



Analyzing soil erosion using a multi-temporal UAV data set after one year of active agriculture in Navarra, Spain

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Unmanned Aerial System (UAS) are becoming popular tools in the geosciences due to improving technology and processing/analysis 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 analyze a multi-temporal data set that was acquired with a fixed-wing UAS in an agricultural catchment (2 sq. km) in Navarra, Spain. The goal of this study is to register soil erosion activity after one year of agricultural activity. The aircraft was equipped with a Panasonic GX1 16MP pocket camera with a 20 mm lens to capture normal JPEG RGB images. The data set consisted of two sets of imagery acquired in the end of February in 2013 and 2014 after harvesting. The raw images were processed using Agisoft Photoscan Pro which includes the structure-from-motion (SfM) and multi-view stereopsis (MVS) algorithms producing digital surface models and orthophotos of both data sets. A discussion is presented that is focused on the suitability of multi-temporal UAS data and SfM/MVS processing for quantifying soil loss, mapping the distribution of eroded materials and analyzing re-occurrences of rill patterns after plowing.