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Cameras and settings for optimal image capture from UAVs

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Aerial image capture has become very common within the geosciences due to the increasing affordability of low payload (<20 kg) Unmanned Aerial Vehicles (UAVs) for consumer markets. Their application to surveying has led to many studies being undertaken using UAV imagery captured from consumer grade cameras as primary data sources. However, image quality and the principles of image capture are seldom given rigorous discussion which can lead to experiments being difficult to accurately reproduce. In this contribution we revisit the underpinning concepts behind image capture, from which the requirements for acquiring sharp, well exposed and suitable imagery are derived. This then leads to discussion of how to optimise the platform, camera, lens and imaging settings relevant to image quality planning, presenting some worked examples as a guide. Finally, we challenge the community to make their image data open for review in order to ensure confidence in the outputs/error estimates, allow reproducibility of the results and have these comparable with future studies. We recommend providing open access imagery where possible, a range of example images, and detailed metadata to rigorously describe the image capture process.