

Monthly Summaries of Soil Temperature and Soil Moisture at Sites in Alaska, Version 1

USER GUIDE

How to Cite These Data

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

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National Snow and Ice Data Center

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1 DATA DESCRIPTION

A Campbell Scientific CR10X-2M datalogger records day, time, battery (voltage), and internal temperature. A combination of the following below-ground sensors are attached to the datalogger: Vitel Hydra dielectric constant soil moisture and temperature sensors, Campbell 107 soil temperature sensors, MRC soil temperature probes.

Above-ground sensors at all sites include Licor LI200X pyranometer (solar radiation) sensors and Met One wind speed and direction sensors, which are mounted 3 m above the ground. Vaisala HMP45C air temperature and relative humidity sensors are mounted at approximately 1.6 m above the ground.

Table 1 displays the active-layer depths (in cm) at the three primary stations. See Appendix A for graphs of soil temperature profiles. Appendix B presents a summary of soil characteristics for the study area.

Table 1. Active-layer depth (in cm) at the primary stations

Year	Barrow 1	Atqasuk	Toolik
1993	30.5		
1994	37.1		
1995	34.2		
1996	35.5		
1997	61.1		
1998	64.7	63.7	
1999			76.5
2000	58.1		

1.1 Format

Each of the 17 station files contains average, median, standard deviation, maximum, and minimum values for the following variables:

Table 2. Variables included in the data files

Col. #	Col. Name	Description	Units	Location	Sensor
1	BATT VOLT	Battery voltage	Volts	Datalogger	Campbell CR10X-2M
2	INT TEMP	Datalogger temperature	°C	Datalogger	Campbell CR10X-2M

Col. #	Col. Name	Description	Units	Location	Sensor
3	REF TEMP	Calibration reference temperature	°C	Enclosure	Campbell CR10TCR
4	TC	Enclosure temperature	°C	Enclosure	Thermocouple
5	SOIL T	Soil temperature at 5-cm depth, measured with Campbell 107 sensor	°C	Soil 5 cm	Campbell 107
6	SOIL T	Soil temperature at 20-cm depth, measured with Campbell 107 sensor	°C	Soil 20 cm	Campbell 107
7	SOIL T	Soil temperature at 30-cm depth, measured with Campbell 107 sensor	°C	Soil 30 cm	Campbell 107
8	MRC	Surface soil temperature, measured with MRC sensor	°C	Vegetation	MRC
9	MRC	Surface soil temperature, measured with MRC sensor	°C	Soil 0 cm	MRC
10	MRC	Soil temperature at 5-cm depth, measured with MRC sensor	°C	Soil 5 cm	MRC
11	MRC	Soil temperature at 10-cm depth, measured with MRC sensor	°C	Soil 10 cm	MRC
12	MRC	Soil temperature at 15-cm depth, measured with MRC sensor	°C	Soil 15 cm	MRC
13	MRC	Soil temperature at 20-cm depth, measured with MRC sensor	°C	Soil 20 cm	MRC
14	MRC	Soil temperature at 25-cm depth, measured with MRC sensor	°C	Soil 25 cm	MRC
15	MRC	Soil temperature at 30-cm depth, measured with MRC sensor	°C	Soil 30 cm	MRC
16	MRC	Soil temperature at 35-cm depth, measured with MRC sensor	°C	Soil 35 cm	MRC
17	MRC	Soil temperature at 45-cm depth, measured with MRC sensor	°C	Soil 45 cm	MRC
18	MRC	Soil temperature at 70-cm depth, measured with MRC sensor	°C	Soil 70 cm	MRC

Col. #	Col. Name	Description	Units	Location	Sensor
19	MRC	Soil temperature at 95-cm depth, measured with MRC sensor	°C	Soil 95 cm	MRC
20	MRC	Soil temperature at 120-cm depth, measured with MRC sensor	°C	Soil 120 cm	MRC
21	Rep 2	Soil temperature at 36-cm depth, measured with Vitel sensor, Stack 2	°C	Soil 36 cm	Vitel
22	Rep 2	Volumetric water content at 36-cm depth, measured with Vitel sensor, Stack 2	H ₂ O v/v	Soil 36 cm	Vitel
23	Rep 2	Soil temperature at 20-cm depth, measured with Vitel sensor, Stack 2	°C	Soil 20 cm	Vitel
24	Rep 2	Volumetric water content at 20-cm depth, measured with Vitel sensor, Stack 2	H ₂ O v/v	Soil 20 cm	Vitel
25	Rep 2	Soil temperature at 5-cm depth, measured with Vitel sensor, Stack 2	°C	Soil 5 cm	Vitel
26	Rep 2	Volumetric water content at 5-cm depth, measured with Vitel sensor, Stack 2	H ₂ O v/v	Soil 5 cm	Vitel
27	Rep 1	Soil temperature at 30-cm depth, measured with Vitel sensor, Stack 1	°C	Soil 30 cm	Vitel
28	Rep 1	Volumetric water content at 30-cm depth, measured with Vitel sensor, Stack 1	H ₂ O v/v	Soil 30 cm	Vitel
29	Rep 1	Soil temperature at 19-cm depth, measured with Vitel sensor, Stack 1	°C	Soil 19 cm	Vitel
30	Rep 1	Volumetric water content at 19-cm depth, measured with Vitel sensor, Stack 1	H ₂ O v/v	Soil 19 cm	Vitel
31	Rep 1	Soil temperature at 5-cm depth, measured with Vitel sensor, Stack 1	°C	Soil 5 cm	Vitel
32	Rep 1	Volumetric water content at 5-cm depth, measured with Vitel sensor, Stack 1	H ₂ O v/v	Soil 5 cm	Vitel

