Low intensity hazard reduction burn. Photo: Marta Yebra.
Key Topics:

- fuel reduction [2]
- planning [3]
- prescribed burning [4]

Optimisation of fuel reduction burning regimes [5]
This research represents a concerted effort to understand the effect of prescribed burning on water quantity and carbon losses and gains in forested ecosystems in south eastern Australia. The research team collected empirical data from over 100 sampling sites treated with a recent prescribed burn, selected to accommodate as much site variability as possible and to take full advantage of prescribed burn plans. Data collected from the field was used in a variety of modelling assignments to capture the effect of prescribed burning on changes in water availability and transformation of carbon pools. Using a mixture of models and empirical sampling and analysis, the research showed that there are few risks to long-term carbon and water cycles when prescribed burning is conducted on cycles of 10 or so years.

Project: detail Notabs

Research team

Research leader

[6]

A/Prof Tina Bell
[6]
RESEARCH LEADER

[7]

Research team

[8]

Danica Parnell
[8]
RESEARCH TEAM

[9]

Dr David Pepper
[9]
RESEARCH TEAM

[7]

[7]

[10]

Prof Mark Adams
[10]
RESEARCH TEAM

[11]

[12]

Dr Malcolm Possell
[12]
RESEARCH TEAM

[7]

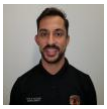
End User representatives

[13]

Dr Adam Leavesley
[13]
END-USER

[14]

[15]



Dr Felipe Aires
[15]
END-USER

[16]

[17]

Jacqueline Frizenschaf
[17]
END-USER

[18]

[19]

Melissa O'Halloran
[19]
END-USER

[20]

[21]

Tim McGuffog
[21]
END-USER

[14]

Student researchers

[22]

Angela Gormley
[22]
STUDENT RESEACHER

[7]

[23]

Dr Gabriela Raducan
[23]
STUDENT RESEACHER

[24]

[25]

Dr Houzhi Wang
[25]
STUDENT RESEACHER

[26]

[27]

Dr Mengran Yu
[27]
STUDENT RESEACHER

[7]

[28]

Veronica Quintanilla Berjon
[28]
STUDENT RESEACHER

[7]

Description

Fire managers often have multiple objectives for a given prescribed burn centred around risk reduction and conservation of biodiversity. The ability to predict the effects of prescribed burning on the capacity of forests to deliver ecosystem services such as clean air, carbon sequestration, and a reliable and high-quality supply of water is becoming increasingly more important.

This research represents a concerted effort to understand the effect of prescribed burning on water quantity and carbon losses and gains in forested ecosystems in south-eastern Australia. The research team collected empirical data from over 100 sampling sites treated with a recent prescribed burn. The sampling strategy used was consistent over time with target sampling variables included for estimation of overstorey and understorey biomass and direct sampling of surface and near surface fuel loads. Site selection was stratified to accommodate as much site variability as possible and to take full advantage of prescribed burn plans.

Data collected from the field was used in a variety of modelling assignments to capture the effect of prescribed burning on changes in water availability and transformation of carbon pools. Using a mixture of models and empirical sampling and analysis, the research showed that there are few risks to long-term carbon and water cycles when prescribed burning is conducted on cycles of 10 or so years. Critical to this analysis is the frequency of bushfires – if the inter-fire interval of unplanned fires becomes short (e.g., <50 years) then ecosystem losses of carbon and reductions in water yield are likely to become semi-permanent features.

