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Dynamic geomorphically-driven soil property evolution in the agricultural landscape

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The agricultural landscape provides a microcosm of interaction between life and landscape. Soil redistribution leads to evolution of both landforms and spatial heterogeneity in soils. The latter, in particular, exerts control on the potential of the landscape element to sustain life – at least, healthy vegetation. This establishes a negative feedback with soil quality that may influence the operation and rate of erosion processes. However, because erosion processes operating in agricultural landscapes have contrasting topographic signatures, agricultural landforms may appear to be in a state of dynamic geomorphic equilibrium even though their soils are in a state of disequilibrium and relatively rapid change in soil properties. This paper will exemplify these patterns in both field data and the output of simple models and explore the applicability of these perspectives to longer timescales of landscape change.