
Correspondence between two soil types on the soil map and in the nature in Käsmu

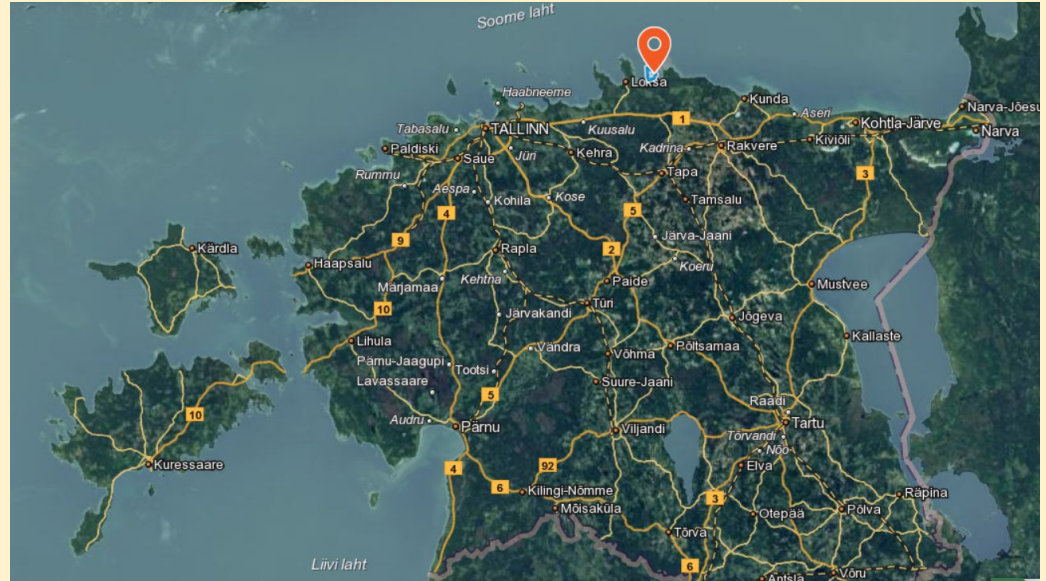
Expedition participants: Xenia Voronovich, Alina Baranova,
Sofia Zimina, Ljubov Melnik, Ranet Viru, Mikk Mattias
Mahla, Liisa Loreena Värton, Julia Nechipor

Supervisors: Elli Altin, Aiki Jõgeva, Rauno Einmann

Käsmu, 4.08. 2022

Introduction

The purpose of the study was to identify two soil types on the map provided by the Maa-amet, find them in the nature by surface forms and vegetation and describe them as well.



maps.google.com



Research questions:

1. How do two soil types in Käsmu correspond to the map provided by Maa-amet?
2. How do these two soil types correspond to surface forms?
3. How do these two soil types correspond to vegetation?

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Hypothesis:

1. The soil types in the nature correspond to the soil map.
2. The soil types correspond to surface forms.
3. The soil types correspond _____ to vegetation.

Work process

1. Checking the research area on the soil map
2. Detecting different soil types on the map
3. Choosing two different soil types on the map
4. Looking for sample sites in the nature by surface forms and vegetation
5. Describing the sample site, identifying plants, taking photos
6. Digging the soil pit in both sites
7. Describing and measuring the soil profiles (horizons)
8. Analyzing results and making conclusions
9. Sending data to the GLOBE database



Equipment:

- clinometer
- compass
- smartphone GPS, camera
- shovel
- scoop
- distilled water
- soil sample cups
- sticks for marking the horizons
- vinegar
- soil thermometer
- air thermometer
- pH meter
- tape measure
- 100 ml cup



Methods by GLOBE soil protocol

Soil pits (Data in tables 1 and 2) dug on
3.08.2022

1. Characterization of the soil horizons and collecting samples, measurements of slope
2. Measurements of soil temperature
3. Analysing the samples (soil consistence, texture and structure, carbonates, pH)



Location 1 Käsma (59.6039851, 25.91087029)

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Location 1: Käsmu

(59.6039851, 25.91087029)

Date: 03.08.2022

Relief: local depression, slope 1-2°C

MUC: 1123

Soil temperature: 16°C (5 cm), 13°C (10 cm)

Weather: sunny

Description: humid; vegetation: spruce, pine, rowan, willow, blueberry, ferns, peat moss, horsetail



Soil profile, site 1

Podzolized gley soil

Typical soils of boreal coniferous forests in cool humid climate but in wetter sites. Gleying occurs when stagnant water causes anaerobic conditions.

