

MEDIANZ • VOL 15 • NO 2 • 2015
DOI: 10.11157/medianz-vol15iss2id113

- ARTICLE -

‘Because we are in an emergency situation, we are unable to meet with you’: A crisis of a crisis commons during the 2011 Christchurch Earthquake¹

Michael Bourk, Kate Holland and Warwick Blood

Abstract

In February 2011 a severe earthquake devastated Christchurch, New Zealand and the surrounding Canterbury region, killing 185 people, injuring hundreds, and severely damaging the city. One prominent disaster response, the Christchurch Recovery Map (CRM), modelled on the concept of a crisis commons, was populated by social network users drawing upon their immediate local knowledge of the disaster site. This paper draws on in-depth interviews with government officials, an IT professional involved in advising government about crises, and a key organizer of the CRM. A key aim of the interviews was to understand how these actors perceived the CRM, the value they attached to it and the challenges it posed for government agencies. Our analysis identified the following interrelated themes: information and identity control; generalized versus localized information; transparency and trust; and blurring the lines of expertise. CRM provides an example of the important role volunteer, citizen-led initiatives using new technologies can play in assisting official efforts to inform communities during and after a disaster. The government rebuffed CRM’s key organizer, Tim McNamara, when he requested a meeting to discuss government concerns about the trustworthiness of CRM information. The paper explores what can be learned from this clash for future disaster preparedness through interviews with McNamara and key government officials.

Introduction

On 22 February 2011, an earthquake of magnitude 6.3 (M_L) devastated New Zealand’s third most populous city, Christchurch, and the surrounding Canterbury region. One of the authors of this paper felt an aftershock move his office on the sixth floor of a building at the University of Otago, approximately 400 kilometres from the epicentre. The earthquake killed 185 people, injured hundreds, some seriously, and severely damaged the city. Rebuilding Christchurch has been estimated to cost in excess of \$NZ 20 billion (\$US 16 billion) making this earthquake NZ’s costliest natural disaster.

Michael Bourk is an Assistant Professor at the Gulf University for Science and Technology. His primary research interests included institutional frames and public policy narratives. Dr Kate Holland is a Senior Research Fellow in the News and Media Research Centre, Faculty of Arts and Design at the University of Canberra. Her primary research interests include media reporting and public understandings of health and risk issues. Warwick Blood is Emeritus Professor at the University of Canberra. His primary research interests are risk communication, and he has published widely on the reporting of health issues such as suicide, mental illness, and influenza.

Initial disaster response was offered by local citizens and available emergency services and within hours a national rescue effort was coordinated from the National Crisis Management Centre in Wellington, the country’s capital. This paper focuses on one aspect of the disaster response, the Christchurch Recovery Map (CRM), as an example of the important role volunteer, citizen-led initiatives using new technologies can play in informing communities during and after disaster and emergency situations (Figure 1). Modelled on the idea of a crisis commons, the map was populated by data drawn from the crowd; that is, social network users drawing upon their local knowledge and technical expertise. But what were the responses of government and other officials to this citizen-led initiative? While researching the role of experts in dealing with risk events we identified a website that posted email exchanges between officials involved in the NZ government response to the 2011 earthquake and Tim McNamara, the key organizer of CRM. The heading was provocative: ‘We are in an emergency situation and cannot meet with you’ (Gruen 2011). McNamara’s request to meet government officials about their concerns with CRM had been refused.

