

Harnessing the power of real and virtual social networks during disasters

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Abstract

The mass media and emergency services organisations routinely gather information and disseminate it to the public. During disaster situations both the media and emergency services require acute situational awareness. New social media technologies offer opportunities to enhance situational awareness by crowd-sourcing information using real and virtual social networks. This paper documents how real and virtual social networks were used by a reporter and by members of the public to gather and disseminate emergency information during the flash flood disaster in Toowoomba and the Lockyer Valley in January 2011 and in the days and weeks after the disaster.

Introduction

At times of natural disaster, power supplies, telephone lines and mobile telephone networks are often disrupted. Journalists who need to quickly gather accurate information may not have access to their usual fax or email feeds from emergency services and welfare organisations. The advent of Facebook, Twitter, online forums and other social media offers reporters access to information, photographs and videos which can be tracked back to source for verification. This paper recounts how the social media were used in the reporting of the deadly flash flooding which engulfed the city of Toowoomba and seven rural communities to the east of the city on the

afternoon of 11 January, 2011. The disaster struck without any official warning to either the emergency services or the public (Gearing and Thomas 2011; McKenna and Gearing 2011; Owens, Bitá and Gearing 2011; Gearing 2011h, 2011e, 2011b).

Further, this paper explores how citizen reporters used social media to convey warnings and emergency information; how reporters used social media to report the event and generate and follow news leads; how individuals used social media as an emergency communication system to find out if family members or friends had survived; how emergency services organisations used social networking sites to deliver news and emergency information directly to their audiences; how individuals and organisations used social networking sites to co-ordinate emergency supplies of food, clothing and other assistance and how individuals and families created ‘tribute pages’ on social networking sites in memory of those who died.

One-way to two-way news

Until the advent of the printing press, news and information primarily spread via word of mouth. Invention of the printing press led to the organised dissemination of news via traditional newspapers, radio and television media that, according to Dennis McQuail, (2000, 55) were ‘largely one-directional, impersonal one-to-many carriers of news and information.’ The mass media continued a similar mode of communication until relatively recent history, when the advent of the computer age, mobile phones and online social networking technologies have facilitated an increase in the amount of news that travels by word of mouth, multi-directionally and person-to-person.

During major disasters, residents are sometimes the only people who witness events or are in a position to be able to record live pictures of the event as it occurs. Bowman and Willis (2003, 47)

noted that the dynamics of emerging news technologies mean that for the first time in history, members of the public can now publish words and pictures online more immediately than traditional outlets can gather and disseminate news and images. When many people record the same event, 'multiperspectival news' emerges (Gans 2003, 103). Facts are presented from a wide range of perspectives, in contrast to the traditional reporting of 'both sides of the story' where commonly only two opposing perspectives are presented.

Whilst most bloggers are focussed on micro-local events, if the events that happen are of state, national or global significance, news blogs can quickly attain a global audience. Early examples of global news blogs include the attack on the World Trade Centre in New York on September 11 in 2001; the wars in Afghanistan and Iraq; the Boxing Day 2004 tsunami in Sumatra and the London Bombings in July 2005, (Bruns 2006). By 2009, it was common for first reports of disasters to come not from traditional media outlets but from local residents using online social networks such as Twitter (Shirky 2009). The technical development in recent years of adding a video camera function mobile phones has enabled members of the public on the scene of unexpected events to video the event as they happen and upload them almost immediately to the internet. Onlookers with mobile phones have become eye-witness recorders of events ranging from the personally significant to the globally significant (Bita and Gearing 2011). During the flood disaster, the relay of information from the media to the public and vice versa became a dynamic system, with audiences turning to the media for emergency information and the media appealing to audiences for eye-witness information, photographs and video footage which was then broadcast to the public.

Social media warnings

The only accurate, but unofficial warning, of the January 2011 ‘inland tsunami’ was given by a sonographer and amateur weather watcher, Neil Pennell. He noticed on the Bureau of Meteorology weather radar that a very large storm was brewing and watched as two large cells within the large cloud mass merged to form a super-storm (Gearing 2011g). Mr Pennell realised people on the ground who looked up would see cloud but would have no warning of the danger of the intense storm within the larger cloud mass. He navigated to the Bureau of Meteorology’s warning page to check that suitable warnings were being issued. They were not. He checked back several times and saw, with rising anxiety, that there was still no effective warning being issued to the public. He accurately pinpointed the location of deadly impact in Grantham and considered phoning the local police. He lifted the phone to dial Helidon, the town upstream from Grantham – realised the police would think him crazy – and replaced the receiver. Knowing the large volume of rainfall in the Lockyer Valley over previous weeks, he realised the catchment was saturated and that the high rain rate being recorded by the Bureau could generate a large amount of almost immediate run-off with the potential for dangerous flash flooding (Pennell 2011a). In an online forum discussion he questioned a meteorologist on the forum, asking how to warn people of what he foresaw and feared:

