
Arctic seabirds versus climate change: a scientific Epos across the North Atlantic

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Abstract

The Arctic is warming faster than any other place on the planet, and there is an urgent need for studies evaluating the ecological consequences of such changes. Working as an international, interdisciplinary team of researchers across the Atlantic Arctic over the past twelve years, we investigated the ecophysiological responses of little auks (*Alle alle*) to environmental change. Little auks feed on zooplankton and are acknowledged arctic ecological indicators, and they are also one of the most numerous seabirds on earth (approx. 80 millions). Using population dynamics, breeding dynamics, trophic analyses, electronic tracking of foraging and migration, and energetics of little auks, as well as oceanographic studies of their marine environments, we tested the impacts of ocean warming, sea-ice and coastal glacier melt on little auk fitness proxies. These studies, conducted along environmental gradients from Greenland to the Russian Arctic, allowed us to demonstrate substantial behavioural plasticity in foraging little auks, allowing them to maintain their fitness levels despite massive environmental change. Our results thereby challenge current climate-environment models of future arctic seabird distributions under climate change, and underline the overwhelming importance of spatialized, long-term ecological monitoring of ecological processes in the field of a changing Arctic.

Keywords: Arctic, Seabirds, Climate change, Long term study, Oceanography, Plankton, Ecophysiology, Behavioural plasticity, Modelling

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