



House loss Black Saturday

- Key Topics:
- economics [2]
  - multi-hazard [3]
  - risk analysis [4]


An analysis of building losses and human fatalities from natural disasters [5]  
This study has informed community flood warning campaigns, emergency services training and national policy initiatives by investigating the circumstances of all flood fatalities in Australia from 1900 to 2015. It has also compare the impacts of disasters from more than 100 years ago with more recent events.  
By exploring the socio-demographic and environmental factors surrounding the 1,859 flood fatalities over 115 years, the research found distinct trends in relation to gender, age, activity and the circumstances of the death. These trends were analysed in the context of changes to emergency management policy and practice over time.

Project: detail Notabs


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<div data-bbox="92 573 121 595">[28]</div> <div data-bbox="384 488 486 580"></div> <div data-bbox="379 604 496 656"> <b>Marcus Morgan</b>  [28]  END-USER </div> <div data-bbox="399 685 474 719"></div> <div data-bbox="92 725 121 748">[18]</div>	<div data-bbox="813 573 842 595">[29]</div> <div data-bbox="1106 488 1208 580"></div> <div data-bbox="1091 604 1224 656"> <b>Melissa O'Halloran</b>  [29]  END-USER </div> <div data-bbox="1133 678 1182 734"></div> <div data-bbox="813 725 842 748">[20]</div>
<div data-bbox="92 927 121 949">[30]</div> <div data-bbox="384 842 486 934"></div> <div data-bbox="384 958 486 1010"> <b>Tim Wiebusch</b>  [30]  END-USER </div> <div data-bbox="419 1032 453 1088"></div> <div data-bbox="92 1081 121 1104">[31]</div>	

## Description

This study has informed community flood warning campaigns, emergency services training and national policy initiatives by investigating the circumstances of all flood fatalities in Australia from 1900 to 2015. It has also compare the impacts of disasters from more than 100 years ago with more recent events.

By exploring the socio-demographic and environmental factors surrounding the 1,859 flood fatalities over 115 years, the research found distinct trends in relation to gender, age, activity and the circumstances of the death. These trends were analysed in the context of changes to emergency management policy and practice over time.

The NSW State Emergency Service has used the findings of the research for its 'FloodSafe' community campaign and training, while the Queensland Fire and Emergency Services has used it to inform its 'If It's Flooded, Forget it' campaign.

The results of this research have significantly contributed to investigations into preventing flood fatalities by the Prevention of Flood Related Fatalities Working Group of the Community Engagement Sub-committee of the Australia–New Zealand Emergency Management Committee. This working group comprised policy makers, practitioners and researchers involved in flood risk management from Australia and New Zealand.

Similar analysis has recently been completed for fatalities due to cyclones, earthquakes and severe storms across the same time period (1900 to 2015). At least 406 fatalities occurred, with three quarters due to severe storms. The majority of these fatalities have been males.

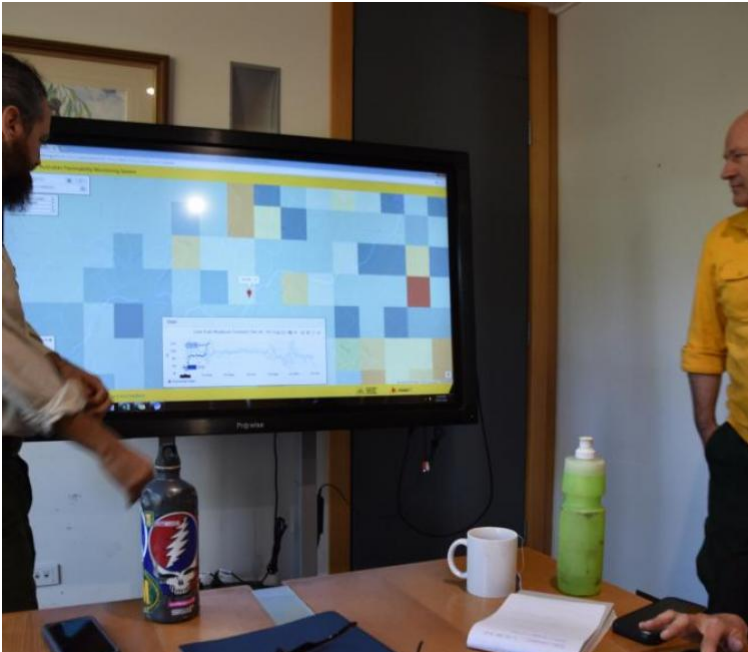
As well as fatalities, the project has also explored building damage, by hazard, across time and by state or territory. Historical losses have been adjusted for known societal changes (i.e. numbers of homes, the value of these homes and improvements in building codes and construction). While there is substantial variability across time, there is no statistically significant upward trend in the cost of natural hazards. This result implies that no signal has yet been detected to indicate that insured losses from causes other than societal changes (such as population changes and wealth growth) are increasing.

