



Two decades of ecosystem CO₂ and H₂O gas exchange above a sub-alpine coniferous forest in Switzerland

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The ICOS Class 1 Ecosystem Station candidate site in Davos, located in a sub-alpine coniferous forest in Switzerland, is one of the longest running eddy covariance (EC) flux stations in the world. Carbon and water exchange above the canopy, i.e. fluxes of CO₂ and H₂O_v, were first recorded in 1995, continuous measurements are available since 1997. The availability of these long-term measurements allows detailed analyses of intra- as well as inter-annual variability of forest carbon and water dynamics and thus facilitates the identification of potential trends in ecosystem functioning over a time period of two decades. An additional EC system for CO₂ and H₂O_v fluxes, compliant with ICOS guidelines, was installed in 2014.

Here we present CO₂ and H₂O_v flux results from the last 20 years and give insights into the complex functioning of the forest ecosystem in response to biotic and abiotic drivers. Flux calculations for all years were standardized, with each year following the same processing steps and corrections. To ensure only data of highest quality go into subsequent analyses, all fluxes were subjected to rigorous quality tests, consistent among all years.

In addition, we compare new fluxes from the ICOS eddy covariance system with fluxes from the previously installed EC system between 2014 and 2016. This comparison aims to investigate the impact of switching to the ICOS EC setup on observed ecosystem fluxes in order to identify potential offsets between the two EC systems.