



Kleinwalser Valley: Small mire – large history

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Until the turn of the millenium, the Kleinwalser Valley (Kleinwalsertal) in the northern Central Alps of Austria did not get much attention from the paleoscientific community. But it came into focus of archaeological studies, after a Neolithic flint mining site was discovered on the southern slopes of the valley: maybe the highest and oldest mine in all Europe. Although there is no evidence of permanent occupation (e.g. buildings or structures), fire pits and rock shelters revealed that people must have been around - at least seasonally - for hunting, mining and pastoralism along the Meso- and Neolithic and in the Bronze- and Iron Age until the Walser people finally colonised the area in the 14th century AD. As there are no lakes in the valley, several small-scale mires allow drawing conclusions about the development of past human activities, environment and climate and can narrow down some gaps in the archaeological record.

The selected peatland, referred to as "Höfleemoor" (HFL), lies between the two rivers Schwarzwasser and Breitach at around 1000 m asl. Nowadays, it is under heavy ecological pressure by drainage and nutrient excess, but nevertheless, a 240 cm long peat core yields an uninterrupted paleo-archive from about 6100 years BP to the present. Geochemical data derived from portable X-ray fluorescence (pXRF) and inductively coupled plasma mass spectrometry (ICP-MS) and pollen data coupled with a robust radiocarbon age-depth model show the transition from fen (minerotrophic) to bog (ombrotrophic) between 3300 and 3000 years BP. The input of lithogenic elements rose drastically just prior to this transition. Afterwards, fluctuations in the younger half remained much higher than in the older half, with maxima around 1700 and 850 years BP. A parallel pollen profile supports interpretations of these signals as elevated surface erosion due to human activities (changes in land use). Additionally, a Pb and Cu accumulation that is up to fortyfold higher than the natural background suggests that the Walser people brought the craft of metallurgy or metalworking with them and practised it for the first three centuries following their arrival. Even if not all of the observed signals are a direct consequence of anthropogenic forcing and might as well be linked to changes in climate and environment, this dataset expands the patchy knowledge of the history of human activities in the Kleinwalser Valley.