No single hazard dominates or is responsible for most insured building losses— hailstorms, cyclones, floods, earthquakes and bushfires all feature as the most damaging events in Australia.

[Read the final report here.](#) [32]

Download:  
 Analysis of building losses and human fatalities from natural disasters - project overview [33], Overview of flood research findings [34]

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Establishing a wider view of impact  
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[35]



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[36]



22 AUG 2019

New online - August 2019  
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[37]



27 JUN 2019

Community engagement research picks up prizes  
COMMUNICATION, WARNINGS

[38]





National award for warnings research  
COMMUNICATION, FLOOD

30 MAY 2019

[39]



Planning for catastrophe: an all-hazards, whole-of-community approach  
EARTHQUAKE, EMERGENCY MANAGEMENT

27 MAY 2019

[40]



13 FEB 2019

Science informing media  
EMERGENCY MANAGEMENT, FIRE

[41]



18 DEC 2018

New online - December 2018  
EMERGENCY MANAGEMENT, MODELLING

[42]



Looking back can prevent future flood deaths  
ECONOMICS, FLOOD

12 DEC 2018

[43]



Preparing for the future focus of magazine  
CYCLONE, EMERGENCY MANAGEMENT

07 DEC 2018

[44]





06 DEC 2018

Research benefits flowing  
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[45]



12 JUN 2018

Animal research awarded  
ANIMALS, COMMUNICATION

[46]



Flood research highlighted  
COMMUNITIES, FLOOD

07 FEB 2018

[47]



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11 JAN 2018

[48]



Looking back can prevent future flood deaths  
ECONOMICS, FLOOD

18 DEC 2017

[49]



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[50]





21 JUL 2017

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13 JUL 2017

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[53]



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EMERGENCY MANAGEMENT, MULTI-HAZARD

[54]



30 MAY 2017

Where, why and how are Australians dying in floods?  
COMMUNICATION, EDUCATION

[55]



26 APR 2017

History provides a lesson in preventing flood deaths  
DECISION MAKING, FLOOD

[56]



30 JAN 2017

Research informs flood safe campaign  
DECISION MAKING, EDUCATION

[57]



16 NOV 2016

Watch our science  
EMERGENCY MANAGEMENT, LAND MANAGEMENT

[58]





New online - September 2016

14 SEP 2016

[59]



New online - July 2015

25 JUL 2016

[60]





Important research insights  
ECONOMICS, FLOOD

24 JUN 2016

[61]



New online - June 2016

16 JUN 2016

[62]



08 JUN 2016

Flood paper highly commended  
FLOOD, RISK ANALYSIS

[63]



07 JUN 2016

Flood deaths are avoidable: don't go in the water  
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[64]



Quick science in videos  
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15 OCT 2015

[65]



Succinct science is key  
FIRE SEVERITY, FLOOD

14 OCT 2015

[66]





Searching for clues  
DECISION MAKING, FLOOD

15 JUL 2015

[67]