Dave, I live in an area that is equally not used to being so saturated I just know that 56mm in an hour here would produce a flood of frightening proportions and one likely to put lives at risk. Falls higher than this in the immediate area are likely. I repeat my question . . . Does someone in . . . Grantham . . . need to know what’s possible? Who do we tell? (Pennell 2011b)

Other members of WeatherZone also provided site-specific warnings to other Lockyer Valley communities. Strikingly accurate flash flood warnings for specific towns in the Lockyer Valley were given via the Weather forum more than three hours earlier than the official Bureau of Meteorology warnings were issued for those locations (Gearing 2011g). The disaster was unfolding faster than authorities could provide adequate warnings. One implication for journalists covering disasters in future is that socially-networked people in disaster zones may prove to be more reliable sources than official emergency services agencies which lack current situational awareness. As a citizen reporter, I posted warnings based on the intensity of rain and the amount of flooding near the top of Mount Lofty that I observed from my house. I posted video with a voice-over to my Facebook page warning that Brisbane could be at risk of flooding in coming days. My citizen journalism report was the first warning that many people had of the onset of the disaster in Toowoomba and was many hours earlier than specific warnings issued by authorities.

From the watershed in Toowoomba, floodwaters from the city flowed west. Floodwaters from the escarpment and the Lockyer Valley flowed to the east towards Brisbane. The Toowoomba flood caused a spike in Twitter traffic as residents alerted others to the impending floods in the city of Ipswich and the state capital of Brisbane. Axel Bruns and his colleagues found a spike of Twitter traffic of more than 600 tweets on the hash tag 'qldfloods' on the evening of 10 January in response to the Toowoomba CBD flooding (Bruns et al. 2011). Tweets on the qldflood hash tag increased in frequency over the following day as the flood approached Brisbane peaking at 1,100 tweets per hour, as seen in Figure 1.

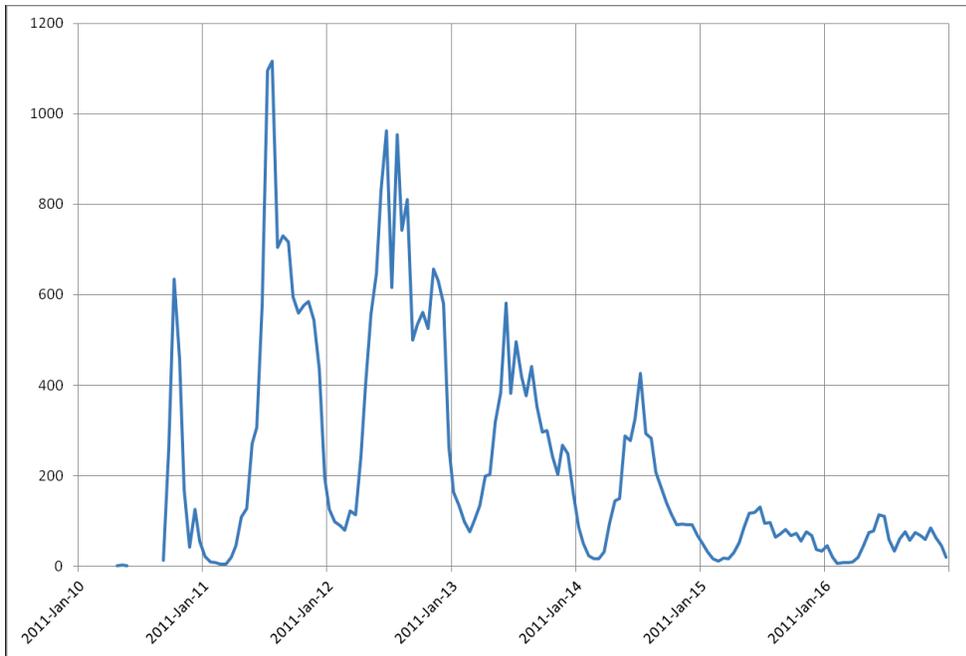


Figure 1. #qldfloods tweets per hour, January 10-16, 2011 (Bruns et al. 2011, 23).

