# Greenhouse gases flux through the land surface at the terminus of Glaciers in Alaska

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Methane has attention as a gas with a high greenhouse effect. Large amounts of methane have been observed at glacier termini in Greenland and Iceland due to the outflow of meltwater saturated with methane. In this study, we conducted observations to determine whether similar methane emissions are observed in small mountain glaciers in Alaska.
We observed methane emissions from the surface and collected water and sediment samples at the terminus of Gulkana and Canwell glacier in the Alaska Range in July 2021. The Alaska Range is a mountainous region where there are many glaciers of various sizes. The Gulkana Glacier is a small glacier that has been observed to shrink in recent years. The location of the outflowing river varied from year to year, and in 2019 it was flowing from the left bank.
Methane emissions were measured using the chamber method by Morishita et al. (2015) and a portable gas analyzer (Picarro G4301). Gas samples collected in the chamber were brought back to FFPRI and analyzed for the analysis of methane and carbon dioxide concentrations by gas chromatography.
Water samples were collected from runoff streams and surface water pools. Water samples were collected from the outflowing rivers and surface water pools, and temperature and water quality measurements (water temperature, pH, and conductivity) were taken. Water samples were analyzed for stable isotope ratios at the Japan Agency for Marine-Earth Science and Technology. Sediments were analyzed by RNA sequencing and compared with previous studies for the methanogen community.

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