

TWITTER AND SOCIETY



Steve Jones
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TWITTER AND SOCIETY

EDITED BY KATRIN WELLER, AXEL BRUNS,
JEAN BURGESS, MERJA MAHRT, & CORNELIUS PUSCHMANN



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Crisis Communication in Natural Disasters

The Queensland Floods and
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CHAPTER Axel Bruns & Jean Burgess



from #qldfloods to #eqnz, Twitter plays an important role in #crisiscomms and emergency management
#SMEM

Over the past decade, social media have gone through a process of legitimization and official adoption, and they are now becoming embedded as part of the official communications apparatus of many commercial and public-sector organisations—in turn, providing platforms like Twitter with their own sources of legitimacy. Arguably, the demonstrated utility of social media platforms and tools in times of crisis—from civil unrest and violent crime through to natural disasters like bushfires, earthquakes, and floods—has been a crucial driver of this newfound legitimacy. In the mid-2000s, user-created content and ‘Web 2.0’ platforms were known to play a role in crisis communication; back then, the involvement of extra-institutional actors in providing and sharing information around such events involved distributed, *ad hoc*, or niche platforms (like Flickr), and was more likely to be framed as ‘citizen journalism’ or ‘crowdsourcing’ (see, for example, Liu, Palen, Sutton, Hughes, & Vieweg, 2008, on the then-emerging role of photo-sharing in disasters). Since then, the dramatically increased take-

up of mainstream social media platforms like Facebook and Twitter means that the pool of potential participants in online crisis communication has broadened to include a much larger proportion of the general population, as well as traditional media and official emergency response organisations.

The growing, multidisciplinary field of crisis informatics engages with a range of perspectives on social media in emergency management and crisis communication: from specific media practices like photo-sharing (Liu et al., 2008); to the role of mobile media in social support and emotional resilience (Hjorth & Kim, 2011); and, most relevantly for this chapter, in-depth analyses of the dynamics and characteristics of microblogging in crisis situations, particularly in natural disasters (Kongthon, Haruechaiyasak, Pailai, & Kongyoung, 2012; Murthy & Longwell, 2012; Qu, Huang, Zhang, & Zhang, 2011; Sakaki, Toriumi, & Matsuo, 2011; Sinnappan, Farrell, & Stewart, 2010), as well as research on issues of trust and veracity in such cases (Spiro et al., 2012; Starbird, Muzny, & Palen, 2012). In this chapter, we draw on our research into the uses of Twitter, and particularly of Twitter hashtags, during the 2010–2011 Queensland floods and Christchurch earthquakes (see also Bruns & Burgess, 2012; Bruns, Burgess, Crawford, & Shaw, 2012) to demonstrate patterns of Twitter-based communication during natural disasters, and to highlight further challenges for crisis communication research in social media, and for the practical application of Twitter during future crisis events.

The year 2011 was something of an *annus horribilis* for crises—from the January floods in south east Queensland, Australia, through the destructive February earthquake in Christchurch, New Zealand, to the March earthquake and tsunami on the east coast of Japan, and extending further through the unrest of the Arab Spring and the riots in London and the wider United Kingdom (see also Chapter 29 by Vis et al., in this volume); and in late 2012, the U.S. East Coast was rocked by Hurricane Sandy. These events have shown, each in their own way, how social media are used to disseminate breaking news, coordinate responses, monitor new developments, and express sympathy; news and emergency organisations around the world are now regularly incorporating social media into their crisis activities.

In all these cases, Twitter—as part of a broader media ecology including word-of-mouth, broadcast radio and television, the websites of mainstream news organisations, and official emergency organisations—has filled a significant mediating and coordinating function. Due to the specific communicative affordances of the Twitter platform (see also Chapter 2 by Bruns & Moe, in this volume), it lends itself especially well to the dissemination of breaking news

from a range of sources, essentially in real time, to a wide network of users who can rapidly form an *ad hoc* public around the event or issue (Bruns & Burgess, 2011): when news with a high degree of perceived global interest breaks on Twitter, it travels around the world with unprecedented speed. Here, it should be noted that as crises emerge, one or several Twitter hashtags (like #sandy or #qldfloods) usually emerge with them: as Twitter users realise that it is important to share the latest crisis information quickly and effectively, they seek to establish a unified hashtag as a reliable marker of tweets which relate to the crisis.

