

## **On the long-term control of vegetation on landforms**

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**Abstract.** Vegetation patterns in the southwestern US are typically organized with respect to the topographic texture with repeated bands consisting of more mesic plant species in the wetter north-facing slopes, and communities dominated by xeric species on the drier south-facing slopes, especially where climate promotes ecosystem coexistence. There is evidence that over the long-term such differences in plant species lead to differential soil and landform development on hillslopes with opposing aspects. In this study we report preliminary results on the mathematical properties of landscape morphology of various small ( $<10 \text{ km}^2$ ) to large-scale ( $100 \text{ km}^2$ ) semiarid catchments in central New Mexico based on digital elevation model analysis. Our results suggest that differences in the vegetation type under essentially the same climate and geologic controls leave detectable signatures on the mathematical properties of landscape organization and morphology.

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