Elements measured in qiviut reflect muskox population trends

Community-Based Muskox and Caribou Health Surveillance Program

Activity Update – June 2025

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What is the issue?

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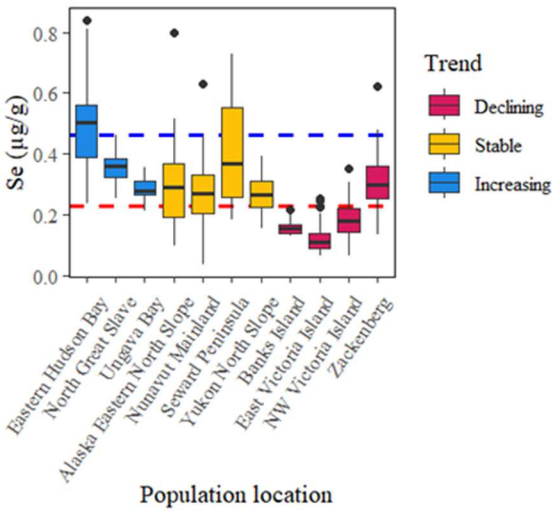
Trace and macro elements are those that all animals need to be healthy. Imbalances of these can lead to problems with growth, immunity and reproduction, and may be linked to population trends. Using qiviut (muskox hair/wool) samples from 11 muskox populations, including samples from the hunter-based sampling program, we measured element levels and looked at the association between different population trends. With these results, we then calculated benchmarks to provide an upper limit of element concentration, above which a population is expected to be increasing, and a lower limit of element concentration, below which a population is expected to be declining.

What are we finding?

Seven trace and macro elements were different between increasing, stable and declining populations. In general, copper, selenium, iron, manganese and cobalt tended to be at higher concentrations in the qiviut of animals from increasing populations, whereas zinc and calcium were generally at lower concentrations in these populations, though differences were observed among populations. With these results, we were able to calculate benchmarks for copper, selenium and iron. We also calculated a lower limit benchmark for zinc and calcium, below which a population is expected to be stable or increasing.

Why does this work matter?

Qiviut is easy to collect through harvesting or monitoring practices and can be simply stored at room temperature. By monitoring element levels in qiviut, we may be able to detect early signs of population changes, including signs that they are not doing well or that they may be increasing.



The concentration of selenium (Se) in 11 muskox populations, colored by the population trend. The dashed lines show the upper (blue) and lower (red) benchmarks.

Thank you to all those who make our research in the Arctic possible

This project was conducted in collaboration with the Kutz Research Group, Aarhus University, Université de Toulouse, Alaska Department of Fish and Game, Caribou Ungava, Ministère des Forêts, de la Faune et des Parcs, Fish and Wildlife Environment Yukon, Government of Nunavut and Parks Canada Inuvik.

The Kutz Research Group works closely with Arctic communities, territorial governments, and industry partners to investigate and monitor wildlife health in the North. The information and results presented here are a direct result of these collaborations. We thank all our collaborators and funders who have made this broader program successful. Please contact Susan Kutz skutz@ucalgary.ca if you have any questions about this program.

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