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Hörsaal Fahnenbergplatz
Friedrichstr. 39

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Deadwood, Carbon and Water: Ongoing Research in the Dübener Heide and the Schwarzwald Nationalpark

Deadwood serves important functions in forest ecosystems including habitat for diverse organisms, nutrient release and carbon and water storage. However, the fate of deadwood carbon is still highly debated with regards to its influence on soil organic carbon (SOC) sequestration in forest soils. We present two research projects that investigate how site conditions—principally soil moisture and canopy exposure—regulate deadwood's influence on different C fractions.

Part One is part of the BENEATH-Project along a moisture gradient in a near natural beech forest in the Dübener Heide (loamy sands, 10.5 °C MAT, 550 mm MAP). Soil cores were taken at three depths beneath deadwood and separated in three density fractions representing different degrees of stability. Deadwood had higher SOC stocks in the dry and wet zones of the moisture gradient, and less SOC in the intermediate zone. Most changes occurred in the labile and stable SOC fractions in topsoil. These results indicate that soil moisture regulates microbial activity and thus the rate of decomposition underneath deadwood.

Part Two is part of the EcoLig Project in canopy gaps in the Schwarzwald Nationalpark (loamy sands & sandy loams, 5.1 °C MAT, 2000 mm MAP). Samples came from open-closed canopy pairs in a managed spruce forest with less deadwood and a strictly protected spruce forest with natural deadwood input since 1911, and were analysed for lignin markers and stability fractions. Concentrations of SOC differed greatly between the two sites, but only minimally between open-closed canopy pairs. Most changes were observed in the labile and stable fractions. Lignin markers indicated most SOC at both sites came from spruce wood with canopy openness altering rates of lignin degradation. Possible mechanisms will be discussed.