Project acronym: HerbiDUNG

Project title: Faecal nutrient contribution of terrestrial herbivores in Arctic ecosystems

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Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Canadian High Arctic Research Station (Canada)

Herbivores can have a profound impact on nutrient dynamics of terrestrial ecosystems through dung deposition. This effect might be even more relevant in the tundra, due to the low nutrient availability which limits primary production. In such nutrient-limited systems, herbivore dung can represent an important source of nutrients. However, information about herbivore faecal nutrient content in tundra ecosystems and their potential contribution to nutrient dynamics is scarce. Our project aims to fill this gap by understanding the role of herbivores in nutrient dynamics in tundra ecosystems. More specifically, based on the comparison of two contrasted arctic locations: Cambridge Bay, Nunavut as a representative of a true arctic ecosystem and Iceland as a sub-arctic ecosystem, we will assess the faecal nutrient content (C, N, P) of the main vertebrate herbivores present at both locations (O1) and study the translocation of these nutrients at a landscape scale through pellet counts and herbivore density assessment (O2). In addition, we will provide methodological insights by developing a pan-arctic model for assessing nutrient dynamics contained in herbivore dung based on Near Infrared Reflectance Spectroscopy (NIRS), by building calibration curves with samples analysed with traditional chemical analyses (O3). By using contrasting herbivore communities across the Arctic we will bring important insights into the role of herbivores in nutrient recycling across a range of environmental conditions.