



Seasonal and diurnal pattern of CH₄ and CO₂ fluxes from the reed area of a fen in South-West Germany

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About 45 million tons of CO₂ equivalents are emitted yearly from peat soils in Germany, making it the second largest source of greenhouse gases after the energy sector. A large part of the emission consists of CH₄. Nevertheless, carbon budgets of peatlands are not well represented in the National Greenhouse Gas Inventory of Germany, required by the Kyoto Protocol. To fill this gap, we measure CO₂ and CH₄ fluxes in the reed area of the minerotrophic peatland 'Federseemoor' (3500 ha) in South-West Germany, by means of the Eddy Covariance method. It is expected that this reed area will release high emissions of CH₄, due to the anoxic conditions in general and the capacity of reed vegetation to transport gas actively between soil and atmosphere in particular.

The results of 2013 show that both CO₂ and CH₄ fluxes exhibit a distinct seasonal pattern. A clear diurnal pattern is visible for both CO₂ and CH₄ fluxes during the vegetation period. Overall, this fen system appears to be a sink for carbon dioxide (-4.7 tCO₂ ha⁻¹ yr⁻¹), and a source for CH₄ (0.3 tCH₄ ha⁻¹ yr⁻¹). Although the site is a carbon sink, the GWP100 is slightly positive (1.9 tCO₂eq ha⁻¹ yr⁻¹), considering CH₄ as a 25 times stronger greenhouse gas than CO₂.

In our presentation, we will (i) introduce the experimental set up, (ii) summarize the key measurement results from 2013 and (iii) evaluate the main environmental variables affecting the temporal pattern of CH₄ and CO₂ fluxes.