2010 EXPEDITION TO KRENKEL STATION, HAYES ISLAND, FRANZ JOSEF LAND, RUSSIA

DATA REPORT

D.A. Walker, S. Carlson, J.J. Frost, G.V. Matyshak, M.E. Leibman, P. Orekhov, A. Khomutov, O. Khitun, M. Zhurbenko, O. Afonina, E.M. Barbour

Alaska Geobotany Center, Institute of Arctic Biology, University of Alaska Fairbanks, AK 99775

January 2011

Funding: NASA Grant No. NNX09AK56J

Citation: D.A. Walker, S. Carlson, J.J. Frost, G.V. Matyshak, M.E. Leibman, P. Orekhov, A. Khomutov, O. Khitun, M. Zhurbenko, O. Afonina, E.M. Barbour. 2011. 2010 Expedition to Krenkel Station, Hayes Island, Franz Josef Land, Russia, Data Report, Alaska Geobotany Center, Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, AK. 63 pp.

Members of the 2010 Expedition to Hayes Island. *From left, Marina Liebman, Artem Khomutov, Andrey Abramov, Dmitriy Drozdov, Elena Slagoda, G.V. (JJ) Frost, Pavel Orekhov, Ina Timling, Andrey Ermak, D.A. (Skip) Walker, Ivan Gameev, Grigory Matyshak*

This research is part of the Greening of the Arctic (GOA) initiative of the International Polar Year (IPY) and is funded by NASA's Land-Cover Land-Use Change (LCLUC) program (Grant Nos. NNG6GE00A and NNX09AK56G). It contributes to NASA's global-change observations regarding the consequences of declining Arctic sea ice and the greening of terrestrial vegetation that is occurring in northern latitudes. The work is also part of the Northern Eurasia Earth Science Partnership Initiative (NEESPI). It addresses the NEESPI science questions regarding the local and hemispheric effects of anthropogenic changes to land use and climate in northern Eurasia.

Cover photo: *View of rolling topography typical of much of Hayes Island, taken during helicopter reconnaissance of the island, 6 August 2010. Photo by D.A. Walker.*

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

One of the goals of the Greening of the Arctic project is to examine the trends in vegetation, soils, permafrost characteristics, and surface spectral properties along a complete Arctic transect in Russia. The transect stretches from Nadym at 65˚ 19' N to Krenkel Station 80˚ 38' and consists of seven study locations in all five of the Arctic bioclimate subzones and the forest-tundra transition (*Figure 1*). This work is comparable to the work recently published for the North America Arctic Transect (Walker D. A. et al. 2008). The 2010 expedition to Hayes Island in the Franz Josef Land Archipelago completed the Eurasia Arctic Transect (EAT). This expedition was the fourth of the project. Data reports from the previous three NASA-GOA Russia expeditions (Walker et al. 2008, 2009a, 2009b) are available online at http://www.geobotany.uaf.edu/yamal/reports.

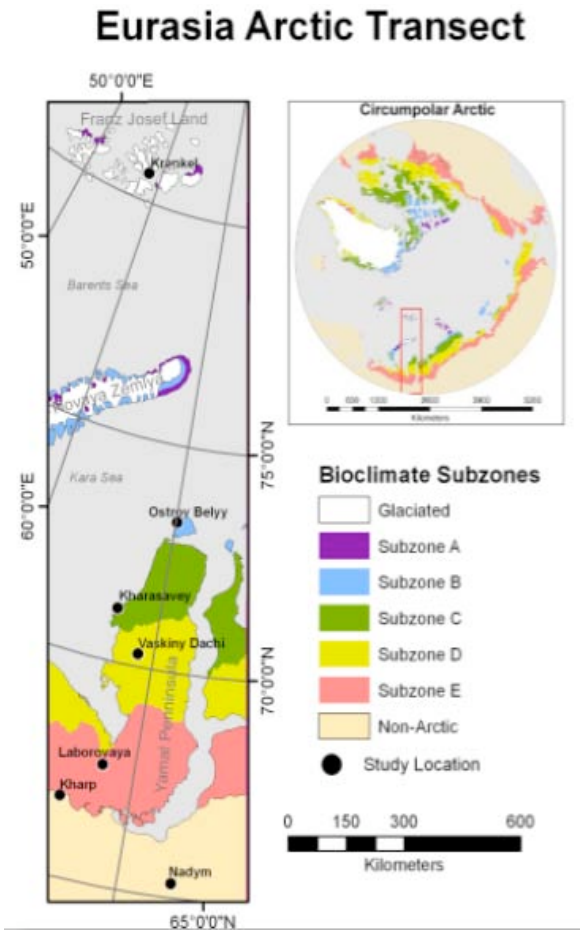


Figure 1. Eurasian Arctic Transect. *Bioclimate subzones are according to CAVM Team (2003). Study locations in each subzone are also shown. Map by Shalane Carlson.*

The Joint Russia-U.S. expedition to Hayes Island occurred from 22 Jul to 26 Aug 2010. Hayes Island was reached during a voyage from Amderma to Arkhangelsk, during 28 Jul to 27 Aug, aboard the ice-class ship *Mikael Somov* (*Figure 2*). The cruise that serviced several Russian Arctic stations along the coasts of the Barents and Kara Seas.

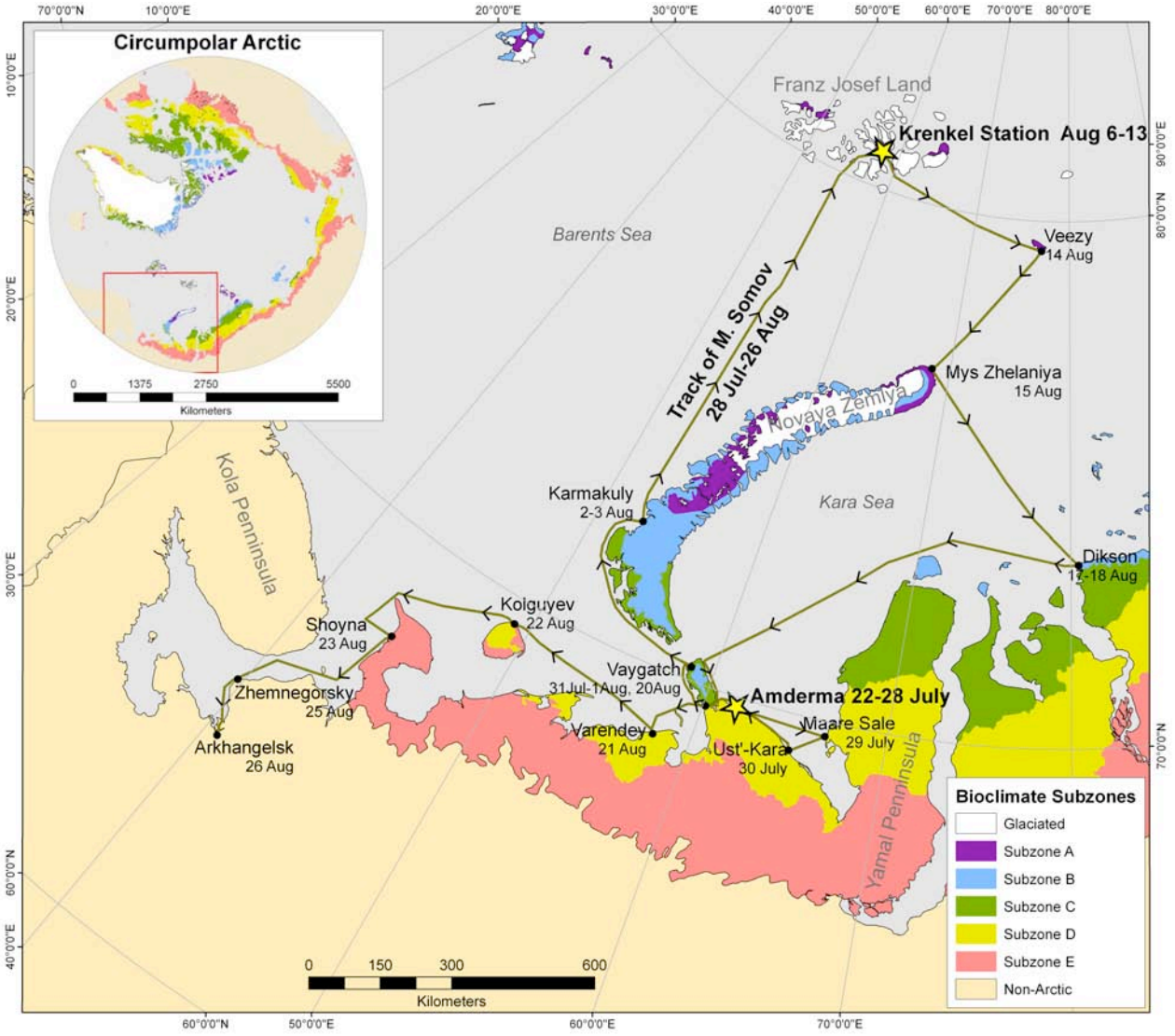


Figure 2. Route of 2010 Joint Russia-U.S. expedition to Hayes Island Franz Josef Land. *The background image shows the bioclimate subzones from the Circumpolar Arctic Vegetation Map (CAVM 2003). Map by Shalane Carlson.*

HAYES ISLAND: GENERAL BACKGROUND

The Hayes Island studies were conducted 7-13 Aug 2010 at two sites near the Krenkel hydrometeorological station in the northeast corner of the island (*Figure 3*). The observations followed the same basic procedures used at other locations along the EAT. Study sites were established on a zonal sandy loam site (Site 1) and a drier sandy site (Site 2). Most of the data were collected from 5 transects at each sample site, 5 permanent vegetation study plots (relevés), and 1 soil pit at each site.

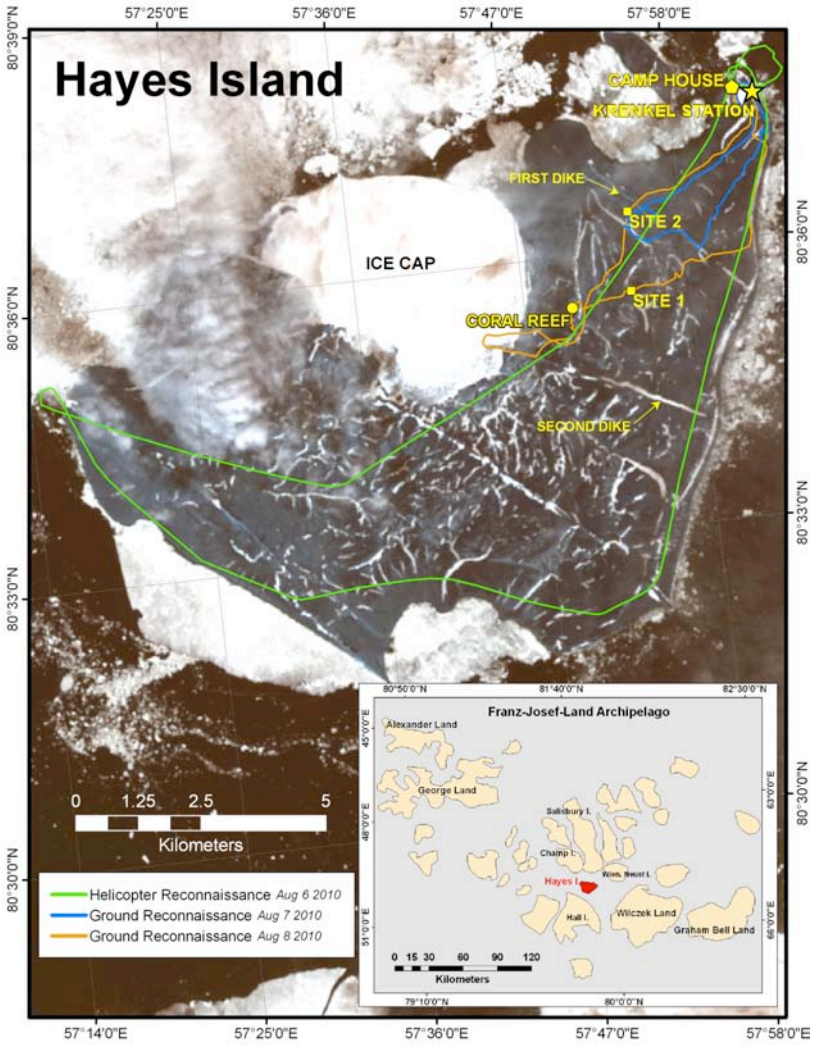


Figure 3. Hayes Island. *Krenkel Station and the expedition camp are in the upper right corner of the map. Colored lines show the routes of the helicopter- and ground-reconnaissance transects. Site 1 and 2 are sites of permafrost boreholes and measurements of vegetation, soils, spectral properties, and active-layer thickness. The "Coral Reef" is a site of lush lichen-rich vegetation that was not sampled, but shown in* ***Fig 8****. Note the ice cap, stream channels filled with snow and the numerous linear snow beds that form on the leeward side of volcanic dikes. Inset shows location within the Franz Josef Land archipelago. (Base map: Pan sharpened false-color infrared composite image (bands, 4, 3, 2), Landsat ETM+ Path 202, Row 101, July 3, 2001. Map by Shalane Carlson).*

A permafrost borehole was drilled by the Earth Cryosphere Institute. The boreholes will be described in another report.

The data in this report include: (1) a general description of the location and the two study sites with photographs, (2) maps of the study sites, study plots, and transects at each location, (3) tabular summaries of the vegetation, site factors, and soils at each relevé, (4) summaries of the Normalized Difference Vegetation Index (NDVI) and leaf area index (LAI) along each transect and relevé, (5) detailed soil descriptions and photos of the large soil pits described by G. Matyshak at each study

site, and (6) contact information for each of the participants. Most of the methods and data forms for the project are contained in earlier data reports, which are referenced by page number in earlier data reports. An exception are the methods used to determine the biomass of cryptogamic crusts that form the majority of the biomass on Hayes Island.

General description of Hayes Island and Krenkel Station

Hayes Island is a small 132 km^2 island in the central part of the Franz Josef Land archipelago, which is the northernmost land mass in Eurasia, situated in the northeast part of the Barents Sea shelf on the border with the Arctic Ocean between 80˚ to 82˚ N latitude (***Figure 3***). The archipelago is composed of 191 islands that are 85% ice covered. Hayes Island (also spelled Heiss, Cheysa or Kheysa through mistranscription into and from the Russian Cyrillic alphabet) was named after Dr. Israel Hayes, a U.S. polar researcher (http://www.franz-josef-land.info/index.php?id=653&L=5). The island is approximately 14 km wide at its widest point and about 10 km at its narrowest dimension. The island is mostly unglaciated, but there is a small semi-circular-shaped ice cap (Hydrogeographers Ice Cap) that is about 5 km in diameter and 242 m high centrally located along the northern coast of the island.

a)

b)

Figure 4. Krenkel station. a) *The small crater and lake that is the water supply for the station. The complex of buildings housed about 200 station personnel and seasonal researchers before the station was abandoned in 2001. The new station was built in 2004 and is housed in second building from the left on the opposite shore of the lake.* ***b)***

The Krenkel Hydrometeorological Station, was established during the 1957/58 International Geophysical Year and was the first climate station in the archipelago. Numerous buildings and facilities associated with the station surround a small lake that is situated in a volcanic crater in the northeast corner of the island at 80˚ 37’ N, 58˚ 3˚06’ E at an elevation of 20 m (***Figure 4a***). Over 1,950 sounding rockets, carrying scientific and military payloads, were launched from the station during 1957 to 1990 http://www.astronautix.com/sites/kheysa.htm, and many of these landed in the tundra near the station and are still present. The base camp for the expedition was located in an abandoned building on the east side of the lake (***Figure 4b***).

Geology and topography

Most of the FJL islands are composed of Mesozoic sedimentary and volcanic deposits. The Archipelago is a network of horsts (the islands) and grabens (the channels (Koryakin and Shipilov 2009). Many of the islands display basaltic plateaus with height of 400-490 m. The maximum difference between the heights of the above-water and subsea portions is about 1000 m. On Hayes Island, basalt cliffs occur along the southern

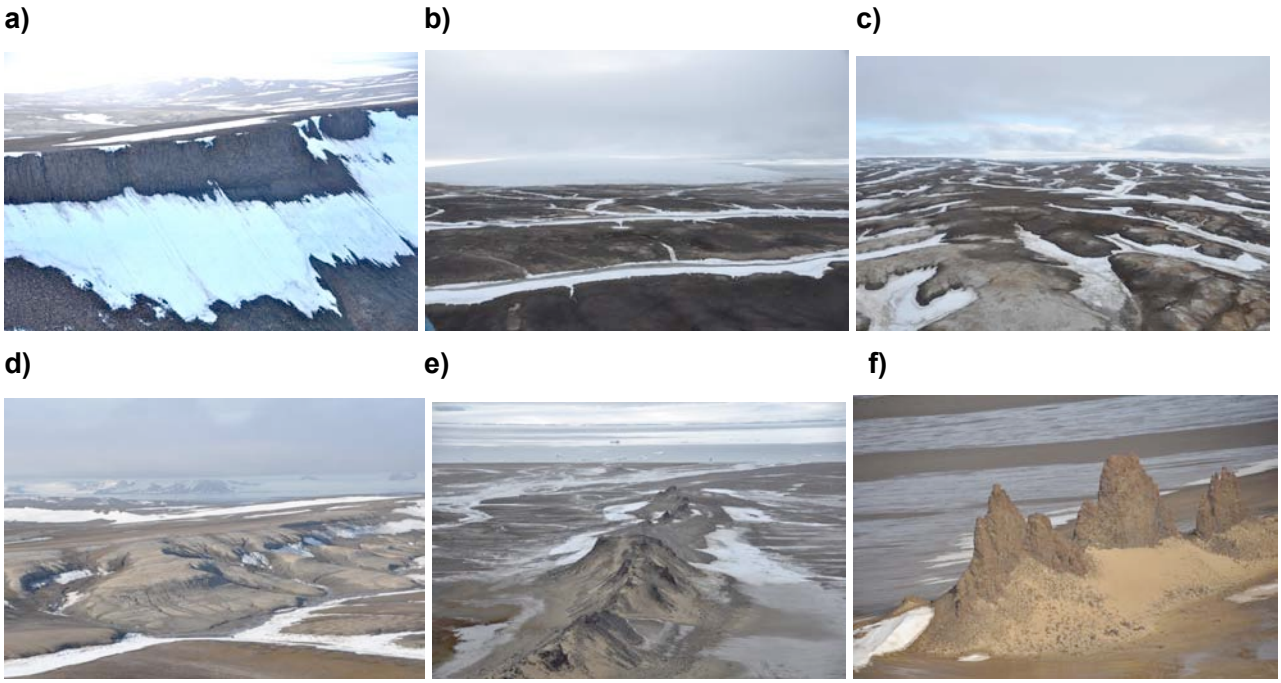


Figure 5. Terrain of Hayes Island. a) *Basalt cliffs along the southern coast.* ***b)*** *Small ice cap along northern coast with gentle hilly topography on sandstone bedrock and numerous snow-filled stream valleys.* ***c)*** *Hills in the central part of the island with barren unconsolidated sandstone deposits in the foreground.* ***d)*** *"First Dike", one of linear several volcanic dikes on the island. The areas right and left of the dike are recent Quaternary marine and alluvial deposits.* ***e)*** *Pinnacles along another dike in the western part of the island.* ***f)*** *Sandstone deposits exposed along stream. Photos: 6 Aug 2010, D.A. Walker5.*

coast (***Figure 5a***), but most of the island is covered with sedimentary deposits that are highly dissected by snow-melt streams (***Figure 5b, c***). Unconsolidated sandstones, presumably of Mesosoic age outcrop along stream channels, on hill tops, and along the front of the small ice cap, forming badland topography in some areas (***Figure 5d***). Numerous volcanic dikes that cross the island provide some spectacular pinnacles and varied topography (***Figure 5e, f***). Unconsolidated Quaternary deposits up to 10 m thick occur at lower elevations. V.D. Dibner delineates the following Quaternary deposits of FJL: (1) marine terraces of the upper complex occurring, as a rule from 30-35 to 125-250 m, (2) marine terraces of the lowermost complex where the upper limit of the height is 30-35 m, (3) the glacial and glaciofluvial deposits of contemporary glaciers, and (4) and recent lacustrine-alluvial, deluvial-proluvial, eluvium and aeolian deposits (Dibner 1965). The Holocene history of the FJL archipelago has been reviewed by Lubinski et al. (Lubinski et al. 1999).

Climate

Krenkel has a maritime Arctic climate. The mean annual temperature is -12 ˚C and the range of mean monthly air temperatures is from - 27 ˚C in February to 1˚C in July (*Table 1*). The absolute recorded extremes are -42 ˚C and 12 ˚C). Only one month (July) has a mean temperature above freezing and the summer warmth index is 1.1 ˚C mo.

Table 1. Summary of climate data from the IM. E.T. Krenkel Station. Data from WeatherReports.com, (http://www.weatherreports.com/?location=Krenkel%2C+Russia)

Latitude: **80°37'N**, Longitude: **58°3'E**, Elevation: **20.1 m**, Distance: **0.80 km** Polargmo IM. E.T. Krenkel, Russia Averages »

	Unit	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average temperature over 21 years	°C	-12	-22	-23	-23	-18	-8	-1	1	0	-3	-11	-18	-22
Average high temperature over 21 years	°C	-11	-20	-21	-21	-17	-7	0	1	1	-2	-10	-16	-20
Average low temperature over 21 years	°C	-15	-26	-27	-26	-21	-10	-2	0	-1	-4	-14	-21	-25
Highest recorded temperature over 21 years	°C	12	0	0	0	0	2	8	12	11	10	3	1	0
Lowest recorded temperature over 21 years	°C	-42	-41	-42	-42	-37	-22	-11	-3	-7	-22	-31	-37	-39
Average precipitation over 33 years	cm	28.2	3.6	3.3	2.3	1.8	2.0	1.3	2.3	2.3	3.0	2.3	4.1	3.3
Average dew point over 19 years	°C	-15	-25	-26	-26	-21	-11	-3	0	-1	-5	-13	-21	-25
Most recorded rainfall over 33 years	cm	61.7	18.3	6.6	7.9	6.1	11.2	2.3	4.8	5.8	18.0	5.6	33.8	22.1
Least recorded rainfall over 33 years	cm	16.0	0.3	0.5	-	-	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5
Average number of days with thunderstorms over 20 years	days	2	-	-	-	-	-	-	-	-	-	-	-	-
Average number of days with fog over 20 years	days	74	6	5	5	3	2	4	13	13	7	4	6	6
Average morning relative humidity over 20 years	%	86	83	81	80	82	86	89	92	92	90	86	84	84
Average evening relative humidity over 20 years	%	85	84	81	80	80	84	87	91	91	89	85	84	84
Average wind speed over 19 years	km/h	27.4	30.6	27.4	29.0	29.0	25.7	29.0	19.3	17.7	29.0	29.0	29.0	32.2
Average number of days below -1.5°C over 21 years	days	347	31	28	31	30	31	28	21	25	29	31	30	31
Average number of days below -17.5°C over 21 years	days	165	28	24	28	23	3	-	-	-	-	10	23	26

The Barents Sea has a strong moderating effect on the climate. Cloudiness, high humidity, summer fog and frequent storms are typical. High relative air humidity (80-92%) occurs all the year. Mean annual precipitation is 282 mm with the maximum precipitation occurring during November to February. Compared to Isachsen, the subzone A station on the North America Arctic Transect, Krenkel is much warmer in winter and on average (at Isachsen the mean annual temperature is -18 ˚C; and the lowest recorded temperature is -65 ˚C) and the summer temperatures are much colder

(Isachsen summer warmth index = 4.4 ˚C mo compared to 1.1 ˚C mo at Krenkel). The annual precipitation at Krenkel is nearly 3 times that at Isachsen (282 mm compared to 97 mm at Isachsen).

The island has consistent strong winds. Easterly winds predominate in the wintertime, and northwesterlies in the summer time. The strongest mean wind speeds are during winter (January mean speed is 30.6 km/h). Summer winds are relatively mild; the mean in August is 17.7 km/h. Very strong winds occur from November to June, and can last for several days on end. Hurricanes with the wind speeds up to 40 m/s (144 km/ hr) are possible during this period. In summer and autumn, hurricanes have not been recorded and very strong winds are comparatively rare.

Vegetation

Hayes Island is in the Polar Desert geobotancial subregion (Alexandrova 1980) and bioclimate subzone A of the Circumpolar Arctic Vegetation Map (CAVM Team 2003). The terrain and vegetation of the island were observed along a helicopter flight on August 7, 2010, and during two ground surveys of August 8 and 9 (***Figure 5***). From the air, most of the mesic gently sloping hills between drainages appear black, a consequence of the abundant cover of black and dark-colored cryptogamic species (***Figure 5b, c***). At the ground level the vascular plant cover is sparse, but much more abundant than is evident from even a low flying helicopter. The vegetation on mesic sites is composed primarily of lichens, mosses, and cushion-forbs. In areas not exposed to extreme winds or excessive erosion, black, white, and gray crustose-lichen species cover about 50-85% of the ground surface and include *Protopannaria pezizoides, Lecidea ramulosa, Baeomyces rufus*, *Lepraria gelida, Ochrolechia inaequatula*, *Ochrolechia frigida*, *Pertusaria* cf. *coriacea,* unidentified lichen prothalli and algal crusts. Fruticose lichens cover about 5-15% of the surface and include *Cetrariella delisei, Cetraria islandica, Thamnolia subuliformis, Flavocetraria cucullata, Stereocaulon alpinum,* and *S. rivulorum.* Mosses cover about 2-25% and include *Cirriphyllum cirrosum, Orthothecium chryseon, Polytrichastrum alpinum,* and *Ditrichum flexicaule*. The most common vascular plant is the polar poppy, *Papaver polare.* This and other cushion and mat forbs *(including Stellaria edwardsii, S. crassipes, Cochlearia groenlandica, Draba subcapitata, D. micropetala, Saxifraga cernua, S. cespitosa, S. oppositifolia, Cerastium arcticum, C. regelii*) cover 3-15% of the ground surface. The most common graminoids are grasses which generally cover less than 1% of the ground surface and include *Phippsia algida, Alopecurus borealis,* and *Poa abbreviata.* Common woody tundra genera such as *Dryas* and *Salix* are conspicuously absent, as are all sedges (*Carex, Eriophorum, Kobresia*).

Although Hayes Island has many similarities to Isachsen, the Subzone A site on the North America Arctic Transect, there were also some big dissimilarities. Perhaps most noticeable is the complete dominance of cushion forms of all plant types — forbs, grasses, lichens, and mosses — apparently a consequence of a more extreme summer climate. The lack of terrestrial herbivores including caribou, muskoxen and lemmings also has numerous effects. For example, well-developed lichen communities occur in favorable sites because of the lack of grazing pressure from caribou and the very moist summer climate (see ***Figure 8***). On the other hand, there is also a lack of small nitrophilous plant communites in inland areas that are normally found around animal dens and dead animal carcasses (although bird perch sites do have similar communities). Also the greater amount of winter snow causes extensive snowbanks to linger into August in all the drainages and leeward slopes, causing extensive sheet flow

Figure 6. Site 1 (sandy loam site). Left: *Landscape at site 1. Dominant vascular plant species are* Papaver dahlianum *spp.* polare, Stellaria edwardsii, S. crassipes, Draba micropetala, Saxifraga cespitosa, *and* Phippsia algida. ***Right:*** *Close up of the vegetation. Photos: D.A. Walker.*

of water draining from these snowbeds and extensive muddy, nearly impassable areas and very late plant phenology. The wetter conditions also cause an abundance of cryptogamic crusts, which cover nearly all surfaces that are not exposed to either extremely late snow or extreme winds. Biomass harvests revealed that this cryptogamic crust forms a surprising large portion of the biomass (33% (95 g m^{-2}) on a sandy loamy soil at Site 1, and 86% (218 g m^{-2}) on a sandy soil at Site 2).

As at the other locations along the Eurasia transect, our vegetation surveys focused on mesic vegetation found on moderately drained flat to gently sloping terrain. Two sites were selected for the vegetation surveys. **Site 1 (sandy loam site)** (***Figure 6***) is located on a gentle west-facing slope at an elevation of 30 m with relatively abundant plant cover. Vascular plants cover 3-8% of the surface, mosses 9-23%, fruticose lichens 4-15%, and crustose lichens 50-60%. The soil pH ranges from 6.0 to 6.2; promoting the growth of some basiphilous cryptogamic species (e.g., *Ditrichum flexicaule, Cirrophyllum cirrosum, Cratoneuron curvicaule*). Mean active layer depth was 34 cm on 11 Aug. Small patterned-ground features (non-sorted polygons (Washburn 1980) 10-15 cm in diameter are common on most surfaces. These are formed by seasonal frost cracking. The cracks between polygons are protected habitats for small mosses, lichens and forbs (***Figure 6,***

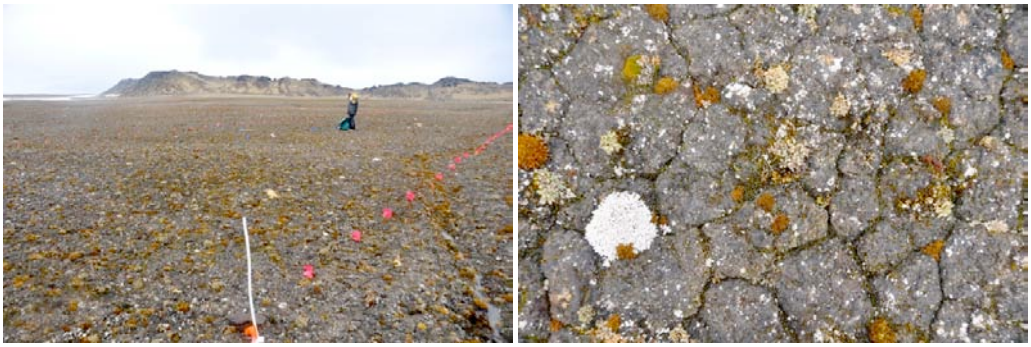


Figure 7. Site 2 (sandy site). Left*: Landscape at Site 2. Dominant vascular plant species are* Papaver dahlianum *spp.* polare, Stellaria edwardsii, S. crassipes, *and* Phippsia algida. The water-filled depression on the right is an ice-wedge-polygon trough. The ridge in the background is "First Dike". ***Right:*** *Close up of the vegetation. The white lichen is* Stereocaulon alpinum. *Note the cryptogamic crust, cushion forms of most of the plants, and the small nonsorted polygons with plants growing preferentially in the cracks between polygons. Photos: D.A. Walker.*

right).

