



Waroona fire. Photo: Neil Bennett, Bureau of Meteorology.

- Key Topics:
- fire impacts [2]
 - fire severity [3]
 - fire weather [4]

Coupled fire-atmosphere modelling [5]
The project aimed to improve understanding of fire and atmosphere interactions and feedback processes through running the coupled fire-atmosphere model ACCESS-Fire. ACCESS-Fire is an important research tool and has the potential to be a critical operational tool. It will assist in informing fire management decisions as increasingly hazardous scenarios are faced in a changing climate. Further deliverables from the project include the preparation of meteorological and simulation case studies of significant fire events as publications, installation and testing of the ACCESS-Fire coupled model on the National Computing Infrastructure; and preparation of training material to support operational implementation of research findings. The project has demonstrably achieved the objective of building and sharing national capability in fire research and has provided fire and meteorology expertise during high impact events in support of end-users inside their operational centres.

Project: detail Notabs

Research team

Research leader

[6]



Dr Jeff Kepert
[6]
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[7]

[8]


















Dr Mika Peace
[8]
RESEARCH LEADER



[7]

End User representatives

<div data-bbox="92 219 113 241">[9]</div> <div data-bbox="384 120 488 224">  </div> <div data-bbox="389 250 483 300"> <p>Andrew Stark [9] END-USER</p> </div> <div data-bbox="392 327 480 376">  </div> <div data-bbox="92 371 121 394">[10]</div>	<div data-bbox="813 219 841 241">[11]</div> <div data-bbox="1106 120 1209 224">  </div> <div data-bbox="1121 250 1193 300"> <p>John Bally [11] END-USER</p> </div> <div data-bbox="1098 327 1217 376">  </div> <div data-bbox="813 371 841 394">[12]</div>
<div data-bbox="92 573 121 595">[13]</div> <div data-bbox="384 477 488 580">  </div> <div data-bbox="371 607 499 656"> <p>Dr Lachlan McCaw [13] END-USER</p> </div> <div data-bbox="400 683 475 719">  </div> <div data-bbox="92 725 121 748">[14]</div>	<div data-bbox="813 573 841 595">[15]</div> <div data-bbox="1106 477 1209 580">  </div> <div data-bbox="1098 607 1217 656"> <p>Laurence McCoy [15] END-USER</p> </div> <div data-bbox="1137 683 1182 732">  </div> <div data-bbox="813 725 841 748">[16]</div>
<div data-bbox="92 927 121 949">[17]</div> <div data-bbox="384 831 488 934">  </div> <div data-bbox="389 960 483 1010"> <p>Mark Chladil [17] END-USER</p> </div> <div data-bbox="392 1037 475 1086">  </div> <div data-bbox="92 1081 121 1104">[18]</div>	<div data-bbox="813 927 841 949">[19]</div> <div data-bbox="1106 831 1209 934">  </div> <div data-bbox="1106 960 1204 1010"> <p>Mike Wouters [19] END-USER</p> </div> <div data-bbox="1058 1037 1257 1086">  </div> <div data-bbox="813 1081 841 1104">[20]</div>
<div data-bbox="92 1281 121 1303">[21]</div> <div data-bbox="384 1187 488 1290">  </div> <div data-bbox="379 1317 491 1366"> <p>Dr Neil Burrows [21] END-USER</p> </div>	<div data-bbox="813 1281 841 1303">[22]</div> <div data-bbox="1106 1187 1209 1290">  </div> <div data-bbox="1090 1317 1225 1366"> <p>Dr Simon Heemstra [22] END-USER</p> </div> <div data-bbox="1137 1393 1182 1442">  </div> <div data-bbox="813 1438 841 1460">[16]</div>

Description

This project aimed to improve understanding of fire and atmosphere interactions and feedback processes through running the coupled fire-atmosphere model ACCESS-Fire.

Project deliverables include: preparation of meteorological and simulation case studies of significant fire events as publications; installation and testing of the ACCESS-Fire coupled model on the National Computing Infrastructure (NCI); and preparation of training material to support operational implementation of research findings.

