Biogeosciences Discuss., 12, C493–C494, 2015
www.biogeosciences-discuss.net/12/C493/2015/

Biogeosciences Discussions
Open Access

Interactive comment on "Global soil nitrous oxide emissions in a dynamic carbon–nitrogen model" *by* Y. Y. Huang and S. Gerber

A.F. Bouwman (Referee)

lex.bouwman@pbl.nl

Received and published: 4 March 2015

This MS presents a module for simulating N2O fluxes at the global scale based on equations for denitrification and nitrification and considering N2O and NOx as fractions of the nitrogen that is processed. Most model elements were borrowed from other models. I have a number of serious problems with this MS:

-The model description in Appendix A is not complete as the units are not provided.

-It is not clear how model calculations at a resolution of 3.75 by 2.5 degrees can be meaningful, since all data such as weather, soil and vegetation are kind of aggregates for that resolution, and how can this be compared with point measurements.

-With this spatial resolution, the time step is 30 minutes, but the authors provide annual

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

and seasonal numbers only. It is probably more interesting to compare the model results with temporal distributions from field measurements. This could be done for a number of test sites in a variety of climate and soil conditions. If not available, perhaps seasonal estimates from experimental sites could be used to validate the model.

-To assess model quality, it is much more interesting to analyze the functioning of the soil-plant nitrogen cycle. How is denitrification compared to field measurements, and leaching, plant uptake, ammonia volatilization, etc. If the large flows in the system are correct, the authors will also be more confident about the small fluxes like N2O and NOx.

-Finally, a true sensitivity analysis will also show what the major variables and parameters are. For example, the N2O and NOx fractions will probably pop up as important coefficients.

I fully agree with one of the other reviewers who states that this work is not ready for publication, and I also agree that perhaps Geoscientific Model Development is a more appropriate journal for submitting a revised MS.

Interactive comment on Biogeosciences Discuss., 12, 3101, 2015.