Online social media

Online social media played vital roles during the Toowoomba and Lockyer Valley floods for individuals, citizen reporters, journalists, media outlets and emergency services organisations. Many people used social networking as an emergency communication system to find out if family members or friends had survived; citizen reporters in the first locations affected by the disaster used social networking to convey warnings and emergency information to family and friends further downstream and to report the event; reporters and media organisations used social networking sites to report the event and generate and follow news leads; emergency services organisations used social networking sites to deliver news and emergency information directly to their audiences (Charlton 2011; Gearing 2012i). After the disaster, individuals and organisations used social networking sites to co-ordinate emergency supplies of food, clothing and other

assistance; and individuals and families created 'tribute pages' on social networking sites in memory of those who died (Gearing 2012i).

Emergency communications: Are you ok?

Hundreds of people were unable to contact family members in the disaster zone because phone lines and power supplies had failed. They used mobile phones to access Facebook to try to get information from the disaster zone to find out if their families and friends were alive. Hundreds of people were not contactable. Most of them were alive and safe but had no communications until services were restored up to eight days later. For those who perished, it would be several weeks until their bodies were found. Three bodies were never found. (Gearing 2011c, 2011d)

The rural township of Murphys Creek in the foothills of the Great Dividing Range had never had mobile phone reception. Once the landline network was destroyed by the flash flooding the only way to communicate was via social media. Intense two-way communication between flood survivors and their families and friends outside the disaster zone was recorded on community Facebook pages. 'Toowoomba & Darling Downs Flood Photos & Info' was set up on January 10 to help locate a missing person. By the next day the page had 37,000 Likes and continues to offer emergency information (Birch 2011). A second Facebook page 'QLD Floods - Withcott, Murphy's Creek, Postman's Ridge - Community Support' was created on 13 January 2011, to help co-ordinate a community-based recovery effort. People outside the disaster zone used the page to communicate with people inside the disaster zone who had no communication. For example, on 11 January, Fiona posted to the Facebook page that she was 'trying to find information about Ken Smith of Twidales Rd, Helidon Spa. If anyone has heard if Ken is ok could you please let me know, my uncle Len from Canada is concerned'. The reply came six hours later: 'Thanks everyone Ken called my parents this morning. Cheers'.

The traditional role of police to locate missing people and confirming their safety was quickly replaced by social media networking amongst the community. Similarly, journalists linked into the social networks were able to source information and make contact with families who were searching for missing people (Gearing and Thomas 2011).

Citizen reporters

Dan Gillmor describes how audiences, who were once passive consumers of news produced by reporters, are now producing news themselves using new media platforms. Journalism has made the transition from ‘journalism as lecture’ to ‘journalism as conversation’ (Gillmor 2004, xxiv; Hermida 2010). The three distinct groups – journalists, newsmakers and audience, as described by (Hermida 2010, 237) – became blurred during this disaster because some audience members volunteered themselves as newsmakers. Several Toowoomba residents who witnessed the flood in the CBD took video footage which they uploaded to YouTube or sent to other people to warn them about the flood. In some cases, emergency workers were alerted to the disaster by people in Toowoomba before they were alerted by the emergency services for which they worked (Tate 2011).

Veteran reporter and digital journalism researcher Alfred Hermida has observed (2010, para 11) that there has been a shift in the relationship between journalists and the public:

The shift from an era of broadcast mass media to an era of networked digital media has fundamentally altered flows of information. Non-linear, many-to-many digital communication technologies have transferred the means of media production and dissemination into the hands of the public, and are rewriting the relationship between the audience and journalists.

The benefit for readers of receiving information from news bloggers is that the bloggers are directly engaged in the news events, or at least have first-hand information. On January 10, 2011, residents in the disaster zone posted photographs of the flood on social networking sites. One of these, Jiaren Lau (2011), created a news blog with photographs and very detailed text about his experience of the disaster. While he was not a journalist, his report demonstrated his in-depth knowledge of the city of Toowoomba and its geography at the top of a mountain range, and included text about his experience of the event and the photographs that he had taken.

Media organisations and emergency services are increasingly using social networking technologies in addition to television and radio, to provide information to citizens during disasters (Nicholls 2012, 46). At the outset of this disaster, media organisations began crowd-sourcing information. I tuned in to Toowoomba's ABC radio station which by then was taken off networked programs from Brisbane and began broadcasting live by putting to air callers who phoned in with eye witness accounts of the disaster as pedestrians and cars were being swept from the streets. The callers were able to name the flooded roads to warn other motorists and give the locations of landslides that had cut highways. Television news reporters browsed YouTube for videos of the floods that were being uploaded and used the vision to compile footage for their news bulletins. Road closures meant news crews could not access Toowoomba or the Lockyer Valley by road.

