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- ARTICLE -

Social Media, Crisis Mapping and the Christchurch Earthquakes of 2011

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Abstract

This article will describe and contextualize the development whereby data and information flows derived from social media sites are gathered and made available as part of crisis maps. In particular it will look at the evidence available to describe and contextualise the use of crisis mapping as it was played out during the initial recovery period of the 2011 Christchurch earthquakes. It will also consider to the extent to which this new media based institutional and public information sharing and deployment constitutes a significant tool within the relevant networks of communication practices and practitioners.

The increasing ownership of personal multimedia recording technologies (such as the mobile phone) is producing what Goodchild (2007, 217) has described as networks of 'citizen sensors', in which a multitude of real-time first-person accounts of crisis events are being documented and broadcast within online networks. While potentially useful, these new information flows have been characterised by humanitarian and emergency management response organisations, since the devastating 7.0M earthquake in Haiti, as a case of 'trying to drink from a fire hose of information' (Harvard Humanitarian Initiative 2011, 17). To find more effective ways to identify, organise and share this critical information with emergency responders and the public, grass-roots

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organisations such as Volunteer & Technology Communities (V&TCs) are attempting to organise these dispersed flows of information into forms of valuable knowledge that can be used to increase situational awareness. By utilising crowd-sourcing techniques, V&TCs are able to mobilise large numbers of internationally dispersed volunteers in order to collaboratively problem-solve informational and logistical management issues; this involves identifying and organising crisis information, and pinpointing community needs and visualising hot-spots of activity within a timeframe that has been described a 'participatory revolution' (Liu and Ziemke 2012, 193).

These crowd-sourced problem-solving techniques are utilized in crisis mapping, specifically for the task of geo-locating relevant information onto 'live' maps to produce and visualise a bird's-eye perspective (in real time) of what usually is a complex and often rapidly changing environment. Information is often captured by personal multimedia recording technologies and sourced via social media (e.g. YouTube, Twitter, Facebook), text messages and images via mobile phones and satellite images, as well as traditional news channels. This information is then geo-referenced and plotted on maps and continuously updated as new information is received and events unfold. Some examples of these information flows are mapped information about trapped persons, medical resources, damaged buildings, closed roads, and the availability and whereabouts of specific needs such as food, water and shelter. The Christchurch Recovery Map is one example of crisis mapping, used to respond to 2011 Christchurch earthquakes. However, little forensic research has been performed on this deployment and this research seeks to identify and contextualise the available data to support and provide an evidential framework for evaluation and future research.

Crisis Mapping

The term 'crisis mapping' was originally conceptualized by the Harvard Humanitarian Initiative to address 'how mobile technologies, geospatial data, and citizen based reporting are influencing humanitarian action and disaster response' (Harvard Humanitarian Initiative 2007). Ziemke (2010, 2) explains the field of crisis mapping as being constituted by and through sites and practices where '[s]cholars, practitioners, and communities alike are working together to create, analyze, visualize, and use real-time data for humanitarian response and post-conflict reconstruction and development'. The 'multitude-of-parts' that this field encompasses is demonstrated in the work of Raymond et al (2012, 3), who describe crisis mapping as a 'digital toolbox – part crowd sourcing, part field reporting, part social media, part digital cartography, and part data mining'.

The relationship between crisis mapping and its advanced use of social media technologies and crowdsourcing techniques is the subject of a valuable debate, among academics and practitioners, happening online: this tends to focus around the hashtag #crisismapping on Twitter and 'The Crisis Mappers Google Group'. There is also a debate among prominent academics (Meier 2012, Raymond et al. 2012) about the term

'crisis mappers', which usually refers broadly to agents who participate in the practice of crisis mapping. The decentralisation of these groups means that the term is difficult to delineate and define as Meier (2012) explains,

> On the one hand, there is the International Network of Crisis Mappers, which is a loose, decentralized, and informal network of some 3,500 members and 1,500 organizations spanning 150+ countries. Then there's the Standby Volunteer Task Force (SBTF), a distributed, global network of 750+ volunteers who partner with established organizations to support live mapping efforts. And then, easily the largest and most decentralized 'group' of all, are all those 'anonymous' individuals around the world who launch their own maps using whatever technologies they wish and for whatever purposes they want.

