



Flooded house Victoria

- Key Topics:
- communication [2]
 - communities [3]
 - resilience [4]


Effective risk and warning communication during natural hazards [5]
This research examined existing and modified communication to community members who may be affected by natural hazards to derive evidence-based insights into risk and warning communication during the response phase of emergencies. Through this project, the research team developed an evidence base for the context of risk and warning messages across multiple channels and sources, constructed evidence-based warning messages that overcome ambiguity caused by conflict between warning messages and socio-environmental cues, optimised warning messages to improve community members' readiness to act in accordance with emergency instructions, and translated research findings into practical tools tailored to the existing and emergent needs of end-users.

Project: detail Notabs


Research team

Research leader

[6]




Prof Vivienne Tippet
[6]
RESEARCH LEADER



[7]


Research team

[8]





















Prof Amisha Mehta
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RESEARCH TEAM





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A/Prof Amanda Stickley
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RESEARCH TEAM

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[16]	 Sharon Christensen [16] RESEARCH TEAM  Queensland University of Technology	[17]	 Dr Sophie Miller [17] RESEARCH TEAM  Queensland University of Technology

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Marc Unsworth
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<div data-bbox="92 329 121 349">[65]</div> <div data-bbox="384 239 486 329">  </div> <div data-bbox="384 356 481 407"> <p>Nicola Moore [65] END-USER</p> </div> <div data-bbox="357 430 515 481">  </div> <div data-bbox="92 479 121 499">[66]</div>	<div data-bbox="815 329 844 349">[67]</div> <div data-bbox="1102 239 1204 329">  </div> <div data-bbox="1117 356 1190 407"> <p>Neil Payn [67] END-USER</p> </div> <div data-bbox="1134 430 1173 481">  </div> <div data-bbox="815 479 844 499">[50]</div>
<div data-bbox="92 685 121 705">[68]</div> <div data-bbox="384 584 486 685">  </div> <div data-bbox="384 712 485 763"> <p>Philip Lindsay [68] END-USER</p> </div> <div data-bbox="411 786 459 837">  </div> <div data-bbox="92 835 121 855">[69]</div>	<div data-bbox="815 685 844 705">[70]</div> <div data-bbox="1102 584 1204 685">  </div> <div data-bbox="1094 712 1212 763"> <p>Peta Miller-Rose [70] END-USER</p> </div> <div data-bbox="1126 786 1177 837">  </div> <div data-bbox="815 835 844 855">[36]</div>
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<div data-bbox="92 1402 121 1422">[74]</div> <div data-bbox="384 1308 486 1397">  </div> <div data-bbox="384 1424 475 1476"> <p>Shane Batt [74] END-USER</p> </div> <div data-bbox="392 1498 475 1550">  </div> <div data-bbox="92 1547 121 1568">[73]</div>	<div data-bbox="815 1402 844 1422">[75]</div> <div data-bbox="1102 1299 1204 1397">  </div> <div data-bbox="1102 1424 1201 1476"> <p>Suellen Flint [75] END-USER</p> </div> <div data-bbox="1098 1498 1204 1550">  </div> <div data-bbox="815 1547 844 1568">[40]</div>
<div data-bbox="92 1760 121 1780">[76]</div> <div data-bbox="384 1666 486 1756">  </div> <div data-bbox="375 1783 493 1834"> <p>Simon Goodwin [76] END-USER</p> </div> <div data-bbox="341 1856 518 1908">  </div> <div data-bbox="92 1906 121 1926">[55]</div>	<div data-bbox="815 1760 844 1780">[77]</div> <div data-bbox="1102 1657 1204 1756">  </div> <div data-bbox="1098 1783 1208 1834"> <p>Shoni Maguire [77] END-USER</p> </div> <div data-bbox="1086 1856 1219 1908">  </div> <div data-bbox="815 1906 844 1926">[78]</div>
<div data-bbox="92 2119 121 2139">[79]</div> <div data-bbox="384 2009 486 2110">  </div> <div data-bbox="375 2136 491 2157"> <p>Tamsin Achilles</p> </div>	<div data-bbox="815 2119 844 2139">[80]</div> <div data-bbox="1102 2009 1204 2110">  </div> <div data-bbox="1102 2136 1200 2157"> <p>Trent Curtin</p> </div>

[79]
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Student researchers

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Dr Melanie Baker-Jones
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Description

The release of the National Review of Warnings and Information (Emergency Management Victoria, 2014) triggered the need for a range of evidence-based practice about constructing better natural hazard emergency warning messages. This research derived evidence-based insights into risk and warning communication during the response phase of natural hazard emergencies. The research examines existing and modified communication to community members who may be affected by natural hazards. The work outlined in this report builds on our previous CRC project on effective communication in natural hazards.

