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Use of small UAVs in rangeland sediment source area mapping

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The occurrence of severe erosion features in rangelands is often seen as a sign of high sediment delivery from those areas into nearby waterbodies. However, runoff, erosion and sediment transport are often patchy and discontinuous and thus assuming a direct link between erosion features and sediment delivery can lead to serious over predictions. So far, available data on the size of erosion features and the movement of sediment was limited by the resolution of Digital Elevation Models, soil and vegetation maps. Small UAVs offer the opportunity to quantify both the loss of surface material associated with erosion features, such as rills, gullies and badlands, as well as an estimate of the volume of depositional features between the site of erosion and nearby waterbodies. This study presents the acquisition and use of UAV-derived topographic information aimed at assessing the relevance of badland-type features in rangeland catchments of the Great Karoo region in South Africa. In particular, the feasility to assess volumes of erosion and sediment deposits, as well as the potential pathways from source to sink area, and the change of connectivity over time, are discussed.