



Nitrous oxide uptake rates in boreal coniferous forests are associated with soil characteristics

Henri Siljanen, Christina Biasi, and Pertti Martikainen

Department of Environmental Science, University of Eastern Finland, Kuopio, Finland

Nitrous oxide (N_2O) is a strong greenhouse gas and a significant contributor to the destruction of the ozone layer. The radiative forcing of N_2O is considered to be 320 more efficient than carbon dioxide. The major portion of global N_2O is emitted from agricultural soils. There are studies suggesting that N_2O has also a sink in forest soils. However there is relatively limited knowledge on factors controlling N_2O consumption in forest soils. Hence N_2O consumption was studied in boreal coniferous forests having different forest cover, soil chemical and physical structure and land-use history. The N_2O consumption was measured by static chamber technique in the field across spatio-seasonal sampling design. Typical and atypical denitrifiers were quantified with *nosZ* functional gene marker. Additionally chemical and physical environmental parameters were analyzed to link N_2O flux, microbial community and composition of soils. Nitrous oxide uptake could be associated with specific ecosystem and environmental conditions. Soil physical structure and land-use history were shown to be prior factors determining the strength of the uptake rate.