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The use of very high resolution DSMs for the investigation of gully evolution in the Souss Basin, Morocco derived from UAV missions

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For the analysis of gullies as one type of landform this work presents an approach using small format aerial photographs derived from field campaigns with an unmanned aerial vehicle (UAV) in the Souss Basin, Morocco. Since many existing gullies are neighboring agro-industrial as well as settlement areas the investigation of current gully development is important. We used aerial photographs to create Digital Surface Models (DSMs) which allows detailed analysis of gully development. Depending on the flying height DSMs resolution ranges between a few centimeters and approx. 0.5 m. Challenges and uncertainties relate to mismatches of objects such as vegetation (i.e. bushes, trees) and built-up areas (i.e. greenhouses). The analysis of high resolution DSMs allows also the identification of specific geomorphological properties of gullies. Identifying unique landform properties may then allow the transfer of those properties onto satellite data. This in turn enables object-based image analysis on large-scale gully distribution. This is necessary to provide the greater spatial context within the study area.