Site 2 (sandy site) (***Figure 7***) is located on a flat sandy marine terrace at about 10 m elevation. The site has scattered glacially derived rocks. Soil pH at this site ranged from 5.1 to 5.6. The depth of thaw averaged 33 cm on Aug 12. The surface geomorphology is composed of large flat-centered ice-wedge polygons 20-25 m in diameter and small nonsorted polygons 10-20 cm in diameter. Compared to Site 1, Site 2 has noticeably less moss cover (1-3%) and more cryptogamic crusts (80-85% cover). The dominant vascular plants are *Papaver dahlianum* spp*. polare, Stellaria edwardsii, S. crassipes, Saxifraga cernua, Phippsia algida* and *Cochlearia groendlandica.* Cushion forms of the lichens *Cetrariella delesii, C. islandica, Flavocetraria cucullata, Thamnolia subuliformis, Stereocaulon alpinum and S. rivulorum* are common. Common bryophytes include *Polytrichastrum alpinum, Orthothecium chryseon, Bryum rutilans* and *Anthelia juratzkana.*

We also visited a site dubbed the "Coral Reef" because of its very well developed lichen vegetation that reminded us, in our semi-frozen delirium, of tropical marine habitats (***Figure 8***). On false-color-infrared Landsat satellite images, this and other similar sites have relatively bright reddish tones, and have the most lush vegetation on the island The site we visited occurred on a gentle south facing slope with sandy loam soils. Unfortunately, we were unable to return to this site to sample it during the short amount time we were on the island.

Figure 8. The "Coral Reef". *The spectacular lichen cover develops in the cool moist arctic maritime climate and is able to thrive because of the lack of reindeer on the island. The brown lichens are mainly* Cetrariella delisei *and* Cetraria islandica*. The white lichens are* Stereocaulon alpinum *and* Thamnolia subuliformis. *The yellowish liches are mainly* Flavocetraria cucullata. *Photos: D.A. Walker.*

METHODS

The primary sampling methods used at the Krenkel study sites were the same as those used in 2007-09 at previously surveyed EAT locations. Readers should refer to the report for the 2008 and 2009 expeditions (Walker, 2009a, b) for details of the sampling methods. Below we cite the page numbers in the first report (Walker et al. 2009a) and note any variations or changes to the methods.

50-m transects

Criteria for site selection, size, arrangement and marking methods:

See Walker et al. (2009a), p. 12-14. GPS coordinates were recorded at the south (00m) and north ends (50m) of each transect. Transect numbers on aluminum-tag markers have a prefix of KR_ (Krenkel) followed by the transect number and the distance along the transect (e.g. KR_T61_00m to designate the beginning of the transect T61, and KR_TR61_50m marks the end.)

Species cover along transects using the Buckner point-intercept sampling device:

See Walker et al. (2009a), p. 14.

Normalized Difference Vegetation Index (NDVI) and leaf-area index (LAI) measurements:

See Walker et al. (2009a), p. 14-15. The NDVI of all relevés was measured, but problems with the PS-2 instrument and snowy conditions prevented measurement at all points along the transects.

Active layer measurements along transects:

Active layer thickness was measured at 5-m intervals along the five transects at both sites. Active layer thickness was also measured on each relevé and is noted in the site characteristics of each study plot.

Relevés

Criteria for site selection, size, arrangement and marking methods:

See Walker et al. (2009a), p. 12-14. Relevé numbers on aluminum-tag markers have the prefix of KR_ (Krenkel) followed by the relevé number (e.g. KR_RV60). (GPS coordinates were recorded at the southwest corner of all 5 x 5-m relevé plots.

Relevé site factors and species cover abundance:

See Walker et al. (2009a), p. 15-16.

Soil sampling at relevés:

See Walker et al. (2009a), p. 18.

Soil pits and descriptions at each site by G. Matyshak:

See Walker et al. (2009a), p. 18 and p. 60-76.

Biomass sampling at relevés:

Biomass was sampled from a 20 x 50-cm clip-harvest frame in the center of each relevé. Relevé numbers on aluminum-tag markers at biomass sample sites have the prefix of KR_ (Krenkel) followed by the relevé number and then BM to designate biomass plot (e.g. KR_RV60_BM). See Walker et al. (2009a), p. 17 and Appendix D, p. 88-95 for general clip-harvest and sorting procedures. In previous years we noted sand contamination in the biomass harvests of mosses and lichens, but did not properly adjust for this contamination. Also previously we did not determine the biomass of cryptogamic crusts. At the Hayes Island sites we adjusted our methods to correct for these problems as described below.

Biomass of mosses, lichens and cryptogamic crusts

Clip harvest and sorting procedures followed the same protocols as in Walker et al. (2009a) for all plant functional types except for mosses, lichens and cryptogamic crusts which had high cover at both sites and considerable mineral mixed in the samples.

Mosses and lichens and one forb sample: 12 samples had high percentages of mineral and needed to be ashed to determine percentage of mineral (RV_60 dead moss and dead forb, RV_61 dead moss and lichen, RV_62 dead moss (w sand), dead moss ("clean"), RV_63 live moss, dead moss, RV_ 64 dead moss "clean", RV_65 dead moss, RV_69 live moss, dead moss). These samples were treated as follows:

a. Heated porcelain 100 ml cups to 750 ˚C to drive water out of clay.
b. Weighed empty cups, recorded number on cup and weight.
c. Ground complete moss, lichen or forb sample in a Waring industrial blender.
d. Added about 5 g of sample to a crucible (less for highly organic samples) and weighed.
e. Heated samples slowly to 750˚C for 4 hours, then ashed for 4 more hours.
f. Reweighed samples, subtracted ashed weight from dry weight to determine percent of dry organic matter

Cryptogamic crusts were treated as follows:

a. The vegetation and top 2 cm of soil were "sliced" intact from each 20 x 50 cm biomass plot using a serrated bread knife. The sample was divided in half and carefully placed into two gallon-size Ziploc bags. In some cases the slice came in pieces, primarily because of cracks between small nonsorted polygons or irregularities in the soil.
b. The vascular plants, mosses and lichens were removed and sorted according to plant functional types as previously defined in Walker et al. (2009a).
c. "Cookies" of soil containing cryptogamic crusts were cut from the pieces of tundra of each slice with the lid from a 300 ml Edge® gel-shaving-lotion can. Each “cookie” was circular and 5-cm diameter (19.6 cm^2 area). 5 cookies were cut from each plot if possible. Three plots had only 3 samples. Excess mineral was removed from each cookie, generally to a thickness of about 0.5 cm.
d. Each entire "cookie" sample was ground in a Waring industrial blender.
e. About 100 ml of water was added to float off the organic matter.
f. The water and organic matter mixture was passed through 0.25 mm sieve (sand stayed in beaker, organic stayed on the sieve). Note: One sample of mineral remaining in the blender was ashed to see how much organic did not float off (4%).
g. The -organic remaining on sieve was scraped into a petri dish. These samples still had high amount of mineral in them and needed to be ashed to determine weight of mineral matter.
h. The dried organic matter and sand on the petri dish was dried at 65 ˚C, and weighed.
i. The samples were then ashed at 750˚C, and reweighed after ashing. These samples contained mineral plus plant ash.
j. Plant ash was removed by treating with 10% HCl, stirred for 5 min and then heated 15-20 min to remove plant ash.
k. The solution containing the mineral and dissolved organic was passed through a filter paper to extract the mineral.
l. We then ashed the filter paper + treated ash at 750˚C, and reweighed the sample, to determine how much of mineral sample was organic material (average 3.2%).
m. Since the cookies were taken generally from small areas with continuous cover of crusts and not randomly collected from each biomass harvest plot it was necessary to adjust the crust biomass to reflect the measured area of crusts. To determine the mass of cryptogamic crust per unit area at each site, the average biomass of crust per m^2 values was calculated from the cookies from each site (307 g/m^2 for Site 1 and 376 g/m^2 for Site 2) was multiplied by average cover of all crusts (black, white and gray crusts as well as indentifiable crustose lichens) as determined from the Buckner sampling transects (41.4% for Site 1 and 52.1% for Site 2). This resulted in a mean crust biomass of 127 g m^{-2} at Site 1 and 197 g m^{-2} at Site 2.
n. To determine mass of cryptogamic crust per unit area within each 20 x 50 cm biomass harvest plot, the average crust biomass for each site (307 g/m^2 for Site 1 and 376 g/m^2 for Site 2) was multiplied by the number of cookies per square meter (509.55) times the visually estimated area of crust in each biomass harvest plot (based on photographs of each harvest plot). The visually estimated area of crust within each biomass plot varied from 20 to 48% at Site 1 and from 40 to 67% at Site 2. Using this method, the average crust biomass within the harvest plots was 95 g m^{-2} at Site 1 and 218 g m^{-2} at Site 2.

Ground surface temperature measurement, and n-factors, (ibutton placement):

See Walker et al. (2009a), p. 16-17.

RESULTS

Maps and locations of study site

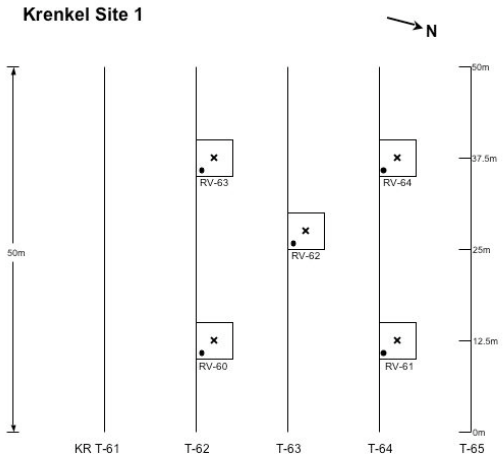


Figure 9. Map of transects and vegetation study plots at Krenkel Site 1. *The x in the center of each plot is the location of the 20 x 50 cm biomass harvest plot. The dot in the lower left corner is the location of the iButtons. Distance between transects is 12.5 m.*

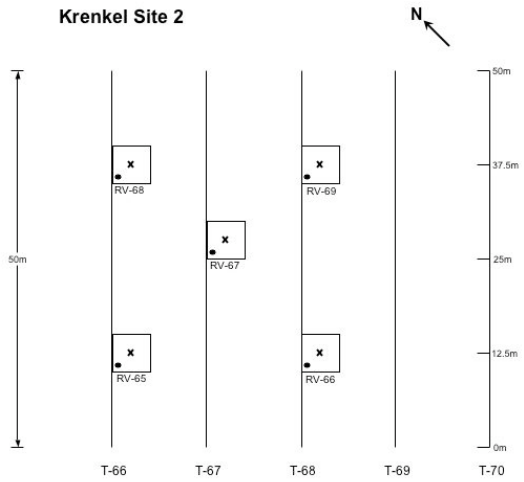


Figure 10. Map of transects and vegetation study plots at Krenkel Site 2. *The x in the center of each plot is the location of the 20 x 50 cm biomass harvest plot. The dot in the lower left corner is the location of the iButtons. Distance between transects is 12.5 m.*

GPS coordinates of all relevés, transects, and other locations along the EAT.

Table 2. GPS coordinates and elevations of vegetation study plots and transects. *BO – Belyy Ostrov, KH – Kharasavey, KR – Krenkel, LA – Laborovaya, ND – Nadym, VD – Vaskiny Dachi. RV = Relevé, T = Transect. Coordinates are recorded at the southwest corner of each grid, and at both ends of the transects (00 and 50 m).*

Description	North	East	Elev.	Site	Description	North	East	Elev.	Site	Description	North	East	Elev	Site	Description	North	East	Ele	Site
BO Camp	73 33.1955	070 61.1257	3	NA	LA Camp	67 42.210	068 01.089	72	NA	KR 61 00m	80 35.560	57 54.217	33	1	VD Camp	70 17.214	068 53.655	29	NA
BO RV 49	73 19.713	070 04.674	0,3	1	LA RV 15	67 42.397	067 59.946	79	1	KR 61 50m	80 35.558	57 54.056	28	1	VD RV 25	70 16.540	068 53.446	38	1
BO RV 50	73 19.713	070 04.713	0,4	1	LA RV 16	67 42.387	067 59.970	79	1	KR 62 00m	80 35.569	57 54.220	32	1	VD RV 26	70 16.528	068 53.465	40	1
BO RV 51	73 19.719	070 04.692	0,6	1	LA RV 17	67 42.396	067 59.971	79	1	KR 62 50m	80 35.565	57 54.056	29	1	VD RV 27	70 16.538	068 53.469	40	1
BO RV 52	73 19.726	070 04.668	0,4	1	LA RV 18	67 42.406	067 59.969	77	1	KR 63 00m	80 35.575	57 54.213	33	1	VD RV 28	70 16.547	068 53.475	41	1
BO RV 53	73 19.726	070 04.712	0,8	1	LA RV 19	67 42.397	067 59.995	78	1	KR 63 50m	80 35.572	57 54.056	30	1	VD RV 29	70 16.536	068 53.498	41	1
BO RV 54	73 18.553	070 07.728	0,3	2	LA RV 20	67 41.691	068.02.244	63	2	KR 64 00m	80 35.581	57 54.213	34	1	VD RV 30	70 17.734	068 53.027	27	2
BO RV 55	73 18.555	070 07.765	0	2	LA RV 21	67 41.684	068 02.283	59	2	KR 64 50m	80 35.579	57 54.055	30	1	VD RV 31	70 17.731	068 53.065	29	2
BO RV 56	73 18.564	070 07.737	0,4	2	LA RV 22	67 41.694	068 02.270	64	2	KR 65 00m	80 35.588	57 54.210	32	1	VD RV 32	70 17.739	068 53.052	29	2
BO RV 57	73 18.566	070 07.719	0,8	2	LA RV 23	67 41.703	068 02.277	62	2	KR 65 50m	80 35.586	57 54.046	31	1	VD RV 33	70 17.747	068 53.038	30	2
BO RV 58	73 18.568	070 07.768	0,1	2	LA RV 24	67 41.696	068 02.301	63	2	KR 66 00m	80 36.430	57 54.373	16	2	VD RV 34	70 17.744	068 53.077	31	2
BO T51 00m	73 19.7050	070 4.74216	0,8	1	LA T09 00r	67 42.396	067 59.920	79	1	KR 66 50m	80 36.442	57 54.512	14	2	VD RV 35	70 18.088	068 50.519	15	3
BO T51 50m	73 19.7320	070 4.72163	2	1	LA T09 50r	67 42.416	067 59.970	79	1	KR 67 00m	80 36.423	57 54.392	13	2	VD RV 36	70 18.031	068 50.587	14	3
BO T52 00m	73 19.7057	070 4.72163	0.3	1	LA T10 00r	67 42.391	067 59.934	79	1	KR 67 50m	80 36.437	57 54.530	15	2	VD RV 37	70 18.060	068 50.580	13	3
BO T52 50m	73 19.7329	070 4.67526	0.2	1	LA T10 50r	67 42.411	067 59.984	79	1	KR 68 00m	80 36.418	57 54.413	15	2	VD RV 38	70 18.097	068 50.554	15	3
BO T53 00m	73 19.7060	070 4.69962	0.2	1	LA T11 00r	67 42.387	067 59.946	80	1	KR 68 50m	80 36.432	57 54.554	19	2	VD RV 39	70 18.031	068.50.625	10	3
BO T53 50m	73 19.7328	070 4.69907	0.2	1	LA T11 50r	67 42.406	067 59.995	79	1	KR 69 00m	80 36.411	57 54.435	13	2	VD T19 00m	70 16.542	068 53.417	45	1
BO T54 00m	73 19.7065	070 4.67441	0.2	1	LA T12 00r	67 42.383	067 59.959	80	1	KR 69 50m	80 36.426	57 54.577	17	2	VD T19 50m	70 16.557	068 53.484	41	1
BO T54 50m	73 19.7329	070 4.72097	0.2	1	LA T12 50r	67 42.402	068 00.008	80	1	KR 70 00m	80 36.407	57 54.463	22	2	VD T20 00m	70 16.537	068 53.427	46	1
BO T55 00m	73 19.7065	070 4.65281	0.7	1	LA T13 00r	67 42.378	067 59.971	81	1	KR 70 50m	80 36.420	57 54.594	17	2	VD T20 50m	70 16.551	068 53.495	41	1
BO T55 50m	73 19.7326	070 4.74365	1.5	1	LA T13 50r	67 42.398	068 00.019	81	1	KR RV60	80 35.569	57 54.177	34	1	VD T21 00m	70 16.529	068 53.441	42	1
BO T56 00m	73 18.5449	070 7.70934	0.5	2	LA T14 00r	67 41.692	068 02.230	60	2	KR RV61	80 35.581	57 54.174	28	1	VD T21 50m	70 16.545	068 53.506	41	1
BO T56 50m	73 18.5714	070 7.6944	0.2	2	LA T14 50r	67 41.712	068 02.273	62	2	KR RV62	80 35.574	57 54.130	31	1	VD T22 00m	70 16.524	068 53.451	39	1
BO T57 00m	73 18.546	070 7.73033	0.2	2	LA T15 00r	67 41.689	068 02.243	61	2	KR RV63	80 35.567	57 54.096	30	1	VD T22 50m	70 16.540	068 53.517	40	1
BO T57 50m	73 18.5722	070 7.71768	0.3	2	LA T15 50r	67 41.709	068 02.287	64	2	KR RV64	80 35.580	57 54.092	29	1	VD T23 00m	70 16.519	068 53.461	39	1
BO T58 00m	73 18.5468	070 7.75469	0.3	2	LA T16 00r	67 41.684	068 02.255	61	2	KR RV65	80 36.426	57 54.430	16	2	VD T23 50m	70 16.535	068 53.527	41	1
BO T58 50m	73 18.5731	070 7.74023	0.3	2	LA T16 50r	67 41.705	068 02.301	64	2	KR RV66	80 36.414	57 54.479	16	2	VD T24 00m	70 17.729	068 53.004	30	2
BO T59 00m	73 18.5474	070 7.77522	0.9	2	LA T17 00r	67 41.679	068 02.269	58	2	KR RV67	80 36.425	57 54.495	16	2	VD T24 50m	70 17.756	068 53.020	29	2
BO T59 50m	73 18.5744	070 7.76555	0.5	2	LA T17 50r	67 41.700	068 02.315	61	2	KR RV68	80 36.432	57 54.508	17	2	VD T25 00m	70 17.728	068 53.024	32	2
BO T60 00m	73 18.5490	070 7.79946	0.2	2	LA T18 00r	67 41.675	068 02.286	60	2	KR RV69	80 36.421	57 54.547	17	2	VD T25 50m	70 17.754	068 53.041	28	2
BO T60 50m	73 18.5757	070 7.78770	0.6	2	LA T18 50r	67 41.696	068 02.330	63	2	KR POLARS	80 37.553	58 03.596	19	NA	VD T26 00m	70 17.726	068 53.043	32	2
KH Camp	71 11.075	066 52.166	3	NA	ND Camp	65 18.873	072 52.841	24	NA	KR CAMP H	80 37.623	58 02.283		NA	VD T26 50m	70 17.752	068 53.061	30	2
KH RV 40	71 10.723	066 58.778	16	1	ND RV 01	65 18.810	072 53.226	32	1						VD T27 00m	70 17.725	068 53.062	28	2
KH RV 41	71 10.719	066 58.819	16	1	ND RV 02	65 18.794	072 53.277	28	1						VD T27 50m	70 17.751	068 53.080	28	2
KH RV 42	71 10.727	066 58.803	16	1	ND RV 03	65 18.811	072 53.274	18	1						VD T28 00m	70 17.723	068 53.082	28	2
KH RV 43	71 10.738	066 58.778	16	1	ND RV 04	65 18.831	072 53.261	27	1						VD T28 50m	70 17.750	068 53.099	32	2
KH RV 44	71 10.733	066 58.828	16	1	ND RV 05	65 18.814	072 53.314	26	1						VD T29 00m	70 18.076	068 50.470	4	3
KH RV 45	71 11.663	066 53.337	8	2a	ND RV 06	65 18.883	072 51.703	23	2						VD T29 50m	70 18.100	068 50.514	4	3
KH RV 46	71 11.667	066 53.341	8	2a	ND RV 07	65 18.863	072 51.695	22	2						VD T30 00m	70 18.083	068 50.504	15	3
KH RV 47	71 11.664	066 55.719	13	2b	ND RV 08	65 18.888	072 51.785	23	2						VD T30 50m	70 18.099	068 50.565	9	3
KH RV 48	71 11.667	066 55.731	13	2b	ND RV 09	65 18.884	072 51.702	21	2						VD T31 00m	70 18.047	068 50.564	14	3
KH RV 49*	71 11.632	066 56.071	13	2b	ND RV 10	65 18.867	072 51.703	21	2						VD T31 50m	70 18.072	068 50.595	13	3
KH T36 00m	71 10.719	066 58.750	16	1	ND RV 11	65 18.887	072 51.785	21	2						VD T32 00m	70 18.031	068 50.567	14	3
KH T36 50m	71 10.745	066 58.770	16	1	ND RV 12	65 18.825	072 51,737	22	2						VD T32 50m	70 18.031	068 50.645	11	3
KH T37 00m	71 10.717	066 58.771	16	1	ND RV 13	65 18.824	072 51.803	16	2						VD T33 00m	70 18.019	068 50.542	14	3
KH T37 50m	71 10.742	066 58.792	16	1	ND RV 14	65 18.828	072 51.831	23	2						VD T33 50m	70 18.024	068 50.620	12	3
KH T38 00m	71 10.715	066 58.790	16	1	ND T01 00	65 18.810	072 53.186	27	1						VD T34 00m	70 17.470	068 52.432	14	4
KH T38 50m	71 10.741	066 58.811	16	1	ND T01 10	65 18.855	072 53.272	36	1						VD T34 50m	70 17.488	068 52.372	16	4
KH T39 00m	71 10.714	066 58.810	16	1	ND T02 00	65 18.799	072 53.208	18	1						VD T35 00m	70 17.422	068 51.823	13	5
KH T39 50m	71 10.739	066 58.832	16	1	ND T02 10	65 18.843	072 53.288	31	1						VD T35 50m	70 17.402	068 51.763	17	5
KH T40 00m	71 10.712	066 58.829	16	1	ND T03 00	65 18.793	072 53.232	28	1										
KH T40 50m	71 10.737	066 58.853	16	1	ND T03 10	65 18.834	072 53.307	28	1										
KH T41 00m	71 11.633	066 53.337	8	2a	ND T04 00	65 18.783	072 53.258	28	1										
KH T41 10m	71 11.668	066 53.330	8	2a	ND T04 10	65 18.824	072 53.331	27	1										
KH T45 00m	71 11.666	066 53.357	8	2a	ND T05 00	65 18.775	072 53.281	31	1										
KH T45 10m	71 11.670	066 53.341	8	2a	ND T05 10	65 18.817	072 53.356	31	1										
KH T46 00m	71 11.664	066 55.719	12	2b	ND T06 00	65 18.828	072 51.730	17	2										
KH T46 10m	71 11.670	066 55.724	12	2b	ND T07 00	65 18.885	072 51.716	23	2										
KH T50 00m	71 11.664	066 55.734	12	2b	ND T08 10	65 18.833	072 51.861	18	2										
KH T50 10m	71 11.669	066 55.738	12	2b															

EAT study locations, site numbers, site names, geological settings and dominant vegetation.

Table 3. Study locations, site numbers, site names, and geological settings and dominant vegetation at each study site.

Location and site no.	Site name	Microsite	Geological setting, parent material	Dominant vegetation
Nadym-1	Forest site		Fluvial terrace II, Karga-age, (about 20-40 kya), alluvial sands	*Pinus sylvestris-Ledum palustre-Cladonia stellaris* lichen-woodland
Nadym-2a	CALM-grid site	Hummocks	Fluvial terrace III, Zyranski-age, (about 60-80 kya), alluvial sands	*Ledum palustre-Betula nana-Cladonia stellaris*dwarf-shrub, lichen tundra
Nadym-2b		Inter-hummocks		*Cladonia stellaris-Carex glomerata* lichen tundra
Laborovaya-1	Clay-site		III glacial terrace, Ermakovsky-age, (about 50-110 kya), clay	*Carex bigelowii-Betula nana-Aulacomnium palustre* sedge, dwarf-shrub, moss tundra
Laborovaya-2	Sand site		Alluvial sand of stream	*Betula nana-Vaccinium vitis-idaea-Sphaerophorus globosus-Polygrichum stirctum* prostrate dwarf-shrub, lichen tundra
Vaskiny Dachi-1	Terrace IV site		Coastal marine plain, Kazantsevskaya-age (Eamian-age 130-117 kya), marine clays	*Carex bigelowii-Vaccinium vitis idaea-Hylocomium splendens* sedge, dwarf-shrub, moss tundra
Vaskiny Dachi-2	Terrace III site		Fluvial-marine terrace, (middle-Wiechselian, 75-25 kya), mixed alluvial sands and marine clays	*Betula nana-Calamagrostis holmii-Aulacomnium turgidu* dwarf-shrub, graminoid, moss tundra
Vaskiny Dachi-3	Terrace II site		Fluvial terrace, (late-Wiechselian, 25-10 kya), alluvial and eolian reworked sands	*Vaccinium vitis idaea-Cladonia arbuscula-Racomitrium lanuginosum* prostrate dwarf-shrub, sedge, lichen, tundra
Kharasavey-1	Clay site		II marine terraces, Karginsky-age, (about 20-40 kya), marine clays	*Carex bigelowii-Calamagrostis holmi-Salix polaris-Dicranum elongatum-Cladonia* spp. graminoid, prostrate dwarf-shrub, moss tundra
Kharasavey-2a	Sand site		Marine terrace I (Sartansky-age, about 10-22 kya) marine clays with eolian reworked sands on surfaces	*Carex bigeolowii-Salix nummularia-Dicranum*sp., *Cladonia*spp. Graminoid, prostrate dwarf-shrub, moss, lichen tundra
Kharasavey-2b	Sand site		Marine terrace II (Karginsky-age, about 20-40 kya) marine sands and clays	*Salix nummularia-Luzula confusa-Polytrichum strictum-Sphaerophorus globosus* prostrate dwarf-shrub, gramioid, moss, lichen tundra
Kharasavey-2b	Sand site		II marine terraces(Karginsky-age, about 20-40 kya) marine sands and clays.	*Salix nummularia-Luzula confusa-Polytrichum strictum-Sphaerophorus globosus* prostrate dwarf-shrub, gramioid, moss, lichen tundra
Ostrov Belyy-1a	Loamy site	Non-sorted circles	Marine terrace II (Upper Pleistocene to Holocene age) , alluvial-marine sediments, loamy facie of mixed sands and clays.	*Carex bigelowii-Calamagrostic holmii-Salix polaris-Hylocomiuim splendens.* Graminoid, prostrate dwarf-shrub, moss tundra
Ostrov Belyy-1b		Inter-circle areas	Marine terrace II (Upper Pleistocene to Holocene age) , alluvial-marine sediments, loamy facie of mixed sands and clays.	*Dryas integrifolia-Arctagrostis latifolia-Racomitrium lanuginosum-Ochrolechia frigida.* Prostrate dwarf-shrub, crustose-lichen barren.
Ostrov Belyy-2a	Sand site	Small nonsorted polygons	Marine terrace I (Upper Pleistocene to Holocene age), alluvial-marine sediments, sands.	*Gymnomitrion corallioides-Salix nummularia-Luzula confusa-Ochrolechia frigida.* Liverwort, dwarf-shrub, gramioid, lichen tundra.
Ostrov Belyy-2b		Polygon crack areas	Marine terrace I (Upper Pleistocene to Holocene age), alluvial-marine sediments, sands.	*Racomitrium lanuginosum-Salix nummularia.* Moss-prostrate dwarf-shrub tundra
Krenkel-1	Sandy loam site		Deluvial slope (perhaps old marine terrace) at 30 m	*Papaver dahlianum* spp. *polare-Stellaria edwardsii-Cetrariella delisei-Ditrichum flexicaule-black crust.* Cushion-forb, lichen, moss tundra.
Krenkel-2	Sandy site		Marine terrace at 10 m	*Papaver dahlianum* spp. *polare-Stellaria edwardsii-Cetrariella delisiei-black crust.* Cushion-forb, lichen, moss tundra.

Kazantsevo = Eemian 130 000-117 000 yr BP.
Karginsky-Zyryanka = Middle Wiechselian 74 000-25 000 yr BP.
Sartan = Late Wiechselian 25 000-10 000 yr BP.

