Geophysical Research Abstracts
Vol. 19, EGU2017-16861, 2017
EGU General Assembly 2017

Do stable isotope approaches hold the potential for distinguishing nitrate ammonification as a source of nitrous oxide production?

Liz Baggs
University of Edinburgh, United Kingdom (liz.baggs@ed.ac.uk)

Nitrate ammonification is one of the least well characterised N2O-genic processes. This is in part due to challenges of quantifying the process and its gaseous products. It is important to resolve this, as there is growing recognition of the likely importance of nitrate ammonification in N cycling, in both tropical and temperate natural and managed systems, and yet we know comparatively little about its regulation. Until recently denitrification was typically considered the only N2O-genic nitrate reducing process in soil, but nitrate ammonification may require different or more targeted strategies for mitigation. It is unknown how much N2O produced during nitrate ammonification has been, and still is being, wrongly attributed to denitrification. Here I briefly present evidence of nitrate ammonifier N2O production from soil systems and cultures of soil isolated strains, and focus on the natural abundance (delta 15N-N2O; 15N isotopomers) signatures of this N2O. I will critically examine the opportunity such a natural abundance 15N approach may offer for estimating the contribution of this process to net N2O emission from soil, and explore how this could be combined with stoichiometry, modelling and molecular approaches to better understand the contribution and regulation of this process in the soil environment.