It is the first stage of bog formation.

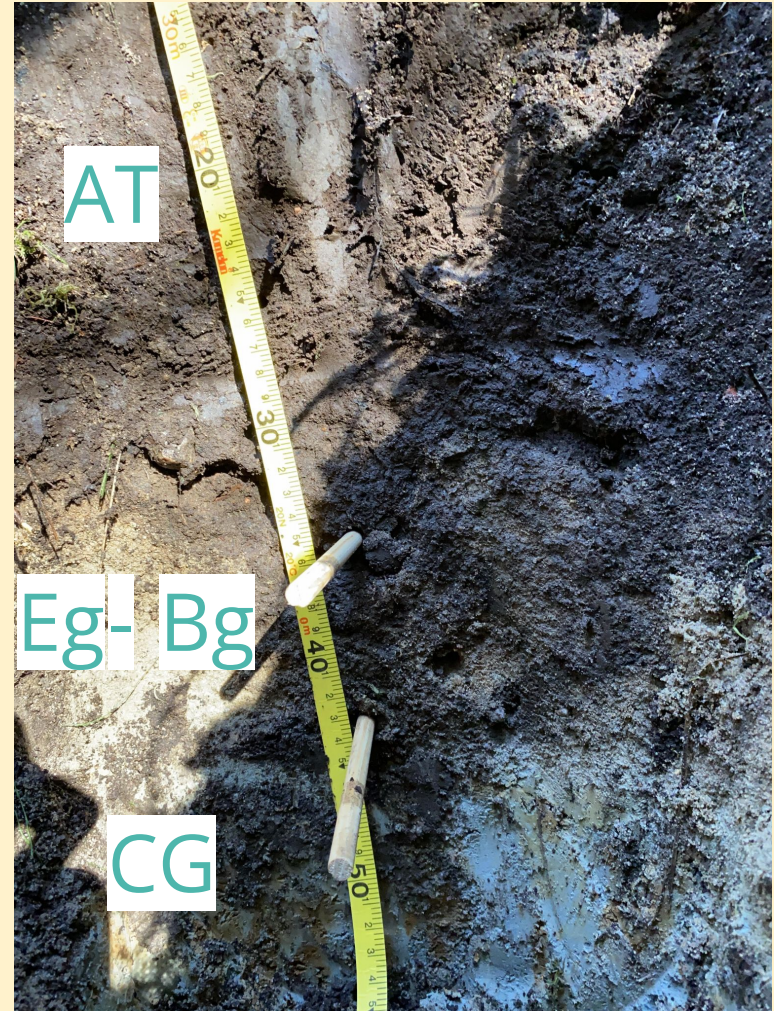


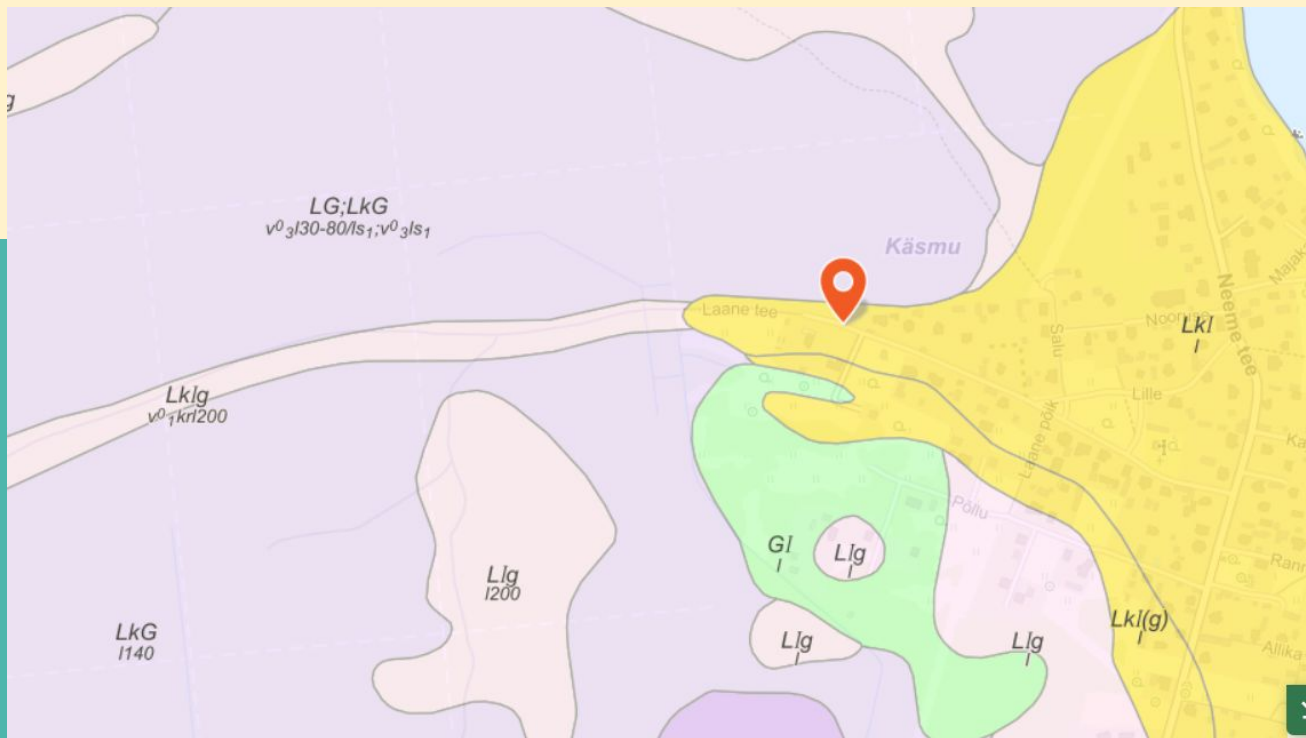
Table 1. Data of the soil profile (location 1)

Name	Top Depth (cm)	Bottom Depth (cm)	Thickness (cm)	Moistur e	pH	Structure	Consistence	Texture	Rocks	Roots	Carbonates
1.Semi-decomposed peat	0	3	3	wet	–	blocky	loose	sand	none	many	none
2. Crude Humus	3	35	32	wet	5	blocky	loose	sand	none	many	none
3. B horizon	35	43	8	wet	5,3	blocky	loose	sand	few	few	none
4.Bedrock (primary)	43	60	17	wet	5,1	structureles s	–	glay	none	none	none
5. Bedrock (secondary	60	60	17	wet	5,1	structureles s	–	glay	none	none	none

Location 2

Location: Käsmu (59.6044196, 25.9079551)

xgis.maaamet.ee



Location 2: Käsmu

(59.6044196, 25.9079551)

Date: 03.08.2022

Relief: flat MUC: 1121

Soil temperature: 17°C (5 cm), 15°C (10 cm)

Weather: sunny

Description: dry, sandy, Vegetation: pine, spruce, lingonberry, red-stemmed feather moss, glittering woodmoss



Soil profile, site 2

Slightly podzolized soil

Typical soils of boreal coniferous forests in cool humid climate but drier sites.

The minerals from the upper layers are leached and concentrated into lower layer.