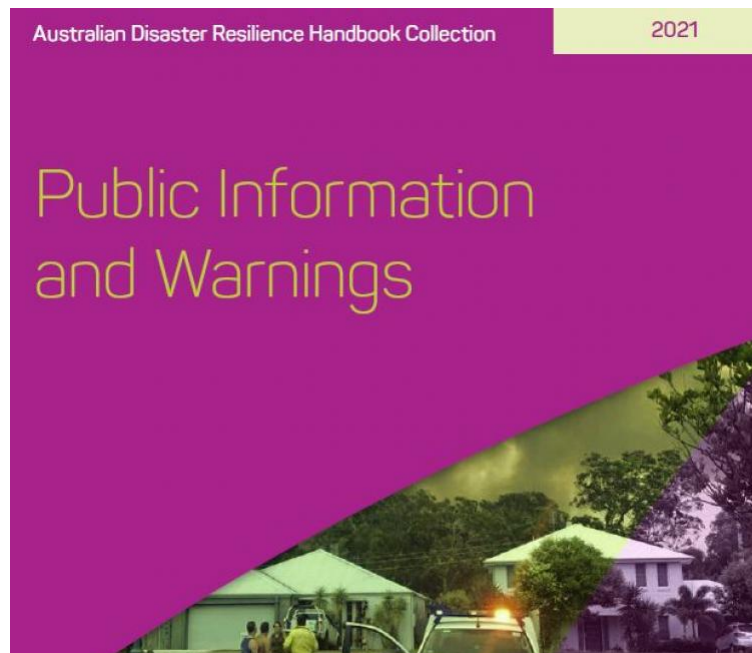
The first CRC project (2014-2017) focused on the pre-decisional processes of community members and business owners, particularly their exposure to, attention to, and comprehension of warning messages in the response and early recovery phase of multiple hazards. The following project (2017-2020) built on that knowledge and focussed on how the inputs into the pre-decisional process—environmental cues, social cues, information sources, channel access and preference, warning messages and receiver characteristics—inform protective action during the response phases of natural hazards.

This project employs a multi-method, multi-hazard research design to:

- develop an evidence-base for the content of risk and warning messaging across multiple channels and sources (e.g., media channels and agencies) to enhance trust in agencies and encourage positive community responses to events (e.g., evacuating and information sharing)
- construct evidence-based warning messages that overcome ambiguity caused by conflict between warning messages and socio-environmental cues (e.g., blue-sky flooding)
- optimise warning messages to improve community members' readiness to act in accordance with emergency instructions
- translate research findings into practical tools tailored to the existing and emergent needs of end-users.

[Read the final report here.](#) [81]

Related News



Key warnings guidelines backed by latest CRC research
COMMUNICATION, COMMUNITIES

21 JAN 2022

[82]

munication and war

olution of unications and warnings ergency preparedness, se and recovery

24 AUG 2021

Protecting communities with better warnings and communications – an online guide to using the latest research
COMMUNICATION, COMMUNITIES

[83]



30 JUL 2021

New online - July 2021
EMERGENCY MANAGEMENT, LAND MANAGEMENT

[84]



22 APR 2021

New online – April 2021
MULTI-HAZARD, RESILIENCE

[85]



