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# More than just $CO_2$: Multiple trace gas exchange measurements at a temperate mountain grassland

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Ecosystems exchange a large number of different trace gases to/from the atmosphere, however the vast majority of FLUXNET sites quantifies only the fluxes of carbon dioxide and when assessing the carbon or greenhouse gas balance neglect other carbon or greenhouse gas fluxes. This causes an overestimation of the role of carbon dioxid exchange for the ecosystem carbon and greenhouse gas balance, the magnitude of which is largely unconstrained
Here we use the eddy covariance method (and variants thereof) with a large variety of analytical methods to quantify the exchange of multiple trace gases to/from a mountain grassland, partly for a time period of over a decade. The monitored trace gas fluxes cover: carbon dioxide, methane, nitrous oxide, carbon monoxide and several volatile organic compounds.
The main result of our study is that carbon dioxide is the major contributor to the gaseous carbon and greenhouse gas budget at this temperate mountain grassland, which however may be significantly modulated by other trace gases may, at least during some years. Differences between source and sink periods for the different trace gases and the underlying drivers are discussed and annual budgets, for some compounds covering multiple years up to decades, are presented.
We conclude that multiple trace gas flux measurements help to elucidate the importance of the exchange of carbon dioxide for the ecosystem carbon and greenhouse gas budget.