

SPATIAL DISTRIBUTION OF SEABIRDS IN SPRING IN THE MARGINAL ICE ZONE OFF WEST GREENLAND

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During the Arctic spring, the marginal ice zone is a very dynamic environment, where primary productivity is high and conditions change rapidly. Factors affecting the spatial distribution of seabirds before the start of the breeding season, when they are not confined to areas around breeding colonies, are not well understood. During spring 2006, detailed aerial and ship-based surveys of seabird abundance and distribution were conducted in the Disko Bay and SE Baffin Bay area in West Greenland. Simultaneous oceanographic sampling was conducted from the survey vessel.

Here, we use recently developed enhancements of distance sampling techniques to investigate how the spatial distribution of four common seabird species (northern fulmar, black-legged kittiwake, Brünnich's guillemot, black guillemot) was affected by static (depth, distance to colony) and dynamic (ice concentration, primary productivity, zooplankton biomass) environmental factors. We did not find any of these species to be positively associated with high ice concentrations, and associations with biological variables were rather weak. Instead, depth and distance to colony seemed more important for the distribution of these species. We speculate that the snapshot environmental data obtained during the survey (ice concentration and biomass at the lowest trophic levels) do not provide reliable proxies of food availability for pelagic seabirds at the relevant spatial scale.

We also estimated the total abundance of seabirds in the study area, based on conventional distance sampling. The study area (88,000km²) was used by approximately 89,000 northern fulmars, 77,000 black-legged kittiwakes, 430,000 Brünnich's guillemots and 21,000 black guillemots in April-May 2006. Understanding what determines the spatial distribution of these large populations is obviously important for assessing the impacts of ongoing oil exploration and future exploitation in the study area and elsewhere in W Greenland.