

Applications of UAS-Obtained Thermal Images for Vegetation Coverage Ratio Monitoring of Mudstone Areas

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Abstract. Soil vegetation coverage is a crucial factor for those wishing to protect naked slopes. Thermal imaging enables monitoring of the changes in infrared temperature of a slope surface and calculating the vegetation coverage ratio (VCR). The VCR is an efficient method for determining infrared temperature changes in different slope lands, which include regions exposed to sunlight, vegetation areas, and shaded areas. The thermal images capture the infrared temperature distribution, boundary of vegetation of temperature, and barren vegetation areas. The VCR can be subsequently calculated. In this study, thermal images were obtained using an unmanned aircraft system (UAS) according to airline planning, frame size of an image, and overlapping of lateral and front images for taking pictures. Moreover, 3D images can compare the VCR by calculating the aggregation of the study area and vegetation area. A satisfactory agreement was obtained between the infrared temperature obtained through thermal imaging and the VCR. Thermal imaging can thus be used to monitor changes in the VCR of mudstone. Moreover, a 3D topographic map was created using the UAS-obtained images to overlap with the thermal images.

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