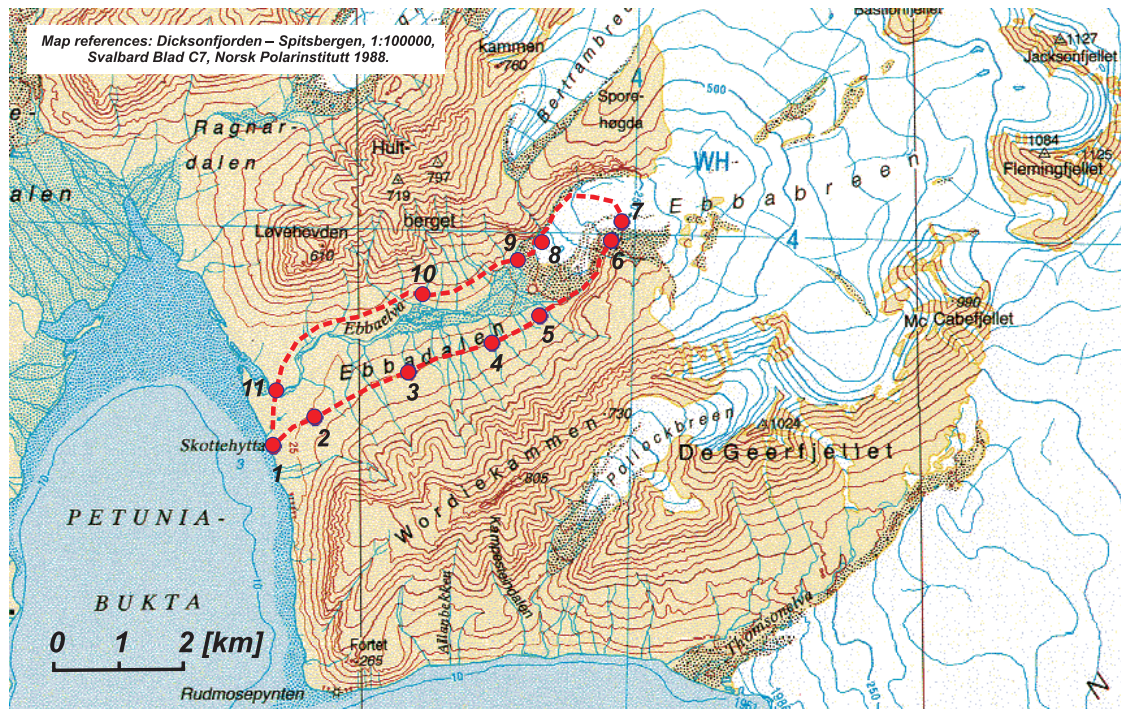


# Petuniabukta: from glacial to paraglacial processes in Ebbadalen – Leader Grzegorz Rachlewicz

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Petuniabukta – excursion programme

- Point 1 – Skottehytta 78°41.944'N 16°36.932'E**  
Introduction, environmental background
- Point 2 – Terrace 78°42.143'N 16°38.428'E**  
Raised marine terraces, non-glacial catchments
- Point 3 – Ebbadalen 78°42.458'N 16°41.790'E**  
Slope processes, periglacial phenomena
- Point 4 – Wordiekammen W 78°42.654'N 16°44.777'E**  
Sedimentary rocks – Gipsdalen Group
- Point 5 – Wordiekammen E 78°42.843'N 16°46.509'E**  
Crystalline bedrock – Hekla Hoeck Formation
- Point 6 – Ebbabreen marginal zone 78°43.368'N 16°49.098'E**  
Glacial geomorphology and deglaciation since Little Ice Age
- Point 7 – Ebbabreen 78°3.495'N 16°49.479'E**  
Glacial phenomena
- Point 8 – Ebbabreen marginal zone, Ebbaelva waterfall 78°43.391'N 16°46.583'E**  
Marginal glacialfluvial outflow
- Point 9 – Bertilva 78°43.219'N 16°45.736'E**  
Bertilbreen characteristic and glacialfluvial processes
- Point 10 – Hultberget 78°42.962'N 16°40.928'E**  
Complex view on Arctic valley system
- Point 11 – Ebbaelva mouth 78°42.319'N 16°37.039'E**  
Catchment closing point and interferences with coastal processes

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## Introduction to the excursion

The surroundings of Petuniabukta is an area easy-accessible from Svalbard West coast, in the inner-fiord region of Central Spitsbergen. It is the most North-Eastern tip of the Isfjorden system, what through its location determines geology, morphology and climate features.

The exploration following the search for natural resources and investigations of natural environment in this region started at the turn of 19<sup>th</sup> and 20<sup>th</sup> century with expeditions of Baron N.A.E. Nordenskjöld, who gave most of place-names in this area, and activ-

ities of Scottish Spitsbergen Syndicate. The share of the control over this territory was crowned by the establishment of settlements and coal-mines Pyramiden by Swedes in 1910 (in 1927 sold to the Soviet Union, operating until 1999) and Brucebyen by Scotts in 1919. The prospection and exploitation of mineral resources, inspite of coal, included also gypsum, uranium and petroleum. About the same age (from 1917) is the cabin Skottehytta, on the eastern coast of Petuniabukta. Later, in the 50. and 60., it was used by Cambridge Geological Expeditions and



