



# Scientific Report

Northern and Baltic  
Regional Congress

From Ice To Life



egea



## Contents

Introduction.....	2
Scientific lecture.....	3
Workshops.....	4
Mobile big data in studying human-nature interactions.....	4
Exploring the Finnish Lakes .....	6
Mapping of geomorphological features.....	9
Reindeers, Dog sledding and endless nightskies with the pole star and northern lights.....	12
The Significance of Finnish Soil.....	15
Excursions.....	19
Bus excursion throughout southern Finland.....	19
Hard hike in Usmi recreation area.....	20
Rajamäki beverage plant and museum.....	21

# Introduction

The theme of the congress was the impact of the Ice Age on Finland. Almost every part of the country has been shaped by the massive ice sheets or meltwaters of the Weichselian glaciation. These forces created Finland's unique landscape and still have an effect today: even 10,000 years later, land uplift is adding about 7 square kilometers to Finland's area each year.

Modern Finnish life is built on this Ice Age legacy. Ridges form natural bridges over lakes, land uplift creates fertile fields for farming, and moraine soil filters some of the world's cleanest drinking water. The retreating glaciers also gave us 180,000 lakes, making water a central part of our daily life, economy, and culture. The traces of the Ice Age remain vital today and will continue to shape Finland for generations to come.

The congress venue and scientific program are also connected to this theme. Our congress venue itself is on the Salpausselkä end moraine, one of Finland's most notable postglacial formations. The workshops continue along the same lines: the lakes shaped by the glaciers, the geomorphological features found across the country, and the soils that influence farming and forests. These are also the same landscapes that provide us with clean water, opportunities for outdoor life, and an important part of tourism.

In this way, the Ice Age is not only part of Finland's distant history. Its traces are present in the ground beneath us and in the ways we live with nature every day. They remind us that the effects of the glaciers are still with us, and will remain part of Finland's landscape for a long time to come.

## Scientific lecture

The scientific lecture, given by University of Helsinki MSc student in physical geography Ilona Tuovinen, provided an overview of the Weichselian glacial period in Finland. She outlined the main stages of the ice sheet's advance and retreat, showing how these shifts shaped the landscape and left behind the characteristic features we see today. The lecture also discussed the wide range of formations created by the glaciers, from ridges and eskers to the countless lakes that now define much of Finland's scenery.

In the second part of the lecture, we were shown how these features have influenced Finnish society in many ways. For example, devil's fields have found a place in mythology and storytelling, while kettle holes have even played a role in urban planning. In this way, the lecture looked both at the history of the Ice Age and at how its traces continue to shape Finnish life today.





# Workshops

## Mobile big data in studying human-nature interactions

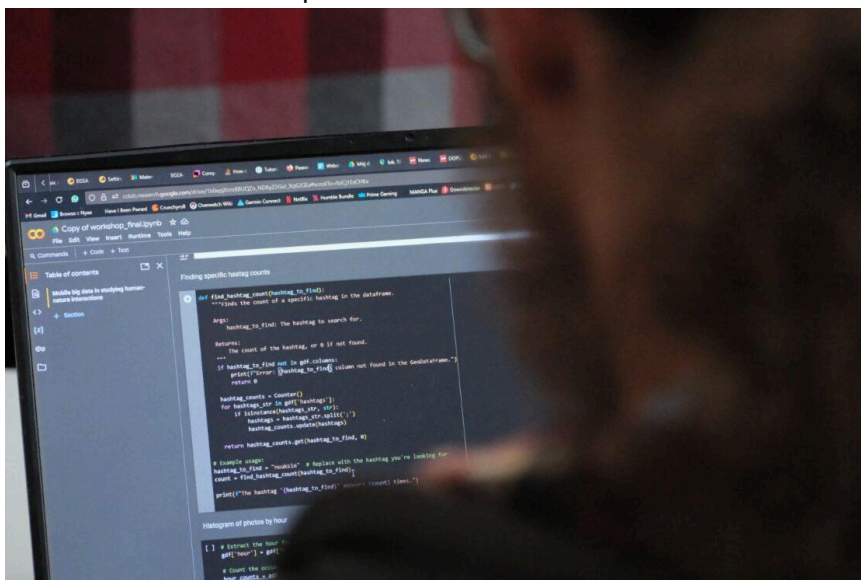
Workshop leaders: Max Buchhart & Eliška Pospěchová

### Introduction

Geolocated social media data is becoming increasingly common and provides a valuable resource for understanding human activities in natural environments. By analyzing such data, researchers can track and study human–nature interactions in ways that were not previously possible.

