

Project information

Project title

Effects of pollutants on a top predator seabird SKUA

Year

2011/2012

Project leader

Jan Ove Bustnes, NINA

Participants

- Jan Ove Bustnes, NINA
- Katrine Borgå, NIVA
- Sveinn Are Hanssen, NINA
- Geir Gabrielsen, NPI
- Sophie Bourgeon, NINA
- Hallvard Strøm, NPI

Flagship

Hazardous substances, Theme: Animal health and ecosystem

Summary of Results

SKUA is a large scale international project in Northeastern Atlantic on one top predator seabird, the great skua. NINA and NPI and several international contributors are cooperating. Great skuas are among the most polluted birds in the Norwegian Arctic, especially at Bjørnøya. Several effect parameters have been measured; oxidative stress, immunology and blood parameters; and how these parameters are affected by pollutant levels. In 2011 data collection have continued at Bjørnøya. The project has dealt with temporal trends, geographical distribution and effects of POPs. Experiments have been carried out at different locations (Shetland, Iceland and Bjørnøya) to test the effect of multiple stressors. Results show great differences in levels and patterns of POPs along the 60-78°N gradient, with the highest levels at Bjørnøya. In addition reduced levels of organochlorines and increased levels of brominated flame retardant and perfluorinated compounds have been found (1980-2008). We have also documented that birds with different winter areas carry different loads of POPs Further analyses are now being carried out.

Published Results/Planned Publications

Leat, E.H.K, Bourgeon, S., Borgå, K., Strøm, H., Hanssen, S.A., Gabrielsen, G.W., Petersen, Æ., Olafsdottir, K., Fisk, A.T., Ellis, S., Bustnes, J.O. & Furness, R.W. Levels and temporal trends (1980-2008) of legacy and new persistent organic pollutants (POPs) in eggs of a top predator in the North Atlantic. *Environmental Pollution* 159: 1222-1228.

Magnusdottir, E., Leat, E.H., Bourgeon, S., Strøm, H., Petersen, A., Hanssen, S.A. Phillips, R.A. Bustnes, J.O. & Furness, R.W. 2012. Wintering areas of great skuas *Stercorarius skua* from Bear Island, Iceland and Shetland. *Bird Study*.

Bourgeon, S., Leat, E.H.K., Strøm, H., Furness, R.W., Magnusdottir, E., Fisk, A.T., Ellis, S., Petersen, Æ., Olafsdottir, K., Borgå, K., Hanssen, S.A., Gabrielsen, G.W. & Bustnes, J.O. Ms. Effects of new- and old persistent organic pollutants on body condition, feather corticosterone, oxidative stress and immunoglobulin levels in the great skua (*Stercorarius skua*) breeding along a geographic gradient.

Communicated Results

Results have been presented in different conferences; e.g. the seabird conferences in Victoria (2010) and Plymouth (2011), and Setac Europe 2011.

Interdisciplinary Cooperation

Ecology, chemistry

Budget in accordance to results

It has been essential for continuing the research on top predator seabirds, which is especially important for the multi-stress perspective.

Could results from the project be subject for any commercial utilization

No

If Yes

Conclusions

- I. a) The project is the first to measure OCs, brominated flame retardants and PFCs over a large geographical gradient (60-78°N) in the same species. This will allow us to better understand the temporal and spatial dynamics of POPs in northern Oceans.
- II. b) The use of feathers for measuring CORT has been implemented for the great skua.