The project has demonstrably achieved the objective of building and sharing national capability in fire research and has provided fire and meteorology expertise during high impact events in support of end-users inside their operational centers. That outcome is not a specific project deliverable and is to some degree intangible, so not as easily measured as outcomes such as publications. However, it successfully realises the CRC objective of building collaborations and trusted partnerships and strengthening national capability. The operational support capability is recognised and valued across fire and land management agencies and in the Bureau.

[Read the final report here.](#) [23]

Related News



22 JUN 2021

Fire weather research on show to the world
FIRE SEVERITY, FIRE WEATHER

[24]



25 MAR 2021

New online - March 2021
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[25]



28 JAN 2021

Australia Day Honours for CRC experts
FIRE, FIRE IMPACTS

[26]



28 JAN 2021

New online - January 2021
COMMUNICATION, EMERGENCY MANAGEMENT

[27]



16 NOV 2020

New online - November 2020
COMMUNICATION, EMERGENCY MANAGEMENT

[28]



11 DEC 2019

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EMERGENCY MANAGEMENT, LAND MANAGEMENT

[29]



19 NOV 2019

CRC science making national impact
FIRE, FIRE SEVERITY

[30]



29 OCT 2019

What happens when women thrive in fire
EMERGENCY MANAGEMENT, FIRE

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Bushfire modelling boost
COMMUNITIES, EMERGENCY MANAGEMENT

29 OCT 2019

[32]



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22 AUG 2019

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[34]



09 AUG 2019

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COINCIDENT EVENTS, FORECASTING

[35]



27 MAY 2019

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EMERGENCY MANAGEMENT, FIRE

[36]



27 MAY 2019

CRC research in magazine's spotlight
EMERGENCY MANAGEMENT, FIRE

[37]

[38]



20 FEB 2019

Fire science helps Queensland
FIRE, FIRE IMPACTS

[39]



12 FEB 2019

A decade of advancements on fire weather
EMERGENCY MANAGEMENT, FIRE IMPACTS

[40]



18 SEP 2018

Conference papers available online
EMERGENCY MANAGEMENT, MULTI-HAZARD

[41]



23 AUG 2018

Science in the pub for researcher
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[42]



New online - November 2017

17 NOV 2017

[43]



New online - August 2016

16 AUG 2016

[44]



17 AUG 2015

How research utilisation enhances severe fire weather forecasting
FIRE SEVERITY, FIRE WEATHER

[45]



24 APR 2015

Where to Next with Fire Modelling?
FIRE, FIRE WEATHER

[46]



CRC magazine details research
ENGINEERING, FIRE WEATHER

24 APR 2015

[47]



Mercury rising replay available
COMMUNITIES, FIRE SEVERITY
















07 OCT 2014

[48]