Col. #	Col. Name	Description	Units	Location	Sensor
33	Rep 3	Soil temperature at 28-cm depth, measured with Vitel sensor, Stack 3	°C	Soil 28 cm	Vitel
34	Rep 3	Volumetric water content at 28-cm depth, measured with Vitel sensor, Stack 3	H ₂ O v/v	Soil 28 cm	Vitel
35	Rep 3	Soil temperature at 20-cm depth, measured with Vitel sensor, Stack 3	°C	Soil 20 cm	Vitel
36	Rep 3	Volumetric water content at 20-cm depth, measured with Vitel sensor, Stack 3	H ₂ O v/v	Soil 20 cm	Vitel
37	Rep 3	Soil temperature at 5-cm depth, measured with Vitel sensor, Stack 3	°C	Soil 5 cm	Vitel
38	Rep 3	Volumetric water content at 5-cm depth, measured with Vitel sensor, Stack 3	H ₂ O v/v	Soil 5 cm	Vitel
39	Rep 4	Soil temperature at 28-cm depth, measured with Vitel sensor, Stack 4	°C	Soil 28 cm	Vitel
40	Rep 4	Volumetric water content at 28-cm depth, measured with Vitel sensor, Stack 4	H ₂ O v/v	Soil 28 cm	Vitel
41	Rep 4	Soil temperature at 20-cm depth, measured with Vitel sensor, Stack 4	°C	Soil 20 cm	Vitel
42	Rep 4	Volumetric water content at 20-cm depth, measured with Vitel sensor, Stack 4	H ₂ O v/v	Soil 20 cm	Vitel
43	Rep 4	Soil temperature at 5-cm depth, measured with Vitel sensor, Stack 4	°C	Soil 5 cm	Vitel
44	Rep 4	Volumetric water content at 5-cm depth, measured with Vitel sensor, Stack 4	H ₂ O v/v	Soil 5 cm	Vitel

1.2 File Naming Convention

Files with the name format `ggd624_[*].txt` contain data from individual stations

The file `ggd624_ak_soiltemp.xls` is an Excel spreadsheet with data from all stations.

1.3 Spatial and Temporal Information

Data were collected from 17 sites in Alaska. Table 3 displays their geographic coordinates and the temporal coverage at each station (date ranges have incomplete coverage; some stations have large gaps of data).

Table 3. Station coordinates and temporal coverage (incomplete)

Station	Latitude	Longitude	Temporal Coverage
Aniak	61° 35' 00.0" N	159° 34' 37.9" W	N/A
Atqasuk	70° 27' 08.88" N	157° 24' 41.87" W	July 1996 to July 2001
Barrow 1	71° 19' 20.68" N	156° 36' 39.37" W	September 1995 to July 2001
Barrow 2	71° 18' 27.64" N	156° 35' 19.53" W	July 1996 to July 2001
Betty Pingo	70° 16' 57.17" N	148° 53' 36.85" W	July 1996 to September 2000
Chandler Shelf	68° 04' 09.2" N	149° 34' 49.0" W	N/A
Coldfoot	67° 14' 15.6" N	150° 09' 41.6" W	November 1997 to August 2001
Franklin Bluffs	69° 40.43' N	148° 43.39' W	N/A
Galbraith Lake	68° 28' 38.8" N	149° 30' 07.7" W	N/A
Homer 1	59° 39' 39.5" N	151° 37' 41.3" W	October 1999 to April 2000
Homer 2	59° 39' 39.5" N	151° 37' 25.8" W	October to November 1999
Homer 3	59° 41' 20.1" N	151° 22' 16.1" W	October 1999 to April 2000
Homer 4	59° 41' 33.8" N	151° 23' 37.2" W	October 1999 to April 2000
Mile 170	67° 12' 03.9" N	150° 16' 12.2" W	March 1998 to July 2001
Mile 411	70° 09' 43.8" N	148° 27' 54.4" W	N/A
Napiamute	61° 31' 36.1" N	158° 46' 42.5" W	N/A
Nenana	64° 41' 08.8" N	148° 54' 40.7" W	N/A
Sagwon 1, Flux site 3, non-acid	69° 26' 22.38" N	148° 40' 07.62" W	July 1996 to February 2001
Sagwon 2, Flux site 4, acid	69° 24' 08.73" N	148° 47' 52.88" W	July 1996 to January 2001
Smith Lake 1	64° 52' 10.72" N	147° 51' 38.57" W	October 1996 to June 2000
Smith Lake 2	64° 51' 55.85" N	147° 51' 23.26" W	October 1998 to April 2000
Smith Lake 3	64° 52' 02.7" N	147° 51' 32.1" W	November 1997 to April 2000
Smith Lake 4	64° 52' 00.1" N	147° 51' 32.0" W	January 1999 to June 2000
Toolik	68° 37' 22.8" N	149° 36' 34.3" W	October 1998 to August 2001
West Dock, high	70° 22' 13.6" N	148° 33' 55.9" W	N/A
West Dock, low	70° 22' 13.4" N	148° 34' 07.1" W	N/A

