Extreme fire weather
Key Topics:

- communication [2]
- fire weather [3]
- severe weather [4]

Improved predictions of severe weather to reduce community impact [5]
This project is using high-resolution modelling, together with a range of meteorological data, to better understand and predict important meteorological natural hazards, including fire weather, tropical cyclones, severe thunderstorms and heavy rainfall. The outcomes from the project will contribute to reducing the impact and cost of these hazards on people, infrastructure, the economy and the environment.

Project: detail Notabs

Research team

Research leader

[6]

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Research team

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Description

This project used high-resolution modelling, together with a range of meteorological data, to better understand and predict important meteorological natural hazards, including fire weather, tropical cyclones, severe thunderstorms and heavy rainfall. The outcomes from the project are contributing to reducing the impact and cost of these hazards on people, infrastructure, the economy and the environment.

Specific case studies undertaken included the New South Wales Blue Mountains bushfires of 2013; ember transport by fire plumes; pyrocumulus cloud simulation and prediction, and the NSW April 2015 East Coast Low.

Ember transport

The study developed an understanding of how fire embers generated during bushfires can be lifted into the atmosphere and carried by winds ahead of a fire front, potentially starting new fires downwind. The team undertook simulations for ember transport for a wide range of wind speeds and ember fall speeds. It is important to consider a range of fall speeds, since different types of embers have different densities and aerodynamic properties which affect how far they are carried.

Pyrocumulonimbus

Plume modelling has also been utilised to study pyrocumulonimbus clouds (PyroCb). Intense fire plumes in suitably moist environments can lead to PyroCb development, with the possibility of strong downbursts which can exacerbate already extreme fire conditions. A survey of current understanding and forecast techniques was completed, and the team has worked towards developing improved techniques.

Blue Mountains bushfire

A detailed case study of the Blue Mountains fires of October 2013 was undertaken, focusing on 17 October when some 200 houses were destroyed. Analysis uncovered a weather phenomenon known as mountain waves which contributed to the severe fire behaviour. Mountain waves are atmospheric oscillations that occur due to air flowing over hills or mountains. They can arise in several different ways, some more predictable than others. Often they cause strong downslope winds on the lee slope of the hill or mountain.

April 2015 East Coast Low

Collectively, the ensemble weather simulations accurately predicted the position and intensity of the low, the strong winds and the rainfall. The differences between them give insight as to the forecast uncertainty, the overall envelope of areas at some risk, and the areas at highest risk. The ensemble also enables insight into the processes that lead to the rapid intensification of these systems. The team is continuing to learn from ensemble simulations about predictability of East Coast Lows and how to use this information to benefit both forecasters and the emergency services.

Specific outcomes of this project have:

- improved the scientific understanding of severe weather phenomena in Australia
- improved the knowledge of how to best predict these phenomena, including model configuration and interpretation
- contributed to the post-event analysis and lessons learned of selected severe events that occur during the course of the project
- informed the development of numerical weather prediction systems specifically for severe weather.

Related News

14 MAY 2021

Making better use of research

CAPABILITY, EMERGENCY MANAGEMENT

[27]

18 MAR 2021

When fires cause storms

COMMUNITIES, FIRE WEATHER

[28]

28 JAN 2021

Australia Day Honours for CRC experts

FIRE, FIRE IMPACTS

[29]

28 JAN 2021

New online - January 2021

COMMUNICATION, EMERGENCY MANAGEMENT

[30]

28 OCT 2020

Innovative severe weather research awarded
COMMUNICATION, FIRE WEATHER

[31]

21 APR 2020

New online - April 2020
COMMUNICATION, EMERGENCY MANAGEMENT

[32]

23 JAN 2020

Media seek research insights

COMMUNICATION, FIRE

[33]

11 DEC 2019

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EMERGENCY MANAGEMENT, LAND MANAGEMENT

[34]

09 AUG 2019

Severe weather research has impact

COINCIDENT EVENTS, FORECASTING

[35]

18 DEC 2018

New online - December 2018

EMERGENCY MANAGEMENT, MODELLING

[36]

17 NOV 2017

New online - November 2017

[37]

13 SEP 2017

New online - September 2017

[38]

02 JUN 2017

Floods and fires, volunteers and resilience
EMERGENCY MANAGEMENT, MULTI-HAZARD

[39]

30 MAY 2017

Mountain waves and extreme fire behaviour
COMMUNICATION, FIRE WEATHER

[40]

17 NOV 2016

New online - November 2016

[41]

14 SEP 2016

New online - September 2016

[42]

07 OCT 2014

Mercury rising replay available

COMMUNITIES, FIRE SEVERITY

[43]