Factors measured along transects

Species cover along transects using the Buckner point sampler

Table 4. Krenkel Site 1; species cover along transects. *"Overstory" species are those recorded at the top of the plant canopy at each point; "understory" species are those recorded at the base of the plant canopy sometimes followed by L (live green plant part) or D (dead or senescent plant part).*

Species	T-61 count	T-61%	T-62 count	T-62%	T-63 count	T-63%	T-64 count	T-64%	T-65 count	T-65%	Total count	Total %
None	101	**100**	101	**100**	100	**100**	101	**100**	102	**100**	505	**100**
(total)	101	**100**	101	**100**	100	**100**	101	**100**	102	**100**	505	**100**
UNDERSTORY												
Species	**T-61 count**	**T-61%**	**T-62 count**	**T-62%**	**T-63 count**	**T-63%**	**T-64 count**	**T-64%**	**T-65 count**	**T-65%**	**Total count**	**Total %**
Bare soil	23	**23**	24	**24**	15	**15**	13	**13**	7	**7**	82	**16.2**
Black crust	41	**41**	38	**38**	29	**29**	34	**34**	48	**47**	190	**37.6**
Bryum rutilans	1	**1**					1	**1**			2	**0.4**
Bryum sp.	1	**1**									1	**0.2**
Cerastium arcticum							2	**2**			2	**0.4**
Cerastium regelii D							1	**1**			1	**0.2**
Cerastium regelii L			1	**1**					1	**1**	2	**0.4**
Cetraria islandica	1	**1**			4	**4**	4	**4**	6	**6**	15	**3.0**
Cetraria sp.									1	**1**	1	**0.2**
Cetrariella delisei	3	**3**	3	**3**					2	**2**	8	**1.6**
Cirriphyllum cirrosum	2	**2**	2	**2**	2	**2**	3	**3**	1	**1**	10	**2.0**
Cladonia pocillum	4	**4**	2	**2**	3	**3**	2	**2**	3	**3**	14	**2.8**
Cratoneuron curvicaule							1	**1**			1	**0.2**
crustose rock lichen			1	**1**							1	**0.2**
Ditrichum flexicaule	4	**4**	7	**7**	8	**8**	8	**8**	5	**5**	32	**6.3**
Dicranum sp.					3	**3**					3	**0.6**
Drepanocladus sp.			1	**1**							1	**0.2**
Flavocetraria cucullata	1	**1**			1	**1**	2	**2**			4	**0.8**
Litter			1	**1**			1	**1**			2	**0.4**
Orthothecium chryseon	3	**3**	3	**3**	7	**7**	6	**6**	2	**2**	21	**4.2**
Papaver dahlianum ssp polare D			1	**1**	1	**1**					2	**0.4**
Papaver dahlianum ssp polar	2	**2**	2	**2**	1	**1**	1	**1**	3	**3**	9	**1.8**
Peltigera rufescens					1	**1**					1	**0.2**
Phippsia algida D			1	**1**	2	**2**	1	**1**			4	**0.8**
Phippsia algida L			2	**2**	1	**1**	1	**1**			4	**0.8**
Poitrichastrum alpinum s.l.	4	**4**			1	**1**	4	**4**	4	**4**	13	**2.6**
Rock	2	**2**	2	**2**					1	**1**	5	**1.0**
Saxifraga cespitosa D	1	**1**									1	**0.2**
Saxifraga oppositifolia L							1	**1**			1	**0.2**
Stellaria sp. D			2	**2**	1	**1**	4	**4**	2	**2**	9	**1.8**
Stellaria sp. L					4	**4**	1	**1**	2	**2**	7	**1.4**
Stereocaulon sp.	1	**1**			2	**2**					3	**0.6**
Thamnolia sp.	2	**2**	2	**2**	2	**2**	3	**3**	6	**6**	15	**3.0**
Lecidea ranulosa	1	**1**	1	**1**	5	**5**	4	**4**	5	**5**	16	**3.2**
white crust	3	**3**	5	**5**	7	**7**	3	**3**	2	**2**	20	**4.0**
(total)	100	**99.0**	101	**100.0**	100	**100.0**	101	**100.0**	101	**99.0**	503	**99.6**

Table 5. Krenkel Site 2, species cover along transects.

OVERSTORY												
Species	**T-66 count**	**T-66%**	**T-67 count**	**T-67%**	**T-68 count**	**T-68%**	**T-69 count**	**T-69%**	**T-70 count**	**T-70%**	**Total count**	**Total %**
None	101	100	101	100	101	100	101	100	101	100	505	100
(total)	101	100	101	100	101	100	101	100	101	100	505	100
UNDERSTORY												
Species	**T-66 count**	**T-66%**	**T-67 count**	**T-67%**	**T-68 count**	**T-68%**	**T-69 count**	**T-69%**	**T-70 count**	**T-70%**	**Total count**	**Total %**
Bare soil	19	**19**	20	**20**	12	**12**	11	**11**	16	**16**	78	**15.4**
Black crust	44	**44**	41	**41**	48	**48**	47	**47**	40	**40**	220	**43.6**
Bryum rutilans			1	**1**							1	**0.2**
Cerastium arcticum D			1	**1**							1	**0.2**
Cerastium arcticum sp. D	1	**1**									1	**0.2**
Cetraria islandica									1	**1**	1	**0.2**
Cetrariella delisei	1	**1**			1	**1**	4	**4**	4	**4**	10	**2.0**
Cirriphyllum cirrosum			1	**1**							1	**0.2**
Cladonia - brown cap									1	**1**	1	**0.2**
Cladonia pocillum			3	**3**					2	**2**	5	**1.0**
Cochlearia groenlandica D							1	**1**			1	**0.2**
Cochlearia groenlandica L			1	**1**					2	**2**	3	**0.6**
Cratoneuron flexicaule					1	**1**					1	**0.2**
Distichium capillaceum	4	**4**	2	**2**	3	**3**	3	**3**	1	**1**	13	**2.6**
Draba micropetala L							1	**1**	1	**1**	2	**0.4**
Lecidea ramulosa	12	**12**	8	**8**	12	**12**	8	**8**	2	**2**	42	**8.3**
Litter			1	**1**	1	**1**			1	**1**	3	**0.6**
Nostoc	1	**1**			1	**1**					2	**0.4**
Orthothecium chryseon			2	**2**	1	**1**			1	**1**	4	**0.8**
Papaver dahlianum ssp polare D			1	**1**			1	**1**			2	**0.4**
Papaver dahlianum ssp polare L	1	**1**	1	**1**	3	**3**	1	**1**	4	**4**	10	**2.0**
Phippsia algida D			1	**1**					1	**1**	2	**0.4**
Phippsia algida L					1	**1**	1	**1**			2	**0.4**
Politrichastrum alpinum	2	**2**	4	**4**	5	**5**	5	**5**	9	**9**	25	**5.0**
Psoroma hypnorum							1	**1**			1	**0.2**
Rock	1	**1**									1	**0.2**
Saxifraga cernua L	1	**1**									1	**0.2**
Saxifraga oppositifolia L			1	**1**	1	**1**					2	**0.4**
Stellaria sp. D	1	**1**	1	**1**	2	**2**	3	**3**	4	**4**	11	**2.2**
Stellaria sp. L	1	**1**	1	**1**	1	**1**	5	**5**	2	**2**	10	**2.0**
Stereocaulon rivulorum	3	**3**	2	**2**	2	**2**			1	**1**	8	**1.6**
Stereocaulon alpinum	7	**7**	6	**6**	5	**5**	9	**9**	6	**6**	33	**6.5**
white crust	2	**2**	2	**2**	1	**1**			2	**2**	7	**1.4**
(total)	101	**100**	101	**100**	101	**100**	101	**100**	101	**100**	505	**100.0**

Leaf-area index (LAI) and Normalized Difference Vegetation Index (NDVI)

Table 6. Mean LAI and NDVI for transect and relevés at Krenkel Sites 1 and 2.

Krenkel 1		LAI	NDVI
	T61	0.03	0.389
	T62	0.04	0.392
	T63	0.06	0.414
	T64	0.04	
	T65	0.02	
	RV60		0.401
	RV61		0.451
	RV62		0.415
	RV63		0.491
	RV64		0.469
Krenkel 2			
	T66	0.01	
	T67	0.01	
	T68	0.01	
	T69	0.01	0.536
	T70	0.01	0.602
	RV65		0.467
	RV66		0.478
	RV67		0.466
	RV68		
	RV69		0.503

Thaw depth

Table 7. Active layer at transects and relevés. *Depths are in centimeters.*

Nadym-1 (no permafrost)										
Nadym-2										
See relevé data Table17. No data from transects.										
Laborovaya-1										
Transect/ Relevé #	T09	T10	T11	T12	T13	RV15	RV16	RV17	RV18	RV19
N	31	8	11	8	8	1	1	1	1	1
Max	104	87	95	100	108					
Min	56	66	75	70	66					
Aver	80.1	77.4	83.4	80.0	77.0	89	70	91	74	82
St Dev	10.10	8.05	5.66	10.58	13.88					
Laborovaya-2										
Transect/ Relevé #	T14	T15	T16	T17	T18	RV20	RV21	RV22	RV23	RV24
N	11	5	10	11	5	1	1	1	1	1
Max	119	136	134	133	136					
Min	83	95	87	104	5					
Aver	100.6	117.6	113.8	115.2	73.5	118	114	128	109	106
St Dev	10.21	13.68	14.08	9.35	60.38					
Yaskiny Dachi-1										
Transect/ Relevé #	T19	T20	T21	T22	T23	RV25	RV26	RV27	RV28	RV29
N	11	11	11	11	11	1	1	1	1	1
Max	83	80	76	84	95					
Min	57	55	61	63	74					
Aver	66.9	69.1	68.6	72.9	81.5	71	66	76	66	79
St Dev	7.54	7.40	4.34	7.35	6.22					
Yaskiny Dachi-2										
Transect/ Relevé #	T24	T25	T26	T27	T28	RV-30	RV-31	RV-32	RV-33	RV-34
N	11	11	11	11	11	1	1	1	1	1
Max	93	85	89	91	90					
Min	40	60	50	56	57					
Aver	68.5	70.5	74.2	73.2	71.5	80	77	78	57	51
St Dev	17.41	8.26	12.66	11.12	8.19					
Yaskiny Dachi-3										
Transect/ Relevé #	T29	T30	T31	T32	T33	RV-35	RV-36	RV-37	RV-38	RV-39
N	11	11	11	11	11	1	1	1	1	1
Max	127	115	125	127	127					
Min	91	85	99	104	105					
Aver	102.6	102.7	117.2	117.1	118.9	104	116	128	107	114
St Dev	11.34	9.34	8.29	5.89	7.27					
Kharasavey-1										
Transect/ Relevé #	T-46	T-47	T-48	T-49	T-50	RV-47	RV-48	RV-49		
N	6	6	6	6	6	1	1	1		
Max	84	85	85	93	86					
Min	68	70	78	64	60					
Aver	77.0	77.0	81.7	73.2	73.8	71	60	76.5		
St Dev	8.75	5.47	3.77	3.87	4.53					
Kharasavey-2a										
Transect/ Relevé #	T-41	T-42	T-43	T-44	T-45	RV-45	RV-46			
N	6	6	6	6	6	1	1			
Max	84	83	82	85	84					
Min	69	62	58	68	70					
Aver	74.8	72.7	73.2	78.2	78.5	67	77			
St Dev	5.42	8.50	8.52	6.40	5.28					

Table 7 (continued). Active layer at transects and relevés. *Depths are in centimeters.*

Kharasavey-2b										
Transect/ Relevé #	T-46	T-47	T-48	T-49	T-50	RV-47	RV-48	RV-49*		
N	6	6	6	6	6	1	1	1		
Max	93	86	91	92	98					
Min	66	64	60	64	64					
Aver	77.7	73.8	76.3	79.2	85.8	71	60	76.5		
St Dev	10.42	8.93	11.00	9.79	12.04					
Ostrov Belyy-1										
Transect/ Relevé #	T-51	T-52	T-53	T-54	T-55	RV-49 boil	RV-50 boil	RV-51 boil	RV-52 boil	RV-53 boil
N						3	3	3	3	3
Max	57	59	68	55	60	56	56	57	51	55
Min	41	41	42	42	43	50	53	55	48	48
Aver	48.8	48.8	52.5	49.8	52.1	53	54.7	55.7	49.7	52.3
St Dev	4.68	4.53	5.56	3.25	4.16	3.00	1.53	1.15	1.53	3.79
Transect/ Relevé #						RV-49 interboil	RV-50 interboil	RV-51 interboil	RV-52 interboil	RV-53 interboil
N						3	3	3	4	3
Max						52	52	49	50	49
Min						50	45	45	40	43
Aver						51.3	49	47.7	44	45.7
St Dev						1.15	3.61	2.31	4.55	3.06
Ostrov Belyy-2										
Transect/ Relevé #	T-56	T-57	T-58	T-59	T-60	RV-54 polygon	RV-55 polygon	RV-56 polygon	RV-57 polygon	RV-58 polygon
N						-	3	3	3	3
Max						-	100	90	84	71
Min						-	97	73	74	57
Aver						89	98	81	79.7	65.3
St Dev						-	1.73	8.54	5.13	7.37
Transect/ Relevé #						RV-54 trough	RV-55 trough	RV-56 trough	RV-57 trough	RV-58 trough
N						-	3	3	3	3
Max						-	97	82	86	77
Min						-	86	55	67	60
Aver						81	92	71.7	75	68.3
St Dev						-	5.57	14.57	9.85	8.50
Krenkel Station										
Transect/ Relevé #	ALD	KR 61 even	KR 62		KR 63		KR 64		KR 65	KR 65 even
N						-	3	3	3	3
Max	37	37	37		36		37		35	35
Min	27	27	32		33		32		30	30
Aver	31.1373	31.2308	34.8077		34.6538		34.5926		32.9216	32.88462
St Dev	2.17274	2.4217	1.16685		0.93562		1.36605		1.23034	1.107318
Transect/ Relevé #	ALD	KR 67	KR 68	KR 69	KR70					
N										
Max	36	38	37	35	37					
Min	30	29	29	27	28					
Aver	33.1154	32.8846	32.1154	31.1154	31.8077					
St Dev	1.53172	2.45482	2.38876	2.10384	2.02028					

Factors measured in study plots

Relevé data

Table 8. Soils data for all EAT relevés.

			Based on 100 C oven dry															
Releve	Gravel	Paste	%	%	%	%	%	meq/100g	meq/100g	meq/100g	meq/100g	meq/100g	Wet soil	Air dry	Weight of H2O	Gravimetric Soil Moisture	Volumetric Soil Moisture	bulk dens.
	> 2mm (%)	pH	Sand	Silt	Clay	C	N	CEC	K	Ca	Mg	Na	Wt	soil wt		(%)	(%)	(g cm-3)
ND-1	<.01	3.25	50.4	38.0	11.6	5.06	0.15	17.53	0.12	0.50	0.22	0.04	110.45	90.5	19.95	22	11	0.49
ND-2	<.01	3.71	38.4	48.4	13.2	1.43	0.03	7.29	0.06	0.17	0.08	0.02	185.45	161.9	23.59	15	13	0.88
ND-3	<.01	3.36	56.4	34.4	9.2	4.56	0.13	15.02	0.09	0.37	0.17	0.05	113.75	93.25	20.5	22	11	0.51
ND-4	<.01	3.54	46.4	44.4	9.2	3.47	0.09	12.67	0.07	0.25	0.16	0.03	119.55	103.7	15.9	15	9	0.56
ND-5	<.01	3.39	52.4	36.4	11.2	2.42	0.04	12.93	0.08	0.49	0.15	0.03	138.05	123.3	14.72	12	8	0.67
ND-6																		
ND-7																		
ND-8	<.01	3.43	84.4	12.8	2.8	0.73	<.01	2.69	0.01	0.10	0.02	<.01	234.2	208.9	25.31	12	14	1.13
ND-9																		
ND-10																		
ND-11	<.01	3.66	96.4	0.8	2.8	0.38	<.01	0.78	0.01	0.06	0.01	0.01	237.05	220.8	16.27	7	9	1.20
ND-12																		
ND-13																		
ND-14																		
LA-15	0.49	4.30	14.4	62.4	23.2	2.36	0.09	10.42	0.11	7.02	4.99	0.11	268.25	197.4	70.88	36	38	1.07
LA-16	0.41	4.36	20.4	58.8	20.8	1.86	0.08	17.97	0.14	6.45	4.72	0.09	265.55	200.4	65.15	33	35	1.09
LA-17	0.82	4.83	12.4	63.8	23.8	1.22	0.04	17.88	0.19	7.76	5.66	0.11	295.15	231	64.16	28	35	1.25
LA-18	0.94	4.65	14.4	62.8	22.8	1.45	0.04	17.71	0.15	6.71	5.43	0.14	315.95	247.7	68.3	28	37	1.34
LA-19	3.26	5.27	28.4	48.8	22.8	1.73	0.05	14.93	0.12	6.93	5.32	0.09	309.85	239.6	70.27	29	38	1.30
LA-20	<.01	3.76	96.4	0.8	2.8	0.70	0.01	3.56	0.02	0.41	0.35	0.03	250.85	220.6	30.21	14	16	1.20
LA-21	0.37	3.88	96.4	0.8	2.8	0.38	<.01	1.13	0.01	0.09	0.03	0.02	270.25	243.1	27.15	11	15	1.32
LA-22	2.53	4.07	94.4	2.8	2.8	0.56	<.01	2.52	0.01	0.10	0.05	0.02	246.45	222.90	23.55	11	13	1.21
LA-23	1.42	3.81	96.4	0.8	2.8	0.46	<.01	2.34	0.01	0.44	0.30	0.02	290.65	247.75	42.90	17	23	1.34
LA-24	<.01	3.57	84.4	12.8	2.8	0.84	<.01	3.73	0.02	0.36	0.17	0.04	324.35	259.33	65.02	25	35	1.41
VD-25	<.01	4.40	26.4	68.8	4.8	5.98	0.36	21.53	0.17	8.51	3.64	0.12	238.35	155.73	82.62	53	45	0.84
VD-26	0.25	4.97	20.4	62.8	16.8	0.75	0.01	10.94	0.16	5.85	3.28	0.12	326.35	262.04	64.31	25	35	1.42
VD-27	<.01	4.54	28.4	62.8	8.8	1.18	0.03	8.33	0.09	4.56	2.19	0.11	301.75	243.47	58.28	24	32	1.32
VD-28	<.01	4.30	24.4	66.8	8.8	1.00	0.01	7.81	0.07	3.03	1.97	0.09	274.05	252.80	21.25	8	12	1.37
VD-29	<.01	3.83	42.4	50.8	6.8	2.06	0.06	10.24	0.13	2.33	1.22	0.04	287.65	233.60	54.05	23	29	1.27
VD-30	<.01	3.92	39.0	56.6	4.4	1.93	0.04	9.11	0.05	1.79	1.02	0.08	293.75	232.43	61.32	26	33	1.26
VD-31	<.01	3.94	35.6	56.0	8.4	1.19	<.01	8.68	0.07	2.43	1.46	0.10	297.55	249.27	48.28	19	26	1.35
VD-32	<.01	3.98	53.6	38.6	7.8	0.86	<.01	7.03	0.09	2.62	1.66	0.07	310.95	258.00	52.95	21	29	1.40
VD-33	<.01	3.88	35.6	55.6	8.8	2.06	0.04	13.11	0.06	2.42	1.69	0.09	313.75	256.89	56.86	22	31	1.39
VD-34	<.01	4.44	27.6	62.6	9.8	1.28	<.01	8.51	0.05	3.35	2.33	0.13	330.15	270.95	59.20	22	32	1.47
VD-35	<.01	3.52	95.6	1.6	2.8	0.74	<.01	2.69	0.02	0.17	0.11	0.02	283.35	235.85	47.50	20	26	1.28
VD-36	<.01	3.58	95.6	2.0	2.4	0.55	0.01	2.95	0.01	0.11	0.07	0.01	264.45	230.59	33.86	15	18	1.25
VD-37	<.01	3.54	93.6	3.6	2.8	1.75	0.06	5.90	0.05	0.69	0.35	0.05	227.55	186.04	41.51	22	22	1.01
VD-38	<.01	3.87	85.6	12.0	2.4	0.98	0.01	5.29	0.02	0.11	0.07	0.03	267.85	221.05	46.80	21	25	1.20
VD-39	<.01	3.45	93.6	4.0	2.4	2.53	0.10	3.56	0.03	0.29	0.22	0.01	259.55	211.65	47.90	23	26	1.15
KH-40	<.01	4.36	34.8	44.4	20.8	0.67	0.03	9.45	0.08	2.45	2.96	0.12	349.6	298.5	51.1	17	28	1.66
KH-41	<.01	4.68	19.8	55.4	24.8	1.22	0.07	14.24	0.16	4.15	5.48	0.17	298	241.5	56.5	23	31	1.34
KH-42	<.01	4.95	18.8	56.4	24.8	1.41	0.08	13.79	0.26	4.47	5.90	0.15	313.5	253.6	59.9	24	32	1.41
KH-43	<.01	4.50	18.8	57.4	23.8	3.87	0.30	23.22	0.21	5.97	7.14	0.23	273	186.5	86.5	46	47	1.04
KH-44	<.01	4.72	21.2	56.0	22.8	2.67	0.19	17.85	0.23	6.27	6.74	0.22	254.2	182.3	71.9	39	39	1.01
KH-45	<.01	4.18	95.2	2.0	2.8	2.71	0.13	4.37	0.07	0.81	0.74	0.09	183.3	158.3	25	16	14	0.88
KH-46	<.01	3.97	65.6	25.6	8.8	1.06	0.05	5.61	0.06	0.85	1.05	0.14	253.2	219.8	33.4	15	18	1.22
KH-47	<.01	4.21	65.6	27.6	6.8	1.29	0.08	7.18	0.19	1.11	1.24	0.14	254.3	218.1	36.2	17	20	1.21
KH-48	<.01	4.14	70.0	26.2	3.8	4.67	0.26	12.65	0.15	2.73	1.70	0.20	217.7	164.6	53.1	32	29	0.91
KH-49*	<.01	4.04	64.0	29.2	6.8	5.87	0.33	13.56	0.14	2.28	2.10	0.17	228	178.3	49.7	28	27	0.99
BO-49a	<.01	4.59	34.4	48.0	17.6	1.06	0.04	11.76	0.16	5.08	3.77	0.24	308.3	255.70	52.60	21.26	11.57	1.39
BO-50a	<.01	5.49	34.4	49.0	16.6	0.81	0.04	11.42	0.29	5.74	3.94	0.19	291.5	238.70	52.80	22.92	12.48	1.30
BO-51a	<.01	5.03	34.4	46.0	19.6	0.71	0.02	6.68	0.29	5.83	3.86	0.19	302.1	250.40	51.70	21.35	11.62	1.36
BO-52a	<.01	4.70	42.8	42.0	15.2	0.74	0.03	9.19	0.12	4.25	2.93	0.20	330.1	278.60	51.50	19.05	10.37	1.52
BO-53a	<.01	5.31	42.8	35.0	22.2	1.31	0.13	17.47	0.37	9.91	5.18	0.29	284.7	219.50	65.20	30.87	16.81	1.19
BO-49b	<.01	4.29	53.2	42.0	4.8	5.60	2.26	19.90	0.15	6.41	3.86	0.29	250.5	161.40	89.10	58.20	31.68	0.88
BO-50b	<.01	4.55	55.2	40.0	4.8	6.87	3.71	16.71	0.19	9.00	4.83	0.33	284.4	138.10	146.30	112.37	61.17	0.75
BO-51b	<.01	4.39	45.2	45.0	9.8	3.97	1.21	23.24	0.19	9.59	5.84	0.38	246.3	160.00	86.30	56.81	30.93	0.87
BO-52b	<.01	4.29	47.2	44.4	8.4	2.31	0.41	14.93	0.11	5.36	3.65	0.23	278	198.20	79.80	41.89	22.80	1.08
BO-53b	<.01	4.23	52.2	39.4	8.4	1.11	0.04	7.43	0.09	2.75	1.74	0.21	299.2	240.90	58.30	25.08	13.65	1.31
BO-54	<.01	4.03	79.2	16.4	4.4	0.65	0.02	3.57	0.06	0.73	0.80	0.16	262.5	229.90	32.60	14.71	8.01	1.25
BO-55	<.01	3.81	78.4	18.0	3.6	0.78	0.02	4.00	0.05	0.51	0.45	0.14	238.9	212.80	26.10	12.74	6.94	1.16
BO-56	<.01	4.23	93.4	2.6	4.0	0.29	<.01	1.56	0.03	0.51	0.60	0.05	228.1	201.30	26.80	13.89	7.56	1.10
BO-57	<.01	4.00	83.4	12.6	4.0	0.71	0.01	3.83	0.06	0.63	0.45	0.06	314.1	263.60	50.50	19.73	10.74	1.43
BO-58	<.01	3.99	84.4	11.2	4.4	0.66	0.01	3.74	0.03	0.36	0.20	0.07	290.6	252.20	38.40	15.76	8.58	1.37
KR-60	<.01	6.20	63.20	31.00	5.80	1.31	0.12	6.46	0.06	6.28	1.14	0.06	290.19	217.9	72.28	33.18	39.35	1.19
KR-61	2.47	6.01	55.20	35.00	9.80	1.28	0.11	6.91	0.09	8.18	1.35	0.08	313.96	244.4	69.61	28.50	37.89	1.33
KR-62	<.01	5.97	62.00	33.20	4.80	1.37	0.12	6.55	0.06	6.44	1.05	0.06	311.39	236.3	75.09	31.79	40.88	1.29
KR-63	<.01	6.10	56.00	34.20	9.80	1.20	0.08	9.19	0.10	8.91	1.72	0.12	303.00	244.2	58.83	24.11	32.03	1.33
KR-64	<.01	6.48	64.00	31.20	4.80	1.45	0.10	6.29	0.06	8.68	1.02	0.02	299.13	223.7	75.46	33.74	41.08	1.22
KR-65	<.01	5.57	88.80	10.40	0.80	0.48	0.04	2.78	0.09	1.48	0.86	0.18	294.31	238.3	56.03	23.53	30.50	1.30
KR-66	<.01	5.16	76.20	21.00	2.80	1.25	0.09	5.32	0.11	2.87	1.72	0.20	288.19	222.2	66.04	29.75	35.95	1.21
KR-67	<.01	6.52	79.60	19.60	0.80	0.57	0.05	4.00	0.11	3.49	0.91	0.21	312.52	248	64.50	26.03	35.11	1.35
KR-68	<.01	5.15	80.60	14.60	4.80	1.17	0.10	4.27	0.14	2.88	1.83	0.24	295.90	235.3	60.65	25.81	33.02	1.28
KR-69	<.01	5.16	81.60	15.60	2.80	0.75	0.05	2.70	0.09	2.20	1.62	0.13	278.11	226.7	51.42	22.70	27.99	1.23

Table 9. Site descriptions for all EAT relevés. *Characteristic species use six letter abbreviations (first three letters of genus name + first three letters of species name). Observers: PK, Patrick Kuss; NM, Nataliya Moskalenko; EK, Elina Kärlajaarvi; RD, Ronnie Daanen; HE; Howie Epstein; JG, Josef Geml; IT, Ina Timling; SW, Skip Walker. Photo archives are at UAF.*