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3 CONTACTS AND ACKNOWLEDGMENTS

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4 DOCUMENT INFORMATION

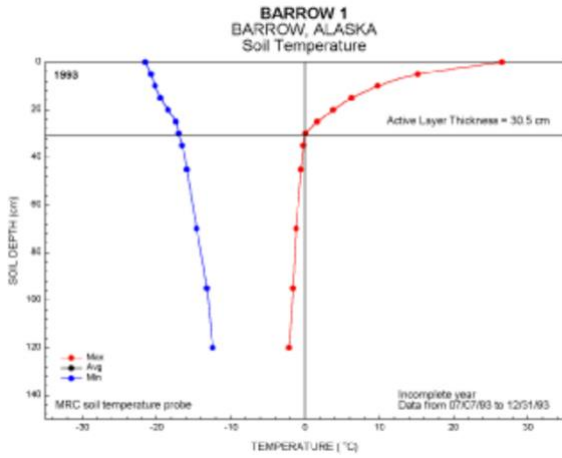
4.1 Publication Date

May 2003

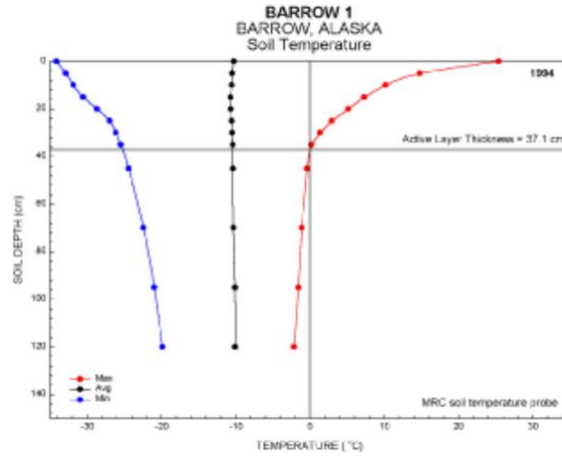
4.2 Date Last Updated

January 2021

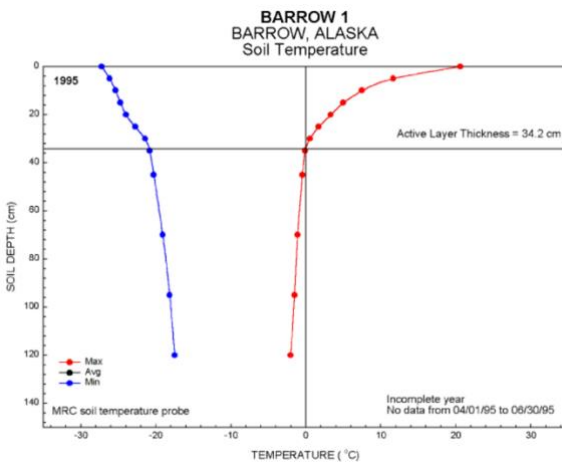
APPENDIX A – SOIL MOISTURE TEMPERATURE PROFILES



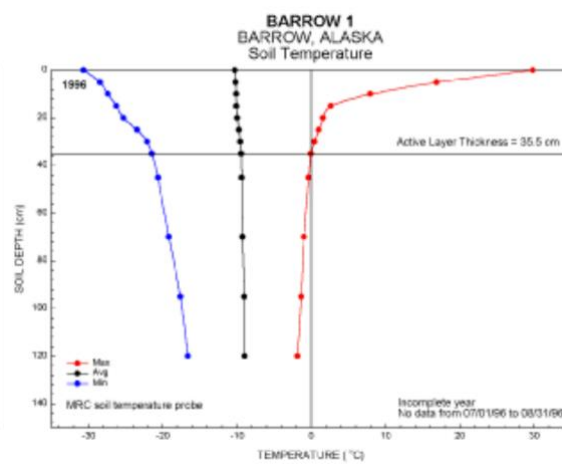
Barrow 1, 1993



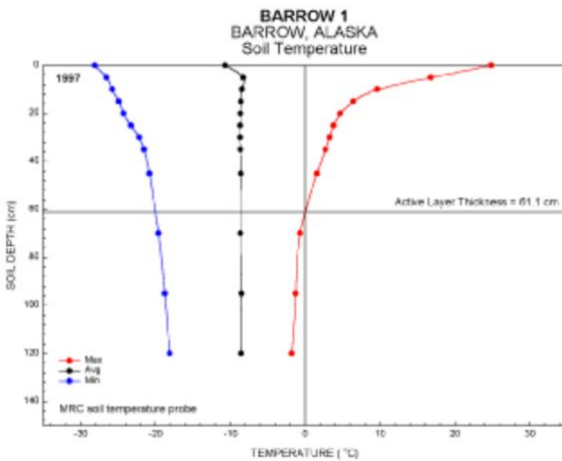
Barrow 1, 1994



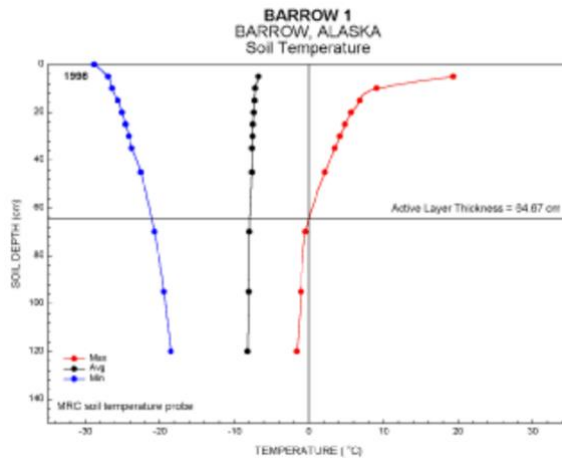
Barrow 1, 1995



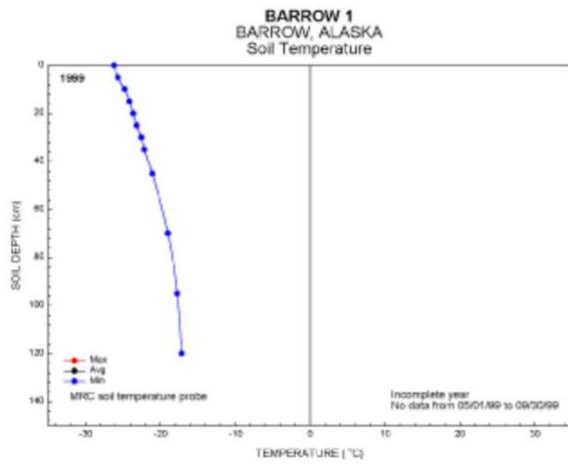
Barrow 1, 1996



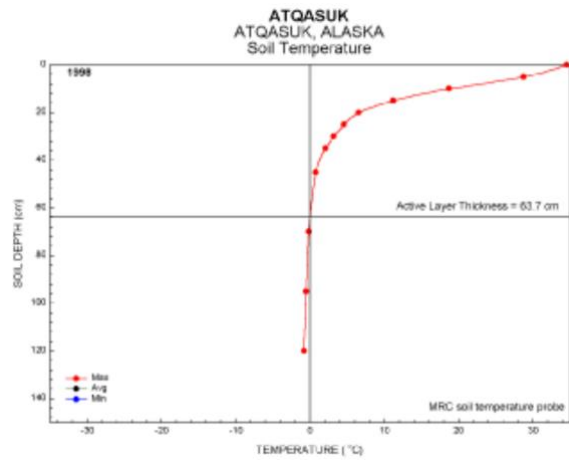
Barrow 1, 1997



Barrow 1, 1998



Barrow 1, 1999



Atqasuk, 1998

APPENDIX B – SOIL CHARACTERISTICS

Explanation of Soil Characteristics:

Coarse: silty, mixed, nonacidic, pergelic family. The soil has a silty-loam texture in its mineral horizons, mixed mineralogy, soil pH > 5.0. Mean annual soil temperature at 50 cm is -4°C to -10°C.

Histic: soils having > 15 cm but < 40 cm of organic horizon.

Aquorthels: soils are wet with permafrost within 1 m to the surface. Soils lack cryoturbation.

West Dock Kane and Hinzman's site (west of the West Dock access road)

Location: 70° 22' 21" N, 148° 33' 30" W

Elevation: 1 m

Landform: Coastal plain; sedge marsh (under 2.5 inches of water)

Microrelief: Plain

Slope: 0%

Drainage: Very poorly drained (ponded)

Parent material: Thaw lake deposit

Vegetation: Carex sp.