### Methodology

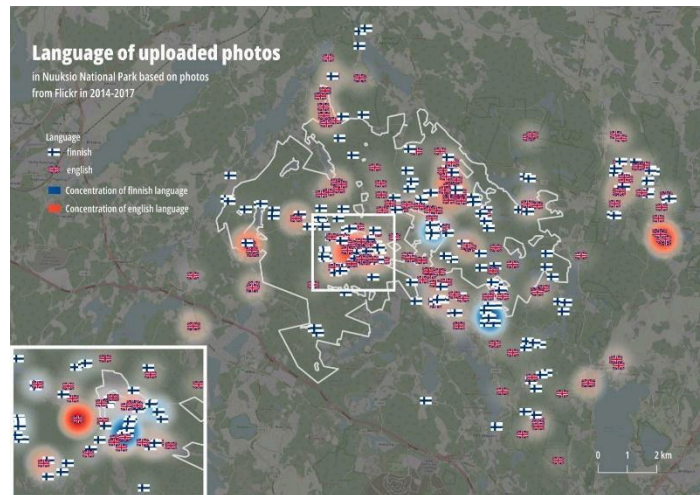
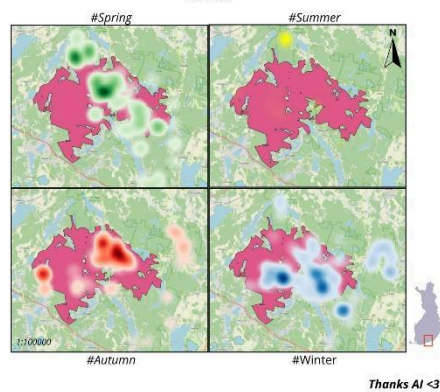
For this study, geolocated social media data was obtained from the University of Helsinki. The research focused on Nuuksio National Park in Finland. Mapping and analysis were carried out using Python programming with its geospatial libraries, which allowed for detailed spatial visualization and interpretation of the data.



### Results and Interpretation

The analysis revealed the movement patterns of hikers within the national park, highlighting the most frequently visited areas and trails as well as seasonal patterns. Additionally, the data showed where visitors from different countries traveled within the park, providing insights into international patterns of park use.

### Frequency of the seasonal hashtags used on flickr in Nuukio National park



### Literature:

Heikinheimo, Vuokko, Enrico Di Minin, Henrikki Tenkanen, Anna Hausmann, Joel Erkkonen, and Tuuli Toivonen. "User-generated geographic information for visitor monitoring in a national park: A comparison of social media data and visitor survey." ISPRS International Journal of Geo-Information 6, no. 3 (2017): 85.

# Exploring the Finnish Lakes

Workshop leaders: Eliina Ahlroth & Paweł Rybowicz

## Introduction

We all have studied aspects of lakes and hydrology, yet both hydrological processes and lake ecosystems vary widely across Europe, and not everything can be covered in basic hydrology courses. For instance, Finland, often called the “land of a thousand lakes,” is strongly shaped by its glacial past, making it a particularly relevant case for studying post-glacial lake systems. Therefore, the focus of this workshop was on the structure and function of different types of lakes, with a special perspective on the unique characteristics of post-glacial lakes. The aim was to expand participants’ theoretical knowledge while also introducing them to fundamental field sampling methods and analysis on the site. These methodologies were mostly learned from our basic hydrology courses including field excursions in Poland and Finland, as well as by self-studying the topic.

## Methodology

We initiated the workshop with an icebreaker game to create a friendly atmosphere and warm up a little bit. The theoretical part that came after was held in the form of multimedia presentation with elements of interaction (mentimeter, questions to participants, elements of discussion). This part aimed to provide essential theoretical knowledge and equip participants for the hands-on fieldwork that followed.

In the field, we explained how to use the measuring equipment and proceeded with the analysis (Figure 1). Participants were divided into groups, and each group used a rowing boat to reach a designated measuring point. There, they conducted a Secchi depth measurement and collected underwater samples. Afterwards, the groups brought their samples back to shore and used a portable multiparameter meter equipped with electrodes for pH and conductivity to analyze the basic water parameters. Meanwhile, the groups that were not using the equipment were occupied with describing the lake surroundings to identify possible sources of particles or energy influx that could have any effect on the lake’s functioning.

After a lunch break we took the participants to another nearby lake to see and discuss the differences and similarities between them. We made a stop at the Devil’s Fields, which are a characteristic postglacial feature of the area. We concluded the workshop with a quick follow-up on laboratory analysis that could be conducted on the samples taken and a quiz to refresh participants’ memories a little bit. Later, the measurements taken on the samples from the lake were compared to the results of previous monitoring of the lake conducted by the municipality of Hyvinkää (1).



Figure 1. Field practice with measurement equipment on the lake.

## Results and Interpretation

During our fieldwork, we found that the lake is relatively shallow and rich in humus, which gives the water a brown coloration. Water clarity was high, with the Secchi disk visible all the way to the bottom. The pH values at the measurement points ranged from 7.0 to 7.5, representing the mid-range of all recorded values (Figure 2). Previous measurements in this lake had been taken in September and March, whereas our sampling took place in early May. The seasonal difference was particularly evident in conductivity, as our measurements showed noticeably lower values compared to earlier records (Figure 3). A likely explanation is the absence of de-icing salt runoff from the nearby road at this time of year.

