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Appendix

Selected Soil Descriptions

Plot SWT-2 Soil Description

Classification: Pergelic Cryoboroll, sandy, mixed.
Location: South end of Toolik Lake along inlet stream, 68°37' N, 149°36' W.
Physiographic position: Active floodplain.
Topography: Featureless, < 2 percent slope.
Drainage: Moderately well drained, flooded annually.
Vegetation: Moist *Salix alaxensis, Aster sibirica, Calamagrostis canadensis, Potentilla fruticosa* tall shrubland.
Parent material: Fine textured alluvium.
Sampled by: D.A. Walker and C. Westberg, August 1, 1989.
Remarks: Shrubs: > 2 m. Profile described to contact with underlying coarse river gravel.
Weather: Cool, cloudy.

Colors are for the moist soil.

A1 0-10 cm. Very dark brown (7.5YR 2/2.5) sand; weak medium granular structure; damp; very friable (moist), gritty, non-sticky, non-plastic (wet); highly-organic; pH = 6.3; many very fine and fine roots; est. 2 percent fine gravel less than 0,5 cm diameter; clear, smooth boundary. (Sample T-003).

A2 10-46 cm. Very dark brown (10YR 2.5/3) sandy loam; weak medium subangular blocky structure; damp to moist; friable (moist), gritty, very slightly sticky, slightly plastic (wet); pH = 6.4; common very fine and few fine roots; est. 5 percent fine gravel less than 2 cm diameter; abrupt, smooth boundary. (Sample T-004).

IIC 46+ cm. Coarse river cobbles.

Plot SWT-5 Soil Description

Classification: Pergelic Cryochrept, sandy-skeletal, mixed.
Location: South side of Toolik Lake, 68°37' N, 149°36' W.
Physiographic position: Top of glacial outwash terrace.
Topography: High centered polygons 6-8 m diameter, 20-40 cm height.
Microrelief height: 2-5 cm.
Drainage: Well drained terrace bluff.
Vegetation: Dry *Arctous alpina, Hierochloe alpina* dwarf-shrub, fruticose-lichen tundra.
Parent material: Itkillik II outwash.
Sampled by: D.A. Walker and C. Westberg, August 2, 1989.
Remarks: Deep active layer, but very rocky soil.
Weather: cold, raining.

Colors are for moist soil.

Oa 0-8 cm. Very dark brown (7.5YR 2/2) sapric organic material with est. < 5 percent silt loam; moderate fine granular structure; damp; smooth, slightly sticky, slightly plastic (wet); pH = 4.0; many fine and very fine roots; abrupt, irregular boundary. (Sample T-008).

Bw 8-12 cm. Brown (7.5YR 4.5/4) cobbly sandy loam; weak medium subangular blocky structure; damp; friable (moist), gritty, slightly sticky, slightly plastic; pH = 4.1; common fine and many very fine roots; est. 75 percent gravel and cobbles to 10 cm diameter; clear, irregular boundary. (Sample T-009).

Bw2 12-39 cm. Strong brown (7.5YR 4.5/6) very gravelly sandy loam; moderate medium subangular blocky structure; damp; slightly gritty, smooth, plastic; pH = 4.6; common fine roots; est. 80 percent gravel and cobbles to 20 cm diameter; wavy, clear boundary. (Sample T-010).

C 39-45+ cm. Dark yellowish brown (10YR 3/4) very gravelly loamy sand; single grained; damp; gritty, nonsticky, nonplastic; pH = 4.9; no roots; est. 90 percent gravel to 15 cm diameter. (Sample T-011).

Plot SWT-11 Soil Description

Classification: Pergelic Cryohemist, euic.
Location: South side of Toolik Lake, SW of inlet bay - final plot in toposequence, including SWT-7, 8, 9 and 10. 68°37' N, 149°36' W.
Physiographic position: Strangmoor in fen (wet element).
Topography: Colluvial basin. Flat featureless ground.
Microrelief height: < 5 cm.
Drainage: Very poorly drained with 5 cm of standing water.
Vegetation: Wet *Carex chordorrhiza, Carex rotundata, Scorpidium scorpioides* sedge tundra.
Parent material: Colluvial deposit on Itkillik II outwash
Sampled by: D.A. Walker and C. Westberg, August 3,1989.
Remarks: Frozen at 40 cm.
Weather: warm, broken high clouds.

Colors are for wet soil.

Oi 0-5 cm. Dark brown (7.5YR 3.5/3) fibric material with est. < 5 percent silt; after rubbing 70 percent recognizable plant fibers mostly roots; saturated; clear, smooth boundary.

Oe 5-25 cm. Dark brown (7.5YR 3.5/3) hemic material with est.< 5 percent sandy loam; after rubbing 10-20 percent recognizable plant fibers, mostly of sedge roots and leaves; saturated; pH = 4.6; abrupt, smooth boundary.
(Sample T-024).

Oa 25-40 cm. Dark brown (7.5YR 3/3) sapric material, est. 5 percent sandy loam; massive; saturated; smooth, nonsticky, nonplastic (wet); pH = 4.5.
(Sample T -025).

Plot SWT-13 Soil Description

Classification: Pergelic Cryohemist, euic.

Location: South side of Toolik Lake, 20 m NW of SWT-12 in sedge marsh, at the edge of small pond, 68°37' N, 149°36' W.

Physiographic position: Colluvial basin. Margin of a small pond.

Topography: Flat, featureless ground.

Microrelief height: < 5 cm.

Drainage: Very poorly drained, with patches of standing water.

Vegetation: Wet *Eriophorum angustifolium, Carex rotundata* sedge tundra.

Parent material: Colluvial deposit.

Sampled by: D.A. Walker and C. Westberg, August 4, 1989.

Remarks: Frozen at 60 cm.

Weather: warm, clear.

Colors are for the wet soil.

Oi 0-15 cm. Dark brown (7.5YR 3/3) fibric material; after rubbing est. 50 percent fiber content (sedge roots); saturated; 60 percent of material is a fine organic iron-rich precipitate; pH = 4.5; many fine and very fine roots; clear, smooth boundary. (Sample T-029).

Oe 15-30 cm. Dark brown (7.5YR 3/5) hemic material; saturated; up to 80 percent fine organic iron-rich precipitate; pH = 4.3; many fine and very fine roots; abrupt, smooth boundary. (Sample T-030).

Oa 30-40+ cm. Dark brown (7.5YR 3/5) fine organic material; massive structure; very saturated; soil is almost 100 percent organic iron-rich precipitate; few very fine roots. (Sample T-031).

Plot SWT-14 Soil Description

Classification: Pergelic Cryohemist, euic.
Location: South side of Toolik Lake, directly west of inlet bay. 68°37' N, 149°36' W.
Physiographic position: Colluvial basin.
Topography: Strangmoor and aligned hummocks in fen.
Microrelief height: 0-5 cm.
Drainage: Poorly drained.
Vegetation: Moist *Trichophorum caespitosum, Tomentypnum nitens* sedge tundra.
Parent material: Colluvial deposit.
Sampled by: D.A. Walker and C. Westberg, August 4, 1989.
Remarks: Frozen at 55 cm. Profile described from aligned hummock element.
Weather: Clear, warm, windy.

Colors are for the moist soil.

Oi 0-6 cm. Very dark brown (7.5YR 2/2.5) fibric material; after rubbing 50 percent recognizable plant fibers; very wet; composed mainly of coarse *Trichophorum caespitosum* roots; many fine and very fine roots; pH = 6.8; clear, smooth boundary. (Sample T-032).

Oe 6-30 cm. Dark brown (7.5YR 3/3.5) hemic material; after rubbing 10 percent recognizable plant fibers; very wet; composed of fine sedge roots; pH = 5.4; abrupt, smooth boundary. (Sample T -033).

