

Interactive
Comment

Interactive comment on “Parameter-induced uncertainty quantification of soil N₂O, NO and CO₂ emission from Höglwald spruce forest (Germany) using the LandscapeDNDC model” by K.-H. Rahn et al.

R. Grote

ruediger.grote@kit.edu

Received and published: 2 May 2012

P. 5252, L. 24ff: Note that LandscapeDNDC has been published only in Haas et al. (accepted, note that the title has been changed) and Werner et al. (accepted, see reference below). The other references are misleading and refer to various model predecessors (PNET-N-DNDC, MoBiLE). I suggest only referring to Haas and Werner here but describing the Model history briefly in the beginning of the next section.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



P. 5253, L12ff: According to the note before I suggest the alternative formulation:

“The LandscapeDNDC model applied in this study can be seen as a derivate of the DNDC model family (Li et al. 1992, Li et al. 2000) and a direct descendent of the MoBiLE model framework (Grote et al. 2009), developed at IMK-FU Garmisch-Partenkirchen, Germany. Compared with its predecessors it offers a flexible initialization of vegetation and soil properties and efficient multi-site calculations that ease regional applications as well as sensitivity and uncertainty studies.

LandscapeDNDC includes a description of vegetation development for agricultural sites (original DNDC model, Li et al. 1992) as well as forest sites (PnET-N, Li et al. 2000, Butterbach-Bahl et al. 2001; PSIM, Grote 2007, Grote et al. 2011). Ecosystem heat transfer, water balance, as well as belowground- carbon and nitrogen processes are described independent from vegetation type (Grote et al. 2009, Holst et al. 2010, Chirinda et al. 2011).

Each module includes parameters derived from physiological, physical, and chemical principles derived from field and laboratory observations. In this study . . .”

References

Butterbach-Bahl K, Stange F, Papen H, Li CS. 2001. Regional inventory of nitric oxide and nitrous oxide emissions for forest soils of southeast Germany using the biogeochemical model PnET-N-DNDC. *Journal of Geophysical Research-Atmospheres* 106: 34155-34166.

Chirinda N, Kracher D, Lägdsmand M, Porter J, Olesen J, Petersen B, Doltra J, Kiese R, Butterbach-Bahl K. 2011. Simulating soil N₂O emissions and heterotrophic CO₂ respiration in arable systems using FASSET and MoBiLE-DNDC. *Plant and Soil* 343: 139-160.

Grote R. 2007. Sensitivity of volatile monoterpene emission to changes in canopy structure – A model based exercise with a process-based emission model. *New Phy-*

BGD

9, C916–C918, 2012

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



tologist 173: 550-561.

Grote R, Lehmann E, Brümmer C, Brüggemann N, Szarzynski J, Kunstmann H. 2009. Modelling and observation of biosphere-atmosphere interactions in natural savannah in Burkina Faso, West Africa. *Physics and Chemistry of the Earth* 34: 251-260.

Grote R, Kiese R, Grünwald T, Ourcival J-M, Granier A. 2011. Modelling forest carbon balances considering tree mortality and removal. *Agricultural and Forest Meteorology* 151: 179-190.

Haas E, Klatt S, Fröhlich A, Werner C, Kiese R, Grote R, Butterbach-Bahl K. 2011. LandscapeDNDC: A process model for simulation of biosphere-atmosphere-hydrosphere exchange processes at site and regional scale. *Landscape Ecology* (accepted).

Li C, Aber J, Stange F, Butterbach-Bahl K, Papen H. 2000. A process-oriented model of N₂ O and NO emissions from forest soils 1. Model development. *Journal of Geophysical Research* 105: 4369-4384.

Li C, Frohling S, Frohling TA. 1992. A model of nitrous oxide evolution from soil driven by rainfall events: 1. Model structure and Sensitivity. *Journal of Geophysical Research* 97: 9759-9776.

Werner C, Haas E, Grote R, Gauder M, Graeff-Hönninger S, Claupein W, Butterbach-Bahl K. Biomass production potential from *Populus* short rotation systems in Romania. *Global Change Biology* (accepted).

Interactive comment on *Biogeosciences Discuss.*, 9, 5249, 2012.

BGD

9, C916–C918, 2012

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

