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Unravelling the interaction between farmer and landscape in a Mediterranean catchment: a model study for the Contrada Maddalena (Calabria, Italy)

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The close link between human occupancy and the Mediterranean landscape has long been recognized. Through the exploitation of the various but fragmented resources that these landscapes have to offer, man has been able to secure a living even though many of these activities are often marginal and threatened by continuous degradation or sudden disturbance. Yet, a knowledge gap exists with regard to the intensity of landscape dynamics and human activities in the past. This hiatus can partly be explained by the absence of a continuous record in these highly denudative areas and a bias in Mediterranean archeology away from the mountainous hinterland, which was regarded as uninteresting and peripheral. To bridge this gap, a meso-scale landscape dynamics model, CALEROS, has been developed that simulates the interactions between climate, soil production and erosion, vegetation and land use on geomorphological to human time scales.
In this study CALEROS is used to quantify the impact of erosion and deposition on the presence and visibility of archaeological remains in the Contrada Maddalena from Neolithic times onwards (5000BP-present). To this end, both the intensity of human activities and the impact of post-depositional processes on the conservation of archaeological remains are simulated. To account for uncertainty, the model was run with similar but varying initial conditions as an overture to a full Monte Carlo simulation. Human activities were conditioned on land use scenarios, specifying technological constraints for different periods and individual energy requirements, but otherwise left free to respond to and interact with the physical landscape. Comparison of the model results with field surveys in the area reveals a logical correlation and provides a test for the capability of process-based models to complement and analyze fragmentary settlement records as well as a basis to postulate new hypotheses on the human impact on landscape dynamics.