Oa 30-40+ cm. Very dark brown (10YR 3/3) sapric material; after rubbing est. 10-15 percent recognizable plant fibers, mostly roots; saturated; pH = 4.8. (Sample T-034).

Plot SWT-26 Soil Description

Classification: Pergelic Cryaquept, fine-loamy, mixed, acid.

Location: Southwest side of Toolik Lake on long hillside near Shaver's greenhouses (SW corner). 68°37' N, 149°37' W at UTM grid stake 7,614,500 N, 393,900 W.

Physiographic position: Midslope of long gentle (5 percent) N-facing slope.

Topography: Hummocky terrain, including turf hummocks; many tussocks.

Microrelief height: 15 cm.

Drainage: Moderately well drained.

Vegetation: Moist *Eriophorum vaginatum, Betula nana, Sphagnum* sp. tussock-sedge, dwarf-shrub tundra.

Parent material: Itkillik I glacial till

Sampled by: D.A. Walker and C. Westberg, August 6, 1989.

Remarks: Frozen at 46 cm. Considerable evidence of cryoturbation in B horizon.

Weather: Broken clouds, very warm, light wind.

Colors are for the moist soil

Oi 0-4 cm. Loose mat of alive and dead mosses *(Aulacomnium turgidum, Dicranum* sp., *Hylocomium splendens);* smooth, abrupt boundary.

Oe 4-7 cm. Very dark brown (7.5YR 2/2) hemic material, est. < 2 percent by volume silt loam; loose (est. pore space 50 percent); weak medium platy structure; smooth, slightly sticky, slightly plastic (wet); smooth, clear boundary.

Oa 7-10 cm. Dark brown (10YR 3/3) loamy-sapric material; weak medium platy structure; wet; smooth, slightly sticky, plastic (wet); pH = 4.4; many fine and very fine roots; abrupt, smooth boundary. (Sample T-060).

Bw 10-40+ cm. Predominantly dark yellowish brown (10YR 3/4) gravelly sandy clay loam with many large brown mottles (10YR 4/6), plus areas of dark greyish brown (10YR 4/2) material; from moderate medium subangular blocky to moderate fine granular structure; firm (moist) gritty, sticky, plastic (wet); pH = 4.5; few fine roots; est. 15 percent by volume fine gravel < 1 cm diameter; thin dark greyish brown (10YR 4/2) band of silty, highly organic material at base of B horizon. (Sample T-061).

Plot SWT-27 Soil Description

Classification: Pergelic Cryohemist, euic.
Location: West side of Toolik lake, in water track, 68°38' N, 149°38' W.
Physiographic position: Midslope of small drainage, gentle (5 percent) N-facing slope.
Topography: Well defined hill slope water track.
Microrelief height: hummocks up to 20 cm.
Drainage: Very poorly drained.
Vegetation: Wet *Eriophorum angustifolium, Sphagnum* sp., *Salix planifolia* ssp. *pulchra* sedge, low-shrub tundra.
Parent material: Retransported fine alluvium.
Sampled by: D.A. Walker and C. Westberg, August 6, 1989.
Remarks: Frozen at 60 cm.
Weather: Clear, very warm.

Colors are for the wet soil.

Oi 0-9 cm. Loose mat of sedge leaves and moss *(Eriophorum angustifolium* and *Sphagnum squarrosum);* clear and smooth boundary.

Oa 9-19 cm. Very dark brown (7.5YR 2/2) sapric material, mainly composed of dead sedge leaves, after rubbing est. 5 percent recognizable plant fibers; saturated; loose, highly porous; abrupt, smooth boundary.

B/O 19-40+ cm. Predominantly very dark grayish brown (10YR 3/2) highly organic loam, mixed with pockets of pure sapric organic material; few brown (10YR 4/3) mottles, particularly around dead *Sphagnum;* weak, medium, subangular blocky structure; saturated; gritty, slightly plastic, slightly sticky (wet); pH = 4.6; few sedge roots. (Sample T-062).

Plot SWT-30 Soil Description

Classification: Pergelic Cryofibrist, euic.
Location: South side of Toolik Lake in water at edge of inlet bay. 68°37' N, 149°36' W.
Physiographic position: Lake.
Topography: Flat lake bottom.
Drainage: Very poorly drained, ponded.
Vegetation: Aquatic *Arctophila fulva* grass marsh.
Parent material: Lacustrine deposit.
Sampled by: D.A. Walker, C. Westberg, August 16, 1989.
Remarks: Frozen at 57 cm.
Weather: overcast, cool.

Colors are for the wet soil.

Oi 0-40 cm. Very dark grayish brown (10YR 3/2) fibric material, composed of live and dead *Scorpidium scorpioides* peat and *Arctophila fulva* roots; saturated; abrupt smooth boundary.

A 40+ cm. Very dark grayish brown (10YR 3/2) organic loam; pH = 4.7; saturated. (Sample T-067).

Plot SWT-32 Soil Description

Classification: Histic Pergelic Cryaquept, fine, mixed, acid.
Location: West side of Toolik Lake, in tussock tundra adjacent to SWT-35 on frost scar. 68°38' N, 149°38' W.
Physiographic position: Sideslope of 7 percent N-facing slope.
Topography: Hummocky terrain, including turf hummocks.
Drainage: Somewhat poorly drained.
Vegetation: Moist *Eriophorum vaginatum, Betula nana, Sphagnum rubellum* tussock-sedge, dwarf-shrub tundra.
Parent material: Itkillik I glacial till.
Sampled by: D.A. Walker and C. Westberg, August 13, 1989.
Remarks: Plot is on interscar element of a frost-scar complex. Plot SWT-35 is on the scar element. Estimate 15 percent of surface covered by frost scars. Ground is frozen at 40 cm.
Weather: cloudy, rainy, cold.

Colors are for the moist soil.

Oi 0 - 3 cm. Mat of mosses and lichen bases; abrupt wavy boundary.

Oe 3 - 9 cm. Primarily very dark brown (7.5YR 2/2) loose mat of fine roots, dead lichens and sedge leaves; after rubbing est. 20 percent recognizable plant fibers; abrupt wavy boundary.

Oa 9 - 18 cm. Dark brown (10YR 3/3) loamy organic material; inclusions of very dark brown (10YR 2/2) hemic organic material; weak medium subangular blocky, breaking to a moderate fine granular structure; friable (moist), smooth, slightly sticky, slightly plastic (wet); pH = 4.1; many fine and very fine roots; abrupt, wavy boundary. (Sample T-072).

Bw 18 - 40+ cm. Brown (10YR 4/3) clay with many medium distinct dark yellowish brown (10YR 4/6) mottles; massive structure; firm (moist), gritty, sticky, plastic (wet); few fine roots. (Sample T-073).

Plot SWT·34 Soil Description

Classification: Pergelic Cryosaprist, euic.
Location: Northwest side of Toolik Lake. 68°38' N, 149°38' W.
Physiographic position: Flat lake margin.
Topography: Solifluction features.
Microrelief height: 50 cm.
Drainage: Somewhat poorly drained.
Vegetation: Moist *Carex podocarpa, Salix reticulata, Aconitum delphinifolium* sedge, forb tundra.
Parent material: Itkillik II glacial outwash.
Sampled by: D.A. Walker and C. Westberg, August 8, 1989.
Remarks: Water at 38 cm.
Weather: mostly sunny, windy.

Colors are for moist soil, except where noted.

Oi 0 - 3 cm. Loose mat of mosses, litter and sedge leaves *(Tomentypnum nitens, Rhytidum rugosum);* smooth, abrupt boundary.