While such processes do not always proceed smoothly, and may result (especially for crises which attract a large Twitter user base) in one or more competing options, network effects—that is, the preferential use of those hashtags which users already encounter in large volumes in their incoming Twitter feeds—nonetheless do tend to produce a very small number of key hashtags over time. Indeed, earlier adopters will often encourage other Twitter users who have important information to use ‘their’ hashtags, as in the following example from the February 2011 Christchurch earthquake, directed at a key emergency organisation:

@NZcivildefence please use #eqnz hashtag. Thanks.

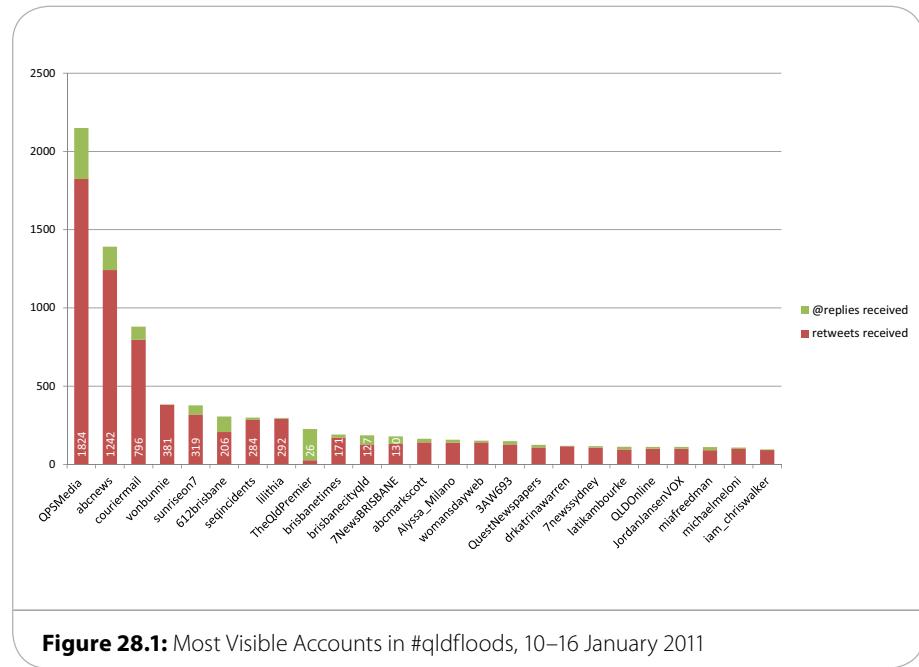
The combination of widespread global interest with the intensity and rapid sequence of events that characterise an emergency situation can produce uncertainty around the trustability of information, leading to concerns about rumours and misinformation—perhaps especially so during the early stages of an emerging crisis situation, at a time when the full facts have yet to be established. For news and emergency organisations, as much as for everyday users seeking to draw on Twitter to inform themselves about the current situation, therefore, the problem of effectively monitoring the flow and evaluating the veracity of crisis-related information on Twitter becomes paramount; in the first place, this begins by examining the patterns of information dissemination and user interaction in relevant communicative spaces on Twitter (see, for example, Mendoza, Poblete, & Castillo, 2010; Spiro et al., 2012).

MAKING SENSE OF #QLDFLOODS AND #EQNZ

Although hashtags such as #qldfloods (for the Queensland floods) and #eqnz (for the earthquakes in Christchurch, New Zealand) emerge as mechanisms for the gathering of *ad hoc* publics, made up of directly affected locals, emer-

gency, media, and other government, NGO, and commercial organisations, and a wider audience of domestic and international Twitter users who are interested in tracking the event, the patterns of communication which take place amongst these rapidly accumulated publics—whose participants are largely unlikely to have been aware of one another beforehand—are far from random or disorganised. Here, as in most other forms of interpersonal and mass communication, network effects apply, and a small number of key accounts will quickly emerge as leading drivers of the communicative exchange.

This is true in the first place for how active participation is distributed across the user base of hashtag participants: usually, a comparatively small number of users will be regularly and committedly engaged in sharing crisis information, while a much larger number of Twitter users will participate only in retweeting or commenting on crisis tweets from time to time, almost randomly. This ‘long tail’ (Anderson, 2006) of users remains important as—especially through its retweeting of information—it enables crisis information to reach a much wider audience than the hashtag or its key contributors would be able to do by themselves, but such users largely act as amplifying ‘repeater stations’ for crisis information only, not as original sources of the information. At the same time, it is also common for some of the most active Twitter accounts in crisis contexts to serve deliberately as pure retweet accounts: the most active Twitter



account during the Queensland floods, for example, was @thebigwetfeed, virtually all of whose tweets were retweets. Whether operated manually or using a retweet bot, such accounts simply pass along all hashtagged tweets which they encounter, thereby fulfilling a function similar to the hashtag itself: Twitter users who wish to receive all hashtagged tweets pertaining to a specific issue or crisis now have the choice between subscribing to the hashtag itself or following the retweet account.