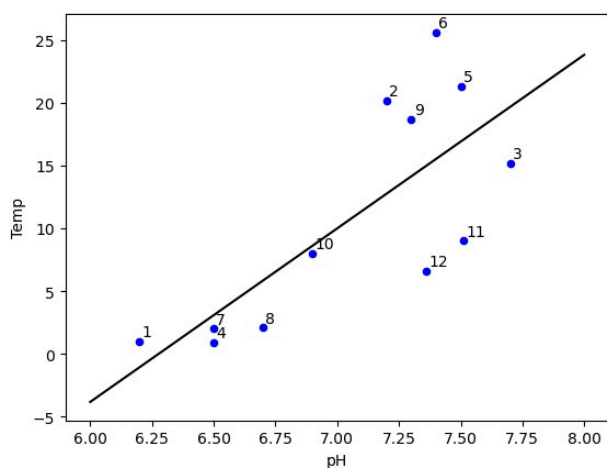
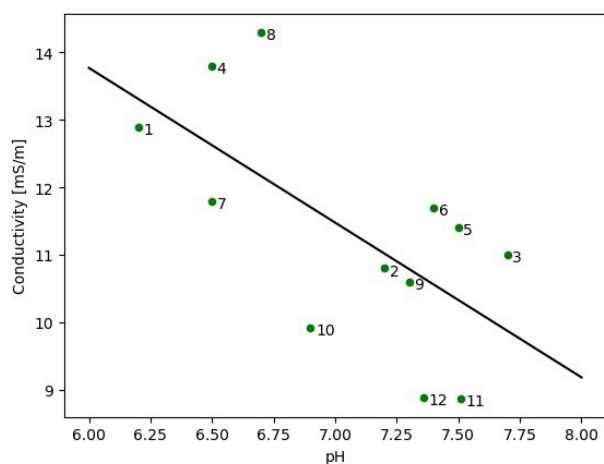


Figure 2. Temperature and pH with samples 10, 11, and 12 representing data collected during our fieldwork. Data source: Finnish Environmental Institute (Syke) and Ely-centre, water quality.





*Figure 3. Conductivity and pH with samples 10, 11 and 12 representing the data collected during fieldwork. Data source: Finnish Environmental Institute (Syke) and Ely-centre, water quality.*

A few problems occurred during the workshop. For example, the lake turned out to be too shallow, reaching only about 1.5 meters at its deepest point, to properly demonstrate the idea of the secchi disk and to collect water samples from different depths. Nevertheless, the underlying principles of the tools could still be explained, and participants were able to practice using them, which was the main goal. The portable multiparameter device performed reliably in the field, though certain parameters still require verification under laboratory conditions. For any future workshop leaders, we strongly recommend thoroughly researching the study site in advance and bringing a wide range of equipment to measure things. It is also advisable to test all instruments beforehand and, if possible, trial them in the intended field location.

## Literature

1. Finnish Environmental Institute (SYKE), The Centres for Economic Development, Transport and the Environment (ELY Centres). Water Quality. [Cited 2025 Jul 17] Available from: <https://wwwp2.ymparisto.fi/Vesla/Default.aspx>.

# Mapping of geomorphological features

Workshop leaders: Mikko Kangasmaa & Aapo Keinänen

## Introduction

Finland's unique geomorphology was mainly shaped during the glacial period. The ice sheet left behind a wide range of postglacial features. Learning to map and identify these postglacial features - both in the field and through remote sensing data - is an important skill for all geographers.

The focus of this workshop was first a field excursion to identify postglacial landforms in the Kiljava area. This was followed by a short lecture on remote sensing, with a particular emphasis on elevation models and LiDAR. Finally, the participants were divided into smaller groups, each receiving a physical map of distinct geomorphological areas in Finland. Using open data provided by the National Land Survey of Finland, the groups then created geomorphological maps of these areas by identifying key features.

## Methodology

We began the workshop with a round of introductions, during which everyone also shared their favorite geographical feature from their own region. After that, we set out to explore the Kiljava area.

The route included several predetermined stops. The first stop was the ridgeline formations located just behind our congress building. From there, we followed the ridgeline to the next feature - an ancient beachline that has since transformed into a devil's field. To locate this formation, which was hidden deep in the forest, we also made use of a drone. Our next stops included a kettle hole and a glacifluvial esker. At each formation, we took photographs and discussed the processes behind their formation.



Figure 1. Devils field (left) and kettle hole (right)



Figure 2. Using a drone to find features in the field.

In the second part of our workshop, we divided the participants into five groups. Each group was assigned a region of Finland with distinct geomorphological characteristics: Kiljava, Lohtaja, Raippaluoto, the Käsivarsi wilderness area, and Kalajoki. Using the mapping symbols and color schemes provided by the Geological Survey of Finland, the groups created geomorphological maps of their assigned areas. To support this work, they utilized open data layers from the National Land Survey of Finland, including hillshade models, orthophotos, and land cover maps.



## Results and Interpretation

Our results indicate that the five research areas each have their own unique geomorphology. The Kiljava area lies on top of the Salpausselkä ridgeline formation, with additional eskers located to its north. The area is mostly composed of sorted gravel and mixed moraine.