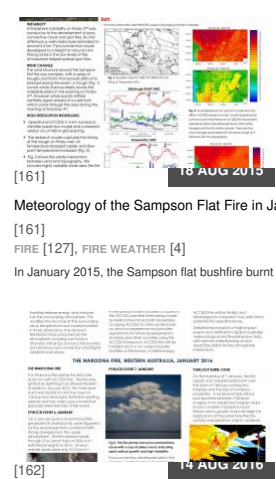
Publications

Year	Type	Citation
2022	Book Chapter	Golding, B. [49] <i>et al. Towards the “Perfect” Weather Warning: Bridging Disciplinary Gaps through Partnership and Communication</i> 149 (Springer Nature, 2022). doi:doi.org/10.1007/978-3-030-98989-7_...
2021	Report	Peace, M. [8], Kepert, J. [6], Ye, H. [54] & Greenslade, J. [55] Coupled fire-atmosphere modelling – final project report [23]. (Bushfire and Natural Hazards CRC, 2021). Google Scholar [56] BibTeX
2020	Journal Article	Peace, M. [8], Charney, J. [59] & Bally, J. [11] Lessons learned from coupled fire-atmosphere research and implications for operational fire prediction and meteorological products provided b
2020	Report	Peace, M. [8], Kepert, J. [6], Ye, H. [54] & Greenslade, J. [55] Coupled fire-atmosphere modelling: ACCESS-Fire – annual report 2019-2020 [65]. (Bushfire and Natural Hazards CRC, 2020). Google
2019	Conference Paper	Peace, M. [8], Kepert, J. [6] & Ye, H. [54] ACCESS-Fire: coupled fire-atmosphere modelling [69]. <i>Bushfire and Natural Hazards CRC Research Day AFAC19</i> (2019). at <https://knowledge.aidr.org.au
2019	Conference Paper	Sturgess, A. [74] & Peace, M. [8] Science in operations: QFES response to the 2018 Queensland fires [75]. <i>Bushfire and Natural Hazards CRC Research Day AFAC19</i> (2019). at <https://knowledge
2019	Journal Article	Virgilio, G. [79] <i>et al. Climate Change Increases the Potential for Extreme Wildfires</i> [80]. <i>Geophysical Research Letters</i> 46 , 8517-8526 (2019). DOI [81] Google Scholar [82] BibTeX [83] EndNote X
2019	Report	Peace, M. [8], Kepert, J. [6] & Ye, H. [54] Coupled fire atmosphere modelling annual report 2018-2019 [85]. (Bushfire and Natural Hazards CRC, 2019). Google Scholar [86] BibTeX [87] EndNote X
2018	Conference Paper	Peace, M. [8], Kepert, J. [6] & Ye, H. [54] Simulations of the waroona fire with the access-fire coupled fire atmosphere model [89]. <i>AFAC18</i> (Bushfire and Natural Hazards CRC, 2018). Google Sci
2018	Conference Paper	Bates, J. [93] Research proceedings from the 2018 Bushfire and Natural Hazards CRC and AFAC Conference [94]. <i>Bushfire and Natural Hazards CRC & AFAC annual conference 2017</i> (Bushfire &
2017	Conference Paper	Peace, M. [8] <i>et al. Lessons learned from a multidisciplinary investigation into the Waroona fire</i> [98]. <i>AFAC17</i> (Bushfire and Natural Hazards CRC, 2017). Google Scholar [99] BibTeX [100] EndN
2017	Journal Article	Peace, M. [8] <i>et al. Meteorological drivers of extreme fire behaviour during the Waroona bushfire, Western Australia, January 2016</i> [102]. <i>Journal of Southern Hemisphere Earth Systems Scienc</i>
2017	Report	Kepert, J. [6], Peace, M. [8] & Ye, H. [54] Coupled fire-atmosphere modelling project: annual project report 2016-17 [107]. (Bushfire and Natural Hazards CRC, 2017). Google Scholar [108] BibTeX
2016	Report	Kepert, J. [6] & Peace, M. [8] Coupled fire-atmosphere modelling: Annual project report 2015-2016 [111]. (Bushfire and Natural Hazards CRC, 2016). Google Scholar [112] BibTeX [113] EndNote X
2015	Presentation	Kepert, J. [6] & Peace, M. [8] Coupled Fire-Atmosphere Modelling [115]. (2015). Google Scholar [116] BibTeX [117] EndNote XML [118]