While an identification of the most *active* contributors to a hashtag provides a measure of interest and commitment, therefore, it does not necessarily point to the most important sources of information. Rather, it is useful instead to establish which accounts are the most *visible* in a hashtag, as measured by the number of @replies and retweets they receive: this approach draws on the communicative actions of the hashtag participant base itself, and examines which Twitter accounts are seen by that community itself as most worthy of engaging with (for an overview of the methods used in such analyses, see Chapter 6 by Bruns & Stieglitz, in this volume). What emerges from such analyses is a clear indication of the systematicity of Twitter communication even during acute crisis events: in most cases, a small group of key accounts receive the lion's share of attention from their peers. Figure 28.1 shows this distribution of attention

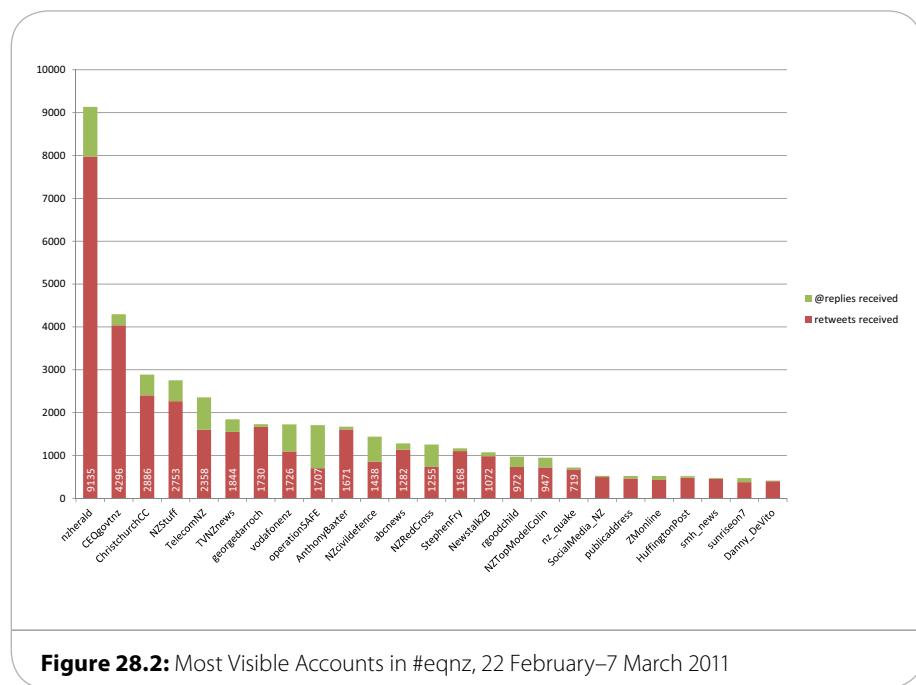


Figure 28.2: Most Visible Accounts in #eqnz, 22 February–7 March 2011

for the main week of the January 2011 Queensland floods, for example, while Figure 28.2 presents a similar picture for the fortnight following the February 2011 Christchurch earthquake.

What is immediately observable from these analyses is that traditional sources of authority remain central to crisis communication on Twitter, too. The Queensland floods field is led by the accounts of Queensland Police (@QPSMedia); the national public-service broadcaster ABC (@abcnews); and local newspaper *Courier-Mail* (@couriermail). The corresponding lead accounts for Christchurch are the *NZ Herald* newspaper (@nzherald); the Canterbury Earthquake Authority (@CEQgovtnz); and the Christchurch City Council (@ChristchurchCC). In both cases, many of the accounts which follow are operated by media, emergency, and other key organisations, too. This includes local radio stations (@612brisbane), or the personal accounts of political leaders (@TheQldPremier), and those of journalists and media executives (like ABC Managing Director @abcmarkscott or political journalist @latikambourke). There are also relevant corporate accounts (landline and mobile-phone providers @TelecomNZ and @vodafonenz); NGOs (@operationSAFE, @NZRedCross), and accounts of individuals in such organisations (like Google.org's @anthonybaxter).