Read the final report here. [29]

Download:
Optimisation of fuel reduction burning regimes - project overview [30]

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[45]

07 MAY 2015

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[46]

Publications

Year	Type	Citation
2021	Report	Bell, T. [6] *et al.* **Optimisation of fuel reduction burning regimes for fuel reduction, carbon, water and vegetation outcomes – final project report** [29]. (Bushfire and Natural Hazards CRC, 2021
2020	Journal Article	Adams, M. A. [10], Shadmanroodposhti, M. [50] & Neumann, M. [51] **Causes and consequences of Eastern Australia's 2019–20 season of mega fires: A broader perspective** [52]. *Global Change*
2020	Journal Article	Adams, M. A. [10], Buckley, T. N. [57] & Turnbull, T. L. [58] **Diminishing CO2-driven gains in water-use efficiency of global forests** [59]. *Nature Climate Change* **10,** 466–471 (2020). DOI [60] Google
2020	Report	Parnell, D. [8], Possell, M. [12] & Bell, T. [6] **Estimating carbon stocks and biomass in surface fuel layers** [64]. (Bushfire and Natural Hazards CRC, 2020). Google Scholar [65] BibTeX [66] EndNote
2020	Report	Bell, T. [6], Parnell, D. [8] & Possell, M. [12] **Sampling and data analysis of field sites of 40 prescribed burns** [68]. (Bushfire and Natural Hazards CRC, 2020). Google Scholar [69] BibTeX [70] EndN
2020	Report	Parnell, D. [8], Bell, T. [6] & Possell, M. [12] **Quantifying the conversion of vegetation to ash for soil carbon fingerprinting** [72]. (Bushfire and Natural Hazards CRC, 2020). Google Scholar [73] Bib
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2019	Report	Bell, T. [6] **Optimisation of fuel reduction burning regimes for fuel reduction, carbon, water and vegetation outcomes** [92]. (Bushfire and Natural Hazards CRC, 2019). Google Scholar [93] BibTe
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2017	Conference Paper	Rumsewicz, M. [112] **Research proceedings from the 2017 Bushfire and Natural Hazards CRC and AFAC Conference** [113]. *Bushfire and Natural Hazards CRC & AFAC annual conference 2017* (
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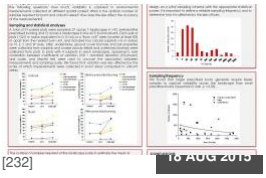
[231]

Optimisation of fuel reduction burning regimes: Determining fire size

[231]

Optimising fuel reduction burning at the landscape- or catchment-scale requires knowledge of the effects of...



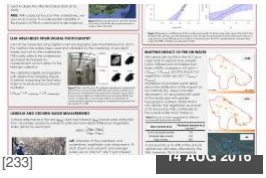
[232]

Spatial Variability After Prescribed Burning: Effects on Vegetation and Soil Properties

[232]

FUEL REDUCTION [2], PLANNING [3]

Optimisation of prescribed burning requires a strong understanding of the underlying variability of fuel,...



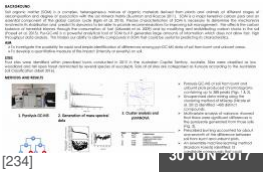
[233]

Estimation of the impact of fuel-reduction burning on catchment water balance using digital photography

[233]

FUEL REDUCTION [2]

This project focuses on improving the capability of land managers to use prescribed fire to reduce fuel loads...



[234]

Assessing the impact of fire using soil and pyrolisis-GC-MS

[234]

FUEL REDUCTION [2], PLANNING [3]

Soil organic matter has strong effects on soil properties such as water holding capacity, soil structure and...

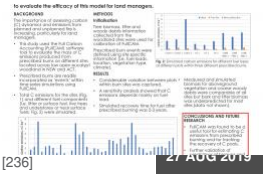
[235]

Understanding carbon pools to improve emission estimates from fires

[235]

FUEL REDUCTION [2], PLANNING [3]

"Use of prescribed burning creates emissions and particulates. However, fire management can potentially...



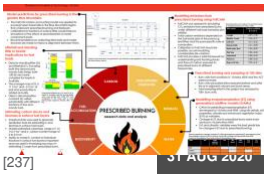
[236]

Modelling carbon emissions from prescribed burning using FullCAM

[236]

FUEL REDUCTION [2], PLANNING [3]

The Full Carbon Accounting Model (FullCAM) is a software tool developed by the Australian Government,...