Raippaluoto is characterized by distinct De Geer moraines - small moraine ridges often found in coastal regions. The area also contains a group of drumlins.

Although Lohtaja and Kalajoki are both located on Finland's western coast, they display different kinds of formations. Both areas were shaped by a large glacial river that deposited fine sediments, creating what is now a dry-land delta. This delta was later reshaped by wind and water, forming dunes and ridges.

The Käsivarsi wilderness area displayed a broader variety of features on a larger scale. Its Arctic location in the Scandes mountain range meant the glacial period had an especially strong impact. Large eskers and blockfields are particularly characteristic of this region.

Overall, the workshop was very successful. The old-school method of using pen and paper allowed everyone to get started immediately without needing to learn new technical skills. However, there were some challenges: slow internet speeds made accessing the data difficult at times, and some of the mapping areas were somewhat monotonous, with many similar formations leading to repetitive work.

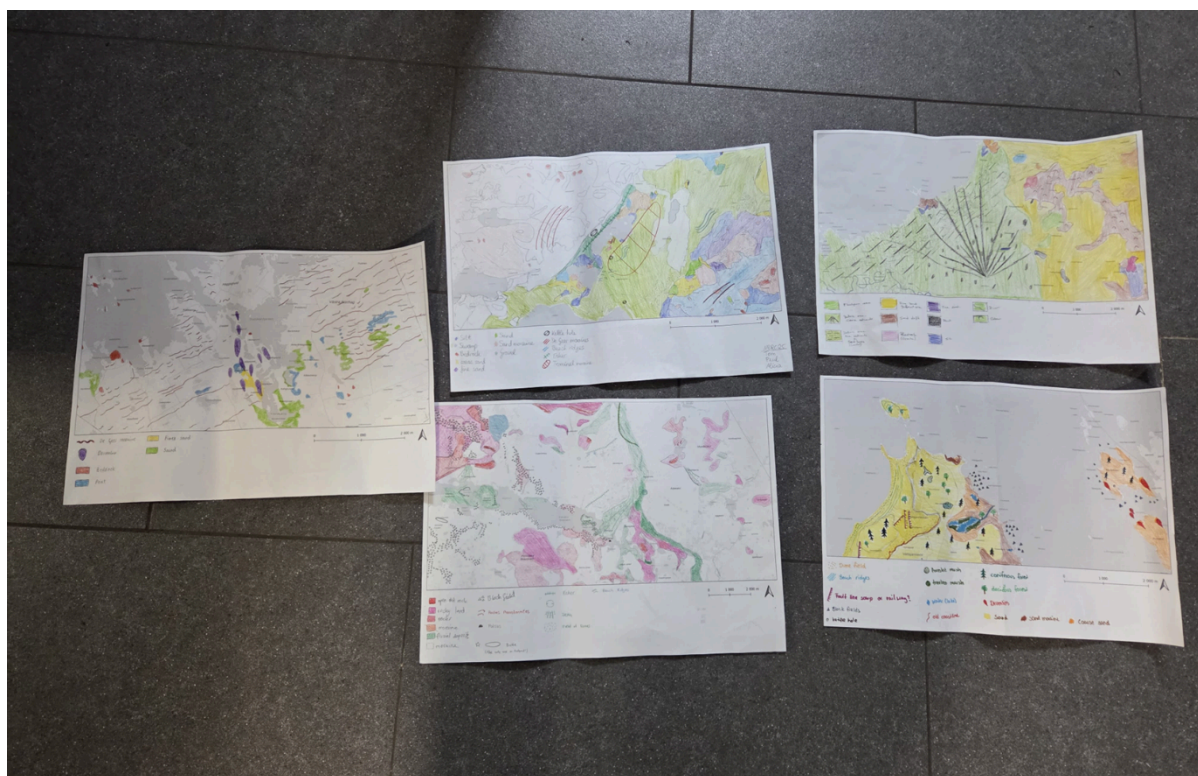


Figure 3. Finished geomorphological maps of five distinct areas in Finland.

## Literature

1. National Land Survey of Finland, \*Paikkatietoikkuna\*, geodata portal, accessed May 6, 2025, <https://kartta.paikkatietoikkuna.fi>.
2. Tikkanen, Matti. "Suomen pinnanmuodot." *Terra* 106, no. 3 (1994): 175-180.



# **Reindeers, Dog sledding and endless nightskies with the pole star and northern lights**

## **Introduction:**

As the title of the workshop suggests, people have various expectations and preconceptions when confronted with northern Finland. The goal of the workshop was to understand and critically reflect upon these preconceived notions by using the "Tourist Gaze" and "Authenticity" as conceptual frameworks, that are well established in the field of tourism geography. The concept of the tourist gaze is strongly linked to John Urry as its founder. At its core, the concept describes the way tourist gaze upon places they visit. The tourists arrive at their destination already loaded with expectations of what they will experience. These prior expectations shape the way they perceive their destination, seeking to confirm what they already believe to be true rather than openly exploring and intaking their surroundings (Urry 1990; Larsen 2014). While the tourist gaze is strongly linked with John Urry, authenticity in the context of tourism is broader and has various competing schools of thought. These authenticities differ in the point of view they take and importantly in what they constitute as authentic (Hsu & Nilep 2015). The most common schools of authenticity have in common, that they do not take the locals perspective of what they believe to be authentic into consideration.

