



Declines in methane uptake in South West Germany forest soils?

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Upland forest soils represent the most important terrestrial methane (CH_4) sink by consuming atmospheric CH_4 and CH_4 that is produced within the soil and that would be emitted otherwise. While soils lose the capacity to consume atmospheric CH_4 after the conversion into agricultural fields, forest soils are considered as intact CH_4 sinks. While the difference in CH_4 consumption between these land use types are well known as well as short time effects of environmental factors, there is less knowledge about the long-term effects, since only very few long-term studies on CH_4 fluxes exist. A recent publication by Ni and Groffman (2018) reported a dramatic decline in methane uptake in forest soils by 53-89%, which they observed during the past 20 year at four sites in the US. The observation was supported by a literature review that yielded a consistent interpretation for the norther hemisphere.

The Forest Institute Baden Wuerttemberg (FVA-BW) runs 12 environmental forest monitoring sites (ICP Forest LevelII) in South West Germany, where soil gases (CO_2 , CH_4 , N_2O , C_2H_6) have been monitored on a monthly scale since 2002. The sites are stocked with either *Fagus sylvatica*, L. (beech), or *Picea abies*, Karst (Spruce) which represent the most abundant tree species in middle Europe. Soil gas fluxes are currently being modelled using the gradient method. We follow a new approach by constraining the model parameters by including additional information of the other measured gases.

We report on first results from this dataset, which shows insignificant changes in longterm CH_4 uptake over the years at most sites (unlike Ni and Groffman, 2018). So far, a decline in methane uptake in forest soils as reported from the US was not observed in SW Germany.

References: Ni, X., Groffman P.M. 2018. Declines in methane uptake in forest soils. *PNAS* 115 (34) 8587-8590.