Seabird activity influences Arctic methane and nitrous oxide emissions

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Seabird activity is contributing significantly to methane and nitrous oxide emissions in the Arctic tundra, a new study shows. Methane emissions, which play an important role in the global carbon cycle, and nitrous oxide fluxes, a key element in the nutrient cycle, are predicted to increase in the Arctic and contribute to Arctic warming in the near future.

To study the effects of seabird activity on variations in nitrous oxide and methane fluxes from the tundra to the atmosphere, Zhu et al. compared fluxes from a seabird sanctuary and two non-seabird colonies on Ny-Ålesund, Svalbard, Norway. They find that seabird activity was a major factor in these emissions. Mean fluxes of nitrous oxide were about 18 micrograms per square meter per hour at the seabird sites, compared with about 8 micrograms per square meter per hour at the non-seabird tundra sites. For methane, seabird activity actually changed the tundra from a methane sink to a source: mean fluxes of methane were about 53 micrograms per square meter per hour at the seabird sites and about -83 micrograms per square meter per hour at the non-seabird sites.

The researchers considered other factors that could influence methane and nitrous oxide emissions, including soil moisture and temperature. However, they find that seabird activity was the predominant factor in controlling the flux of these gases from the tundra to the atmosphere. They conclude that sites with high seabird activity are likely to be hotspots of methane and nitrous oxide emissions.

More information: Impact of seabird activity on nitrous oxide and methane fluxes from High Arctic tundra in Svalbard, Norway, *Journal of Geophysical Research-Biogeosciences*, doi:10.1029/2012JG002130 , 2012

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