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Title: *Arctic ornithogenic tundra in the conditions of a changing climate on Spitsbergen*

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Recent oceanographic studies indicate that increasing inflow of warmer Atlantic waters into the west Spitsbergen shelf carries zooplankton consisting of much smaller taxa, pushing out indigenous Arctic communities. This may cause long-term effects on the food abundance and availability to the consumers of higher trophic levels. Such trend in a longer perspective may facilitate plankton-eating fish populations and, in a consequence, fish-eating seabirds. At the same time, feeding conditions for planktivorous seabirds will get worse. Large seabird colonies in the Arctic play very important role in creating and sustaining tundra. As a result, changes in avifauna composition related to climate fluctuations may generate changes in development and functioning of different types of ornithogenic tundra supplied by colonial seabirds of a different diet.

We studied ornithogenic tundra in three Spitsbergen fjords representing distinct climatic and oceanographic regimes: Hornsund (SW Spitsbergen) strongly influenced by Arctic Sorkapp Current, Isfjorden (middle part of W Spitsbergen) with predominating warm Atlantic water and Magdalenefjorden (NW Spitsbergen) influenced by Atlantic West Spitsbergen Current but with short distance to favorable cold polar waters with abundant Arctic zooplankton. Using physicochemical analyses of soil and tundra plant communities we compared the impact of colonial plankton-eating little auks (*Alle alle*) and fish-eating Brunich's guillemots (*Uria lomvia*) and kittiwakes (*Rissa tridactyla*) on the terrestrial ecosystem. Thanks to ¹³C and ¹⁵N isotopic signals of successive food web links we studied the ecosystem trophic structure and organic matter circulation in the areas enriched by seabirds of a different diet, dependent on diversified local climatic conditions.