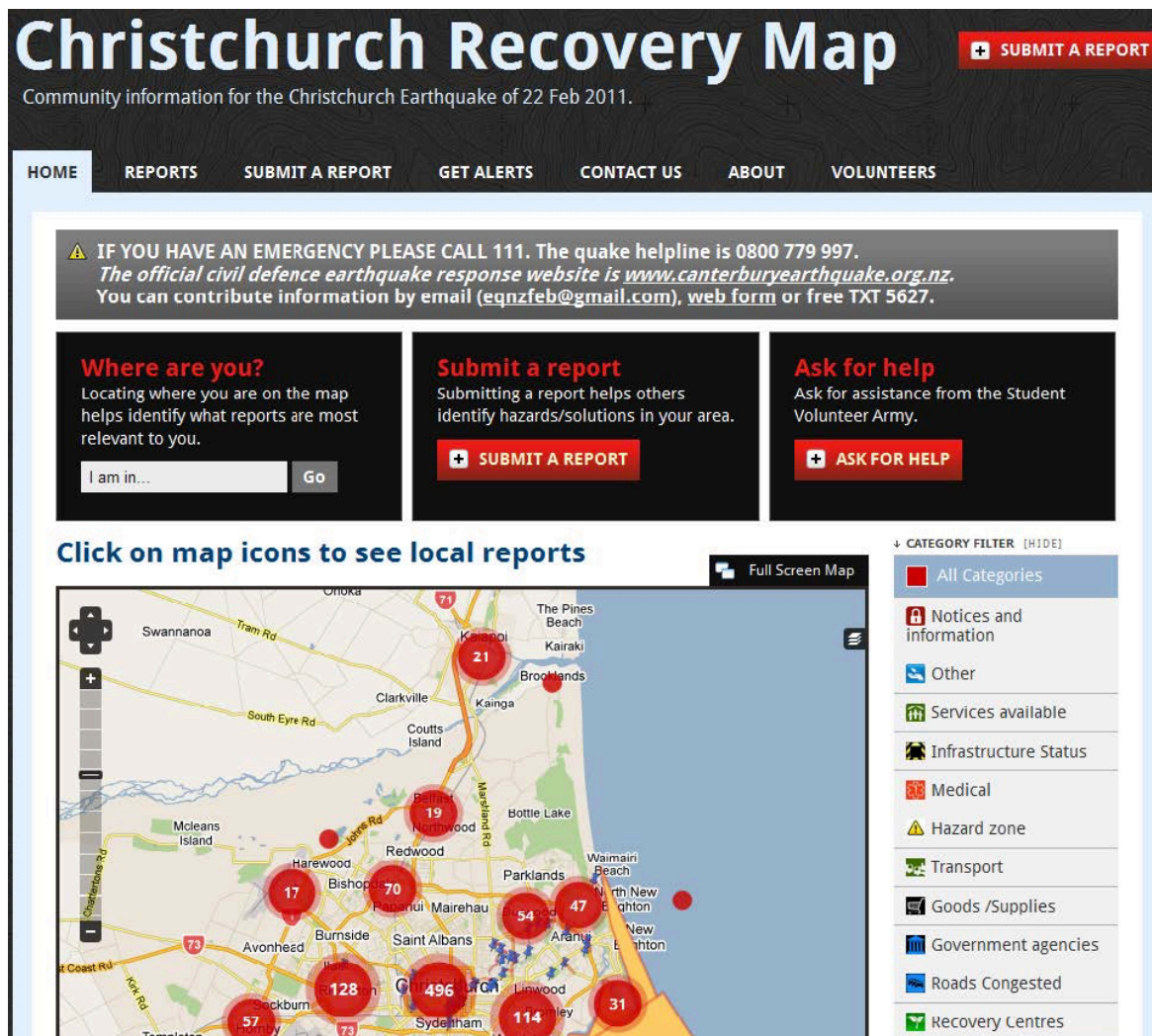


Figure 1: The CRM was a real-time, interactive map of earthquake-affected areas displaying locations of essential services and their times of operation. (Image courtesy of Julian Carver 2015)

New Media and Disasters

There is a growing body of research on the role of new media (internet, social media, mobile phones, etc.) during natural disasters (see, for example: Skuse and Brimacombe 2014; Veil, Buehner and Palenchar 2011). Much work is evaluative in documenting and assessing the nature and extent of the uses of these technologies by citizens. Hjorth and Kim (2011), for example, examined the use of social media in maintaining social relationships among residents living in Tokyo during the 2011 earthquake and tsunami. Similarly, Bruns (2011) examined the rapid emergence of online citizen interactions during the 2011 floods in Queensland, Australia, and argues (2011, 48) for the value of going beyond mainstream approaches to building government-to-citizen or citizen-to-citizen engagement to 'analyse the rapid *ad hoc* forms of participatory organisation which are forged in a more distributed fashion during acute events'. Macias, Hilyard and Freimuth (2009) content analysed a multistage sample of blogs during the two weeks after Hurricane Katrina catastrophically damaged New Orleans in August 2005. The study documented the use of blogs in filtering and linking information about rescue efforts, listing missing persons, finding assistance, and providing information on government responses.

Of direct relevance to our study is the more than decade long systematic program of research by Palen and colleagues on what is termed 'crisis informatics' (for example Palen, et. al. 2010; Palen et al. 2009; Sutton, Palen, and Shklovski, 2009; Shklovski, Palen and Sutton, 2008; Hughes, et al. 2008; Palen and Liu 2007; Palen, Hiltz and Liu 2007). This research draws on previous sociological disaster research (for example: Quarantelli 2008, 873) that examines the role of local citizens, usually the first responders at times of disaster, and challenges commonly held myths about public responses. More than 25 years ago before the advent of mobile digital platforms, Stallings and Quarantelli (1985, 94) identified what they labelled 'emergent citizen groups' that take shape around perceived needs or problems associated with both natural and technological disasters. Their term reflects the lack of formal social structure, their newness, and their often ephemeral nature. In a prescient observation, they noted (1985, 94) that emergent citizen groups are usually ignored by public officials who do not take them into account in formal disaster preparedness plans, despite the likelihood they will play a 'more prominent role in the future'.

In the digital era, elaborating this direction, Palen (2010) challenges the mainstream view about how information should be controlled and communicated during a disaster. She advocates 'reframing emergency response as a socially-distributed information system' such that publically available computer-mediated communications including community websites, blogs, Twitter, social networking sites, mapping sites, etc. are integrated into official systems to empower citizens to 'assess context, validity, source credibility, and timeliness to make the best decisions for their highly localized, changing

conditions' (Palen et al. 2010, 2). Palen recognizes the potential for a clash between the imperatives of official (normally government) information and 'publically-available, grassroots, peer generated information' but she holds great promise for her model of inclusive public participation (Palen, Hiltz and Liu 2007, 57). Palen's model both emphasises the beneficial contribution from increasingly ubiquitous ICT, and an associated heightened risk of 'ineffectively managed' crises if potential new informational relationships between officials and the public are not pursued (Palen, Hiltz and Liu 2007, 58).

Palen and her colleagues give numerous examples—ranging from the 2007 Southern California wildfires, to Hurricane Katrina, to preparation for an Avian influenza (h5n5) outbreak—of the active and dynamic roles of local citizens in creating *ad hoc* systems to provide localized information to suit their immediate needs.

This research parallels recent developments in risk theory examining the clash between and within expert systems of knowledge (scientists, technologists, government, etc.) and lay peoples' knowledges.