Oe 3 - 15 cm. Very dark brown (7.5YR 2/1.5) loose organic material, est. 2 percent silt; moist to wet; pH = 6.9; many fine, very fine and few medium roots; smooth, clear boundary. (Sample T-076).

Oa 15 - 63 cm. Very dark brown (7.5YR 2/1.5) sapric organic material with est. < 2 percent sandy loam; weak, medium, platy structure due to compressed organics; wet; pH = 6.2; many fine live roots; water table at 38 cm. (Sample T -077).

Plot SWT-35 Soil Description

Classification: Pergelic Cryaquept, fine-loamy, mixed, acid.
Location: South of Toolik Lake, on hill in tussock tundra, along transect across water track, adjacent to Plot SWT-32. 68°38' N, 149°38' W.
Physiographic position: Sideslope of 5 percent N-facing slope.
Topography: Frost scar element in tussock tundra. Diameter of frost scar is about 1 m.
Microrelief height: 5 cm.
Drainage: Well drained.
Vegetation: Dry *Luzula arctica, Juncus biglumis* barren.
Parent material: Itkillik I glacial till.
Sampled by: D.A. Walker and C. Westberg, August 13, 1989.
Remarks: Frost scar element of frost-scar complex. Plot SWT-32 is the inter-scar element. Ground frozen at 75 cm.
Weather: cold, rainy.

Colors are for the moist soil.

Bw1 0 - 6 cm. Dark yellowish brown (10YR 4/6) sandy clay loam; moderate, fine, granular structure; oxidized surface layer; firm (moist), gritty, sticky, plastic (wet); pH = 4.7; est. 2 percent fine gravel < 1 cm diameter; irregular boundary. (Sample T-078).

B2 6 - 40+ cm. Predominantly grey (7.5YR 5.5/1) sandy clay loam with many large strong brown (7.5YR 5/8) mottles; moderate medium platy breaking to moderate, fine, granular structure; firm (moist), gritty, sticky, plastic (wet); est. 2 percent fine gravel < 1 cm diameter; few very fine roots to 40 cm.

Plot SWT-37 Soil Description

Classification: Pergelic Cryohemist, euic.
Location: Northwest side of Toolik Lake, between S-7 and Toolik Lake, in marsh, surrounding small lake. Base of toposequence SWT-37 to SWT-47. 68°38' N, 149°38' W.
Physiographic position: Colluvial basin (marsh along small lake margin).
Topography: Strangmoor and aligned hummocks. Interhummock element.
Microrelief height: 15 cm.
Drainage: Very poorly drained.
Vegetation: Wet *Carex chordorrhiza, Carex aquatilis, Scorpidium scorpioides* sedge tundra.
Parent material: Colluvial deposit.
Sampled by: D.A. Walker and C. Westberg, August 8, 1989.
Remarks: Water at surface. Thaw depth is > 1 m.
Weather: Clear, breezy.

Colors are for the wet soil.

Oi1 0 - 2 cm. Dead sedge leaves and marl; abrupt, smooth boundary.

Oi2 2 - 32 cm. Dark brown after rubbing (7.5YR 3/2) fibric material with est. < 2 percent fine sand and silt; tight mat of sedge roots; saturated; pH = 5.6; abrupt smooth boundary. (Sample T-083).

Oa 32 - 40+ cm. Very dark gray (7.5YR 3.5/1) gravelly loamy sapric material; saturated; gritty, slightly sticky, slightly plastic (wet); pH = 6.1; est. 20 percent fine gravel to 3 cm diameter. (Sample T-084).

Plot SWT-38 Soil Description

Classification: Histic Pergelic Cryaquoll, fine-loamy, mixed.

Location: Northwest side of Toolik Lake. Close to plot SWT-37, on strang. Part of toposequence SWT-37 - SWT-47. 68°38' N, 149°38' W.

Physiographic position: Colluvial basin, on fen margin.

Topography: Aligned hummock in flat fen.

Microrelief height: 10 - 15 cm.

Drainage: Poorly drained.

Vegetation: Moist *Carex aquatilis, Dryas integrifolia, Tomentypnum nitens* sedge, dwarf-shrub tundra.

Parent material: Colluvial deposit.

Sampled by: D.A. Walker and C. Westberg, August 8,1989.

Remarks: Ground frozen at 78 cm.

Weather: Clear, breezy.

Colors are for the wet soil.

Oi 0 - 3 cm. Loose mat of live mosses, moss bases, dead sedge leaves; pH = 7.0; abrupt smooth boundary. (Sample T-085).

Oa 3 - 8 cm. Very dark brown after rubbing (7.5YR 2/1.5) sapric material with est. < 1 percent by volume silt; after rubbing < 1 percent recognizable plant material; loose structure; moist to wet; smooth, nonsticky, slightly plastic (wet); pH = 7.5; many fine and very fine roots, < 1 percent recognizable plant material after rubbing; abrupt smooth boundary. (Sample T-086).

IIOe1 8 - 19 cm. Very dark brown after rubbing (7.5YR 2/3) hemic material with est. < 2 percent by volume loamy sand; after rubbing 50 percent recognizable plant fibers; weak, medium, platy structure, due to compressed organics; wet; many fine and very fine roots; clear smooth boundary. (Sample T-087).

II0e2 19 - 24 cm. Very dark brown (10YR 2/2.5) hemic material with est. 5 percent by volume loam; weak, medium, platy structure due to compressed organics; wet; gritty, slightly sticky, plastic (wet); many very fine roots; abrupt smooth boundary.

Bg 24 - 53 cm. Very dark grey (10YR 3.5/1) organic rich gravelly sandy clay loam; massive structure; wet; gritty, plastic, sticky (wet); pH = 5.7; est. 15 percent fine gravel < 2 cm diameter; clay increases at 50 cm depth; common very fine roots; water table at 27 cm. (Sample T-088).

Plot SWT-39 Soil Description

Classification: Pergelic Cryaquoll, fine-loamy, mixed.

Location: Northwest side of Toolik Lake. South-facing slope on toposequence upslope from little lake between S-7 and Toolik. 68°38' N, 149°38' W.

Physiographic position: Lower backslope on long SSE-facing gentle (10 percent) hillslope.

Topography: Numerous non-sorted stripes, soil is described from area between stripes; solifluction lobes to 20-25 cm height; small flarks between lobes.

Microrelief height: 10 cm.

Drainage: Somewhat poorly drained.

Vegetation: Moist *Carex bigelowii,Dryas integrifolia, Salix reticulata, Tomentypnum nitens* sedge, dwarf-shrub tundra.

Parent material: Retransported Itkillik II glacial till.

Sampled by: D.A. Walker and C. Westberg, August 8,1989.

Remarks: Soil frozen at 65 cm depth. Water dripping into pit at base of organic layer (15 cm depth).

Weather: Warm, partly cloudy, windy.

Colors are for the wet soil.

Oi 0 - 4 cm. Loose mat of *Hylocomium splendens, Aulacomnium palustre* and dead sedge leaves; pH = 6.8; smooth clear boundary. (Sample T-089).

Oa 4 - 15 cm. Very dark brown (7.5YR 2/1.5) sapric material with est. 5 percent by volume fine sandy loam, that increases toward the base of the horizon; wet; pH = 6.7; smooth abrupt boundary. (Sample T-090).

Bh 15 - 51 cm. Very dark grayish brown (10YR 3/2) organic rich loam; est. 15 percent organic material by volume; common medium brown (10YR 4/6) mottles to 2 - 3 cm diameter, and occasional olive (5Y 5/4) mottles; medium, moderate, subangular blocky structure; wet; slightly gritty, plastic, sticky (wet); pH = 6.1; est. 10 percent fine gravel to 2 cm diameter; smooth clear boundary. (Sample T-09l).