Crowd sourcing from social networks

The increase in the speed of newsgathering and the advent of the crowd-sourcing paradigm have greatly impacted the way reporters operate in disaster zones. Instead of relying on the traditionally 'authoritative' sources such as police and other emergency services for information,

crowd-sourcing via online social media allows journalists to source video footage, photographs and information directly from eye witnesses in the disaster zone (Gearing 2011f). Alfreda Hermida (2010) has observed that with the advent of online information technologies, ‘journalism, which was once difficult and expensive to produce, today surrounds us like the air we breathe . . . The challenge going forward is helping the public negotiate and regulate this flow of ambient news, to facilitate the collection, transmission and understanding of events’.

Journalists in the Toowoomba and Lockyer Valley disaster zone quickly realised that emergency organisations which had no warning of the impending disaster had virtually no situational awareness and therefore could not provide authoritative information in time for news deadlines. Journalists and news organisations turned to their own social networks and to social media networking sites to gather information, photographs and videos that were being posted on the Internet. Social networking sites did not replace real social networks and news contacts, but they expanded the reporter’s networks and enhanced their ability to find and follow news leads. In some instances, information posted on social networking sites was broadcast overseas before people very close to the disaster zone were aware of the flash flooding. In some cases, people in the disaster zone received phone calls from family or friends overseas who had seen flooded houses they recognised on videos broadcast on television news overseas, asking if they were alright before the local people knew there was a local flash flood emergency (Gallagher 2011).

The advent of the social media not only adds to the traditional tools of the reporter but exponentially increases the power of these tools since everyone who witnesses an event may have pictures and video footage (Gearing and Elks 2011). Media organisations made general invitations to readers, listeners and viewers to submit photographs and videos of the disaster.

A huge shift of audiences occurred in Queensland away from newspapers, radio and television to online content during the January flood disaster. Media agency Universal McCann found that during January 2011, the public traffic to Brisbane's Courier-Mail website jumped from an average of 500,000 unique browsers to nearly 1.6 million (Canning 2011, 29). Page impressions increased four-fold, from 10 million to 40 million. The competitor Fairfax-owned brisbanetimes.com.au news website registered similar increases in demand and the Australian Provincial News website recorded an increase in use during the month of 295 per cent (Canning 2011, 32).

Social networking emergency information: QPS direct

Writing as recently as 2010, Hermida predicted that Twitter might be overtaken as a vehicle for 'ambient' journalism – news that is participatory and pervasive in the social environment – by other digital technologies such as MySpace and Facebook (Hermida 2010). The social media sites have quickly gained very large shares of the market, attracting organisations to the 'eyeballs' they attract. In Queensland, authorities such as the Queensland Police Service are using Facebook and Twitter to deliver news directly to their audiences.

QPS Media and Public Affairs Branch executive director Kym Charlton began the Facebook account in May 2010 without any media launch. During the following eight months it grew steadily to more than 7,000 users (Charlton 2011, ii). The number of users more than doubled in two weeks as natural disasters threatened, beginning with Cyclone Tasha which threatened the Queensland coast from Christmas Day 2010. When the Fitzroy River peaked in Rockhampton on January 5, user numbers jumped to about 12,000 (Charlton 2011, iii), as shown in Figure 2. The practical information posted on the QPS Facebook page became vital information on January 10.

Chris Griffith reported that when police posted at 9.17pm a warning for people in all low-lying communities near Toowoomba to ‘move to higher ground immediately’, it received 94 responses from Facebook users asking for specific information about what to do (Griffith 2011, 32). The QPS then replied with specific directions that enabled people to know where and how to go for help.