Relevé #	Location	Study site	Characteristic species	Date	Observer	Plot size (m2)	GPS north	GPS east	Elev. (m)	Slope (°)	Aspect	Photo
01	Nadym	Forest	Pinsyl, Betpub, Betnan, Ledpal, Vacmyr, Claste, Piesch	6-Aug-07	PK	10x10	65 18.810	72 53.226	25	0	0	ll photos in folder: /geobotany/Nasa_Yamal/
02	Nadym	Forest	Pinsyl, Betpub, Betnan, Ledpal, Vacmyr, Claste, Piesch	6-Aug-07	PK	10x10	65 18.794	72 53.277	25	0	0	Photos Satellite Images airphotos Maps/
03	Nadym	Forest	Pinsyl, Ledpal, Vacmyr, Claste	6-Aug-07	PK	10x10	65 18.811	72 53.274	25	0	0	Photos/SubzoneN ND Nadym/
04	Nadym	Forest	Pinsyl, Betnan, Ledpal, Claste	6-Aug-07	PK	10x10	65 18.831	72 53.261	25	0	0	ND Site1 ForestSite
05	Nadym	Forest	Betpub, Ledpal, Vacmyr, Claste	6-Aug-07	PK	10x10	65 18.814	72 53.314	25	0	0	Terrasse2
06	Nadym	CALM-grid, hummock	Ledpal, Rubcha, Claste	8-Aug-07	PK,NM	1x1	65 18.883	72 51.703	23	0	0	ll photos in folder: /geobotany/Nasa_Yamal/
07	Nadym	CALM-grid, hummock	Ledpal, Rubcha, Sphfus	8-Aug-07	PK,NM	1x1	65 18.863	72 51.695	23	0	0	Photos Satellite Images airphotos Maps/
08	Nadym	CALM-grid, hummock	Betnan, Ledpal, Carglo, Clasty	8-Aug-07	PK,NM	1x1	65 18.888	72 51.785	23	0	0	Photos/SubzoneN ND Nadym/
09	Nadym	CALM-grid, inter-hummock	Claste, Clasty	8-Aug-07	PK,NM	1x1	65 18.884	72 51.702	21	0	0	ND Site2 CALMGrid
10	Nadym	CALM-grid, inter-hummock	Carglo, Claste, Clasty	8-Aug-07	PK,NM	1x1	65 18.867	72 51.703	21	0	0	Terrasse3
11	Nadym	CALM-grid, inter-hummock	Carglo, Claste, Clasty	8-Aug-07	PK,NM	1x1	65 18.887	72 51.785	21	0	0	
12	Nadym	CALM-grid, mire	Carcho, Carrot, Shpmaj	8-Aug-07	PK,NM	1x1	65 18.825	72 51.737	18	0	0	
13	Nadym	CALM-grid, mire	Carrot, Sphmaj	8-Aug-07	PK,NM	1x1	65 18.824	72 51.803	18	0	0	
14	Nadym	CALM-grid, mire	Carrot, Sphmaj	8-Aug-07	PK,NM	1x1	65 18.828	72 51.831	18	0	0	
15	Laborovaya	Clay-site	Betnan, Vacvit, Erivag, Dicelo	15-Aug-07	EK,NM,PK	5x5	67 42.397	67 59.946	79	2	SW	ll photos in folder: /geobotany/Nasa_Yamal/
16	Laborovaya	Clay-site	Betnan, Carbiq, Dicelo	15-Aug-07	EK,NM,PK	5x5	67 42.387	67 59.970	80	2	SW	Photos Satellite Images airphotos Maps/
17	Laborovaya	Clay-site	Betnan, Vacvit, Carbiq, Dicelo	15-Aug-07	EK,NM,PK	5x5	67 42.396	67 59.971	80	2	SW	Photos/SubzoneE LA Laborovaya/
18	Laborovaya	Clay-site	Betnan, Carbiq, Dicelo	15-Aug-07	EK,NM,PK	5x5	67 42.406	67 59.969	80	2	SW	LA Site1
19	Laborovaya	Clay-site	Betnan, Salphy, Vacvit, Carbiq, Dicelo	15-Aug-07	EK,NM,PK	5x5	67 42.397	67 59.995	80	2	SW	ClayeySite
20	Laborovaya	Sand-site	Betnan, Vaculi, Claarb, Sphglo, Dicelo	17-Aug-07	PK,NM,SW,EK	5x5	67 41.691	68 02.244	60	1	S	ll photos in folder: /geobotany/Nasa_Yamal/
21	Laborovaya	Sand-site	Betnan, Vaculi, Sphglo, Dicelo	17-Aug-07	PK,NM,SW,EK	5x5	67 41.684	68 02.283	60	1	S	Photos Satellite Images airphotos Maps/
22	Laborovaya	Sand-site	Vaculi, Sphglo, Dicelo	17-Aug-07	NM,PK	5x5	67 41.694	68 02.270	60	1	S	Photos/SubzoneE LA Laborovaya/
23	Laborovaya	Sand-site	Betnan, Vaculi, Carbiq, Claarb, Dicelo, Polstr	17-Aug-07	NM,PK	5x5	67 41.703	68 02.277	60	1	S	LA Site2
24	Laborovaya	Sand-site	Betnan, Empsub, Vaculi, Carbiq, Claarb, Dicelo	17-Aug-07	NM,PK	5x5	67 41.696	68 02.301	60	1	S	SandySite
25	Vaskiny Dachi	Terrace IV	Salnum, Carbiq, Aultur, Hylspl	23-Aug-07	PK,NM,SW,EK	5x5	70 16.540	68 53.446	40	2	S	ll photos in folder: /geobotany/Nasa_Yamal/
26	Vaskiny Dachi	Terrace IV	Dryoct, Salpol, Carbiq, Aultur, Hylspl, Tomnit	23-Aug-07	PK,NM	5x5	70 16.528	68 53.465	40	2	S	Photos Satellite Images airphotos Maps/
27	Vaskiny Dachi	Terrace IV	Salnum, Salpol, Carbiq, Aultur, Hylspl	23-Aug-07	PK,NM	5x5	70 16.538	68 53.469	40	2	S	Photos/SubzoneD VD VaskinyDachi/
28	Vaskiny Dachi	Terrace IV	Salnum, Carbiq, Aultur, Hylspl	23-Aug-07	PK,NM	5x5	70 16.547	68 53.475	40	2	S	VD Site1 LoamySite Terrasse4
29	Vaskiny Dachi	Terrace IV	Salnum, Carbiq, Aultur, Polstr	23-Aug-07	PK,NM	5x5	70 16.536	68 53.498	40	2	S	
30	Vaskiny Dachi	Terrace III	Betnan, Vacvit, Calhol, Aultur, Hylspl, Ditfle	26-Aug-07	PK,NM,SW,EK	5x5	70 17.734	68 53.027	30	2	SW	ll photos in folder: /geobotany/Nasa_Yamal/
31	Vaskiny Dachi	Terrace III	Betnan, Vacvit, Calhol,Ditfle, Aultur	26-Aug-07	PK,NM	5x5	70 17.731	68 53.065	30	2	SW	Photos Satellite Images airphotos Maps/
32	Vaskiny Dachi	Terrace III	Betnan, Vacvit, Calhol, Stelae	26-Aug-07	PK,NM	5x5	70 17.739	68 53.052	30	2	SW	Photos/SubzoneD VD VaskinyDachi
33	Vaskiny Dachi	Terrace III	Vacvit, Calhol,Carbiq, Dicacu	26-Aug-07	PK,NM	5x5	70 17.747	68 53.038	30	2	SW	/VD Site2
34	Vaskiny Dachi	Terrace III	Betnan, Vacvit, Calhol, Stelae, Dicacu	26-Aug-07	PK,NM	5x5	70 17.744	68 53.077	30	2	SW	ClayeySite Terrasse3
35	Vaskiny Dachi	Terrace II	Vacvit, Carbiq, Sphglo, Raclan	28-Aug-07	PK,NM,SW,EK	5x5	70 18.088	68 50.519	15	1	NW	ll photos in folder: /geobotany/Nasa_Yamal/
36	Vaskiny Dachi	Terrace II	Ledpal, Vacvit, Carbiq, Sphglo, Raclan	28-Aug-07	PK,NM	5x5	70 18.031	68 50.587	15	1	NW	Photos Satellite Images airphotos Maps/
37	Vaskiny Dachi	Terrace II	Ledpal, Salnum, BlackCrust	28-Aug-07	PK,NM	5x5	70 18.060	68 50.580	15	1	NW	Photos/SubzoneD VD VaskinyDachi
38	Vaskiny Dachi	Terrace II	Vacvit, Carbiq, BlackCrust, Raclan	28-Aug-07	PK,NM	5x5	70 18.097	68 50.554	15	1	NW	/VD Site3
39	Vaskiny Dachi	Terrace II	Ledpal, Salnum, BlackCrust, Raclan	28-Aug-07	PK,NM	5x5	70 18.031	68.50.625	15	1	NW	SandySite Terrasse2
40	Kharasavey	Clay-site	Carbiq, Salpol, Calhol, Dicspp, Hylspl, Poljun, Claspp	21-Aug-08	SW,NM,JG	5x5	71 10.723	66 58.778	16	0	0	Portfolio Database
41	Kharasavey	Clay-site	Carbiq, Salpol, Carhol, Dicspp, Claunc, Sphglo	21-Aug-08	SW,NM,JG	5x5	71 10.719	66 58.819	16	0	0	d8008DSC 1502-1559
42	Kharasavey	Clay-site	Carbiq, Salpol, Calhol, Dicspp, Poljun	21-Aug-08	SW,NM,JG	5x5	71 10.727	66 58.803	16	0	0	
43	Kharasavey	Clay-site	Eriang, Salpol, Carbiq, Calhol, Poljun, Dicspp	21-Aug-08	SW,NM,JG	5x5	71 10.738	66 58.778	16	0	0	
44	Kharasavey	Clay-site	Carbiq, Salpol, Calhol, Poljun, Dicspp, Ochfri, Claqra	21-Aug-08	SW,NM,JG	5x5	71 10.733	66 58.828	16	0	0	
45	Kharasavey	Sand-sites	Salnum, Vacvit, Carbiq, Calhol, Claspp, Dicelo, Thaver	22-Aug-08	SW,NM,JG,HE	5x5	71 11.663	66 53.337	8	0	0	Portfolio Database
46	Kharasavey	Sand-sites	Salnum, Vacvit, Carbiq, Claspp, Dicspp, Thaver	22-Aug-08	SW,NM,JG,HE	5x5	71 11.667	66 53.341	8	0	0	d8008DSC 1792-1813, 1882-1893
47	Kharasavey	Sand-sites	Salnum, Poljun, Thaver, Claspp	23-Aug-08	SW,NM,JG,HE	5x5	71 11.664	66 55.719	13	0	0	
48	Kharasavey	Sand-sites	Salnum, Poljun, Hylspl, Thaver, Claspp	23-Aug-08	SW,NM,JG,HE	5x5	71 11.667	66 55.731	13	0	0	
49*	Kharasavey	Sand-sites	Salnum, Carbiq, Aultur, Dicspp, Ochfri, Claspp, Thaver	23-Aug-08	SW,NM,JG,HE	5x5	71 11.632	66 56.071	13	0	0	
49	Ostrov Belyy	Clayey-site	Carbiq, Salpol, Hylspl, sedge, dwarf shrub, moss	24-Jul-09	SW, RD, HE	5x5	73 19.713	70 04.674	0.3	0-2	NE	Portfolio Database d9009DSC 1582--1658,
50	Ostrov Belyy	Clayey-site	Carbiq, Salpol, Hylspl, sedge, dwarf shrub, moss	24-Jul-09	SW, RD, HE	5x5	73 19.713	70 04.713	0.4	0-2	NE	1725-1749
51	Ostrov Belyy	Clayey-site	Carbiq, Salpol, Hylspl, sedge, dwarf shrub, moss	24-Jul-09	SW, RD, HE	5x5	73 19.719	70 04.692	0.6	0-2	NE	
52	Ostrov Belyy	Clayey-site	Carbiq, Salpol, Hylspl, sedge, dwarf shrub, moss	24-Jul-09	SW, RD, HE	5x5	73 19.726	70 04.668	0.4	0-2	NE	
53	Ostrov Belyy	Clayey-site	Carbiq, Salpol, Hylspl, sedge, dwarf shrub, moss	24-Jul-09	SW, RD, HE	5x5	73 19.726	70 04.712	0.8	0-2	NE	
54	Ostrov Belyy	Sandy-site	dry Gymcor, Salnum, Raclan	22-Jul-09	SW, RD, HE	5x5	73 18.553	70 07.728	0.3	0	0	Portfolio Database d9009DSC 1449-1581
55	Ostrov Belyy	Sandy-site	dry Gymcor, Salnum, Raclan	22-Jul-09	SW, RD, HE	5x5	73 18.555	70 07.765	0	0	0	
56	Ostrov Belyy	Sandy-site	dry Gymcor, Salnum, Raclan	22-Jul-09	SW, RD, HE	5x5	73 18.564	70 07.737	0.4	0	0	
57	Ostrov Belyy	Sandy-site	dry Gymcor, Salnum, Raclan	22-Jul-09	SW, RD, HE	5x5	73 18.566	70 07.719	0.8	0	0	
58	Ostrov Belyy	Sandy-site	dry Gymcor, Salnum, Raclan	22-Jul-09	SW, RD, HE	5x5	73 18.568	70 07.768	0.1	0	0	
60	Krenkel	Sandy loam site	Papdah, Stelsp, Black crust, Cetspp, Ditfle, Orthchr, Circir	11-Aug-10	SW, IT	5x5	80 35.569	57 54.177	30	4	W	Portfolio Database d9010DSC 5284-5387
61	Krenkel	Sandy loam site	Papdah, Stelsp, Black crust, Cetspp, Ditfle, Orthchr, Circir	11-Aug-10	SW, IT	5x5	80 35.581	57 54.174	30	4	W	
62	Krenkel	Sandy loam site	Papdah, Stelsp, Black crust, Cetspp, Ditfle, Orthchr, Circir	11-Aug-10	SW, IT	5x5	80 35.574	57 54.130	30	4	W	
63	Krenkel	Sandy loam site	Papdah, Stelsp, Black crust, Cetspp, Ditfle, Orthchr, Circir	11-Aug-10	SW, IT	5x5	80 35.567	57 54.096	30	4	W	
64	Krenkel	Sandy loam site	Papdah, Stelsp, Black crust, Cetspp, Ditfle, Orthchr, Circir	11-Aug-10	SW, IT	5x5	80 35.580	57 54.092	30	4	W	
65	Krenkel	Sandy site	Papdah, Stelsp, Saxcer, Cocoff, Phialq, Cetspp, Blk Crst	12-Aug-10	SW, IT	5x5	80 36.426	57 54.430	10	0	0	Portfolio Database d9010DSC 5388-5517
66	Krenkel	Sandy site	Papdah, Stelsp, Saxcer, Cocoff, Phialq, Cetspp, Blk Crst	12-Aug-10	SW, IT	5x5	80 36.414	57 54.479	10	0	0	
67	Krenkel	Sandy site	Papdah, Stelsp, Saxcer, Cocoff, Phialq, Cetspp, Blk Crst	12-Aug-10	SW, IT	5x5	80 36.425	57 54.495	10	0	0	
68	Krenkel	Sandy site	Papdah, Stelsp, Saxcer, Cocoff, Phialq, Cetspp, Blk Crst	12-Aug-10	SW, IT	5x5	80 36.432	57 54.508	10	0	0	
69	Krenkel	Sandy site	Papdah, Stelsp, Saxcer, Cocoff, Phialq, Cetspp, Blk Crst	12-Aug-10	SW, IT	5x5	80 36.421	57 54.547	10	0	0	

Table 10. Site characteristics for all EAT relevés. *For key to values, see Walker et al. 2009a.*

Releve #	Tree height	Shrub height	Herbs height	Moss height	Soil moss horizon thickness	Soil organic horizon thickness	Soil A-horizon thicknes s	Micro-relief	Mean thaw depth	Landform	Surficial geology, parent material	Surficial geomorpholog y	Micro-site	Site moisture	Soil moisture	Topographic position	Snow bank persistence after meltout	Disturbance degree	Disturbance type	Stability	Exposure
	height / cm																				
01	800	50	10	0	0	4	0	40	NA	4	5	11	0	4	3	4	5	0	0	1	1
02	1000	50	10	0	0	4	0	50	NA	4	5	11	0	4	3	4	5	0	0	1	1
03	900	60	12	0	0	2	0	20	NA	4	5	11	0	4	3	4	5	0	0	1	1
04	1100	50	10	0	0	3	0	20	NA	4	5	11	0	4	3	4	5	0	0	1	1
05	1100	45	10	0	0.5	4	0	30	NA	4	5	11	0	4	3	4	5	0	0	1	1
06	0	15	0	0	1	>40	?	30	40	4	5	3	3	6	5	4	3	0	0	3	3
07	0	15	0	1	27	>40	?	20	36	4	5	3	3	6	5	4	3	0	0	3	3
08	0	15	0	0	1	2	1	30	?	4	5	3	3	6	5	4	3	0	0	3	3
09	0	10	10	0	0	25	1	5	50	4	5	6	4	6	5	4	5	0	0	3	3
10	0	10	15	0	20	>20	?	10	60	4	5	6	4	6	5	4	5	0	0	3	3
11	0	10	15	0	0	2	0.5	10	?	4	5	6	4	6	5	4	5	0	0	3	3
12	0	0	25	0	0	?	?	0	?	4	NA	19	0	10	10	4	5	0	0	1	2
13	0	0	25	0	0	?	?	0	?	4	NA	19	0	10	10	4	5	0	0	1	2
14	0	0	25	0	0	?	?	0	?	4	NA	19	0	10	10	4	5	0	0	1	2
15	0	30	10	5	3	5	6	30	89	4	?	11	0	5	6	4	4	2	2,3	1	2
16	0	20	35	2	2	10	3	15	70	4	?	11	0	5	6	4	4	2	2,3	1	2
17	0	15	25	2	2	6	0.5	30	91	4	?	11	0	5	6	4	4	2	2,3	1	2
18	0	30	35	2	2	4	0.5	20	74	4	?	11	0	5	6	4	4	2	2,3	1	2
19	0	25	30	2	2	3	2	20	82	4	?	11	0	5	6	4	4	2	2,3	1	2
20	0	5	15	2	0	1	3	10	118	4	5	18	NA	5	5	4	4	2	3	1	2
21	0	5	5	1	0	3	2	10	114	4	5	6,18	NA	5	5	4	4	2	3	1	2
22	0	8	5	1	0	4	1	5	128	4	5	6,18	NA	5	5	4	4	2	3	1	2
23	0	10	10	1	0	4	2	10	109	4	5	6,18	NA	5	5	4	4	2	3	1	2
24	0	20	3	2	1	5	3	10	106	4	5	6,18	NA	5	5	4	4	2	3	1	2
25	0	10	10	1	1	3	1	5	70	1, 5	15	11	0	6	6	1	3	3	1, 2	1	3
26	0	10	15	1	1	4	1	5	66	1, 5	15	11	0	6	6	1	3	3	1, 2	1	3
27	0	8	10	1	4	3.5	1	5	76	1, 5	15	11	0	6	6	1	3	3	1, 2	1	3
28	0	10	10	1	2	4	1	5	66	1, 5	15	11	0	6	6	1	3	3	1, 2	1	3
29	0	2	10	1	3	2	1	5	79	1, 5	15	11	0	6	6	1	3	3	1, 2	1	3
30	0	5	7	1	3.5	2.5	2	5	71	5	16	11	0	5	6	1	4	2	1, 2, 3	1	3
31	0	5	7	1	4	4.5	1	5	71	5	16	11	0	5	6	1	4	2	1, 2, 3	1	3
32	0	5	7	1	2	2	0	5	76	5	16	11	0	5	6	1	4	2	1, 2, 3	1	3
33	0	5	7	1	3	4	9	5	61	5	16	11	0	5	6	1	4	2	1, 2, 3	1	3
34	0	5	7	1	3	3.5	0	5	61	5	16	11	0	5	6	1	4	2	1, 2, 3	1	3
35	0	1	4	0.5	2	3	2	5	0	5	15	11	0	3	2	4	3	2	1, 2, 3	1	3
36	0	3	4	1	1	1	1	5	0	5	15	11	0	3	2	4	3	2	1, 2, 3	1	3
37	0	2	2	1	1	2	2	5	0	5	15	11	0	3	2	4	3	2	1, 2, 3	1	3
38	0	2	2	1	0	0.5	5	5	0	5	15	11	0	3	2	4	3	2	1, 2, 3	1	3
39	0	3	4	1	1	0	1	5	0	5	15	11	0	3	2	4	3	2	1, 2, 3	1	3
40	0	2	10	2	2	6	4	10	60	5	16	1 (30%)	1,2	6	5	4	9	3.5	1,3	1	2
41	0	2	10	2	2	6	0	13	67/52	5	16	1(30%)	1,2	6	5	4	9	3.5	1,3	1	2
42	0	2	10	2	2	6	0	10	59/50	5	16	1(30%)	1,2	6.5	5	4	9	1	3	1	2
43	0	2	10	2	3	8	2	10	56/52	5	16	1(10%)	1,2	6	6	4	9	2	1,3	1	2
44	0	2	10	2	3	6	0	12	64/46	5	16	1(50%)	1,2	6	6	4	9	2	3	1	2
45	0	1	3	1	3	2	1	5	67	14	15	11	.	5	4	4	3	1	3	1	3
46	0	1	3	1	2	2	1	10	77	14	15	11	.	5	4	4	3	1	2,3	1	3
47	0	1	5	1	1	0.5	1	5	74	14	15	11,3	.	4	4	1	2	1	1,3	1	3
48	0	1	5	1	1	3	4	5	70	14	15	11,3	.	4	4	1	2	2	1,3,8	1	3
49*	0	1	5	1	1	5	2	5	76.5	14	15	1	1,2	4.5	4	1	2	2	1,3,2,7	1	3
49a	0	1	2	1	1	2	0	4	53	20	16	1	1	5	6	4	4	2	3	4	2
49b	0	1	6	2	2	2	3	5	51.3	20	16	1	2	6	7	4	4	2	3	1	2
50a	0	1	3	0.5	0.5	0	2	4	54.7	20	16	1	1	5	6	4	4	2	3	4	2
50b	0	1	7	1	1	3.5	9	5	49	20	16	1	2	6	7	4	4	2	3	1	2
51a	0	1	3	0.5	0.5	1	0	2	55.7	20	16	1	1	5	6	4	4	2	3	4	2
51b	0	1	5	1	1	5	4	5	47.7	20	16	1	2	6	7	4	4	2	3	1	2
52a	0	1	3	0.5	0.5	0	1	2	49.7	20	16	1	1	5	6	4	4	2	3	4	2
52b	0	1	6	4	4	5	1	5	44	20	16	1	2	6	7	4	4	2	3	1	2
53a	0	1	3	0.5	0.5	0	0	2	52.3	20	16	1	1	5	6	2	4	2	3	4	2
53b	0	1	6	2	1.5	1.5	3	5	45.7	20	16	1	2	6	7	2	4	2	3	1	2
54a	0	0.5	1	0	0	0	0	2	89	14	15	20	13	3	3	4	2	2	1,3,8	1	3
54b	0	1	2	1	1	1	0	10	81	14	15	20	14	4	4	4	4	1	1,3,8	1	2
55a	0	0.5	1	0	0	0	0	2	98	14	15	20	13	3	3	4	2	1	1,2,3,8	1	3
55b	0	1	2	1	1	1	2	10	92	14	15	20	14	4	4	4	4	0	1,2,3,8	1	2
56a	0	0.5	1	0	0	0	0	2	81	14	15	20	13	3	3	4	2	1	1,3	1	3
56b	0	1	2	1	1	1	5	15	72	14	15	20	14	4	4	4	4	0	1,3	1	2
57a	0	0.5	1	0	0	0	0	2	79.7	14	15	20	13	3	3	4	2	1	1,3	1	3
57b	0	1	2	1	1	0	1	10	75	14	15	20	14	4	4	4	4	0	1,3	1	2
58a	0	0.5	1	0	0	0	0	2	65.3	14	15	20	13	3	3	4	2	1	1,3	1	3
58b	0	1	2	1	1	1	2	5	68.3	14	15	20	14	4	4	4	4	0	1,3	1	2
60	0	0	2		0	0	0	3	34	1	6	20	0	7	7	2	4	0	0	2	3
61	0	0	2		0.5	0	0	2	35	1	6	20	0	7	7	2	4	0	0	2	3
62	0	0	2		0.1	0	0	3	31	1	6	20	0	6	6	2	4	0	0	2	3
63	0	0	2		1	0	0	2	35	1	6	20	0	6	6	2	4	0	0	2	3
64	0	0	2		1	0	0	3	33	1	6	20	0	6	6	2	4	0	0	2	3
65	0	0	4		0.5	0	0	4	31	21	marine terrace	20	0	5	4	4	4	0	0	1	3
66	0	0	5		0.5	0	0	5	30	21	marine terrace	20	0	5	4	4	4	0	0	1	3
67	0	0	3		0.5	0	0	3	31	21	marine terrace	20	0	5	4	4	4	0	0	1	3
68	0	0	2		0.5	0	0	2	37	21	marine terrace	20	0	5	4	4	4	0	0	1	3
69	0	0	2		0.5	0	0	2	35	21	marine terrace	20	0	5	4	4	4	0	0	1	3

Mean thaw depths for releves 40 through 44 are given as NSC/Inter
For releves 49a through 53, first value is for frost boil, second value is for interboil
For releves 54 through 58, first value is for polygon center, second value is for trough

Table 11. Species cover-abundance in vegetation study plots (relevés). *Nomenclature for vascular plants followed Elven et al. 2007: Checklist of the Panarctic Flora (PAF). Vascular plants. -Draft. University of Oslo. Lichens followed H. Kristinsson & M. Zhurbenko 2006: Panarctic lichen checklist*

(http://archive.arcticportal.org/276/01/Panarctic_lichen_checklist.pdf). Mosses followed M.S. Ignatov, O.M. Afonina & E.A. Ignatova 2006: Check-list of mosses of East Europe and North Asia. Arctoa 15: 1-130 and for liverworts N.A. Konstantinova & A.D. Potemkin 1996: Liverworts of Russian Arctic: an annotated check-list and bibliography. Arctoa 6: 125-150. Cover-abundance scores: r = rare, + = <0.1% cover, 1 = 1-5%, 2 = 6-25%, 3 = 26-50% 4 = 51-75%, 5 = 76-100%.

Species	ND_RV_01	ND_RV_02	ND_RV_03	ND_RV_04	ND_RV_05	ND_RV_06	ND_RV_07	ND_RV_08	ND_RV_09	ND_RV_10	ND_RV_11	ND_RV_12	ND_RV_13	ND_RV_14	LA_RV_15	LA_RV_16	LA_RV_17	LA_RV_18	LA_RV_19	LA_RV_20	LA_RV_21	LA_RV_22	LA_RV_23	LA_RV_24	VD_RV_25	VD_RV_26	VD_RV_27	VD_RV_28	VD_RV_29	VD_RV_30	VD_RV_31	VD_RV_32	VD_RV_33	VD_RV_34	VD_RV_35	VD_RV_36	VD_RV_37	VD_RV_38	VD_RV_39	KH_RV_40
Vascular plants:																																							
Alopecurus alpinus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	+	1	+	.	+	.	.	.	.	.	.	.	.
Andromeda polifolia	.	.	.	.	.	1	+	.	r	r	1	r	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Arctagrostis latifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	.	.	.	.	.	r	r	r	+	+	+	1	1	+	1	+	.	.	.	.	+
Arctous alpina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Betula nana	2	2	2	2	2	.	1	2	.	.	+	.	.	.	2	3	3	3	2	2	2	2	2	2	1	1	2	2	.	2	3	3	1	2	.	.	1	.	1	.
Betula pubescens	2	2	1	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bistorta vivipara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.
Calamagrostis holmii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	1	1	1	+	+	.	+	+	+	.	+	+	+	2	3	2	2	2	+	+	+	+	.	2
Cardamine bellidifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex aquatilis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex bigelowii s.l.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2	2	2	2	1	2	3	2	4	3	3	3	2	2	1	1	2	2	2	2	+	2	1	2
Carex chordorrhiza	.	.	.	.	.	.	.	.	.	.	.	3	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex globularis	.	.	.	.	.	+	+	2	+	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex limosa	.	.	.	.	.	.	.	.	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex rotundata	.	.	.	.	.	.	.	.	.	.	.	3	3	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Cerastium arcticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cerastium regelii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chamaedaphne calyculata	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cochlearia groenlandica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Deschampsia sukatschewii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diapensia lapponica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diphasiastrum alpinum	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Draba subcapitata/micropetala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Draba sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dryas octopetala s.l.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	1	1	1	.	.	.	.	.	.	.	.	.	.	1
Empetrum nigrum	1	1	1	1	1	.	.	1	.	.	.	.	.	.	1	.	1	1	1	+	1	1	1	2	.	.	.	+	.	.	1	.	.	.	.	.	+	+	+	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.	1	+	.	1	.	.	.	.	+	+	.	.	+	.	.	.	r	.	+	+	.	1	1	.	.	.	.	.	+
Eriophorum russeolum	.	.	.	.	.	.	.	.	.	.	.	1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum scheuzeri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum vaginatum	.	.	.	.	.	+	.	.	.	.	.	.	.	.	2	+	1	+	1	+	+	+	+	+	.	+	+	+	.	.	.	.	1	1	.	.	+	+	+	.
Festuca cf. *ovina*	.	.	.	.	r	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	r	r	+	+	r	r	+	+	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	r	r	r	.	r	.	.	.	.	.	.	.	1	.	1	.
Huperzia selago	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.
Juncus biglumis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Juniperus communis	.	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Larix sibirica	1	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ledum palustre	2	2	2	2	2	4	3	4	+	r	r	.	.	.	1	.	.	.	1	+	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	2	2	1	2	.
Lloydia serotina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula cf. *wahlenbergii*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	r	.	+	+	+	.
Luzula confusa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Luzula nivalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Minuartia cf. *arctica*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	1	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oxyria digyna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pachypleurum alpinum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Papaver dahlianum ssp. *polare*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Parrya nudicaulis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis cf. *lapponica*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	r	r	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis hirsuta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.
Pedicularis labradorica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Petasites frigidus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phippsia algida	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	KH_RV_41	KH_RV_42	KH_RV_43	KH_RV_44	KH_RV_45	KH_RV_46	KH_RV_47	KH_RV_48	KH_RV_49*	BO_RV_49a	BO_RV_49b	BO_RV_50a	BO_RV_50b	BO_RV_51a	BO_RV_51b	BO_RV_52a	BO_RV_52b	BO_RV_53a	BO_RV_53b	BO_RV_54a	BO_RV_54b	BO_RV_55a	BO_RV_55b	BO_RV_56a	BO_RV_56b	BO_RV_57a	BO_RV_57b	BO_RV_58a	BO_RV_58b	KR_RV_60	KR_RV_61	KR_RV_62	KR_RV_63	KR_RV_64	KR_RV_65	KR_RV_66	KR_RV_67	KR_RV_68	KR_RV_69	Sum of occurrences
Vascular plants:																																							
Alopecurus alpinus	.	.	.	.	+	+	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12
Andromeda polifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Arctagrostis latifolia	1	+	+	+	+	+	.	+	+	1	+	1	1	+	1	+	+	+	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	33
Arctous alpina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29
Betula pubescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Bistorta vivipara	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Calamagrostis holmii	2	2	1	2	2	1	1	1	1	+	+	+	2	+	1	+	1	+	+	+	1	.	.	.	+	.	.	r	.	.	.	.	.	.	.	.	.	.	46
Cardamine bellidifolia	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Carex aquatilis	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Carex bigelowii s.l.	2	2	1	2	2	2	+	+	2	1	3	1	3	1	3	+	3	1	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	45
Carex chordorrhiza	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Carex globularis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Carex limosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Carex rotundata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Cerastium arcticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	.	r	+	9
Cerastium regelii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	r		r	+	9
Chamaedaphne calyculata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Cochlearia groenlandica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	+	1	10
Deschampsia sukatschewii	.	.	.	.	.	.	+	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Diapensia lapponica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Diphasiastrum alpinum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Draba subcapitata/micropetala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	r	.	.	.	.	.	.	+	+	+	+	+	+		r	+	11
Draba sp.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dryas octopetala s.l.	.	.	.	.	+	.	+	.	.	2	+	2	1	1	1	+	+	2	+	+	1	.	2	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	23
Empetrum nigrum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20
Eriophorum angustifolium	+	1	2	+	r	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18
Eriophorum russeolum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Eriophorum scheuzeri	.	.	.	.	.	+	.	.	.	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Eriophorum vaginatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19
Festuca cf. *ovina*	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Huperzia selago	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Juncus biglumis	.	.	.	.	.	.	.	.	.	+	.	+	r	+	.	1	.	+	.	.	.	.	.	r	.	r	.	.	.	.	.	.	.	.	.	.	.	.	8
Juniperus communis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Larix sibirica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Ledum palustre	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22
Lloydia serotina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	5
Luzula cf. *wahlenbergii*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Luzula confusa	+	+	+	+	+	+	1	1	1	.	.	.	.	.	.	.	.	r	+	+	+	1	+	1	+	+	+	+	.	.	.	.	.	.	.	.	.	.	23
Luzula nivalis	.	.	.	.	.	r	.	.	.	.	.	r	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Minuartia cf. *arctica*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Oxyria digyna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	+	.	.	.	.	.	.	.	.	.	+	.	9
Pachypleurum alpinum	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Papaver dahlianum ssp. *polare*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	1	2	1	2	1	2	2	2	10
Parrya nudicaulis	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Pedicularis cf. *lapponica*	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Pedicularis hirsuta	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	14
Pedicularis labradorica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Petasites frigidus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Phippsia algida	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	+	+	+	+	+	+	1	10