Publications

Year	Type	Citation
2022	Report	Kepert, J. [6] *et al.* **Improved predictions of severe weather to reduce community impact – final project report** [44]. (Bushfire and Natural Hazards CRC, 2022). Google Scholar [45] BibTeX [46] E
2020	Journal Article	Tory, K. J. [8] & Kepert, J. [6] **Pyrocumulonimbus Firepower Threshold: Assessing the atmospheric potential for pyroCb** [48]. *Weather and Forecasting* (2020). doi:https://doi.org/10.1175/WAF-D-
2020	Report	Tory, K. J. [8] **The real-time trial of the Pyrocumulonimbus Firepower Threshold** [53]. (Bushfire and Natural Hazards CRC, 2020). Google Scholar [54] BibTeX [55] EndNote XML [56]
2020	Report	Kepert, J. [6], Tory, K. J. [8], Zovko-Rajak, D. [9], Wilke, D. [57] & Schroeter, S. [58] **Improved predictions of severe weather to reduce community impact** [59]. (Bushfire and Natural Hazards CRC,
2019	Conference Paper	Zovko-Rajak, D. [9], Tory, K. J. [8] & Kepert, J. [6] **A case study of South Australia's severe thunderstorm and tornado outbreak** [63]. *AFAC19 powered by INTERSCHUTZ - Bushfire and Natural H*
2019	Conference Paper	Tory, K. J. [8] **Pyrocumulonimbus Firepower Threshold: a pyrocumulonimbus prediction tool** [68]. *AFAC19 powered by INTERSCHUTZ - Bushfire and Natural Hazards CRC Research Forum* (Au
2018	Journal Article	Zieger, S. [72], Greenslade, D. [73] & Kepert, J. [6] **Wave ensemble forecasts for tropical cyclones in the Australian region** [74]. *Ocean Dynamics* **68,** 603-625 (2018). DOI [75] Google Scholar [76]
2018	Journal Article	Kepert, J. [6] **The boundary layer dynamics of tropical cyclone rainbands** [79]. *Journal of the Atmospheric Sciences* **75,** (2018). DOI [80] Google Scholar [81] BibTeX [82] EndNote XML [83]
2018	Report	Tory, K. J. [8] **Models of buoyant plume rise** [84]. (Bushfire and Natural Hazards CRC, 2018). Google Scholar [85] BibTeX [86] EndNote XML [87]
2017	Conference Paper	Kepert, J. [6] **Secondary eyewall formation in tropical cyclones** [88]. *AFAC17* (Bushfire and Natural Hazards CRC, 2017). Google Scholar [89] BibTeX [90] EndNote XML [91]
2017	Conference Paper	Rumsewicz, M. [92] **Research proceedings from the 2017 Bushfire and Natural Hazards CRC and AFAC Conference** [93]. *Bushfire and Natural Hazards CRC & AFAC annual conference 2017* (Bu
2017	Conference Paper	Tory, K. J. [8], Thurston, W. [97] & Kepert, J. [6] **Thermodynamic considerations of pyrocumulus formation** [98]. *AFAC17* (Bushfire and Natural Hazards CRC, 2017). Google Scholar [99] BibTeX [1
2017	Journal Article	Kepert, J. [6] **Time and space scales in the tropical cyclone boundary layer, and the location of the eyewall updraft** [102]. *Journal of the Atmospheric Sciences* (2017). doi:10.1175/JAS-D-17-007
2017	Journal Article	Thurston, W. [97], Kepert, J. [6], Tory, K. J. [8] & Fawcett, R. [107] **The contribution of turbulent plume dynamics to long-range spotting** [108]. *International Journal of Wildland Fire* **26,** 317-330 (20
2017	Report	Kepert, J. [6] *et al.* **Improved predictions of severe weather to reduce community impact: midterm report 2014-17** [113]. (Bushfire and Natural Hazards CRC, 2017). Google Scholar [114] BibTeX
2016	Conference Paper	Thurston, W. [97], Tory, K. J. [8], Fawcett, R. [107] & Kepert, J. [6] **The effects of turbulent plume dynamics on long-range spotting** [117]. *AFAC16* (Bushfire and Natural Hazards CRC, 2016). Goog
2016	Conference Paper	Thurston, W. [97], Tory, K. J. [8], Fawcett, R. [107] & Kepert, J. [6] **Long-range spotting by bushfire plumes: The effects of plume dynamics and turbulence on firebrand trajectory** [121]. *5th Inte*
2016	Conference Paper	Thurston, W. [97], Tory, K. J. [8], Fawcett, R. [107] & Kepert, J. [6] **Large-eddy simulations of pyro-convection and its sensitivity to mositure** [125]. *5th International Fire Behaviour and Fuels Confe*
2016	Conference Paper	Rumsewicz, M. [92] **Research proceedings from the 2016 Bushfire and Natural Hazards CRC and AFAC conference** [129]. *Bushfire and Natural Hazards CRC & AFAC annual conference 2016* (B
2016	Conference Paper	Ching, S. [133], Fawcett, R. [107], Thurston, W. [97], Tory, K. J. [8] & Kepert, J. [6] **Mesoscale features related to the Blue Mountains fires of 17 October 2013 revealed by high resolution Numeri**
2016	Report	Tory, K. J. [8], Peace, M. [138] & Thurston, W. [97] **Pyrocumulonimbus forecasting: needs and issues** [139]. (Bushfire and Natural Hazards CRC, 2016). Google Scholar [140] BibTeX [141] EndNote
2016	Report	Kepert, J. [6] *et al.* **Improved predictions of severe weather to reduce community impact: Annual project report 2015-2016** [143]. (Bushfire and Natural Hazards CRC, 2016). Google Scholar [144]
2015	Conference Paper	Kepert, J. [6], Naughton, M. [147] & Bally, J. [11] **Managing Severe Weather - Progress and Opportunities Conference Paper 2014** [148]. *Bushfire and Natural Hazards CRC and AFAC Wellington C*
2015	Conference Paper	Fawcett, R. [107], Yeo, C. [152], Thurston, W. [97], Kepert, J. [6] & Tory, K. J. [8] **Modelling the Fire Weather of the Coonabarabran Fire of 13 January 2013** [153]. *Bushfire and Natural Hazards CR*
2015	Conference Paper	Rumsewicz, M. [92] **Research proceedings from the 2015 Bushfire and Natural Hazards CRC & AFAC conference** [157]. *Bushfire and Natural Hazards CRC & AFAC annual conference 2015* (Bush
2015	Conference Paper	Thurston, W. [97], Tory, K. J. [8], Fawcett, R. [107] & Kepert, J. [6] **Large-eddy simulations of pyro-convection and its sensitivity to environmental conditions - peer viewed** [161]. *Adelaide Confe*
2015	Journal Article	Thurston, W. [97], Fawcett, R. [107], Tory, K. J. [8] & Kepert, J. [6] **Simulating boundary-layer rolls with a numerical weather prediction model** [165]. *Quarterly Journal of the Royal Meteorological S*
2015	Presentation	Kepert, J. [6], Thurston, W. [97], Ching, S. [133], Tory, K. J. [8] & Fawcett, R. [107] **Improved predictions of severe weather to reduce community risk** [170]. (2015). Google Scholar [171] BibTeX [17
2015	Report	Tory, K. J. [8] & Thurston, W. [97] **Pyrocumulonimbus: A Literature Review** [174]. (2015). Google Scholar [175] BibTeX [176] EndNote XML [177]
2015	Report	Kepert, J. [6], Tory, K. J. [8], Thurston, W. [97], Ching, S. [133] & Fawcett, R. [107] **Improved predictions of severe weather to reduce community impact: Annual project report 2014-2015** [178]. (I

