Exploring the Suur Taevaskoda sandstone outcrop

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GLOBE protocols

- Defining the Soil Characterization Site and Describing the Soil Profile (Horizons)

- Defining the Soil Moisture and Temperature Site

- Measuring Soil Temperature

- Describing the Soil Profile (Horizons)

- Measuring Soil pH

Equipment

Shovel

Soil auger

Universal indicator

Soil thermometers

Measuring tape

Vinegar

Gloves

Compass

Mobile phone

Distilled water

Nails

GLOBE "Soil color book"

Scoop/Shovel

Spray bottle

Research Questions and Hypotheses

- What kind of human impact can we see on the soil horizons?

- Is there a difference in soil pH at the Suur Taevaskoda clearing and upper forest?

- How does the different vegetation affect the soil, mainly the temperature?

Following our research questions, we set our hypotheses:

- The top horizons of soil will be more compressed at the areas where human impact is bigger.

- Because of the acetic pine tree needles, the pH will be lower in the forest on top of the outcrop.

- The temperature will be higher on the clearing because of the lack of trees and shadows.

Group 1: Taevaskoja clearing

Research points:

1. Grass (soil auger)
2. Sand (soil auger)
3. Outcrop

Species: poacae and carex, common bracken (Pteridium aquilinum), common nettle (Urtica dioica), and ground elder (Aegopodium podagraria).

Elevation: 37,5 m

Location: The slope of the Great Taevaskoja outcrop

1. Grass

The first site was located on the clearing in a grassy area with little to no visible trampling.

2. Sand

The second site was located on the clearing in a visibly trampled and sandy area.

All the horizons have a granular structure, with the upper horizons being clayey sands and the rest being sandy soils.

3. Outcrop

The third site was located on the clearing at a natural outcrop. It was located about 2 meters from the Sand site and around 10 meters from the river.

Group 2: Taevaskoja pine forest

Research sites:

4. Natural

5. Road

Species: Baltic pines (Pinus sylvestris), ferns (Dryopteris), raspberries (Rubus idaeus), Rubus nessensis, buckthorns (Frangula alnus), rowan (Sorbus aucuparia), lingonberry (Vaccinium vitis-idaea), lily of the valley (Convallaria majalis), European blueberry (Vaccinium myrtillus), European spruce (Picea abies).

Elevation: 61 m

Location: On the Great Taevaskoja outcrop, next to the trail.

4. Natural

The fourth site was located on top of the Suur Taevaskoja outcrop in a pine forest.

5. Road

The fifth site was located near the fourth site, but around half a meter from the road in a more trampled area.

The pine forest mainly has leached soils. All the horizons have a granular structure of sands.


4   5

Results, soil chemistry

	1. Grass (rohi)	2. Sand (liiv)	3. Outcrop (paljand)	4.Natural (looduslik)	5. Path (rada)
pH	neutral, pH 7			more acid pH 5-6	

Because we are located in Southern Estonia on Devonian sandstone and the soil was either acidic or neutral, no carbonates were found.

We confirmed our hypothesis: the soil in the pine forest was indeed more acidic than in the clearing.

1. ja 2. Horisondi kogu paksus
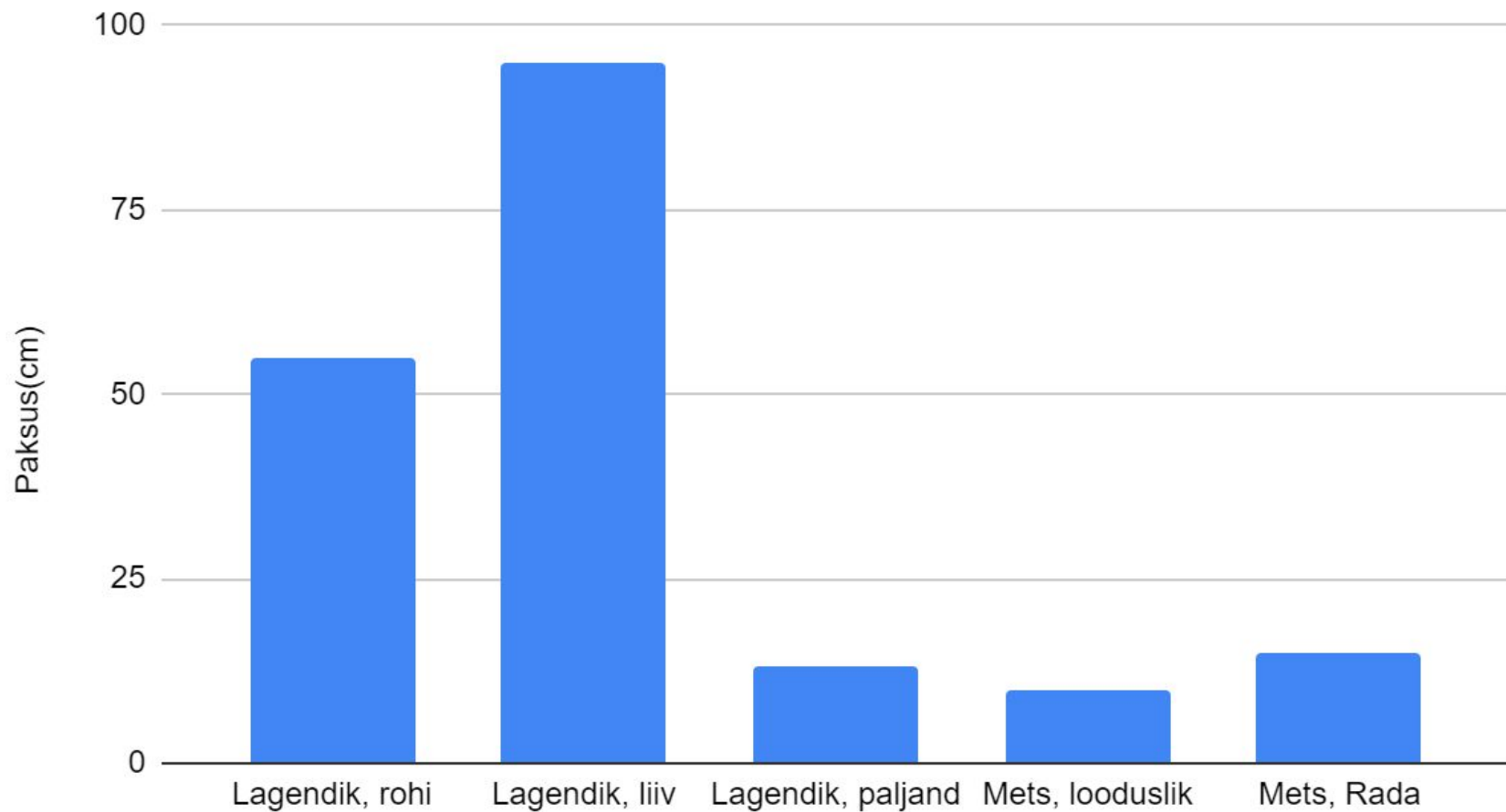
Results: temperature and humidity