This can lead to problems or further amplify existing problems and struggles, especially of minorities. One such minority that is relevant in the context of northern Finland are the Sámi people. The Sámi are the last remaining indigenous people in the European Union and inhabit parts of northern Finland as well as Norway, Sweden and Russia (Sámi Parliament 2018). In the past the Sámi have faced various levels of colonialism and cultural repression with some aspects carrying on to this day. At the same time, interest in Sámi culture for tourism purposes has increased over the years (Kramvig 2017; Ziliacus 2022). The resulting implications that originate from the tourist gaze and authenticity for this tourism are at the very centre of the case study discussed in the workshop.

## **Methodology:**

The main method of the workshop was discussing various questions first in small groups and later in the complete workshop group. In the beginning, various ice-breaking activities were conducted and resulted in the first division into smaller groups based on the personal perceived experience with Finland, as the first task for the smaller groups was mapping the groups perception of northern Finland. After this first round of free association, the participants were introduced to the concept of tourist gaze, before returning to the smaller groups and using the perspective of the tourist gaze as a basis for reflecting their groups perceptions and considering potential downsides that can result from the tourist gaze. After a short introduction into different schools of authenticity, participants were divided into new small groups to discuss "what is authenticity?"; "who decides what is authentic and what isn't?" and "why is authenticity important?". Again, the results of the groups were afterwards discussed in the complete group. Having established a general understanding of the two concepts, the focus of the workshop was moved towards the case study of the Sámi people. First, relevant aspects were briefly introduced before forming groups once more to discuss

potential challenges Sámi face due to tourism; how the tourist gaze and authenticity might be problematic in the context of Sámi tourism and how potential solutions could look like. At last, the “Principles for responsible and ethically sustainable Sámi tourism” as guidelines that have been created by the Finnish Sámi parliament have been introduced as a best practice solution to some of the previously discussed issues.

### **Results and Interpretation:**

Expectations of northern Finland:

Many of the participants' perceptions of northern Finland were centred around the natural environment of the region, Finnish culture, Christmas and winter in general. Some groups also mentioned Sámi. The origins of these perceptions were in all different sorts of sources such as school and university, television and other media, Finnish EGEAns and Finnish celebrities and various other sources. In many cases participants couldn't exactly pinpoint where certain aspects of their preconceptions originated.

The tourist gaze:

The participants of the workshop identified various downsides and potential problems that can originate from the tourist gaze. One core issue can be that the tourist gaze centres the attention of tourists to specific places that can become overcrowded. These “tourist attractions” as main focus of tourists' attention can suffer from tourism induced gentrification and crowding out effects, where short term rental units create more revenue than long term rental agreements with locals, leading to increased cost of living for locals and displacement. Additionally, the limited view by tourists can lead to reinforcement of stereotypes of the hosts' culture, a disappointing tourist experience when expectations aren't met, othering and in general a loss of authenticity and many other challenges and downsides.

Authenticity:

Authenticity, the participants found, isn't easy to define, especially not in the context of cultural experiences. Authenticity can be a subjective truth of what an individual host or guest might perceive to be authentic in the moment. Authenticity can also be a label to protect certain aspects of culture or commercialize others. In terms of power over the definition of what is and what isn't authentic, the participants found that often power is on the side of the tourism industrial complex that markets products and experiences as authentic. At the same time political bodies like the EU can have a say in what is an authentic product or experience through protected labels. For the question of why authenticity matters in the context of tourism, participants found that it can give tourists a good experience if they perceive their experience to be authentic. At the same time, it can be a tool utilized for education and preservation of culture.

The Sámi:

In the case of Sámi tourism, participants found that the tourist gaze and authenticity can lead to many problems for the Sámi, as these concepts can narrow down the visitors' perspective to a very narrow and potentially primitive image of Sámi culture as a culture of “wild” people. At the same time Sámi that are not actively part of the tourism ecosystem can be gazed at and disrupted in their daily lives as a “tourist attraction”. Besides these challenges that directly

connect to the tourist gaze and authenticity, participants found that land use conflicts, overtourism, exploitation and cultural appropriation and misrepresentation are amongst the challenges that the Sámi face due to tourism.

In order to tackle these issues, potential solutions were discussed. These solutions include increased awareness that should be spread to tourists visiting Sámi homeland, quality and quantity control measures for tourism products and in general a bigger direct influence of Sámi on Sámi -related tourism and politically as a minority.

## **Conclusion**

The concepts of tourist gaze and authenticity can help to better understand how tourists perceive the places they visit and the aspects they value about their experiences. At the same time the concepts are limited in their ability to understand tourism holistically and both concepts offer aspects that give room for criticism. Nevertheless, they help understand where tourism that connects to Sámi people can create challenges that go beyond the tourism sector and affect most if not all Sámi. The "Principles for responsible and ethically sustainable Sámi tourism" that have been created by the Sámi government can be a best practice of how to handle these issues, their effectiveness however hasn't been determined yet. In general, the workshop gave room to critically reflect personal preconceptions of other places by the participants and had an open and productive discussion culture.