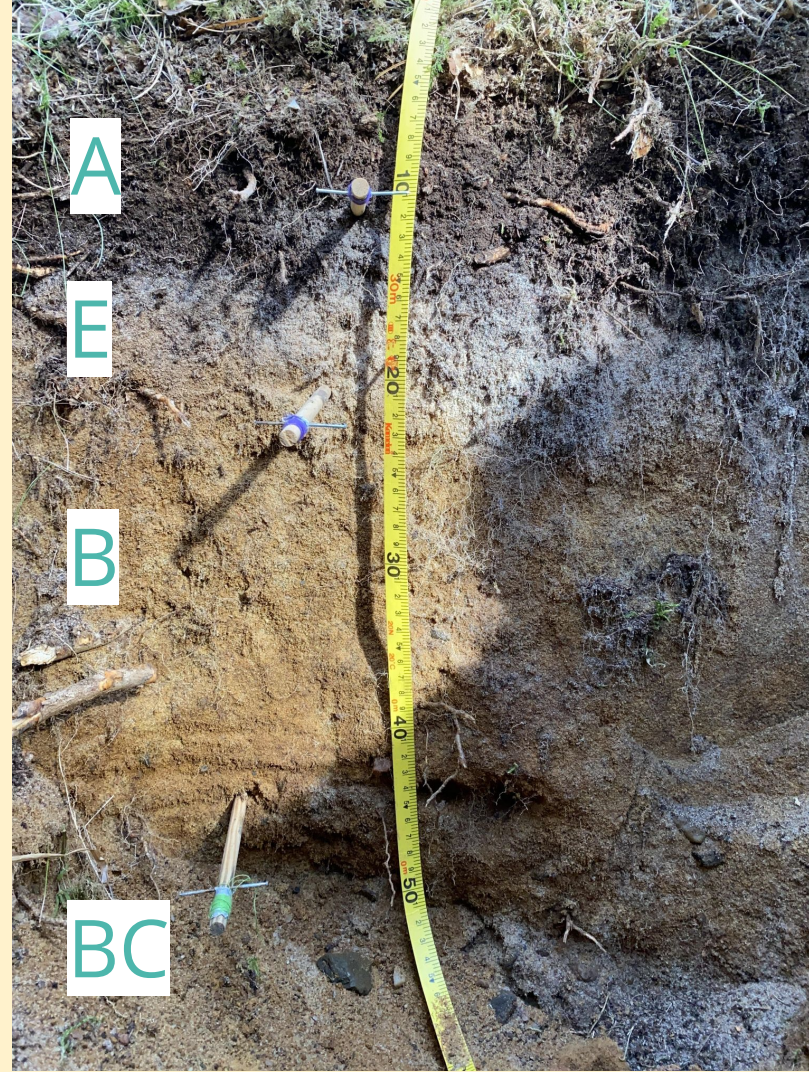


Table 2. Data of the soil profile (location 2)

Letter or nr	Top Depth (cm)	Bottom Depth (cm)	Thickness (cm)	Moisture	pH	Structure	Consistence	Texture	Rocks	Roots	Carbonates
1. Mould	0	3	3	dry	—	blocky	loose	sand	none	many	none
2. Humus	3	11	8	dry	4,7	blocky	loose	sand	none	many	none
3. E horizon	11	20	9	dry	4,5	blocky	loose	sand	none	many	none
4. B horizon	20	45	25	dry	4,2	blocky	loose	sand	none	few	none
5. Bedrock	45	60	15	dry	—	blocky	loose	sand	many	none	none

Discussion and conclusions

1. Our first hypothesis was right because we found the soil types in the nature as we predicted by the soil map
2. Our second hypothesis was right because we found the gleyed soil in a wet local depression and podzolized soil in a dry higher place.
3. Our third hypothesis was right because we found the gleyed soil by looking for deciduous trees and peat moss and podzolized soil by looking for pine trees and forest mosses.

Used sources

1. Maa kui süsteem. Globe 25” (2021). MTÜ GLOBE Eesti
2. Maa-ameti kaardiserver.
<https://xgis.maaamet.ee/xgis2/page/app/mullakaart> (4.08.2021)
3. “Google maps. <https://maps.google.com> (4.08.2021)
4. The GLOBE program.
<https://www.globe.gov/do-globe/globe-teachers-guide/soil-pedosphere> (3.08.2022)

Photos taken by participants of the expedition