23 FEB 2021

New online - February 2021
COMMUNICATION, EMERGENCY MANAGEMENT

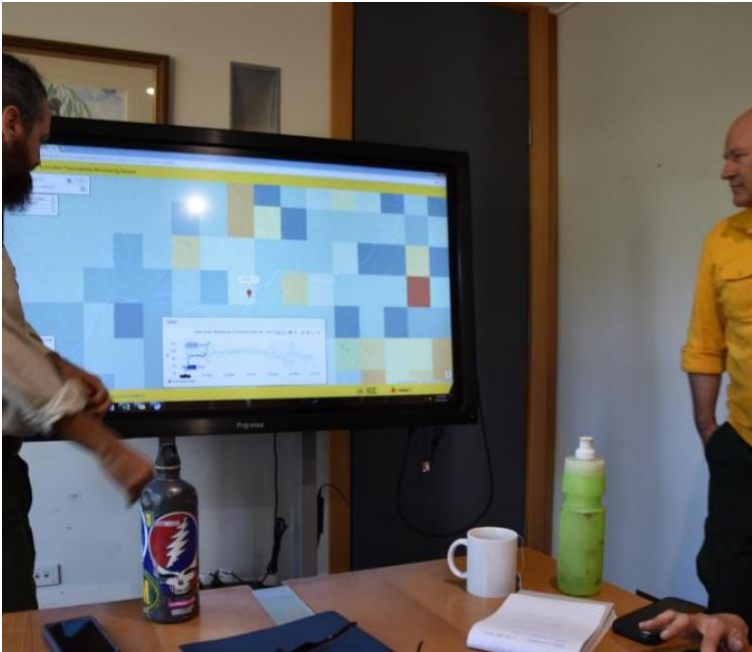
[86]



28 JAN 2021

New online - January 2021
COMMUNICATION, EMERGENCY MANAGEMENT

[87]



18 NOV 2020

Establishing a wider view of impact
LOCAL KNOWLEDGE

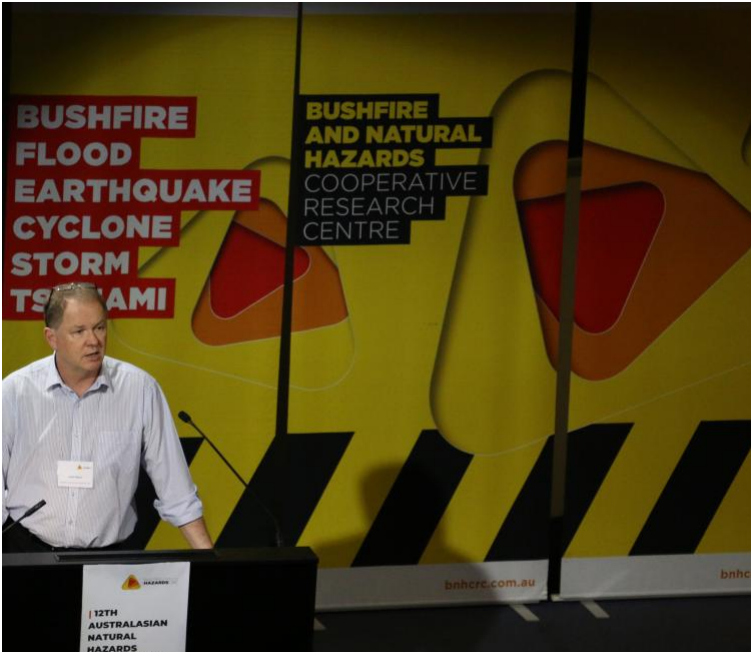
[88]



05 NOV 2020

3.2 billion images and 720,000 hours of video are shared online daily. Can you sort real from fake?
COMMUNICATION, COMMUNITIES

[89]



20 OCT 2020

Are we ready now? Will we be ready then?
COMMUNICATION, COMMUNITIES

[90]



30 JUN 2020

Science galore – key CRC event dates
EMERGENCY MANAGEMENT, PRESCRIBED BURNING

[91]



10 JUN 2020

Excellence in CRC research nationally recognised
COMMUNICATION, VOLUNTEERING

[92]



20 MAY 2020

New Fellowship for researcher
COMMUNICATION, COMMUNITIES

[93]



13 FEB 2020

Science Roundtable meets on bushfires
FIRE, FIRE IMPACTS

[94]



10 FEB 2020

Breaking down Australia's bushfires
COMMUNITIES, EMERGENCY MANAGEMENT

[95]



18 DEC 2019

Researcher acknowledged with Vice Chancellor award
COMMUNICATION, DECISION MAKING

[96]



04 SEP 2019

Magazine highlights data and warnings research
COMMUNICATION, EMERGENCY MANAGEMENT

[99]



19 AUG 2019

Collaboration is key for communications cluster success
CLIMATE CHANGE, COMMUNICATION