## **Literature:**

Hsu, Pei-Hsin and Chad Nilep (2015): "Authenticity in indigenous tourism: the provider's perspective". In: International Journal of Critical Indigenous Studies.

<https://doi.org/10.5204/ijcis.v8i2.124>

Kramvig, Britt (2017): "Orientalism or cultural encounters? Tourism assemblages in cultures, capital and identities". In: Tourism and Indigeneity in the Arctic.

DOI:10.21832/9781845416102-006

Larsen, Jonas (2014): "The Tourist Gaze 1.0, 2.0, and 3.0". In: The Wiley Blackwell Companion to Tourism. DOI:10.9781118474648.

Sámi Parliament (2018): "Principles for responsible and ethically sustainable Sámi tourism".

<https://samediggi.fi/en/areas-of-expertise/livelihoods-justice-and-environment/ethical-guidelines-for-sami-tourism/>

Urry, John (1990): "The Tourist Gaze: Leisure and Travel in Contemporary Societies".

Zilliacus, Johanna (2022): "A colonial history of social exclusion of indigenous Sámi in Finland".

<https://blogs.abo.fi/socialexclusion/2022/03/29/a-colonial-history-of-social-exclusion-of-indigenous-sami-in-finland/>

# **The Significance of Finnish Soil**

Workshop leaders: Barbara Kurtov and Ognjen Ožegović, EGEA Zagreb

## **Introduction**

The goal of this workshop was to research how different types of soil in Finland are correlated with forestry, agriculture, ecology and traditions in Finnish folklore and culture. This topic seemed ideal for the theme of the congress "From Ice to Life", regarding how ice had a significant role in shaping today's relief and soil