

Project information

Project title

Relationship between environmental stress and organic pollutants, temporal trend analysis - COPOL I

Year

2011/2012

Project leader

Jan Ove Bustnes, NINA

Participants

- Jan Ove Bustnes, NINA
- Geir Wing Gabrielsen, NPI
- Børge Moe, NINA
- Sveinn Are Hanssen, NINA
- Dorte Herzke, NILU
- Anita Evenset, APN
- Olivier Chastel, Chizé, France

Flagship

Hazardous substances, Theme: Animal health and ecosystem

Summary of Results

The most important aspect of this project is to understand how POPs inflict stress on northern animal populations, in concert with other stressors (e.g. climate). Data has been collected for temporal trend analysis and effects of POPs on black-legged kittiwake and eider ducks from Kongsfjorden, Svalbard (April until July 2011). Firstly, the relationships between environmental stress and organic pollutants have been documented (Nordstad et al. submitted); i.e. a positive relationships between CORT and POPs in kittiwakes in spring. Moreover, in kittiwakes there are declining trends of PCBs and DDE over the period 2008-2010, but there is need for more data to verify this. Priority in 2012 will be put on analyzing a 5 year (2007-2011) data in relation to climate and feeding conditions. In common eiders it has been documented that lipid-soluble POPs increase much more during incubation fast in high arctic common eiders compared to subarctic eiders (see figure). This suggests that the low temperatures in the high arctic leads to stronger increase in POP levels in eiders than in more benign environments (Bustnes et al. ms.).

Published Results/Planned Publications

Nordstad, T., Moe, B., Bustnes, J.O., Gabrielsen, G.W., Bech, C., Chastel, O. & Herzke, D. submitted. Are baseline corticosterone levels affected by persistent organic pollutants in arctic breeding kittiwakes? *Environmental Pollution*

Bustnes, J. O., Moe, B., Herzke, D., Hanssen, S. A., Nordstad, T., Fenstad, A., Gabrielsen, G. W. & Borgå, K. Ms. Temporal dynamics of persistent organic pollutant in the blood of fasting common eiders under different climate conditions.

Bustnes, J. O., Gabrielsen, G. W. & Verreault, J. 2010. Climate variability and temporal trends of persistent organic pollutants in the Arctic: a study of glaucous gulls. *Environmental Science and Technology* 44: 3155-3161.

Communicated Results

Data from this project has been presented in several talks, f.eks. The AMINOR workshop at the FRAM centre, 27 October 2011.

Interdisciplinary Cooperation

Ecology, chemistry

Budget in accordance to results

It has been essential for continuing the research on seabirds in Svalbard, which is especially important for the continuity of the multi-stress perspective.

Could results from the project be subject for any commercial utilization

No

Conclusions

- I. **a)** Understanding variation and impacts of POPs in the vulnerable ecosystems of the north is a long-term endeavor. In this respect this project is important because it allows us to have a long horizon on our research. The project is now starting to generate new results, both with regard to trends and effects of POPs that is novel to ecotoxicology.
- II. **b)** No new methods have been developed