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	ND_RV_01	ND_RV_02	ND_RV_03	ND_RV_04	ND_RV_05	ND_RV_06	ND_RV_07	ND_RV_08	ND_RV_09	ND_RV_10	ND_RV_11	ND_RV_12	ND_RV_13	ND_RV_14	LA_RV_15	LA_RV_16	LA_RV_17	LA_RV_18	LA_RV_19	LA_RV_20	LA_RV_21	LA_RV_22	LA_RV_23	LA_RV_24	VD_RV_25	VD_RV_26	VD_RV_27	VD_RV_28	VD_RV_29	VD_RV_30	VD_RV_31	VD_RV_32	VD_RV_33	VD_RV_34	VD_RV_35	VD_RV_36	VD_RV_37	VD_RV_38	VD_RV_39	KH_RV_40
Pinus sibirica	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pinus sylvestris	2	2	2	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Poa arctica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	r	+	.	+	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla hyparctica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus chamaemorus	.	.	.	.	.	2	2	1	1	1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rumex arcticus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sagina intermedia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix cf. *hastata*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	1	1	1	1	.	.	.	.	.	.	.	.	.	.
Salix cf. *myrtilloides*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix lanata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix nummularia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	2	1	1	1	1	.	+	1	.	2	.
Salix phylicifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1	2	1	+	+	1	1	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Salix polaris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	2	2	2	2	.	.	.	.	.	.	.	.	.	2
Salix reptans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	1	1	1	2	1	1	1	.	1	1	.	.	.	.	+
Saxifraga cernua	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Saxifraga foliolosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Saxifraga oppositifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Saxifrage cespitosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Saxifriga tenuis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria edwardsii / crassipes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria longipes s.l.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.
Tephroseris atropurpurea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium myrtillus	2	2	2	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium uliginosum	2	2	2	1	2	.	.	1	.	.	1	.	.	.	+	1	2	1	1	2	2	2	2	2	1	.	1	+	.	.	.	.	.	.	.	.	.	.	.
Vaccinium vitis-ideae	1	1	1	1	1	1	1	1	1	+	1	.	.	.	2	2	2	2	2	+	+	.	+	.	1	1	1	1	2	3	2	2	2	2	3	2	1	2	1	.
Valeriana capitata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.
Lichens:																																						
Alectoria nigricans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	+	.	+	+	.	+	.	+	+	+	+	+	.	+
Alectoria ochroleuca	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	+	.	.	.	+	+	+	+	+	+	.
Arctocetraria andrejevii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Arctocetraria negnicascens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asahinea chrysantha	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bacidia bagliettoana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Baeomyces rufus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Bryocaulon divergens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	r	.	+	+	+	+	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bryoria nitidula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.	.	+	.	.	+	.	.
Candelariella placodizans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cetraria aculeata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cetraria islandica	1	1	1	1	1	.	.	+	1	.	.	.	.	.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cetraria laevigata	.	.	.	.	.	1	r	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.
Cetraria nigricans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Cetrariella delisei	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
Cetrariella fastigiata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Cladonia amaurocraea	.	.	.	.	.	+	1	r	+	r	r	.	.	.	r	r	+	+	+	1	+	+	.	+	+	+	.	+	+	+	+	+	+	+	+	.	+	+	.	1
Cladonia arbuscula s.l.	.	1	.	1	1	.	.	1	.	.	.	.	.	.	+	r	.	r	+	2	1	2	2	2	.	.	.	.	.	+	+	+	+	+	1	1	1	1	1	1
Cladonia bellidiflora	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	+	+	+	+	+	.	.	.	+	+	.	.	+	.	.	+	+	.	+	+	+
Cladonia cenotea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.
Cladonia cf. *decortiata*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.
Cladonia cf. *grayi*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	+	+	.
Cladonia cf. *scabriuscula*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.

Table 9. **Species cover-abundance in vegetation study plots (relevés) (cont.).**

Species	KH_RV_41	KH_RV_42	KH_RV_43	KH_RV_44	KH_RV_45	KH_RV_46	KH_RV_47	KH_RV_48	KH_RV_49*	BO_RV_49a	BO_RV_49b	BO_RV_50a	BO_RV_50b	BO_RV_51a	BO_RV_51b	BO_RV_52a	BO_RV_52b	BO_RV_53a	BO_RV_53b	BO_RV_54a	BO_RV_54b	BO_RV_55a	BO_RV_55b	BO_RV_56a	BO_RV_56b	BO_RV_57a	BO_RV_57b	BO_RV_58a	BO_RV_58b	KR_RV_60	KR_RV_61	KR_RV_62	KR_RV_63	KR_RV_64	KR_RV_65	KR_RV_66	KR_RV_67	KR_RV_68	KR_RV_69	Sum of occurrences
Pinus sibirica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Pinus sylvestris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Poa arctica	.	1	1	+	.	.	r	.	r	+	+	+	+	+	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17
Polemonium acutiflorum	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Potentilla hyparctica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Rubus chamaemorus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Rumex arcticus	.	.	+	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Sagina intermedia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Salix cf. *hastata*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Salix cf. *myrtilloides*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Salix lanata	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Salix nummularia	.	.	.	.	2	2	4	4	3	.	.	.	.	.	.	.	.	.	.	1	3	+	4	1	2	1	3	+	2	.	.	.	.	.	.	.	.	.	.	.	24
Salix phylicifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12
Salix polaris	2	1	2	2	.	.	.	.	.	1	3	1	3	1	3	+	3	1	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20
Salix reptans	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Saxifraga cernua	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	+	+	+	1	+	.	8
Saxifraga foliolosa	.	.	+	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Saxifraga oppositifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	+	r	.	.	r	.	5
Saxifrage cespitosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	+	1	+	.	.	.	+	2	7
Saxifriga tenuis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Stellaria edwardsii / crassipes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1	2	1	2	1	2	2	10
Stellaria longipes s.l.	r	.	+	+	.	.	r	.	.	+	.	+	+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Tephroseris atropurpurea	+	+	+	+	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
Trisetum spicatum	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-	-	-	-	-	-	-	.	1
Vaccinium myrtillus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Vaccinium uliginosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20
Vaccinium vitis-ideae	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	38
Valeriana capitata	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Lichens:																																							
Alectoria nigricans	.	.	.	.	+	+	+	+	+	.	.	.	.	+	.	.	.	+	.	+	+	.	+	+	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.	29
Alectoria ochroleuca	.	.	.	.	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	21
Arctocetraria andrejevii	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Arctocetraria negricascens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Asahinea chrysantha	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Bacidia bagliettoana	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Baeomyces rufus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	2
Bryocaulon divergens	+	r	.	r	1	+	+	+	.	+	.	+	.	+	.	+	.	+	.	+	+	+	+	+	+	+	+	+	+	.	r	+	+	+	.	.	.	.	.	48
Bryoria nitidula	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	11
Candelariella placodizans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	r	r	.	3
Cetraria aculeata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.	r	r	.	.	+	+	+	+	.	8
Cetraria islandica	+	+	+	+	1	+	+	1	1	+	+	+	+	+	+	+	+	+	+	.	+	.	+	.	+	.	+	+	+	1	1	1	1	2	1	2	+	+	1	68
Cetraria laevigata	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Cetraria nigricans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Cetrariella delisei	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1	1	1	2	2	1	2	13
Cetrariella fastigiata	.	.	r	.	.	.	.	r	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Cladonia amaurocraea	1	r	+	.	1	1	1	1	1	+	1	+	+	+	+	+	+	+	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	48
Cladonia arbuscula s.l.	1	+	+	+	2	1	+	+	+	+	+	+	3	+	3	+	3	+	3	.	.	.	.	.	r	.	r	.	r	.	.	.	.	.	.	.	.	.	.	46
Cladonia bellidiflora	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	+	.	.	.	.	.	.	.	.	.	.	20
Cladonia cenotea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Cladonia cf. *decortiata*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Cladonia cf. *grayi*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Cladonia cf. scabriuscula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	ND_RV_01	ND_RV_02	ND_RV_03	ND_RV_04	ND_RV_05	ND_RV_06	ND_RV_07	ND_RV_08	ND_RV_09	ND_RV_10	ND_RV_11	ND_RV_12	ND_RV_13	ND_RV_14	LA_RV_15	LA_RV_16	LA_RV_17	LA_RV_18	LA_RV_19	LA_RV_20	LA_RV_21	LA_RV_22	LA_RV_23	LA_RV_24	VD_RV_25	VD_RV_26	VD_RV_27	VD_RV_28	VD_RV_29	VD_RV_30	VD_RV_31	VD_RV_32	VD_RV_33	VD_RV_34	VD_RV_35	VD_RV_36	VD_RV_37	VD_RV_38	VD_RV_39	KH_RV_40
Cladonia chlorophaea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	+	+	.	+	.	.	+	.	.	.
Cladonia coccifera	.	.	.	.	.	.	+	.	+	r	.	.	.	.	r	r	r	r	r	+	+	+	+	+	.	+	+	+	+	+	+	+	.	+	+	+	.	+	+	+
Cladonia cornuta	.	.	.	r	.	.	.	r	.	.	.	.	.	.	r	r	.	.	.	r	+	+	.	.	.	.	.	+	.	+	.	.	+	+	.	.	.	.	.	.
Cladonia crispata	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cladonia cyanipes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Cladonia deformis	.	.	.	.	.	1	.	.	.	.	+	.	.	.	r	r	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.
Cladonia gracilis	r	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	r	1	+	+	.	+	+	+	+	.	+	+	+	+	+	+	+	+	+	.	+
Cladonia macrophylla	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Cladonia pleurota	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.
Cladonia pocillum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cladonia pyxidata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	+	.	+	+	+	.	.	.	.	.	r	.	.	.
Cladonia rangiferina	1	.	2	1	.	.	.	.	+	.	.	.	.	.	.	1	+	+	.	1	+	1	1	1	.	.	.	+	+	+	.	.	.	.	.	1	.	.	+
Cladonia squamosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	+	r	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.
Cladonia stellaris	3	3	5	5	3	3	+	.	5	3	4	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.
Cladonia stricta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	r	.	.	.	.	+	+	+	.	.	.	.
Cladonia stygia	.	1	1	.	1	2	2	2	2	3	2	.	.	.	+	+	+	r	r	2	1	1	1	1	.	.	.	.	+	+	+	+	+	+	1	1	.	1	1	+
Cladonia subfurcata/furcata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	r	+	+	+	+	+	+	+	+	+	.	+	+	.	.	+	+	+	.	+	+	.
Cladonia sulphurina	.	.	.	.	.	.	.	.	r	.	+	.	.	.	r	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Cladonia symphycarpia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cladonia uncialis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	r	r	r	1	1	1	1	1	.	.	+	+	+	+	+	+	1	+	1	1	.	1	1	1
Dactylina arctica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	r	.	r	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Dactylina ramulosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flavocetraria cucullata	.	.	.	.	.	1	+	1	.	.	.	.	.	.	+	+	+	+	+	1	2	1	1	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Flavocetraria nivalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	+	.	r	+	2	2	1	1	.	.	.	.	.	.	.	.	.	.	1	1	+	1	+	.
Fulgensia bracteata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gowardia arctica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hypogymnia physodes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Hypogymnia subobscura	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Icmadophila ericetorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	1	+	.
Japewia toroënsis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lecanora geophila	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lecidea limosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lecidea ramulosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lepraria gelida																																								
Lichenomphalia hudsoniana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+
Lobaria linita	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Micarea incrassata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mycoblastus sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nephroma expallidum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ochrolechia androgyna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Ochrolechia frigida	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	r	1	1	r	+	+	+	+	.	.	.	.	+	.	.	.	.	.	1	1	1	1	r	1
Ochrolechia inequatula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	1	1	1	+	1	+	.	.	.	.	.
Parmelia omphalodes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r
Peltigera aphthosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Peltigera canina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Peltigera cf. *frippii*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.
Peltigera cf. *neckeri*	.	1	.	.	.	.	.	.	.	.	.	.	.	.	r	.	+	.	r	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Peltigera kristinssonii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Peltigera leucophlebia	1	1	1	1	1	.	.	.	.	.	.	.	.	.	r	.	r	.	.	.	.	.	.	.	+	+	+	+	+	+	.	+	+	+	.	.	.	.	.	.
Peltigera malacea	.	1	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Peltigera polydactylon-group	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Peltigera scabrosa	.	.	.	+	.	.	.	.	.	.	.	.	.	.	r	r	r	.	.	+	.	.	.	+	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	+
Peltigera sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Peltigera venosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	KH_RV_41	KH_RV_42	KH_RV_43	KH_RV_44	KH_RV_45	KH_RV_46	KH_RV_47	KH_RV_48	KH_RV_49*	BO_RV_49a	BO_RV_49b	BO_RV_50a	BO_RV_50b	BO_RV_51a	BO_RV_51b	BO_RV_52a	BO_RV_52b	BO_RV_53a	BO_RV_53b	BO_RV_54a	BO_RV_54b	BO_RV_55a	BO_RV_55b	BO_RV_56a	BO_RV_56b	BO_RV_57a	BO_RV_57b	BO_RV_58a	BO_RV_58b	KR_RV_60	KR_RV_61	KR_RV_62	KR_RV_63	KR_RV_64	KR_RV_65	KR_RV_66	KR_RV_67	KR_RV_68	KR_RV_69	Sum of occurrences
Cladonia chlorophaea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Cladonia coccifera	+	r	+	r	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	.	+	.	+	.	+	+	+	+	+	.	.	.	.	.	.	.	.	.	52
Cladonia cornuta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Cladonia crispata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Cladonia cyanipes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Cladonia deformis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Cladonia gracilis	+	+	1	1	1	1	+	1	1	+	+	.	+	+	+	+	+	+	1	+	+	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	45
Cladonia macrophylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Cladonia pleurota	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Cladonia pocillum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	+	+	1	1	+	+	1	1	2	11
Cladonia pyxidata	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	r	13
Cladonia rangiferina	+	.	.	+	1	1	+	.	+	+	.	+	+	+	+	+	+	+	+	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	35
Cladonia squamosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Cladonia stellaris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13
Cladonia stricta	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Cladonia stygia	+	+	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	35
Cladonia subfurcata/furcata	.	.	.	+	r	+	r	r	.	.	+	.	+	.	+	.	+	.	+	.	.	+	+	.	.	.	+	.	r	.	.	.	.	.	.	.	.	.	.	33
Cladonia sulphurina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Cladonia symphycarpia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	4
Cladonia uncialis	1	1	.	+	1	1	.	.	1	+	+	+	+	+	1	+	+	+	+	.	+	.	.	.	+	+	1	+	1	.	.	.	.	.	.	.	.	.	.	44
Dactylina arctica	+	+	+	+	+	+	+	+	+	+	+	.	+	+	+	+	.	+	+	.	+	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	46
Dactylina ramulosa	.	.	.	.	.	.	.	.	.	r	.	.	.	r	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Flavocetraria cucullata	+	+	+	+	+	+	+	+	+	.	.	+	+	+	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	+	+	1	+	+	+	+	+	+	+	54
Flavocetraria nivalis	.	.	.	.	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19
Fulgensia bracteata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	+	r	+	.	+	+	.	7
Gowardia arctica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	+	+	.	r	.	.	.	5
Hypogymnia physodes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Hypogymnia subobscura	.	.	.	.	.	.	.	.	.	r	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Icmadophila ericetorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Japewia toroënsis	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Lecanora geophila	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	.	.	2
Lecidea limosa	r	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Lecidea ramulosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2	2	2	+	+	+	1	2	10
Lepraria gelida																														+		+								2
Lichenomphalia hudsoniana	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Lobaria linita	r	r	.	r	.	r	+	.	+	.	+	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Micarea incrassata	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Mycoblastus sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Nephroma expallidum	.	.	.	r	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Ochrolechia androgyna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Ochrolechia frigida	.	+	+	1	.	.	.	.	.	1	.	2	1	2	+	1	+	2	+	1	+	1	1	1	1	1	+	2	1	.	.	.	+	.	.	.	.	.	.	40
Ochrolechia inequatula	+	.	.	.	+	+	+	+	1	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	+	.	.	21
Parmelia omphalodes	.	.	.	r	r	r	+	+	+	1	.	1	.	1	.	1	.	1	.	+	.	1	+	+	.	+	.	+	.	.	.	.	.	r	.	.	.	.	.	19
Peltigera aphthosa	+	+	+	+	+	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Peltigera canina	+	+	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Peltigera cf. *frippii*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Peltigera cf. *neckeri*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Peltigera kristinssonii	.	r	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Peltigera leucophlebia	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	-	.	-	.	-	.	.	.	19
Peltigera malacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Peltigera polydactylon-group	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Peltigera scabrosa	+	+	.	+	r	r	.	.	+	.	.	.	+	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23
Peltigera sp.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Peltigera venosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	1

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	ND_RV_01	ND_RV_02	ND_RV_03	ND_RV_04	ND_RV_05	ND_RV_06	ND_RV_07	ND_RV_08	ND_RV_09	ND_RV_10	ND_RV_11	ND_RV_12	ND_RV_13	ND_RV_14	LA_RV_15	LA_RV_16	LA_RV_17	LA_RV_18	LA_RV_19	LA_RV_20	LA_RV_21	LA_RV_22	LA_RV_23	LA_RV_24	VD_RV_25	VD_RV_26	VD_RV_27	VD_RV_28	VD_RV_29	VD_RV_30	VD_RV_31	VD_RV_32	VD_RV_33	VD_RV_34	VD_RV_35	VD_RV_36	VD_RV_37	VD_RV_38	VD_RV_39	KH_RV_40
Pertusaria dactylina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.
Pertusaria geminipara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Pertusaria panyrga	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.
Pertusaria sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Physconia muscigena	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Protopannaria pezizoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
Protothelenella leucothelia	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Psoroma hypnorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.
Rhexophiale rhexoblephara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.
Rinodina turfacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Siphula ceratides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Solorina bispora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Solorina crocea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphaerophorus globosus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	2	3	3	2	2	+	+	+	+	+	1	1	1	1	1	2	2	2	2	2	+
Stereocaulon alpinum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+
Stereocaulon paschale	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stereocaulon rivulorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sticta arctica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thamnolia vermicularis s.l.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	r	r	r	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Black crust	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	+	+	2	2	2	.
White crust	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Varicellaria rhodocarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.
Bryophytes:																																							
Anthelia juratzkana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aplodon wormskioldii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aulacomnium palustre	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aulacomnium turgidum	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	1	1	1	1	r	1	+	+	1	3	3	4	3	3	2	2	2	2	1	r	.	+	.	+	2
Barbilophozia binsteadii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	+	.	.	.	.	.	.
Barbilophozia kuzeana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Bartramia ithyphylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Blepharostoma trichophyllum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bryoerythrophyllum recurvirostrum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bryum cryophyllum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bryum pseudotriquetrum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bryum rutilans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bryum sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calliergon stramineum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calypogeia sphagnicola	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Campylium cf. *arcticum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cephalozia bicuspidata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cephalozia sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cephaloziella sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	r	.	.	.	.	.	.
Ceratodon purpureus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
Cimphyllum cirrosum (= *Brachythecium cirrosum*) / *B. turgidum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Conostomum tetragonum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	+	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.
Cratoneuron curvicaule	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cynodontium strumiferum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicranella subulata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicranum acutifolium	.	+	.	.	.	.	.	r	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	1	1	1	.	+	.	2	2	.	.	1	.	.	.
Dicranum elongatum	.	.	.	.	.	.	.	+	.	.	+	.	.	.	2	2	2	2	2	2	2	2	2	3	1	1	1	1	1	+	+	+	+	.	1	.	.	1	1	2
Dicranum flexicaule	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	r	+	.	.	.	+	.	.	.	.	2	3	.	.	.	.	.	.	.	.	.

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	KH_RV_41	KH_RV_42	KH_RV_43	KH_RV_44	KH_RV_45	KH_RV_46	KH_RV_47	KH_RV_48	KH_RV_49*	BO_RV_49a	BO_RV_49b	BO_RV_50a	BO_RV_50b	BO_RV_51a	BO_RV_51b	BO_RV_52a	BO_RV_52b	BO_RV_53a	BO_RV_53b	BO_RV_54a	BO_RV_54b	BO_RV_55a	BO_RV_55b	BO_RV_56a	BO_RV_56b	BO_RV_57a	BO_RV_57b	BO_RV_58a	BO_RV_58b	KR_RV_60	KR_RV_61	KR_RV_62	KR_RV_63	KR_RV_64	KR_RV_65	KR_RV_66	KR_RV_67	KR_RV_68	KR_RV_69	Sum of occurrences
Pertusaria dactylina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Pertusaria geminipara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Pertusaria panyrga	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	5
Pertusaria sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	+	.	+	.	+	.	.	+	.	.	.	.	.	+	8
Physconia muscigena	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	1
Protopannaria pezizoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	+	.	.	+	6
Protothelenella leucothelia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Psoroma hypnorum	r	r	.	.	.	.	.	.	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
Rhexophiale rhexoblephara	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Rinodina turfacea	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Siphula ceratides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Solorina bispora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	.	.	.	+	7
Solorina crocea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	5
Sphaerophorus globosus	1	1	.	+	1	1	1	+	1	+	2	2	1	+	2	1	+	2	+	1	2	1	2	+	1	1	2	+	1	.	.	.	.	.	.	.	.	.	.	53
Stereocaulon alpinum	+	.	.	+	+	+	+	+	+	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	r	.	.	.	.	.	.	.	+	+	+	+	+	+	.	23
Stereocaulon paschale	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Stereocaulon rivulorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	1	1	.	4
Sticta arctica	.	.	.	.	.	.	.	.	.	1	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Thamnolia vermicularis s.l.	+	+	+	+	1	1	1	1	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	+	2	1	1	+	+	+	+	1	65
Black crust	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	4	3	3	3	4	5	4	4	4	16
White crust	r	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	1	2	2	2	+	2	1	1	12
Vahliellaria rhodocarpa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Bryophytes:																																							
Anthelia juratzkana	.	.	.	.	.	.	.	.	.	1	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	8
Aplodon wormskioldii	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Aulacomnium palustre	1	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Aulacomnium turgidum	1	+	1	1	1	1	1	1	2	+	1	+	1	+	1	+	1	+	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	46
Barbilophozia binsteadii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Barbilophozia kuzeana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
Bartramia ithyphylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	5
Blepharostoma trichophyllum	.	.	.	.	.	.	.	.	.	3	+	2	+	1	+	2	+	2	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Bryoerythrophyllum recurvirostrum	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+	.	.	.	+	9
Bryum cryophyllum	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	+	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Bryum pseudotriquetrum	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	5
Bryum rutilans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	r	.	+	.	+	6
Bryum sp.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	r	r	.	.	.	r	r	r	+	r	12
Calliergon stramineum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Calypogeia sphagnicola	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Campylium cf. *arcticum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	+	.	.	.	4
Cephalozia bicuspidata	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Cephalozia sp.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Cephaloziella sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Ceratodon purpureus	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Cimphyllum cirrosum (= Brachythecium cirrosum) / B. turgidum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1	1	.	.	r	.	1	7
Conostomum tetragonum	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	8
Cratoneuron curvicaule	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	+	5
Cynodontium strumiferum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dicranella subulata	.	r	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Dicranum acutifolium	.	.	.	.	.	.	+	.	.	.	.	+	1	+	2	.	1	2	2	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	21
Dicranum elongatum	2	3	1	2	1	1	1	1	1	2	+	2	1	2	1	1	1	1	3	.	+	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	49
Dicranum flexicaule	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	ND_RV_01	ND_RV_02	ND_RV_03	ND_RV_04	ND_RV_05	ND_RV_06	ND_RV_07	ND_RV_08	ND_RV_09	ND_RV_10	ND_RV_11	ND_RV_12	ND_RV_13	ND_RV_14	LA_RV_15	LA_RV_16	LA_RV_17	LA_RV_18	LA_RV_19	LA_RV_20	LA_RV_21	LA_RV_22	LA_RV_23	LA_RV_24	VD_RV_25	VD_RV_26	VD_RV_27	VD_RV_28	VD_RV_29	VD_RV_30	VD_RV_31	VD_RV_32	VD_RV_33	VD_RV_34	VD_RV_35	VD_RV_36	VD_RV_37	VD_RV_38	VD_RV_39	KH_RV_40
Dicranum fuscescens	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicranum groenlandicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicranum laevidens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2	2	2	.	.	.	.	.	.	.	.	.	.	.	.	3	+	2	.	.	.	.	.	2
Dicranum majus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicranum sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dicranum spadiceum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	2	1	.	.	1	.
Distichium capillaceum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ditrichum flexicaule	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Encalypta alpina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocolea inflata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Gymnomitrion corallioides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	+	2	2	2	.
Hylocomium splendens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	1	1	1	.	r	r	.	.	3	3	3	3	2	2	2	2	2	2	.	.	+	+	+	2
Hypnum holmenii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.
Hypnum subimponens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.
Jungermannia sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Kiaeria cf. *blyttii*	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lophozia sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lophozia ventricosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	r	+	.	+	+	+	.	.	+	.	.	.	+	+	+
Meesia uliginosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mylia anomala	.	.	.	.	.	r	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Myurella julacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Myurella tenerrima	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Niphrotrichum panschii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oncophorus compactus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oncophorus virens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oncophorus wahlenbergii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	r	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Orthothecium chryseon	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Orthothecium strictum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Plagiomnium ellipticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Plagiothecium berggrenianum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pleurozium schreberi	3	3	2	2	2	.	.	+	.	.	.	.	.	.	r	+	1	.	r	.	+	+	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Pogonatum dentatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	.
Pogonatum urnigerum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.
Pohlia cruda	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pohlia crudoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.
Pohlia nutans	.	.	.	.	.	r	.	.	.	.	r	.	.	.	.	.	.	.	.	.	r	r	r	.	.	.	r	r	.	+	r	+	r	.	.	.	r	r	r
Polytrichastrum alpinum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	2	2	2	.	.	.	.	.	.	.
Polytrichastrum alpinum var. *fragile*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polytrichastrum longisetum	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polytrichum commune	r	.	r	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
Polytrichum hyperboreum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1	1	.
Polytrichum jensenii	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.
Polytrichum piliferum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.
Polytrichum strictum	.	.	.	.	+	.	.	.	r	r	r	.	.	.	+	+	+	+	+	2	+	1	2	2	1	1	1	2	3	2	1	2	1	2	1	.	.	.	.
Psilopilium cavifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ptilidium ciliare	.	r	.	.	.	.	.	r	.	.	.	.	.	.	1	1	1	1	1	1	1	+	1	1	+	+	+	+	+	1	1	1	1	1	1	1	1	1	1
Ptilidium crista-castrensis	.	.	.	.	.	.	.	r	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Racomitrium lanuginosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	1	1	+	+	+	.	.	+	.	.	+	1	1	+	1	2	2	1	1	1	+
Sanionia cf. *georgicouncinata*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sanionia uncinata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	r	+	.	+	.	+	+	.	.	r	+	.	.	.	.	.	.	.	.	.
Scapania sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum balticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum fuscum	.	.	.	.	.	r	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum girgensohnii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	KH_RV_41	KH_RV_42	KH_RV_43	KH_RV_44	KH_RV_45	KH_RV_46	KH_RV_47	KH_RV_48	KH_RV_49*	BO_RV_49a	BO_RV_49b	BO_RV_50a	BO_RV_50b	BO_RV_51a	BO_RV_51b	BO_RV_52a	BO_RV_52b	BO_RV_53a	BO_RV_53b	BO_RV_54a	BO_RV_54b	BO_RV_55a	BO_RV_55b	BO_RV_56a	BO_RV_56b	BO_RV_57a	BO_RV_57b	BO_RV_58a	BO_RV_58b	KR_RV_60	KR_RV_61	KR_RV_62	KR_RV_63	KR_RV_64	KR_RV_65	KR_RV_66	KR_RV_67	KR_RV_68	KR_RV_69	Sum of occurrences
Dicranum fuscescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Dicranum groenlandicum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Dicranum laevidens	1	1	1	1	2	1	1	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18
Dicranum majus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Dicranum sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
Dicranum spadiceum	.	.	.	.	r	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	9
Distichium capillaceum	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	1	+	+	+	+	+	.	+	.	1	11
Ditrichum flexicaule	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	1	.	1	.	.	.	.	.	.	.	.	.	.	1	1	1	+	2	r	.	.	.	1	12
Encalypta alpina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	+	.	.	+	.	+	6
Gymnocolea inflata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Gymnomitrion corallioides	.	.	.	.	.	+	1	1	1	+	.	.	.	.	.	.	.	.	.	5	+	5	+	4	+	5	+	5	+	.	.	.	.	.	.	.	.	.	.	21
Hylocomium splendens	1	+	1	1	+	+	1	1	+	+	4	+	3	+	3	+	3	+	1	.	+	.	r	.	r	.	+	.	+	.	.	.	.	.	.	.	.	.	.	45
Hypnum holmenii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Hypnum subimponens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Jungermannia sp.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Kiaeria cf. *blyttii*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Lophozia sp.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Lophozia ventricosa	1	1	+	1	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22
Meesia uliginosa	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Mylia anomala	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Myurella julacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	+	4
Myurella tenerrima	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Niphrotrichum panschii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	r	r	.	.	.	.	.	r	4
Oncophorus compactus	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Oncophorus virens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	r	.	.	.	.	.	.	3
Oncophorus wahlenbergii	.	.	.	.	+	.	.	.	.	.	1	.	1	.	1	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Orthothecium chryseon	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	+	1	+	+	+	+	1	11
Orthothecium strictum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Plagiomnium ellipticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Plagiothecium berggrenianum	.	.	+	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14
Pogonatum dentatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.	10
Pogonatum urnigerum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	2
Pohlia cruda	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	+	+	+	+	+	12
Pohlia crudoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	5
Pohlia nutans	.	+	.	.	.	+	.	.	+	+	.	+	.	.	.	.	.	+	+	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	24
Polytrichastrum alpinum	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	r	.	+	.	+	.	+	+	+	1	+	1	1	+	+	+	+	23
Polytrichastrum alpinum var. *fragile*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	3
Polytrichastrum longisetum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Polytrichum commune	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7
Polytrichum hyperboreum	.	.	.	.	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8
Polytrichum jensenii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Polytrichum piliferum	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	7
Polytrichum strictum	.	.	.	.	.	.	.	.	.	1	1	1	1	+	1	+	1	+	+	+	1	.	1	+	1	+	1	.	.	.	.	.	.	.	.	.	.	.	.	42
Psilopilum cavifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	1
Ptilidium ciliare	.	.	.	.	.	+	.	.	.	+	1	.	2	+	2	+	2	+	2	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	39
Ptilidium crista-cristensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Racomitrium lanuginosum	.	r	.	+	r	+	1	+	1	1	.	1	.	1	.	+	.	1	.	1	3	.	2	+	4	+	4	1	4	.	.	.	.	.	.	.	.	.	.	39
Sanionia cf. *georgicouncinata*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	1
Sanionia uncinata	r	+	1	r	.	.	.	.	.	+	.	+	+	+	.	+	+	.	+	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	r	.	.	23
Scapania sp.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Sphagnum balticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Sphagnum fuscum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Sphagnum girgensohnii	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2

Table 11 (cont.). Species cover-abundance in vegetation study plots (relevés).

