



The effect of flight altitude to data quality of fixed-wing UAV imagery: case study in Murcia, Spain

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Unmanned Aerial System (UAS) are becoming popular tools in the geosciences due to improving technology and processing techniques. They can potentially fill the gap between spaceborne or manned aircraft remote sensing and terrestrial remote sensing, both in terms of spatial and temporal resolution. In this study we tested a fixed-wing Unmanned Aerial System (UAS) for the application of digital landscape analysis. The focus was to analyze the effect of flight altitude and the effect to accuracy and detail of the produced digital elevation models, derived terrain properties and orthophotos. The aircraft was equipped with a Panasonic GX1 16MP pocket camera with 20 mm lens to capture normal JPEG RGB images. Images were processed using Agisoft Photoscan Pro which includes the structure-from-motion and multiview stereopsis algorithms. The test area consisted of small abandoned agricultural fields in semi-arid Murcia in southeastern Spain. The area was severely damaged after a destructive rainfall event, including damaged check dams, rills, deep gully incisions and piping. Results suggest that careful decisions on flight altitude are essential to find a balance between the area coverage, ground sampling distance, UAS ground speed, camera processing speed and the accurate registration of specific soil erosion features of interest.