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High-resolution palaeohydrology of an Alpine mire since AD 1864: the impact of recent temperature trends

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Mauntschas is a *Sphagnum* mire situated in the forest-limit ecotone (1818 m a.s.l.) near St. Moritz, Engadin, south-eastern Alps of Switzerland. The local climate is sub-continental. The microtopography of this peatland is not disturbed by drainage and its present form is the result of natural hydrological dynamics. A peat monolith was extracted in 2003 and sampled at high resolution for testate amoebae, pollen, and stabile isotopes in *Sphagnum* with the goal to achieve annual resolution. Surface samples for a testate-amoebae training set were collected from mires in the same area during summer 2007 to construct a local training set. This resulted in a new local transfer function for estimating mire wetness that was tested with several statistical models (PLS, WA, WA-PLS, ML and MA). Classical weighted averaging model (WA_Cla) performed the

best (RMSEP(boot)=6.2 cm, Boot_Max_Bias=16.4 cm, Boot_R^2=0.72). This model was used for reconstructing mire wetness since AD 1864. Reconstructed water table was compared with instrumental meterorological data from a nearby climate station (Sils Maria; data for AD 1864-2003) to evaluate the impact of variations in precipitation and temperature on the hydrological balance of the mire. As precipitation had no long-term trend during the instrumental period, a recent drop in water table (around AD 1950) was probably caused by increased spring and summer temperatures resulting in increased evapotranspiration. The local mire vegetation became ombrotrophic at the same moment, which was probably caused by this dry shift influencing the microtopography and causing the development of hummocks. In the next step we will reconstruct the palaeohydrology for the last 1000 years at high-resolution, and results will be compared with the other proxies studied.