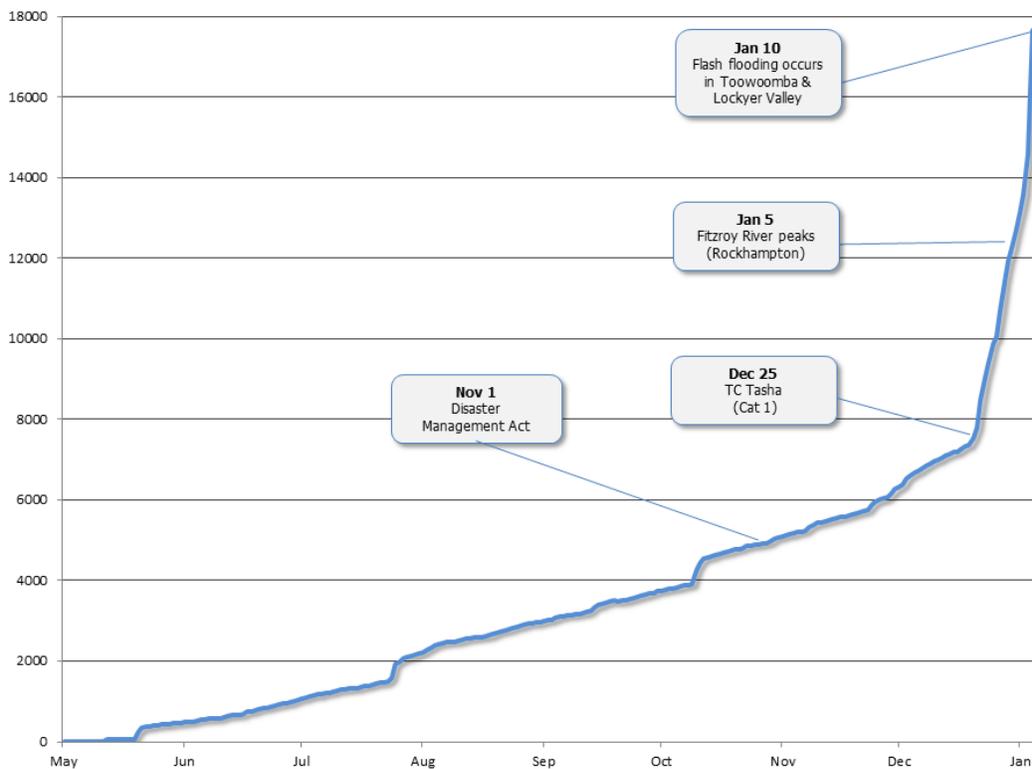


Figure 2. Number of QPS Facebook ‘Likes’ from May 2010 to January 2011 (Charlton 2011, iii).

Striking as the growth in user numbers had been, the growth was to be eclipsed by far by the growth in user numbers during the Ipswich and Brisbane floods and Cyclone Yasi, as shown in

Figure 3. At the height of the Cyclone Yasi emergency in early February the site had more than 170,000 followers (Charlton 2011, iv).

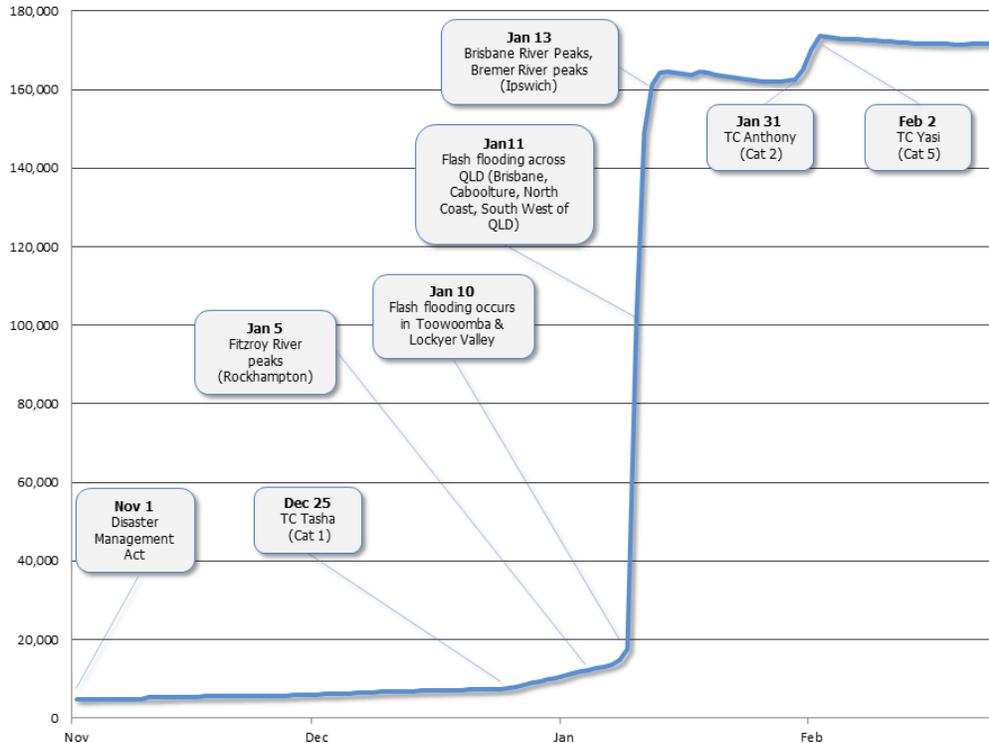


Figure 3. Growth of QPS Facebook ‘Likes’ from May 2010 to February 2011 (Griffith 2011, iv).