IIBg 51 - 65+ cm. Dark gray (10YR 4.5/1) gravelly clay; common medium brown (10YR 4/6) mottles; massive structure; wet; very sticky, very plastic (wet); est. 15 percent fine gravel to 3 cm diameter.

Plot SWT-40 Soil Description

Classification: Pergelic Cryaquoll, fine-loamy, mixed.
Location: Northwest side of Toolik Lake. Toposequence upslope from small lake between pond S-7 and Toolik Lake.
Physiographic position: Sideslope of 10 percent SSE-facing slope.
Topography: Nonsorted stone stripes with frost scars.
Microrelief height: 15 cm.
Drainage: Moderately well drained.
Vegetation: Dry *Vaccinium uliginosum, Salix reticulata, Tomentypnum nitens, Equisetum arvense, Astragalus umbellatus, Cetraria cucullata* dwarf-shrub, horsetail, fruticose-lichen tundra.
Parent material: Itkillik II glacial till.
Sampled by: D.A. Walker and C. Westberg, August 9,1989.
Remarks: Ground unfrozen to 100 cm.
Weather: Cloudy, windy.

Colors are for the moist soil.

Oi 0 - 3 cm. Mat of *Polytrichum juniperinum, Dicranum* spp. and lichens; smooth clear boundary.

Oe 3 - 8 cm. Very dark brown (7.5YR 2/2) organic silt; medium fine granular structure; moist; smooth clear boundary.

Oa 8 - 13 cm. Black (7.5YR 2/1) loamy sand; weak, medium subangular blocky, breaking to a weak medium granular structure; wet; smooth, slightly sticky, slightly plastic (wet); pH = 5.3; abrupt wavy boundary. (Sample T-092).

B1 13 - 18 cm. Dark brown (10YR 3/3) sandy clay loam; moderate medium subangular blocky, breaking to moderate medium granular structure; wet; slightly gritty, plastic, sticky (wet); pH = 6.2; est. 10 percent gravel to about 3 cm; indistinct boundary. (Sample T-093).

B2 18 - 44+ cm. Brown (10YR 4/3) gravelly clay; massive structure; wet; gritty, sticky, plastic (wet); est. 20 percent gravel.

Plot SWT-41 Soil Description

Classification: Pergelic Cryosaprist, euic.

Location: Northwest side of Toolik Lake. South-facing slope on toposequence upslope from little lake between S-7 and Toolik. 68°38' N, 149°36' W.

Physiographic position: Midslope on lower part of non sorted stripe complex. Backslope of 10 percent SSE-facing hill.

Topography: Interstripe area of non sorted stone stripe complex. Hummocks to 20 cm height. with frost scars (lower part of stonestripe complex).

Microrelief height: 20 cm.

Drainage: Somewhat poorly drained.

Vegetation: Moist *Carex bigelowii, Salix reticulata, Tomentypnum nitens, Equisetum arvense* sedge, horsetail, dwarf-shrub tundra.

Parent material: Retransported Itkillik II glacial till.

Sampled by: D.A. Walker and C. Westberg, August 9, 1989.

Remarks: Soil frozen at 53 cm. Interstripe areas are elevated above stripes, possibly due to build up of organic material. Stripe adjacent to this site has 10 cm of organic material; whereas, this site has 53 cm. Thaw depth on stripe is > 100 cm; thaw in interstripe areas is ~ 50 cm. Considerable evidence of cryoturbation in Oa/A horizon.

Weather: Cloudy, cool.

Colors are for the wet soil.

Oi 0 - 3 cm. Mat of *Tomentypnum nitens, Ditrichum flexicaule, Ptilidium ciliare;* wavy abrupt boundary.

Oa1 3 -7 cm. Very dark brown (7.5YR 2/1.5) sapric material with est. 10 percent by volume loamy fine sand; loose structure; moist to wet; slightly sticky, slightly plastic, smooth (wet); pH = 7.2; wavy clear boundary. (Sample T-094).

Oa2 7 - 53+ cm. Very dark brown (7.5YR 2/2) sandy loam, mixed with sapric material; weak, medium, platy structure due to compressed organics; wet; smooth, slightly sticky, slightly plastic (wet); pH = 6.9; areas of more mineral-rich material and pockets of loose organic material, that have been stirred into the horizon; occasional live roots at 50 cm depth; est. 10 percent fine gravel to 2 cm diameter. (Sample T-095).

Plot SWT-44 Soil Description

Classification: Pergelic Cryaquoll, loamy-skeletal, mixed.
Location: Northwest side of Toolik Lake. 68°38' N, 149°38' W. Part of southfacing toposequence.
Physiographic position: Shoulder of long gentle (12 percent slope) SSE-facing toposequence.
Topography: Stripe element of sorted stone stripe complex.
Microrelief height: 5 cm.
Drainage: Moderately well drained.
Vegetation: Dry *Dryas integrifolia, Cassiope tetragona, Oxytropis maydelliana, Cetraria cucullata* dwarf-shrub, fruticose-lichen tundra.
Parent material: Itkillik II glacial till.
Sampled by: D.A. Walker and C. Westberg, August 9, 1989.
Remarks: Active layer is > 100 cm. Water table at 37 cm. This plot represents the stripe element of a sorted stripe complex.
Weather: Cool, cloudy.

Colors are for the moist soil, except where noted.

Oi 0 - 2 cm. Mat of mosses, dead *Dryas integrifolia* and *Rhytidium rugosum.*

Oa 2 - 17 cm. Very dark brown (7.5YR 2/1.5) sapric material mixed with gravelly sandy loam; weak, medium, subangular blocky, breaking to a fine, weak, granular structure; moist; pH = 5.9; friable (moist), smooth, slightly sticky, slightly plastic (wet); est. 45 percent by volume gravel to 15 cm diameter; common very fine and fine roots; wavy abrupt boundary. (Sample T-104).

Bw 17 - 53 cm. Dark greyish brown (10YR 3.5/2, wet) very gravelly sandy clay loam; few small strong brown (7.5YR 3/6) mottles; moderate, medium, subangular blocky, breaking to a moderate medium granular structure; moist to wet; gritty, sticky, plastic (wet); pH = 6.8; est. 45 percent by volume gravel to 15 cm diameter; few fine roots penetrate to 30 cm; water table at 37 cm. (Sample T-105).

Plot SWT-45 Soil Description

Classification: Histic Pergelic Cryaquoll, loamy-skeletal, mixed.

Location: Northwest side of Toolik Lake, part of south-facing toposequence. Interstripe plot, matched with SWT-44 - stripe plot. 68°37' N, 149°38' W.

Physiographic position: Shoulder of long gentle (12 percent slope) SSE-facing toposequence on upper part of sorted stripe complex.

Topography: Interstripe element of sorted stone-stripe complex. Hummocks to 10 cm tall.

Drainage: Moderately well drained.

Vegetation: Moist *Equisetum arvense, Carex bigelowii, Salix reticulata, Dryas integrifolia, Tomentypnum nitens* horsetail, sedge, dwarf-shrub tundra.

Parent material: ItkilliK II glacial till.

Sampled by: D.A. Walker and C. Westberg, August 9, 1989.

Remarks: Soil frozen at 80 cm. Water table at 53 cm. Interstripe element of sorted stripe complex. Plot SWT-44 is the stripe element.

Weather: Cool, cloudy.

Colors are for the moist soil.

Oi 0 - 8 cm. Mat of alive and dead *Tomentypnum nitens,* sedge leaves, *Cassiope tetragona* and *Dryas integrifolia;* pH = 6.2; smooth abrupt boundary. (Sample T-106).

