we investigated the relationship between weather variables and breeding success for the peregrine in South Greenland



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Methods

Analyses are based on **monitoring data** from 1981-2015. The survey area is located in the Southwest Greenland¹ and the sample sites are distributed along the coastal and inland areas of Tunulliarfik and Igaliku Fjords. We selected two response variables selected to represent the peregrine's breeding success: young per site and nest success (% successful sites).

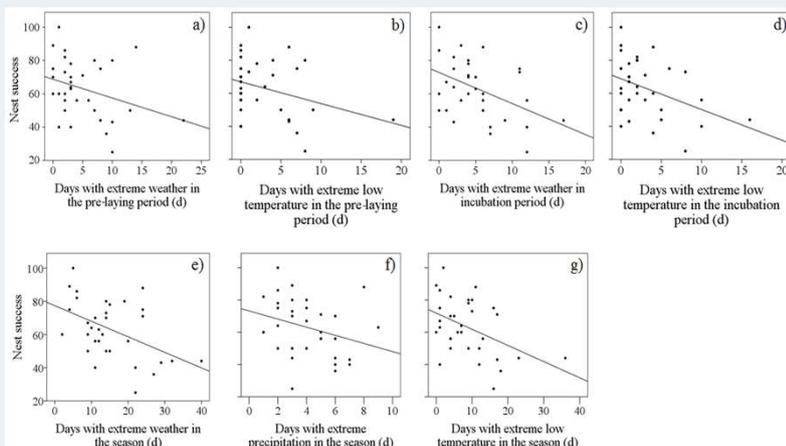
Weather data from the study area were obtained from weather stations in Qaqortoq and Narsarsuaq, available from The Danish Meteorological Institute². We calculated mean daily temperature and total precipitation (24-hour period) for the periods: pre-laying (May), incubation (June) and nestling period (July) from the years 1981 – 2015. The four weather variables we calculated were: 1) extreme low temperatures, 2) extreme precipitation, 3) consecutive rainy days and 4) total days with extreme weather.

Results

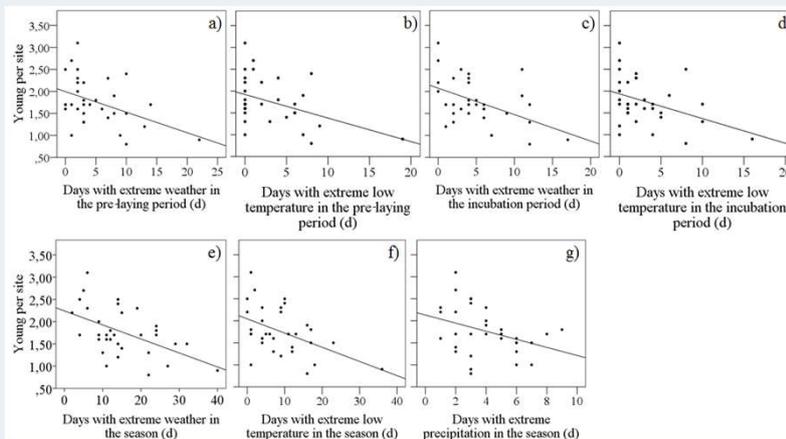
Peregrine breeding success (nest success and young per site) was correlated negatively with number of days with extreme weather; the strongest correlation found was between total days in the season with extreme weather and breeding success ($P = 0,003$; $P = 0,001$). The figures show the linear regression tests that were significant.

Conclusion

Results from this study show that extreme weather events explain approximately 20 % of the variation of the peregrine's breeding success. Breeding success is negatively affected by extreme weather. With climate change likely leading to increased rainfall and temperature variations in the study area, the Peregrine's future breeding success in South Greenland is also likely to fluctuate more.



Nest success plotted against days with extreme weather through the pre-laying period (a, b), incubation period (c, d) and the whole season (e, f, g).



Young per site plotted against days with extreme weather through the pre-laying period (a, b), incubation period (c, d) and the whole season (e, f, g).



References

- 1: www.vandrefalk.dk
- 2: DMI (2016) Danmarks Meteorologiske Institut. DMI Report 16-08 Weather observations from Greenland 1958-2015 - Observation data with description. Available at: http://www.dmi.dk/fileadmin/user_upload/Rapporter/TR/2016/DMIREp16-08.pdf (Last accessed on 6 Mars 2017).