

Book of Abstracts

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'Soil Science in a Changing World'

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SOIL FOOD WEB ASSEMBLY AND VEGETATION DEVELOPMENT IN A GLACIAL CHRONOSEQUENCE IN ICELAND

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Soil is the most important natural resource for life on Earth after water, and provides important ecosystem services, such as food and fibre production, carbon sequestration and nutrient cycling. It is therefore essential that we are aware of the importance of protecting soil, and at the same time understand processes that build up and regenerate soil. This requires study of soil ecosystem development.

Glaciers are retreating due to the temperature rise of the last decades and provide natural chronosequences in soil formation and weathering. By this, retracting glaciers create ideal model systems for studying soil formation and the concomitant colonization and succession of above- and belowground organisms.

We analysed soil food web development and vegetation succession during soil formation in five soil age groups ranging from 1 year old to 120 year old soils, along the retreating glacier Skaftafelljökull in SE Iceland. We hypothesised that along nutrient content, vegetation cover and plant species richness, the soil food webs show increases in biomass and complexity. We investigated soil food webs in terms of the presence and abundance of microbes (bacteria, fungi) and soil fauna (protozoa and nematodes), representing dominant taxonomic groups and trophic levels in soil communities. Furthermore, the soils were characterized in terms of soil pH, C and N pools, C and N mineralisation rates, and plant species cover and composition.

We indeed saw soil ecosystem development according our expectations, i.e. an increase in soil carbon and nitrogen, vegetation cover and plant species richness, a developing soil food web structure and an increase soil organism biomass (total and per trophic group). The development of the soil food web will be linked with aboveground vegetation development and implications for soil ecosystem functioning in terms of nutrient cycling and productivity will be discussed.