in Finland. This workshop was inspired by the lectures I took in Pedogeography at the Faculty of Agriculture at the University of Zagreb. The motivation behind it was to apply that knowledge on the example of Finland and to teach the participants more about it through fieldwork.

## **Methodology**

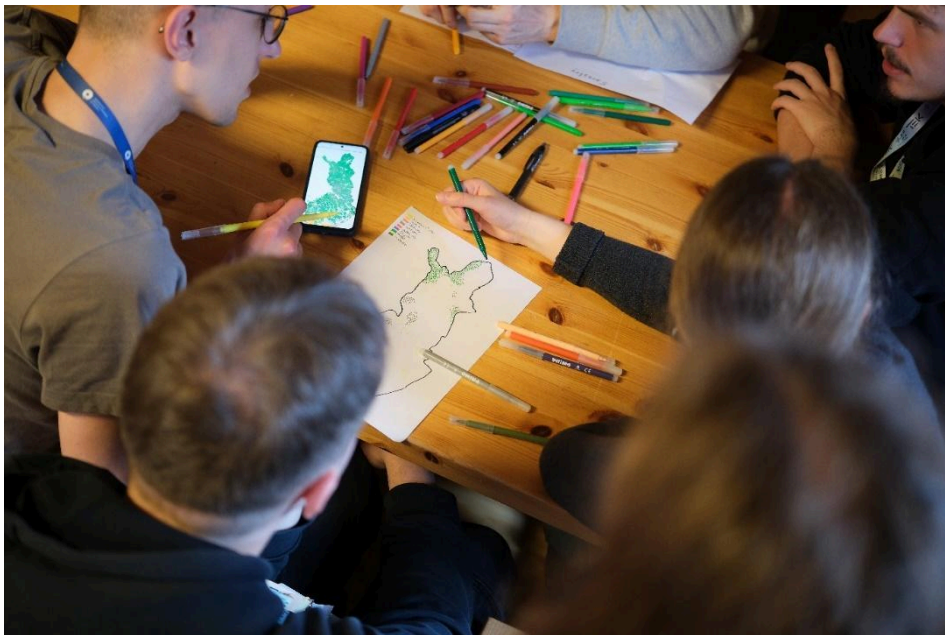
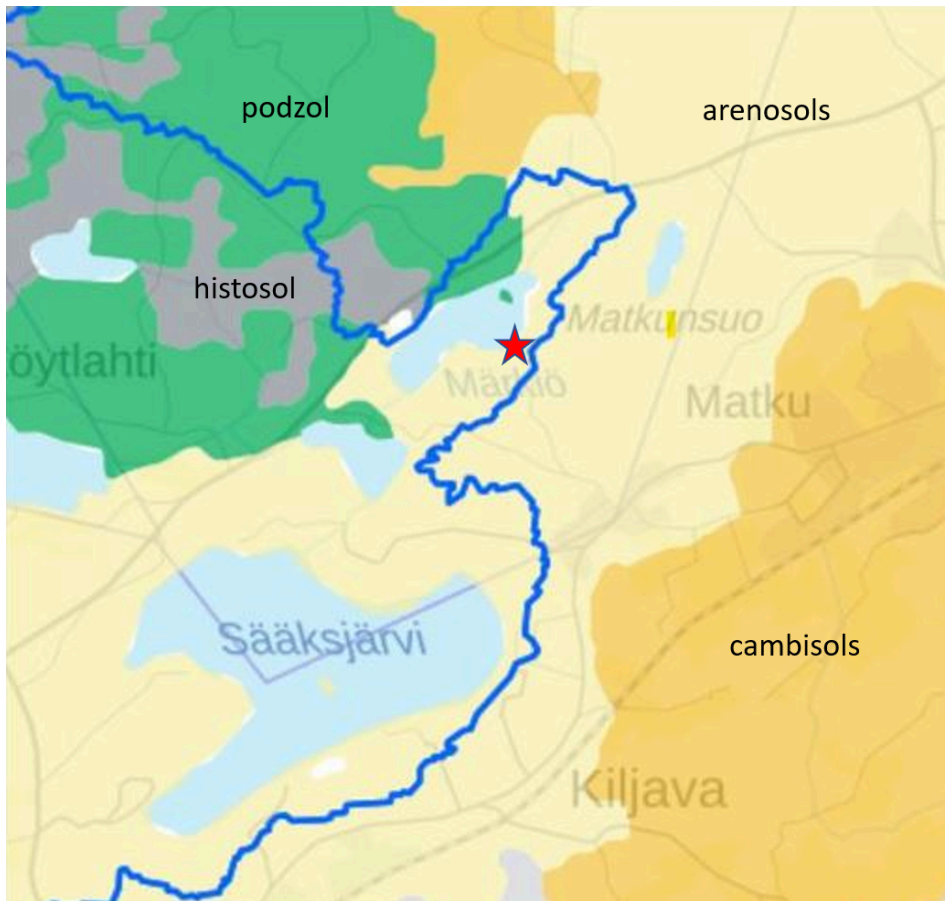
In the first lecture part of the workshop our participants were introduced to the basics of pedology, how the soil is made, the geomorphological and geological background of Finland and more about current soils through Finnish soil classification. We also gave our participants a cultural frame of Finnish practices in agriculture and forestry. Fieldwork was the second part of the workshop where we dug up a soil profile and did soil testing. The next session was dedicated to peatlands as one of the most important landscapes and ecosystems in Finland. This session was in the form of a lecture and we watched a short educational documentary about peatlands and forestry in Finland through which our participants could see specific examples of peatland management. We also had a short fieldwork session where we visited a local peatland, dug up a soil profile and took a sample of *Sphagnum* (peat moss). In the last part of the workshop we split our participants into 3 groups – forestry, peatlands and generally Finnish soil classification where the goal was to revise all the things they learned in the workshop and make a poster of it.

