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The investigation of soil carbon sequestration and storage in forest sites on different climates in South Zala (Hungary)

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Due to global climate change, carbon-absorbing forests and soils will come to the fore to achieve carbon neutrality as soon as possible. Continuously increasing emissions upset the equilibrium of the atmosphere and manifest themselves in climate change or weather extremes as processes shift. Our research aimed to assess the organic carbon content stored in forest ecosystems under different climatic and forestry conditions. We focused on soil analysis because the volume of soil carbon is closely equal to the amount of carbon stored in the above-ground biomass. In the recent period, we have sampled about 12 designated forest stands to determine the amount of organic carbon stored in the soil of each forest stand. Soil samples were collected by drilling to a depth of 100 cm and 110 cm, respectively. Simultaneously with the soil sampling, the living tree stock of each stand near the sampling point was also assessed. Based on the studies carried out so far in the 12 designated forest stands, the areas can be classified into soil classes Cambisols and Luvisols (WRB 2020). The pH of the soil is mostly acidic (average = 5.2) and the texture can be determined as loam. The soil organic matter (SOM) of 0-40 cm of topsoils is 1.3%, which means ~10 t carbon content by hectares. There is still enough precipitation in the area for vegetation without disturbance; therefore, the carbon balance in the area is currently stable despite stocks are already declining due to the decline of litter amount.