Major award for CRC researcher  
COMMUNITIES, RESILIENCE

25 MAY 2015

[68]





11 MAR 2015

Newsletter 3 - fatalities and building losses  
FLOOD, HEAT TRANSFER

[69]



13 FEB 2015

Media get briefing on key research issues  
EMERGENCY MANAGEMENT, MITIGATION

[70]



Research profiled in CRC magazine

09 FEB 2015

[71]



A century of natural hazards - what are the costs?  
ECONOMICS, MULTI-HAZARD

23 JAN 2015

[72]





Newsletter 2 - fatalities and building losses

29 OCT 2014

[73]



Newsletter 1 - fatalities and building losses  
FIRE IMPACTS, INFRASTRUCTURE

13 JUN 2014



















[74]

## Publications



Year	Type	Citation
2023	Journal Article	Gissing, A. [8], Hamilton, K. [75], Smith, G. [76] & Peden, A. [77] <b>Vehicle-related causes of flood fatalities</b> [78]. <i>Natural Hazard Science</i> (2023). doi:https://doi.org/10.1093/acrefore/9780199389407.01
2019	Journal Article	Fountain, L. [83], Tofa, M. [12], Haynes, K. [6], Taylor, M. [84] & Ferguson, S. [85] <b>Older adults in disaster and emergency management: What are the priority research areas in Australia?</b> [86]. <i>In</i>
2019	Journal Article	Gissing, A. [8], Oppen, S. [91], Tofa, M. [12], Coates, L. [11] & McAneney, J. [10] <b>Influence of road characteristics on flood fatalities in Australia</b> [92]. <i>Environmental Hazards</i> <b>18</b> , (2019). DOI [93] Google Scholar [94] BibTeX [95] EndNote XML [96]
2019	Report	Coates, L. [11] <i>et al.</i> <b>Flash flood fatalities in NSW, VIC, ACT and South East QLD from 1 January 2000 to 30 June 2017</b> [97]. (Bushfire and Natural Hazards CRC, 2019). Google Scholar [98] BibTeX [99] EndNote XML [100]
2018	Report	Tofa, M. [12] <i>et al.</i> <b>Exploring the experiences of those who shelter in place during severe flooding</b> [101]. (Bushfire and Natural Hazard CRC, 2018). Google Scholar [102] BibTeX [103] EndNote XML [104]
2017	Conference Paper	Rumsewicz, M. [105] <b>Research proceedings from the 2017 Bushfire and Natural Hazards CRC and AFAC Conference</b> [106]. <i>Bushfire and Natural Hazards CRC &amp; AFAC annual conference 2017</i> (2017). Google Scholar [107] BibTeX [108] EndNote XML [109]
2017	Conference Paper	Haynes, K. [6], Tofa, M. [12], Gissing, A. [8], Coates, L. [11] & Roche, K. [110] <b>Sheltering in place during flooding: a case study of ex cyclone Debbie</b> [111]. <i>AFAC17</i> (Bushfire and Natural Hazards CRC, 2017). Google Scholar [112] BibTeX [113] EndNote XML [114]
2017	Journal Article	Haynes, K. [6] <i>et al.</i> <b>Exploring the circumstances surrounding flood fatalities in Australia—1900–2015 and the implications for policy and practice</b> [115]. <i>Environmental Science &amp; Policy</i> <b>76</b> , 16–25 (2017). DOI [116] Google Scholar [117] BibTeX [118] EndNote XML [119]
2017	Report	Coates, L. [11] <i>et al.</i> <b>An analysis of human fatalities from cyclones, earthquakes and severe storms in Australia</b> [32]. (Bushfire and Natural Hazards CRC, 2017). Google Scholar [120] BibTeX [121] EndNote XML [122]
2017	Report	Haynes, K. [6], Coates, L. [11] & Gissing, A. [8] <b>An analysis of human fatalities and building losses from natural disasters: annual project report 2016-17</b> [123]. (Bushfire and Natural Hazards CRC, 2017). Google Scholar [124] BibTeX [125] EndNote XML [126]
2017	Report	McAneney, J. [10] <i>et al.</i> <b>A natural hazard building loss profile for Australia: 1900-2015</b> [127]. (Bushfire and Natural Hazards CRC, 2017). Google Scholar [128] BibTeX [129] EndNote XML [130]
2017	Report	Gissing, A. [8], Tofa, M. [12], Oppen, S. [91] & Haynes, K. [6] <b>Influence of road characteristics on flood fatalities in Australia</b> [131]. (Bushfire and Natural Hazards CRC, 2017). Google Scholar [94] BibTeX [95] EndNote XML [96]
