

Arctic Soil Research Group Field Activity Report, Chien-Lu Ping

April 27-28, 2002

Purpose of activity:

1. To core a frostboil site on wet nonacidic tundra when the soil was totally frozen.
2. To estimate the ice content and exam cryogenic structure.

Location: Franklin Bluff, Arctic Coastal Plain
GPS Reading: 69°40.448' N; 148°42.966' W

Sampled by: C.L. Ping, G.J. Michaelson, A. Kade, D.A. Walker and cryogenic structure was examined by Yuri Shur in UAF lab on 4/29/02.

Site condition: At center of the boil, top soil exposed. There was no ice indicating that there was no standing water during freeze-up. In previous year the site was under 10-20 cm of water.

July, 2002

Purpose of activity: UAF Summer Session course NRM-489/689 Alaska Soil Geography Field Study.

July 3 `10 NRM-489/689 Alaska Soil Geography Field Study class.

July 3. MP 185. Studied landform, frost blister (palsa), soils and vegetation associated with calcareous fen west of Sukapaka Mountain.

July 4. Measured soil pH, temperatures and redox potential at one MAT site at Toolik Lake and one MAT site at Sagwan Hill.

July 5. Studied Coastal Plain landform, frost polygons, thaw lakes in Prudhoe Bay and polygon degradation along the Sag River banks, west of Deadhorse Airport.

July 6. Studied hydric soil properties in coastal marsh: soil drainage, soil horizon depths, color, pH, temperatures and redox potential at the following sites:

1. Endicott Access Road (70°14.417' N; 148°10.917' W): Flat polygons,

Histic

Aquorthels.

2. W. Dock (70°21.650' N; 140°29.210' W): tidal flats, (Sulfuric) Sapristel; strong hydrogen sulfite smell and Munsell color of N2/.

3. W. Dock (Hinzman's tower): water table 5-7 cm.

4. Bety Pingo:

5. MP 411 (Frost Boil study site): Compared the hydric soils properties between the boila and the interboils.

July 8. MP 202, North of MarionCreek Campground (67°34.547' N; 149°48.691' W).

Studied soil morphology and discussed hydric soils property on a black

spruce

Site joined by Dr. Mary Edwards' PALE group.

MP 165. Peat plateau, south of Coldfoot (67°08.163' N; 150°21.034' W).

Drilled

2 cores for soils and PALE study.

July 9-11. Studied soils associated with boreal forest around Fairbanks area.

July 19-30, 2002.

Purposes of the Field activity:

1. Describe and sample soils at the Frost Boil study sites,
2. Extended portion of the NRM-489/689 Alaska Soil Geography Field Study class, and
3. Soil sampling for graduate thesis study.

Methods:

Soil profile description and sampling followed Soil Survey Manual (Soil Survey Staff, 1994). A trench was opened across the frost boil and the interboil areas unless specified by coring. Both soils underneath the boils and the interboils were described and sampled.

Participants: C.L. Ping, G.J. Michaelson, P. Borden, C.A. Stiles, A. Kade, L.J. Zhu, and L. Zhao.

July 19. WNT, Galbraith Lake near Paul Ovediu's monitoring site

Lat. 68° 28' 54" N

Long. 149° 28' 34" W

Sampled soils in both the frost boil and the adjacent tundra.

July 20, 2002: Toolik Lake MNT, on Itlillik II surface

Latitude: 68° 38' N

Longitude: 149° 39' W

Sampled with the participation of Sarah Hobbie's research team and Bill Gould's class.

July 21, 2002: MP 294, MAT on Sagavanirtoq surface

Lab Pedon #: 02AK185-002

Lat. 68°40.081' N

Long. 149°13.766' W

July 22, 2002: Sagwan MNT1, east of the highway MP359

Latitude: 69° 26 33 N

Longitude: 148° 37 55 W

July 23, 2002: Franklin Bluff WNT (drilled in April)

Latitude: 69° 40.449' N

Longitude: 148° 43.013' W

July 24, 2002: Sagwan MNT2, near Kade study plots, MP352

Latitude: 69° 25 55 N

Longitude: 148° 40 16.2 W

July 25, 2002: Sagwon MAT1, MP351

Latitude: 69° 25.505' N

Longitude: 148° 41.714' W

July 26, 2002: Sagwon MNT3, MP-348, Anaktuvuk surface (?)

Latitude: 69° 20 25.0 N

Longitude: 148°44 8.4 W

July 28, 2002: Sagwon MAT2, E. of highway MP356

Latitude: 69° 25 32.2 N

Longitude: 148° 39 27.4 W

July 29, 2002: Peat Plateau, MP165.