Oa1 8 - 22 cm. Black (7.5YR 2/1) sandy loam; weak medium subangular blocky, breaking to a weak fine granular structure; wet; friable (moist), smooth, nonsticky, nonplastic (wet); pH = 6.1; many fine and very fine roots; clear smooth boundary. (Sample T-107).

Oa2 22 - 35 cm. Dark brown (7.5YR 3/2) loam; wet; weak medium sub angular blocky, breaking to a moderate fine granular structure; wet; friable (moist), smooth, slightly sticky, slightly plastic (wet); pH = 6.4; most roots are above 31 cm; irregular abrupt boundary. (Sample T-108).

A/B Dark brown (10YR 4/3) gravelly sandy clay loam with many fine yellowish brown (10YR 5/6) mottles and traces of very dark brown (7.5YR 2/2) organic matter, that appear to have been stirred into horizon from above; massive structure; wet; firm (moist), gritty, sticky, plastic (wet); pH = 6.8; few fine roots to base of B; est. 15 percent of gravel less than 2 cm diameter; indistinct boundary. (Sample T-I09).

Bw 60 - 65+ cm. Grayish brown (10YR 4.5/2) gravelly loam; massive structure; wet; firm (moist), gritty, plastic, sticky (wet); pH = 7.5. (Sample T-110).

Plot SWT-47 Soil Description

Classification: Pergelic Cryoboroll, loamy-skeletal, mixed.
Location: Northwest side of Toolik Lake. Top of hill above *S-5.* 68°38' N, 149°38' W.
Physiographic position: Hill crest.
Topography: Featureless ground.
Microrelief height: 10 - 15 cm.
Drainage: Somewhat excessively drained.
Vegetation: Dry *Dryas octopetala, Arnica alpina, Hierochloë alpina, Calamagrostis purpurascens, Oxytropis* sp. dwarf-shrub, crustose-lichen tundra.
Parent material: Itkillik II glacial till.
Sampled by: D.A. Walker and C. Westberg, August 10, 1989.
Remarks:
Weather: Hazy overcast, very windy weather.

Colors are for the moist soil.

Oi 0 - 1 cm. Dead *Dryas* sp. leaves and miscellaneous litter.

Oa 1 - 5 cm. Very dark brown (7.5YR 2/2) sandy clay loam; weak fine granular structure; dry; friable (moist), smooth, slightly sticky, slightly plastic (wet); pH = 5.0; many fine and very fine roots; est. 10 percent of fine gravel less than 2 cm diameter; abrupt smooth boundary. (Sample T-113).

A 5 - 23 cm. Dark brown (10YR 3.5/3) gravelly sandy loam; weak medium subangular blocky, breaking to a weak granular structure; damp; friable (moist), gritty, slightly sticky, slightly plastic (wet); pH = 4.9; common very fine and occasionally fine roots; est. 35 percent gravel with cobbles up to 20 cm diameter; clear wavy boundary., (Sample T-114).

IIB 23 -65 cm. Dark grayish brown (10YR 4/2) gravelly sandy clay loam; moderate medium subangular blocky, breaking to a fine moderate granular structure; damp; friable (moist), gritty, sticky, plastic (wet); pH = 7.3; est. 35 percent gravel with cobbles up to 20 cm diameter. (Sample T-115).

Plot SWT-48 Soil Description

Classification: Pergelic Cryoboroll, fine-loamy, mixed.
Location: Northwest side of Toolik Lake, directly above bay with creek from pond S-7 running into it. *68°38′* N, *149°38′* W.
Physiographic position: Hillcrest.
Topography: Disturbed by animal activity (bird and squirrel mounds).
Microrelief height: 30 cm.
Drainage: Well drained.
Vegetation: Moist *Poa glauca, Bromus pumpellianus, Ranunculus pedatifidus* grass, forb tundra.
Parent material: Itkillik II glacial till.
Sampled by: D.A. Walker and C. Westberg, August 9,1989.
Remarks: Many ground squirrel tunnels and dens. Shrub height: 50 cm.
Weather: Cloudy, windy.

Oi 0- 2 cm. Mat of moss *(Thuidium abietinum*) and dead grass litter.

Oa 2 - 16 cm. Very dark brown (10YR 2.5/3) in dry condition or very dark brown (7.5YR 2/2.5) when wet sandy loam; weak medium subangular blocky, breaking to a very fine weak granular structure; dry; slightly gritty, slightly plastic, slightly sticky (wet); pH = 6.4; many fine and common fine roots; est. 10 percent fine gravel less than 2 cm diameter; gradual, wavy boundary. (Sample T-116).

B 16 - 45+ cm. Yellowish brown (10YR 5/5, dry) or dark yellowish brown (10YR 3/4, wet) sandy loam; weak medium subangular blocky, breaking to a very fine weak granular structure; dry; gritty, slightly sticky, slightly plastic (wet); pH = 6.6; est. 20 percent of gravel and cobbles; carbonate stage 1 on underside of larger cobbles; areas of crotovinas have brown (10YR 4/3) dry color or dark brown (10YR 3/3) wet color; many very fine roots to 40 cm. (Sample T-117).

Plot SWT-49 Soil Description

Classification: Pergelic Cryoboroll, loamy-skeletal, mixed.

Location: Northwest side of Toolik Lake. North slope of hill. Part of toposequence between plot SWT-47 and S8. 68°38' N, 149°38' W.

Physiographic position: Upper backslope of north-facing 50 percent slope.

Topography: Slope angle 30°. Hummocky terrain with some solifluction features.

Microrelief height: 10 cm.

Drainage: Well drained.

Vegetation: Dry *Cassiope tetragona, Carex microchaeta, Cladonia arbuscula* dwarf- shrub, fruticose-lichen tundra.

Parent material: Itkillik II glacial till.

Sampled by: D.A. Walker and C. Westberg, August 10, 1989.

Remarks: Upper portion of well-drained snowbed with numerous ground squirrel dens. Active layer is > 50 cm.

Weather: clear.

Colors are for the damp soil.

Oi 0 - 4 cm. Mat of *Dicranum* sp., *Cladonia arbuscula,* C. *rangijerina* and dead *Cassiope tetragona* branches.

Oa 4 - 14 cm. Very dark brown (7.5YR 2/2.5) sandy loam; weak medium subangular blocky, breaking to a weak fine granular structure; damp; friable (moist), smooth, slightly sticky, slightly plastic (wet); pH = 4.0; many fine and very fine roots; abrupt wavy boundary. (Sample T-118).

AB 14 - 30 cm. Dark brown (10YR 3.5/3) very gravelly sandy loam; very weak subangular blocky, breaking to a moderate fine granular structure; damp; friable (moist), gritty, nonplastic, nonsticky (wet); pH = 5.3; common fine roots; est. 60 percent gravel, cobbles and stones to 20-cm diameter; gradual indistinct boundary. (Sample T-119).

C 30 - 50+ cm. Dark grayish brown (10YR 4/2) very gravelly sandy loam; single grain structure; damp; friable (moist), gritty (wet); pH = 7.6; no roots; est. 60 percent gravel. (Sample T -120).

Plot SWT-51 Soil Description

Classification: Pergelic Cryaquoll, loamy-skeletal, mixed.

Location: Northwest side of Toolok Lake. North slope of hill, directly above and to the north of lake S-5. Part of toposequence SWT-47 to 58. 68°38' N, 149°38' W.

Physiographic position: Lower backslope of N-facing 20 percent slope.

Topography: Solifluction features.

Microrelief height: to 30 cm.

Drainage: Somewhat poorly drained.

Vegetation: Moist *Salix rotundifolia, Hylocomium splendens* dwarf-shrub, moss tundra.

