Geophysical Research Abstracts
Vol. 16, EGU2014-16035, 2014
EGU General Assembly 2014


# Parameter-induced uncertainty quantification of crop yields, soil N2O and $CO_2$ emission for 8 arable sites across Europe using the LandscapeDNDC model

Ignacio Santabarbara, Edwin Haas, David Kraus, Saul Herrera, Steffen Klatt, and Ralf Kiese
IMK-IFU, Regionalization of Biogenic Trace Gas Fluxes, Garmisch Partenkirchen, Germany (ignacio.santabarbara@kit.edu)

When using biogeochemical models to estimate greenhouse gas emissions at site to regional/national levels, the assessment and quantification of the uncertainties of simulation results are of significant importance.

The uncertainties in simulation results of process-based ecosystem models may result from uncertainties of the process parameters that describe the processes of the model, model structure inadequacy as well as uncertainties in the observations.

Data for development and testing of uncertainty analisys were corp yield observations, measurements of soil fluxes of nitrous oxide (N2O) and carbon dioxide ($CO_2$) from 8 arable sites across Europe.

Using the process-based biogeochemical model LandscapeDNDC for simulating crop yields, N2O and $CO_2$ emissions, our aim is to assess the simulation uncertainty by setting up a Bayesian framework based on Metropolis–Hastings algorithm. Using Gelman statistics convergence criteria and parallel computing techniques, enable multi Markov Chains to run independently in parallel and create a random walk to estimate the joint model parameter distribution. Through means distribution we limit the parameter space, get probabilities of parameter values and find the complex dependencies among them. With this parameter distribution that determines soil-atmosphere C and N exchange, we are able to obtain the parameter-induced uncertainty of simulation results and compare them with the measurements data.