Risk Communication

Palenchar's (2009) historical review of risk and crisis communication developments traces a move away from sender-receiver communicative models to more audience-centred perspectives. These dialogic approaches stand in stark contrast to earlier 'one-way, top-down expert-to-public' models as exemplified by Palen, Hiltz and Liu's (2007, 55) dismissal of the 'idealized linear depiction of information dissemination . . . from authority to news events to the public.' Communication conceptualized as information-transfer is replaced with more interactive processes designed to empower various publics.

This shift towards participatory or dialogic models is theoretically underpinned by Wynne's (1996) seminal critique of Beck's (1992) original 'risk society' thesis and by concurrent and subsequent research by Giddens (1990; 1991; 1994) and Lash (1994a; 1994b). In essence, Wynne (1996, 60) documents how expert or technical assessment of risk embodies assumptions and commitments that are neither neutral or value free. As a consequence, expert systems often neglect and denigrate lay perspectives and define resistance to expert assessment as irrational or ignorant. Thus, he observes (1996, 70) that while risks may be debated at the level of scientific or technological expertise and public accountability, they are dealt with by most people as individuals in specific situations at the local level in their everyday lives. It is therefore critical to explore how perceptions of risks are constructed by local, or as he terms it 'situated', knowledge, as well as by expert knowledge. This does not imply a hierarchy because the perspectives of all stakeholders are important whether they be of expert or lay. In criticizing Beck for neglecting lay knowledge, Wynne argues (1996, 70) that lay knowledge tends to be more contextual, localized, individualized, and reflexively aware

of diversity, change and ambivalence, than the generalising tendencies of expert knowledge.

A recent international survey of government and non-government disaster management experts echoes Wynne's critique. Palttala, Boano, Lund and Vos (2012, 9) found that experts stressed the critical importance in disaster preparedness of empowering those citizens directly affected. Palttala et al. argue that strengthening the self-efficacy of those affected lessens the threat to be faced if those citizens have the power to act. The authors caution, however, that communication processes between state and civic groups are yet to manifest as core competencies in practice.

Methodology

In investigating the contextual background to the provocative email from government to Tim McNamara's CRM, 'We are in an emergency situation and cannot meet with you', we sought data about the following questions:

1. How did those involved in CRM and official public information management practices view the information needs of the community?
2. How did this influence their views of their own and other forms of information provision in response to the earthquake?
3. What role could non-government specialist groups have in knowledge transfer activities following a natural disaster?

Our methodology involved inductively analysing secondary and primary data collected from news media reports, website content, departmental memos, and in-depth interviews with key actors involved in the email exchanges. We used multiple data collection methods to identify recurring significant themes, which we compared with those found in the literature addressing formal and alternative communication responses to natural disasters. We completed seven qualitative in-depth interviews of about 60 to 90 minutes each, in Auckland, Wellington and Christchurch, NZ. Four of the participants held positions within the Civil Defence Emergency Management section of the Department of Internal Affairs in Wellington. Two others worked in government on disaster recovery, and one, an IT professional, advised government about crises. The aim of these interviews was to understand the experiences and challenges they faced and their perceptions of the CRM. The participants have been de-identified in the analysis. To understand the processes involved in the creation, development and day-to-day operations of the CRM we interviewed Tim McNamara, the site's key organizer.

We recognize that our research team is largely distant from the on-going recovery and rebuilding in Christchurch and the Canterbury region. Our overall objective is to learn from the communications between CRM and government to better prepare for crisis in a digital era in New Zealand and elsewhere.

Christchurch Recovery Map

The Christchurch Recovery Map (also known as eq.org.nz) was created in response to the February earthquake and contained information gathered via email, Twitter, SMS and locally based websites and was built with open source tools and active support of *CrisisCommons* and *Ushahidi* (Bourk & Holland 2014). Ushahidi (Swahili for testimony) was first developed to map reports of violence in Kenya in 2008 following the election. The Ushahidi platform combines crisis information from citizen generated reports, media and NGOs and facilitates early warning systems and assists in data visualization (geographical mapping tools) for crisis response and recovery.² It is believed to be the most prominent platform used by crisis-mapping and crowdsourcing organisations (Skuse & Brimacombe, 2014, 37). Beatson, Buettner and Schirato (2014) et al. citing McDougal (2012, 7) observe CRM is an amalgamation of three previous crisis maps, the outcome of self-organising and self-deploying Volunteer and Technical Communities (V&TCs). As such, CRM is the result of a collaborative effort to ‘maximise efforts and reduce duplication’.

The CRM provided a visual map of essential services, their location and opening times, and in the ten days of its operation received more than one hundred and fifty thousand hits, was embedded in the major daily broadsheet, the *New Zealand Herald*, and regularly accessed by major banking and other commercial institutions. It operated on a 24-7 basis, receiving and redistributing tweets and SMS messages, and converting the data to a relational database that could display visual information for each affected suburb (Beatson, Buettner and Schirato 2014). In a comprehensive overview of CRM, Beatson et al describe in detail its logistics, structure and content. One of the developers who later emerged as the public face of CRM is Tim McNamara (2011).

McNamara, who was working with the Intellectual Property Office when the earthquake struck, contacted several friends via Twitter and proposed they build a visual community map of current information essentially functioning as an ‘emergency information source’. McNamara received support from technical and commercial institutions with significant resources, as well as a large group of volunteers. For example, senior Google administrators in Zurich contacted him shortly following the launch of the CRM offering their services. At the peak of its operation, more than 100 volunteers from seven countries maintained the CRM, tweeting and retweeting essential data, removing redundant data and updating the visual interface. Many of the local volunteers required training in using open source software and other IT skills.

