# Convergence of soil nitrogen isotopes across global climate gradients

**JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**

**ID** 3115337
**Author(s)** Craine, Joseph M.; Elmore, Andrew J.; Wang, Lixin; Augusto, Laurent; Baisden, W. Troy; Brookshire, E. N. J.; Cramer, Michael D.; Hasselquist, Niles J.; Hobbie, Erik A.; Kahmen, Ansgar; Koba, Keisuke; Kranabetter, J. Marty; Mack, Michelle C.; Marin-Spiotta, Erika; Mayor, Jordan R.; McLauchlan, Kendra K.; Michelsen, Anders; Nardoto, Gabriela B.; Oliveira, Rafael S.; Perakis, Steven S.; Peri, Pablo L.; Quesada, Carlos A.; Richter, Andreas; Schipper, Louis A.; Stevenson, Bryan A.; Turner, Benjamin L.; Viani, Ricardo A. G.; Wanek, Wolfgang; Zeller, Bernd

**Author(s) at UniBasel** Kahmen, Ansgar ;
**Year** 2015

**Title** Convergence of soil nitrogen isotopes across global climate gradients

**Journal** Scientific Reports

**Volume** 5

**Pages** / **Article-Number** 8280

Quantifying global patterns of terrestrial nitrogen (N) cycling is central to predicting future patterns of primary productivity, carbon sequestration, nutrient fluxes to aquatic systems, and climate forcing. With limited direct measures of soil N cycling at the global scale, syntheses of the (15)N:(14)N ratio of soil organic matter across climate gradients provide key insights into understanding global patterns of N cycling. In synthesizing data from over 6000 soil samples, we show strong global relationships among soil N isotopes, mean annual temperature (MAT), mean annual precipitation (MAP), and the concentrations of organic carbon and clay in soil. In both hot ecosystems and dry ecosystems, soil organic matter was more enriched in (15)N than in corresponding cold ecosystems or wet ecosystems. Below a MAT of 9.8řC, soil $\delta$(15)N was invariant with MAT. At the global scale, soil organic C concentrations also declined with increasing MAT and decreasing MAP. After standardizing for variation among mineral soils in soil C and clay concentrations, soil $\delta$(15)N showed no consistent trends across global climate and latitudinal gradients. Our analyses could place new constraints on interpretations of patterns of ecosystem N cycling and global budgets of gaseous N loss.

**Publisher** Nature Publishing Group

**ISSN/ISBN** 2045-2322

**edoc-URL** http://edoc.unibas.ch/dok/A6381816

**Full Text on edoc** Available;

**Digital Object Identifier DOI** 10.1038/srep08280

**PubMed ID** http://www.ncbi.nlm.nih.gov/pubmed/25655192

**ISI-Number** WOS:000348903800001

**Document type (ISI)** Journal Article