

Biogeosciences Discuss., author comment AC1
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Reply on RC1

Jessica Plein et al.

Author comment on "Response of vegetation and carbon fluxes to brown lemming herbivory in northern Alaska" by Jessica Plein et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-286-AC1>, 2022

We thank the referee for the positive comment about our study. We agree that there is often a disconnect between studies of greenhouse gases and studies of herbivory, in which the link between the two topics is too frequently overlooked. We hope this study helps elucidate some of the effects of herbivory on vegetation and greenhouse gases in the tundra ecosystem.

We initially expected CH₄ emission to decrease in response to herbivory by reducing the biomass of vascular plants, given their role not only for CH₄ transport from deeper anoxic soil layers into the atmosphere (which could be affected by the removal of vegetation), but also for the release of labile carbon from photosynthetic tissues. Additionally, CH₄ emission could be affected by lemming urine: ammonium from urine has been linked to an increase in CH₄ production. We will better explain our hypothesis in the revised manuscript, by more clearly and carefully describing these additional processes.