Rock glaciers from Norway and Svalbard, Version 1

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

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National Snow and Ice Data Center

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1 DETAILED DATA DESCRIPTION

Data: Position, Type, Altitue, Velocity, Geophysics

1.1 Details on Principal Investigators

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1.2 Organization

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1.3 Coverage of Data Set

1.3.1 Locations

Mainland Norway and Svalbard

1.3.2 Geographic Extent

Northwestern latitude: 81 degrees N
Northwestern longitude: 10 degrees E
Southeastern latitude: 58 degrees N
Southeastern longitude: 31 degrees E

1.3.3 Period of Investigation

1985-1997; additional data from earlier papers by other scientists.

1.4 Summary Description

So far, a complete inventory of rock glaciers on mainland Norway and Svalbard has only been carried out in connection with coarse geomorphological mapping. The data obtained are therefore averaged on a regional scale. However, some detailed geomorpholgical maps exist where more detailed information can be extracted. The data listed here are not a complete database of Norwegian rock glaciers.

Recently detailed studies have been carried out on rock glaciers in the Ny Ê lesund and the Longyearbyen areas on Svalbard. From these studies, detailed data are available.

On mainland Norway, there are at least 150 rock glaciers (Sollid and S°rbel 1992). These may be grouped as follows:

1. Probably active rockglaciers in high mountain areas in southern and northern Norway. Most of these are situated in the Rondane mountain area of southern Norway.
2. Relict rockglaciers in low-lying areas near the coast of northern Norway. These rock glaciers have a position marginal to the Weichselian ice sheet and were formed during permafrost conditions before or during deglaciation.
3. Relict rockglaciers in higher inland areas of northern Norway. These rock glaciers are believed to have formed under permafrost conditions during deglaciation, possibly the result of rock falls caused by tectonic activity during isostatic uplift.

On Svalbard, there are at least 500 rock glaciers (Kristiansen and Sollid 1986). Most of these are situated in the central and western part of Spitsbergen. They are most common in coastal areas, often below the steep escarpment which delimits the inner part of the strandflat. As Svalbard has continous permafrost, most of these are probably active. Some may be inactive, as for instance the rock glaciers at Stuphallet near Ny Ê lesund (Sollid and S°rbel 1992). In those cases, the rock glaciers have moved out of their source area and onto the strandflat.

Partly in cooperation with ETH-Z'rich, detailed investigations have been started in the Ny Ê lesund area, Western Spitsbergen. These investigations have been extended also to the Longyearbyen area in central Spitsbergen. Principal methods have been:

- Velocity measurements, using theodolite/EDM, GPS and photogrammetry;
- Geophysical methods (DC resistivity soundings, seismic refraction soundings, gravimetry and geo-radar);
- Morphometrical analysis using a digital elevation model and a grid-based GIS.

Typical velocities are between 5 and 10 cm/year, both for lobate and tongue-shaped rock glaciers.

1.5 Data Storage

Paper (maps)
Spreadsheets
Word/WP-files

1.6 Data Center

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Norway

Risk of data loss: No

1.7 Keywords

- Norway
- Svalbard
- Rockglaciers
- Rockglacier activity
- Rockglacier velocity
- Internal structure
- Geophysical investigations
- Geodetic surveys

1.8 Data Sample

Location: Svalbard, Prins Karls Forland, Fuglehuken west
Coordinates: 78-50'N 10-30'E
Number of rockglaciers: 20
Type: Talus-derived lobate
Activity: Active
Elevation: ca 50 m a.s.l.
Velocities: 5-10 cm/year
Geophysical investigations: DC resistivity soundings
    Number of DC resistivity profiles: 10
    DC resistivity of high-resistivity layer: 30-1000 k(m
Other data: Morphometrical analysis

2 REFERENCES AND RELATED PUBLICATIONS

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Berthling, I., Etzelm'ller, B., Eiken, T. & Sollid, J.L. 1998?: The rockglaciers on Prins Karls Forland, Svalbard (I). Internal structure, velocity and morphology. Accepted for publication in Permafrost and Periglacial Processes

Flakstad, N. , Sollid, J.L. and Tolgensbakk, J. 1985: Nordre And°ya, kvart†rgeologi og geomorfologi 1:50000. Geografisk institutt, Universitetet i Oslo (English legend)

Hoelzle, M. 1993: DC resistivity soundings 1992 in north-western Svalbard. VAW Arbeitsheft 13, Versuchsanstalt f'r Wasserbau, Hydrologi und Glaziologie der ETH Z'rich

Kristiansen, K.J. and Sollid, J.L. 1986: Svalbard, Glasialgeologisk og Geomorfologisk Kart, 1:1000000. Nasjonalatlas for Norge. Geografisk Institutt, Universitetet i Oslo (English legend)

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Sollid, J.L. and Kristiansen, K.J. 1984: Raumavassdraget, kvart†rgeologi og geomorfologi 1:80000. Geografisk Institutt, Universitetet i Oslo (English legend)

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Vere, D.M. and Matthews, J.A. 1985: Rock glacier formation from a lateral moraine at Bukkeholsbreen, Jotunheimen, Norway: a sedimentological approach. Z. Geomorph. N. F. 29, p. 397-415

Vonder M'hll, D. 1996. Gravimetrical investigation in the permafrost of two selected rock glaciers near Ny-Êlesund, Svalbard. Versuchsanstalt f'r Wasserbau, Hydrologie und Glaziologie der Eidgen÷ssichen Technischen Hochschule Z'rich, Arbeitsheft Nr. 18, 26 pp

Wagner, S. 1996: DC resistivity and seismic refraction sounding on rock glacier permafrost in north-west Svalbard. Norsk Geografisk Tidsskrift 50. 25-36.

3 DOCUMENT INFORMATION

3.1 Publication Date

1998

3.2 Date Last Updated

February 2021