McNamara’s association with an online disaster response stems from a long-standing involvement in community search and rescue efforts. After graduating, he worked with the Ministry of Civil Defence and Emergency Management, where he had responsibility for coordinating response teams. Despite ending his contract with CDEM as a result of departmental restructuring, he maintained an interest in resourcing urban and regional councils with online civil defence capabilities that led him to learn open-source software coding.

Over time, he connected with other like-minded volunteers that represented a new class of lay-experts forming international groups such as Crisis Commons, Crisis Mappers and HumanitarianOpenStreetMap. This gave him reciprocal access to the group's social resources and expertise during the Christchurch disaster that enabled a quick mobilization of effort. Despite lacking a formal connection to NZ civil defence systems, McNamara's continuing employment in various roles within the public sector provided him with an eclectic knowledge of government structures and policies, which allowed him, he said, to navigate bureaucratic hurdles and expectations in the design and operation of CRM. For example, he and his colleagues avoided the use of official government or corporate logos, chose different colour codes from the Civil Defence's blue and yellow, and generally avoided any signs or visual markers that might confuse users about the website's status and identity.

Government Websites and Social Media Use

Numerous government websites were used in response to the 22 February earthquake and an earlier earthquake on 4 September. Prior to the first event, the government had three primary earthquake-related government websites. The NZ Ministry of Civil Defence & Emergency Management, Earthquake Commission, and GNS Science are the lead agencies responsible for delivering and managing each service. The Earthquake Commission, a Crown entity established by the Earthquake Commission Act 1993, has three primary functions: to provide natural disaster insurance for residential property; to administer the Natural Disaster Fund; and, to support research on natural disasters and impact mitigation. The Commission and GNS Science share responsibility for delivering a website, Geonet, that distributes information on oceanic, climatic and geological activity, including potential hazards. Other government websites concerned with emergency preparedness, disaster recovery, historic events, and science and education also carried earthquake-related information.

Following the September 4 earthquake, an additional eight earthquake-related government websites appeared. The lead agencies responsible for these sites included Environment Canterbury, the Christchurch City Council, Housing NZ, the Ministry of Social Development and the Prime Minister's Office. In addition to the plethora of existing and newly created government websites, a number of government departments and agencies also began carrying earthquake related information.

Twitter also featured in the national and local government earthquake response with 5000 messages tweeted in the three weeks following the February earthquake (Bourk & Holland 2014, 37). Many of the government messages were retweeted across user networks, greatly increasing their reach. Bourk and Holland found Government staff used Twitter to correct erroneous information and answer questions from the affected communities concerning a range of issues, including power services, sanitation and

road closures. To maintain consistency and accuracy, all responses were managed through the Public Information Manager at the Crisis Response Centre in Christchurch.

Analysis

Our participants recognized the importance of new media and communication technologies during disasters but there were barriers to this recognition being translated into workable day-to-day relationships between official systems and those of emergent citizen groups. Our analysis of the qualitative interview data revealed recurring interdependent themes:

- *Information and identity control*: contrasting and often changing assumptions about information provision and citizen reception during disasters;
- *Generalised versus localised information*; differences in meeting the perceived information needs of citizens and the opportunities for interactive communication;
- *Transparency and trust*; differences in investing trust in citizens in disaster communications; and
- *Blurring of the lines of expertise*; differences in reconceiving the boundaries between 'official' and 'crowd-sourced' information and expertise.

Information and identity control

Our participants pointed to barriers in creating relationships between official systems and those of emergent citizen groups. CRM's McNamara suggested that within New Zealand's Civil Defence Management sector there is a strong emphasis on community development including enabling communities to create their own solutions. But, in practice, this presents challenges to established ways of doing things. One such challenge centres on accepting that communities are in a position to take ownership of their own issues.

During the Christchurch earthquake, there was uncertainty and lack of clarity about where CRM fitted into the overall scheme: what was its role; was it encroaching on the Civil Defence site and other agencies? Some of the initial hesitation on the part of Civil Defence was connected to concern that the information being published on the CRM could potentially cause harm because it had not necessarily passed through official filtering channels.

The spread of misinformation during disasters could have serious consequences, and thus ensuring the accuracy and integrity of information is a key concern for emergency management practitioners and government agencies. In reflecting on the perception of CRM within Civil Defence, one government official suggested their initial hesitation centred on the twin concerns that CRM information could potentially cause harm and create confusion among those affected. In particular, that people might confuse CRM with official information and thereby threaten the integrity of government authorised information and its control of the flow of that information to the public. This in turn reflects uncertainty about the credibility of the information provided by CRM.

The principal concern about CRM was directly linked to its nature as a community sourced information site rather than a government site. McNamara sought to remedy concerns about this and the verification of information with both a disclaimer acknowledging their site was not official and by including a signpost to the Civil Defence site.

Verifying the accuracy of reports generated by social media is a critical concern of officials and those engaged in Crisis Commons and related activities. The processes by which Civil Defence and those working on the CRM sorted through and filtered incoming information appeared to be similar. CRM's technology and its lack of bureaucratic oversight, however, enabled it to disseminate information in a more timely fashion than official sites. McNamara described how they configured CRM to retrieve any report mentioning keywords EQ, NZ, Christchurch and earthquake from Twitter, from which they filtered about 12,000 map data items from more than a half a million incoming messages.