2016	Conference Paper	Rumsewicz, M. [105] <b>Research proceedings from the 2016 Bushfire and Natural Hazards CRC and AFAC conference</b> [134]. <i>Bushfire and Natural Hazards CRC &amp; AFAC annual conference 2016</i> (2016). Google Scholar [135] BibTeX [136] EndNote XML [137]
2016	Conference Paper	Rae, E. [138], Campbell, P. [139], Haynes, K. [6], Gissing, A. [8] & Coates, L. [11] <b>Preventing flood related fatalities: a focus on people driving through floodwater</b> [140]. <i>AFAC16</i> (Bushfire and Natural Hazards CRC, 2016). Google Scholar [141] BibTeX [142] EndNote XML [143]
2016	Journal Article	Gissing, A. [8], Haynes, K. [6], Coates, L. [11] & Keys, C. [144] <b>Motorist behaviour during the 2015 Shoalhaven floods</b> [145]. <i>Australian Journal of Emergency Management</i> <b>31</b> , (2016). Google Scholar [146] BibTeX [147] EndNote XML [148]
2016	Report	Haynes, K. [6] <i>et al.</i> <b>An analysis of human fatalities from floods in Australia 1900-2015</b> [149]. (2016). Google Scholar [150] BibTeX [151] EndNote XML [152]
2016	Report	Haynes, K. [6], Coates, L. [11] & van den Honert, R. [16] <b>An analysis of human fatalities and building losses from natural disasters: Annual project report 2015-2016</b> [153]. (Bushfire and Natural Hazards CRC, 2016). Google Scholar [154] BibTeX [155] EndNote XML [156]
2015	Conference Paper	van den Honert, R. [16], Coates, L. [11], Haynes, K. [6] & Crompton, R. [15] <b>Estimating the Impacts of Natural Hazards on Fatalities and Building Losses Conference Paper 2014</b> [157]. <i>Bushfire and Natural Hazards CRC &amp; AFAC annual conference 2015</i> (2015). Google Scholar [158] BibTeX [159] EndNote XML [160]
2015	Conference Paper	Rumsewicz, M. [105] <b>Research proceedings from the 2015 Bushfire and Natural Hazards CRC &amp; AFAC conference</b> [161]. <i>Bushfire and Natural Hazards CRC &amp; AFAC annual conference 2015</i> (2015). Google Scholar [162] BibTeX [163] EndNote XML [164]
2015	Conference Paper	Gissing, A. [8], Haynes, K. [6], Coates, L. [11] & Keys, C. [144] <b>How do we reduce vehicle related deaths: exploring Australian flood fatalities 1900-2015 - non peer reviewed extended abstract</b> [165]. <i>AFAC15</i> (Bushfire and Natural Hazards CRC, 2015). Google Scholar [166] BibTeX [167] EndNote XML [168]
2015	Journal Article	Gissing, A. [8], Haynes, K. [6], Coates, L. [11] & Keys, C. [144] <b>Reducing deaths from driving into floodwaters</b> [169]. <i>Crisis Response Journal</i> <b>11</b> , 66-67 (2015). Google Scholar [170] BibTeX [171] EndNote XML [172]
2015	Report	van den Honert, R. [16] <b>An Analysis of Human Fatalities and Building Losses from Natural Disasters Annual Report 2014</b> [173]. (2015). Google Scholar [174] BibTeX [175] EndNote XML [176]
2015	Report	Haynes, K. [6] & Coates, L. [11] <b>An analysis of building losses and human fatalities from natural disasters: Annual project report 2014-2015</b> [177]. (Bushfire and Natural Hazards CRC, 2015). Google Scholar [178] BibTeX [179] EndNote XML [180]
2014	Journal Article	Okada, T. [181], Haynes, K. [6], Bird, D. [182], van den Honert, R. [16] & King, D. [183] <b>Recovery and Resettlement following the 2011 flash flooding in Lockyer Valley</b> [184]. <i>International Journal of Disaster Resilience</i> <b>10</b> , 103–114 (2014). DOI [185] Google Scholar [186] BibTeX [187] EndNote XML [188]
2014	Journal Article	Coates, L. [11], Haynes, K. [6], O'Brien, J. [188], McAneney, J. [10] & de Oliveira, F. Dimer [189]. <b>Exploring 167 years of vulnerability: An examination of extreme heat events in Australia 1844–2013</b> [190]. <i>International Journal of Disaster Resilience</i> <b>10</b> , 115–127 (2014). DOI [191] Google Scholar [192] BibTeX [193] EndNote XML [194]

