

## **Holocene Landscape Dynamics in the Ammer Rv. Catchment (Bavarian Alps) – Influence of extreme weather events and land use on soil erosion using peat bogs as geoarchives**

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Soil degradation and the loss of soil organic carbon (SOC) induced by erosion events significantly influence soils and fertility as parts of the ecosystem services and play an important role with regard to global carbon dynamics. Soil erosion is strongly correlated with anthropogenic land use since the Neolithic Revolution around 8.000 BP. Likewise the effect of extreme weather events on soil erosion is of great interest with regard to the recent climate change debate, predicting a strong increase of extreme weather events. Aim of this study is the reconstruction of the Holocene landscape dynamic as influenced by land use and climate conditions.

In this study peat bogs containing layers of colluvial sediments directly correlated to soil erosion were used as geoarchives for landscape dynamics. A temporal classification of extreme erosion events was established by dating organic material via  $^{14}\text{C}$  within both, colluvial layers as well as their direct peat surroundings. Detection and characterization of peat bogs containing colluvial sediments was based on geomorphological mapping, the application of geophysical methods (ERT – electrical resistivity tomography, GPR – ground penetrating radar) and core soundings. Laboratory analysis included the analysis of particle sizes and the content of organic material. We investigated 16 peat bogs following the altitudinal gradient of the Ammer River from alpine and subalpine towards lowland environments. A deposition of colluvial material could be detected in 4 peat bogs, all situated in the lower parts of the catchment.

The minerogenic entry into peat bogs occurred throughout the Holocene as revealed by radiocarbon dating. A distinct cluster of erosional events e.g. during the little ice age could not be detected. Therefore, soil erosion dynamics and the appearance of colluvial sediments within peat bogs must rather be regarded as an effect of land use, actually farming and crop cultivation, or small-scale morphodynamic like slumping caused by cattle tracks than driven by variations of climate conditions.