

Public Abstract

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Title:LAND USE EFFECTS ON GREENHOUSE GAS PRODUCTION IN LOWER MISSOURI RIVER FLOODPLAIN SOILS

Soil-based greenhouse gases (GHG) are produced primarily through plant and microbial processes and are affected by soil properties. The lower Missouri River Floodplain (MRF) region encompasses different land use systems including agriculture, agroforestry and riparian forest. The goal of this study was to investigate the influences of lower MRF land use on the variations of soil GHG emissions through a laboratory incubation and field spatial study. Within the incubation Lower MRF land uses and water regime had effects on carbon dioxide and nitrous oxide cumulative emissions. Flooded (FLD) soil methane efflux rates were significantly higher than under the OPT and FLX soil moisture regimes. Fertilized agriculture and agroforestry soils emitted the most nitrous oxide among the land use and nitrogen fertilizer treatments. The in situ study component was comprised of three spatially intensive samplings through the 2011. Limited significant relationships were found between soil properties and GHG emissions. Interpolations of GHG flux rates allowed for the investigation of GHG spatial variation across each lower MRF land use.