Presentations & Resources

DATE	TITLE	DOWNLOAD	KEY TOPICS
20 Oct 2014	Managing severe weather - progress and opportunities [121]		risk management [122], severe weather [123]
22 Oct 2014	Managing severe weather: progress and opportunities [124]		forecasting [125], risk management [122], severe weather
27 Oct 2014	The effects of fire-plume dynamics on the spread of long range spotting [126]		fire [127], modelling [128]
01 Apr 2015	Fire Australia Autumn 2015 [129]	 8.64 MB	[130] (3.27 MB) modelling [128], severe weather [123]
02 Sep 2015	The Sydney 2014 Forecasting Demonstration Project A Step from Research to Operations [131]	 1.27 MB	[132] (1.27 MB) fire weather [4], severe weather [123]
22 Mar 2016	Severe and High Impact Weather - cluster overview [133]	 0 bytes	[134] (0.27 MB) modelling [128], scenario analysis [135]
24 Oct 2016	Coupled fire-atmosphere modelling project [136]	 2.46 MB	[137] (2.46 MB) fire weather [4], modelling [128]
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31 Oct 2017	Coupled fire-atmosphere modelling project: ACCESS-Fire [144]	 580.38 KB	[145] (580.38 KB) weather [4], modelling [128]
05 Dec 2017	Lessons learned from the Waroona fire: AFAC webinar [146]	 0 bytes	[147] (0.27 MB) fire weather [4], modelling [128]
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18 Sep 2018	ACCESS-Fire to better understand risk [150]	 1.81 MB	[151] (1.81 MB) modelling [128]
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30 Jul 2019	ACCESS-Fire [157]	 773.27 KB	[158] (773.27 KB) modelling [128]
27 Aug 2019	ACCESS-Fire [159]	 11.32 MB	[160] (11.32 MB) modelling [128]

Posters



[161]
Meteorology of the Sampson Flat Fire in January 2015
 [161]
 FIRE [127], FIRE WEATHER [4]
 In January 2015, the Sampson flat bushfire burnt in the Adelaide hills. it was active for 6 days, burning 12,...



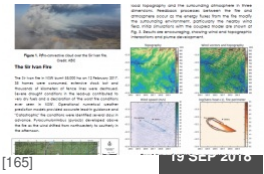
[162]
Coupled fire-atmosphere modelling project: case study of the Waroona fire
 [162]
 REMOTE
 FIRE SEVERITY [3], SENSING [163]
 Coupled fire-atmosphere models show three-dimensional interactions between a fire and the surrounding...



[164] Access-fire: Australia's coupled fire-atmosphere model

[164]
FIRE
IMPACTS [2], FIRE SEVERITY [3]

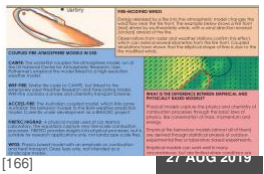
Some bushfires exhibit extreme behaviour that exceeds the bounds of existing predictive guides. Coupling...



[165] Coupled fire-atmosphere simulations of the Sir Ivan Fire

[165]
FIRE
IMPACTS [2], FIRE SEVERITY [3]

ACCESS-Fire couples an empirical fire spread model to the Australian numerical weather prediction model. The...



[166] Lessons learned from coupled fire-atmosphere research and implications for operational fire modelling

[166]
FIRE
IMPACTS [2], FIRE SEVERITY [3]

Coupled models are a class of fire prediction models that combine fire and atmospheric components. The...



[167] ACCESS-Fire: a case study

[167]
MODELLING [128]

Key findings: Coupled modelling can provide the next level of value for fire danger forecasting, if it can be...

Linked Projects

Through the flames - quantitative analysis of strategic and tactical wildfire suppression

[168] BUSHFIRE PREDICTIVE SERVICES [169]

Dr Greg Penney
Edith Cowan University [170]



[170]

Threshold conditions for extreme fire behaviour

[171] BUSHFIRE PREDICTIVE SERVICES [169]

A/Prof Trent Penman
University of Melbourne [172]



[172]

Fire coalescence and mass spotfire dynamics

[173] BUSHFIRE PREDICTIVE SERVICES [169]

Prof Jason Sharples
University of New South Wales [174]



[174]

