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The missing tie of climate research in South Tyrol: the presence of fog?

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Rainfall inputs to Alpine forests has been extensively studied. A good example is the case of South Tyrol, which is within the CarboEurope-IP network located in Renon. Although the presence of fog has been observed, this water component has been neglected in all past energy balance studies. Since fog patterns change with climate change conditions, it is therefore important to understand fog presence and how it might influence the forest physiology through changes in local carbon and transpiration fluxes. Functional delays might be of special interest. The aim of this study is to prove the validity of the proposed methodology used to characterize fog distribution without direct fog measurements. The Renon/Ritten site (RE) is operated by the Forest Service and the Agency of the Environment of the Autonomous Province of Bolzano (APB) and is situated at 1735 m a.s.l. in the Italian Alps 12 km NNE of Bolzano (Alto Adige, Italy). Renon/Ritten is in [U+FB02]uenced by an alpine, windy and humid climate. Its topography is characterized by an alpine slope with a mean slope of about 11 grades N–S direction. Fog monitoring was achieved through the interpretation of an in-situ phenocam sensor and comparison with traditional meteorological equipment like raingauges, temperature, relative humidity and wind sensors. Ground-based information and field campaigns were used to validate satellite remote sensing information. This proxy methodology will be tested in the future with fog measurement (active and passive fog collectors) and the results will be used to better understand how fog and rainfall influence forest physiology through changes in local carbon and transpiration fluxes.