

Celtic field agriculture and Early Anthropogenic Environmental change in soil records of the Meuse-Demer-Scheldt region, NW Europe.

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Archaeological research is fundamental in the process of obtaining a greater understanding on the intricate dynamics between the human species and the ‘natural’ environment. Deep historical processes can evaluate the complex interactions that eventually led to the human species as the dominating agent, in terms of the Earth’s biotic and abiotic processes. Regional landscape studies can determine whether the human species can be evaluated as a formative element in soil formation processes during the Holocene. This study is directed to examine early anthropogenic land cover change (ALCC) in the Meuse-Demer-Scheldt region, in the southern Netherlands and northern Belgium, between the Late Bronze Age and Early Roman Period (1050-200 AD). The introduction of an extensive agricultural system, the Celtic field system, in co-relation with demographic rise, led to increased anthropogenic pressure on the MDS landscape. Throughout the Holocene, demographic rise pressured farmers to develop increasingly efficient and innovative methods of extracting more yields per unit area farmed resulting in a decrease in land use per capita over time (Kaplan et al. 2010; Boserup, 1965,1981)). The land use per capita under Celtic field technology was relatively high compared to contemporary numbers, based on the assumption that land use per capita did not remain constant. The MDS region is a clear example of early Holocene ALCC and modification of terrestrial ecosystems due to excessive clearance of vegetation. Early Holocene ALCC resulted in ecological deficiencies in the landscape, e.g. deforestation, acceleration of podzolisation and a decrease in terrestrial carbon storage as well as water retention capacity. ALCC can impact climate through biogeophysical and biogeochemical feedbacks to the atmosphere, and result in regional negative radiative forcing. Here we hypothesize that the previously presumed fundamental restructuring that led to a structural bipartition in the landscape due to negative modification of the terrestrial environment (Roymans & Gerritsen, 2002; Kluiving et al. 2015), is the result of a collaboration between internal forcing – anthropogenic land cover change - as well as external climate forcing – reduction in solar irradiance – (2.8 kyr event). We will present an estimation of net surface cover of Celtic Field Complexes during the Urnfield period in the MDS region and indicate that the agricultural system was even more extensive than previously thought based on detailed remote sensing (LiDAR) analyses.