

## Measurement and quality control of atmosphere-forest exchange processes at the new TERENO site Wüstebach

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A 36-m tower was erected in a spruce forest covering the catchment of a small creek called “Wüstebach” in the German national park “Eifel”. It is part of the “Eifel/Lower Rhine Valley” Observatory within the German Terrestrial Environmental Observatories (TERENO) network. The tower instrumentation is intended to yield long-term monitoring of the atmosphere-canopy exchange processes of a typical mid-latitude forest. Intended applications are, among others, monitoring reactions of the forest to recent climate change and basic studies on turbulence over forests. As a primary goal, the site will serve as a reference for a nearby clear cut intended to accelerate succession from the current spruce plantation (*picea abies*) to natural vegetation dominated by beech.

To characterize the entire exchange process, quantities are measured above, within and below the vegetation: Flux measurements, i.e. eddy-covariance (EC) measurements of heat, momentum, CO<sub>2</sub> and water-vapour fluxes, are taken above the canopy. Profile measurements of mean quantities are taken from the ground to 1.2 times canopy height; CO<sub>2</sub>, and N<sub>2</sub>O concentration profiles are planned. Surface and soil property measurements are measured around the tower base. Currently the EC instrumentation is operational and the two other blocks of measurements are being set up.

First results show turbulent fluxes that conform with the behaviour of a spruce forest as reported by other authors. However, the assumption of horizontal homogeneity might not be met perfectly and under stable stratification the instrument position might be above the actual surface layer. As a consequence, calculated flux errors can become large. Hence, the performance of quality tests proposed by various authors is compared and their relevance for the flux results is being investigated.