

Science for Environment Policy

Arctic ice melt affects seabird feeding behaviour

Virtually sea ice-free summers since 2005 have forced an important Arctic seabird species to change its foraging grounds and prey, new research shows. The body mass of the little auk — the most abundant seabird in the Atlantic Arctic — has shrunk by 4% in the past 20 years in one of its Russian breeding grounds, the study found. This change may be caused by its new foraging behaviour.

Understanding the impacts of changes in the cryosphere — the Earth's frozen regions — on Arctic [biodiversity](#) has been identified as a major scientific challenge by organisations including the [Arctic Council](#). Like polar bears, little auks (*Alle alle*) are an important Arctic 'sentinel species', this study explains. This means that any changes to this species, such as behavioural or population change, may send advance warning signals to the wider world that the birds' environment is changing.

Globally, there are around 40 million little auks and they play an important role in marine ecosystems, preying on zooplankton. They breed on islands around the Arctic and migrate south in winter to the North Sea.

The researchers studied the species in their most northerly habitat, the remote Franz-Josef Land islands of Russia, during the summer of 2013. They measured the bodies of 108 individuals and assessed foraging behaviour by placing movement monitors on 15 individuals as well as by watching birds' diving behaviour. In addition, 20 adult birds were captured to identify which prey species they had caught and were carrying back in special pouches for their chicks back on land.

The results indicate that the average body mass of the population has shrunk by 4% since 1992, when a similar study was conducted at the same location. In addition, their prey had changed since another earlier study from 1991–1993, also at the same site. In the current study, nearly all prey (97.5%) were copepod species of plankton. In the 1991–1993 study, the auks also ate copepods, but 13% of their diet was a small crustacean called *Apherusa glacialis*.

Foraging behaviour also differed to the behaviour of little auk populations observed by scientists in other locations. Birds in this study spent much less time flying per foraging trip, because they fed extremely close to their nesting colonies, unlike populations in Greenland and Svalbard (Norway) which feed offshore.

The researchers attribute these results to changes in sea ice cover in recent years. Little auks normally feed on prey species that are found in cold water around the edge of sea ice. However, satellite images show that the region has been almost ice-free in August every year since 2003–2004, because sea ice is melting earlier each year. Previously, between 1979 and 2003, images show that sea ice covered 55–70% of the area every year in August.

Fortunately, the little auk is an adaptable species and has been able to find new, closer foraging grounds in meltwater around a local glacier. This has allowed the birds to maintain chick growth rate, but has led to the decline in adult body mass. The study notes that the glacier has shrunk by 9% since 1994, however, so this feeding option is only available for as long as the glacier survives.

The study's authors conclude that species' adaptable behaviour needs to be considered in computer models that predict the future distributions of species under climate change.



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