Species	ND_RV_01	ND_RV_02	ND_RV_03	ND_RV_04	ND_RV_05	ND_RV_06	ND_RV_07	ND_RV_08	ND_RV_09	ND_RV_10	ND_RV_11	ND_RV_12	ND_RV_13	ND_RV_14	LA_RV_15	LA_RV_16	LA_RV_17	LA_RV_18	LA_RV_19	LA_RV_20	LA_RV_21	LA_RV_22	LA_RV_23	LA_RV_24	VD_RV_25	VD_RV_26	VD_RV_27	VD_RV_28	VD_RV_29	VD_RV_30	VD_RV_31	VD_RV_32	VD_RV_33	VD_RV_34	VD_RV_35	VD_RV_36	VD_RV_37	VD_RV_38	VD_RV_39	KH_RV_40
Sphagnum lenense	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum majus	.	.	.	.	.	.	.	.	.	.	.	5	5	5	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum rubellum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum squarrosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum teres	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum warnstorfii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sphenolobus minutus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	+	r	.	1	1	+	+	.	.	.	r	r	+	r	r	+	.	1	+	r	.	.	2
Splachnum sphaericum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Splachnum vasculosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stereodon holmenii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stereodon revolutus (= Hypnum revolutum)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Straminergon stramineum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Syntrichia ruralis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tetralophozia setiformis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.
Tetraplodon mnioides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tomenthypnum nitens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	+	.	.	.	.	.	1	2	1	1	.	.	.	.	.	.	.	.	.	.	.
Tortella fragilis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tritomaria quinquedentata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	+	.	.	.	+	+	.	.	.	.	.	.
Warnstorfia pseudostraminea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Warnstorfia sarmentosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sum of occurrences	16	21	20	18	23	19	18	19	14	11	16	8	7	6	52	35	44	38	43	49	56	58	55	47	41	42	45	47	43	55	41	41	44	43	49	39	42	42	44	39

Species	KH_RV_41	KH_RV_42	KH_RV_43	KH_RV_44	KH_RV_45	KH_RV_46	KH_RV_47	KH_RV_48	KH_RV_49*	BO_RV_49a	BO_RV_49b	BO_RV_50a	BO_RV_50b	BO_RV_51a	BO_RV_51b	BO_RV_52a	BO_RV_52b	BO_RV_53a	BO_RV_53b	BO_RV_54a	BO_RV_54b	BO_RV_55a	BO_RV_55b	BO_RV_56a	BO_RV_56b	BO_RV_57a	BO_RV_57b	BO_RV_58a	BO_RV_58b	KR_RV_60	KR_RV_61	KR_RV_62	KR_RV_63	KR_RV_64	KR_RV_65	KR_RV_66	KR_RV_67	KR_RV_68	KR_RV_69	Sum of occurrences
Sphagnum lenense	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Sphagnum majus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
Sphagnum rubellum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Sphagnum squarrosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Sphagnum teres	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Sphagnum warnstorfii	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Sphenolobus minutus	1	+	1	1	1	1	1	1	1	1	1	1	1	1	1	+	1	1	2	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	39
Splachnum sphaericum	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Splachnum vasculosum	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Stereodon holmenii	.	.	.	.	+	.	.	.	.	r	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
Stereodon revolutus (= Hypnum revolutum)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	1
Straminergon stramineum	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Syntrichia ruralis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	1
Tetralophozia setiformis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Tetraplodon mnioides	.	.	.	.	.	r	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Tomenthypnum nitens	.	.	.	.	.	.	.	.	.	+	+	+	+	+	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15
Tortella fragilis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Tritomaria quinquedentata	.	.	.	.	+	+	1	+	+	+	.	+	+	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16
Warnstorfia pseudostraminea	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Warnstorfia sarmentosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Sum of occurrences	43	47	38	45	48	52	47	38	44	57	29	47	41	45	32	48	36	39	46	26	35	17	30	22	35	22	31	23	30	33	38	36	42	35	35	29	36	32	33	282

Sorted species table for Krenkel relevés

Table 12. Sorted table for Krenkel relevés. *Values are Braun-Blanquet cover-abundance scores.*

	Site 1: Sandy loam					Site 2: Sandy					
Releve No.	KR_RV_60	KR_RV_61	KR_RV_62	KR_RV_63	KR_RV_64	KR_RV_65	KR_RV_66	KR_RV_67	KR_RV_68	KR_RV_69	
Ubiquitous taxa at Krenkel											
Black crust^	4	4	3	3	3	4	5	4	4	4	10
White crust*	2	1	1	2	2	2	+	2	1	1	10
Papaver dahlianum ssp. *polare*	1	2	1	2	1	2	1	2	2	1	10
Stellaria edwardsii / crassipes	1	1	1	1	2	1	2	1	2	2	10
Cetrariella delisei	1	1	1	1	1	1	2	2	1	2	10
Cetraria islandica	1	1	1	1	2	1	2	+	+	1	10
Thamnolia vermicularis ssp. *subuliformis*	1	+	2	1	1	+	+	+	+	+	10
Lecidea ramulosa	2	2	2	2	2	+	+	+	1	+	10
Orthothecium chryseon	1	1	1	+	1	+	+	+	+	+	10
Phippsia algida	1	1	+	+	+	+	+	+	+	1	10
Cochlearia groenlandica	+	+	+	+	+	+	+	+	1	+	10
Flavocetraria cucullata	+	+	1	+	+	+	+	+	+	+	10
Cladonia pocillum	1	+	+	1	1	+	+	1	1	1	10
Polytrichastrum alpinum	+	1	+	1	1	+	+	+	+	1	10
Draba subcapitata / micropetala	+	+	+	+	+	+		r	+	+	9
Cerastium arcticum	+	+	+	+	+	+		r	+	+	9
Stereocaulon alpinum			+	+	+	+	+	+	+	+	8
Saxifraga cernua			r	+	+	+	+	1	+	+	8
Pohlia cruda / cf. drummondii	+	+		+		+	+	+	+	+	8
Distichium cf. capillaceum	1	+	+	+	+	+		+		1	8
Fulgensia bracteata		r	r	+	r	+		+	+	+	8
											0
Differential taxa for sandy loam site											0
Cirriphyllum cirrosum (= Brachythecium cirrosum) / B. turgidum	1	1	1	1	1			r		r	7
Ditrichum flexicaule	1	1	1	+	2	r				r	7
Saxifrage cespitosa	1	+	+	1	+				+		6
Solorina bispora	+	+	+	+	+	+					6
Cerastium regelii	+	+	+	+	+	r			r		7
Cratoneuron curvicaule	+	+	+	+							4
Bryocaulon divergens		r	+	+	+						4
Gowardia arctica		r	+	+	+		r				5
Bryoerthrophyllum recurvirstrum	+		+	+	+	+					5
Bryum pseudotriquetrum	+		+	+							3
Niphotrichum panschii	r		r	r							3
Oncophorus virens		r	r	r							3
Myurella julacea	+	+	+								3

Table 12 (cont.). Sorted table for Krenkel relevés.

Differential taxa for sandy loam site											0
Cirriphyllum cirrosum (= Brachythecium cirrosum) / B. turgidum	1	1	1	1	1			r		r	7
Ditrichum flexicaule	1	1	1	+	2	r				r	7
Saxifrage cespitosa	1	+	+	1	+				+		6
Solorina bispora	+	+	+	+	+	+					6
Cerastium regelii	+	+	+	+	+	r			r		7
Cratoneuron curvicaule	+	+	+	+							4
Bryocaulon divergens		r	+	+	+						4
Gowardia arctica		r	+	+	+		r				5
Bryoerthrophyllum recurvirstrum	+		+	+	+	+					5
Bryum pseudotriquetrum	+		+	+							3
Niphotrichum panschii	r		r	r							3
Oncophorus virens		r	r	r							3
Myurella julacea	+	+	+								3
											0
Differential taxa for sandy site											0
Stereocaulon nivulorum						1	+	1	1	+	5
Cladonia symphycarpia						+	+	+	+	+	5
Bartramia ithyphylla						+	+	+	+	+	5
Anthelia juratzkana						+		1	1	1	4
Polytrichastrum alpinum var. fragile							+	+	+	+	4
Candelariella placodizans						r		r	r		3
Lecanora geophila							r	r		+	3
Sanionia uncinata						r		r			2
Pogonatum urnigerum								+		+	2
											0
Nondifferential taxa											0
Cetraria aculeata		r	r			+	+	+	+	+	7
Bryum sp.	r	r				r	r	r	+	+	7
Bryum rutilans	+	+		+		r		+		r	6
Encalypta alpine	+	+		+	+			+		+	6
Saxifraga oppositifolia			+	1	+	r			r		5
Campylium cf. *arcticum*		+		+	+		+				4
Orthothecium strictum	+						+	+	+		4
Oxyria digyna				r					+	+	3
											0
Single occurrences											0
Cladonia pyxidata	r										1
Stereodon revolutus (= Hypnum revolutum)		r									1
Peltigera venosa			r								1
Physconia muscigena				r							1
Syntrichia ruralis				r							1
Sanionia cf. *georgicouncinata*					+						1
Parmelia omphalodes					r						1
Psilopilum cavifolium							r				1
Alopecurus borealis (= A. alpinus)										+	1
	33	35	36	40	33	35	28	36	33	36	

^Black crust includes: *Protopannaria pezizoides* (RV_60, 62, 63, 66, 69), unidentified lichen prothalli (all), and algal crusts (all).

*White crust includes: *Baeomyces rufus* (RV_61), *Lepraria gelida* (RV_61, 63), *Ochrolechia inaequatula* (RV_62, 64, 67), *Ochrolechia frigida* (RV_63), *Pertusaria* cf. *coriacea* (RV_60, 64).

Plant biomass

Table 13. Summary of above-ground plant biomass for all EAT vegetation relevés. *Tree biomass was determined from the plot-count method. See Appendix D in Walker et al. (2009a) for biomass sampling and sorting methods for the non-tree species. For the trees, biomass was determined from the plot-count method and expressed in g m^{-2}.*

	Deciduous shrubs				Evergreen shrubs				Graminoid		Forb												
Releve #	Stem	Live foliar	Att. dead foliar	Repro-ductive	Stem	Live foliar	Att. dead foliar	Repro-ductive	Live foliar	Att. dead foliar	Live	Dead	Live bryo-phyte	Live lichen	Total excluding dead moss & lichen & litter	Dead bryo-phyte	Dead lichen	Litter	Total including dead moss & lichen & litter, excluding trees	Broad-leaf deci-duous trees	Needle-leaf deci-duous trees	Ever-green trees	Total above-ground biomass	Cryp-togamic crust
Nadym-1*																								
ND_RV_01	47	11	0	1	77	49	2	1	T	2	0		161	0	352	1123	22	333	1830	305	51	6777	8964	
ND_RV_02	142	22	1	1	99	71	3	T	0	0	T		252	151	741	773	76	414	2003	224	2413	3176	7816	
ND_RV_03	83	14	0	1	17	21	2	0	0	0	0		3	1720	1860	2	342	663	2866	1	247	3969	7084	
ND_RV_04	9	3	0	0	7	5	2	0	0	0	0		1	1450	1478	0	560	603	2641	370	74	4494	7579	
ND_RV_05	46	4	0	0	109	68	7	T	0	0	0		34	703	972	22	469	844	2307	512	471	3608	6898	
Average	65	11	T	1	62	43	3	T	T	T	T		90	805	1081	384	294	571	2330	282	651	4405	7668	
s.d.	50	8	0	1	47	29	2	0	0	1	0		112	765	596	530	237	203	431	189	999	1412	813	
s.e.	22	4	0	0	21	13	1	0	0	0	0		50	342	267	237	106	91	193	85	447	631	363	
Nadym-2																								
Hummocks																								
ND_RV_06	0	0	0	0	682	197	3	1	3	12	18		17	343	1275	97	142	682	2196	0	0	0	2196	
ND_RV_07	13	1	0	0	110	67	T	T	0	1	28		160*	3	1114	1437**	0	6	1826	0	0	0	1826	
ND_RV_08	74	31	0	1	420	182	11	4	9	56	10		21	340	1159	36	170	265	1630	0	0	0	1630	
Average	29	11	0	T	404	149	5	2	4	23	19		66	228	1182	523	104	317	1884	0	0	0	1884	
s.d.	40	17	0	0	286	71	6	2	4	29	9		81	195	83	792	91	341	288	0	0	0	288	
s.e.	23	10	0	0	165	41	3	1	3	17	5		47	113	48	457	53	197	166	0	0	0	166	
Inter-hummocks																								
ND_RV_09	0	0	0	0	3	3	0	0	0	0	3		1	1008	1019	0	877	51	1946	0	0	0	1946	
ND_RV_10	22	1	0	0	12	1	0	0	3	7	4		0	1030	1080	0	594	47	1721	0	0	0	1721	
ND_RV_11	9	1	0	0	423	96	2	2	39	132	1		2	754	1461	4	0	548	2013	0	0	0	2013	
Average	10	1	0	0	146	33	1	1	14	46	3		1	930	1186	1	490	216	1894	0	0	0	1894	
s.d.	11	1	0	0	240	55	1	1	22	74	1		1	154	240	2	448	288	153	0	0	0	153	
s.e.	6	0	0	0	138	32	1	1	13	43	1		0	89	138	1	258	166	88	0	0	0	88	
Laborovaya-1																								
LA_RV_15	259	43	0	3	44	25	3	0	36	83	4		271	60	832	613	0	183	1627	0	0	0	1627	
LA_RV_16	248	53	0	0	38	44	6	0	35	48	1		395	103	972	313	0	337	1621	0	0	0	1621	
LA_RV_17	303	27	0	5	11	21	5	0	43	120	6		203	42	786	1060	0	170	2015	0	0	0	2015	
LA_RV_18	299	86	0	1	17	25	0	0	15	83	5		265	31	828	596	0	73	1496	0	0	0	1496	
LA_RV_19	78	24	0	0	20	33	4	0	7	23	T		375	92	657	684	0	104	1444	0	0	0	1444	
Average	238	47	0	2	26	30	4	T	27	71	3		302	66	815	653	0	173	1641	0	0	0	1641	
s.d.	92	25	0	2	14	9	2	0	15	37	2		81	31	113	268	0	102	224	0	0	0	224	
s.e.	41	11	0	1	6	4	1	0	7	17	1		36	14	50	120	0	46	100	0	0	0	100	
Laborovaya-2																								
LA_RV_20	124	13	0	0	21	29	0	0	13	62	0		110	285	659	316	0	596	1570	0	0	0	1570	
LA_RV_21	285	113	0	3	9	17	0	0	9	19	0		78	201	734	281	0	532	1546	0	0	0	1546	
LA_RV_22	14	3	0	0	11	19	1	0	3	18	0		9	233	308	29	0	502	839	0	0	0	839	
LA_RV_23	100	6	0	0	1	5	0	0	32	83	0		95	343	664	507	10	301	1482	0	0	0	1482	
LA_RV_24	81	7	0	0	5	16	1	0	10	33	0		119	244	514	467	0	333	1314	0	0	0	1314	
Average	121	28	0	1	9	17	T	0	13	43	0		82	261	576	320	2	453	1350	0	0	0	1350	
s.d.	101	48	0	1	7	9	0	0	11	29	0		44	55	170	189	4	129	303	0	0	0	303	
s.e.	45	21	0	1	3	4	0	0	5	13	0		20	24	76	84	2	58	135	0	0	0	135	

Table 13 (cont.). Summary of above-ground plant biomass for all EAT vegetation relevés.

	Deciduous shrubs				Evergreen shrubs				Graminoid		Forb													
Releve #	Stem	Live foliar	Att. dead foliar	Repro-ductive	Stem	Live foliar	Att. dead foliar	Repro-ductive	Live foliar	Att. dead foliar	Live	Dead	Live bryo-phyte	Live lichen	Total excluding dead moss & lichen & litter	Dead bryo-phyte	Dead lichen	Litter	Total including dead moss & lichen & litter, excluding trees	Broad-leaf deci-duous trees	Needle-leaf deci-duous trees	Ever-green trees	Total above-ground biomass	Cryp-togamic crust
Vaskiny Dachi-1																								
VD_RV_25	32	43	0	0	3	5	2	0	24	69	3		169	27	378	688	0	167	1233	0	0	0	1233	
VD_RV_26	32	20	0	0	47	56	21	1	45	71	14		287	33	628	587	0	235	1449	0	0	0	1449	
VD_RV_27	172	44	0	0	13	40	0	1	24	73	0		151	21	539	450	0	318	1306	0	0	0	1306	
VD_RV_28	10	11	0	1	7	23	0	1	38	64	2		268	25	450	516	0	150	1116	0	0	0	1116	
VD_RV_29	25	32	0	1	0	0	0	0	9	25	1		317	54	465	834	0	92	1390	0	0	0	1390	
Average	54	30	0	1	14	25	5	T	28	60	4		239	32	492	615	0	192	1299	0	0	0	1299	
s.d.	66	15	0	1	19	24	9	1	14	20	6		74	13	95	151	0	87	131	0	0	0	131	
s.e.	30	6	0	0	9	11	4	0	6	9	3		33	6	42	68	0	39	59	0	0	0	59	
Vaskiny Dachi-2																								
VD_RV_30	7	6	0	0	15	29	2	T	17	33	0		211	73	393	514	0	112	1019	0	0	0	1019	
VD_RV_31	114	37	0	0	11	33	2	0	19	29	0		210	89	544	456	0	171	1172	0	0	0	1172	
VD_RV_32	40	8	0	0	16	46	1	T	6	29	0		254	54	453	603	0	147	1202	0	0	0	1202	
VD_RV_33	13	5	0	0	18	50	3	2	19	64	0		278	68	521	667	0	90	1278	0	0	0	1278	
VD_RV_34	120	21	0	1	9	31	0	1	15	27	0		367	60	652	1258	0	132	2043	0	0	0	2043	
Average	59	15	0	T	14	38	2	1	16	36	0		264	69	513	700	0	131	1343	0	0	0	1343	
s.d.	55	14	0	0	4	9	1	1	5	15	0		64	14	98	323	0	31	403	0	0	0	403	
s.e.	24	6	0	0	2	4	0	0	2	7	0		29	6	44	144	0	14	180	0	0	0	180	
Vaskiny Dachi-3																								
VD_RV_35	0	0	0	0	16	43	0	T	8	27	0		115	174	383	400	0	239	1021	0	0	0	1021	
VD_RV_36	0	0	0	0	7	11	0	0	3	15	0		231	183	450	460	0	105	1016	0	0	0	1016	
VD_RV_37	4	5	0	1	9	6	0	1	1	2	0		43	191	264	164	0	278	706	0	0	0	706	
VD_RV_38	0	0	0	0	9	21	2	2	8	26	0		116	257	440	284	0	135	859	0	0	0	859	
VD_RV_39	0	0	0	0	93	34	0	2	1	2	0		403	256	791	166	0	398	1354	0	0	0	1354	
Average	1	1	0	T	27	23	T	1	4	15	0		182	212	466	295	0	231	991	0	0	0	991	
s.d.	2	2	0	0	37	15	1	1	4	12	0		141	41	196	134	0	118	241	0	0	0	241	
s.e.	1	1	0	0	17	7	0	0	2	5	0		63	18	88	60	0	53	108	0	0	0	108	
Kharasavey-1																								
KH_RV_40	18	15	2	1	0	0	0	0	14	29	T		261	184	525	1126	2	212	1865	0	0	0	1865	
KH_RV_41	8	8	2	0	0	0	0	0	72	128	T		416	122	755	1613	4	128	2501	0	0	0	2501	
KH_RV_42	9	7	0	0	0	0	0	0	93	205	T		285	17	616	687	0	72	1375	0	0	0	1375	
KH_RV_43	14	12	2	5	0	0	0	0	58	96	0		320	93	599	653	0	149	1401	0	0	0	1401	
KH_RV_44	6	4	0	3	0	0	0	0	32	54	1		202	263	563	905	0	125	1593	0	0	0	1593	
Average	11	9	1	2	0	0	0	0	54	102	T		297	136	612	997	1	137	1747	0	0	0	1747	
s.d.	5	4	1	2	0	0	0	0	31	69	0		79	93	88	394	2	51	465	0	0	0	465	
s.e.	2	2	0	1	0	0	0	0	14	31	0		35	42	39	176	1	23	208	0	0	0	208	
Kharasavey-2a																								
KH_RV_45	10	10	1	0	13	43	0	0	14	25	T		292	386	793	901	0	243	1937	0	0	0	1937	
KH_RV_46	16	9	7	T	9	35	0	0	12	26	0		406	292	813	1186	0	95	2093	0	0	0	2093	
Average	13	9	4	T	11	39	0	0	13	26	T		349	339	803	1044	0	169	2015	0	0	0	2015	
s.d.	5	1	5	0	3	5	0	0	1	1	0		81	67	14	201	0	105	111	0	0	0	111	
s.e.	3	1	3	0	2	4	0	0	1	1	0		57	47	10	142	0	74	78	0	0	0	78	

Table 13 (cont.) . Summary of above-ground plant biomass for all EAT vegetation relevés.

	Deciduous shrubs				Evergreen shrubs				Graminoid		Forb													
Releve #	Stem	Live foliar	Att. dead foliar	Repro-ductive	Stem	Live foliar	Att. dead foliar	Repro-ductive	Live foliar	Att. dead foliar	Live	Dead	Live bryo-phyte	Live lichen	Total excluding dead moss & lichen & litter	Dead bryo-phyte	Dead lichen	Litter	Total including dead moss & lichen & litter, excluding trees	Broad-leaf deci-duous trees	Needle-leaf deci-duous trees	Ever-green trees	Total above-ground biomass	Cryp-togamic crust
Kharasavey-2b																								
KH_RV_47	67	27	22	0	0	0	0	0	24	53	2		329	115	638	628	0	534	1800	0	0	0	1800	
KH_RV_48	101	39	6	0	0	0	0	0	12	31	T		969	62	1220	1075	0	427	2722	0	0	0	2722	
KH_RV_49*	58	32	11	1	0	0	0	0	12	26	1		367	325	832	1400	0	345	2577	0	0	0	2577	
Average	75	33	13	T	0	0	0	0	16	37	1		555	167	896	1034	0	436	2366	0	0	0	2366	
s.d.	23	6	8	0	0	0	0	0	7	15	1		359	139	296	388	0	95	496	0	0	0	496	
s.e.	13	4	5	0	0	0	0	0	4	8	1		207	80	171	224	0	55	286	0	0	0	286	
Ostrov Belyy-1																								
BO_RV_49a	30	15	0	0	0	0	0	0	23	45	0		256	34	402	254	0	64	720	0	0	0	720	
BO_RV_50	20	15	0	0	0	0	0	0	19	67	0		332	55	508	80	0	92	680	0	0	0	680	
BO_RV_51	4	2	0	0	38	12	82	0	7	18	0		44	100	308	29	0	19	355	0	0	0	355	
BO_RV_52	33	16	2	0	0	0	0	0	15	33	0		294	38	431	506	0	2	938	0	0	0	938	
BO_RV_53	14	0	0	0	0	0	0	0	1	22	0		379	145	561	216	0	21	798	0	0	0	798	
Average	20	9	0	0	8	2	16	0	13	37	0		261	74	442	217	0	39	698	0	0	0	698	
s.d.	12	8	1	0	17	6	36	0	9	20	0		130	47	98	186	0	37	215	0	0	0	215	
s.e.	5	3	0	0	8	2	16	0	4	9	0		58	21	44	83	0	17	96	0	0	0	96	
Ostrov Belyy-2																								
BO_RV_54	18	9	17	0	0	0	0	0	0	1	5		7	59	116	27	0	21	164	0	0	0	164	
BO_RV_55	8	2	0	0	0	0	0	0	0	0	0		4	21	36	0	0	0	36	0	0	0	36	
BO_RV_56	82	16	0	0	0	0	0	0	0	0	0		327	268	693	821	0	153	1667	0	0	0	1667	
BO_RV_57	50	12	7	0	0	0	0	0	0	0	0		207	103	378	346	0	0	724	0	0	0	724	
BO_RV_58	0	0	2	0	0	0	0	0	0	0	0		698	67	767	1671	0	0	2438	0	0	0	2438	
Average	32	8	5	0	0	0	0	0	0	0	1		249	104	398	573	0	35	1006	0	0	0	1006	
s.d.	34	7	7	0	0	0	0	0	0	0	2		287	96	330	697	0	66	1027	0	0	0	1027	
s.e.	15	3	3	0	0	0	0	0	0	0	1		128	43	147	312	0	30	459	0	0	0	459	
Krenkel-1																								
KR_RV_60	0	0	0	0	0	0	0	0	0	0	10	106	18	3	137	18			155	0	0	0	302	147
KR_RV_61	0	0	0	0	0	0	0	0	0	0	1	19	0	50	69	133			203	0	0	0	301	98
KR_RV_62	0	0	0	0	0	0	0	0	0	0	6	28	100	38	171	236			407	0	0	0	484	77
KR_RV_63	0	0	0	0	0	0	0	0	0	1	7	34	14	25	80	1			81	0	0	0	173	92
KR_RV_64	0	0	0	0	0	0	0	0	1	1	6	21	0	55	84	34			118	0	0	0	179	61
Average	0	0	0	0	0	0	0	0	0	0	6	41	26	34	108	84			193	0	0	0	288	95
s.d.	0	0	0	0	0	0	0	0	0	0	3	37	42	21	44	99			128	0	0	0	126	32
s.e.	0	0	0	0	0	0	0	0	0	0	2	16	19	9	20	44			57	0	0	0	57	14
Krenkel-2																								
KR_RV_65	0	0	0	0	0	0	0	0	0	0	2	3	0	10	15	19			34	0	0	0	185	151
KR_RV_66	0	0	0	0	0	0	0	0	0	0	0	0	0	16	16	0			16	0	0	0	269	253
KR_RV_67	0	0	0	0	0	0	0	0	0	0	3	11	0	6	20	3			23	0	0	0	268	245
KR_RV_68	0	0	0	0	0	0	0	0	0	0	5	12	0	10	27	0			27	0	0	0	242	215
KR_RV_69	0	0	0	0	0	0	0	0	1	4	9	29	11	0	55	27			81	0	0	0	307	226
Average	0	0	0	0	0	0	0	0	0	1	4	11	2	8	27	10			36	0	0	0	254	218
s.d.	0	0	0	0	0	0	0	0	0	2	3	11	5	6	16	12			26	0	0	0	45	40
s.e.	0	0	0	0	0	0	0	0	0	1	2	5	2	3	7	5			12	0	0	0	20	18

* Bryophyte biomass consisted purely of Sphagnums. Sphagnum carpet was sampled until 10 cm depth. Live bryophyte biomass was calculated to be 1 cm layer of sampled bryophyte biomass.