Presentations & Resources

DATE [182]	TITLE [183]	DOWNLOAD	KEY TOPICS
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22 Oct 2014	Managing severe weather: progress and opportunities [201]		forecasting [202], risk management [186], seve
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03 Apr 2016	Monitoring and prediction - cluster overview [208]	0 bytes	[209] (0 bytes) [202], multi-hazard [210], scenario a
30 Aug 2016	Why use ensemble prediction? - Jeff Kepert [212]	4.81 MB	[213] (4.81 MB) [3], forecasting [202], severe weat
30 Aug 2016	The effects of turbulent plume dynamics on long-range spotting - Will Thurston [214]	2.56 MB	[215] (2.56 MB) severity [216], fire weather [3]
24 Oct 2016	Improved predictions of severe weather to reduce community risk [217]	9.18 MB	[218] (9.18 MB) [202], modelling [193], severe weat
28 Nov 2016	Monitoring and predicting natural hazards [219]	853.18 KB	[220] (853.18 KB) [202], modelling [193], severe weat
12 Dec 2016	Fire escalation by downslope winds [221]	1.08 MB	[222] (1.08 MB) [197], fire severity [216], fire weath
30 May 2017	Fire Australia Issue Two 2017 [223]	5.11 MB	[224] (5.11 MB) severe weather [4], volunteering [2
07 Jul 2017	Lightning presentation: improved predictions of severe weather [227]	2.59 MB	[228] (2.59 MB) [2], fire weather [3], severe wea
07 Sep 2017	Secondary eyewall formation in tropical cyclones [229]	1.04 MB	[230] (1.04 MB) [231], severe weather [4], tropical [232
07 Sep 2017	Thermodynamics of pyrocumulus formation [233]	2.79 MB	[234] (2.79 MB) weather [3], severe weather [4]
31 Oct 2017	Improved predictions of severe weather to reduce community impact [235]	1.93 MB	[236] (1.93 MB) [202], mitigation [237], severe weat
23 Nov 2018	Improved predictions of severe weather to reduce community risk [238]	2.14 MB	[239] (2.14 MB) [240], severe weather [4]
13 Dec 2018	The development of a pyrocumulonimbus prediction tool: AFAC webinar [241]	0 bytes	[242] (0 bytes) [240], fire [196], fire impacts [197]
18 Jun 2019	Forecasting the Impacts of Severe Weather: How does our work reduce the impacts of natural disasters? [243]	648.54 KB	[244] (648.54 KB) [240], severe weather [4]
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08 Dec 2020	Forecasting fire-generated thunderstorms [258]		fire weather [3], severe weather [4], storm surg
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17 May 2021	Fire Australia Issue Two 2021 [262]	11.74 MB	[263] (11.74 MB) [264], emergency management [265]

Posters

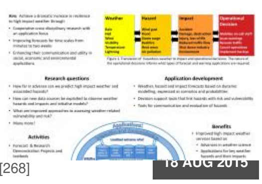
25 AUG 2014

[267]

Improved predictions of severe weather to help reduce community impact

[267]

To improve our understanding of and ability to predict severe weather, including for bush fires, tropical...



18 AUG 2015

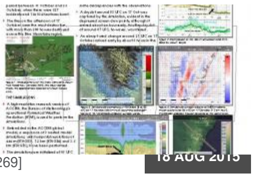
[268]

Weather Science to Societal Impact: Opportunities for Australia in the World Meteorological Organisation's High Impact Weather Project

[268]

COMMUNICATION [2], FIRE WEATHER [3]

The Bureau of Meteorology seeks Australian collaborators to participate in a new 10-year international high...

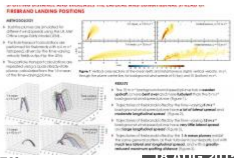

[269] 18 AUG 2015

Modelling the Fire Weather of the Blue Mountains Fires of October 2013

[269]

COMMUNICATION [2], FIRE WEATHER [3]

High resolution simulations over the Blue Mountains Region on 17 October 2013 show several interesting...

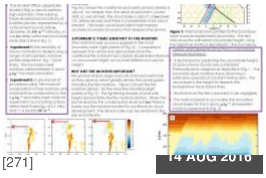

[270] 18 AUG 2015

Long-Range Spotting by Bushfire Plumes: The Effects of In-Plume Turbulence on Firebrand Trajectory

[270]

COMMUNICATION [2], FIRE WEATHER [3]

Large-eddy simulations of bushfire plumes are combined with firebrand trajectory calculations to estimate the...

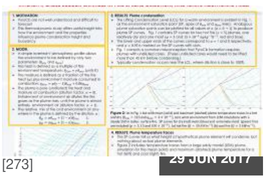

[271] 14 AUG 2016

Is fire moisture importance for pyrocumulus development?