This attempt to define and delineate crisis mapping is further complicated by the multiple overlapping terms in which it is encompassed, and the diversity of disciplines in which it is discussed. Terms such as neogeography (Turner 2006), geoweb (Roche et al. 2011), volunteered geographic information (Goodchild 2007) and public participation geographic information systems (Sieber 2006) have all been used to discuss the practice of crisis mapping. Even relatively straightforward terms and categories are the subject of debate and revision. After reviewing more than forty different definitions of the term 'crowdsourcing', Estellés and González (2012, 9) proposed a new integrated definition, part of which describes crowdsourcing as 'a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task'.

However as Starbird (2012, 7) argues, the second-half of the term 'sourcing' is not broad enough to enable a full understanding of the diversity of crowd work produced during a crisis or disaster situation. As she explains, volunteers are not sourced; rather, they deploy 'themselves via digital technology and began to act in whatever ways they could think of to help. Tasks [we]re eventually developed, but they rose from the bottom up. Coordination was ad hoc and lateral' (2012, 7). Consequently the concept of 'crowdfeeding' is now being used to help explain, and move beyond the limitations imposed by, the term 'crowdsourcing'. It refers to the ongoing feedback loop of information that crisis mapping enables by returning information 'directly to the crowd itself' (Liu & Palen 2010, 82). One of the goals is to increase participation on the part of the public: 'blurring the distinction between producers, communicators, and consumers' of near real-time crisis information (Goodchild 2009, 82).

The connection forged between crisis mapping and social media is also part of a wider development that Manuel Castells characterises as the rise of the network society (1996). Castells argues that there has been a transformation of the systems of economic, social and cultural production and communication due to the development, since the

1980s, of new informational technologies. His argument is that this new and increasingly centralised organisational form is characterised by the logic of networks. These networks are supported by technological developments that enable the transformation of information into digital data. This digitalised information is able to pass through, across and between systems of interconnected technological hosts to create information networks. These informational networks are central to understanding the field of crisis mapping: digitalisation, for instance, is crucial to the development of both the forms of media (telephone and computers) and the types of text (pictures, sounds, scripts) that are able to converge together and across national boundaries.

The process of turning digitalised information into units of knowledge is central to setting up social, cultural and economic networks of production and communication. This has brought about an informational economy where, as Castells explains, 'productivity and competitiveness of units or agents in this economy (be it firms, regions, or nations) fundamentally depend on their capacity to generate, process, and apply efficiently knowledge-based information' (Castells 1996, 66). Although Castells acknowledges that there is something of a theoretical hiatus in terms of explicating the movement from information to knowledge (1996), we can say that this process is largely facilitated by and through authorised cultural fields and institutions (sciences, universities, research institutes, government agencies, credentialed consultants). However it is worth adding that in the case of the use of social media as part of crisis mapping, the media often becomes a significant player in this authorisation and verification process because of its ability and willingness to influence political and bureaucratic decision-making.

Volunteer & Technical Communities (V&TCs)

The convergence of people online during, and after, a crisis event or disaster has been well documented (Hughes et al. 2008; Palen et al 2008; Qu et al 2009). However, the culture shift on the internet towards what has been coined 'Web 2.0' - represented by information production and dissemination being increasingly propagated from the 'bottom up' - has enabled a growing emergence of users becoming 'active participants rather than observers' (National Research Council 2009, 28). As Starbird (2012, 1) explains, this has led to the emergence of a new sub-category – 'the digital volunteer'. Digital volunteers are self-organising in order to form Volunteer and Technical Communities (V&TCs), and self-deploying in the event of a crisis or disaster event. A member of a V&TC will often repeatedly participate in multiple crisis events, and dedicate considerable time and effort to the work at hand. Understanding the motivations behind this ongoing commitment is still in its infancy, and literature in this area is limited. However, in their analysis of specific crisis mapping case studies Liu and Palen (2010, 73-75) explore some of the primary reasons behind these motivations, which they describe as: personal interest and gain; curiosity about information display potential;

expediting communication of information; making information more accessible and usable; and persuasion and mobilisation of audience.