Soil Classification: Coarse-silty, mixed, nonacidic, pergelic Histic Aquorthels

Sampled by: C.L. Ping, R. Pringle, J. Arndt, R.J. Candler, and S. Goetz.

Soil profile description:

Horizon	Depth (cm)	Description
Oi	0-20	Sedge root mat, undecomposed
A	20-41	Mucky silt loam
Cgf	41-55	Frozen sediment, silty loam, gleyed presumably season frost
Cf	55-80	Frozen sediment, upper permafrost, high ice content (> 60% by volume)

Remarks: This is not a Wet Soils Monitoring site, but it is the most northern site located on a coastal marsh. Larry released some soil temperature data.

Barrow Ecological Observatory (Paetzold's CALM site)

GPS location: 71° 19' 20" N, 156° 36' 29" W

Slope characteristics:

Slope: 1%

Aspect: N
 Slope shape: slightly convex
 Total slope length: 0.5 km
 Elevation: 2 m asl
 Physiography: Arctic Coastal Plain
 Geomorphic position: Raised beach
 Microtopography: slightly undulating with relief of 15 cm
 Flooding information: Frequency rare
 Ponding information: Frequency rare
 Classification: Coarse-loamy over lomy-skeletal, mixed, nonacid, gelic Typic Aquiturbels
 Moisture regime: Aquic
 Landuse: Wildlife habitat and oil exploration
 Stoness: none
 Permeability: moderately slow
 Natural drainage class: poor
 Parent material: beach deposits
 Vegetation: wet nonacidic tundra, Salix spp., Carex spp., and mosses
 MAAT:- °C
 MAP: 200 mm, est.
 MAST: -7° C, est.
 Active layer depth: 80 cm
 Sampled by C.L. Ping, G.J. Michaelson
 Sampling date: August 10, 1998

Soil profile description:

Horizon	Depth (cm)	Description
Oi	0-1	peat; many fine and few medium roots; abrupt smooth boundary.
Bw	1-20	Brown (7.5YR4/4) silt loam; moderate medium granular and weak medium lenticular fabrics; slightly sticky and slightly plastic; many very fine and fine roots; clear smooth boundary.
Bg	20-31	Brown (7.5YR4/4) and dark gray (2.5Y4/1) gravelly silt loam; saturated; slightly sticky and slightly plastic; few very fine and fine roots; abrupt wavy boundary.
Ab/Oab	31-52	Very dark gray (10YR3/1) and black (10YR2/1) mucky silt loam; slightly sticky and slightly plastic; abrupt smooth boundary
Cf	52-85	Dark gray (5Y4/1) and olive gray (5Y4/2) very gravelly silt loam; strong medium lenticular fabrics; frozen, hard, sticky and slightly plastic; 40% pebbles and 60% ice.

MP 411, Dalton Highway, Alaska (next to Vladimir Romanovsky's CALM site)

GPS location: 70° 09' 48" N, 148° 27' 32.4" W

Slope characteristics:

Slope: 1%

Aspect: N

Horizontal shape: plane

Vertical shape: plane

Total slope length: > 1 km

Slope length above site: > 1 km

Elevation: 5 m asl

Physiography: Arctic Coastal Plain

Geomorphic position: alluvial plain

Microtopography: low hummocks with relief of 15 cm, both old and new frost boils, common and old frost boils vegetated, marl formed in depressions and coated on vegetation.

Pit face aspect: E

Flooding information: Frequency is moderate

Ponding information: Frequency is frequent

Classification: Silty, mixed, nonacid, gelic Ruptic-Histic Aquiturbels

Moisture regime: Aquic

Landuse: Wildlife habitat and oil exploration

Stoness: none

Permeability: moderate

Natural drainage class: frequently ponded

Parent material: alluvium

Vegetation: wet nonacidic tundra with some small tussocks; *Eriophrum vaginatum*, *Salix* spp., *Carex* spp., *Cladonia* spp. and mosses

MAAT: - ° C

MAP: 200 mm

MAST: -7° C

Active layer depth: 80 cm

Sampled by C.L. Ping, G.J. Michaelson

Sampling date: September 15, 1999

Soil profile description:

Horizon	Depth (cm)	Description
Oi	0-8	Peat; many fine and few medium roots; abrupt smooth boundary
Oe	8-20	Dark brown (10YR3/1) peat muck; saturated; many very fine and fine roots; clear, abrupt wavy boundary
Bgl	20-35	Light gray (5Y 4/1) silt loam; saturated, slightly sticky and slightly plastic; many very fine roots; abrupt irregular boundary
Oe _{jj}	35-43	Dark brown (10YR3/2) mucky silt loam; saturated, slightly sticky and nonplastic; abrupt irregular boundary
Bg ₂	43-80	Dark grayish brown (10YR3.5/1.5) silt loam; saturated, slightly sticky and slightly plastic; common fine roots; abrupt smooth boundary
Cf	80-100	Light gray (5Y4/1) silt loam; frozen, firm, slightly sticky and slightly plastic; occasional pebbles; ice-rich (ataxic fabric), estimated ice content >55% by volume

Another pit was sampled nearby by Warren Lynn, X.Y. Dai, G.J. Michaelson, and C.L. Ping in 06 July 1998. S98AK-185-001 and 001a are in mudboil.