** Dead bryophyte biomass was calculated to be 9 cm layer of sampled 10 cm Sphagnum carpet. Total mass of all dead Sphagnum down to the permafrost table was 4582.26g/m^2, and the total depth was 40cm.

Biomass notes added:

May 22, 2009: The following ash data were obtained by Gosha Matyshak:

samples	*ash, % (450°C)*
RV	
KH_RV_49 dead bryophyte	24,25
KH_RV_ 49 live bryophyte	11,01
KH_RV_ 48 dead bryophyte	31,84
KH_RV_ 48 live bryophyte	16,91
KH_RV_ 46 dead bryophyte	33,21
KH_RV_ 46 live bryophyte	20,66
KH-RV-41 Bryophyte live	2,51
KH-RV-44 Lichen	7,65
KH-RV-43 Bryophyte dead 1/2	1,61
KH- RV-48 Litter	25,91
KH- RV-49 Litter	33,98

The high ash weights for live and dead bryophytes and the litter from the sandy plots at Kharasavey (KH_RV_46, 48, 49) indicate that these samples were likely contaminated by sand that was not burned off during the ashing process. The mass of live and dead bryophytes, lichens and litter should be reduced. Reasonable estimates based on these limited data are: Live bryophytes biomass, -13%; dead bryophytes -26%; litter, -28%. Lichens probably should also be reduced about 20%.

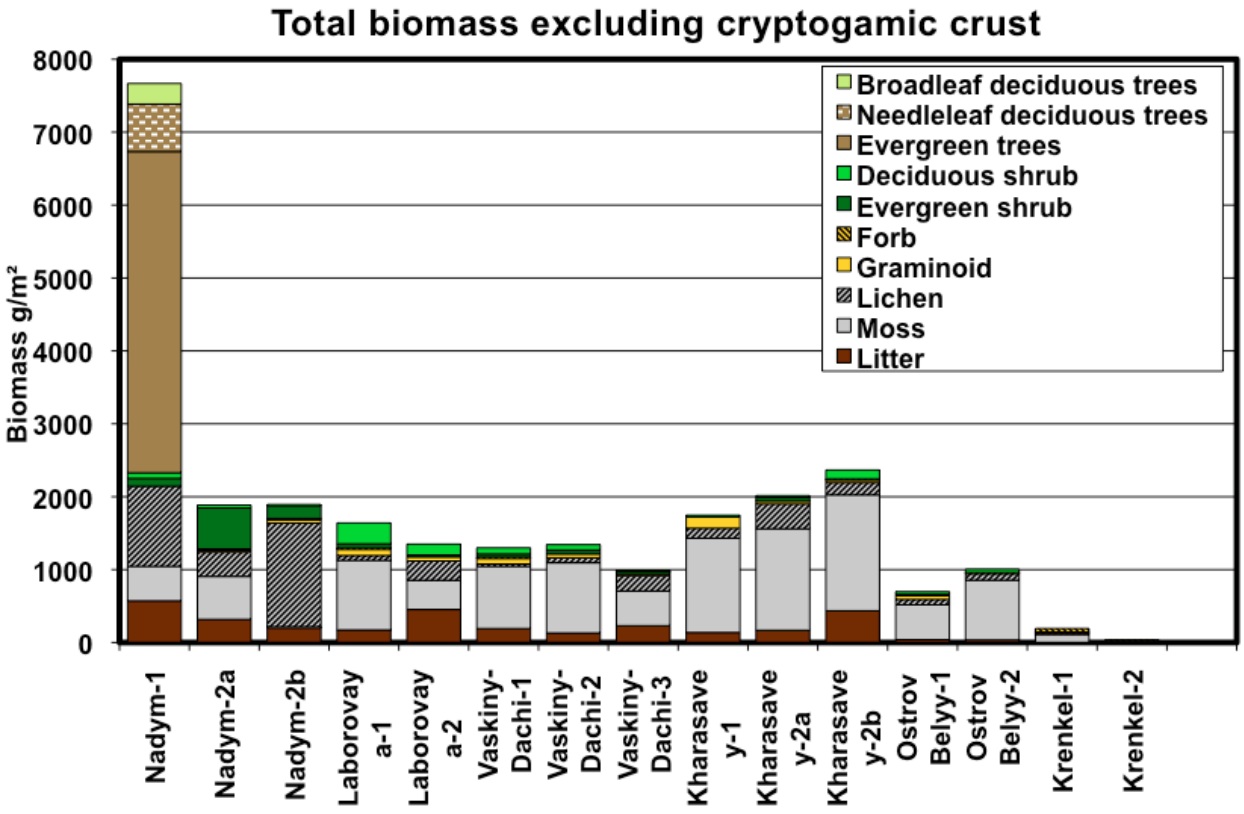


Figure 11. Total live and dead biomass excluding cryptogamic crust.

T=trace amounts	live+dead	live+dead	live+dead	live+dead	all	all		Broadleaf	Needleleaf	Evergreen
Site	**Moss**	**Lichen**	**Graminoid**	**Forb**	**Evergreen shrub**	**Deciduous shrub**	**Litter**	**deciduous trees**	**deciduous trees**	**trees**
Nadym-1	474	1099	T	T	108	77	571	282	651	4405
Nadym-2a	589	332	27	19	559	40	317	0	0	0
Nadym-2b	2	1421	60	3	181	11	216	0	0	0
Laborovaya-1	955	66	99	3	59	286	173	0	0	0
Laborovaya-2	402	263	56	0	27	150	453	0	0	0
Vaskiny-Dachi-1	853	32	88	4	44	85	192	0	0	0
Vaskiny-Dachi-2	964	69	52	0	54	74	131	0	0	0
Vaskiny-Dachi-3	476	212	19	0	51	2	231	0	0	0
Kharasavey-1	1294	137	156	T	0	23	137	0	0	0
Kharasavey-2a	1393	339	39	T	50	27	169	0	0	0
Kharasavey-2b	1589	167	52	1	0	121	436	0	0	0
Ostrov Belyy-1	478	74	50	0	26	30	39	0	0	0
Ostrov Belyy-2	822	104	T	1	0	45	35	0	0	0
Krenkel-1	111	34	1	47	0	0		0	0	0
Krenkel-2	12	8	1	15	0	0		0	0	0

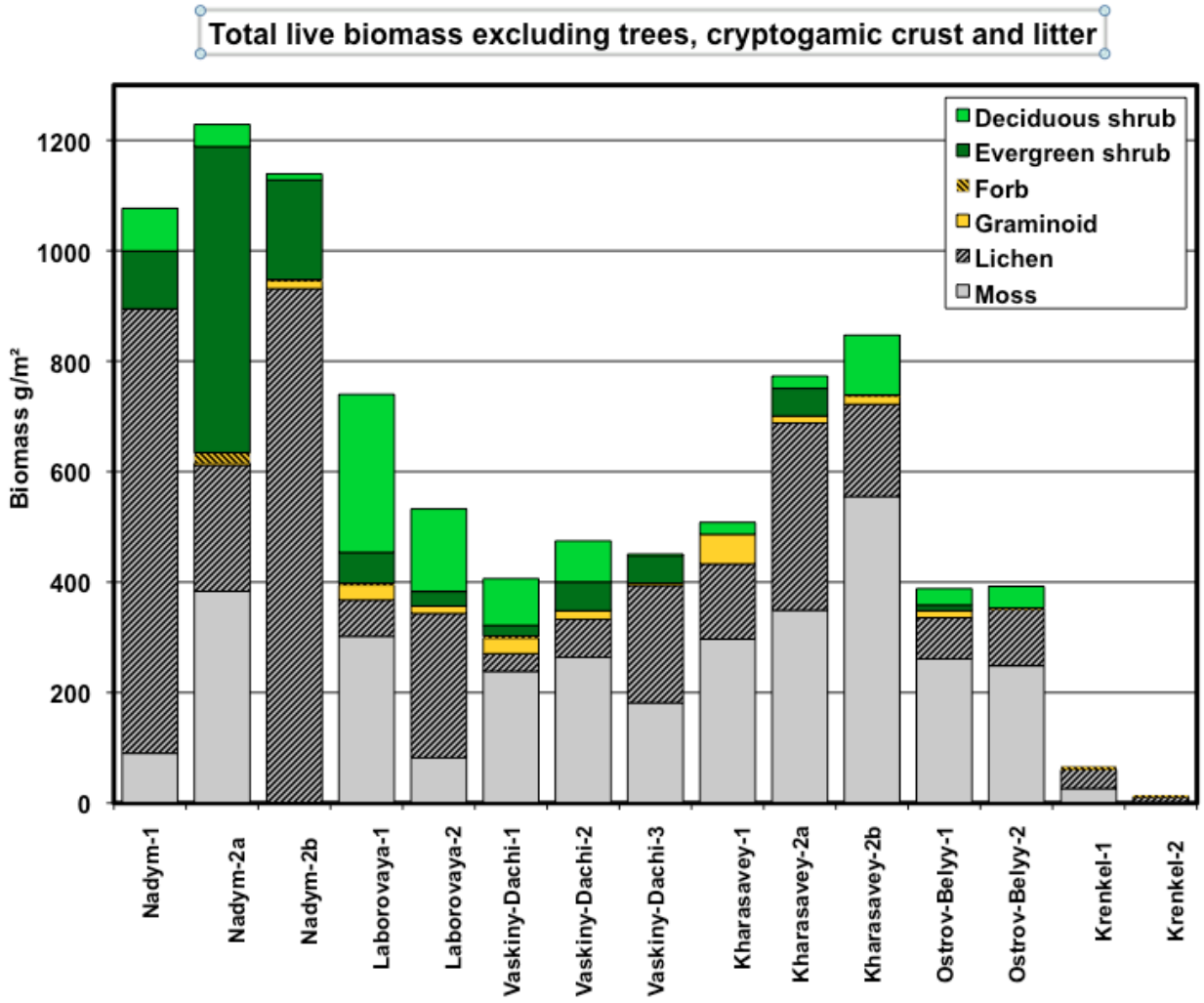


Figure 12. Total live biomass excluding trees and cryptogamic crust and litter.

T=trace amounts	live	live	live	live	live foliar+repr+stem	live foliar+repr+stem
Site	**Moss**	**Lichen**	**Graminoid**	**Forb**	**Evergreen shrub**	**Deciduous shrub**
Nadym-1	90	805	T	T	105	77
Nadym-2a	383	228	4	19	554	40
Nadym-2b	1	930	14	3	180	11
Laborovaya-1	302	66	27	3	56	286
Laborovaya-2	82	261	13	0	26	150
Vaskiny-Dachi-1	239	32	28	4	19	85
Vaskiny-Dachi-2	264	69	16	0	52	74
Vaskiny-Dachi-3	182	212	4	0	51	2
Kharasavey-1	297	136	54	T	0	22
Kharasavey-2a	349	339	13	T	50	23
Kharasavey-2b	555	167	16	1	0	108
Ostrov Belyy-1	261	74	13	0	10	30
Ostrov Belyy-2	249	104	T	1	0	39
Krenkel-1	26	34	T	6	0	0
Krenkel-2	2	8	T	4	0	0

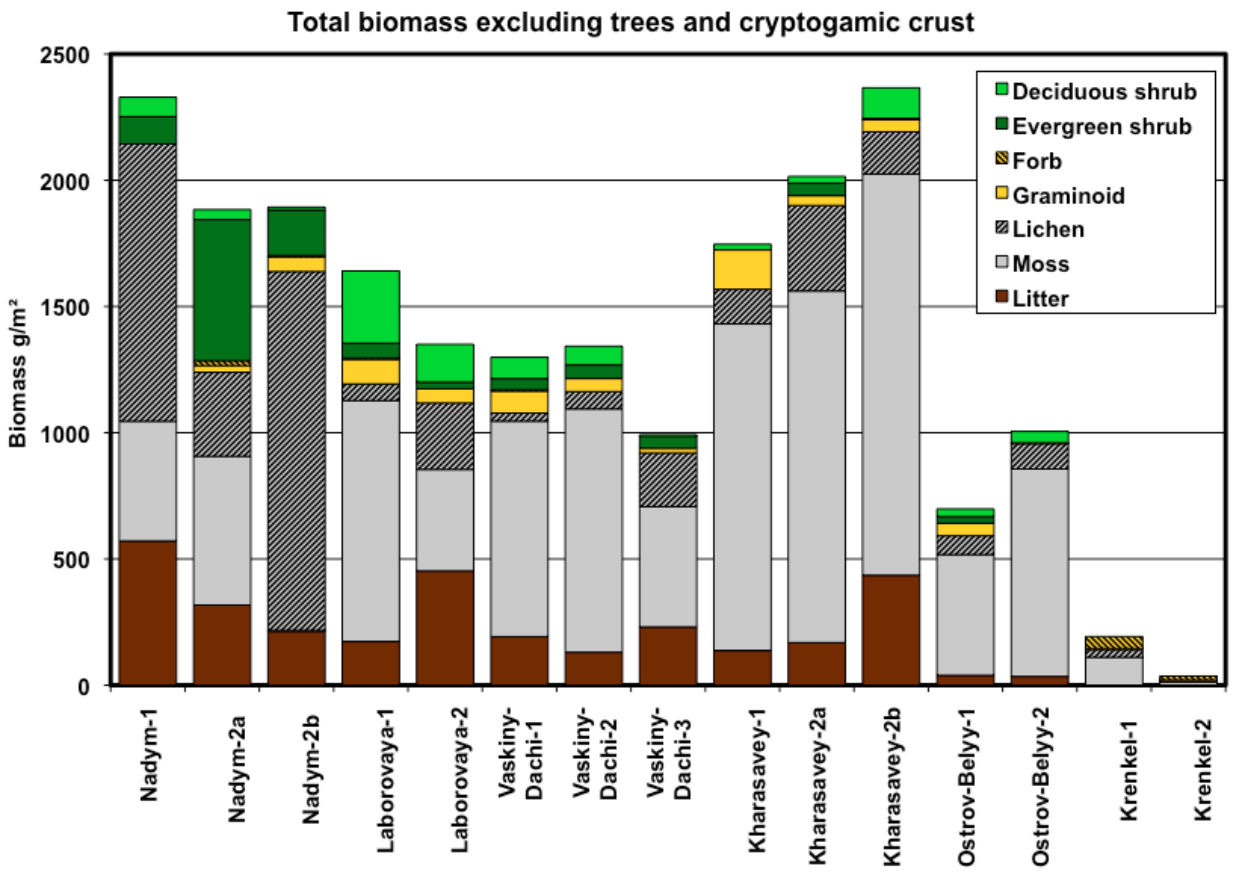


Figure 13. Total biomass excluding trees and cryptogamic crust

T=trace amounts	all	all	all	live+dead	all	all		Cryptogamic	Cryptogamic
Site	**Moss**	**Lichen**	**Graminoid**	**Forb**	**Evergreen shrub**	**Deciduous shrub**	**Litter**	**Crust**	**Crust**
Nadym-1	474	1099	T	T	108	77	571		
Nadym-2a	589	332	27	19	559	40	317		
Nadym-2b	2	1421	60	3	181	11	216		
Laborovaya-1	955	66	99	3	59	286	173		
Laborovaya-2	402	263	56	0	27	150	453		
Vaskiny-Dachi-1	853	32	88	4	44	85	192		
Vaskiny-Dachi-2	964	69	52	0	54	74	131		
Vaskiny-Dachi-3	476	212	19	0	51	2	231		32
Kharasavey-1	1294	137	156	T	0	23	137		
Kharasavey-2a	1393	339	39	T	50	27	169		11
Kharasavey-2b	1589	167	52	1	0	121	436		7
Ostrov Belyy-1	478	74	50	0	26	30	39		
Ostrov Belyy-2	822	104	T	1	0	45	35		155
Krenkel-1	111	34	1	47	0	0		95	
Krenkel-2	12	8	1	15	0	0		218	
* Based on 2009 transect data, with estimate of 353.61 g/m^2									

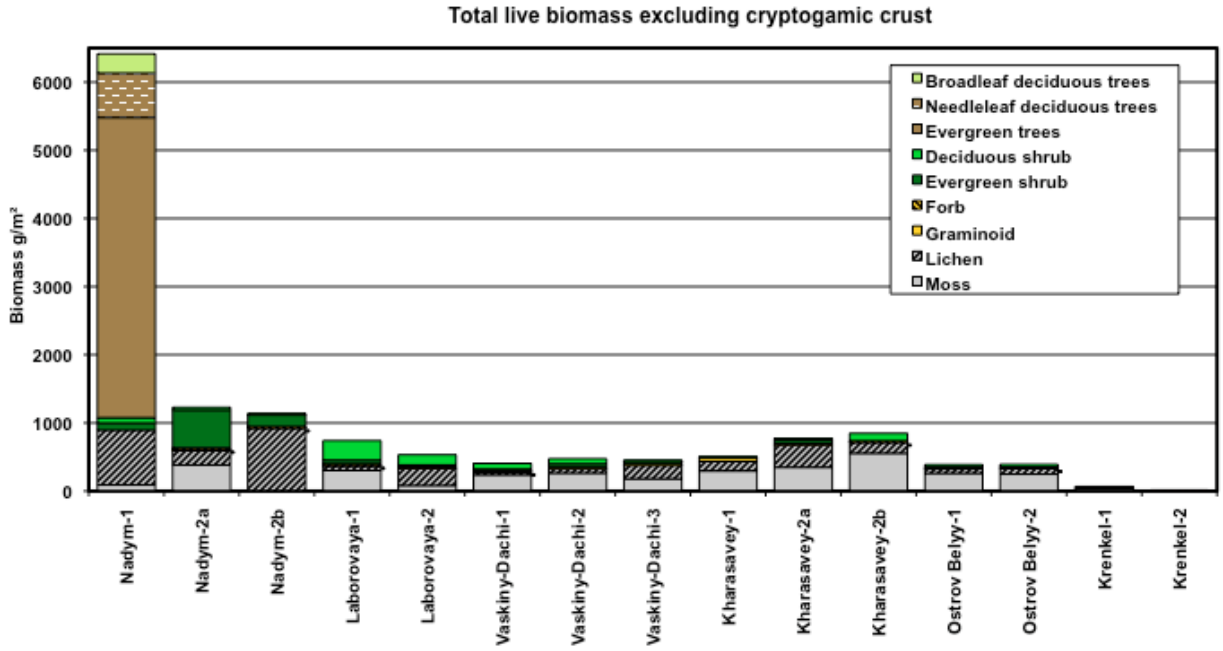


Figure 14. Total live biomass excluding cryptogamic crust.

T=trace amounts	live	live	live	live	live foliar+repr+stem	live foliar+repr+stem	Broadleaf	Needleleaf	Evergreen
Site	**Moss**	**Lichen**	**Graminoid**	**Forb**	**Evergreen shrub**	**Deciduous shrub**	**Deciduous**	**Deciduous trees**	**trees**
Nadym-1	90	805	T	T	105	77	282	651	4405
Nadym-2a	383	228	4	19	554	40	0	0	0
Nadym-2b	1	930	14	3	180	11	0	0	0
Laborovaya-1	302	66	27	3	56	286	0	0	0
Laborovaya-2	82	261	13	0	26	150	0	0	0
Vaskiny-Dachi-1	239	32	28	4	19	85	0	0	0
Vaskiny-Dachi-2	264	69	16	0	52	74	0	0	0
Vaskiny-Dachi-3	182	212	4	0	51	2	0	0	0
Kharasavey-1	297	136	54	T	0	22	0	0	0
Kharasavey-2a	349	339	13	T	50	23	0	0	0
Kharasavey-2b	555	167	16	1	0	108	0	0	0
Ostrov Belyy-1	261	74	13	0	10	30	0	0	0
Ostrov Belyy-2	249	104	T	1	0	39	0	0	0
Krenkel-1	26	34	T	6	0	0	0	0	0
Krenkel-2	2	8	T	4	0	0	0	0	0

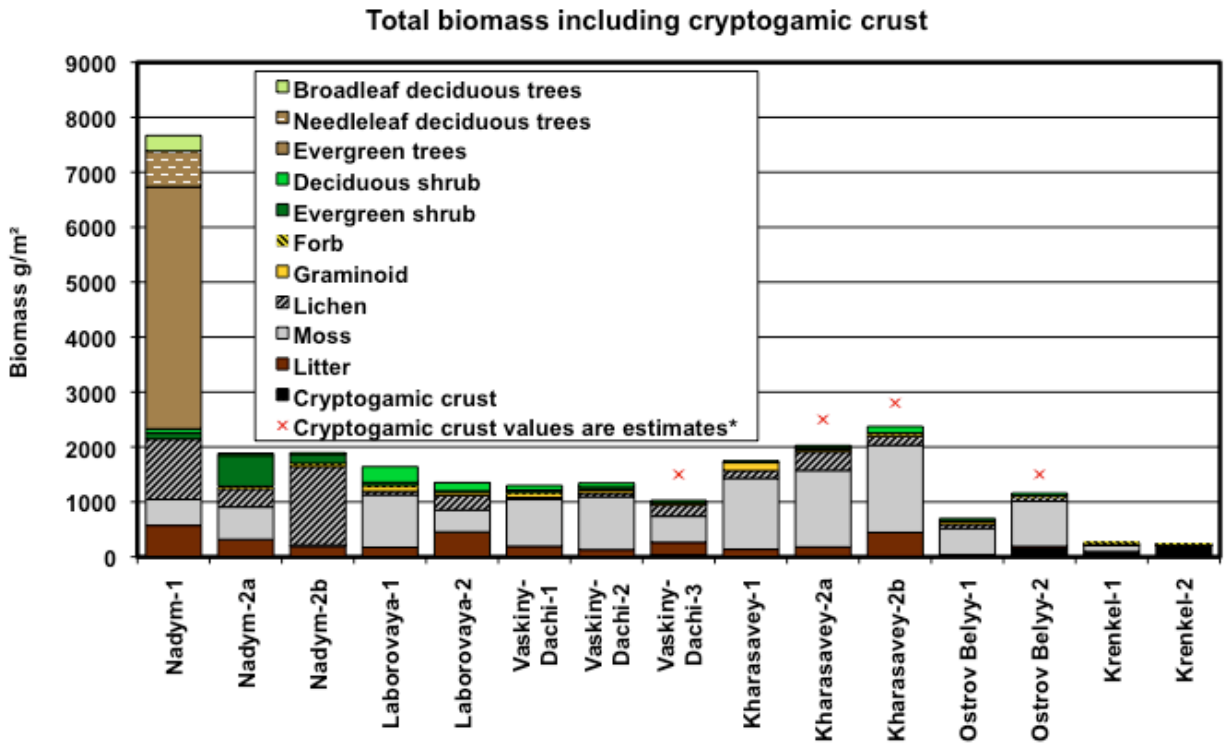


Figure 15. Total biomass including cryptogamic crust

T=trace amounts	live+dead	live+dead	live+dead	live+dead	all	all		Broadleaf	Needleleaf	Evergreen	Cryptogamic	Cryptogamic Crust Estimates*
Site	**Moss**	**Lichen**	**Graminoid**	**Forb**	**Evergreen shrub**	**Deciduous shrub**	**Litter**	**deciduous**	**deciduous**	**trees**	**Crust**	
Nadym-1	474	1099	T	T	108	77	571	282	651	4405		
Nadym-2a	589	332	27	19	559	40	317	0	0	0		
Nadym-2b	2	1421	60	3	181	11	216	0	0	0		
Laborovaya-1	955	66	99	3	59	286	173	0	0	0		
Laborovaya-2	402	263	56	0	27	150	453	0	0	0		
Vaskiny-Dachi-1	853	32	88	4	44	85	192	0	0	0		
Vaskiny-Dachi-2	964	69	52	0	54	74	131	0	0	0		
Vaskiny-Dachi-3	476	212	19	0	51	2	231	0	0	0		32
Kharasavey-1	1294	137	156	T	0	23	137	0	0	0		
Kharasavey-2a	1393	339	39	T	50	27	169	0	0	0		11
Kharasavey-2b	1589	167	52	1	0	121	436	0	0	0		7
Ostrov Belyy-1	478	74	50	0	26	30	39	0	0	0		
Ostrov Belyy-2	822	104	T	1	0	45	35	0	0	0		155
Krenkel-1	111	34	1	47	0	0		0	0	0	95	
Krenkel-2	12	8	1	15	0	0		0	0	0	218	
* Based on 2009 transect data, with estimate of 353.61 g/m^2												

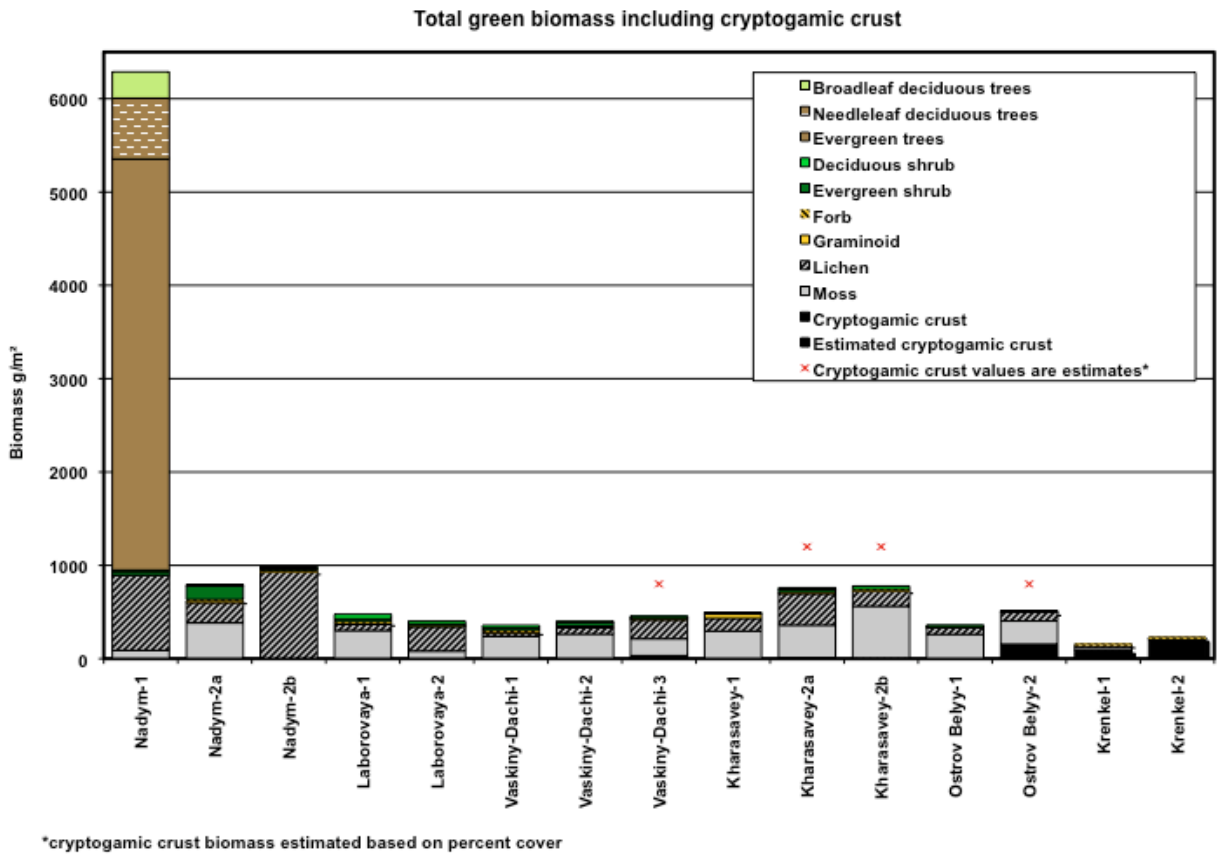


Figure 16. Total green biomass including cryptogamic crust.

T=trace amounts	live	live	live	live	live foliar+repr	live foliar+repr	Broadleaf	Needleleaf	Evergreen	Cryptogamic	Cryptogamic
Site	**Moss**	**Lichen**	**Graminoid**	**Forb**	**Evergreen shrub**	**Deciduous shrub**	**Deciduous**	**Deciduous**	**trees**	**Crust**	**Crust Estimates***
Nadym-1	90	805	T	T	43	12	282	651	4405		
Nadym-2a	383	228	4	19	150	11	0	0	0		
Nadym-2b	1	930	14	3	34	1	0	0	0		
Laborovaya-1	302	66	27	3	30	48	0	0	0		
Laborovaya-2	82	261	13	0	17	29	0	0	0		
Vaskiny-Dachi-1	239	32	28	4	25	30	0	0	0		
Vaskiny-Dachi-2	264	69	16	0	38	15	0	0	0		
Vaskiny-Dachi-3	182	212	4	0	24	1	0	0	0		32
Kharasavey-1	297	136	54	T	0	11	0	0	0		
Kharasavey-2a	349	339	13	T	39	9	0	0	0		11
Kharasavey-2b	555	167	16	1	0	33	0	0	0		7
Ostrov Belyy-1	261	74	13	0	2	9	0	0	0		
Ostrov Belyy-2	249	104	T	1	0	8	0	0	0		155
Krenkel-1	26	34	T	6	0	0	0	0	0	95	
Krenkel-2	2	8	T	4	0	0	0	0	0	218	
* Based on 2009 transect data, with estimate of 353.61 g/m^2											

iButtons:

Table 14. iButton logger number (on duct tape) and serial numbers and locations at Krenkel.