[237]

An interdisciplinary approach to examine trade-offs between environmental objectives and prescribed burning

[237]

FUEL REDUCTION [2]

Key findings: Optimisation of fuel reduction burning regimes for carbon, water and vegetation

Linked Projects

Mapping bushfire hazard and impacts
[238]

BUSHFIRE PREDICTIVE SERVICES [239]

A/Prof Marta Yebra
Australian National University [240]

[240]

Fire surveillance and hazard mapping
[241]

BUSHFIRE PREDICTIVE SERVICES [239]

Prof Simon Jones
RMIT University [24]

[24]

Fire spread prediction across fuel types
[242]

BUSHFIRE PREDICTIVE SERVICES [239]

A/Prof Khalid Moinuddin
Victoria University [243]

[243]

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[244]

SEVERE AND HIGH IMPACT WEATHER [245]

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Bureau of Meteorology [246]

[246]

Scenario planning for remote community risk management in northern Australia
[247]

PRESCRIBED BURNING AND CATCHMENT MANAGEMENT [248]

Adj Prof Jeremy Russell-Smith
Charles Darwin University [249]

[249]

Mapping the area of Tathra to study, if Mechanical Fuel Load Reduction (MFLR) along with prescribed burning can save houses (in future) at Tathra NSW
[250]

PRESCRIBED BURNING AND CATCHMENT MANAGEMENT [248]

