



Biological process studies support modelling of biosphere-atmosphere exchange

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Substantial amounts of trace gases such as volatile organic compounds, nitrogen oxides and reduced sulphur compounds are exchanged between biosphere and the atmosphere. Within these processes chemistry, physics and biology are closely coupled. For interpretation, upscaling and diagnosis, modelling is necessary, supported by understanding production/consumption and exchange regulations on a leaf or branch level. The finding that European beech is a high monoterpene emitter has a significant impact on emission budget calculations. Understanding the close relation between primary productivity and trace gas emission helps to evaluate seasonality and plant development. Investigations of the close relations between the plant uptake of CO₂ and carbonyl sulphide (COS) result in a new global estimate of the COS sink strength. Compensation points help to assess the bi-directional exchange of trace gases, such as NO₂ and COS. These few examples demonstrate the relevance of mechanistic studies.