5. Vegetation Monitoring

5.1 Enhanced Fire Behaviour Prediction in Spinifex Grasslands of Arid Australia using UAS and Landsat imagery (Katherine Zdunic, Paul Rampant and Neil Burrows)

Flammable spinifex grasslands of arid Western Australia cover about 98 million hectares of the state [1], and large wildfires in this environment threaten biodiversity, life, property and cultural values [2]. Understanding fire behaviour in spinifex grasslands

informs prescribed burning and wildfire suppression activities. Unmanned aerial systems (UAS) are aiding in improving fire behaviour prediction [3] by providing comprehensive and accurate measurements of vegetation cover, volume and height, the fuel characteristics of vegetation that influence fire behaviour. Classification of spinifex cover derived from UAS image capture has been compared to field transects. Data from UAS align significantly better with Landsat satellite imagery than fuel cover measures from field transects. A good correlation was found between UAS-derived vegetation cover and Landsat imagery, which means satellite imagery can be used with confidence to estimate and map fuel cover at a range of temporal and spatial scales. The rapid development of affordable UAS instruments and software has enabled the production of point clouds, which provide further vegetation structure information not available from previous image captures. These developments in UAS application together with satellite imagery will enable fire managers to more efficiently and accurately map fuel characteristics at a range of scales, greatly enhancing their ability to forecast fire danger and to predict fire behaviour without having to carry out costly ground-based field measurements.

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