[100]



24 JUL 2019

New online - July 2019
EMERGENCY MANAGEMENT, FIRE

[101]



28 JUN 2019

Is it floodwater, a wet road or just a puddle?
COMMUNICATION, DECISION MAKING

[102]



27 JUN 2019

Community engagement research picks up prizes
COMMUNICATION, WARNINGS

[103]



30 MAY 2019

National award for warnings research
COMMUNICATION, FLOOD

[104]



12 DEC 2018

Better warnings to ensure action
COMMUNICATION, COMMUNITIES

[105]



07 DEC 2018

Preparing for the future focus of magazine
CYCLONE, EMERGENCY MANAGEMENT

[106]



06 DEC 2018

Research benefits flowing
DECISION MAKING, FIRE

[107]



13 JUN 2018

Queen's Birthday Honours for CRC researcher
COMMUNICATION, EMERGENCY MANAGEMENT

[108]



Animal research awarded
ANIMALS, COMMUNICATION

12 JUN 2018

[109]



International insights and local lessons: Themes from the International Risk and Crisis Communication Conference
COMMUNICATION, COMMUNITIES

21 MAY 2018

[110]



Risk and warning communication that supports women during disasters
COMMUNICATION, FLOOD

08 MAR 2018

[111]



Better warnings to ensure action
COMMUNICATION, COMMUNITIES

18 DEC 2017

[112]



New online - November 2017

17 NOV 2017

[113]



Flood warning research leading impact
COMMUNICATION, FLOOD

04 OCT 2017

[114]



02 FEB 2017

Enhancing emergency warnings
COMMUNICATION, DECISION MAKING

[115]



17 NOV 2016

National gong for researcher
COMMUNICATION, COMMUNITIES

[116]



New online - October 2016

13 OCT 2016

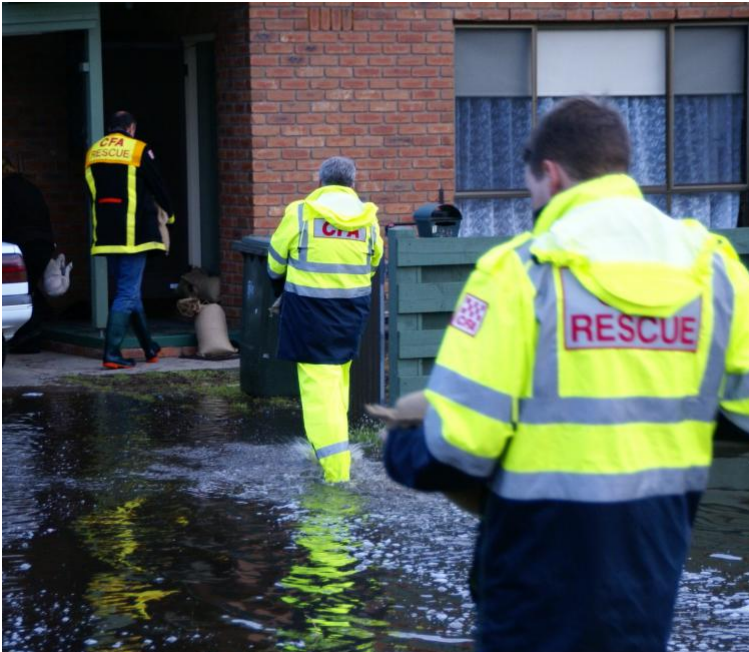
[117]



Awards recognise outstanding achievements

08 SEP 2016

[118]



10 JUN 2016

Designing warnings with community at the start and heart of national frameworks
COMMUNICATION, COMMUNITIES

[119]



15 OCT 2015

Quick science in videos
COMMUNICATION, DECISION MAKING

[120]



Hazard learning in Colorado

29 JUL 2015

[121]



Marketing research informs risk communication in South Australia
COMMUNICATION, EMERGENCY MANAGEMENT

11 MAR 2015

[122]



Research profiled in CRC magazine

09 FEB 2015

[123]



Newsletter - Communications and warnings cluster
COMMUNICATION, COMMUNITIES

09 FEB 2015

[124]



23 JAN 2015

How can communities and agencies weather the storm?
 COMMUNICATION, COMMUNITIES

[125]