It could be argued that labelling information as verified or unverified could signal to citizens that a verification process was in place. Equally, it might also be that people are more likely to think critically if they know the information they are accessing is unfiltered or unverified. This fundamental tension was the essence of CRM's mission; to capture and disseminate information as it emerged rather than waiting for official verification. The IT professional who advised government was in Christchurch at the time of the earthquake and described how CRM provided timely localised information for addressing immediate necessities:

So we had no power for five days, we had no water for two weeks, we had no sewage for two and a half weeks. So I needed to know things like where can I go and fill up my gas bottle, and where can I collect water? And, so, that data is not perfect, but it exists, it's much better than nothing. (IT professional and advisor)

Numerous studies of risk communication identify the importance of informing citizens about uncertainties rather than leaving an information vacuum or seeking to project a

level of certainty when it does not exist. An overly contrived or managed presentation of information may be deemed disingenuous and insincere, thereby limiting its effectiveness (Crowe, 2012, 257). The time that it can take for information to be filtered and verified through official channels and finally packaged for public consumption inevitably leaves a vacuum and, even after having gone through these official processes, information will still inevitably be partial and incomplete. The IT professional noted that since the earthquake some civil defence centres had invested more time and resources in training, consulting Google and collaborating with peer organizations to establish closer relations between state and IT professionals.

Knowledge about how the Ushahidi platform worked in real-time could be seen as an obstacle to a collaborative and coordinated relationship between CRM and official agencies. Ironically, the response McNamara received when he tried to arrange a meeting with officials, 'Because we are in an emergency response situation, we are unable to meet with you' clearly underscores the importance of ensuring that relationships are in place and roles understood before a crisis. This echoes the critical importance Palttala et al. (2012) place in disaster preparedness that empowers those citizens directly affected and strengthens their self-efficacy.

One government official reflected on the seriousness of the crisis and how agencies such as Civil Defence should consider community sourced information:

at the time because of the magnitude of what was going on, everybody just went, no; too hard; we can't deal with that right now. It's all too new; it's all too different; it's a little bit uncertain; who is this Ushahidi; what's this platform? (Government official)

Later in the interview the official acknowledged that centralized control went against the grain of these new localized platforms. While emergent citizen groups that build themselves around new online technologies may not need the 'semi-official stamp', to use this official's words, they suggested some government support will be necessary to ensure that such platforms are adequately resourced in the face of the next disaster.

Another government official, while accepting 'those sorts of things as useful' reflected on the extent to which initiatives like CRM ought to be controlled, or brought into existing systems, or allowed to evolve organically, on the basis that people using them will be able to put them in their correct context and act responsibly on the information provided.

Generalised versus localised information

A familiar topic in our conversations with participants involved differences between the range of information provided by official agencies and that provided by CRM. The term

used by one government official was ‘a broad spectrum of information needs at times of crisis’—that is distinguishing between broader national strategic information needs (such as impact of the disaster on the economy) and what may be useful at street level (what pharmacies are open).

Predictably, McNamara, ever keen to promote open-sourced community information, was blunt in his assessment that people did not necessarily need press releases. Nor did they need to know about things such as portable toilets in their neighbourhood, which were clearly visible. CRM focussed on disseminating information on essential services and their times of operation such as pharmacies, petrol stations and water deliveries.

Similarly, one government official recognized the importance of understanding and effectively using a broad spectrum of communication modalities for multiple communities to meet both generalized information and more localised needs—ranging from those physically affected to international audiences requiring accurate updates.

But there was also cooperation between official sites and the CRM. The NZ Banking Federation used CRM to signal which ATMs were working, and other public sector organizations were involved including the well-known NZ appliance manufacturer Fisher and Paykel who asked CRM to publicise that affected people could use washing machines set up at their warehouses.

In this context, one government official recognised that CRM and similar open source platforms did fill a gap in official information because it was community sourced, and therefore more localised, and timely. And McNamara did see different roles for government sites and sites like CRM:

Now, if we can take some of the burden, or if the community can take some of the burden for distributing local, rapid, highly—you know, *highly variable information*, it means that officials hopefully should be able to focus on getting the picture right. (Our emphasis)

Transparency and trust

While social media has opened up new ways of capturing and presenting information during disasters, its proliferation raises serious questions about the possibility and desirability of establishing hierarchies of source credibility. Consistent with the work of Palen et al. (2010), there was evidence of tension between a centralized top-down model of disaster communication and an inclusive public participatory model using a citizen-distributed information system such as CRM.

Our participants raised issues not only about the speed at which information was provided through these competing modalities but also the style of the information and its impact on reception, including perceptions of the credibility and trustworthiness of

sources. As McNamara concedes, this approach not only requires investing faith in citizens to determine what is worthy of their attention but to be risk-tolerant:

We respect that people have their own judgment and we are willing to take the risk that it could be misinformation . . . people communicate all the time, and they detect lies all the time. Our brain is very good at detecting lies.

Yet the risks are real. Government officials are genuinely concerned that misinformation may lead to subsequent harm, and in a crisis situation that harm could be catastrophic. On the one hand, McNamara recognises this but, on the other, he is willing to ‘push the burden downstream’, as he puts it, in letting people actively interpret and manage information. But he is reflexively clear about official information:

if I was in another country, say, I would always hunt for the government sources. If they were deficient, I would then go somewhere else. I mean, you’d—but you’d always want to go to the original source.

Blurring the lines of expertise

The nature of expertise and the way in which a crisis brings to the fore new forms of expertise, emerged as a key theme in the interviews.

One government official reflexively observed a shift from an initial sense of uncertainty and caution within Civil Defence to a gradual recognition that the CRM was fulfilling a significant role in providing localised, detailed, timely and specific information, which his own agency was unable to do.