Lat. 67°8.144' N

Long. 150°20.971' W

Drilled 2 cores fro paleoenvironmental and C-store study

July 30-Aug. 4 Soils associated with boreal forest in Caribou-Poker Creek Watershed and the Fairbanks areas.

September 2, 7 Frost boil Crust Sampling

The last soils field trip for the season left Fairbanks on Monday September 2nd with Gary Michaelson, and Anja Kade and field assistant Renee of the vegetation group. We arrived at the Arctic Oilfield Hotel in Deadhorse that evening.

9-03-02 Sagwon MNT and MAT (east of DH) Study Sites:

The next morning Anja and Renee worked on manipulation experiment plots and releves at the Sagwon MNT frost boil site, while I sampled soil crusts at the site. Soil samples were taken from areas within frost boils having black soil crusts. These crusted areas on boils were microsites recently been affected by frost disruption of the surface and the crusts are establishing on the bare frost-affected soil patches. The black crust areas were sampled along with adjoining lichen/Dryus mat covered areas on the same boil for comparison. Two sets of incremental depth samples were collected for each cover type. Each set consisted of samples from 4 depth increments (0-2, 2-4, 4-6, and 6-8cm) in a 15 x 15 cm excavation. All sites visited on this trip were sampled similarly and locations close to characterization pits dug on the 7/02 or earlier field trips. All sites and crust microsites were photographed.

While vegetation work was being completed I moved to a site that was studied and sampled by the soils group in July 2002 located to the east of the Dalton Highway at Mile 350. This is a site with general MAT cover but with MNT plants establishing on the freshly frost-heaved soils exposed within active frost boils. Frost boil crust microsites were sampled as mentioned above. These sites included the bare/carbonate salt crusts located at the crest area of the elevated boil center, the bare/black crusts at the lower

areas of the boil center near the rim, and the moss/Dryas/lichen/Cassiope mat areas located midway between the rim and boil center crest.

9-03-02 Franklin Bluffs Study Sites:

In the afternoon, we moved to the Franklin Bluffs frost boil study site. Anja and Renee continued their work on relevés and I sampled boil crusts on moist, dry and wet locations. On the moist site boils, crusts sampled were the bare/black and black continuous types with comparative samples taken under the lichen/sedge mat. For the dry site boils, the crusts were the also the bare/black and black cont. types with a comparative lichen/Dryas mat sampled also. In the wet site boils only the brown crust (marl-carbonate) was sampled. In the evening having completed their work, Anja and Renee flew back to Fairbanks.

9-04-02 Oilfield sites:

The hydric soils monitoring sites of Endicott Rd., West Dock, and Betty Pingo were visited and a set of readings taken. Soil crusts were sampled on a dry elevated surface adjacent to Endicott Rd. This area showed evidence of large polygonal patterned ground with small frost boil-like patterns (1 m diameter) within the large polygons similar to those of Howe Island. Soils were calcareous and fizzed to at least a 16 cm depth. Crusts sampled were the bare and white/carbonate-salt type with comparative samples taken under the Dryus mat areas.

9-05-02 Sagwon MAT, Mile 348 MNT-River, and Happy Valley Sites:

I left Deadhorse with sampling stops ending at Galbraith Lake campground for the night. The first stop was for hydric soil monitoring and crust sampling at the Sagwon MAT frost boil study site. Sets of crust samples were collected on boils from the areas of bare, cyanobacteria, bare and black crust, black and white lichen, and the moss/Ledum/Cassiope mat cover types.

The second stop was at the MNT-River site that was visited in the 7-02 soil-sampling trip. A crust series was collected here on the earlier trip and only a set of samples from the bare boil microsite was collected to complete the set.

The third stop was at the Happy Valley frost boil grid site for hydric soil readings and to collect crust samples. Three frost boils near the Walker relevés, were sampled with sets of samples from three covers on each boil. Cover types sampled included bare, cyanobacteria, bare/black crust, moss/lichen mat and moss mat.

The third stop was at Toolik Lake where hydric soils monitoring readings were taken near the soil monitoring site. Overnight was at Galbraith Lake campground.

9-06-02 Mineral sampling and travel:

In the morning mineral samples were collected as reference soil mineralogical samples from acidic rock outcroppings located approximately 2 miles down stream from the bridge on the Atigun River. In the afternoon I continued to Yukon River campground for overnight.

0-07-02 Travel to Palmer

