



Hot spots and hot moments of N₂O emissions from Austrian agricultural soils - A modeling approach

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The overall aim of NitroAustria was to identify drivers for N₂O emissions taking into account different soil types, climate conditions and agricultural management. Thirty-four sites in six agricultural production regions of Austria were selected, and site and region specific N₂O emissions from managed arable and grassland soils were calculated by the model LandscapeDNDC for the period 2005 to 2014. The cumulative N₂O emissions from the six regions over the ten-year period ranged from 3 to 35 kg N₂O-N ha⁻¹ and were higher from intensively managed grasslands compared to arable fields. The N₂O emissions showed high inter-annual variations due to climate for many regions except for those regions emitting most. In these two arable and one grassland regions, the N₂O emissions were evenly distributed over the years, which insinuates that N₂O emissions were mainly a result of management measures. In the hot spot regions, extreme peak emissions made up for 50 to 80% of annual N₂O emissions. Peak emissions correlated positively with available nitrogen and soil temperature and took place mainly in the vegetation period from April to September.