HERBIVORY NETWORK
STUDYING HERBIVORY IN ARCTIC AND ALPINE ECOSYSTEMS

http://herbivory.biology.ualberta.ca/

# Herbivory Network Soil Working Group: a Novel Arena for Circumpolar Soil Research

Maria Väisänen[1], Maria Tuomi[2], C. Guillermo Bueno[3], Francis Q. Brearley[4]

(1) Climate Impacts Research Center, Department of Ecology and Environmental Science, Umeå University, Vetenskapens väg 38, SE-981 07 Abisko, Sweden, tel. +46 90 786 90 89, e-mail: maria.vaisanen@umu.se; (2) Section of Ecology, Department of Biology, University of Turku, FI-20 0014, e-mail: maria.tuomi@utu.fi; (3) Institute of Ecology and Earth Sciences, Department of Botany, University of Tartu, Lai 40, Tartu 51005, Estonia, e-mail: cgbuenog@gmail.com; (4) School of Science and the Environment, Manchester Metropolitan University, Chester Street, Manchester, M1 5GD, UK, e-mail: f.q.brearley@mmu.ac.uk

## WHAT IS THE HERBIVORY NETWORK?

- Brings together scientists interested in the role of tundra herbivory
- A platform for developing coordinated research and long-term monitoring
- Over 100 members from 17 countries

## WHY?

- Northern soils are significant carbon stores
- Thus, they play a key role in the ongoing climate warming
- Herbivores are present throughout circumpolar tundra and can impact soil carbon cycling and nutrient availability (Fig. 1)
- These effects can further feedback to plant communities and ecosystem-level carbon and nutrient balance

Therefore, understanding tundra ecosystems requires revealing how herbivory drives soil properties and processes

## HOW?

- Develop "plant friendly" **protocols** for measuring the effects of herbivores on soils (Fig. 2)
- Review the available information on herbivore-soil relationships

## WHAT IS THE SOIL WORKING GROUP?

- Informs about the vital role of soils in modulating herbivore-plant interactions
- Encourages incorporation of soils into research in a standardized way

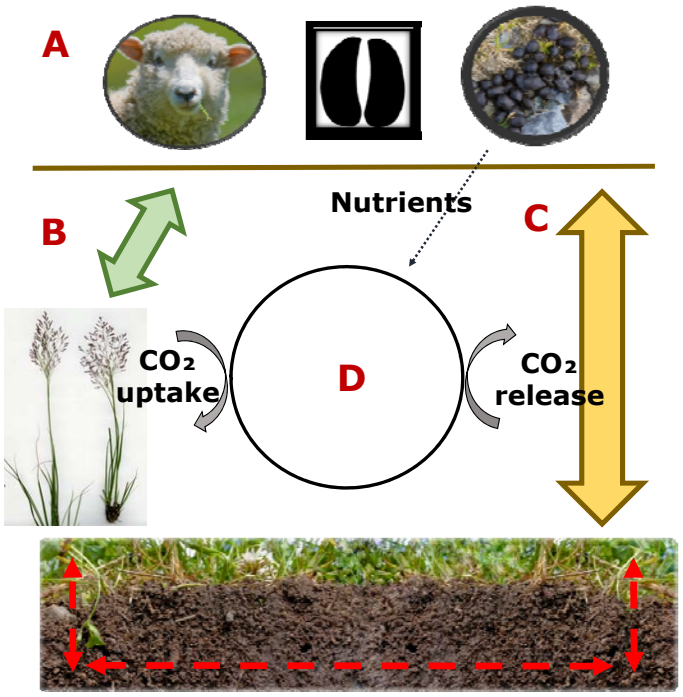


**Figure 1.** Herbivory impacts include plant eating, physical disturbance and fertilization (**A**). Currently, the interaction between plants and herbivores is mainly studied (**B**). Herbivory, however, impacts also soils (**C**) that can feedback on plants and thereby to plant-eating animals. Herbivory mediated effects on plants and soil can further impact on biogeochemical cycles of carbon and nutrients e.g. via altered soil microbial carbon release and plant carbon uptake (**D**).


**Figure 2.** Sampling scheme for testing the spatial variability of different soil parameters (**A**). Several sites were sampled during summer 2016, such as Meikle Kilrannoch, Scotland (**B**). Comparisons of organic layer thickness obtained by soil probing and destructive soil coring at different vegetation types, heath and meadow, in northern Sweden (**C**).

http://herbivory.biology.ualberta.ca/files/2016/11/herbivory-network-pilot-soil-protocol.pdf