The deployment of a crisis map usually aims to resolve or mitigate a socio-political or geophysical disaster: it is particularly relevant and useful when communication infrastructure is overloaded, damaged, or restricted. These objectives are supported by underlying technologies and practices that allow crisis mapping to make significant contributions to disaster response and recovery practices; its speed of deployment, along with its ability to activate 'humans as sensors' and enable peer-to-peer counter-disaster systems to be developed 'on the fly', are the main advantages of the work that it performs (Utani et al. 2011, 1). However the work performed, and speed at which it is done, is only possible because these communities are separated and distinct from the traditional hierarchical framework of disaster response and recovery organisations, and their data-sharing practices, protocols, procedures and standards.

The organisational structure of many V&TCs has been described as a form of decentralised 'stigmergic' self-organisation, and defined by Heylighen et al. (2012, 3) as 'a mechanism of spontaneous coordination between actions, where the result of an individual's work stimulates a next individual to continue that work'. This 'snowballing' effect enables large numbers of volunteers to collaboratively problem-solve online as a flexible unit and, if needed, re-organise quickly and effectively to adapt to the informational and logical problems of a rapidly changing environment. As discussed by Giroux and Roth (2012, 8), this adaptive system of organisation 'refers to learning processes that allow a system to ensure its survival through change'. Interestingly, the theoretical framework of stigmergic self-organisation was originally developed and used in order to explain the coordination of behaviour among insects such as 'termites coordinating nest building activities through scent trails' (Marsden 2012, 4). This type of collective behaviour is clearly evident in crisis-mapping deployments in the sense that individuals, even without direct contact or communication, are able to collaborate together by developing upon the work of those that came before them.

A central focus of New Zealand's Civil Defence Emergency Management (CDEM), for instance, is on creating resilient communities that can 'learn and adapt, and be capable of self-organisation and reorganisation after an emergency event' (Jackson et al. 2012, 27). This focus is fundamentally aligned with the organisational structure that the work of V&TCs supports and enables. There are multiple V&TCs currently in existence, including the International Network of Crisis Mappers, Open Street Map (OSM), Ushahidi, MapAction, and Humanity Road and a central V&TC in New Zealand is Crisis Commons New Zealand. These are communities that are likely to self-deploy in the event of a crisis by building and activating their own counter-disaster systems and practices to provide assistance to the overall response. However, the current distinction between these two systems of organisation means that the majority of V&TC members are not emergency managers, and are untrained in established operational procedures and standardised information-sharing processes. Without a formal interface and

training for information exchange with traditional disaster response organisations, V&TCs are unwittingly contributing to the problem they are trying to resolve by adding to the 'raging river' of unstructured information that response organisations face in the event of a crisis (Harvard Humanitarian Initiative 2011, 18).

V&TCs therefore can potentially exert a 'disruptive and ineffective' (Harvard Humanitarian Initiative 2011, 36) influence if they produce new information sources during an active operation:

> without a formal interface for information exchange with the humanitarian system, or appropriate data standards, this new data add(s) to the raging river of information that aid workers faced as they … build the relief effort from the ground up. As the volunteer and technical communities continue to engage with humanitarian crises they will increasingly add to the information overload problem. Unless they can become a part of the solution (Harvard Humanitarian Initiative 2011,18).

Attempts have been made to overcome this 'double-edged sword' effect by developing working relationships and standard formats for information exchange between both V&TCs and humanitarian response organisations. However, the institutional, cultural and procedural differences between these centralised and decentralised systems of organisation make this relationship difficult to establish. As Cavelty & Giroux (2013, 9) point out: 'from a systems perspective, understanding how to facilitate collaboration and encourage organic movement, without controlling it is significant'. The first step to 'facilitating collaboration' and 'encouraging organic movement' is to have a clear understanding of the value of crowd-sourced information as part of a traditional emergency management response.

In light of this, there has been a proliferation of academic interest and research in Crisis Mapping since its 'impressive proof of concept' in response to the M7.0 2010 Haiti earthquake (Morrow et al. 2011, 4). Jen Ziemke, co-founder & co-director of the International Network of Crisis Mappers, points out that:

> Meetings on crisis mapping or closely related subjects are rapidly proliferating because so much can and has been crisis mapped: from humanitarian assistance and disaster response after tornados and earthquakes to citizen-action around government repression, street crime, protests, oil spills, and infectious disease, to name but a few, so many individuals and institutions from around the world have begun discussing and debating these rapid developments. We are thus witnessing the rapid rise of concurrent, multiple, and overlapping conversations on crisis mapping and there are already far too many discussions underway for any one individual or group to be engaged in all debates (Ziemke 2012, 101).

