

# Storage and depth distribution of dissolved organic carbon under different land-uses of NSW Australia

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Carbon accumulation in surface soils is well documented but very little is known about the mechanisms and processes that result in carbon accumulation and long-term storage in the deeper soil profile.

Understanding soil carbon storage and distribution mechanisms is critical to evaluate the sequestration potential of the soils of different land uses. Recent investigations have demonstrated that the movement of dissolved organic carbon (DOC) in the soil profile could contribute significantly to the carbon balance of terrestrial ecosystems. However, very little is known regarding the importance of DOC to vertical distribution of soil organic carbon (SOC) pool through the soil profile in different land-use system, management practices and conditions prevalent in Australia. We investigated the quantity and distribution of DOC through the profile under three different land-use systems in northern NSW, Australia. A series of site clusters containing a representative range of land-uses (woodland, pasture and cropland) were selected across the region. Within each land use, we determined total organic carbon (TOC) and DOC concentration and quantity down the soil profile to a depth of 0-100 cm using six soil depth increments. Here we discuss the distribution of SOC and DOC down the soil profile and the relative importance of DOC the storage and distribution of carbon to 1.0 m depth. We compare and contrast the patterns associated with the different land use systems and explore potential mechanisms of carbon cycling in these soils. Our results provide new insights into the mechanisms and importance of DOC to the soil carbon cycle in Australian soils.