28 FEB 2014

Warning communities to take action
 COMMUNICATION, COMMUNITIES

[126]


Publications

Year	Type	Citation
2023	Journal Article	Dootson, P. [15], Kuligowski, E. [127] & Murray, S. [128] Using videos in floods and bushfires to educate, signal risk, and promote protective action in the community [129]. <i>Safety Science</i> 164 ,
2022	Journal Article	Dootson, P. [15], Kuligowski, E. [127], Greer, D. A. [134], Miller, S. A. [135] & Tippet, V. [6] Consistent and conflicting information in floods and bushfires impact risk information seeking, risk pe
2021	Journal Article	Dootson, P. [15] <i>et al.</i> Managing problematic visual media in natural hazard emergencies [141]. <i>International Journal of Disaster Risk Reduction</i> (2021). doi:https://doi.org/10.1016/j.ijdr.2021.10224
2021	Journal Article	Mehta, A. [8] <i>et al.</i> Mind the gap: Contrasting operational and behavior-oriented flood warnings [146]. <i>International Journal of Disaster Risk Reduction</i> (2021). doi:https://doi.org/10.1016/j.ijdr.2021
2021	Journal Article	Mehta, A. [8], Murray, S. [128], McAndrew, R. [151], Jackson, M. [152] & Tippet, V. [6] Encouraging evacuation: the role of behavioural message inputs in bushfire warnings [153]. <i>International J</i>
2021	Report	Tippet, V. [6] <i>et al.</i> Towards protective action: effective risk and warning communication during natural hazards – final project report [81]. (Bushfire and Natural Hazards CRC, 2021). Google S
2021	Report	Greer, D. [11], Dootson, P. [15], Miller, S. [17] & Tippet, V. [6] Supplementing emergency warning messages to encourage readiness to act: the effect of colours and icons [161]. (Bushfire and N
2020	Journal Article	Mehta, A. [8], Murray, S. [128], Hammill, C. [165], Dootson, P. [15] & Langdon, R. [166] Checks and balances: A business oriented lens on disaster management and warnings [167]. <i>Disasters</i> (20
2020	Journal Article	Mehta, A. [8], Murray, S. [128], Hammill, C. [165], Dootson, P. [15] & Langdon, R. [166] Checks and balances: A business oriented lens on disaster management and warnings [172]. <i>Disasters</i> (20
2020	Journal Article	Thomson, T. J. [175], Angus, D. [176], Dootson, P. [15], Hurcombe, E. [177] & Smith, A. [178] Visual Mis/disinformation in Journalism and Public Communications: Current Verification Practices,
2019	Conference Paper	Riley, J. [184] Intelligent warnings: a twenty-first century approach to encouraging protective action in emergencies [185]. <i>AFAC19 powered by INTERSCHUTZ - Bushfire and Natural Hazards C</i>
2019	Journal Article	Dootson, P. [15], Greer, D. [11], Miller, S. [17] & Tippet, V. [6] Overcoming Ambiguity: Conflict Between Emergency Warning Messages and Socio-Environmental Cues [190]. <i>Prehospital and Dis</i>
2019	Report	Tippet, V. [6] <i>et al.</i> Towards Protective Action: Effective Risk and Warning Communication during Natural Hazards Annual Report 2017-2018 [195]. (Bushfire and Natural Hazards CRC, 2019). G
2017	Conference Paper	Rumsewicz, M. [199] Research proceedings from the 2017 Bushfire and Natural Hazards CRC and AFAC Conference [200]. <i>Bushfire and Natural Hazards CRC & AFAC annual conference 2017</i> (f
2017	Conference Paper	Mehta, A. [8] <i>et al.</i> Evidence-based risk communication: an industry-academic research collaboration that enhanced dam release message effectiveness [204]. <i>AFAC17</i> (Bushfire and Natural
2017	Report	Tippet, V. [6] <i>et al.</i> Building resilient communities - effective multi-channel communication during disasters: annual project report 2016-17 [208]. (Bushfire and Natural Hazards CRC, 2017). G
2016	Report	Tippet, V. [6] <i>et al.</i> Building resilient communities - effective multi-channel communication in disasters: Annual project report 2015-2016 [212]. (Bushfire and Natural Hazards CRC, 2016). Goo
2015	Report	Tippet, V. [6] <i>et al.</i> Connecting communities and resilience: A multi-hazard study of preparedness, response and recovery communications: Annual project report 2014-2015 [216]. (Bushfire
2015	Report	Tippet, V. [6] Building Resilient Communities: Effective Multi-Channel Communication in Disasters Annual Report 2014 [220]. (2015). Google Scholar [221] BibTeX [222] EndNote XML [223]