At the same time, several accounts of non-affiliated, individual users also appear in this list of the most visible participants. It is in this context that the value of Twitter and other social media as platforms for the dissemination of situational information from the scene of the disaster is most clearly revealed: a number of such accounts appear in prominent positions because they used Twitter to share their photos or video footage from the crisis event, or provided other important details about the current situation on the ground. Where such accounts providing important firsthand information can be identified, in close to real time, by drawing on the collective curation of crisis information by participants in topical hashtags, this may also be of immediate operational value to the emergency authorities themselves: in such cases, the Twitter community helps to highlight and thereby bring to the attention of authorities the latest important updates from the crisis area. Importantly, this distribution of attention may change over time, depending on the current crisis context (see Bruns & Burgess, 2012). During the early stages of an unexpected crisis event, on the one hand, news organisations may be highly featured, as local as well as remote Twitter users seek to understand the situation; later on, on the other hand, attention may shift towards emergency and support organisations, as the attention of more remote audiences to the crisis fades and local users turn to the question of how to deal with the aftermath and long-term effects of the disaster.

In several cases, however, highly visible accounts are visible not because they are able to share new updates from the disaster area, but simply because their comments on the situation were retweeted in sympathy by their already established, large networks of followers. This accounts for the presence of international celebrities such as actress @Alyssa_Milano or actor and comedian @StephenFry in the two cases above—each used their Twitter account to express their sympathies for affected locals, and were joined in such sentiments by their followers as they retweeted these messages. While such phenomena demonstrate the rapidly established global reach of hashtags which address localised natural disasters and other crises, these tweets necessarily have no immediate operational value; emergency organisations seeking to draw on Twitter as an additional source of crisis intelligence must find approaches to filter out this kind of material.

But even peripheral accounts like these can help—along with more closely involved Twitter users—by lending their follower base to the amplification of news and information about the crisis event, and to raising awareness of the associated hashtag(s). Retweeting of messages—which, as Figures 28.1 and 28.2 show, is the most important driver of visibility for the leading accounts—disseminates them well beyond the hashtag itself, making the tweets, the originating accounts, and the hashtag as such visible not only to followers of the original senders or the hashtag, but also to the many more Twitter users who follow any one of the retweeting accounts. On average, for example, every one of @QPSMedia's 72 hashtagged tweets during the main week of the 2011 Queensland floods crisis received some 25 (manual) retweets; this means that these tweets did not only reach the thousands of users following the @QPSMedia account or the #qldfloods hashtag at the time, but also the potentially many tens of thousands of additional users who followed the various retweeters, but were as yet unaware of @QPSMedia or #qldfloods itself. While the hashtag itself already enables Twitter users to make their tweets potentially visible to an audience which is much larger than their established retinue of followers, the retweeting of such hashtagged tweets by other users to *their* followers amplifies that reach even further, possibly by a substantial factor. (This demonstrates the interweaving of the various layers of Twitter communication which Bruns & Moe discuss in Chapter 2, in this volume.)

Finally, additional amplification is also achieved by the cross-media flow of information between Twitter and other media channels. Although this remains difficult to track empirically, anecdotal evidence from the Queensland floods event documents, for example, how updates tweeted by the @QPSMedia account

directly from situation briefings with Queensland Premier Anna Bligh and the heads of emergency services organisations were copied verbatim (misspellings included) into the on-screen news tickers inserted into live TV coverage of the floods, and “retweeted” again as viewers passed on the information seen on the news tickers to their own Twitter followers. Similarly, of course, crisis news and information which originated outside of Twitter was also passed on in this manner—Twitter and other social media platforms, therefore, are not separate from, but increasingly deeply embedded into the overall crisis communication infrastructure, where they complement rather than replace existing channels.

CONCLUSION: USING TWITTER IN CRISIS MANAGEMENT

The widespread use of Twitter to share information about unfolding crisis situations, and the initial successes of various emergency organisations in experimenting with the use of social media as additional channels for crisis communication, have led to a growing interest in developing more comprehensive strategies for such approaches. Two major areas of activity must be distinguished here: on the one hand, emergency services are interested in using Twitter as an additional means to *communicate* their messages; on the other hand, they are also exploring the potential to *monitor* valuable situational information from directly affected locals in crisis-affected areas.