**Fig. 2.** Poznań research station at Petuniabukta

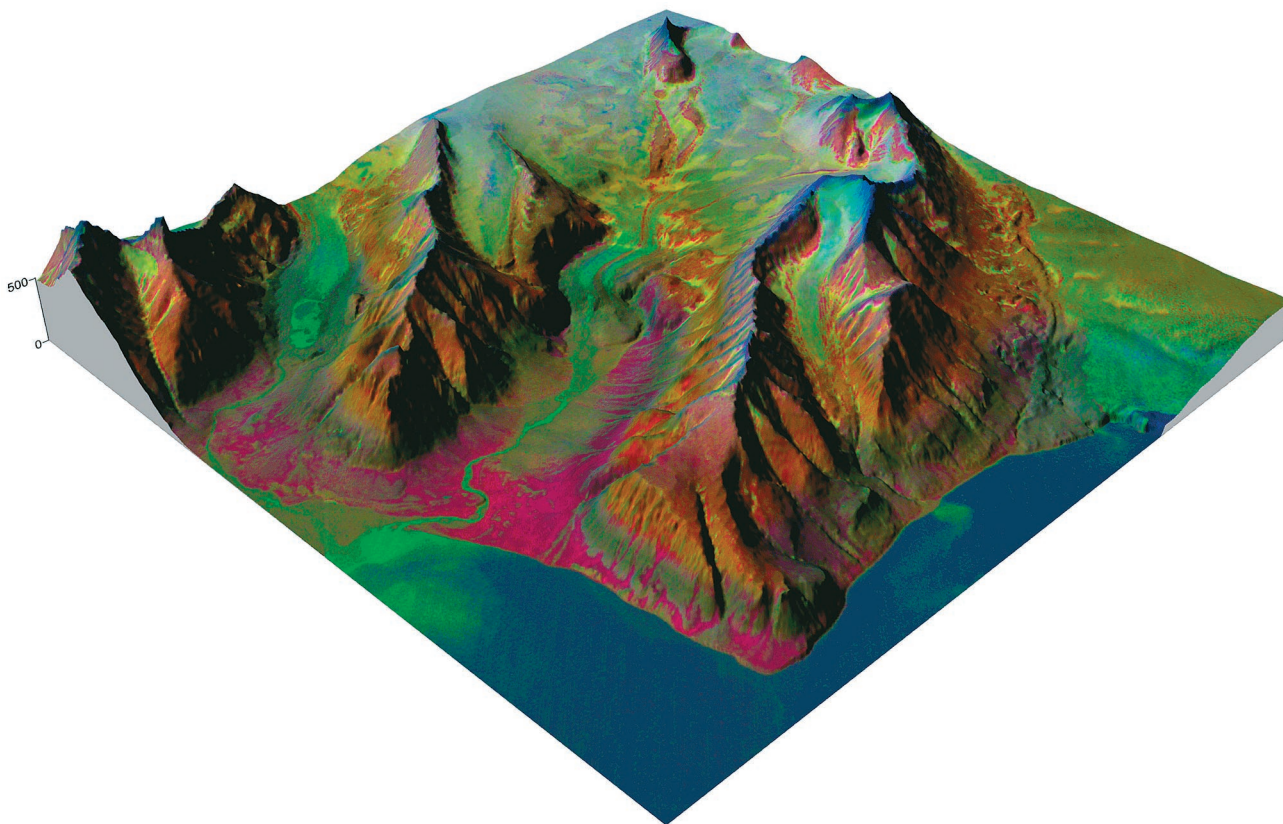
since the 80., “discovered” for scientific use by P. Kłysz in 1979, became a base of Polish expeditions from Adam Mickiewicz University in Poznań (Fig. 2); consecutive leaders: 1984 – W. Stankowski, 1985 – A. Kostrzewski, 1986 – A. Karczewski, 1987 – W. Stankowski, 1989 – A. Karczewski, 2000–2003 – G. Rachlewicz, 2005 – L. Kasprzak, G. Rachlewicz, 2006 – Zb. Zwoliński, 2007 – L. Kasprzak, K. Dragon.

First period of Polish investigations in Petuniabukta (1984–1989) realized geomorphological mapping around Petuniabukta and a general subject “Quaternary palaeogeography and present-day processes in an area between Billefjorden and Austfjorden, central Spitsbergen”. Among other publications a map and a volume of papers cited below were published. In the year 2000 a new project “Matter circulation in the Arctic terrestrial-marine geocosystem on the example of Billefjorden” has been started. It is continued until present days preparing and realizing a part of Polish National Project for the International Polar Year 2007–2008 “Structure, evolution and dynamics of lithosphere, cryosphere and biosphere in the European sector of the Arctic and in the Antarctic”.

Main topics of the current project in Petuniabukta are covering:

- geology, geomorphology and Quaternary paleogeography;
- meteorology and environment reactions to climate changes with special attention paid to glaciers and permafrost;
- morphology and functioning of glaciers marginal zones;
- spatial and temporal mass fluxes in terrestrial and marine environments.

Petuniabukta, within an area of average glaciers coverage and specific alteration of quasi-continental climate, not observed on the Western coast of the Island, offers a variety of interesting examples to study past and present features of the natural environment, like: unique and diversified geology, activity of various morphogenetic processes, unequivocal linkage between terrestrial and marine systems, limited human impact, and finally easy access to investigation sites (Fig. 3). Further investigations in the Billefjorden region, with possibilities of their expansion on neighboring areas, will continue with more detailed approach and advanced instrumentation to obtain long-term observation databases.



**Fig. 3.** Orthophotomap of Petuniabukta region – satellite (TERRA/ASTER, taken on July 13, 2002) image draped on DEM (elaborated by A. Stach)