Presentations & Resources

DATE	TITLE	DOWNLOAD	KEY TOPICS
27 Mar 2014	Connecting communities and resilience [226]	1.14 MB	[227] (1.14 MB) [3], recovery [228]
10 Apr 2015	Connecting Communities and Resilience 2015 NSW RAF Presentation [229]	1.74 MB	[230] (1.74 MB) [3], resilience [4],
15 Sep 2015	Communications and Warnings [232]	0 bytes	[233] (0 bytes) ion [2], multi-hazarc
21 Oct 2015	Turning warnings into action [236]	236.32 KB	[237] (236.32 KB) [2], tsunami [23
17 May 2016	Connecting communities and resilience: a multi-hazard study of preparedness response and recovery communications [239]	544.2 KB	[240] (544.2 KB) [3], recovery [228]
15 Aug 2016	Melaine Baker Jones - 2016 Progress Report [241]	60.19 KB	[242] (60.19 KB) [2], communitie
18 Apr 2017	Emergency Message Eye-Tracking Study & Business-Focused Risk Communication [243]	1.17 MB	[244] (1.17 MB) on [2], communitie
07 Jul 2017	Communicating and warning: getting the message across more effectively [245]	4.79 MB	[246] (4.79 MB) on [2], flood [247],
07 Sep 2017	Evidence-based risk communication: an industry-academic research collaboration that enhanced dam release messages [248]	726.78 KB	[249] (726.78 KB) [2], emergency
16 Apr 2018	Towards Protective Action: Effective Risk and Warning Communication During Natural Hazards [251]	1.01 MB	[252] (1.01 MB) on [2], multi-hazarc
13 Dec 2018	Communicating for maximum comprehension [253]	700.61 KB	[254] (700.61 KB) [2], communitie
04 Apr 2019	Conflicting cues with emergency warnings impacts protective action [255]	920.62 KB	[256] (920.62 KB) [2], communitie
30 May 2019	Warnings that save lives [257]	0 bytes	[258] (0 bytes)
18 Jun 2019	Communication challenges in complex events [259]	1.04 MB	[260] (1.04 MB) on [2], warnings [2
18 Jul 2019	Conflicting cues and their impact on emergency warning response [261]	0 bytes	[262] (0 bytes) ion [2], warnings [2
27 Aug 2019	Intelligent Warnings [263]	392.51 KB	[264] (392.51 KB) [2], multi-hazarc
24 Sep 2019	Towards protective action: Effective risk and warning communication during natural hazards [265]	1.29 MB	[266] (1.29 MB) on [2], warnings [2
12 Mar 2020	How words matter in emergency alerts during natural hazard emergencies [267]	0 bytes	[268] (0 bytes) ion [2], communitie
06 Apr 2020	Addressing conflicting cues during natural hazards: lessons from emergency agencies [269]	1.23 MB	[270] (1.23 MB) on [2], communitie
10 Jun 2020	Recognition for Excellence in Research at EMPA conference 2020 [271]	0 bytes	[272] (0 bytes) ion [2], emergency
22 Sep 2020	Emergency warning messages: how do community members comprehend them? [273]	629.29 KB	[274] (629.29 KB) [2], communitie
22 Sep 2020	Emergency warning messages: encouraging readiness to act [275]	1.02 MB	[276] (1.02 MB) on [2], communitie
22 Sep 2020	Emergency warning messages: do colours and icons improve community readiness to act? [277]	354.67 KB	[278] (354.67 KB) [2], communitie
25 Nov 2020	Better warnings to ensure action [279]		communication [2], communitie
13 Aug 2021	Driving change: the evolution of communications and warnings in emergency preparedness, response and recovery [280]		communication [2], communitie
13 Aug 2021	Prof Amisha Mehta interview: effective risk and warnings [281]	0 bytes	[282] (0 bytes) ion [2], communitie
13 Aug 2021	Prof Vivienne Tippet interview: effective risk and warnings [283]	0 bytes	[284] (0 bytes) ion [2], communitie
13 Aug 2021	Response 1: Effective risk and warning communication during natural hazards [285]	0 bytes	[286] (0 bytes) ion [2], communitie
13 Aug 2021	The evolution of communications and warnings in emergency preparedness, response and recovery [287]	0 bytes	[288] (0 bytes) ion [2], communitie
13 Aug 2021	Trailer, Response 1: Effective risk and warning communication during natural hazards [289]	0 bytes	[290] (0 bytes) ion [2], communitie
14 Jan 2022	Choosing powerful words that signal risk and encourage action [291]	86.06 KB	[292] (86.06 KB) [2], communitie
14 Jan 2022	Creating effective Emergency Alerts [293]	191.16 KB	[294] (191.16 KB) [2], communitie

