

Abstract

Svalbard archipelago is located halfway between the Northern coast of Norway and the North Pole. About 60 % of Svalbard area is covered by glaciers of many types, from small cirque to large ice caps. Retreat of most glaciers in Svalbard has been recorded since the Little Ice Age at the end of the 19th century. Deglaciation of Svalbard landscape is connected with significant changes of natural environment, such as changes of erosion and accumulation processes, climate change or beginning of vegetation succession. This thesis aims to establish the elementary glaciological parameters of valley glacier Ferdinandbreen located in Petuniabukta, central part of Spitsbergen, by analyzing remote sensing data and field GPR and (d)GPS survey and evaluate it's evolution between 1960 – 2014. Glacier's length and area have been based on aerial imagery of years 1960, 1990, 2009 and GPS measurements in 2014. Ice thickness and volume have been derived from GPR measurements. The length of the glacier in 2014 was 1,401 km, area 0,560 km² and volume 6 561 684 m³. The maximum measured ice thickness in 2014 was 42,5 m. During the period 1960 – 2014, the length of the glacier had been reduced by 45 % and area by 69 %, ice thickness had been reduced by 23,5 m during the period 1990 – 2014. Recorded retreats of length, area and thickness, were comparable with other valley glaciers in Petuniabukta.

Key words: valley glacier, Ferdinandbreen, Petuniabukta, Svalbard, GPR, differential GPS, aerial imagery