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Making Other Worlds: Modelling Past Interactions of Agriculture and Erosion

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It is argued that the understanding of past agricultural erosion has been greatly simplified because conceptual or numerical models have been used that emphasize the technical aspects of the erosion process, fail to recognize the spatial and temporal scaling of the erosion, and especially ignore the idea that such erosion is the result of multiple, interacting decisions made by people. While there have been significant developments in the first two of these areas over the last decade, there has been little explicit recognition of the third of these limitations. This problem is a consequence of the very different disciplinary approaches that are needed. One method that can be used to address this limitation is that of agent-based modelling. Agent-based models permit an explicit representation of how individuals or groups of individuals interact with each other and their environment. Furthermore, environmental changes can be fed back into agent behaviour, and other potential controls such as climate variations can be assessed. The CYBEROSION modelling framework has been developed to take this approach and evaluate patterns of erosion due to past land-use decision-making.

Examples will be drawn from case studies in the Neolithic and Bronze Age, largely from the Mediterranean region. The emphasis is on modelling as a heuristic approach to understanding, rather than necessarily as a predictive tool. In particular, it provides guidance in relation to which parts of existing discipline-bound knowledge are needed to produce an explicit, interdisciplinary understanding of patterns of landscape change as a result of changing agricultural practice. Results from the case studies demonstrate how complex spatio-temporal patterns of past erosion can arise from relatively simple, local interactions between people and their environment.

To conclude, will also be an assessment of more modern examples, as well as of related literature in archaeology, and geoarchaeology, and a consideration of how anthropological and ethnographic approaches complement those in geography and ecology for making the linkages between past, present and future change.