Posters



[295]

Building resilient communities: Creating effective multi-channel communication during disaster response and recovery

[295]

To examine evidence-based strategies that motivate appropriate action and increase informed decision-making...



[296]

Legal implications of utilising social media for communication during a disaster: An analysis by Responder Group

[296]

Social media plays an increasing role as a tool for: information dissemination, situational awareness and co-...



[297]

[297] 18 AUG 2015

Building Resilient Communities: Creating Effective Multi-Channel Communication During Disaster Response and Recovery

[297]
COMMUNICATION [2], COMMUNITIES [3]

Our aim is to examine evidence-based strategies to motivate appropriate action and increase informed decision...



[298] 12 AUG 2016

Building resilient communities: creating effective multi-channel communication during disaster response and recovery

[298]
INFRASTRUCTURE [299], RESILIENCE [4]

Testing the elements of optimal emergency warnings: Some insights from 10 focus groups and 77 experiments of...

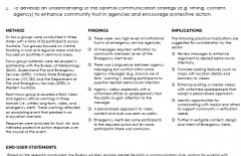


[300] 29 JUN 2017

Building resilient communities: creating effective multi-channel communication during disaster response and recovery

[300]
COMMUNICATION [2], COMMUNITIES [3]

The aim of this project is to examine evidence-based strategies that motivate appropriate action and increase...



[301] 18 SEP 2016

Community Trust and Responses to Multi-Agency Warnings Findings from Phase One of Research Package 1: Encouraging Protective Action and Enhancing Trust with Multi-Agency Risk and Warning Communication Strategies

[301]
COMMUNICATION [2], COMMUNITIES [3]

*Based on the research conducted, the Bureau will likely explore greater flexibility in communication style,...

27 AUG 2019

The Roles of Pharmacists in Disaster Health Management

[302]
MULT-HAZARD [234], WARNINGS [235]

Disasters significantly impact the welfare of communities and the patient demographic of disaster-affected...



[303] 27 AUG 2019

Do Current Emergency Warning Messages Encourage Readiness to Act?

[303]
COMMUNICATION [2], COMMUNITIES [3]

Natural hazards provoke considerable uncertainty but community members often 'under-react' when confronted...



[304] 31 AUG 2020

Adding Colour and Icons to Emergency Warning Messages

[304]
COMMUNICATION [2], MULTI-HAZARD [234]

Key findings: Red headers on bushfire evacuation messages help encourage community members to follow...

Linked Projects

Community understanding of the tsunami risk and warnings systems in Australian communities

[305]
COMMUNICATION AND WARNINGS [306]

Prof David Johnston
Massey University, New Zealand [307]

Child-centred disaster risk reduction
[308]

COMMUNICATION AND WARNINGS [306]

Dr Briony Towers
RMIT University [309]



[309]

Improving the role of hazard communications in increasing residents' preparedness and response planning
[310]

COMMUNICATION AND WARNINGS [306]

Dr Ilona McNeill
University of Melbourne [311]



[311]

Managing animals in disasters: improving preparedness, response, and resilience through individual and organisational collaboration
[312]

COMMUNICATION AND WARNINGS [306]

Dr Mel Taylor
Macquarie University [313]



[313]

Developing effective emergency management partnerships in remote northern Australian communities
[314]

UNDERSTANDING AND ENHANCING RESILIENCE [315]

Adj Prof Jeremy Russell-Smith
Charles Darwin University [316]



[316]

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