[271]

FIRE SEVERITY [216], REMOTE SENSING [272]

Pyrocumulonimbus clouds have been linked to highly dangerous fire behaviour.

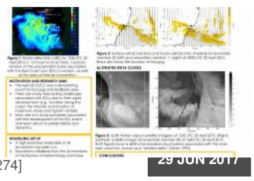

[273] 29 JUN 2017

Thermodynamics of pyrocumulus formation

[273]

COMMUNICATION [2], FIRE WEATHER [3]

In favourable atmospheric conditions, large hot fires can produce pyrocumulus cloud: deep convective columns...

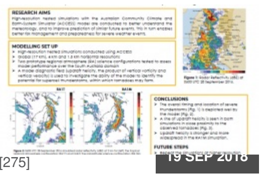

[274] 29 JUN 2017

Ensemble prediction of the East Coast Low of April 2015

[274]

COMMUNICATION [2], FLOOD [225]

Between 20-23 April 2015 the eastern coast of Australia was affected by a low-pressure system, known as an...


[275] 19 SEP 2018

A case study of South Australia's severe thunderstorm and tornado outbreak (28 September 2016)

[275]

COMMUNICATION [2], FIRE WEATHER [3]

One of the most significant thunderstorm outbreaks recorded in South Australia impacted central and eastern...

27 AUG 2019

A fast, physically based scheme for predicting long-range spotting potential

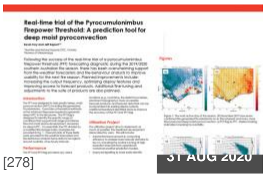
[276]

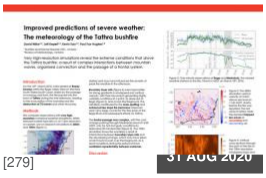
COMMUNICATION [2], SEVERE WEATHER [4]

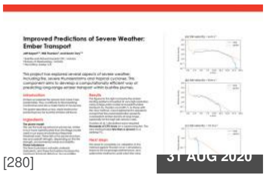
In extreme cases, embers transported in a bushfire plume have started new fires over thirty kilometres away....


[277] 27 AUG 2019

Pyrocumulonimbus Firepower Threshold: A pyroCb prediction tool.
[277]
COMMUNICATION [2], FIRE WEATHER [3]
Pyrocumulonimbus (fire-induced thunderstorms, pyroCb) are associated with unpredictable changes in fire...


31 AUG 2020
[278]
Real-time trial of the Pyrocumulonimbus Firepower Threshold: A prediction tool for deep moist pyroconvection
[278]
COMMUNITIES [240], SEVERE WEATHER [4]
Key findings: "The PFT provided very useful guidance to forecasters briefing emergency services."


31 AUG 2020
[279]
Improved predictions of severe weather: The meteorology of the Tathra bushfire
[279]
COMMUNITIES [240], SEVERE WEATHER [4]
Key findings: High-resolutionsimulations provide valuable insight into the meteorology of the Tathrabushfire.


31 AUG 2020
[280]
Improved Predictions of Severe Weather: Ember Transport
[280]
COMMUNITIES [240], SEVERE WEATHER [4]
Key findings: Our new method for calculating bushfire ember transport is accurateand very fast.

Linked Projects

Resilience to clustered disaster events on the coast - storm surge
[281]
FLOOD AND COASTAL MANAGEMENT [282]

Dr Scott Nichol
Geoscience Australia [283]

[283]

Fire spread prediction across fuel types
[284]
BUSHFIRE PREDICTIVE SERVICES [285]

A/Prof Khalid Moinuddin
Victoria University [286]

[286]

Improved predictions of severe weather to reduce community impact
[5]
SEVERE AND HIGH IMPACT WEATHER [287]

Dr Jeff Kepert
Bureau of Meteorology [7]

[7]

Improving land dryness measures and forecasts
[288]
SEVERE AND HIGH IMPACT WEATHER [287]

Dr Imtiaz Dharssi
Bureau of Meteorology [7]

[7]

