

Interactive comment on “Estimating Grassland Curing with Remotely Sensed Data” by Wasin Chaivaranont et al.

Anonymous Referee #1

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This manuscript aims to assess the performance of satellite data to improve the accuracy of the degree of grass curing (DOC) during dry summer seasons in Australia. The percentage of dead material in a grassland, as obtained by DOC, is a crucial factor for determining fire danger. The authors use satellite observed vegetation greenness (Normalised Difference Vegetation Index, NDVI) and vegetation water 15 content (Vegetation Optical Depth, VOD) information to estimate DOC. Results show a good accordance between satellite based DOC estimation and ground based observations in space and time. The authors aim also to include DOC into GFDI (Grassland Fire Danger Index) and assess if better fire severity predictions can be achieved. The overall context of the subject seems to be appropriate for this journal. Therefore, I consider that this paper could be published in Natural Hazards and Earth System Sciences

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(NHESD) after the authors provide the following revisions: A. Major comments

A.1 VOD and NDVI The application of stepwise regression on Equation 4 has excluded VOD as predictor (eq. 10). Please provide in the main text a possible explanation for that feature. If NDVI is also excluded by stepwise regression is expected that the obtained model performance will decrease significantly. How much? NDVI and VOD are assumed to be (anti-) correlated. When the predictors are correlated, some of them may be insignificant in regression and their inclusion may lead to overfitting. The difference in R² coefficient between calibration and evaluation may be also a signal of overfitting. Did the authors aware of this feature? Please consider using a cross-validation technique to evaluate model performance.

A.2 Spatial and Temporal Standard Deviation(SD) A seasonal behaviour of Spatial SD seems to be present. Further analysis of the seasons/months with higher values of SD should give additional and important information. The same analysis could be performed for each land cover type.

A.3 Spatial and Temporal Standard Deviation(SD)

Burned area maps were used as true baseline. However, the burned area map may include fires that are lit in low–moderate conditions, such as prescribed burns and fire. The less good quality of the proposed model could be associated with such type of fires that are included in low and moderate classes. Please consider using Fire Radiative Power (hotspots) as obtained by MODIS, in order to categorize burned areas according to the power (energy) released and consequently with fire intensity and severity. This will allow to eliminate low and moderate fires from your analysis and increase model accuracy, namely in case of severe fires.

B. Minor suggestions/comments

B.1 Why MODIS AQUA was not included in the analysis. The authors will have higher amount of available data and better opportunities to have valid data and to avoid clouds.

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B.2 Several sites are referred by name; e.g., Darnum, Simcocks, and Neerim South, Durran Durra, Monaro, and Parry Lagoons. The authors should provide more details about the location of the sites. Non-Australian readers will get lost without those additional informations.

B.3 The sites showed in Figure 2 are the 23 sites retained from the original pool? Please clarify and introduce this information in the main text.

B.5 Page 10, line 12: Use a dot before 'With'

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