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Title: *Bathymetry, geographical regionalization and diversification of Brepollen (Hornsund, Spitsbergen) based on bathymetric profiles interpolations and Cluster Analyses chosen mathematical parameters*

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Determination of High Arctic regions bathymetry is strictly dependent from weather and ice mass quantity. Due to safety, it is often necessary to use a small boat to study fjords area, especially close to glaciers with unknown bathymetry. This precludes the use of modern multi-beam echosounders, and so traditional single-beam echosounders have been used for bathymetry profiling. Adequate interpolation techniques were determined for the most probable morphological formations in-between bathymetric profiles. In total, eight geographical units were separated in Brepollen, based on the bathymetry, slope and aspect maps. The seafloor morphological differentiation was determined by calculating statistical, spectral and wavelet transformation, fractal and median filtration parameters of segments of bathymetric profiles. The set of parameters constituted to the input of Principal Component Analysis and next in the form of Principal Components to the Clustering Analysis. As the result of such procedure a classification of Brepollen to three morphological regions was proposed: (i) steep slopes (southern Brepollen), (ii) flat bottoms (central Brepollen) and mild slopes (Storbreen glacier valley and southern part of Hornbreen glacier valley), (iii) the most morphologically diverse region (central Storebreen valley, northern part of Hornbreen glacier valley and NE part of central Brepollen).