Lat. 70° 09' 48" N; Long. 148° 27' 32" W

Horizon	Depth (cm)	Description
Oe	0-18 (13-20)	
Bg	18-46	
Oe _{jj}	30-46	
Bg ₂	36-54	
Cf	54-61	Ice net formation with thin ice lense;
W _{fm} /C _f	61-81	Ataxitic layer (intermediate layer) medium ice lense;
2C _f /O _{ii}	81-100	Matrix contains thin ice lense with cryoturbated organic matter.

Remarks: Bg, Bg₂, Cf, and 2C_f/O_{jj} had a positive reaction to a,a-dipyridyl.

Toolik Lake (S98AK-185-002), moist acidic tundra

Location: 68° 37' 22.2" N, 149° 36' 35.4" W

Elevation:

Slope characteristics:

Slope: 3%

Aspect: E

Horizontal shape: plane

Vertical shape: convex

Total slope length: 0.5 km

Slope length above site: 0.2 km

Landform: Foothills, convex

Microrelief: hummocky

Drainage: poorly-drained

Parent material: glacial till

Vegetation: Eriophrum vaginatum, Betula nana, Vaccinium uliginosum, Ledum decumbens, Vaccinium vitis-idaea, Empetrum nigrum, and Rubus chamaemorus, Hylocomium splendens, Sphagnum spp, and lichens.

Classification: Coarse-loamy, mixed, acidic, gelic Typic Aquiturbels

Sampled and described by: CL. Ping, Xiaoyan Dai, Warren Lynn and G.J. Michaelson

Soil profile description, west side of pit (ortho face):

Horizon	Depth (cm)	Description
Oi	0-8	Brown (7.5YR4/2) peat; many medium and common fine roots; abrupt wavy boundary.
Oe	8-13	Dark brown (7/5YR3/2) mucky peat; many very fine, fine and common medium roots; abrupt wavy boundary.
Bw	13-19	70% brown (7.5Y4/4), 20% grayish brown (10YR5/2) and 10% dark reddish brown (5YR3/4) silt loam; saturated, slightly sticky and slightly plastic; common very fine and fine roots; clear irregular boundary.
Bg	19-32	Gray (10YR5/1) silt loam; saturated, slightly sticky and slightly plastic; few fine roots; abrupt irregular boundary.
Oe _{jj}	32-41	Very dark grayish brown (10YR3/2) muck with 10% grayish brown (10YR5/2) peat muck; cryoturbated; saturated; abrupt irregular boundary.
Cf	41-54	Grayish brown (2.5Y5/2) silt loam; frozen, moderate medium angular blocky structures caused by ice net formation; firm, slightly sticky and slightly plastic; ice rich upper permafrost, 65% ice. Clear smooth boundary.
Oe/Cf	54-80	40% black to very dark brown (10YR 2/1, 7.5YR2.5/1, 2.5/2) muck sand loam and 60% dark grayish brown (2.5Y4/2) silt loam; frozen, firm, slightly sticky and slightly plastic; 40% ice in very fine lenses; 10% rock fragments including 2 cobble stones.

Soil profile description, east side of pit:

Horizon	Depth (cm)	Description
Oe	0-3	Dark brown (7.5YR3/2) muck peat; abrupt wavy boundary.
Bwl	3-11	Matrix strong brown (7.5YR5/6) silt loam with 5% grayish brown (2.5Y5/1); moderate medium granular; friable, slightly sticky and slightly plastic; common very fine and fine roots; clear irregular boundary.
Bg	11-31	Gray (2.5Y5/1) silt loam; saturated, slightly sticky and slightly plastic; common very fine and fine roots; clear irregular boundary.
Bw2	11-37	Strong brown (7.5YR5/6) silt loam with 10% gray (10YR5/1) silt loam; weak medium granular and pocket of fine platy structures; friable, slightly sticky and slightly plastic; hallow of Fe depletion around root channels; estimated 20% clay; common very fine and fine roots; clear irregular boundary.
OAJj	37-50	Dark grayish brown (7.5YR2.5/2) mucky silt loam; cryoturbated; frozen, fine ice lenses, firm, slightly sticky and slightly plastic; abrupt smooth boundary.
Cgf	50-65	Gray (2.5Y5/1) silt loam; frozen, firm, slightly sticky and slightly plastic; moderate fine ice lenses; abrupt smooth boundary.
Wfm/Cf	65-80	Gray (2.5Y5/1) silt loam; frozen, firm, slightly sticky and slightly plastic; ataxitic layer, ice rich (>60%).