Presentations & Resources

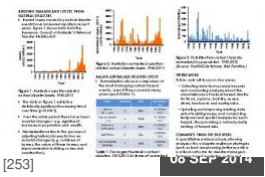
DATE	TITLE	DOWNLOAD	KEY TOPICS
21 Mar 2014	An analysis of human fatalities and building losses from natural disasters [197]	 250.37 KB	[198] (250.37 KB), infrastructure [199], risk analysis [4]
07 Aug 2014	Measuring the impacts of bushfires on human fatalities and building losses [200]	 3.25 MB	[201] (3.25 MB), fire [203]
08 Sep 2014	NSW RFS bushfire household assessment tool [204]	 3.62 MB	[205] (3.62 MB), living [206], risk analysis [4]
08 Sep 2014	Measuring the impacts of natural hazards on human fatalities and building losses [207]	 1.66 MB	[208] (1.66 MB)
27 Oct 2014	Estimating the impacts of natural hazards on property and bulding losses [209]		infrastructure [199], resilience [210]
15 Jan 2015	Fire Australia Summer 2014-15 [211]	 10.47 MB	[212] (10.47 MB), communities [214], multi-hazard [3]
10 Apr 2015	Human Fatalities and Building Losses 2015 NSW RAF Presentation [215]	 2.3 MB	[216] (2.3 MB), infrastructure [199], multi-hazard [3]
20 Aug 2015	An analysis of building losses and human fatalities from natural disasters [217]	 0 bytes	[218] (0 bytes), multi-hazard [3], risk analysis [4]
27 Aug 2015	Learning from the past, planning for the future [219]	 166.29 KB	[220] (166.29 KB), multi-hazard [3], risk analysis [4]
03 Sep 2015	An analysis of human fatalities from flood hazards in Australia 1900-2014 [222]	 1.39 MB	[223] (1.39 MB), risk analysis [4], risk management [225]
17 May 2016	An analysis of human fatalities from flood hazards in Australia, 1900-2015 [226]	 1.78 MB	[227] (1.78 MB), management [228], flood [224], risk analysis [4]
01 Sep 2016	An analysis of human fatalities from flood hazards in Australia, 1900-2015 - Katharine Haynes [229]	 1.28 MB	[230] (1.28 MB), flood [224], policy [232]
01 Sep 2016	Prevention of flood-related fatalities: a focus on driving through floodwater - Elspeth Rae [233]	 2.26 MB	[234] (2.26 MB), living [206], education [231], flood [224]
12 Oct 2016	Overview of flood research findings - An analysis of building losses and human fatalities [235]	 0 bytes	[236] (0 bytes), living [206], flood [224], warnings [237]
13 Oct 2016	Where, why and how are Australians dying in floods? [238]	 867.95 KB	[239] (867.95 KB), [206], flood [224], warnings [237]
18 Apr 2017	An Analysis of Building Losses and Human Fatalities from Natural Disasters [240]	 5.22 MB	[241] (5.22 MB), multi-hazard [3], risk analysis [4]
30 May 2017	Fire Australia Issue Two 2017 [242]	 5.11 MB	[243] (5.11 MB), severe weather [244], volunteering [245]
07 Sep 2017	Sheltering during floods: experiences of residents and businesses in the Northern Rivers region [246]	 760.42 KB	[247] (760.42 KB), flood [224], severe weather [244]
08 Oct 2020	How do road characteristics influence flood fatalities? [248]	 820.34 KB	[249] (820.34 KB) [250], decision making [206], flood [224]
25 Nov 2020	Looking back can prevent future flood deaths [251]		economics [2], flood [224], risk analysis [4]