The relatively incipient status of this field means that this attention is largely focussed on facts and objectivities (basically what, when and where) at the expense of analysis: this is in contrast to the limited scholarship available that researches and reviews the field of crisis mapping outcomes and end results. It is worth noting that any reporting of the subsequent levels of success and effectiveness of a crisis map deployment is mostly done in-house. This subjective reporting naturally gravitates towards and focuses on the achievements and perceived successes of the deployment, which sometimes means that errors or practices that were counter-effective to the overall response can be understated or ignored. This makes it difficult for researchers and traditional response organisations to arrive at a realistic appraisal of their subsequent levels of effectiveness and value. This limited independent analysis exists in parallel to, and is overshadowed by, the ongoing and dominant media discourse that crisis mapping is 'saving lives' (International Conference of Crisis Mappers, 2009) and creating 'a revolution in humanitarian response' (Bureau 2012). These results are often taken for granted, both before and after a crisis-mapping deployment, which undermines the need for an extensive and careful analysis of the results. Media reports tend to naturalise the value of crisis mapping, but such assumptions are not based on data that has been systematically assessed and verified.

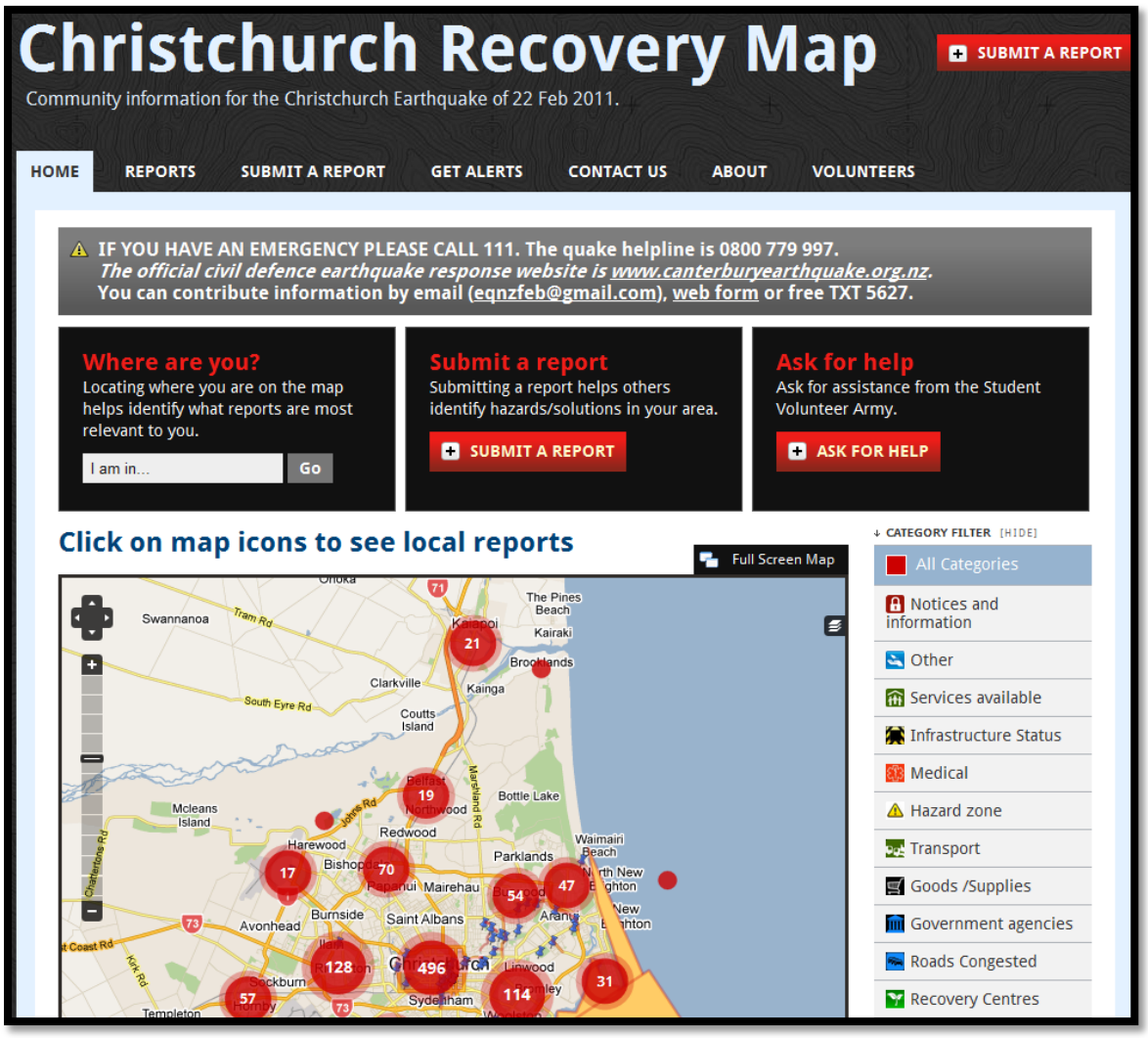
The Christchurch Recovery Map

The Christchurch Recovery Map (eqnz.co.nz) was launched within 24 hours of the M6.3 earthquake that struck Christchurch on Tuesday 22nd February 2011. It was employed to collate, verify, prioritise and visually reproduce the collective intelligence of a crisis-affected crowd to support disaster response and recovery efforts in the months following the earthquake. This earthquake was part of the aftershock sequence to the M7.1 earthquake on Saturday 4th September 2010. Its depth, at only 5 km, caused significant infrastructure damage and nearly 200 fatalities. The initial M7.1 earthquake was the 'first high-impact geological event to affect New Zealand in the 'internet age'', and a significant feature of this earthquake was the extensive use of social media channels for information sharing (Gledhill et al. 2010, 215). As Nicki Dabner from the University of Canterbury explains:

