



## **Woodland carbon code: building an evidence base for the “4 per mil” initiative in land converted to forestry.**

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The Woodland Carbon Code is a voluntary standard for woodland creation projects in the UK. Carbon sequestration resulting from certified projects will contribute directly to the UK's national targets for reducing emissions of greenhouse gases (GHG). Whilst this is concerned primarily with above ground capture there is little empirical evidence of the longer term carbon sequestration potential of soils under this land use change in the UK. We present preliminary results from a resurvey of 20 sites originally sampled as part of the soil survey of England and Wales. It includes soil carbon stocks assessed within the soil profile (up to 1m depth) where sites have been converted to forestry in the last 40 years. The small number of sites (n=20) and high variability in soil type, forest type and original land use prevented detailed analysis between these different factors, but overall there was an increase in carbon concentration in the whole profile, driven primarily by an increase the surface organic layers. For all sites combined there was no significant difference in the C stocks between the two survey periods. The increase in carbon stock in the surface organic horizons tended to be offset by a decrease in the mineral subsoils (specifically in Brown Earth soils) primarily as a result of bulk density changes. There are presently insufficient measured data from a range of UK climate, land-use and soil type conditions to quantify with confidence soil C changes during afforestation. This is partly because of the difficulties of detecting relatively slow changes in spatially heterogeneous soils and also obtaining good examples of sites that have undergone documented land use change. Reviewing results from all ongoing afforestation projects in the UK will provide better quantification of the C sequestration potential of forest soils to be accounted for in the Woodland Carbon Code's overall GHG mitigation potential.