Charlton (2011, iv) listed the benefits of social media in the disaster:

- It is immediate and allowed Police Media to proactively push out large volumes of information to large numbers of people ensuring there was no vacuum of official information
- The QPS Facebook page became the trusted, authoritative hub for the dissemination of information and facts for the community and media

- Large amounts of specific information could be directed straight to communities without them having to rely on mainstream media coverage to access relevant details
- The QPS quickly killed rumour and misreporting before it became ‘fact’ in the mainstream media, mainly through the #mythbuster hashtag
- It provides access to immediate feedback and information from the public at scenes
- The mainstream media embraced it and found it to be a valuable and immediate source of information
- It provided situational awareness for QPS members in disaster-affected locations who otherwise had no means of communications.

Based on her experience of the QPS Facebook page, Charlton advised other emergency organisations to establish social media capabilities before they are needed (Charlton 2011, vii). She was adamant in her belief that emergency organisations should embrace social media: ‘If you are not doing social media, do it now. If you wait until it’s needed, it will be too late’. She also recognised the need for speed and the elimination of the usual hierarchical approvals for external communications: ‘Rethink clearance processes. Trust your staff to release information’. Charlton also emphasised the role of social media as an information gatherer: ‘Do not use social media solely to push out information. Use it to receive feedback and involve your online community’ (Charlton 2011, vi).

Social networking the recovery

Bowman and Willis (2003, 13) note that in the new media eco-system, online communities discuss and extend the stories created by the mainstream media. Bruns describes this process as one whereby media consumers move from being only ‘users’ to becoming ‘producers’[sic] – a hybrid of producer and user. Once engaged in ‘producing’ news, many citizens begin also to engage in the democratic process, becoming ‘producers’ not only of news, but also of democracy (Bruns 2006, 11). I observed that flood survivors with no previous media experience became actively engaged with the media as willing representatives of their towns, repeatedly agreeing to be interviewed to update the news media on the progress of the searches for missing people and the need for food, clothing and emergency supplies. Various individuals volunteered to speak to reporters about the emergency needs of their communities and the precautions that needed to be taken to reduce the risk of future disasters, (Gearing 2011a; Koch and Gearing 2011; Gearing 2012a, 2012e, 2012f, 2012d, 2012c, 2012g, 2012h, 2012b). They realised the quickest way to obtain action from local, state and federal government agencies was via media coverage. Unsurprisingly, the locations which had the highest level of media coverage received the most government assistance. For example, Grantham was the first location in Australia to be ‘moved’ to higher ground. Residents in the lowest section of the town were offered a free land swap – to exchange their (virtually worthless) flooded land with a newly-developed block in a new estate above flood level adjoining the town.

Socially networked grief

Facebook became the conduit for a huge outpouring of sympathy for the families of the children who died in the floods. Relatives, friends, local community members, people around Australia and people around the world posted messages of sadness, love and support to grieving families

of the children who died. The public messages of sympathy provided information reporters could draw upon. Reporters were also able to make contact with relatives and friends, reducing the necessity for dozens of reporters to phone or door-knock families seeking information.

Conclusion

The advent of online social networking has enabled people to communicate globally with virtually instantaneous speed. Online social media played vital roles during the Toowoomba and Lockyer Valley floods for individuals, citizen reporters, journalists and emergency services. The six important roles social networking media fulfilled before, during and post-disaster were:

- a) Citizen reporters in the disaster zone used social networking to convey warnings and emergency information and to report the event
- b) Reporters and media organisations used social networking sites to report the event and generate and follow news leads
- c) Individuals used social media as an emergency communication system to find out if family members or friends had survived
- d) Emergency services organisations used social networking sites to deliver news and emergency information directly to their audiences
- e) Individuals and organisations used social networking sites to co-ordinate emergency supplies of food, clothing and other assistance
- f) Individuals and families created ‘tribute pages’ on social networking sites in memory of those who died.

Reporters and emergency services organisations working in disaster zones can improve their communications ability by tapping into online social media to gather and disseminate news using the new media tools available through social media.

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