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[1] https://www.bnhcrc.com.au/files/tulku-plumejpg [2] https://www.bnhcrc.com.au/research/topics/communication [3] https://www.bnhcrc.com.au/research/topics/fire-weather [4] https://www.bnhcrc.com.au/research/topics/severe-weather [5] https://www.bnhcrc.com.au/research/predictingsevereweather [6] https://www.bnhcrc.com.au/people/jkepert [7] https://www.bnhcrc.com.au/organisations/bom [8] https://www.bnhcrc.com.au/people/ktory [9] https://www.bnhcrc.com.au/people/dzovkorajak [10] https://www.bnhcrc.com.au/people/david.wilke [11] https://www.bnhcrc.com.au/people/jbally [12] https://www.bnhcrc.com.au/organisations/afac [13] https://www.bnhcrc.com.au/people/pfoxhughes [14] https://www.bnhcrc.com.au/people/agale [15] https://www.bnhcrc.com.au/organisations/dfes [16] https://www.bnhcrc.com.au/people/sheemstra [17] https://www.bnhcrc.com.au/organisations/nswrfs [18] https://www.bnhcrc.com.au/people/agrace [19] https://www.bnhcrc.com.au/node/4579 [20] https://www.bnhcrc.com.au/people/fcrisci [21] https://www.bnhcrc.com.au/organisations/sa-power-networks [22] https://www.bnhcrc.com.au/people/lmccaw [23] https://www.bnhcrc.com.au/organisations/dpaw [24] https://www.bnhcrc.com.au/people/alisaschofield [25] https://www.bnhcrc.com.au/people/alisa.schofield [26] https://www.bnhcrc.com.au/organisations/nswses [27] https://www.bnhcrc.com.au/news/2021/making-better-use-research [28] https://www.bnhcrc.com.au/news/2021/when-fires-cause-storms [29] https://www.bnhcrc.com.au/news/2021/australia-day-honours-crc-experts [30] https://www.bnhcrc.com.au/news/2021/new-online-january-2021 [31] https://www.bnhcrc.com.au/news/2020/innovative-severe-weather-research-awarded [32] https://www.bnhcrc.com.au/news/2020/new-online-april-2020 [33] https://www.bnhcrc.com.au/news/2020/media-seek-research-insights [34] https://www.bnhcrc.com.au/news/2019/special-edition-monographs-share-afac19-science-0 [35] https://www.bnhcrc.com.au/news/2019/severe-weather-research-has-impact [36] https://www.bnhcrc.com.au/news/2018/new-online-december-2018 [37] https://www.bnhcrc.com.au/news/2017/new-online-november-2017 [38] https://www.bnhcrc.com.au/news/2017/new-online-september-2017 [39] https://www.bnhcrc.com.au/news/2017/floods-and-fires-volunteers-and-resilience [40] https://www.bnhcrc.com.au/news/2017/mountain-waves-and-extreme-fire-behaviour [41] https://www.bnhcrc.com.au/news/2016/new-online-november-2016 [42] https://www.bnhcrc.com.au/news/2016/new-online-september-2016 [43] https://www.bnhcrc.com.au/news/2014/mercury-rising-live-streams-available [44] https://www.bnhcrc.com.au/publications/biblio/bnh-8318 [45] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Improved%2Bpredictions%2Bof%2Bsevere%2Bweather%2Bto%2Breduce%2Bcommunity%2Bimpact%2B%E2%80%93%2Bfinal%2Bproject%2Breport%22&as_sauthors=Kepert&amp [46] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/8318 [47] https://www.bnhcrc.com.au/publications/biblio/export/xml/8318 [48] https://www.bnhcrc.com.au/publications/biblio/bnh-7773 [49] http://dx.doi.org/10.1175/WAF-D-20-0027.1 [50] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Pyrocumulonimbus%2BFirepower%2BThreshold%3A%2BAssessing%2Bthe%2Batmospheric%2Bpotential%2Bfor%2BpyroCb%22&as_sauthors=Tory&as_occt=any&as_epq [51] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/7773 [52] https://www.bnhcrc.com.au/publications/biblio/export/xml/7773 [53] https://www.bnhcrc.com.au/publications/biblio/bnh-8134 [54] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22The%2Breal-time%2Btrial%2Bof%2Bthe%2BPyrocumulonimbus%2BFirepower%2BThreshold%22&as_sauthors=Tory&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&a [55] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/8134 [56] https://www.bnhcrc.com.au/publications/biblio/export/xml/8134 [57] https://www.bnhcrc.com.au/people/davidwilke [58] https://www.bnhcrc.com.au/people/sschroeter [59] https://www.bnhcrc.com.au/publications/biblio/bnh-6801 [60] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Improved%2Bpredictions%2Bof%2Bsevere%2Bweather%2Bto%2Breduce%2Bcommunity%2Bimpact%22&as_sauthors=Kepert&as_occt=any&as_epq=&as_oq=&a [61] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/6801 [62] https://www.bnhcrc.com.au/publications/biblio/export/xml/6801 [63] https://www.bnhcrc.com.au/publications/biblio/bnh-6511 [64] https://knowledge.aidr.org.au/resources/australian-journal-of-emergency-management-monograph-series/ [65] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22A%2Bcase%2Bstudy%2Bof%2BSouth%2BAustralia%27s%2Bsevere%2Bthunderstorm%2Band%2Btornado%2Boutbreak%2B%22&as_sauthors=Zovko-Rajak&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [66] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/6511 [67] https://www.bnhcrc.com.au/publications/biblio/export/xml/6511 [68] https://www.bnhcrc.com.au/publications/biblio/bnh-6528 [69] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Pyrocumulonimbus%2BFirepower%2BThreshold%3A%2Ba%2Bpyrocumulonimbus%2Bprediction%2Btool%22&as_sauthors=Tory&as_occt=any&as_epq=&as_oq=&am [70] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/6528 [71] https://www.bnhcrc.com.au/publications/biblio/export/xml/6528 [72] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1514 [73] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=1515 [74] https://www.bnhcrc.com.au/publications/biblio/bnh-5184 [75] http://dx.doi.org/10.1007/s10236-018-1145-9 [76] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Wave%2Bensemble%2Bforecasts%2Bfor%2Btropical%2Bcyclones%2Bin%2Bthe%2BAustralian%2Bregion%22&as_sauthors=Zieger&as_occt=any&as_epq=&as_oq=& [77] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/5184 [78] https://www.bnhcrc.com.au/publications/biblio/export/xml/5184 [79] https://www.bnhcrc.com.au/publications/biblio/bnh-5145 [80] http://dx.doi.org/10.1175/JAS-D-18-0133.1 [81] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22The%2Bboundary%2Blayer%2Bdynamics%2Bof%2Btropical%2Bcyclone%2Brainbands%22&as_sauthors=Kepert&as_occt=any&as_epq=&as_oq=&as_eq=& [82] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/5145 [83] https://www.bnhcrc.com.au/publications/biblio/export/xml/5145 [84] https://www.bnhcrc.com.au/publications/biblio/bnh-5267 [85] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Models%2Bof%2Bbuoyant%2Bplume%2Brise%22&as_sauthors=Tory&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi= [86] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/5267 [87] https://www.bnhcrc.com.au/publications/biblio/export/xml/5267 [88] https://www.bnhcrc.com.au/publications/biblio/bnh-3877 [89] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Secondary%2Beyewall%2Bformation%2Bin%2Btropical%2Bcyclones%22&as_sauthors=Kepert&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&a [90] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3877 [91] https://www.bnhcrc.com.au/publications/biblio/export/xml/3877 [92] https://www.bnhcrc.com.au/people/michael-rumsewicz [93] https://www.bnhcrc.com.au/publications/researchproceedings2017 [94] 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& [95] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3946 [96] https://www.bnhcrc.com.au/publications/biblio/export/xml/3946 [97] https://www.bnhcrc.com.au/people/wthurston [98] https://www.bnhcrc.com.au/publications/biblio/bnh-3883 [99] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Thermodynamic%2Bconsiderations%2Bof%2Bpyrocumulus%2Bformation%22&as_sauthors=Tory&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=& [100] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3883 [101] https://www.bnhcrc.com.au/publications/biblio/export/xml/3883 [102] https://www.bnhcrc.com.au/publications/biblio/bnh-3820 [103] http://dx.doi.org/10.1175/JAS-D-17-0077.1 [104] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Time%2Band%2Bspace%2Bscales%2Bin%2Bthe%2Btropical%2Bcyclone%2Bboundary%2Blayer%2C%2Band%2Bthe%2Blocation%2Bof%2Bthe%2Beyewall%2Bupdraft%22&as_sau [105] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3820 [106] https://www.bnhcrc.com.au/publications/biblio/export/xml/3820 [107] https://www.bnhcrc.com.au/people/rfawcett [108] https://www.bnhcrc.com.au/publications/biblio/bnh-3924 [109] http://dx.doi.org/10.1071/WF16142 [110] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22The%2Bcontribution%2Bof%2Bturbulent%2Bplume%2Bdynamics%2Bto%2Blong-range%2Bspotting%22&as_sauthors=Thurston&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [111] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3924 [112] https://www.bnhcrc.com.au/publications/biblio/export/xml/3924 [113] https://www.bnhcrc.com.au/publications/biblio/bnh-4232 [114] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Improved%2Bpredictions%2Bof%2Bsevere%2Bweather%2Bto%2Breduce%2Bcommunity%2Bimpact%3A%2Bmidterm%2Breport%2B2014-17%22&as_sauthors=Kepert&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [115] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/4232 [116] https://www.bnhcrc.com.au/publications/biblio/export/xml/4232 [117] https://www.bnhcrc.com.au/publications/biblio/bnh-2944 [118] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22The%2Beffects%2Bof%2Bturbulent%2Bplume%2Bdynamics%2Bon%2Blong-range%2Bspotting%22&as_sauthors=Thurston&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [119] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2944 [120] https://www.bnhcrc.com.au/publications/biblio/export/xml/2944 [121] https://www.bnhcrc.com.au/publications/biblio/bnh-4113 [122] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Long-range%2Bspotting%2Bby%2Bbushfire%2Bplumes%3A%2BThe%2Beffects%2Bof%2Bplume%2Bdynamics%2Band%2Bturbulence%2Bon%2Bfirebrand%2Btrajectory%22&as_sauthors=Thurston&as_occt=any&as_ep [123] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/4113 [124] https://www.bnhcrc.com.au/publications/biblio/export/xml/4113 [125] https://www.bnhcrc.com.au/publications/biblio/bnh-4112 [126] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Large-eddy%2Bsimulations%2Bof%2Bpyro-convection%2Band%2Bits%2Bsensitivity%2Bto%2Bmositure%22&as_sauthors=Thurston&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&a [127] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/4112 [128] https://www.bnhcrc.com.au/publications/biblio/export/xml/4112 [129] https://www.bnhcrc.com.au/publications/researchproceedings2016 [130] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Research%2Bproceedings%2Bfrom%2Bthe%2B2016%2BBushfire%2Band%2BNatural%2BHazards%2BCRC%2Band%2BAFAC%2Bconference%22&as_sauthors=Rumsewicz& [131] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2960 [132] https://www.bnhcrc.com.au/publications/biblio/export/xml/2960 [133] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=880 [134] https://www.bnhcrc.com.au/publications/biblio/bnh-4114 [135] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Mesoscale%2Bfeatures%2Brelated%2Bto%2Bthe%2BBlue%2BMountains%2Bfires%2Bof%2B17%2BOctober%2B2013%2Brevealed%2Bby%2Bhigh%2Bresolution%2BNumerical%2BWea [136] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/4114 [137] https://www.bnhcrc.com.au/publications/biblio/export/xml/4114 [138] https://www.bnhcrc.com.au/people/mpeace [139] https://www.bnhcrc.com.au/publications/biblio/bnh-3205 [140] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Pyrocumulonimbus%2Bforecasting%3A%2Bneeds%2Band%2Bissues%22&as_sauthors=Tory&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&am [141] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/3205 [142] https://www.bnhcrc.com.au/publications/biblio/export/xml/3205 [143] https://www.bnhcrc.com.au/publications/biblio/bnh-2974 [144] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Improved%2Bpredictions%2Bof%2Bsevere%2Bweather%2Bto%2Breduce%2Bcommunity%2Bimpact%3A%2BAnnual%2Bproject%2Breport%2B2015-2016%22&as_sauthors=Kepert&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [145] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2974 [146] https://www.bnhcrc.com.au/publications/biblio/export/xml/2974 [147] https://www.bnhcrc.com.au/publications/biblio?f%5Bauthor%5D=682 [148] https://www.bnhcrc.com.au/publications/biblio/bnh-1563 [149] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Managing%2BSevere%2BWeather%2B-%2BProgress%2Band%2BOpportunities%2BConference%2BPaper%2B2014%22&as_sauthors=Kepert&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as [150] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/1563 [151] https://www.bnhcrc.com.au/publications/biblio/export/xml/1563 [152] https://www.bnhcrc.com.au/people/cyeo [153] https://www.bnhcrc.com.au/publications/biblio/bnh-2203 [154] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Modelling%2Bthe%2BFire%2BWeather%2Bof%2Bthe%2BCoonabarabran%2BFire%2Bof%2B13%2BJanuary%2B2013%22&as_sauthors=Fawcett&as_occt=any&as_epq=& [155] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2203 [156] https://www.bnhcrc.com.au/publications/biblio/export/xml/2203 [157] https://www.bnhcrc.com.au/publications/researchproceedings2015 [158] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Research%2Bproceedings%2Bfrom%2Bthe%2B2015%2BBushfire%2Band%2BNatural%2BHazards%2BCRC%2B%26%2BAFAC%2Bconference%22&as_sauthors=Rumsewicz&amp [159] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2169 [160] https://www.bnhcrc.com.au/publications/biblio/export/xml/2169 [161] https://www.bnhcrc.com.au/publications/biblio/bnh-2081 [162] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Large-eddy%2Bsimulations%2Bof%2Bpyro-convection%2Band%2Bits%2Bsensitivity%2Bto%2Benvironmental%2Bconditions%2B-%2Bpeer%2Bviewed%22&as_sauthors=Thurston&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [163] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2081 [164] https://www.bnhcrc.com.au/publications/biblio/export/xml/2081 [165] https://www.bnhcrc.com.au/publications/biblio/bnh-1963 [166] http://www.cawcr.gov.au/staff/jdk/Kepert_papers/Thurston_etal_2015_qjrms_acc.pdf [167] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Simulating%2Bboundary-layer%2Brolls%2Bwith%2Ba%2Bnumerical%2Bweather%2Bprediction%2Bmodel%22&as_sauthors=Thurston&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&a [168] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/1963 [169] https://www.bnhcrc.com.au/publications/biblio/export/xml/1963 [170] https://www.bnhcrc.com.au/publications/biblio/bnh-2404 [171] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Improved%2Bpredictions%2Bof%2Bsevere%2Bweather%2Bto%2Breduce%2Bcommunity%2Brisk%22&as_sauthors=Kepert&as_occt=any&as_epq=&as_oq=&as_ [172] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2404 [173] https://www.bnhcrc.com.au/publications/biblio/export/xml/2404 [174] https://www.bnhcrc.com.au/publications/biblio/bnh-1882 [175] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Pyrocumulonimbus%3A%2BA%2BLiterature%2BReview%22&as_sauthors=Tory&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&a [176] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/1882 [177] https://www.bnhcrc.com.au/publications/biblio/export/xml/1882 [178] https://www.bnhcrc.com.au/publications/biblio/bnh-2386 [179] http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Improved%2Bpredictions%2Bof%2Bsevere%2Bweather%2Bto%2Breduce%2Bcommunity%2Bimpact%3A%2BAnnual%2Bproject%2Breport%2B2014-2015%22&as_sauthors=Kepert&as_occt=any&as_epq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAAP=1&as_sdtp=1 [180] https://www.bnhcrc.com.au/publications/biblio/export/bibtex/2386 [181] https://www.bnhcrc.com.au/publications/biblio/export/xml/2386 [182] https://www.bnhcrc.com.au/node/257/generate-pdf?order=field_date_release&sort=asc [183] https://www.bnhcrc.com.au/node/257/generate-pdf?order=title&sort=asc [184] https://www.bnhcrc.com.au/resources/presentation-slideshow/432 [185] https://www.bnhcrc.com.au/file/524/download?token=HZRhxs9P [186] https://www.bnhcrc.com.au/research/topics/risk-management [187] https://www.bnhcrc.com.au/research/topics/warnings [188] https://www.bnhcrc.com.au/resources/presentation-slideshow/1340 [189] https://www.bnhcrc.com.au/file/4108/download?token=sfITCsWN [190] https://www.bnhcrc.com.au/research/topics/governance [191] https://www.bnhcrc.com.au/resources/presentation-slideshow/1263 [192] https://www.bnhcrc.com.au/file/3745/download?token=gW9MNH2t [193] https://www.bnhcrc.com.au/research/topics/modelling [194] https://www.bnhcrc.com.au/resources/presentation-slideshow/1272 [195] https://www.bnhcrc.com.au/file/3758/download?token=Gw-BUiX4 [196] https://www.bnhcrc.com.au/research/topics/fire [197] https://www.bnhcrc.com.au/research/topics/fire-impacts [198] https://www.bnhcrc.com.au/resources/presentation-slideshow/1273 [199] https://www.bnhcrc.com.au/file/3760/download?token=JqQt_38j [200] https://www.bnhcrc.com.au/resources/presentation-audio-video/1391 [201] https://www.bnhcrc.com.au/resources/1400 [202] https://www.bnhcrc.com.au/research/topics/forecasting [203] https://www.bnhcrc.com.au/resources/presentation-slideshow/2168 [204]