I don’t think there was a clearly, sort of, defined set of boundaries in place. That, kind of, got established as things happened but it probably took days, if not a week or two, for things to settle down. So initially there might have been some hesitation from the Civil Defence team here. . . . They’re (CRM) playing in slightly different spaces; the target audience had a big—big overlap, but the guys that were in the CrisisCommons were able to get down to a much more localised and—and specific layer of detail. (Government Official)

Unlike CRM’s volunteer supported effort there was a sense in which NZ government agencies responded to the earthquake in a much less coordinated and user-friendly way, which may have contributed to confusion within the community. As one government official put it:

every government agency in town (Christchurch) had created a website, you know, basically for their sector of helping the earthquake [Government official]

There was some level of bemusement about the central government's decision to create a new website Canterburyearthquake.govt.nz in response to the earthquake, given that much of the information that would appear on it would already have been available on existing websites. One government official commented that the imperatives of government authorities may not put them in the best position to use the internet in crisis situations:

And it was, kind of, like, well sorry Prime Minister, maybe you don't actually know the best way to arrange things on the Internet. (Government official)

Multiple government websites were also seen by this official as a potential source of confusion, but his position was grounded in the harsh reality of the crisis as he noted, 'people 'were running from falling buildings and making sure they had a roof over their heads'.

Despite all the resources of government there appeared to be a view that it was not well-positioned to facilitate something like the CRM. Yet, the following comment from a government official does hint at the need for future government responses to emergencies to include working more closely with local communities by potentially tapping into the volunteer market:

We don't have that, sort of, size and budgets available so we are going to have to tap into the volunteer market more. How do we leverage that through the various local Civil Defence groups? (Government official)

Of importance to establishing future dialogue between government and citizen groups is the need to rethink assumptions about what constitutes relevant expert knowledge and expertise. For example, McNamara said just because the volunteers who contributed to the CRM were not being paid did not mean that they were any less qualified or committed to their tasks:

I think the lessons for community is that there are now tools available for you to support yourselves . . . the designation of lay people or volunteer effort does not mean unqualified, it doesn't mean unaware, it doesn't mean unsavvy necessarily.

Thus, McNamara also challenged the value of dichotomies such as 'expert versus lay' when he referred to the buy-in CRM had from some official sources, such as the Banking Federation who used the website to provide updates on the status of ATMs. And the

usefulness of CRM also depended upon the goodwill of the private sector especially in volunteer expert technical support.

Clearly, the concept of emergence is central to disaster response. Disasters challenge the assumptions of predictability and the capacity for technical expertise to know, control and manage emergent events because of the inherent uncertainty. This complicates the boundaries between expert and lay, or expert and specialist lay, expertise. McNamara gave the example of trusting a text message accompanied by date-stamped, geo-coded photographs from the ground more than he would trust an official report:

Officialdom—official doesn't mean correct; official means it's come from officials . . . official information should not be trustworthy because it's official; it should be trustworthy because the information itself is trustworthy. It should have good sources. It should be internally consistent . . . it should be verified in some way. I mean, the truth worthiness or—I mean, there's a high degree of, ah, correlation between truthfulness and officialdom, but there—there's no necessary, ah—there's no necessary link there.

The willingness to bracket one's predispositions about what constitutes trustworthy or authoritative information was evident in one of our interviewee's reflections about how government agencies might have been able to fruitfully engage with CRM:

could we, you know, endorse some of the information that their site (CRM) was putting up; could we re-tweet some of the information they were putting up; could we even start directing people to the site as a, you know, if you want, local, more real time information; you know, start lodging reports here because it's actually a useful tool? [Government official]

The official added that the value of CRM was that agencies like Civil Defence could focus on the core issue of managing events. There was a sense of gratitude toward CrisisCommons for providing a service that his own team was not equipped or able to do at the time because its focus was on other areas:

I could see a value in doing it and partly because I could also see that the main Civil Defence team here was in no head space for dealing with that; and we weren't resourced to deal with it . . . we had about eight people, we're trying to provide 24 hour a day, seven day a week coverage—we couldn't do that and also take care of, you know, validating all of these localised reports and—and—and, sort of, vetting the—the slightly dubious information out. (Government official)

Discussion

CRM's efforts were developed by local, national and international volunteers as an immediate response to the earthquake crisis and the perceived need for location-focused rather than topic or service focused information. They involved rapidly processing, repackaging and adding value to available information from social media (especially Twitter) and official agencies in the form of populating a visual representation of this data. A key goal was to keep information current and flowing.

While new online platforms like CRM are facilitating more grass-roots, interactive communicative styles during crises, the tendency for governments to favour a centralised model of information delivery grounded in risk aversion and accountability is a potential barrier to enabling an active role for emergent citizens groups. Conceptualization of disaster communication among emergency management practitioners and government agencies still tends to be based on a conduit model (Pechta, Brandenburg and Seeger 2010).

Disasters by their nature break down boundaries, creating challenges for existing official crisis response and communication systems. The importance of maintaining a lead agency with an authoritative voice that can act as a reference point in the context of several different information sources still remains. Yet, as this case study reveals, there is a need to rethink or recast established hierarchies of information value and flow and the assumptions and expectations that underpin them.

The notion of emergence is critical in a dynamic, often changing, disaster response. Emergence provides an informative way of thinking about the value of crowd source tools for facilitating dialogue among and between citizens and government agencies. A deeper understanding of the processes behind particular initiatives may lead to greater awareness and acceptance of crowd source tools and ways of responding to the challenges they present to established governmental ways of operating.

