Fire severity map of the major fires in Gippsland and north east Victoria in 2019/20 (version 1.0)

Vicmap Imagery and Elevation Metadata Report

Description

Title: Fire severity map of the major fires in Gippsland and north east Victoria in 2019/20 (version 1.0)

Custodian:

Abstract:

Fire severity classification of bushfires (wildfires) impacting ~1.5 million hectares of predominantly forested public land in eastern and north-eastern Victoria (and ~300,000 ha of southern NSW), between November 2019 and March 2020. Fire severity mapping was derived using machine learning classification (Random forests) of eight Spectral Indices (SI) from pre and post fire Sentinel 2 satellite imagery. The fire severity classification model was trained using high resolution (<35 cm) post-fire near-infrared aerial imagery from 12 bushfires which occurred during the 2018/2019 fire season across areas of Central and Eastern Victoria. A detailed description of the classification methodology can be found in Collins et al. (2018). The classification covers woody vegetation landcover types (including native and non-native forest, woodland and shrubland).
The primary purpose of this data to provide rapid and comprehensive landscape-scale spatial information about bushfire severity to inform initial risk assessments on the public land in the actual and potential impact zone. This assists with the transition from response to emergency stabilisation and initial recovery in accordance with the Code of Practice for Bushfire Management on Public Land (2012).
Fire severity classes are i) Canopy burnt (Class 6)- CB (> 20% canopy foliage consumed); ii) High canopy scorch (5) - HCS (>80% of canopy foliage is scorched); Medium canopy scorch (4) - MCS (Canopy is a mosaic of both unburnt and scorched foliage, 20 - 80%); iii) Low canopy scorch (3) - LCS (Canopy foliage is largely unaffected (<20% scorched), but the understorey has been burnt); iv) Unburnt (2) - UB (Canopy and understorey foliage are largely (>90%) unburnt). Additional classes: v) No Data (0) (e.g. due to obscuration by cloud, cloud-shadow and/or smoke and haze) and vi) Non-woody vegetation (unclassified) (1).
An independent cross-validation of the classification model was used to estimate global and per-class model accuracy. Overall accuracy is estimated to be 85% (0.81 Kappa), with producer per-class accuracy ranging from 97% (CB), 91% (HCS), 88% (UB), 75% (LCS) and 61% (MCS). A ground-based validation of the classification has not been undertaken.
Data is provided on the basis that users undertake responsibility for assessing the relevance and accuracy of its content. The Department of Environment, Land, Water and Planning, on behalf of the Victorian Government, makes no representations, either expressed or implied, as to the suitability of this data for any particular purpose.
We do not accept any liability to any person:
- for the information, data or advice (or the use of such information, data or advice) which is provided or incorporated into it by reference
- for any interference with or damage to a user's computer, software or data occurring in connection with or relating to this data or its use
Related research can be found in L. Collins, P. Griffioen, G. Newell, A. Mellor (2018), The utility of Random Forests for wildfire severity mapping, Remote Sensing of Environment, 216, 374-384

Geographic Extent: General - Victoria

Jurisdiction: Victoria

Processing Lineage:

N/A

Logical Consistency:

N/A

Completeness:

A six-class fire severity classification across 1.8 million hectares of predominately forested public land in east and north east Victoria and southern New South Wales, Australia. The classification covers three main areas:
East Gippsland (comprising the Snowy and Tambo complex fires, start date: 21/11/2019, end date: 13/03/2020; extent (WGS84): N: -36.929, S: -37.814, E: 150.033, W: 147.417)
Ovens-Alpine (comprising the Ovens 41 - Abbeyard - Yarrarabula South Fires and the western part of the Alpine complex fires, start date: 30/12/2019, end date: 26/01/2020; extent (WGS84): N -36.627, S: -37.332, E: 147.565, W: 147.565)
Upper Murray-Alpine (comprising the Upper Murray 26 - Upper Murray - Walwa and the north eastern part of the Alpine complex fires, start date: 19/12/2019 , end date: 14/02/2020; extent (WGS84): -N: 35.782, S: -36.901, E: 148.2632, W: 147.4582)

Completeness Verification: An independent ground-based validation of the data has not been undertaken. An accuracy assessment of the classification model has been performed (see Classification) using independent cross validation approach to estimate model accuracy. Twelve wildfires occuring inacross Central and Eastern Victoria were used for the cross validation. Cross validation involved holding out one fire for model validation and using the remaining fires to train the Random Forest. The Random Forest model was then used to predict fire severity for the validation fire. This process was repeated until validation had been undertaken for each fire. Metrics of model performance were then calculated using the independent predictions and observed fire severity

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