2007			
Logger No.	Serial no.	Logger No.	Serial no.
1	12350A	35	125050
2	1252B2	36	123003
3	122D12	37	125256
4	122A9E	38	124A0A
5	1231E8	39	12506D
6	124E85	40	12516B
7	123A83	41	125333
8	124585	42	1250E8
9	12505D	43	12450E
10	122ED0	44	1233E3
11	12339F	45	12534D
12	124EE3	46	12311D
13	122EBF	47	125375
14	123050	48	125389
15	124235	49	123589
16	125073	50	124CC7
17	123163	51	124C87
18	124C01	52	12514D
19	123415	53	123389
20	1236DE	54	1231D8
21	12312A	55	122B9C
22	122EE8	56	1237CE
23	122D44	57	1233BA
24	1233FE	58	122F28
25	125305	59	1251C9
26	1242D8	60	124AA8
27	12333D	61	122A82
28	125086	62	1245A5
29	12379C	63	1230F8
30	1234EE	64	124C68
31	122D4F	65	125204
32	123855	66	124E27
33	124B9E	67	12320C
34	122D94	68	124FD3

2008			
Logger No.	Serial no.	Logger No.	Serial no.
1	12CD2B	11	12D5EE
2	11CB6E	12	12DFD4
3	12E16A	13	11BC6D
4	11AB6F	14	12D52D
5	12D39B	15	11C23D
6	11D136	16	11B049
7	11C572	17	12CF89
8	12D5BF	18	11A6D2
9	11D57B	19	12E2F8
10	12B58B	20	12CD59
2009			
Logger No.	Serial no.	Logger No.	Serial no.
1	221147	11	224647
2	221898	12	22172D
3	2201F6	13	OBBBFB
4	22233E	14	OD6CFA
5	21EF85	15	OD533E
6	21F392	16	OD692E
7	22A69	17	OD3591
8	21FEFB	18	OD65B2
9	21F255	19	OD74OC
10	21E3D9	20	OD6418
2010			
Logger No.	Serial no.	Logger No.	Serial no.
1	26D0BD	11	26D07D
2	26D0F6	12	26D214
3	26E161	13	26CD86
4	26E304	14	26DD1F
5	26CF88	15	26D3E9
6	26DCAD	16	26D9D1
7	26E770	17	26CC70
8	26E4E1	18	26E8F7
9	26DD75	19	26DD36
10	26E16F	20	26DE86

iButton logger locations at Krenkel.

2010		
Releve No.	Logger No.	Depth (cm)
KR_RV60	10	1
	6	0.5
KR_RV61	7	1
	8	0.5
KR_RV62	3	2
	2	0.5
KR_RV63	4	1
	5	0.5
KR_RV64	1	0.5
	9	0.25
KR_RV65	19	1
	15	0.25
KR_RV66	13	1
	17	0.25
KR_RV67	18	0.5
	12	0.25
KR_RV68	1	1
	20	0
KR_RV69	14	2
	16	0

Soil descriptions of study sites: G. Matyshak

Site 1

Location: Hayes Island
GPS position: N80°35' 35.3", E 057°54' 13.8"
Elevation: 50 m.
Parent material: sandstones (carbonate ?)

Figure 17: soil pit № 1-10, Site 1. Right photo shows polygon crack.

Figure 18: soil pit № 2-10. Site 1, Polygon center.

Description:

Interpolygon (crack):

0-2 cm; Oi; fibric material (moss), loose.

2-4 cm; Oi; dark brown (7.5YR3/3) slightly decomposed moss (H3, F8, R3); very friable, many fine roots; abrupt irregular boundary.

4-13 cm; Bw; grayish brown (10YR5/2) loamy sand, few medium Fe concentrations (masses) (2.5YR5/8) around boundary; few fine vesicular pores, few fine roots, non-sticky, non-plastic, weak medium subangular blocky structure; gradual wavy boundary.

13-34 cm; Bwf; grayish brown (10YR4/2) sandy loam, with 3-5 mm of strong decomposed (H9) organic streaks (10YR2/2) across the horizon , common fine vesicular pores, slightly sticky, slightly plastic, few coarse gravel, weak medium platy structure; frozen below 34cm., 40-50% ice by volume, ice lenses and ice veins of 3-5 mm. thickness.

Polygon (center)

0-0.5cm; Oi; (2,5YR2/1); fibric material (black crust), firm.

0.5-15 cm; Bwjj; grayish brown (10YR5/2) loamy sand, few medium vesicular pores, few fine roots, non-sticky, non-plastic, slightly effervescence, few coarse gravel, weak medium subangular blocky structure; gradual wavy boundary.

15-37 cm; Bhf; grayish brown (10YR4/2) sandy loam, common fine vesicular pores, slightly sticky, slightly plastic; weak medium platy structure; frozen below 37cm., 40-50% ice by volume, ice lenses and ice veins of 3-5 mm. thickness.

Site 2

Location: Hayes Island
GPS position: 80º36'24.2"N, 057 º54'36.5"E
Elevation: 15 m.
Parent material: marine sediments

Depth: 0 cm. 2 cm. 5 cm.

Figure 19. Horizontal pit, Site 2.

Figure 20. Soil pit № 3-10. Site 2.

Figures 21. Soil pit № 4-10, Site 2 polygon crack.

Description:

Interpolygon (crack):

0-1.5cm; Oi; fibric material, loose, slightly decomposed moss

1.5-2.0cm; E; gray (10YR5/2) sand, discontinuous, friable, non-sticky, non-plastic, structureless, common medium roots, abrupt irregular boundary.

2-10cm; Bhjj; grayish brown (7.5YR4/2) sand, friable, common medium vesicular pores, common medium roots, non-sticky, non-plastic, weak medium platy structure; clear irregular boundary.

10 - 35cm; Bwf; gray (10YR5/3) sandy loam, with 3-5 mm of strong decomposed (H8) organic streaks (10YR2/2) across the horizon , many medium vesicular pores, slightly sticky, slightly plastic; many shell fragments, few coarse gravel, few medium Fe concentrations (masses) (2.5YR5/8), weak medium platy structure, frozen below 35cm., massive.

Polygon:

0-0.5cm; Oi; (2,5YR2/1); fibric material (black crust) and moss

0.5-15cm; Bh; grayish brown (7.5YR4/2) sand, many fine vesicular pores, friable, few fine roots, non-sticky, non-plastic, weak medium platy structure; clear irregular boundary.

15 - 36cm; Bwf; gray (10YR5/3) sandy loam, medium vesicular pores, slightly sticky, slightly plastic; many shell fragments**,** few coarse gravel, weak medium platy structure, frozen below 36cm., massive.

References

Von Post, L. and Granlund, E. 1926. Södra Sveriges Torvtillgångar I. Sveriges Geologiska Undersökning, Yearbook, 19.2 Series C, No. 335. pp1–127, Stockholm. English translation in: Damman AWH and French TW (1987), The Ecology of Peat Bogs of the Glaciated Northeastern United States: A Community Profile. US Department of Interior, Fish and Wildlife Service, Research Development, National Wetlands Research Center. Washington, DC. Biological Report. 85 (7.16) 1-115.

Munsell soil color charts. Determination of soil color quoted in part from U.S. Dept. Agriculture Handbook 18-Soil Survey Manual .

REFERENCES

Alexandrova VD. 1980. The Arctic and Antarctic: Their Division into Geobotanical Areas. Cambridge: Cambridge University Press.

CAVM Team, Walker, D.A., Gould, W.A., Bliss, L.C., Edlund, S.A., Raynolds, M.K., Zoltai, S.C., Daniëls, F.J.A., Bay, C., Wilhelm, M., Einarsson, E., Gudjonsson, G., Elvebakk, A., Johansen, B.E., Ananjeva, G.V., Drozdov, D.S., Katenin, A.E., Kholod, S.S., Konchenko, L.A., Korostelev, Y.V., Melnikov, E.S., Moskalenko, N.G., Polezhaev, A.N., Ponomareva, O.E., Pospelova, E.B., Safronova, I.N., Shelkunova, R.P., Yurtsev, B.A., Fleming, M.D., Markon, C.J., Murray, D.F., and Talbot, S.S., 2003, Circumpolar Arctic Vegetation Map: Anchorage, AK, Conservation of Arctic Flora and Fauna (CAFF) Map No. 1, U.S. Fish and Wildlife Service.

Dibner VD. 1965. The history of late Pleistocene and Holocene sedimentation in Franz Josef Land (in Russian). Transactions of the Scientific Research Institute of the Geology of the Arctic 143: 300-318.

Koryakin YV, Shipilov EV. 2009. Geochemical specifics and 40Ar/39Ar age of the basaltoid magmatism of the Alexander Land, Northbrook, Hooker and Hayes Islands (Franz josef Land Archipelago). Doklady Earth Sciences 425: 260-263.

Lubinski DL, Forman SL, Miller GH. 1999. Holocene glacier and climate fluctuations on Franz Josef Land, Arctic Russia, 80˚N. Quaternary Science Reviews 18: 85-108.

Walker, D.A., Epstein, H.E., Romanovsky, V.E., Ping, C.L., Michaelson, G.J., Daanen, R.P., Shur, Y., Peterson, R.A., Krantz, W.B., Raynolds, M.K., Gould, W.A., Gonzalez, G., Nicolsky, D.J., Vonlanthen, C.M., Kade, A.N., Kuss, P., Kelley, A.M., Munger, C.A., Tarnocai, C.T., Matveyeva, N.V., and Daniëls, F.J.A., 2008, Arctic patterned-ground ecosystems: A synthesis of field studies and models along a North American Arctic Transect: Journal of Geophysical Research - Biogeosciences, v. 113, p. G03S01.

Walker, D.A., Epstein, H.E., Leibman, M.E., Moskalenko, N.G., Kuss, J.P., Matyshak, G.V., Kaärlejarvi, E., and Barbour, E.M., 2009, Data Report of the 2007 and 2008 Yamal Expeditions: Nadym, Laborovaya, Vaskiny Dachi, and Kharasavey: Fairbanks, AK, University of Alaska, p. 133.

Walker, D.A., Orekhov, P., Frost, G.V., Matyshak, G., Epstein, H.E., Leibman, M.O., Khitun, O., Khomotov, A., Daanen, R., Gobroski, K., and Maier, H.A., 2009, The 2009 Yamal Expedition to Ostrov Belyy and Kharp, Yamal Region, Russia Fairbanks, AK, University of Alaska Fairbanks, p. 63.

Walker, D.A., Epstein, H.E., Leibman, M.E., Moskalenko, N.G., Kuss, H.P., Matyshak, G.V., Kaarlejaärvi, E., Forbes, B.C., and Barbour, E.M., 2008, Data Report of the 2007 Yamal Expedition to Nadym, Laborovaya, and Vaskiny Dachi, Yamal Peninsula Region, Russia: Fairbanks, AK, University of Alaska Fairbanks.

Washburn AL. 1980. Geocryology: A Survey of Periglacial Processes and Environments. New York: Halsted Press, John Wiley and Sons.

APPENDIX A. LIST OF PARTICIPANTS IN THE FOUR NASA-SPONSORED EURASIA ARCTIC TRANSECT EXPEDITIONS

Locations visited: N: Nadym; L: Laborovaya; V: Vaskiny Dachi; K: Kharasavey; Kp: Kharp; B: Ostrov Belyy; Kr: Krenkel

Andrey Abramov: Kr
Earth Cryosphere Institute, SB RAS
Malygin Street 86
625026 Tyumen, Russia

Ronnald Daaen: B, Kp
Geophysical Institute
University of Alaska Fairbanks
P.O. Box 757320
Fairbanks, AK 99775-7320
rdaanen@alaska.edu

Dmitriy S. Drozdov: N, Kr
Earth Cryosphere Institute, SB RAS
Vavilov Street 30/6, room 15
119991 Moscow, Russia
+7-495-135-98-71
ds_drozdov@mail.ru

Evgeny Elanchev: N
Earth Cryosphere Institute, SB RAS
Malygin Street 86
625026 Tyumen, Russia
eelanchev@yandex.ru

Howard E. Epstein: N, L, V, K, B
Department of Environmental Sciences
University of Virginia
P.O. Box 400123
Clark Hall, 211
Charlottesville, VA 22904-4123
Phone: +1 434-924-4308
Fax: +1 434-982-2137
hee2b@virginia.edu

Andrey Ermakov: Kr
Earth Cryosphere Institute, SB RAS
Malygin Street 86
625026 Tyumen, Russia

Gerald V. (JJ) Frost: B, Kh, Kp
Department of Environmental Sciences
University of Virginia
P.O. Box 400123
Clark Hall, 211
Charlottesville, VA 22904-4123
Gvf5y@virginia.edu

Jozef Geml: K
Biology and Wildlife Department University of Alaska Fairbanks
PO Box 757000
Fairbanks, Alaska 99775-7000
jozsef.geml@gmail.com

Ivan Gameev: Kr
Earth Cryosphere Institute, SB RAS
Malygin Street 86
625026 Tyumen, Russia

Anatoly Gubarkov: L, V, K
Tyumen State Oil and Gas University
Volodarsky Street 38
625000 Tyumen, Russia
agubarkov@mail.ru

Elina Kaarlejärvi: N, L, V, K
Arctic Centre
University of Lapland
Box 122
96101 Rovaniemi, Finland
+358-50-560-86-87
elina.kaarlejarvi@gmail.com

Olga Khitun: B
Khomarov Botanical Institute
St. Petersburg, Russia
Khitun-olga@yandex.ru

Artem Khomutov: L, V, K, B, Kr
Earth Cryosphere Institute, SB RAS
Malygin Street 86
625026 Tyumen, Russia
akhomutov@gmail.com

Patrick Kuss: N, L, V
Institute of Plant Sciences
University of Bern
Altenbergrain 21
3013 Bern, Switzerland
Phone: +41 31 631 4992
Fax: +41 31 631 4942
patrick.kuss@ips.unibe.ch

Marina Leibman: L, V, K, B, Kr
Earth Cryosphere Institute, SB RAS
Vavilov Street 30/6
119991 Moscow, Russia
+7-916-607-83-93
moleibman@gmail.com

Grigory V. Matyshak: N, L, V, K, B, Kp, Kr
Department of Soil Science
Lomonosov Moscow State University
Leninskie Gory
119992 Moscow, Russia
+7-495-939-39-80
matyshak@ps.msu.ru

Nataliya G. Moskalenko: N, L, V, K
Earth Cryosphere Institute, SB RAS
Vavilov Street 30/6, room 67
119991 Moscow, Russia
+7-499-135-98-71
nat-moskalenko@hotmail.com

Aleksander Nikitin: N
Earth Cryosphere Institute, SB RAS
Vavilov Street 30/6
119991 Moscow, Russia
Aleksandernikol@gmail.com

Olga Opokina: N
Earth Cryosphere Institute, SB RAS
Malygin Street 86
625026 Tyumen, Russia
+7-3452-688-787
opokina@ikz.ru

Pavel T. Orekhov: N, K, B, Kr
Earth Cryosphere Institute, SB RAS
Vavilov Street 30/6, room 67
119991 Moscow, Russia
+7-499-135-98-71
744001@gmail.com

Olga E. Ponomareva: N
Earth Cryosphere Institute, SB RAS
Vavilov Street 30/6, room 67
119991 Moscow, Russia
+7-499-135-98-71
o-ponomareva@yandex.ru

Vladimir Romanovsky: N
Department of Geology and Geophysics
University of Alaska Fairbanks
P.O. Box 757320
Fairbanks, Alaska 99775-7320
+1-907-474-7459
veromanovsky@alaska.edu

Stanislaus Sizonenko: B
Salekhard, Russia

Elena Slagoda: Kr
Earth Cryosphere Institute, SB RAS
Malygin Street 86
625026 Tyumen, Russia
akhomutov@gmail.com

Andrei Tarosov: B
Earth Cryosphere Institute, SB RAS
Vavilov Street 30/6
119991 Moscow, Russia

Ina Timling: Kr
Institute of Arctic Biology
Alaska Geobotany Center
University of Alaska Fairbanks
PO Box 757000
Fairbanks, Alaska 99775-7000
Phone: +1 907-474-7957
itimling@alaska.edu

Donald A. (Skip) Walker: N, L, V, K, B, Kp, Kr
Institute of Arctic Biology
Alaska Geobotany Center
University of Alaska Fairbanks
PO Box 757000
Fairbanks, Alaska 99775-7000
Phone: +1 907-474-2460
Fax: +1 907-474-7666
dawalker@alaska.edu

APPENDIX B: PLOT SOIL AND VEGETATION PHOTOS

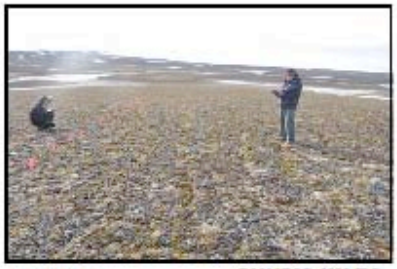
Figure B1 – Krenkel relveé, soil photo.

KR-RV-60 D9010DSC_5297.JPG

KR-RV-60 D9010DSC_5301.JPG

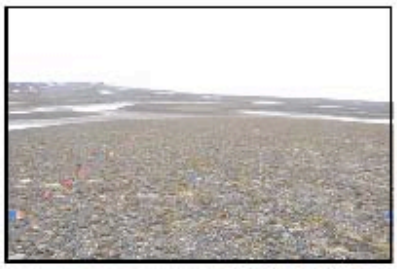
KR-RV-61 D9010DSC_5312.JPG

KR-RV-61 D9010DSC_5320.JPG



KR-RV-62 D9010DSC_5329.JPG

KR-RV-62 D9010DSC_5339.JPG



KR-RV-63 D9010DSC_5347.JPG

KR-RV-63 D9010DSC_5358.JPG

KR-RV-64 D9010DSC_5364.JPG

KR-RV-64 D9010DSC_5373.JPG

Figure B1. Krenkel Site 1. Vegetation and biomass plotos

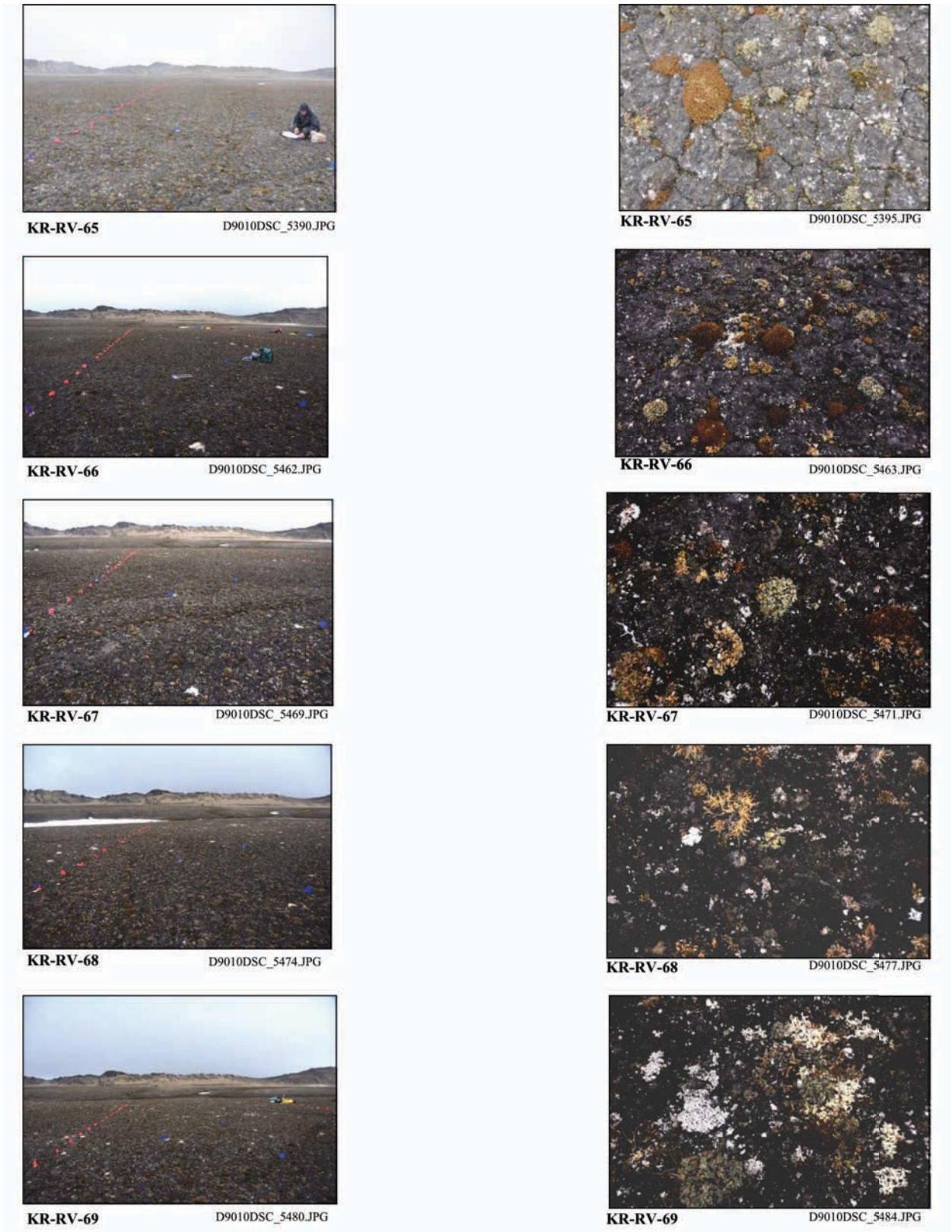


Figure B2. Krenkel Site 2. Vegetation and biomass plots.

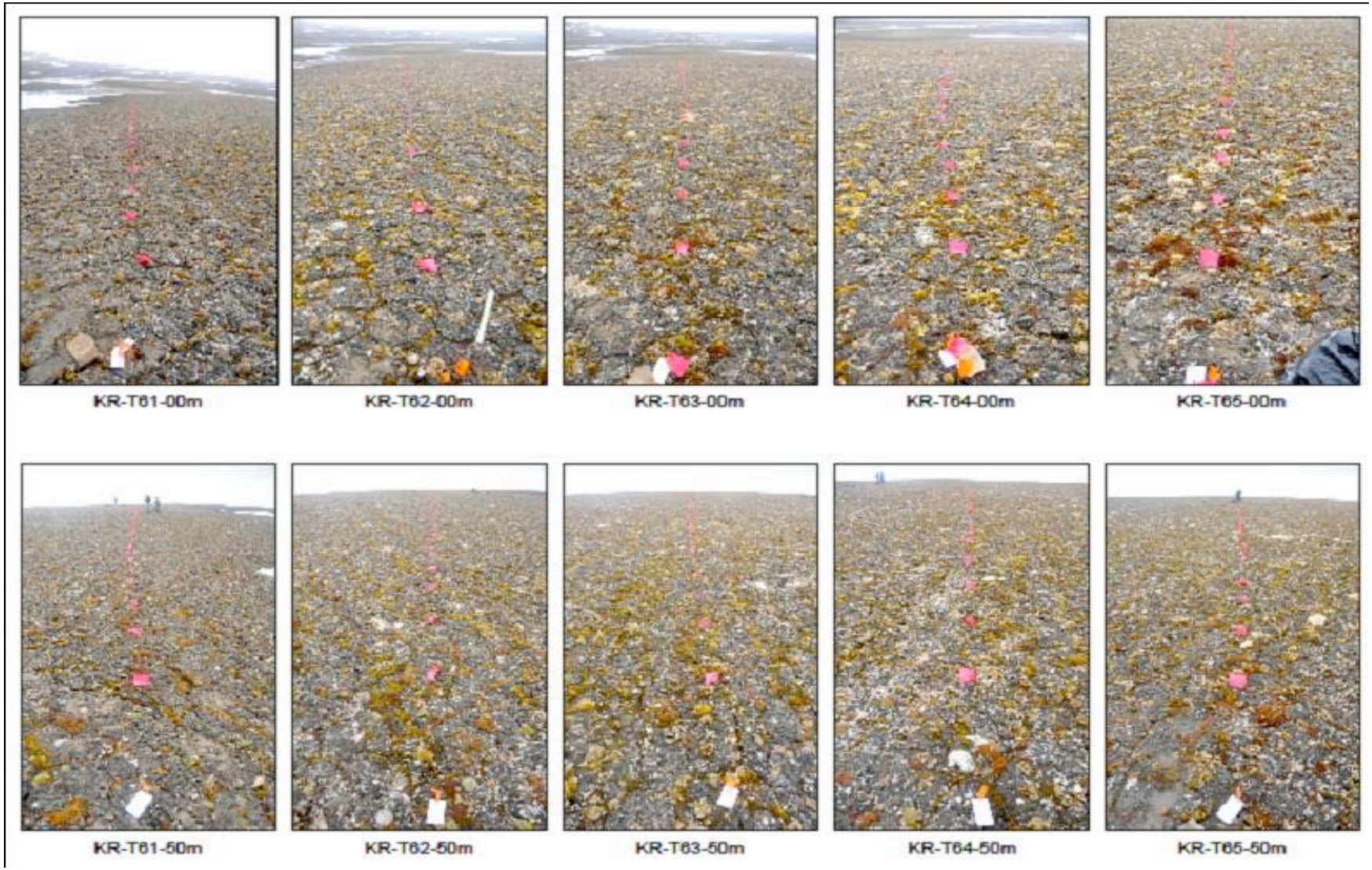


Figure B3. Krenkel Sites1, Transect photos.

KR-T66-00m KR-T67-00m KR-T68-00m KR-T69-00m KR-T70-00m

KR-T66-50m KR-T67-50m KR-T68-50m KR-T69-50m KR-T70-50m

Figure B4. Krenkel Sites 2, Transect photos.

APPENDIX C. BIRD LIST FROM 2010 FRANZ JOSEF LAND EXPEDITION .

LIST OF BIRDS OBSERVED DURING HAYES ISLAND EXPEDITION, 2010. OBSERVATIONS FROM MIKHAIL SOMOV INCLUDE BIRDS SEEN AT SEA AND WHILE ANCHORED AT PORTS-OF-CALL. BREEDING SPECIES ARE INDICATED WITH AN ASTERISK. COMPILED BY G.V. FROST.

				Mikhail Somov			
Common Name	Scientific Name	Vorkuta	Amderma	Kara Sea	Barents Sea	FJL	Hayes Island
Bewick's Swan	*Cygnus bewickii*				X*		
Green-winged Teal	*Anas crecca*		X				
Common Eider	*Somateria mollissima*		X		X		X*
King Eider	*Somateria spectabilis*				X		
White-winged Scoter	*Melanitta fusca*		X	X	X		
Red-breasted Merganser	*Mergus serrator*		X				
Northern Fulmar	*Fulmarus glacialis*			X	X*	X*	X
Northern Gannet	*Morus bassanus*				X		
Red-throated Loon	*Gavia stellata*		X				X
Arctic Loon	*Gavia arctica*			X			
Rough-legged Hawk	*Buteo lagopus*		X*				
Common Ringed Plover	*Charadrius hiaticula*		X*				
Ruff	*Philomachus pugnax*		X		X		
Wood Sandpiper	*Tringa glareola*	X*	X*				
Temminck's Stint	*Calidris temminckii*		X*				
Purple Sandpiper	*Calidris maritima*				X		X*
Red-necked Phalarope	*Phalaropus fulicarius*		X	X			
Great Skua	*Stercorarius skua*				X		X
Pomarine Jaeger	*Stercorarius pomarinus*		X	X	X	X	X
Parasitic Jaeger	*Stercorarius parasitcus*		X	X	X	X	X*
Long-tailed Jaeger	*Stercorarius longicaudus*			X			
Great Black-backed Gull	*Larus marinus*				X		
Herring Gull	*Larus argentatus*		X	X	X		
Heuglin's Gull	*Larus heuglini*		X	X	X		
Glaucous Gull	*Larus hyperboreus*		X	X	X*	X	X
Mew Gull	*Larus canus*	X					
Ivory Gull	*Pagophila eburnea*			X			X
Black-legged Kittiwake	*Rissa tridactyla*		X	X	X*	X*	X
Arctic Tern	*Sterna paradisea*			X			X*
Dovekie	*Alle alle*					X*	X
Common Murre	*Uria aalge*				X*		
Thick-billed Murre	*Uria lomvia*			X	X*	X*	
Black Guillemot	*Cepphus grylle*			X	X*	X*	X
Atlantic Puffin	*Fratercula arctica*				X*		
Rock Pigeon	*Columba livia*	X					
Horned Lark	*Eremophila alpestris*		X*				
Meadow Pipit	*Anthus pratensis*	X*					
Red-throated Pipit	*Anthus cervinus*		X*				
Yellow Wagtail	*Motacilla flava*		X				
White Wagtail	*Motacilla alba*	X*	X*				
European Magpie	*Pica pica*	X	X*				
Hooded Crow	*Corvus cornix*	X	X				
Common Raven	*Corvus corax*	X		X			
Willow Warbler	*Phylloscopus trochilus*	X*					
Arctic Warbler	*Phylloscopus borealis*	X*					
Northern Wheatear	*Oenanthe oenanthe*		X*				
Bluethroat	*Luscinia svecica*	X*	X*				
Fieldfare	*Turdus pilaris*		X*				
Common Redpoll	*Acanthis flammea*	X					
Little Bunting	*Ocyris pusillus*	X*					
Snow Bunting	*Plectrophenax nivalis*		X*				X*