Clearly, there are real concerns about the potential for information overload with the increasing number of people involved in disseminating information during an emerging disaster. New communication platforms create opportunities for representing data, including official data, in new and accessible ways. But just because these representations have not been filtered and verified through official channels does not necessarily mean the information is inaccurate or not meeting a local need that is unsatisfied by official agencies.

Conclusion

In conclusion, our research strengthens the argument that relationships between government agencies and civic-minded lay specialists need to be already in place to leverage all available skills and resources during emergencies, which illustrates Palttala

et al., (2012) call for disaster-preparedness. However, the ad-hoc and informal structure of pre-disaster civic-public relationships requires consideration and additional research. Otherwise, rigid policy structures around membership and participation may alienate civic entrepreneurs who are volunteers and not employed agents. Arguably, tech-savvy, civic-minded groups of individuals using crowd-sourcing skills will respond to loose, informal organisational arrangements with government agencies. Pre-crisis gatherings between government and civic entrepreneurial groups will be organised similar to crisis commons meetings, which are generally non-hierarchical, periodic gatherings in material and online spaces. Access and participation to institutional websites already differentiate public from members-only areas. It would be relatively simple to add an additional membership area for lay-specialist groups that could be coordinated across different government department websites. Both material and virtual gatherings among government and lay-specialist groups prior to an emergency present opportunities to exchange knowledge, skills, and differing priorities through dialogue where one learns to understand and use the 'language' of the other.

Government, specialist lay, and lay audiences play differing roles in emerging crises. As suggested, specific information needs necessitate different ways of meeting them and different forms of expertise. Government and its agencies would likely benefit from recognizing the limitations of their own communication approaches during emerging crisis. As the analysis demonstrates, there is recognition by some government officials of the need to invest more resources in and build collaborations with lay and expert specialists in crowd-source technologies. From a risk theory perspective, our data analysis points once again (following Wynne 1996) to recognizing the importance of expert, specialist lay and lay audiences during an emerging risk crisis.

A weakness of our research design is the lack of investigation into how affected communities used, managed and valued differing websites and social media during the emerging crisis. The one exception is the IT professional and government advisor who was in Christchurch during the earthquake. Nonetheless, our observations reveal that the Civil Defence website and CRM received considerable traffic. CRM capitalized on data volume by translating community-sourced information into a format designed to assist people to easily access practical information specific to their location. The level of international traffic CRM received also suggests that it was a useful source of information for people outside of NZ to know what was happening in particular locales. An analysis of how affected communities engaged, prioritized, and differentiated between the range of data and civic entrepreneurial online responses, as well as to other communication modalities, would complement this study's findings.

Acknowledgments

The research for this project was supported by a grant from Emergency Media and Public Affairs (Australia), Examining the “crisis commons” during the 2011 Christchurch earthquake’.

Notes

1. An earlier version of this paper, ‘Crisis Commons and the 2011 Christchurch Earthquake’ was presented to the annual conference, Emergency Media and Public Affairs, Canberra, 2-3 June. At this time data gathering and analysis had not been completed.
2. Some images of the Christchurch Recovery Map are still available on the Internet. Search ‘Christchurch Recovery Map’.

References

Beatson, A., A. Buettner and T. Schirato, 2014, ‘Social Media, Crisis Mapping and the Christchurch Earthquake of 2011’. *MEDIANZ: Media Studies Journal of Aotearoa New Zealand* 14 (1): 38-53.

Beck, U. 1992. *Risk Society: Towards a New Modernity*. Translated by M. Ritter. Thousand Oaks, Calif: Sage.

Beck, U., Giddens, A. and S. Lash 1994. *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*. Cambridge, UK: Polity.

Bourk, M. and K. Holland. 2014. ‘From Silos to Flows: Spatial Metaphor and Communication Responses to the Christchurch Earthquakes’. *Australian Journal of Emergency Management* 29 (2) April.

Bruns, A. 2011. ‘Towards Distributed Citizen Participation: Lessons from Wikileaks and the Queensland Floods’. In *CeDEM11 Proceedings of the International Conference for E-Democracy and Open Government*. Edited by P. Parycek, M.J. Kripp and N. Edelmann, 35-52. Krems, Austria: Edition Donau-Universität Krems.

CrisisCommons. n.d. *CrisisCommons: Connecting People, Tools & Resources to Support Crisis Response*. Accessed 8 August 2012. <http://crisiscommons.org>.

Christchurch Recovery Map. 2011. *Christchurch Recovery Map: Providing Community Information for the Christchurch Earthquake 22 Feb. 2011*. Accessed 30 July 2012. <http://eq.org.nz>

Crowe, Adam. 2012. ‘Open and Social Leadership: A New Paradigm in Emergency Management’, *Journal of Business Continuity and Emergency Planning* 6 (3): 253-67.

Giddens, Anthony. 1990. *The Consequences of Modernity*, Cambridge, UK: Polity.

Giddens, Anthony. 1991. *Modernity and Self-Identity: Self and Society and the Late Modern Age*, Cambridge, UK: Polity.

Giddens, Anthony. 1994. 'Living in a Post-traditional Society'. In *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*. Edited by Ulrich Beck, Anthony Giddens, and Scott Lash, 56-109. Cambridge, UK: Polity.

