



Buried stone lines in deserts – What can they tell us about landscape evolution?

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Stone pavements are typical features of climate-sensitive arid environments. They allow formation of cumulic soils, protected from erosion, which may be used as archives that recorded past geomorphologic and pedologic processes. Stone lines within the soil column resulted from buried stone pavements. These stone lines, situated between compound soil horizons were affected by postdepositional processes that may be attributed to specific palaeoenvironmental conditions.

From Cima Volcanic Field, eastern Mojave Desert, California, we present detailed alignment measurements of buried stone stratae. Soils in the study area were developed on basalt flows of middle Pleistocene age and consist mainly of aeolian dust which was overprinted by several phases of soil formation and stone pavement development. Stones that were arranged in specific depth intervals between compound soil horizons showed prominent orientation patterns that may be attributed to geomorphic processes that created, distorted or reworked at least two ancient stone pavements, now covered by sediment and the modern pavement.

We suggest fluvial (re-)orientation of surficial stones prior to burial. Furthermore, a lateral displacement of clasts within the sediment matrix is recorded. The stratigraphic position of realigned stone lines within soil horizons presumably formed, both, under humid and arid environmental conditions allows the description of geomorphic processes for discrete climatic frameworks. Buried stone pavements are thus a unique opportunity for investigating past landscape dynamics, not recorded in other archives.