Posters



The heat is on... and has been for a while, new research shows

A paper analysing the historical impacts of extreme heatwaves in Australia has been one of the first outputs...



Estimating the Impacts of Natural Hazards on Property and Building Losses

To measure and understand the impacts of natural hazards in terms of the toll on human life and injuries, and...



Would You Drive Through Flood Water?

FLOOD [224], POLICY [232]

Floods are the second highest cause of death from natural hazard events in Australia following extreme heat...



Who wants to be a survivor?

DECISION MAKING [206], ECONOMICS [2]

This project is measuring and gaining a greater understanding of the impacts of natural hazards in terms of...



An analysis of human fatalities and building losses from natural disasters in Australia

ECONOMICS [2], MULTI-HAZARD [3]

Who is most at risk? Why? What are they doing? How have vulnerability and exposure trends changed over time? ...

Linked Projects

Mapping and understanding bushfire and natural hazard vulnerability and risks at the institutional scale

ECONOMICS AND STRATEGIC DECISIONS [258]

Prof Roger Jones  
Victoria University [259]



[259]

Economics of natural hazards

ECONOMICS AND STRATEGIC DECISIONS [258]

Dr Veronique Florec  
University of Western Australia [261]



[261]

Improved decision support for natural hazard risk reduction

ECONOMICS AND STRATEGIC DECISIONS [258]



## Optimising post-disaster recovery interventions in Australia [264]

ECONOMICS AND STRATEGIC DECISIONS [258]



## Using realistic disaster scenario analysis to understand natural hazard impacts and emergency management requirements [266]

SCENARIOS AND LOSS ANALYSIS [267]



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[1] <https://www.bnhcrc.com.au/files/research-taskforce-feb-20094.jpg> [2] <https://www.bnhcrc.com.au/research/topics/economics> [3] <https://www.bnhcrc.com.au/research/topics/multi-hazard> [4] <https://www.bnhcrc.com.au/research/topics/risk-analysis> [5] <https://www.bnhcrc.com.au/research/buildinglosses> [6] <https://www.bnhcrc.com.au/people/khaynes> [7] <https://www.bnhcrc.com.au/organisations/uow> [8] <https://www.bnhcrc.com.au/people/agising> [9] <https://www.bnhcrc.com.au/node/4221> [10] <https://www.bnhcrc.com.au/people/imcaneney> [11] <https://www.bnhcrc.com.au/people/coates> [12] <https://www.bnhcrc.com.au/people/mtola> [13] <https://www.bnhcrc.com.au/organisations/magrf> [14] <https://www.bnhcrc.com.au/people/nmadappatt> [15] <https://www.bnhcrc.com.au/people/rcrompton> [16] <https://www.bnhcrc.com.au/people/rvandenhorst> [17] <https://www.bnhcrc.com.au/people/bdaviess> [18] <https://www.bnhcrc.com.au/organisations/nswsfs> [19] <https://www.bnhcrc.com.au/people/cshackleton> 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