Soil profile description, north face of pit:

Horizon	Depth (cm)	Description
Oe	0-5	Dark brown (7.5YR3/2) muck peat; abrupt irregular boundary.
Bw	5-25	Matrix strong brown (7.5YR5/6) silt loam with 5% grayish brown (2.5Y5/1); saturated, slightly sticky and slightly plastic; common very fine and fine roots; clear irregular boundary.
Bgl	5-15	Matrix gray (2.5Y 5/1) silt loam; saturated, slightly sticky and slightly plastic; root pores lining of Fe concentration (7.5YR4/4); common fine and medium roots; clear irregular boundary.
Bg2	15-35	Gray (2.5Y5/1) silt loam; massive, slightly sticky and slightly plastic; Few pore lining of 10YR5/6; few fine roots; abrupt smooth boundary.
Ab/Oejj	35-42	Dark-grayish brown (7.5YR2.5/2) mucky silt loam; cryoturbated; frozen, fine ice lenses, firm, slightly sticky and slightly plastic; abrupt wavy boundary.
Cgf	42-65	Gray (2.5Y5/1) silt loam; frozen, firm, slightly sticky and slightly plastic; moderate fine ice lenses.

Galbraith Lake Site (Vladimir Romanovsky's CALM Site)

Location: 68° 28' 37.3" N, 149° 30' 12" W. Located north of airstrip.

Slope characteristics:

Slope: 1%

Aspect: E

Horizontal shape: plane

Vertical shape: plane

Total slope length: > 1 km

Slope length above site: 0.6 km

Elevation: m asl

Physiography: Arctic Foothills

Geomorphic position: alluvial fan

Microtopography: low hummocks with relief of 20-25 cm, , common frost boils

Pit face aspect: S

Flooding information: Frequency is occasional

Ponding information: Frequency is common

Classification: Silty, mixed, nonacid, gelic Ruptic-Histic Aquiturbels

Moisture regime: Aquic

Landuse: Wildlife habitat

Stoness: none

Permeability: moderate

Natural drainage class: frequently ponded

Parent material: alluvium

Vegetation: wet nonacidic tundra with some small tussocks; *Eriophrum vaginatum*, *Salix* spp.,

Carex spp., and mosses

MAAT: - ° C

MAP: 350 mm, est.

MAST: -5 ° C, est.

Active layer depth: 60 cm (from top of hummocks)

Sampled by C.L. Ping, G.J. Michaelson

Sampling date: September 17, 1999

Soil profile description

Horizon	Depth (cm)	Description
Oi	0-10	Dark brown (7.5YR3/1) peat; many very fine, fine and few medium roots; clear smooth boundary.
Oe	10-28	Dark brown (7.5YR2.5/2) muck peat; saturated; many very fine and fine roots; abrupt smooth boundary.
Bg	28-49	Gray (2.5Y4/1) silt loam; wet but not saturated; weak coarse angular blocky breaking into weak medium lenticular fabric; friable, slightly sticky and plastic; common very fine and fine roots; abrupt wavy boundary.
Oii/Bg	49-58	Black (10YR2/2) muck peat and gray (2.5Y4/1) silt loam; wet, slightly sticky and slightly plastic; abrupt irregular boundary.
Bgf/Ojif	58-75	Gray (2.5Y4/1) silt loam and black (10YR2/2) muck peat; frozen, firm, slightly sticky and slightly plastic; ice rich, estimated 60% ice by volume.

Chandler Shelf Site (Vladimir Romanovsky's CALM Site)

Location: 68° 04' 20" N, 149° 34' 11" W

Slope characteristics:

Slope: 0%

Aspect:

Horizontal shape: plane

Vertical shape: plane

Total slope length: km

Slope length above site: km

Elevation: m asl

Physiography: Brooks Range

Geomorphic position: terrace

Microtopography: Earth hummocks with relief of 20-30 cm and 40-70 cm across, common frost boils

Pit face aspect: E

Flooding information: Frequency is rare

Ponding information:

Classification: Fine-silty, mixed, acidic, gelic Ruptic-Histic Aquiturbels

Moisture regime: Aquic

Landuse: Wildlife habitat

Stoness: none

Permeability: moderately slow in active layer

Natural drainage class: somewhat poorly (hummocks) and poorly (inter-hummocks)

Parent material: lacustrine

Vegetation: moist acidic tundra with some small tussocks; *Butula nana*, *Ledium decumbens*, *Eriophrum vaginatum*, *Salix* spp., *Carex biglowii*, *Vaccinium uliginosum*, coldfoot, mosses and *Cladonia*. spp.

MAAT: - ° C

MAP: 400 mm, est.

MAST: -5 ° C, est.

