

Dear Dr. Wanek.

We would like to thank you for your helpful and constructive comments that helped to improve our review paper. Please find below our response to your comments, but note that technical corrections were done as suggested without mentioning here. We are confident that we could successfully address all your comments. (Reviewer comments are presented in *italics*)

The only thing one may criticize is that the paper is a “classical” review presenting no meta-analysis of the DNRA data. Though the authors state that the data do not allow meta-analysis techniques, the paper would become much more attractive and significant given that they used multivariate statistics to investigate broad controls of DNRA across and within ecosystems. Based on Table 1, after filling some gaps with further data (e.g. [...]), the effects of soil water content or WFPS, soil texture, soil C and N content and soil C:N, soil pH, nitrate and DOC content, where presented, as well as biome, vegetation type, mean annual precipitation and mean annual temperature, and or other parameters (such as technique used) on absolute and relative DNRA rates could be statistically studied.

As mentioned in the paper, there is a lack of data available to conduct a meta-analysis on the importance of DNRA in terrestrial ecosystems. This will also partly hold true for conducting other types of statistical analyses (e.g. the suggested multivariate statistics). As an example, almost none of the studies that have quantified gross DNRA rates have reported the soil organic matter (SOM) content, a soil factor that is known to significantly influence N cycling transformations. Because of the lack and gaps in data on environmental factors we are reluctant to conduct statistical analyses, but we will point out the need in future studies to report the soil properties. None the less, we included the results from a multiple regression analysis (using the stepwise forward approach), which indicate that total soil C and N are combined the best predictors for DNRA in soil. This result will be included into the revised paper in a new section on “Importance and regulation of DNRA activity”, in which we will also address comments by the other reviewers.

We would like to also point out that one further problem with any statistics is the lack of a generally agreed methodology to quantify gross DNRA rates. Basically two approaches have

been used, either applying an analytical or a numerical tracing model. One additional aspect is that, unfortunately, some of the studies using the analytical model have actually used an insufficient experimental setup. That is some studies have applied a classical pool dilution experiment but have not used the “mirror labeling” approach, which would be required in order to assure the same microbial activity in both ^{15}N labeling treatments (as data from both treatments are used in the calculations). This will also prevent a reliable statistical evaluation, but may deserve mentioning in the paper.