Links

[https://www.bnhrcr.com.au/files/report/png1\[2\]](https://www.bnhrcr.com.au/files/report/png1[2]) <https://www.bnhrcr.com.au/research/topics/risk-management> <https://www.bnhrcr.com.au/research/topics/fire-severity> [4] <https://www.bnhrcr.com.au/news/2021/new-online-january-2021> [28] <https://www.bnhrcr.com.au/research/coupledfire> [6] <https://www.bnhrcr.com.au/people/kperpet> [7] <https://www.bnhrcr.com.au/organisations/bath> [8] <https://www.bnhrcr.com.au/people/mpacee> [9] <https://www.bnhrcr.com.au/people/astark> [10] <https://www.bnhrcr.com.au/organisations/cfs> [11] <https://www.bnhrcr.com.au/people/jbalby> [12] <https://www.bnhrcr.com.au/organisations/afac> [13] <https://www.bnhrcr.com.au/people/lmccaw> [14] <https://www.bnhrcr.com.au/organisations/dpaw> [15] <https://www.bnhrcr.com.au/people/lmccoq> [16] <https://www.bnhrcr.com.au/organisations/nswrfis> [17] <https://www.bnhrcr.com.au/people/mccahill> [18] <https://www.bnhrcr.com.au/organisations/tasfire> [19] <https://www.bnhrcr.com.au/people/mwouters> [20] <https://www.bnhrcr.com.au/organisations/dewnr> [21] <https://www.bnhrcr.com.au/people/nburrows> [22] <https://www.bnhrcr.com.au/people/sheemstra> [23] <https://www.bnhrcr.com.au/publications/biblio/bnh-7900> [24] <https://www.bnhrcr.com.au/news/2021/new-online-january-research-show> [25] <https://www.bnhrcr.com.au/news/2021/new-online-march-2021> [26] <https://www.bnhrcr.com.au/news/2021/australia-dia-honours-cr-experts> [27] <https://www.bnhrcr.com.au/news/2021/new-online-january-2021> [28] <https://www.bnhrcr.com.au/news/2020/new-online-november-2020> [29] <https://www.bnhrcr.com.au/news/2019/special-edition-monographs-share-afac19-science-0> [30] <https://www.bnhrcr.com.au/news/2019/crc-science-making-national-impact> [31] <https://www.bnhrcr.com.au/news/2019/what-happens-when-women-thrive-fire> [32] <https://www.bnhrcr.com.au/news/2019/bushfire-modelling-boost> [33] <https://www.bnhrcr.com.au/news/2019/queensland-fire-contribution-awarded> [34] <https://www.bnhrcr.com.au/news/2019/new-online-august-2019> [35] <https://www.bnhrcr.com.au/news/2019/severe-weather-research-has-impact> [36] <https://www.bnhrcr.com.au/news/2019/science-expertise-helps-queensland> [37] <https://www.bnhrcr.com.au/news/2019/cr-research-magazines-spotlight> [38] <https://www.bnhrcr.com.au/news/2019/fire-prediction-aides-queensland> [39] <https://www.bnhrcr.com.au/news/2019/fire-science-helps-queensland> [40] <https://www.bnhrcr.com.au/news/2019/decade-advancements-fire-weather> [41] <https://www.bnhrcr.com.au/news/2019/conference-papers-available-online> [42] <https://www.bnhrcr.com.au/news/2018/science-publish-researcher> [43] <https://www.bnhrcr.com.au/news/2017/new-online-november-2017> [44] <https://www.bnhrcr.com.au/news/2016/new-online-august-2016> [45] <https://www.bnhrcr.com.au/news/2015/how-research-utilisation-enhances-severe-fire-weather-forecasting> [46] <https://www.bnhrcr.com.au/news/2015/where-next-fire-modelling> [47] <https://www.bnhrcr.com.au/news/2015/crc-magazine-details-research> [48] <https://www.bnhrcr.com.au/news/2014/mercury-rising-live-streams-available> [49] <https://www.bnhrcr.com.au/publications/biblio/?%5Bauthor%5D=2088> [50] http://dx.doi.org/10.1007/978-3-030-98989-7_6 [51] [http://scholar.google.com/scholar?](http://scholar.google.com/scholar?btnG=Search%2BScholar&as_q=%22Connecting%2BWeather%2Band%2BHazard%3A%2BA%2Bpartnership%2Bof%2Bphysical%2Bscientists%2Bin%2Bconnected%2Bdisciplines%22&as_sauthors=Golding&as_occt=any&as_eq=&as_oq=&as_eq=&as_publication=&as_ylo=&as_yhi=&as_sdtAP=1&as_sdtP=1)
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