"Our assumption that the ground would be warmer in the clearing did not hold true. The soil temperature was consistently between 17-19 degrees, and in some places, the forest was even a degree warmer (17-19) compared to the clearing (17-18).

To determine moisture levels, we used a dry/moist/wet scale, and due to its simplicity, we consistently found that the soil was moist."
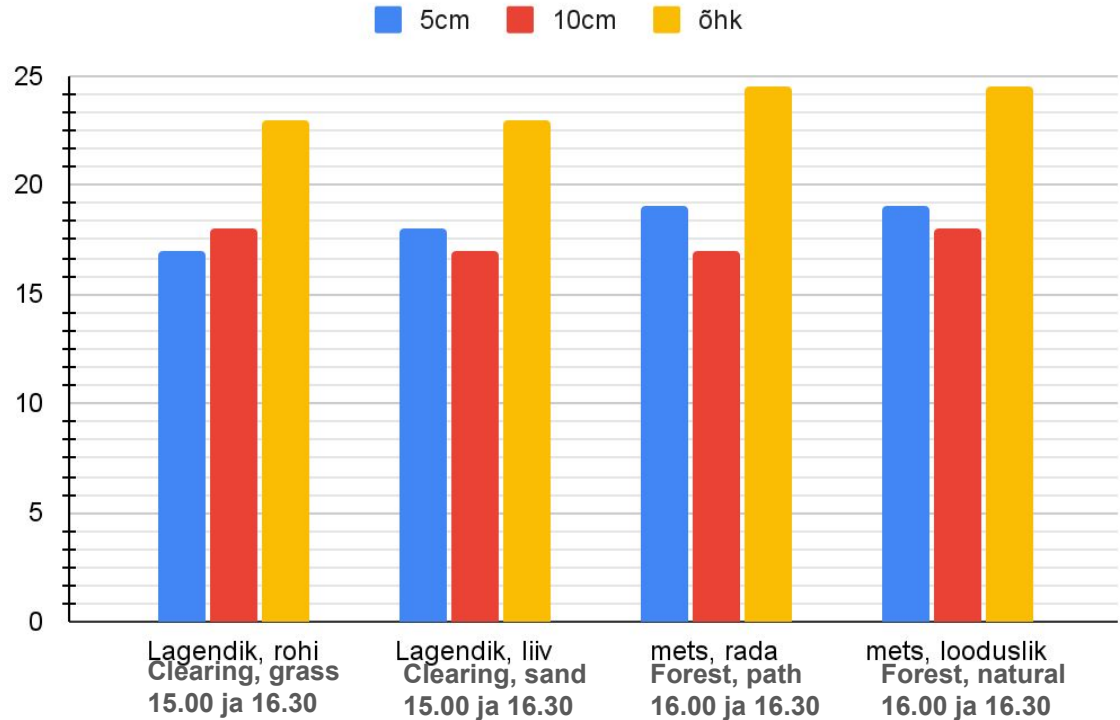
Conclusions

A significant difference in the humus layer was visible in the meadow, but due to the footpath that passed over the outcrop near our measurement site, our measurement results did not differ at the top.

The pH values did indeed differ. The forest floor was quite acidic, whereas the results measured from the meadow remained consistently neutral.

The hypothesis that the temperatures would differ did not turn out to be true.

Thank you!