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Title: *Analysis of wind regime in Petuniabukta (Billefjorden, Central Spitsbergen) in the period 2010–2011*

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The wind regime at a specific site is given by the free airflow above the boundary layer following the course of weather systems and by the effects of local topography. The topography effects are more enhanced in areas with large height differences, steep slope angles and different types of surfaces, which is the case of the Svalbard archipelago.

This study compares the measurements of surface wind and reanalysed low-level geostrophic winds to investigate the role of topography and spatiotemporal variability of winds within a fjord. We focused primarily on describing the seasonal and annual regimes of surface wind along the coastal ice-free zone of Petuniabukta (Billefjorden, Central Spitsbergen) in the period 2010–2011. Our next objective was to evaluate spatiotemporal variability of geostrophic wind at levels of 925 and 850 hPa and explain its relationship to surface wind patterns and fjord topography. The analysis of geostrophic wind was based on the NCEP/NCAR reanalysis data provided by NOAA/ESRL/PSD.

The results show that the large-scale flows were often modified by channelling and drainage effects accompanied by an increase in local wind speed. Therefore, along-fjord (southern) winds in Petuniabukta were the most frequent in the study period. Similar features were found during the northeasterly and easterly drainage flows from the Ragnarbreen and Ebbabreen glaciers. The highest wind speed was recorded from the Ragnarbreen glacier. Such a wind mainly occurred in autumn and winter.

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