

Mercury contamination threatens Antarctic birds

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South polar skua (*Catharacta maccormicki*) defending its breeding site in Adélie Land. Mercury contamination affects the fecundity of this seabird. Credit: Samuel Blanc / www.horizonspartages.fr

Mercury contamination in the Antarctic and Subantarctic affects bird populations, reveal researchers from the Centre d'Etudes Biologiques de Chizé and from the 'Littoral, Environnement et Sociétés' Laboratory (CNRS / Université de La Rochelle). The scientists monitored skuas in Adélie Land and the Kerguelen Islands for ten years and showed that, when these seabirds exhibit high mercury levels in their blood, their breeding success decreases. This is the first time that toxicological measurements have been combined with a population study carried out

over such a long period in the Antarctic and Subantarctic. The results, published in the journal *Ecology* in April 2014, show that pollutants that accumulate at the Poles can indeed cause a decline in bird populations.

Part of the mercury from industrial and domestic activities (burning of hydrocarbons and coal) is transported to the Arctic and Antarctic by winds. This mercury of anthropogenic origin, together with naturally occurring mercury, enters the food chain. A heavy metal, mercury is a powerful endocrine disruptor that can inhibit the production of hormones for reproduction. In the Polar Regions, many seabirds such as skuas were known to accumulate this toxic element at high levels in their tissues. However, the long-term effects on their populations had not yet been assessed.

For the first time, the researchers have carried out a ten-year population study of two seabird species: brown skuas living in the Kerguelen Islands (Subantarctic) and south polar skuas living in Adélie Land (Antarctica). Skuas are migratory birds that feed essentially on penguin eggs and chicks, as well as fish. These formidable predators, which live for up to 25 to 30 years, accumulate mercury in their tissues.

The researchers first captured around a hundred south polar skuas and brown skuas and took blood samples to measure their [mercury levels](#). The birds were then ringed and released. For ten years, the scientists returned to the nesting sites in order to observe their breeding success. Skuas can rear one to two chicks per year.

The first finding was that mercury levels in brown skuas were three times higher than in south polar skuas. The researchers showed that, in both species, the higher the mercury levels in the birds, the fewer chances they had of breeding successfully and especially of rearing their chicks. Unexpectedly, it is in the least contaminated species, the south polar skua, that the effects of mercury are the most obvious. This could

be due to the fact that, in Adélie Land, the more severe environmental conditions, combined with the increasing presence of other pollutants (pesticides, PCBs), magnify the impact of [mercury contamination](#).

These findings show that pollutants that accumulate in the Polar Regions are an important threat to biodiversity. Modelling by the researchers indicates that, if [mercury](#) contamination continues to increase, skua populations could decline in the long term. The scientists call for further toxicological and demographic studies on other southern species. In addition, they are carrying out similar studies to measure the effects on [bird populations](#) of 'conventional' pollutants such as pesticides and other heavy metals, as well as new molecules such as perfluorinated compounds that are also accumulating in the Antarctic.

More information: "Demographic responses to mercury exposure in two closely-related Antarctic top predators." Goutte A., Bustamante P., Barbraud C., Delord K., Weimerskirch H., Chastel O.. *Ecology*. April 2014. [DOI: 10.1890/13-1229.1](https://doi.org/10.1890/13-1229.1)

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