Introduction

Seasonal dynamics

Redox-active soil components

In field work and monthly soil monitoring it was difficult to observe seasonal dynamics due to very stable dry weather conditions over a period of 12 months.

Therefore it was decided to force waterlogged states by an irrigation experiment. Additionally, batch experiments were conducted to identify appropriate storage and extraction methods for field samples.

Batch Experiments

Soil sample spiked with 3 µg NH₄NO₃/g soil to understand stability of N species during sample storage and extraction

Sample storage conditions

Sample extraction with 2 M KCl

oxic

- 20 °C

- 4 °C

- -21 °C

anoxic

Dynamics of redox potential and nutrient turnover in dry floodplain soils during a simulated rain fall event

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Results

Batch experiments showed that in order to preserve their redox state, soil samples should be stored frozen and extracted without previous thawing.

- 2 M KCl as extractant for Nᵣᵣᵣᵣpecies prevents turnover processes during extraction

- An extraction time of 15 minutes is already long enough for exhaustive extraction

Conclusions & Outlook

- The irrigation experiment showed that upon heavy application of water and thereby rising water saturation in the soil, the soil redox potential decreases.

- We assume that this also leads to a change in redox state of redox active pore water species and soil components and influences turnover processes of nutrients and pollutants.

- Batch experiments showed that in order to preserve their redox state, soil samples should be stored frozen and extracted without previous thawing.

- 2 M KCl as extractant for Nᵣᵣᵣᵣ species prevents turnover processes during extraction

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