

Tagungsnummer

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Thema

AG 3-4D Bodenmodellierung

3-4D Bodenmodelle zur räumlich-quantitativen Darstellung von Böden und Bodenlandschaften

Autoren

S. Stadler¹, U. Noell², C. F. Stange¹

¹BGR, B2.4 Boden als Ressource - Stoffeigenschaften und Dynamik, Hannover; ²BGR, Berlin

Titel

Understanding heterogeneities of flow paths for agricultural practice

Abstract

Heterogeneous flow processes, especially preferential flow, facilitate the influx of contaminants (and nutrients) through the soil into the groundwater. With a combination of soil physical, soil chemical and soil geophysical methods we investigate the susceptibility of selected soils for such flow processes on agricultural fields in Lower Saxony. Investigations are performed within the EU Interreg project TOPSOIL which investigates opportunities to improve surface and groundwater quality as well as water management strategies under the consideration of climate adaptation challenges. The project addresses the transport behavior of percolation water in the unsaturated zone, the migration of nitrogen and veterinary pharmaceuticals in soils, and elaborates - together with different stakeholders (e.g. farmers, water supply companies) - common strategies to minimize the migration of these substances into the groundwater.

We present results of a first soil scientific and soil geophysical census using radiometry and electrical conductivity which shows the heterogeneity of the site with regard to conductivity and radiation. We used the CMD explorer for electromagnetic mapping (horizontal and vertical dipoles, intercoil spacing of 1.48/2.82/4.49 m, investigation depths of appr. 0 - 6 m). The radiometry detector comprised five sodium-iodide crystals each with a volume of 4 litres. The spectral data are evaluated for potassium, uranium (Bi-214), thorium (T-208) and total counts. The geophysical measurements were used to generally differentiate areas of different soil properties. These areas were sampled for soil physics and soil chemistry (ram coring at 48 sites, 0 - 2 m) with the aim of determining the variability of the transport behavior on a field scale.