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http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Diminishing%2BCO2-driven%2Bgains%2Bin%2Bwater-use%2Befficiency%2Bof%2Bglobal%2Bforests%22&as_sauthors=Adams&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [62] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/7471 [63] https://www.bnhcrc.com.au/publications/biblio/export/xml/7471 [64] https://www.bnhcrc.com.au/publications/biblio/bnh-7029 [65] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Estimating%2Bcarbon%2Bstocks%2Band%2Bbiomass%2Bin%2Bsurface%2Bfuel%2Blayers%22&as_sauthors=Parnell&as_occt=any&as_epq=&as_oq=&as_eq=& [66] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/7029 [67] https://www.bnhcrc.com.au/publications/biblio/export/xml/7029 [68] https://www.bnhcrc.com.au/publications/biblio/bnh-6980 [69] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Sampling%2Band%2Bdata%2Banalysis%2Bof%2Bfield%2Bsites%2Bof%2B40%2Bprescribed%2Bburns%22&as_sauthors=Bell&as_occt=any&as_epq=&as_oq=&a [70] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/6980 [71] https://www.bnhcrc.com.au/publications/biblio/export/xml/6980 [72] https://www.bnhcrc.com.au/publications/biblio/bnh-6978 [73] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Quantifying%2Bthe%2Bconversion%2Bof%2Bvegetation%2Bto%2Bash%2Bfor%2Bsoil%2Bcarbon%2Bfingerprinting%22&as_sauthors=Parnell&as_occt=any&as_epq=&amp [74] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/6978 [75] https://www.bnhcrc.com.au/publications/biblio/export/xml/6978 [76] https://www.bnhcrc.com.au/publications/biblio/bnh-6907 [77] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Near%2Binfrared%2Bspectroscopy%2Bas%2Ba%2Bnew%2Bfire%2Bseverity%2Bmetric%22&as_sauthors=Parnell&as_occt=any&as_epq=&as_oq=&as_eq=&amp [78] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/6907 [79] https://www.bnhcrc.com.au/publications/biblio/export/xml/6907 [80] https://www.bnhcrc.com.au/publications/biblio/bnh-7299 [81] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Optimisation%2Bof%2Bfuel%2Breduction%2Bburning%2Bregimes%2Bfor%2Bfuel%2Breduction%2C%2Bcarbon%2C%2Bwater%2Band%2Bvegetation%2Boutcomes%3A%2Bannual%2Br 2020%22&as_sauthors=Bell&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [82] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/7299 [83] https://www.bnhcrc.com.au/publications/biblio/export/xml/7299 [84] https://www.bnhcrc.com.au/publications/biblio/bnh-6905 [85] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Detecting%2Bthe%2Beffects%2Bof%2Bprescribed%2Bburning%2Busing%2Bgeneralised%2Badditive%2Bmodelling%22&as_sauthors=Yu&as_occt=any&as_epq=&as_ [86] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/6905 [87] https://www.bnhcrc.com.au/publications/biblio/export/xml/6905 [88] https://www.bnhcrc.com.au/publications/biblio/bnh-7030 [89] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Model%2Bpredictions%2Bfor%2Bfuel%2Breduction%2Bburning%2Bof%2Beucalypt%2Bopen%2Bforest%2Bin%2Bthe%2Bgreater%2BBlue%2BMountains%2Bregion%22&as_sauthors [90] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/7030 [91] https://www.bnhcrc.com.au/publications/biblio/export/xml/7030 [92] https://www.bnhcrc.com.au/publications/biblio/bnh-6281 [93] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Optimisation%2Bof%2Bfuel%2Breduction%2Bburning%2Bregimes%2Bfor%2Bfuel%2Breduction%2C%2Bcarbon%2C%2Bwater%2Band%2Bvegetation%2Boutcomes%22&as_sauthor [94] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/6281 [95] https://www.bnhcrc.com.au/publications/biblio/export/xml/6281 [96] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1648 [97] https://www.bnhcrc.com.au/publications/biblio/bnh-5619 [98] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Modelling%2Bemissions%2Bfrom%2Bprescribed%2Bburning%2Busing%2BFULLCAM%22&as_sauthors=Karunaratne&as_occt=any&as_epq=&as_oq=&as_eq=&a [99] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/5619 [100] https://www.bnhcrc.com.au/publications/biblio/export/xml/5619 [101] https://www.bnhcrc.com.au/people/mgharun [102] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1464 [103] https://www.bnhcrc.com.au/publications/biblio/bnh-5094 [104] http://dx.doi.org/10.1016/j.scitotenv.2017.09.315 [105] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Can%2Ba%2Bgrowth%2Bmodel%2Bbe%2Bused%2Bto%2Bdescribe%2Bforest%2Bcarbon%2Band%2Bwater%2Bbalance%2Bafter%2Bfuel%2Breduction%2Bburning%2Bin%2Btemperate [106] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/5094 [107] https://www.bnhcrc.com.au/publications/biblio/export/xml/5094 [108] https://www.bnhcrc.com.au/publications/biblio/bnh-5033 [109] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Sampling%2Band%2Bdata%2Banalysis%2Bof%2Bfield%2Bsites%2Bin%2BNSW%22&as_sauthors=Bell&as_occt=any&as_epq=&as_oq=&as_eq=&as_public [110] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/5033 [111] https://www.bnhcrc.com.au/publications/biblio/export/xml/5033 [112] https://www.bnhcrc.com.au/people/michael-rumsewicz [113] https://www.bnhcrc.com.au/publications/researchproceedings2017 [114] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Research%2Bproceedings%2Bfrom%2Bthe%2B2017%2BBushfire%2Band%2BNatural%2BHazards%2BCRC%2Band%2BAFAC%2BConference%22&as_sauthors=Rumsewicz& [115] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3946 [116] https://www.bnhcrc.com.au/publications/biblio/export/xml/3946 [117] https://www.bnhcrc.com.au/publications/biblio/bnh-3875 [118] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Modelling%2Bfeedback%2Bbetween%2Bfuel%2Breduction%2Bburning%2Band%2Bforest%2Bcarbon%2Band%2Bwater%2Bbalance%2Bin%2Beucalypt%2Bforests%22&as_sauthors [119] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3875 [120] https://www.bnhcrc.com.au/publications/biblio/export/xml/3875 [121] https://www.bnhcrc.com.au/publications/biblio/bnh-4117 [122] http://dx.doi.org/10.1016/j.jenvman.2017.07.056 [123] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Optimisation%2Bof%2Bfuel%2Breduction%2Bburning%2Bregimes%2Bfor%2Bcarbon%2C%2Bwater%2Band%2Bvegetation%2Boutcomes%22&as_sauthors=Gharun&as_occt=a [124] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/4117 [125] https://www.bnhcrc.com.au/publications/biblio/export/xml/4117 [126] https://www.bnhcrc.com.au/publications/biblio/bnh-4118 [127] http://dx.doi.org/10.1016/j.foreco.2017.03.001 [128] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Improving%2Bforest%2Bsampling%2Bstrategies%2Bfor%2Bassessment%2Bof%2Bfuel%2Breduction%2Bburning%22&as_sauthors=Gharun&as_occt=any&as_epq=&a [129] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/4118 [130] https://www.bnhcrc.com.au/publications/biblio/export/xml/4118 [131] https://www.bnhcrc.com.au/publications/biblio/bnh-4202 [132] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Optimisation%2Bof%2Bfuel%2Breduction%2Bburning%2Bregimes%2Bfor%2Bfuel%2Breduction%2C%2Bcarbon%2C%2Bwater%2Band%2Bvegetation%2Boutcomes%3A%2Bannual%2Br 17%22&as_sauthors=Bell&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [133] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/4202 [134] https://www.bnhcrc.com.au/publications/biblio/export/xml/4202 [135] https://www.bnhcrc.com.au/publications/biblio/bnh-3325 [136] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Calibration%2Bof%2Bwater%2Bbalance%2Busing%2Bdigital%2Bphotography%22&as_sauthors=Gharun&as_occt=any&as_epq=&as_oq=&as_eq=&as_publi [137] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3325 [138] https://www.bnhcrc.com.au/publications/biblio/export/xml/3325 [139] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=380 [140] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1085 [141] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1086 [142] https://www.bnhcrc.com.au/publications/biblio/bnh-3416 [143] http://dx.doi.org/10.1016/j.foreco.2016.04.028 [144] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Production%2Bof%2Bpyrogenic%2Bcarbon%2Bduring%2Bplanned%2Bfires%2Bin%2Bforests%2Bof%2BEast%2BGippsland%2C%2BVictoria%22&as_sauthors=Jenkins&as_occ [145] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3416 [146] https://www.bnhcrc.com.au/publications/biblio/export/xml/3416 [147] https://www.bnhcrc.com.au/publications/biblio/bnh-3093 [148] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Application%2Bof%2Bstatistical%2Btechniques%2Bto%2Bpyrolysis-GC-MS%2Bdata%2Bfrom%2Bsoil%2Bto%2Bidentify%2Bthe%2Bimpact%2Bof%2Bfire%22&as_sauthors=Possell&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&an [149] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3093 [150] https://www.bnhcrc.com.au/publications/biblio/export/xml/3093 [151] https://www.bnhcrc.com.au/publications/biblio/bnh-3047 [152] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Optimisation%2Bof%2Bfuel%2Breduction%2Bburning%2Bregimes%2Bfor%2Bfuel%2Breduction%2C%2Bcarbon%2C%2Bwater%2Band%2Bvegetation%2Boutcomes%3A%2BAnnual%2Bp 2016%22&as_sauthors=Bell&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [153] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3047 [154] https://www.bnhcrc.com.au/publications/biblio/export/xml/3047 [155] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=253 [156] https://www.bnhcrc.com.au/publications/biblio/bnh-3414 [157] http://dx.doi.org/10.1007/s00442-015-3252-3 [158] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Stomatal%2Bstructure%2Band%2Bphysiology%2Bdo%2Bnot%2Bexplain%2Bdifferences%2Bin%2Bwater%2Buse%2Bamong%2Bmontane%2Beucalypts%22&as_sauthors=Gharun&a [159] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3414 [160] https://www.bnhcrc.com.au/publications/biblio/export/xml/3414 [161] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1083 [162] https://www.bnhcrc.com.au/publications/biblio/bnh-3413 [163] http://dx.doi.org/10.1016/j.agrformet.2014.09.027 [164] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Mapping%2Bspatial%2Band%2Btemporal%2Bvariation%2Bin%2Btree%2Bwater%2Buse%2Bwith%2Ban%2Belevation%2Bmodel%2Band%2Bgridded%2Btemperature%2Bdata%22&as_ [165] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3413 [166] https://www.bnhcrc.com.au/publications/biblio/export/xml/3413 [167] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1082 [168] https://www.bnhcrc.com.au/publications/biblio/bnh-3412 [169] http://dx.doi.org/10.3390/w7020599 [170] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Short-term%2Bforecasting%2Bof%2Bwater%2Byield%2Bfrom%2Bforested%2Bcatchments%2Bafter%2Bbushfire%3A%2Ba%2Bcase%2Bstudy%2Bfrom%2Bsouth-east%2BAustralia%22&as_sauthors=Gharun&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [171] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3412 [172] https://www.bnhcrc.com.au/publications/biblio/export/xml/3412 [173] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1076 [174] https://www.bnhcrc.com.au/publications/biblio/bnh-3409 [175] http://dx.doi.org/10.1007/s10021-015-9861-1 [176] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Fire%2Beases%2Bimbalances%2Bof%2Bnitrogen%2Band%2Bphosphorus%2Bin%2Bwoody%2Bplants%22&as_sauthors=Dijkstra&as_occt=any&as_epq=&as_oq=&an

