



## Declines in methane uptake in South West Germany forest soils?

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Upland forest soils represent the most important terrestrial methane ( $\text{CH}_4$ ) sink by consuming atmospheric  $\text{CH}_4$  and  $\text{CH}_4$  that is produced within the soil and that would be emitted otherwise. While soils lose the capacity to consume atmospheric  $\text{CH}_4$  after the conversion into agricultural fields, forest soils are considered as intact  $\text{CH}_4$  sinks. While the difference in  $\text{CH}_4$  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  $\text{CH}_4$  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 ( $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ ,  $\text{C}_2\text{H}_6$ ) 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  $\text{CH}_4$  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.