In the first place, crisis communication efforts by emergency services crucially depend on a thorough understanding of Twitter as a communicative environment, also established through regular use of the platform outside of crisis contexts. Emergency organisations must build a visible Twitter presence during non-crisis periods so that at times of crisis, Twitter users will be able to find and follow them quickly and effectively; users may be considerably less prepared to trust an account (and retweet its messages) if it is new to Twitter and has as yet failed to build up a strong track record. In developing a Twitter presence, it is also important for an emergency service organisation to follow the established standards of the platform—that is, to use appropriate hashtags as required to maximise the visibility of its messages, and to engage with other Twitter users as they correspond with it through @replies. Such activities build trust and increase the likelihood that the account’s messages are disseminated further through retweets.

This also increases the authority of emergency service accounts, and improves their ability to address and correct possible misinformation. During the Queensland floods, for example, the Queensland Police Service Twitter

account instituted a series of tweets which directly engaged in the debunking of potentially dangerous rumours about the current situation in the disaster area, responding to them one by one with the dedicated hashtag #mythbuster (Bruns et al., 2012). Such tweets were amongst the most widely retweeted @QPSMedia messages during the Queensland floods crisis, considerably helping to limit the spread of misinformation. Initiatives of this kind can only be successful if they come from an account which already has strong traction in the overall community of Twitter users following an unfolding crisis event, however.

The monitoring of crisis-relevant information on Twitter by emergency services must similarly build on a sophisticated understanding of how social media are used during crisis situations. Automatic monitoring of relevant hashtags and keywords on Twitter may be able to pinpoint a range of potential relevant tweets sent by users, which may then be evaluated further by assigning differing levels of trust to users and tweets depending on a range of parameters—for example, the past track record of users (the extent of their past Twitter activity, their number of followers, tweeting styles, or location information), or the correlation of information between different user accounts. Such evaluations are far from straightforward. A very recently established Twitter account may be considered to be less reliable because of its lack of an established track record, but it may also have been set up specifically to provide disaster-related information. Tweets from several users reporting a bushfire may be seen as reliable if the senders are separate from one another, but not if the users are retweeting one another. In most contexts, automated crowdsourcing of situational information will be unable to replace the manual evaluation of such information altogether; using Twitter as an *additional* information source can, however, provide useful further detail on local circumstances in the disaster area, especially if emergency services staff have yet to reach the area or are insufficient in numbers to cover the entire space.

Potentially, such automated approaches to identifying and highlighting crisis information may also play an important role in the early detection of crisis situations. Twitter has rapidly become an important medium, especially for the dissemination of breaking news, including news about natural disasters and other crises. Although relatively simplistic in its implementation, Twitter's own "trending topics" feature often provides a useful pointer to emerging issues on the global, national, and local scale. Taking a similar approach to the identification of trending themes, but using a more sophisticated set of measures which are able to describe the ebb and flow in Twitter communication in more comprehensive detail, it may be possible to detect the weak signals of an impending

crisis even before they appear in the “trending topics”, and certainly before the Twitter community settles on a unified hashtag to coordinate the further discussion of the event (for examples of early conceptual and experimental work on such “real-world event” detection by “social sensors”, see Becker, Naaman, & Gravano, 2011; Sakaki et al., 2010).

This, however, would also depend on comprehensive access to the full “fire-hose” of Twitter data, from which such trends would need to be extracted. By contrast, much current research into crisis communication on Twitter (including our own studies of #qldfloods and #eqnz, as outlined above) proceeds by evaluating user activities within a range of clearly established hashtags. While such approaches are useful for tracking the further development of crises once they have been clearly recognised by the wider Twitter user base, and for tracking the further aggregation, structuration, and eventual dissipation of a community of users following the disaster, they are unable to shed sufficient light on the early, formative stages of such crisis communication efforts on the platform. They provide very little information on where the very first—possibly unhashtagged—tweets reporting the crisis events originated; how they were shared; and how, through these processes, an overall awareness of the crisis began to grow.

To track such early developments, it would be necessary to monitor the Twitter firehose on an ongoing basis for any small-scale signs of increased user activity that might be indicative of a potential emergency situation. Such an approach would need to distinguish—for example on the basis of keywords—natural disasters and other emergencies from other forms of trending topics (such as breaking news of a non-crisis nature), and to identify the key users, keywords, and eventually hashtags which come to be associated with the event. If such weak signals of emerging crisis events can be detected and highlighted to emergency services authorities with any degree of accuracy, this would substantially boost their ability to respond in close to real time to crisis situations as they are reported on Twitter.

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