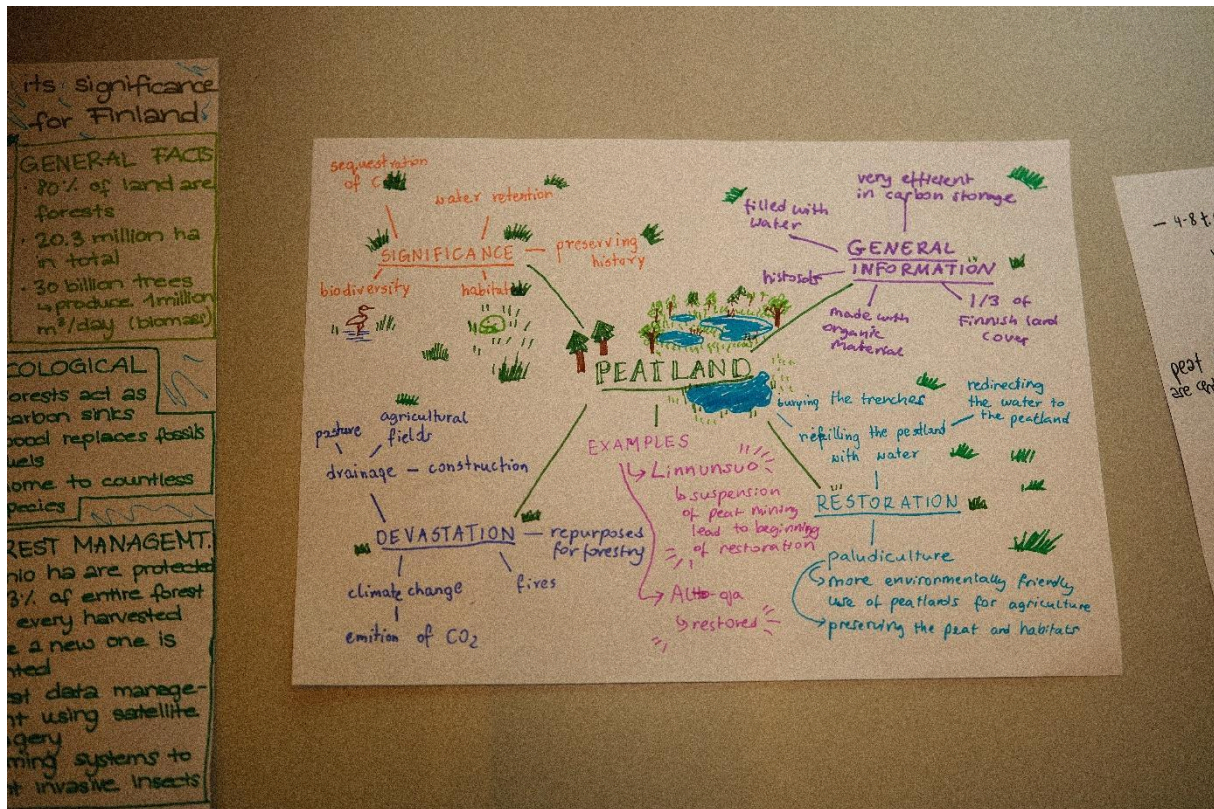


## Results and interpretation

In the soil testing part of the workshop we concluded that the lower part of the upper part of the soil was more alkaline and the lower more acidic, but it was clear that the lower part of the profile has occasional periods of flooding, regarding how close to the lake it was located. We couldn't specify in our profile which type of the soil is it exactly, because of the mixture of different characteristics, but the map of the area helped (Image 3). The conclusion of the workshop was that the peatlands play a significant role in Finnish environmental health and protection. A lot of peatlands are located in protected areas and their sustainable management is crucial.







## Literature

Yli-Halla M. Classification of Soils in Finland According to Soil Taxonomy. Soil Horizons 1999; 59-69.

Yli-Halla M. Problems encountered when classifying the soils of Finland, European Soil Bureau. 2002; 183-89.

Lindholm T. Heikkilä R. Finland – land of mires, The Finnish Environment 2006;23

Mokmaa, D.L., Yli-Halla M., Lindqvist K. Podzol formation in sandy soils of Finland. Geoderma 2004;20:289-72.



# Excursions

## Bus excursion throughout southern Finland

On this excursion, we took a bus through Southern Finland and visited several fascinating historical and natural sites. Our first stop was the largest concentration of giants' kettles in Finland. These bowl-like rock formations were created during the last Ice Age, when meltwater streams carried stones that rotated under intense pressure, drilling deep holes into the bedrock. We learned not only about their geological formation but also about their place in Finnish mythology. In earlier times, people often explained mysterious natural formations through stories of giants. Because of the bowl-like shape of the kettles, they were believed to be the butter churns of a giant named *Hiisi*.

Next, we explored the charming town of Porvoo, once an important trading hub along the river. The old town, with its red-painted wooden riverside houses and well-preserved medieval street plan, offered a glimpse into centuries of Finnish history and culture.

Our final stop was Emäsalo Island, located just off Porvoo. Here, we walked across the smooth, glacially polished bedrock, sculpted thousands of years ago beneath the massive weight of the ice sheet. Today, the island is a popular place for recreation, but it also has a military base. On the way back, we saw Finland's largest oil refinery and talked about its importance for the economy and new energy innovations. Along the trip, we also spotted wildlife such as deer, foxes, and swans.





## Hard hike in Usmi recreation area

On this excursion, we completed a hard hike in the Usmi recreation area, located close to our congress venue. Usmi provides an excellent representation of Finnish nature, with its forests, lakes, swamps, polished bedrock, and well-maintained trails and campsites. We also had the opportunity to take advantage of Finland's Right to Roam laws by hiking one section off-trail, directly through the forest.

Midway through the hike, we practiced making a fire and prepared pancakes over it while enjoying tea and coffee. The weather was ideal, neither too warm nor too cold, making it perfect for hiking. Along the way, we encountered different types of forests: an old protected spruce-dominated forest with abundant decaying wood, and a typical managed industrial pine forest.

By the end of the day, we had covered approximately 15 kilometers. Some participants noted that the route would not normally be considered a hard hike, but without mountains this was about as challenging as it gets in Finland. Most importantly, we all had a wonderful time.



## Rajamäki beverage plant and museum

On this excursion, we visited the nearby town Rajamäki and a local history museum for alcohol making in Finland. Our excursion started a bit later than others, around noon. We walked first to the Rajamäki, where we had lunch in a classic Finnish burger restaurant, Hesburger.

Next we visited the Rajamäki church, which was built in 1938 for the alcohol factory workers. It is a rare and beautiful neo-classist/functionalist church designed by Erkki Hilttunen, Finnish architect. Before entering the museum, we climbed to a nearby hill to watch two World war 2 era air-defence towers, which were built to defend the alcohol museum during the war. During the war, that factory produced all the Molotov cocktails used by finns.

At the museum we had an interesting tour about the history of the alcohol factory and alcohol politics in Finland. The exhibition included old alcohol making machinery, war time equipment, old products and various pictures of the factory and the workers during the years. The factory is still in use (you might know Finlandia vodka), but due strict alcohol laws in Finland, in the museum you could only see old products (Showing current production counts as alcohol advertisement, which is big no no in Finland). After the amusing tour we had car rides back to the congress venue.

