Geomorphological Map Ny Alesund/ Bayelva, Svalbard

The geomorphological map for the test site Bayelva was taken from the geomorphological map 1:50 000 of Joly (1969), created by the 'Service de documentation et de cartographie géographiques du C.N.R.S.' at the Institut du Géographie in Paris. To correctly use it in a GIS tool and for further modelling efforts, it was georeferenced and imported in ArcGIS. The georeferencing was done by means of the open source software 'QLandkarteGT' provided by the 'Bayrische Vermessungsamt'. Reference coordinates for georeferencing were taken out of 'Google Earth'. The map is projected in WGS84 UTM Zone 33Northern Hemisphere. Additionally the legend, originally in French, was translated into English (please find below).

Unfortunately data about water/ice content in the soil is very low for this test site. Only very few punctual measurements have been conducted over the last decades (e.g. Boike et al., 2007; Schwamborn et al., 2006). Consequently it was not possible to provide spatial distribution information of this parameter, and the measured values are only listed for the different sampling points in the table below. The locations of the sampling points are marked in the geomorphollogical map with red triangles.

Station	**Depth [cm]**	**Wet bulk density WBK [g/cm³]**	**Vol. measured Water/Ice content [%]**	**Geormophology (based on Joly, 1969)**
1	0-325	N/A	5-28	Periglacial sediments (close to a slope)
2	0-125	1.48	N/A	Periglacial sediments
3	0-60	1.51	N/A	Periglacial sediments
4	0-120	N/A	N/A	Fluvial and fluvial-glacial formes (old and recent)
5	0-110	1.51	N/A	Fluvial and fluvial-glacial formes (old and recent)
6	80-90	2.04	2.53	Periglacial sediments

The six sampling points of the Bayelva Sites. 1 Schwamborn et al. (2006), 2,3,4,5 Boike et al. (2006), 6 PAGE21 field campaign 2013 (data provided by S. Faucherre).

Translation of legend of geomorphological map:

French	**English**
TOPOGRAPHIE	TOPOGRAPHY
Equidistance des courbes: 50 m	Equidistance between lines: 50 m
Altitude en mètres	Elevation in m
HYDROGRAPHIE	HYDROGRAPHY
Cote bathymétrique en metres	Isobaths in m
Limite approximative de la plate-form pré-littorale	Approximate limit of the littoral platform

Cours d'eau	Stream
Lac	Lake
Névé (Courbes figuratives, équidistance ≠ 50 m)	Firn (lines for rendering only - equidistance ≠ 50m)
Langue glaciaire (Courbes figurative, équidistance ≠ 50m)	Glacier tongue (lines for rendering only - equidistance ≠ 50m)
Transfluence active	Active transfluence
Sérac	serac
Front de glace	Icefront
STRUCTURE ET FORMES STRUCTURALES	STRUCTURE AND STRUCTURED FORMES
Lithologie du substratum	Substrate lithology
Série de l'Hecla Hoek (Précambrien) Micachistes, marbres et quartzites	Hekla Hoek series (precambrian), micachist marble and quartz crystal
Série permo-carbonifère Calcaires, grés.	Permo-carboniferous series, limestone,sandstone
Série tertiaire (Eocène) Conglomérates, grès, pélites molasses, charbon	Tertiary series (Eocene), conglomerates, sandstone, fine-grained sediments, coal
Tectonique	Tectonic
Pendage	Slope
Pendage général avec replis nombreux	Slope with chaotic topography
Faille	Fault
Front de chevauchement	Overlapping front
Formes structurales	Structural forms
Escarpements, vires, ressauts	escarpments, bands, Protrusions
Crêtes monoclinales (<50 m/ >50m)	monocline crests (<50 m/ >50m)
FORMES ET FORMATIONS MARINES ET LITTORALES	MARINE AND LITTORAL FORMS AND FORMATIONS
Formations et formes aciennes	Old formations and formes
Falaise morte	clinactive cliff
Surface d'abrasion marine	marine abrasion surface
- sans dépôt	- without debris
- couverte de sables coquilliers	- covered by sand and shells
- cordon littoral de galets	gravel spit
- dépôts de sable fin	- fine sand deposit
Formations actuelles et formes vives	Recent formations and active forms
Falaise de glace	Ice cliff
Cordon littoral (galets et graviers) plage	Spit (flint and gravel) beach
Falaise vive rocheuse	Active rocky cliff
- avec plage	- with beach
- sans plage	- without beach
FORMES ET FORMATIONS GLACIAIRES	GLACIAL FORMS AND FORMATIONS
Cirque glaciaire	Glacial cirque

Paroi de cirque ou d'auge, morte	Cirque wall or basin wall, inactive
Verrou	Glacial bedrock bar
Arête de recoupement de versants supraglaciaires	Arête of slopes supraglacial
Sommet d'intersection d'arêtes glaciaires	Summit of intersections of glacial arêtes
Col de transfluence ancienne	Pass of past transfluence
Moraines	Moraines
Bourrelet et matérial morainique	Morainic fold and material
Trainée morainique sur glacier	Morainic strem on glacier
Moraine démantélée par ruissellement	Moraine eroded by runoff
FORMES ET FORMATIONS PÉRIGLACIAIRES	PERIGLACIAL FORMS AND FORMATIONS
Gélification	Gelification
Cryoturbation	Cryoturbation
Escarpement de modelé périglaciaire	Periglacial escarpment
Versant réglé	Sorted slope
Dépôts périglaciaires de versants (grèzes)	Periglacial sediments
Dépôts périglaciaires remaniés par congélifluxion et cryoturbation	Periglacial sediments eroded by gelifluction and cryoturbation
Ravin d'eaux de fonte, couloir d'avalanches	Canyon formed by meltwater, avalanche path
Convexité de modelé cryonival	Cryonival convexity
Concavité de bas de versant cryoconival	Cryonival concavity
Moraine nival	Nival moraine
Toundra sur mollisol	Mollisol tundra
Pingo	Pingo
FORMES FLUVIALES ET FLUVIO-GLACIAIRES	FLUVIAL AND FLUVIAL-GLACIAL FORMS
Formes et formations hors du lit inondable	Forms and formations outside the flooding area
Modelé d'entaille fluvial	Fluvial gully
Plaine d'épandage fluvio-glaciaire ancienne	Former fluvial-glacial outwash plain
Formations actuelles et formes vives	Recent formations and active forms
Entaille vive, ravin	Active gully, canyon
Cônes de remaniement dans les moraines	debris cones in morainic deposits
Plaine d'epandage actuelle pro-glaiciaire (sandr)	Recent pro-glacial outwash plain (sandur)

References:

Boike, J., Ippisch, O., Overduin, P. P., Hagedorn, B. & Roth, K. 2007. Water, heat and solute dynamics of a mud boil, Spitsbergen, Geomorphology. doi: 10.1016/j.geomorph.2006.07.033.

Joly, P.F. 1969. Carte Géomorphologique de reconnaissance de la presqu'île de Brögger (Spitsberg). 1:50.000. Service de documentation et de cartographie géographiques du C.N.R.S. Institut du Géographie. Paris.

Schwamborn, G., Heinzel, J. & Schirrmeister, L. 2006. Internal characteristics of ice-marginal sediments deduced from georadar profiling and sediment propoertis (Brögger Peninsula, Svalbard), Geomorphology. doi: 10.1016/j.geomorph.2006.07.032.