> In the weeks that followed, social media, and in particular Web 2.0 tools, played an increasingly important role in the community, providing vehicles for communication, collaboration, information sharing, and support. Within hours of the event personal accounts and words of concern and support flooded pages on the social network site 'Facebook', and images of earthquake damage appeared on 'YouTube' and 'Flickr'. Texting proved an invaluable means of making contact with phone landlines down. Never have so many been so thankful for the invention of internet tools and mobile technology devices, and their continued ability to access them after the event (2012, 69).

The Twitter hashtag '#eqnz' (earthquake New Zealand) averaged some 100 tweets per minute in the hours following the quake, with nearly 20,000 unique users participating, and generating nearly 50,000 #eqnz tweets that day (Bruns and Burgess 2012, 13). As Hughes et al. (2008, 1) explain, sociologists 'have documented the nature of convergence onto the physical sites of disasters . . . and now, increasingly, parallels of such behaviour can be seen on-line'. The Christchurch earthquake is now part of a large body of case studies where there was a significant online social convergence of people and information in the aftermath of a crisis or disaster. In New Zealand, which has a limited number of Volunteer and Technology Communities, three crisis maps were initially deployed in February 2011, with overlapping objectives, to respond to this online social convergence. The organisations producing the maps were the Eagle Technology Group, Ushahidi and Stuff (an online news service owned by the Fairfax Media group), and it was only after ongoing negotiation that the organisations agreed to collaborate on producing one map in order to 'maximise efforts and reduce duplication' (McDougall 2012, 207). A screen shot of the Christchurch Recovery Map is below:

Figure 1: Screen Shot of The Christchurch Recovery Map courtesy of Gruen (2011)



The map is organised by categories, listed on the right in Figure 1, which constitute a systemization of the processed information flows. This information is viewable as optional layers of data through which the map can be filtered; for example, clicking on the category 'Medical' will produce information only related to that category filter. Each category is an optional data layer that can be added to, or removed from the map. This means that multiple information layers can be compiled and viewed at one time, depending on information needs. The 'All Categories' tab, as reproduced in the screen-shot above, represents the information clusters for all the information available on the map, at a certain point of time. The Christchurch map, like all crisis maps, had its own set of distinctive categories, identified and defined by the volunteers in response to the mapping objectives of the deployment. The Christchurch Map could be zoomed into any relevant location, and in doing so it is possible to view each individual posting, which is represented by an individual icon.