[177] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3409 [178] https://www.bnhcrc.com.au/publications/biblio/export/xml/3409 [179] https://www.bnhcrc.com.au/publications/biblio/bnh-3431 [180] http://dx.doi.org/10.5194/bg-12-257-2015 [181] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Emissions%2Bfrom%2Bprescribed%2Bfires%2Bin%2Btemperate%2Bforest%2Bin%2Bsouth-east%2BAustralia%3A%2Bimplications%2Bfor%2Bcarbon%2Baccounting%22&as_sauthors=Possell&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sd [182] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3431 [183] https://www.bnhcrc.com.au/publications/biblio/export/xml/3431 [184] https://www.bnhcrc.com.au/publications/biblio/bnh-2399 [185] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Optimisation%2Bof%2Bfuel%2Breduction%2Bburning%2Bregimes%2Bfor%2Bfuel%2Breduction%2C%2Bcarbon%2C%2Bwater%2Band%2Bvegetation%2Boutcomes%22&as_sauthor [186] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2399 [187] https://www.bnhcrc.com.au/publications/biblio/export/xml/2399 [188] https://www.bnhcrc.com.au/publications/biblio/bnh-2338 [189] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Optimisation%2Bof%2Bfuel%2Breduction%2Bburning%2Bregimes%2Bfor%2Bfuel%2Breduction%2C%2Bcarbon%2C%2Bwater%2Band%2Bvegetation%2Boutcomes%3A%2BAnnual%2B2015%22&as_sauthors=Bell&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [190] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2338 [191] https://www.bnhcrc.com.au/publications/biblio/export/xml/2338 [192] https://www.bnhcrc.com.au/publications/biblio/bnh-1531 [193] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Optimisation%2Bof%2BFuel%2BReduction%2BBurning%2BRegimes%2Bfor%2BFuel%2BReduction%2BAnnual%2BReport%2B2014%22&as_sauthors=Bell&as_occt=any& [194] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/1531 [195] https://www.bnhcrc.com.au/publications/biblio/export/xml/1531 [196] https://www.bnhcrc.com.au/node/262/generate-pdf?order=field_date_release&sort=asc [197] https://www.bnhcrc.com.au/node/262/generate-pdf?order=title&sort=asc [198] https://www.bnhcrc.com.au/resources/presentation-slideshow/428 [199] https://www.bnhcrc.com.au/file/520/download?token=UKR6M_LO [200] https://www.bnhcrc.com.au/research/topics/greenhouse-gases [201] https://www.bnhcrc.com.au/resources/presentation-slideshow/1494 [202] https://www.bnhcrc.com.au/file/4811/download?token=U6E482L0 [203] https://www.bnhcrc.com.au/research/topics/fire [204] https://www.bnhcrc.com.au/hazardnotes/14 [205] https://www.bnhcrc.com.au/file/6006/download?token=DV6EcqbT [206] https://www.bnhcrc.com.au/research/topics/land-management [207] https://www.bnhcrc.com.au/resources/presentation-audio-video/2576 [208] https://www.bnhcrc.com.au/file/6035/download?token=G0NxadQC [209] https://www.bnhcrc.com.au/resources/presentation-slideshow/3755 [210] https://www.bnhcrc.com.au/file/7567/download?token=DIiXaif7 [211] https://www.bnhcrc.com.au/research/topics/fire-weather [212] https://www.bnhcrc.com.au/research/topics/modelling [213] https://www.bnhcrc.com.au/resources/presentation-slideshow/3995 [214] https://www.bnhcrc.com.au/file/7851/download?token=N5e6nbY8 [215] https://www.bnhcrc.com.au/research/topics/environments [216] https://www.bnhcrc.com.au/resources/presentation-slideshow/4182 [217] https://www.bnhcrc.com.au/file/7959/download?token=_enEu8Kc [218] https://www.bnhcrc.com.au/research/topics/mitigation [219] https://www.bnhcrc.com.au/resources/presentation-slideshow/4186 [220] https://www.bnhcrc.com.au/file/7963/download?token=P752lY2q [221] https://www.bnhcrc.com.au/research/topics/fire-impacts [222] https://www.bnhcrc.com.au/resources/presentation-slideshow/5118 [223] https://www.bnhcrc.com.au/file/9195/download?token=-cBxjb84 [224] https://www.bnhcrc.com.au/resources/presentation-slideshow/6897 [225] https://www.bnhcrc.com.au/file/11315/download?token=6Tt-kT8U [226] https://www.bnhcrc.com.au/resources/presentation-slideshow/6898 [227] https://www.bnhcrc.com.au/file/11316/download?token=qUIjnioI [228] https://www.bnhcrc.com.au/webinar/qandabell [229] https://www.bnhcrc.com.au/file/11394/download?token=JAIroVTs [230] https://www.bnhcrc.com.au/research/topics/fire-severity [231] https://www.bnhcrc.com.au/resources/poster/1226 [232] https://www.bnhcrc.com.au/resources/poster/2024 [233] https://www.bnhcrc.com.au/resources/poster/2896 [234] https://www.bnhcrc.com.au/resources/poster/3732 [235] https://www.bnhcrc.com.au/resources/poster/4933 [236] https://www.bnhcrc.com.au/resources/poster/5914 [237] https://www.bnhcrc.com.au/resources/poster/7768 [238] https://www.bnhcrc.com.au/research/bushfireimpacts [239] https://www.bnhcrc.com.au/research/cluster/bushfire-predictive-services [240] https://www.bnhcrc.com.au/organisations/anu [241] https://www.bnhcrc.com.au/research/firesurveillance [242] https://www.bnhcrc.com.au/research/firespread [243] https://www.bnhcrc.com.au/organisations/vu [244] https://www.bnhcrc.com.au/research/landdryness [245] https://www.bnhcrc.com.au/research/cluster/severe-high-impact-weather [246] https://www.bnhcrc.com.au/organisations/bom [247] https://www.bnhcrc.com.au/research/firemanagement [248] https://www.bnhcrc.com.au/research/cluster/prescribed-burning [249] https://www.bnhcrc.com.au/organisations/cdu [250] https://www.bnhcrc.com.au/research/understanding-and-mitigating-hazards/5377 [251] https://www.bnhcrc.com.au/node/5604