Parent material: Itkillik II glacial till.

Sampled by: D.A. Walker and C. Westberg, August 10, 1989.

Remarks: Lower part of snowbed. Ground frozen at 53 cm. Water is seeping out of wall of soil pit at 18 cm depth (base of Oa).

Weather: partly cloudy, warm, windy.

Colors are for the wet soil.

Oi 0 - 4 cm. Mat of live and dead *Hylocomium splendens* and *Salix rotundifolia* litter; smooth abrupt boundary.

Oe 4 - 9 cm. Black (7.5YR 2/1) hemic material; loose structure; wet; pH = 6.4; very many very fine and common fine roots; smooth clear boundary. (Sample T-124).

Oa 9 - 24 cm. Very dark brown (10YR 2/2) silt loam; weak medium subangular blocky, breaking to a weak fine granular structure; at the base of horizon there is a band of dark yellowish brown (10YR 4/5) mottles; wet; smooth, slightly sticky, slightly plastic (wet); pH = 6.7; roots penetrate to about 18 cm; abrupt wavy boundary. (Sample T-125).

IIBw 24 - 45 cm. Brown (10YR 4/3) very gravelly sandy clay loam; moderate medium subangular blocky structure; wet; gritty, sticky, plastic (wet); pH = 7.3; est. 40 percent gravel to 3 - 4 cm diameter; clear irregular boundary. (Sample T-126).

IIC 45 - 53+ cm. Brown (10YR 4/3) to dark grayish brown (10YR 4/2) very gravelly sandy loam; single grain structure; very wet; gritty, nonsticky, nonplastic (wet); pH = 7.9; est. 50 percent gravel to 3 cm diameter. (Sample T-127).

Plot SWT-53 Soil Description

Classification: Histic Pergelic Cryaquoll, fine-loamy, mixed.

Location: Northwest side of Toolik Lake, out of sight of the lake, at base of the north- facing toposequence between SWT-47 and SWT-58. 68°38' N, 149°38' W.

Physiographic position: Toeslope of 8 percent N-facing slope.

Topography: Hummocky area with solifluction features.

Microrelief height: 20 cm.

Drainage: Somewhat poorly drained.

Vegetation: Moist *Carex bigelowii, Dryas integrifolia, Hylocomium splendens, Salix planifolia* ssp. *pulchra* sedge, dwarf-shrub tundra.

Parent material: Itkillik II glacial till.

Sampled by: D.A. Walker and C. Westberg, August 10, 1989.

Remarks: Ground frozen at 40 cm. Pit saturated at 21 cm. Slight evidence of grazing. Moderate animal disturbance, mostly voles (tracks, holes etc.).

Weather: overcast, light wind.

Colors are for the wet soil.

Oi 0 - 7 cm. Loose mat of *Hylocomium splendens, Dicranum scoparium, Cassiope tetragona* and litter; inorganic part of soil - sandy loam; pH = 5.8. (Sample T-132).

Oe 7 - 12 cm. Loose mat of hemic organic material; weak medium platy structure (due to compressed organics); 30 percent recognizable plant fiber after rubbing; pH = 6.1; clear, smooth boundary. (Sample T-133).

Oa 12 - 17 cm. Very dark brown (7.5YR 2/1.5) silty organic material, with strong brown (7.5YR 4/6) mottles at base of horizon; weak moderate platy, breaking to a weak fine granular structure; wet; smooth, slightly plastic, slightly sticky (wet); pH = 6.0; abrupt wavy boundary. (Samples T-134, T135).

A 17 - 40+ cm. Very dark brown (10YR 2/3) gravelly sandy loam; moderate medium subangular blocky structure; very wet; gritty, plastic, sticky (wet); pH = 5.3; est. 15 percent gravel to 3 cm diameter. (Sample T-136).

Plot SWT-54 Soil Description

Classification: Histic Pergelic Cryaquoll, fine-loamy, mixed.

Location: Northwest side of Toolik lake, at base of steep north slope toposequence, between SWT-47 and SWT-58. 68°38' N, 149°38' W.

Physiographic position: Lower footslope of 6 percent SSW-facing slope.

Topography: Hummocky terrain, including turf hummocks and some solifluction features.

Microrelief height: 30 cm.

Drainage: Somewhat poorly drained.

Vegetation: Moist *Eriophorum vaginatum, Salix planifolia* ssp. *pulchra, Hylocomium splendens, Sphagnum rubellum* tussock-sedge, dwarf-shrub tundra.

Parent material: Itkillik II glacial till.

Sampled by: D.A. Walker and C. Westberg, August 10,1989.

Remarks: Ground frozen at 44 cm. Soil saturated below 11 cm. Minor animal disturbance.

Weather: raining.

Colors are for the wet soil.

Oi 0 - 8 cm. Loose moss, moss bases, tussock bases and roots; pH = 4.3; wavy clear boundary. (Sample T-137).

Oe 8 - 15 cm. Black (7.5YR 2/1) loose hemic material; est. 20 percent recognizable plant fibers after rubbing (beneath tussocks); weak moderate platy structure; pH = 6.2; coarse roots of *Eriophorum vaginatum* make up to 75 percent of horizon's volume; clear smooth boundary. (Sample T-138).

Oa 15 - 21 cm. Very dark brown (7.5YR 2/3) sandy loam; dark yellowish brown (10YR 4/6) medium mottles form discontinuous band at base of Oa; weak moderate platy structure; wet; pH = 5.4; est. 20 percent recognizable plant fibers after rubbing (sedge leaves and roots); abrupt smooth boundary. (Sample T -139).

Bw 21 - 39 cm. Dark brown (10YR 3.5/3) gravelly sandy clay loam; massive structure; very wet; gritty, sticky, plastic (wet); pH = 5.6; est. 15 percent fine gravel up to 2-cm diameter; gradual wavy boundary. (Sample T-140).

Cg 39 - 44+ cm. Dark gray (10YR 4/1) gravelly sandy clay loam; massive structure; very wet; gritty, very sticky, very plastic (wet); pH = 5.0; est. 15 percent fine grave less than 2 cm diameter. (Sample T-I41).

Plot SWT-56 Soil Description

Classification: Pergelic Cryosaprist, euic.

Location: Northwest side of Toolik Lake. Floodplain at the bottom of north-facing toposequence. 68°38' N, 149°38' W.

Physiographic position: Middle part of stabilized floodplain.

Topography: Flat centered polygon. Trough-center elevation: 90 cm.

Microrelief height: 10 cm hummocks.

Drainage: Poorly drained.

Vegetation: Moist *Carex bigelowii, Eriophorum triste, Dryas integrifolia, Cetraria cucullata* sedge, dwarf-shrub tundra.

Parent material: Alluvial deposit.

Sampled by: D.A. Walker and C. Westberg, August 11, 1989.

Remarks: Ground frozen at 38 cm. Soil saturated below 14 cm. Minor animal disturbance (signs of caribou, vole and ptarmigan activity).

Weather: Cloudy.

Colors are for the wet soil.

Oi 0 - 3 cm. Mat of *Racomitrium lanuginosum, Dryas integrifolia,* dead sedge leaves, moss bases etc.; smooth abrupt boundary.

Oe 3 - 8 cm. Black (7.5YR 2/1) loose organics; est. 10 percent recognizable plant fibers after rubbing; weak medium platy structure; wet; smooth clear boundary.

Oa 8 - 21 cm. Very dark brown (7.5YR 2/2) hemic material; est. 15 percent recognizable plant fibers after rubbing, tightly bound with roots; weak medium platy structure; wet; pH = 5.4; abrupt wavy boundary. (Sample T-143).