A number of sources or sites were maintained during the mapping process and provide a useful record of the ways the map functioned and the tasks that it performed, the flows of information it collected, how it was deployed, and the problems it encountered. In order to provide an evidential framework for evaluation and future research some of these sources are discussed. All the sources referred to are currently available online and provide a sufficient body of data in which an extensive analysis of the mapping process and corresponding information flows can be comprehended and analysed. Other research methodologies, such as interviews with the mappers themselves, or a survey analysis of the community members who used the map, are a necessary development of, but reliant on, the foundational framework of evidence provided here. For example, the detailed 'EQNZ Task Allocation SpreadSheet', developed, and available, through Google Documents (a service provided by Google to enable users to create and edit documents online) identified and categorized some of the flows of information that passed through the map by providing an account of the tasks allocated to volunteers who were working on The Christchurch Recovery Map, between the 2nd and 10th of March 2011. This spreadsheet was part of the background infrastructure and part of a multitude of organisational tools that enabled the Christchurch Recovery Map volunteers to collaborate, and organise, across geographical boundaries.

While a comprehensive account and analysis of this data is not yet available, as this article constitutes a small part of a PhD dissertation, it is possible to provide an overview of the information categories and items being mapped, within a specific timeframe. The EQNZ Task Allocation Spread-Sheet is divided between seven information-processing subsets: Quick Tasks, Ongoing Tasks, Other Location Tasks, Completed Tasks, Useful Links, Recovery Phase and Business Status Sheet. The table below incorporates these subsets to list the information classifications and specific mapping tasks allocated to each category in the mapping process.

Figure 2: EQNZ Task Allocation Spreadsheet: Information Classifications and Mapping Tasks

Emergency	Category	Specific Mapping Task
General	Twitter	Verify and update reports
	Email	Verify and update reports
	SMS	Verify and update reports
	News Services	Update reports as needed
	Canterbury Earthquake Website	Update reports as needed
	Community Briefings	Times and update reports as needed
	Civil Defence	Times and update reports as needed
Medical	Pharmacies	New opening hours and services available (all categories), Plunket, elder care, dentists, diabetes centres, free medical treatment, closed surgeries/medical centres, welfare centres, birthing units and maternity services, physiotherapy, transferred patients, elective surgery and urgent medical treatment.
	GPs/Doctors	
	Hospitals, Medical Centres	
Supplies & Services	Supermarkets	Location & services available
	Emergency Supplies & Food	Location & services available
	Water	Distribution information, location of water stations & tanker deliveries
	Government Agencies	New opening hours and services available (all categories).
	Services for the Blind	Location & services available
	Services for the Deaf	Location & services available
	Disability Support Services	Location & services available
	Libraries	Services available & opening times.
	Recovery Assistance Centres	Location & services available
	Showers	Location & services available
	Phones Available	Location & services available
	Community Laundry	Location & services available
	Welfare Centres	Location, opening hours and services available (all categories)
	Police	Information on relatives centre
	Petrol Stations	Location & services available
	Gas Bottle Refills	Location & services available
	Retailers	Efpos availability, location & services available
	Banks	Opening times, location of working ATMs
	Law Firms	Location, opening hours and services available
	Building Supplies/Hardware	Update stores open
	Wifi	Location & services available
	Postal Services	Box lobby relocations & affected services
Transport	Bus Services	Update services & availability, new routes.
	Other	Road Closures, vehicle Repairs & services, airport updates, diversions, roading, infrastructure & bridges, CBD access.
Education	Schools	Update opening/closed schools, early childhood centres.
Infrastructure	Sewer/Portaloos	Location & services available
	Sanitation	Chemical loo collection points, campervan toilet disposal sites, rubbish collection.
	Power Supply	Outages
Housing		Tenant information & accommodation register
Other	Church Services	Times/locations
	Pets	Location & services available
	Gardens and Parks	Update open/closed
	Sports	Update community programmes/activities

It is important to note that this not an identical replication of the information classifications listed and/or the specific tasks allocated, but a summation in order to give an overview of the relevant information and associated tasks within the confines of this research. The Task Allocation Spreadsheet also lists the URLS, personal contacts and e-mails from which regularly updated information could be sourced. The spreadsheet also enables each specific task to be tracked, requesting the volunteers to input information such as date last reviewed and updating schedule (e.g. hourly, daily), comments and which volunteer completed the task. This table provides a relatively organized, accessible and clear picture of the complexity of the changing information landscape, and multiple information flows, that the volunteers attempted to map.