Active layer depth: 32 cm (from inter- hummocks)

Sampled by C.L. Ping, G.J. Michaelson, W. Lynn, X.Y. Dai

Sampling date: September 17, 1998

Soil profile description:

Horizon	Depth (cm)	Description
Oi	0-7	Dark brown (10YR3/3) peat; many very fine, fine and few medium roots; clear smooth boundary.
Oe	7-12	Black (10YR2/1) and brown (7.5YR4/2) muck peat; saturated; many very fine, fine and common medium roots; abrupt smooth boundary
Bw	12-31	Under hummocks; brown (10YR4/3) silt loam; moderate fine and strong medium granular structures; slightly firm, slightly sticky and slightly plastic; many very fine, fine and common medium roots; abrupt irregular boundary
Bgl	15-20	Grayish brown (2.5Y5/1) silt loam matrix; Fe concentration (7.5YR4/4, 4/6, and 3/3 as pore linings around root channels massive, slightly sticky and slightly plastic; exists as islands in Bw; abrupt irregular boundary
Bg2	31-40	Gray (2.5Y4/1) silt loam; wet but not saturated; weak coarse angular blocky breaking into weak medium lenticular fabric; friable, slightly sticky and plastic; common very fine and fine roots; abrupt irregular boundary.
Bg/Oejf	40-55	Bgf gray (2.5Y4/1) silty clay loam and Oejf black (10YR2/1) and dark brown (7.5YR3/2) muck peat; frozen, thin ice lenses, firm, sticky and plastic; ice rich, estimated 50% ice by volume; clear smooth boundary
Wfm/Bgf	56-70	Gray (2.5Y4/1) silty clay loam; ataxitic layer, 65-70% ice; sticky and plastic; estimated 25% clay; clear smooth boundary.
Cf	70-90	Gray (2.5Y4/1) silty clay loam; massive, thin ice lenses, 50% ice content; sticky and plastic.

Soils interhummocks (trough:

Oi: 0-10 cm

Oe: 10-18 cm

Bg: 18-24 cm

Bgf/Oejjf: 24-40 cm

Cf: > 40 cm

Remarks: Site Examined in 20 August 1997. Depth to frost table: 42 cm below the top of earth hummock, 8 cm below interhummocks, and 43 cm below the center of mudboils. Campbell datalogger and borehole. Diagrams show positions of soil temperature and Vitel sensors.

Coldfoot East, Alaska (Vladimir Romanovsky' site)

GPS location: 67° 14' 15" N, 150° 09' 42" W

Slope characteristics:

Slope: 3%

Aspect: NW

Horizontal shape: plane

Vertical shape: slightly convex

Total slope length: > 1 km

Slope length above site: > 1 km

Elevation: m asl

Physiography:

Geomorphic position: terrace

Microtopography: tussocks with relief of 20-30 cm

Pit face aspect: E

Flooding information: Frequency is zero

Ponding information: Frequency is zero

Classification: Silty, mixed, acidic, gelic Ruptic-Histic Aquiturbels

Moisture regime: Aquic

Landuse: Wildlife habitat

Stoness: none

Permeability: moderate in active layer

Natural drainage class: poor

Parent material: alluvium

Vegetation: moist acidic tussock tundra; *Eriophrum vaginatum*, *Vaccinium uliginosum*, *Vaccinium vitis-idaea*, *Ledum decumbens*, *Betula nana*, *Rubus chamomoris*, *Hylocomium splendens*, *Cladonia* spp. and scattered *Picea mariana*.

MAAT: - ° C

MAP: 400 mm est.

MAST: -5 ° C est.

Active layer depth: 45 cm intertussocks with 15 cm organic horizon and 58 cm from top of tussocks

with 35 cm of organic horizon observed 8/21/97

Sampled by C.L. Ping, G.J. Michaelson, W. Lynn, X.Y. Dai

Sampling date: September 17, 1998

Soil profile description:

Horizon	Depth (cm)	Description
Oi	0-13	Dark brown (7.5YR3/1) peat; many very fine, fine and few medium roots; clear wavy boundary.
Oe	13-29	Dark-reddish brown (5YR2.5/2) peaty muck; 60% fiber unrubbed and 30% fiber rubbed; many very fine, fine and medium roots; at the bottom of horizon, thin (0.5 cm) band of charcoal (10YR2/1); abrupt smooth boundary.
Oa	29-50	Dark brown (7.5YR 2.5/2) muck; 10% unrubbed fiber and 2% rubbed fiber; many very fine and fine roots; abrupt smooth boundary.
Bg	50-62	Light gray (5Y5/1) silt loam; saturated; massive; slightly sticky and slightly plastic; few very fine and fine roots; abrupt smooth boundary.
Bgf	62-78	Light gray (5Y5/1) silt loam; frozen, very firm; light gray (5Y5/1) silt loam; estimated 45% ice content, ice lense 3-10 mm thick.

Remarks: The intertussocks areas occupy about 50% of the total surface area with organic horizon 29-30 thick. An estimated 60% of the pedons have organic horizons less than 40 cm. Campbell datalogger and borehole site.