B/O 21 - 34 cm. Very dark grayish brown (10YR 3/2) loam; moderate medium subangular blocky structure; very wet; smooth, slightly sticky, slightly plastic (wet); pH = 6.1; est. 5 percent recognizable plant fibers after rubbing. (Sample T-144).

Plot SWT-57 Soil Description

Classification: Pergelic Cryohcmist, euic.

Location: Northwest side of Toolik Lake, in wetland at bottom of the north-facing toposequence. Stake is in the water. 68°38' N, 149°38' W.

Physiographic position: Small colluvial basin.

Topography: Strangmoor and aligned hummocks in fen. Plot is in the interhummock element of the fen.

Microrelief height: 15 cm.

Drainage: Very poorly drained.

Vegetation: Wet *Carex chordorrhiza, Carex rotundifolia, Carex aquatilis, Scorpidium scorpioides* sedge tundra.

Parent material: Colluvial deposit.

Sampled by: D.A. Walker and C. Westberg, August 11, 1989.

Remarks: Ground frozen at 56 cm. Water table at 10 cm. Very complex microtopography in wetland. Inter-hummock element of strangmoor complex. Paired with Plot SWT-58.

Weather: mostly cloudy.

Colors are for the saturated soil.

Oi Black (7.5YR 1.7/1) mat of sedge bases and root fibers; abrupt smooth boundary.

Oe 2 - 36 cm. Very dark brown (7.5YR 2/3) very tight mat of peat, composed of very fine roots; est. 25 percent recognizable plant fibers after rubbing; pH = 5.6; saturated; abrupt smooth boundary. (Sample T-145).

Cg 36+ cm. Dark gray (10YR 4/1) clay; saturated; smooth, sticky, plastic (wet); pH = 5.2. (Sample T-146).

Plot SWT-58 Soil Description

Classification: Pergelic Cryohcmist, euic.

Location: Northwest side of Toolik Lake. Wetland at the end of toposequence, that begins on hill to the North of S-5, associated with SWT-57. 68°38' N, 149°38' W.

Physiographic position: Small colluvial basin.

Topography: Strangmoor and aligned hummocks in fen.

Drainage: Poorly drained.

Vegetation: Moist *Carex aquatilis, Carex rariflora, Salix fuscescens* sedge, dwarf-shrub tundra.

Parent material: Colluvial deposit.

Sampled by: D.A. Walker and C. Westberg, August 11, 1989.

Remarks: Hummock element of strangmoor complex. Paired with Plot SWT-57. Ground frozen at 70 cm. Water table at 10 cm.

Weather: Mostly cloudy, light rain.

Colors are for the wet soil, unless otherwise indicated.

Oi 0 - 3 cm. Loose mat of mosses and lichens - mainly *Cetraria cucullata, Aulacomnium turgidum, Rhytidium rugosum, Dicranum* sp.; abrupt smooth boundary.

Oa 3 - 8 cm. Black (5YR 2/1) sapric organic material (moist color); weak fine granular structure; moist; smooth (wet); pH= 6.6; smooth abrupt boundary. (Sample T-147).

Oe1 8 - 24 cm. Very dark brown (7.5YR 2/2.5) hemic material, tightly bound by very fine roots; est. 30 percent recognizable plant fibers after rubbing; wet; pH = 6.6; clear irregular boundary. (Sample T-148).

Oe2 24 - 37 cm. Very dark grayish brown (10YR 3/2) loose hemic material, composed of mostly sedge leaves; very wet; pH = 6.0; clear irregular boundary.

Cg 37 - 45+ cm. Gray (N 4/0) clay; massive structure; saturated; smooth, very sticky, very plastic (wet); pH = 5.2. (Sample T-149).

Plot SWT-61 Soil Description

Classification: Pergelic Cryoboroll, fine-loamy, mixed.
Location: North side of Toolik Lake, near Limno Bay, in willow patch. 68°38' N, 149°36' W.
Physiographic position: Midslope, 40 percent south-facing slope.
Topography: Featureless ground.
Microrelief height - 25 cm.
Drainage: Somewhat poorly drained.
Vegetation: Moist *Salix glauca, Betula nana, Festuca altaica* low-shrub tundra.
Parent material: Itkillik: II glacial till.
Sampled by: D.A. Walker and C. Westberg, August 14,1989.
Remarks: 1-m shrubs. Rocky terrain, probably deep active layer.
Weather: Raining.

Colors are for the moist soil.

Oi 0 - 2 cm. Layer of moss Rhytidium rugosum and litter; smooth abrupt boundary.

Oa 2 - 8 cm. Very dark brown (7.5YR 2/3) organic silty loam; weak fine granular structure; smooth, nonsticky, nonplastic (wet); wavy clear boundary.

Oa2 8 - 16 cm. Very dark brown (7.5YR 2/2) sandy loam; weak medium subangular blocky, breaking to a weak fine granular structure; smooth, slightly sticky, slightly plastic (wet); pH = 6.4; many fine roots; abrupt smooth boundary. (Sample T-152).

A2 16 - 40+ cm. Dark brown (10YR 3/3) gravelly sandy loam; weak medium subangular blocky, breaking to a weak fine granular structure; gritty, slightly sticky, slightly plastic (wet); pH = 7.1; est. 20 percent fine gravel less than 2 cm diameter. (Sample T-153).

Plot SWT-65 Soil Description

Classification: Pergelic Cryumbrept, loamy-skeletal, mixed.

Location: North side of Toolik Lake. To the west of outlet stream, above floodplain. 68°38' N, 149°36' W.

Physiographic position: Glaciofluvial outwash.

Topography: Featureless ground.

Microrelief height: 5 cm.

Drainage: Well drained.

Vegetation: Dry *Vaccinium vitis-idaea, Hierochloë alpina, Cladonia arbuscula* dwarf-shrub, fruticose-lichen tundra.

Parent material: Itkillik II glaciofluvial outwash.

Sampled by: D.A. Walker and C. Westberg, August 12, 1989.

Remarks: Deep active layer in rocky soils.

Weather: Mostly clear, very windy.

Colors are for the damp soil.

Oi 0 - 1 cm. Mat of lichens and mosses, mostly *Polytrichum juniperinum* and *Cladonia* spp.

Oa 1 - 4 cm. Very dark brown (7.5YR 2/2) organic clay loam; weak fine granular structure; damp; pH = 3.7; abrupt smooth boundary. (Sample T-158).

A 4 - 7 cm. Thin discontinuous layer of brown (7.5YR 5.5/3) clay loam; weak medium subangular blocky, breaking to a weak fine granular structure; damp; smooth, sticky, plastic (wet); pH = 3.7; abrupt smooth boundary.

Bw1 7 - 18 cm. Mixed dark brown (7.5YR 3/4) with strong brown (7.4YR 4/7) and very dark brown (7.5YR 2/3) very gravelly clay loam; weak medium subangular blocky, breaking to a weak fine granular structure; damp; friable (moist), gritty, slightly sticky, slightly plastic (wet); pH = 4.3; common very fine roots to 25 cm depth with silt caps to 4 mm; est. 70 percent gravel and small cobbles; gradual wavy boundary. (Sample T-159).

Bw2 18 - 35+ cm. Dark brown (10YR 3/3) very gravelly sandy loam; very weak moderate subangular blocky structure; damp; friable (moist), gritty, nonplastic, nonsticky (wet); pH = 4.8; dark manganese stains on bottom of rocks. (Sample T-160).

Plot SWT-68 Soil Description

Classification: Lithic Pergelic Cryosaprist, euic.

Location: North side of Toolik Lake, east of outlet stream, west of runway in *Salix* community along river. 68°38' N, 149°36' W.

Physiographic position: Stabilized floodplain.