Other relevant sources for researching the Christchurch Map, include the EQNZ Google Group Mailing List, a general forum for anyone involved in The Christchurch Recovery Map, which contains over 48 topics of conversations and commentary by and between mapping volunteers, often specifically concerning the roles and effectiveness of stigmergic self-organisations in this context. Finally, the Christchurch Recovery Map call notes (Crisis Camp NZ 2011) from both 21 and 23 February 2011 recorded the decisions made, resources needed, and the questions posed at the initial stages of this organisation and development.

In light of the data available there is still a relatively limited body of academic literature regarding The Christchurch Recovery Map. The map is identified and described in several journal articles, as part of a case-study selection, or within an overview of the field (Roche et al. 2011, 8; McDougall 2012, 207); but these accounts are largely descriptive, and do not provide much in the way of critical analysis or extrapolation. The research usually refers to the date of deployment, the number of views by the public, and the general objectives. There are no scholarly articles dedicated to analysing this deployment as a singular entity. This is a surprising outcome considering the significant and high profile cross-organisational participation in the production of this map. As McNamara has written:

> The site has been helped out by so many organisations. Some of the biggest, in no particular order, are Telecom, Vodafone and 2 Degrees for phone support, Catalyst IT for staff, Kestrel Group for expert advice, the google.org crisis response team, Victoria University of Wellington for somewhere to work from and CrisisCommons.org for the software and support (McNamara 2011).

Evaluating the Christchurch Recovery Map

Measuring the benefits of The Christchurch Recovery Map with regard to the people affected by the earthquake is reliant on the limited user-data available. The Christchurch Recovery Map received over 100,000 visits (McDougall 2012, 207). However because of the urgency of the situation, there was little time or inclination on

the part of authorities, or the public, to document what data was used, or the value it had in supporting response activities.

There is some relevant or cognate scholarship available, such as the work of Bruns and Burgess (2012) in 'Local and Global Responses to Disaster: #eqnz and the Christchurch Earthquake'. Although this literature does not discuss the Christchurch Recovery Map in any depth, it does elaborate upon the collective response and information flows that emerged around the hashtag #eqnz on Twitter. In doing so it provides some insight into the underlying social media information flows that The Christchurch Recovery Map sourced in order to then geolocate and map this information. Other relevant literature in this regard is the work of Gelernter and Mushegian (2011), who directly explore these information flows using a sample of Twitter messages from the February 2011 earthquake. In particular, they evaluate the sorts of location-mentions that occur in these disaster-related social messages, a potentially valuable resource for emergency responders, as this location-based correspondence highlights where problems have occurred (Gelernter and Mushegian 2010, 753).

Very little forensic research or critical analysis has been conducted on this deployment within a public space, either on or offline. However there is a body of non-scholarly literature that can be utilised. One example is the conversations carried out and documented within the Social Media Crisis Response (NZ) Google Group, conducted in June 2012. This material is useful and important in that it includes multiple first-person accounts, commentary and debate from and between members of The Christchurch Recovery Map Volunteer Team. Some central themes and issues are evident in this conversation, with the most fundamental being the lack of knowledge that the volunteers had as to the evidence of the effectiveness of their work. This lack of user-data with regard to the Christchurch case is a significant generic issue for understanding and evaluating the value of a crisis mapping deployment.

As Clark (2012) writes:

> This is not to say that social media does not have a role to play in a disaster - it very much does - but I recall during the frantic construction of eq.org.nz a question that people kept asking: 'Are we helping?'

Conclusion

The context in which the value of new and social media-generated data is being considered and evaluated is characterised by strong discursive and cultural dispositions. This can be understood as a more or less naturalised commitment to and belief in the efficacy of new technology as a form of progress; in other words, there is a willingness – mostly on the part of the media – to accept, almost as a reflex, that new technology must deliver some benefits. Despite this acceptance with which it has been received, very little forensic research or critical analysis has been conducted on The Christchurch Recovery Map; and any evaluative process is reliant on the limited data

available. To avoid any unnecessary application of future crisis mapping practices alongside, or instead of, established and already verifiable means of saving lives and responding to a disaster situation, it is important to identify and contextualise the available data to support and provide an evidential framework for evaluation and future research. This research endeavours to recontextualise, and effect a reconsideration of, the value of social media within crisis mapping. It seeks to provide a contextual and evidential framework for a consideration of this issue and, as a corollary, contribute to the on-going process by which crisis mapping can be evaluated as a significant tool within a New Zealand emergency response organisational framework.

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