Summary

Near-natural peatlands with water levels near to the surface are landscape elements that serve as slowly filling carbon stores. If their water balance is intentionally upset due to agriculture, this will result in a sagging of the peat, which happens fast in the beginning but slows down soon. This leads to a continuous loss in thickness, resulting from a mineralisation of the peat. The carbon store will be emptied out again with the organic carbon mostly evaporating into the atmosphere as a tracer gas with an impact on the climate. The loss in thickness of peat, the bulk density and the organic C concentration of the peat allow for a calculation of CO_2 emissions from peatlands. The expected annual loss in thickness is between 0 and >30 mm and can be measured in open land only over a span of several decades as a cumulative value. Between 1949 and 1974, 11,541 peatland sites with historical dimensional checks were remeasured in the years 2012 and 2013. The measured median annual thickness loss was between 2.9 and 8.8 mm, depending on peat type and intensity of agricultural use. The calculated annual CO_2 emissions resulting from this loss are 626,626 tons for all peatlands in Baden-Württemberg. The total of carbon store in the peatlands of Baden-Württemberg could be derived from the data for thickness in layer specifications made for 28,823 bog drillings. For the reference year of 2014 the total organic carbon store is 34,1 m tons , which equates 125 m tons of CO_2. The vulnerability of all peatlands in Baden-Württemberg was evaluated with regard to their potential loss in expanse, assuming a continuous future loss in vertical peat of 6.5 mm a^{-1}. The prognosis derived from this assumption is a potential loss in expanse of 6,300 ha by the year 2055. By the end of this century the loss in expanse might be at 11,400 ha, assuming the agricultural use of the bogs to continue at present-day rate, and assuming no water engineering measures for bog preservation to be taken. The vulnerability of 655 single peatlands, making for 50 % of all peatlands in Baden-Württemberg, has been stated in a ranking list with declining percental loss in expanse for the predicted year of 2055.