Geophysical Research Abstracts
Vol. 16, EGU2014-2816, 2014
EGU General Assembly 2014

Biogeochemistry in the initial phase of the constructed catchment Chicken Creek

Wolfgang Schaaf and Zönnchen Claudia

Brandenburg University of Technology, Soil Protection and Recultivation, Cottbus, Germany (schaaf@tu-cottbus.de)

We studied biogeochemical processes over a period of 8 years at the constructed catchment Chicken Creek, NE Germany. The site with a size of 6 ha and defined boundary conditions serves as a research infrastructure to study feedback mechansims during early ecosystem development.
Gypsum dissolution and decalcification were important processes controlling soil solution and surface water composition and element budgets of the catchment. With invading vegetation, different patches formed. Element transformation within these patches was studied in controlled microcosm experiments using soil from the catchment and labelled plant litter of dominating species. Litter from Lotus corniculatus with low C/N ratio increased decalcification due to faster decomposition and nitrification. Potassium leached from litter was almost completely retained in the sandy soils. These results were not mere additive effects of parent materials plus plant litter, but reflect differences in biogeochemical process intensities and could result in an increasing heterogeneity of soil properties, nutrient availability, and element leaching fluxes with time.
Similar trends were recorded at the field site.
Compared the the low organic carbon contents in the soil (< 2 mg g-1), DOC concentrations were high. Both 14C dating of field samples and 13C labelling in the microcosms indicated that old inherited carbon was the main source of DOC.