Topography: Irregular relief associated with stream drainage.

Microrelief height: 30 - 60 cm.

Drainage: Somewhat poorly drained.

Vegetation: Moist *Salix planifolia* ssp. *pulchra, Salix lanata, Calamagrostis canadensis, Potentilla fruticosa, Rubus arcticus* low shrubland.

Parent material: Alluvial deposit.

Sampled by: D.A. Walker and C. Westberg, August 12, 1989.

Remarks: Shrub height: 1.5 - 2.0 m. Rock cover> 5 percent. Soil lies directly on large cobbles of river bed at 27 cm depth.

Weather: Cloudy.

Colors are for the wet soil.

Oi 0 - 4 cm. Mat of *Calamagrostis canadensis* with mosses; abrupt smooth boundary.

Oe 4 - 10 cm. Very dark brown (7.5YR 2/2) loose mat, composed of grass roots, leaves, hemic material; est. 50 percent recognizable plant fibers after rubbing; many fine rhizomes and very fine roots; abrupt smooth boundary.

Oal 10 - 18 cm. Very dark brown (7.5YR 2/2) organic loam; est. less than 2 percent recognizable plant fibers after rubbing; weak medium subangular blocky, breaking to a weak fine granular structure, tightly bound with fine grass roots; wet; smooth, slightly sticky, slightly plastic (wet); pH = 6.9. (Sample T-164).

Oa2 18 - 27 cm. Very dark grayish brown (10YR 3/2) loam, with many medium yellowish brown (10YR 5/6) and yellowish red (5YR 4/8) mottles; weak subangular blocky structure, bound by many fine roots; wet; smooth, sticky, plastic (wet); pH = 4.8; roots extend all the way to the bottom of horizon. (Sample T-165).

Plot SWT-70 Soil Description

Classification: Pergelic Cryochrept, sandy-skeletal, mixed.

Location: North side of Toolik Lake, east of outlet stream, west of runway. 68°38' N, 149°36' W.

Physiographic position: Glaciofluvial outwash.

Topography: Featureless ground.

Microrelief height - 10 cm.

Drainage: Moderately well drained.

Vegetation: Dry *Betula nana, Hierochloë alpina, Cladonia arbuscula* low-shrub, fruticose-lichen tundra.

Parent material: Itkillik II glaciofluvial outwash.

Sampled by: D.A. Walker and C. Westberg, August 12, 1989.

Remarks: Deep active layer in rocky soils. Shrub height 25 - 30 cm.

Weather: Partly cloudy, light wind.

Colors are for the damp soil.

Oi 0 - 2 cm. Birch leaves and moss bases (mostly *Dicranum* spp. and *Aulacomnium turgidum);* wavy abrupt boundary.

Oa1 2 - 7 cm. Very dark brown (7.5YR 2/3) highly organic loam; loose structure; dry; wavy abrupt boundary.

Oa2 7 - 11 cm. Dark brown (7.5YR 4/3) gravelly sandy loam; weak medium subangular blocky, breaking to a weak fine granular structure; damp; friable (moist), smooth, sticky, plastic (wet); pH = 3.8; est. 20 percent fine gravel; (Sample T -167).

Bw 11 - 21 cm. Strong brown (7.5YR 4/5) very gravelly sandy clay loam; loose single grain structure; damp; gritty (wet); pH = 4.3; est. 75 percent gravel; roots penetrate to 20 cm; wavy abrupt boundary. (Sample T-168).

C 21 - 30+ cm. Very dark gray (10YR 3.5/1.5) very gravelly loamy sand; loose single grain structure; damp; gritty (wet); pH = 5.1; est. 80 percent gravel. (Sample T-169).

Plot SWT-75 Soil Description

Classification: Histic Pergelic Cryaquept, coarse-loamy, mixed, nonacid.
Location: Southwest side of Toolik Lake. Water track transect. 68°37' N, 149°38' W.
Physiographic position: Water track margin on side slope, Itkillik glaciated surface.
Topography: Featureless. Slope angle 2° N.
Microrelief height: 10 - 15 cm.
Drainage: Poorly drained.
Vegetation: Moist *Betula nana, Rubus Chamaemorus, Hylocomium splendens* low- shrub tundra.
Parent material: Colluvial deposit over till.
Sampled by: D.A. Walker and C. Westberg, August 21,1989.
Remarks: Water table at 20 cm. Permafrost at 31 cm.
Weather: Clear, warm.

Colors are for the wet soil.

Oi 0 - 5 cm. Loose fibric mosses *Hylocomium splendens, Sphagnum* sp. and *Aulacomnium turgidum;* pH = 4.2; abrupt smooth boundary. (Sample T -177).

Oe 5 - 10 cm. Very dark brown (7.5YR 2.5/2) loose mat of hemic material, mostly mosses; wet; pH = 5.2; many fine and very fine roots; abrupt smooth boundary. (Sample T-178).

Oa1 10 - 13 cm. Very dark brown (7.5YR 2/1.5) silty organic; weak fine granular structure; wet; smooth, mostly sticky, mostly plastic (wet); smooth abrupt boundary.

Oa2 13 - 18 cm. Dark reddish brown (5YR 3/4) silty organic; loose structure; wet; smooth, mostly sticky, mostly plastic (wet); pH = 4.5; smooth abrupt boundary. (Sample T-179).

Bhs 18 – 31+ cm. Dark brown (10YR 3.5/3) loam; weak medium subangular blocky, breaking to weak fine granular structure; wet; smooth, slightly sticky, slightly plastic (wet); pH = 4.3. (Sample T-180).

Plot SWT-79 Soil Description

Classification: Histic Pergelic Cryaquept, coarse-loamy, mixed, nonacid.
Location: Southwest side of Toolik lake. Toolik water track study. 68°37' N, 149°38' W.
Physiographic position: Middle part of long N-facing slope on 5 percent NNE-facing back slope of water track.
Topography: Well developed water track.
Microrelief height: 5 - 10 cm.
Drainage: Poorly drained.
Vegetation: Moist *Salix planifolia* ssp. *pulchra, Rubus chamaemorus, Sphagnum rubellum, Sphagnum* spp. low shrubland.
Parent material: Alluvial deposit over till.
Sampled by: D.A. Walker and C. Westberg, August 22, 1989.
Remarks: Shrubs to 47 cm. Water table at 10 cm. Permafrost at 43 cm.
Weather: Clear, breezy.

Colors are for the wet soil.

Oi 0 - 4 cm. *Sphagnum* mat; loose structure; pH = 4.5; smooth abrupt boundary. (Sample T-189).

Oe1 4 - 7 cm. Very dark brown (7.5YR 2/2) mostly hemic sedge roots and unrecognizable plant fiber; loose platy structure; wet; pH = 5.8; est. 30 percent plant fiber recognizable after rubbing; smooth abrupt boundary. (Sample T-190).

Oe2 7 - 12 cm. Dark reddish brown (5YR 3/5) hemic material, mostly *Sphagnum;* loose structure; wet; pH = 4.5; est. 50 percent plant fiber recognizable after rubbing; smooth abrupt boundary. (Sample T-191).

Oa 12 - 20 cm. Dark brown (7.5YR 3.5/3) loam; weak medium platy, breaking to weak fine granular structure; wet; smooth, slightly sticky, slightly plastic (wet); pH = 4.2; wavy abrupt boundary. (Sample T-192).

IICox 20 - 32 cm. Brown (10YR 4.5/3) sandy clay loam, with many medium distinct strong brown (7.5YR 4/6) mottles; fine platy structure; wet; gritty, sticky, plastic (wet); pH = 4.5; est. up to 5 percent gravel to 1 cm diameter. (Sample T-193).