

DIGITAL VOLUNTEERING IN DISASTER RISK REDUCTION: AN OPPORTUNITY OR A CHALLENGE?

ABOUT THIS PROJECT

This research was conducted as a PhD study: *Volunteered geographic information, community engagement and bushfire preparation*, which was part of the broader CRC project *Out of uniform*.

AUTHOR

Dr Billy Haworth, University of Western Australia. Dr Haworth completed his CRC PhD in 2016 at the University of Sydney. Contact billy.haworth@uwa.edu.au

SUMMARY

In recent years, information from community members contributed online has proved highly useful in emergencies. Information sharing activities by private



citizens using social media, smartphones, and web mapping tools have been termed volunteered geographic information (VGI)

◀ **Left:** SMARTPHONES ARE JUST ONE TOOL ENABLING CITIZENS TO COLLECT AND SHARE LOCAL DISASTER INFORMATION. PHOTO: BILLY HAWORTH.

or digital volunteering. This research examined the potential role of VGI in fostering community engagement in bushfire preparation.

Findings show that VGI is more than just technology – it is about people sharing their knowledge and mapping collaboratively as a social practice. It presents opportunities for citizen empowerment in line with shared responsibility, but also challenges with power moving away from the traditional command and control of emergency services. This research provides a clearer path for emergency service agencies to best-utilise these technologies.

CONTEXT

The Internet, social media and smartphones have enabled private citizens to create and share geographic information, dramatically increasing public participation in disaster response. While there are numerous documented benefits and challenges, this research examines the role of these technologies and practices in promoting community engagement in disaster risk reduction.

BACKGROUND

Practices of citizens creating, sharing and mapping their own information have been termed volunteered geographic information (VGI), and in emergency management digital volunteering or digital humanitarianism. VGI enables cost-effective, rapid sharing of diverse information from community members at all stages of disaster management. However, VGI also presents new challenges, including issues of trust and data quality, data management, liability, and the digital divide (or those without access to VGI technologies being excluded). Existing literature emphasised disaster response, but as preparing for disasters significantly

reduces the likelihood of negative impacts, there is a need for increased community engagement in disaster risk reduction. VGI is one tool that can help to achieve this.

BUSHFIRE AND NATURAL HAZARDS CRC RESEARCH

This research assessed the usefulness of VGI in fostering community bushfire preparation engagement and increased disaster resilience in Tasmania. It also examined the broader impacts of VGI on traditional top-down disaster management.

The research had three main components. Firstly, surveys were completed with 154 residents of bushfire-risk communities. These examined bushfire preparedness and the uptake, usage, and limitations of VGI technologies like social media.

Following this, interviews with 13 emergency management professionals were conducted to evaluate how community VGI practices are impacting authoritative disaster management.

Lastly, workshops were conducted with 31 residents of bushfire-risk communities to assess participatory mapping activities,

examining the user-experience of contributing VGI for bushfire preparation, and the value of sharing local knowledge and mapping together with other community members.

RESEARCH FINDINGS

Three key insights are presented in this *Hazard Note*. More information is available in the 'further reading' panel on page 2.

First, VGI is not just about technology, it is also about people – people sharing knowledge and mapping collaboratively. Conceiving VGI as a social practice, rather than simply data, can lead to opportunities such as increased community connectedness, shared risk understanding and collective engagement in activities such as disaster preparation.

Second, VGI does not include everybody. Many people are excluded from contributing through lack of access to technology, skills, time, or the 'right' cultural/social circles. Worryingly, those marginalised for the reasons above are often the most vulnerable to disasters. On the other hand, VGI may disproportionately promote the views of those who can contribute.

Finally, VGI involves shifts in the control

of information and decentralisation of power away from emergency service agencies. This provides opportunities for citizen empowerment in line with notions of shared responsibility and resilience, but also challenges, where organisational adaptation is required to effectively harness VGI.

HOW IS THIS RESEARCH BEING USED?

By revealing the opportunities, challenges, and implications of VGI in emergency management, the research provides a clearer path for emergency service agencies to best utilise these technologies for and *with* communities. While significant challenges remain, understanding of the benefits gained by valuing citizen knowledge, embracing change and harnessing the power of technological and communication innovation will contribute to more effective use of VGI to meet agency and community needs.

Insights gained through this research into VGI have contributed to the broader national understanding of the changing nature of emergency volunteering in Australia and internationally, with close links to other CRC projects. This research will influence local and national policy and sectoral change, with an enhanced understanding of digital volunteering contributing to goals of increasing

PARTICIPATORY MAPPING

Participatory mapping involves providing skills and expertise for citizens to create maps themselves that represent their own spatial knowledge, including through VGI. This might be drawing freehand, using existing printed maps, or digitally via GIS or the Internet. Participatory mapping can facilitate shared decision-making, community advocacy and increased community empowerment.

END-USER STATEMENT

The Bushfire Ready Neighbourhoods program at the Tasmania Fire Service collaborated with this research to explore a different community engagement technique that can be utilised in the programs' 'one size doesn't fit all' approach to working with communities.

Billy has provided an important evidence base for the use of participatory mapping in community engagement, and I'd encourage other agencies to use these findings to inform their approach. – **Peter Middleton, A/Manager, Community Development & Education, Tasmania Fire Service**

volunteering sustainability, community engagement and national disaster resilience.

Working collaboratively with Tasmania Fire Service has resulted in research outcomes that can be directly applied in agency thinking on community development and the use of VGI in the future. The TFS Bushfire Ready Neighbourhoods Program has expressed interest in adopting participatory mapping into their community engagement activities. The findings, however, are not limited to Tasmania or bushfire, but are applicable to other natural hazards, social settings and regions across the globe, and questions right across the discipline of geography.

FUTURE DIRECTIONS

Strategies that seek to bridge the digital divide must continue to be investigated, including how to engage a wider variety of people in VGI, particularly those most vulnerable to emergencies.

Longitudinal studies would permit evaluation of ongoing outcomes associated with VGI use for community engagement. Studies of longer duration would also allow for better appraisal of methods for managing VGI data and initiatives. There is a need to develop effective ways of managing, verifying, and filtering community data for integration with other databases.

VGI should be examined in other emergency management contexts, such as disaster recovery, other geographic or political settings, and other hazards and crises.

FURTHER READING

Haworth B (2016), Assessing the potential, application, and implications of volunteered geographic information in disaster risk reduction, PhD thesis, School of Geosciences, Faculty of Science, University of Sydney. Available at www.billyhaworth.com/publications/

Haworth B, Whittaker J and Bruce E (2016), Assessing the application and value of participatory mapping for community bushfire preparation, *Applied Geography* **76**, pp. 115-127.

Haworth B (2016), Emergency management perspectives on volunteered geographic information: opportunities, challenges and change, *Computers, Environment and Urban Systems* **57**, pp. 189-198.

Haworth B, Whittaker J and Bruce E (2016), Using participatory mapping to harness local knowledge and increase community connectedness in bushfire preparation, paper presented at AFAC16, Bushfire and Natural Hazards CRC.

Haworth B, Bruce E and Middleton P (2015), Emerging technologies for risk reduction: assessing the potential use of social media and VGI for increasing community engagement in bushfire preparation, *Australian Journal of Emergency Management* **30**(3), pp. 36-41.

Haworth B and Bruce E (2015), A review of volunteered geographic information for disaster management, *Geography Compass* **9**(5), pp. 237-250.

The Bushfire and Natural Hazards CRC is a national research centre funded by the Australian Government Cooperative Research Centre Program. It was formed in 2013 for an eight-year program to undertake end-user focused research for Australia and New Zealand.

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