https://www.bnhcrc.com.au/file/5695/download?token=a8fMQ8hI [205] https://www.bnhcrc.com.au/resources/presentation-slideshow/2190 [206] https://www.bnhcrc.com.au/file/5721/download?token=VeFCLG4E [207] https://www.bnhcrc.com.au/research/topics/environments [208] https://www.bnhcrc.com.au/resources/presentation-audio-video/3044 [209] https://www.bnhcrc.com.au/file/6536/download?token=Uwv21qSG [210] https://www.bnhcrc.com.au/research/topics/multi-hazard [211] https://www.bnhcrc.com.au/research/topics/scenario-analysis [212] https://www.bnhcrc.com.au/resources/presentation-slideshow/2999 [213] https://www.bnhcrc.com.au/file/6490/download?token=v332Qb8A [214] https://www.bnhcrc.com.au/resources/presentation-slideshow/3025 [215] https://www.bnhcrc.com.au/file/6519/download?token=fuehF24w [216] https://www.bnhcrc.com.au/research/topics/fire-severity [217] https://www.bnhcrc.com.au/resources/presentation-slideshow/3146 [218] https://www.bnhcrc.com.au/file/6630/download?token=xqv_BH8J [219] https://www.bnhcrc.com.au/hazardnotes/22 [220] https://www.bnhcrc.com.au/file/6725/download?token=elaEthRk [221] https://www.bnhcrc.com.au/hazardnotes/24 [222] https://www.bnhcrc.com.au/file/7000/download?token=dgt4Jwgp [223] https://www.bnhcrc.com.au/resources/fireaustralia-edition/3580 [224] https://www.bnhcrc.com.au/file/7373/download?token=m9L-UTNF [225] https://www.bnhcrc.com.au/research/topics/flood [226] https://www.bnhcrc.com.au/research/topics/volunteering [227] https://www.bnhcrc.com.au/resources/presentation-slideshow/3774 [228] https://www.bnhcrc.com.au/file/7587/download?token=RcL4Fbam [229] https://www.bnhcrc.com.au/resources/presentation-slideshow/3984 [230] https://www.bnhcrc.com.au/file/7840/download?token=QqOMncZ7 [231] https://www.bnhcrc.com.au/research/topics/cyclone [232] https://www.bnhcrc.com.au/research/topics/tropical [233] https://www.bnhcrc.com.au/resources/presentation-slideshow/3999 [234] https://www.bnhcrc.com.au/file/7854/download?token=t7z0SGG6 [235] https://www.bnhcrc.com.au/resources/presentation-slideshow/4177 [236] https://www.bnhcrc.com.au/file/7954/download?token=n3hnSmHN [237] https://www.bnhcrc.com.au/research/topics/mitigation [238] https://www.bnhcrc.com.au/resources/presentation-slideshow/5121 [239] https://www.bnhcrc.com.au/file/9198/download?token=TZsKakDv [240] https://www.bnhcrc.com.au/research/topics/communities [241] https://www.bnhcrc.com.au/resources/presentation-audio-video/5320 [242] https://www.bnhcrc.com.au/file/9509/download?token=Y34EQRLj [243] https://www.bnhcrc.com.au/resources/presentation-slideshow/5636 [244] https://www.bnhcrc.com.au/file/10042/download?token=BVLinr3o [245] https://www.bnhcrc.com.au/resources/presentation-slideshow/5638 [246] https://www.bnhcrc.com.au/file/10044/download?token=8WTIRpD1 [247] https://www.bnhcrc.com.au/resources/presentation-slideshow/5753 [248] https://www.bnhcrc.com.au/file/10199/download?token=6MY8CUXT [249] https://www.bnhcrc.com.au/resources/presentation-slideshow/5951 [250] https://www.bnhcrc.com.au/file/10366/download?token=Ure9XxDt [251] https://www.bnhcrc.com.au/resources/presentation-slideshow/5989 [252] https://www.bnhcrc.com.au/file/10402/download?token=d6ggUIsO [253] https://www.bnhcrc.com.au/resources/PFT-training [254] https://www.bnhcrc.com.au/file/11513/download?token=18ZpGIna [255] https://www.bnhcrc.com.au/research/topics/storm-surge [256] https://www.bnhcrc.com.au/casestudy/tornadooutbreak [257] https://www.bnhcrc.com.au/research/topics/coastal [258] https://www.bnhcrc.com.au/casestudy/pyrocumulonimbusforecasting [259] https://www.bnhcrc.com.au/resources/fireaustralia-edition/7897 [260] https://www.bnhcrc.com.au/file/12636/download?token=vM0REOdx [261] https://www.bnhcrc.com.au/research/topics/animals [262] https://www.bnhcrc.com.au/resources/fireaustralia-edition/8005 [263] https://www.bnhcrc.com.au/file/12775/download?token=fGwhU9Kp [264] https://www.bnhcrc.com.au/research/topics/capability [265] https://www.bnhcrc.com.au/research/topics/emergency-management [266] https://www.bnhcrc.com.au/research/topics/northern-australia [267] https://www.bnhcrc.com.au/resources/poster/1234 [268] https://www.bnhcrc.com.au/resources/poster/2011 [269] https://www.bnhcrc.com.au/resources/poster/2043 [270] https://www.bnhcrc.com.au/resources/poster/2055 [271] https://www.bnhcrc.com.au/resources/poster/2883 [272] https://www.bnhcrc.com.au/research/topics/remote-sensing [273] https://www.bnhcrc.com.au/resources/poster/3678 [274] https://www.bnhcrc.com.au/resources/poster/3709 [275] https://www.bnhcrc.com.au/resources/poster/4919 [276] https://www.bnhcrc.com.au/resources/poster/5899 [277] https://www.bnhcrc.com.au/resources/poster/5901 [278] https://www.bnhcrc.com.au/resources/poster/7744 [279] https://www.bnhcrc.com.au/resources/poster/7718 [280] https://www.bnhcrc.com.au/resources/poster/7733 [281] https://www.bnhcrc.com.au/research/stormsurge [282] https://www.bnhcrc.com.au/research/cluster/flood-coastal-management [283] https://www.bnhcrc.com.au/organisations/ga [284] https://www.bnhcrc.com.au/research/firespread [285] https://www.bnhcrc.com.au/research/cluster/bushfire-predictive-services [286] https://www.bnhcrc.com.au/organisations/vu [287] https://www.bnhcrc.com.au/research/cluster/severe-high-impact-weather [288] https://www.bnhcrc.com.au/research/landdryness