

# DIG - 50

## Source

**Title:** Within and between species competition in a seabird community: statistical exploration and modeling of time-series data

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**Reference:** Durant, J.M., Krasnov, Y.V., Nikolaeva, N.G., Stenseth, N.C. (2012). Within and between species competition in a seabird community: statistical exploration and modeling of time-series data. *Oecologia*, 169: 685-694. [DOI](#)

## Summary

This study applied competitive interaction models to data on three seabird breeding populations collected over 27 years at Kharlov Island in the Barents Sea. The authors found a competitive effect only for the kittiwake breeding population size on the common guillemot breeding population size when the former species was abundant. The timing of kittiwake breeding negatively affected the number of breeding Brünnich's guillemots. The timing of breeding was negatively correlated to biomass of capelin, the main pelagic fish in the Barents Sea.

## System description

**System type:** Marine

**Location:** Kharlov Island

**Latitude:** 68.81      **Longitude:** 37.33

**Country:** Russia      **Region:** Europe

## Study description

### Methods

To determine the breeding population of the three species, a census of apparently occupied nests (kittiwakes) or individuals (guillemots) was conducted annually during the incubation period between 1973 and 1999 for the whole island of Kharlov. An annual total count of kittiwakes and guillemots was conducted once a year. Photos were used for dense or hard to access nesting places. Capelin biomass was estimated from acoustic stock size estimates with trawler sampling in the Barents Sea conducted by Norway and Russia each September. The authors used the biomass measured in September in year  $t - 1$  as an estimate of capelin biomass available to the seabirds during the winter preceding breeding. The Arctic Oscillation (AO) describes the air pressure distribution north of 20° N. Monthly average ST was measured at 0-200 m depth in May on the Russian Kola meridian transect. The sea temperature in May corresponds to the highest peak of reproduction of the three seabird species.

**Community type:** Non-trophic

**Start year:** 1973

**End year:** 1999

**Duration:** 27 years

**Number of species:** 3

Species	Start	End	Count	Missing	Units
<i>Rissa tridactyla</i>	1973	1999	27	0	ln of breeding population
<i>Uria aalge</i>	1973	1999	26	1	ln of breeding population
<i>Uria lomvia</i>	1973	1999	26	1	ln of breeding population

**Number of environmental variables:** 3

Variable	Start	End	Count	Missing	Units
Capelin biomass	1973	1999	27	0	Million tonnes
Arctic Oscillation Index	1973	1999	27	0	AO index
Sea temperature in May	1973	1999	27	0	Degrees Celsius

**Comments:**