Gruen, N. 2011. "'We are in an Emergency Situation and Cannot Meet with you": Postscript to the Christchurch Earthquake', *Club Troppo*, 1 April. Accessed May 2011. <http://clubtroppo.com.au/2011/04/01/we-are-in-an-emergency-situation-and-cannot-meet-with-you-postscript-to-the-christchurch-earthquake>

Hjorth, L. and H-H. Kim. 2011. 'Good Grief: The Role of Social Mobile Media in the 3.11 Earthquake Disaster in Japan'. *Digital Creativity* 22 (3): 187-99.

Hughes, A., L. Palen, J. Sutton, S. Liu and S. Vieweg. 2008. "'Site-Seeing" in Disaster: An Examination of On-Line Social Convergence'. *Proceedings of the 5th International Association for Information Systems for Crisis Response and Management*, Washington, DC, May, 324-33.

Kranich, N. 2004. *The Information Commons*. Brennan Center for Justice, NYU School of Law, New York.

Lash, Scott. 1994a. 'Reflexivity and its Doubles: Structure, Aesthetics, Community'. In *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*. Edited by Ulrich Beck, Anthony Giddens, and Scott Lash, 110-73. Cambridge, UK: Polity.

Lash, Scott. 1994b. 'Expert Systems or Situated Interpretations? Replies and Critiques'. In *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*. Edited by Ulrich Beck, Anthony Giddens, and Scott Lash, 198-215. Cambridge, UK: Polity.

Macias, W., K. Hilyard and V. Freimuth. 2009. 'Blog Functions as Risk and Crisis Communication during Hurricane Katrina'. *Journal of Computer-Mediated Communication* 15: 1-31.

McDougall, K. 2012. 'An Assessment of the Contribution of Volunteered Geographic Information during Recent Natural Disasters.' In *Spatially Enabling Government, Industry and Citizens: Research and Development Perspectives*. Needham, MA: GSDI Association Press: 201-14. Accessed February 2015. http://eprints.usq.edu.au/21536/5/McDougall_GSDI_2012_PV.pdf.

McNamara, T. 2011. 'The Power of Usahidi'. *New Zealand Computer Society* 10 November. <http://www.nzcs.org.nz/newsletter/article/94>.

McShane, I. 2010. 'Trojan Horse or Adaptive Institutions? Some Reflections on Urban Commons in Australia'. *Urban Policy and Research* 28 (1): 101-16.

Palen, L. K Anderson, G. Mark, J. Martin, D. Sicker, M. Palmer and D. Grunwald. 2010. 'A Vision for Technology-Mediated Support for Public Participation & Assistance in Mass Emergencies & Disasters'. *Proceedings of ACM-BCS Visions of Computer Science*. Swindon, UK.

Palen, L., S. Vieweg, S. Liu and A. Hughes. 2009. 'Crisis in a Networked World: Features of Computer-Mediated Communication in the April 16, 2007, Virginia Tech Event'. *Social Science Computer Review*, OnlineFirst, 8 April.

Palen, L. and S. Liu. 2007. 'Citizen Communications in Crisis: Anticipating a future of ICT-Supported Public Participation'. *Proceedings of the ACM 2007 Conference on Human Factors in Computing Systems (CHI 2007)*, San Jose, CA, 727-36.

Palen, L., R. Hiltz, R. and S. Liu. 2007. Online Forums Supporting Grassroots Participation in Emergency Preparedness and Response. *Communications of the ACM*, 50 (3): 54-8.

Palenchar, M. 2009. 'Historical Trends of Risk and Crisis Communication'. In *Handbook of Risk and Crisis Communication*. Edited R. Heath and D. O'Hair. Routledge: New York, 31-52.

Palttala, P.,C. Boano, R. Lund and M. Vos. 2012. 'Communication Gaps in Disaster Management: Perceptions by Experts from Governmental and Non-Governmental Organizations'. *Journal of Contingencies and Crisis Management* 20 (1): 3-12.

Pechta, L., D. Brandenburg and M. Seeger. 2010. 'Understanding the Dynamics of Emergency Communication: Propositions for a Four Channel Model'. *Journal of Homeland Security and Emergency Management* 7 (1): Article 55.

Quarantelli, E. 2008. 'Conventional Beliefs and Counterintuitive Realities'. *Social Research* 75 (3): 873-904.

Shklovski, I., L. Palen and J. Sutton.. 2008. 'Finding Community Through Information and Communication Technology During Disaster Events'. *Proceedings of the 2008 Conference of Computer Supported Cooperative Work*, November: 127-36.

Skuse, A. and T. Brimacombe. 2014. Social Networking, Social Media and Complex Emergencies: Issues Paper. Australian Civil-Military Centre and The University of Adelaide.

Stephens, K. and Malone, P. 2009. 'If the Organization Won't Give Us Information. . . : The Use of Multiple New Media for Crisis Technical Translation and Dialogue'. *Journal of Public Relations Research* 21 (2): 229-39.

Sutton, J., L. Palen and I. Shklovski. 2009. 'Backchannels on the Front Line: Emergent Uses of Social Media in the 2007 Southern California Wildfires'. *Proceedings of the 5th International Association for Information Systems for Crisis Response and Management*, Washington, DC, May: 624-32.

Stallings, R. and E. Quarantelli. 1985. 'Emergent Citizen Groups and Emergency Management'. *Public Administration Review* 45.

Veil, S., T. Buehner and M. Palencha. 2011. 'A Work-in-progress Literature Review: Incorporating Social Media in Risk and Crisis Communication'. *Journal of Contingencies and Crisis Management* 19 (2): 110-22.

Wynne, B. 1996. 'May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide'. In *Risk, Environment and Modernity*. Edited by S. Lash, B. Szczyński and B. Wynne, 44-83. Sage: London.