ONLINE FORUMS SUPPORTING GRASSROOTS PARTICIPATION *in Emergency Preparedness and Response*

"When danger arises, the rule in normal situations is for people to help those next to them before they help themselves."

BY LEYSIA PALEN, STARR ROXANNE HILTZ, AND SOPHIA B. LIU

Contrary to what is often portrayed, local citizens are the true "first responders" in emergency situations. Until professional response personnel arrive, citizens are the first to perform rescues, administer first aid, and transport victims to hospitals. Even after the response moves from an informal to a formal effort, sociological research shows that citizens continue to self-organize and provide ongoing assistance by providing food, shelter, child care assistance, employment, transportation, and so on [1]. Now, with the increasingly accessible Internet, online forums have allowed people to cross geographical boundaries that normally constrain the reach of crises to share information and coordinate citizen-led efforts,

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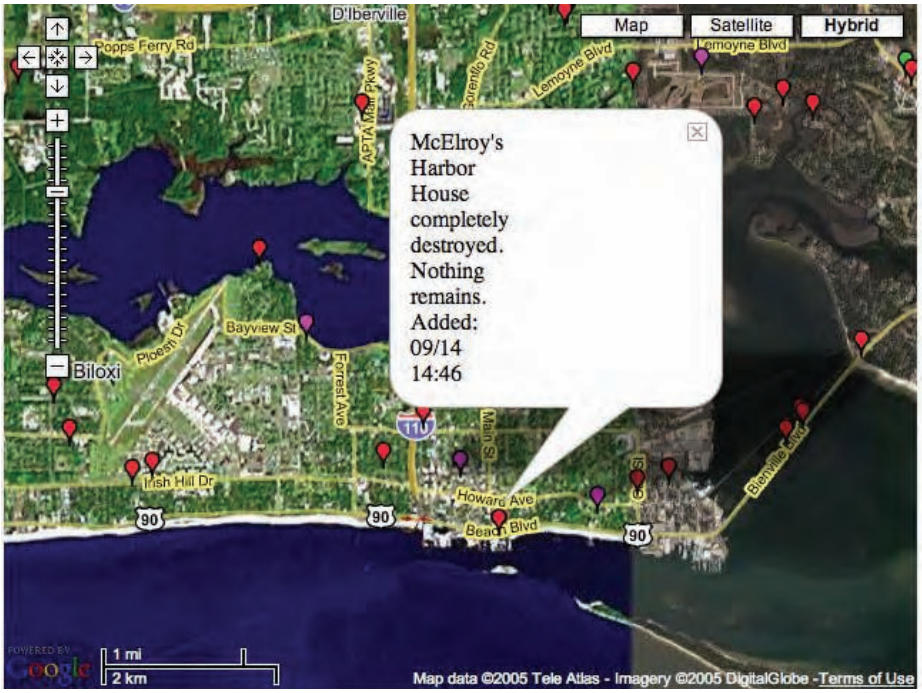

Figure 1. A map annotation describing the status of a well-known landmark after Hurricane Katrina struck the U.S. Gulf Coast in 2005.

in addition to any official government and non-governmental Web sites (for example, see the article by Currion, de Silva, and Van de Walle in this issue and [8]). Online groups might themselves become new "virtual" communities with their own membership policies and norms [4, 9]; they might be based on an existing, physical space community first guided by the local knowledge that the population shares; or they might be a blend of the two, depending on the magnitude of the crisis. Online forums can extend the opportunity for grassroots social action to anyone who wants to get involved; physical space community members might turn to them as virtual gathering spaces to communicate with fellow citizens when disaster conditions make this difficult.

In this article, we describe illustrative citizen-led online forums that emerged following the August 2005 Hurricane Katrina disaster; during the rampant 2003 San Bernardino, CA wildfires; and in preparation for a possible avian flu pandemic.

2005 Hurricane Katrina

On August 29, 2005, Hurricane Katrina made landfall as a Category 3 storm on the coasts of Louisiana and Mississippi, causing catastrophic damage throughout the region. The city of New Orleans was devastated by flooding from breaches in the levees designed to protect the city from the water contained in neighboring Lake Pontchartrain. Citywide evacuation led to the eventual dispersion

of the population across the U.S., separating friends, families, and neighborhoods.

Even before Katrina made landfall, citizen-led online sites sprang up to aid in emergency planning and response. One makeshift forum was Katrina.com (www.katrina.com), a Web site previously used to advertise a small software consulting business run by Katrina Blankenship. Upon the sudden surge in page hits from people looking for hurricane information, Blankenship swiftly converted her site to serve as a resource that included pointers to other Web sites and a message board to help locate missing people. Over the next five months, the site received 12 million hits and remains active today after evolving into a Hurricane Katrina memorial page and resource for hurricane preparedness.

This is one example of the countless forums generated by the public following Katrina to find missing people and to offer and seek shelter, employment, and other forms of relief. Some Web sites, like Hurricane Information Maps (www.scipionus.com) were created to collect and share location-specific information about the storm and the damage in its aftermath. Scipionus was a visual wiki—a Web site that lets users write and edit content—that used a Google map interface on which users could textually annotate the status of buildings, roadways, and other geographic features in the hurricane region. Date- and time-stamping associated with the annotations provided temporal points of reference. Figure 1 illustrates how understanding the annotations depended on users' local knowledge about the physical environment to fully appreciate implications. As with most other online forums, scipionious.com established a collection of policies and norms to guide behavior, though with varying amounts of success. For example, users were explicitly instructed to not make requests for information on the map interface, though many continued to do so with still others helpfully offering replies.

The purpose of the Flu Wiki is to help local communities prepare for and perhaps cope with a possible influenza pandemic. This is a task previously ceded to local, state and national governmental public health agencies. Our goal is to be:

- A reliable source of information, as neutral as possible, about important facts useful for a public health approach to pandemic influenza
- A venue for anticipating the vast range of problems that may arise if a pandemic does occur
- A venue for thinking about implementable solutions to foreseeable problems

Figure 2. FluWiki online forum description.

2003 Southern California Wildfires

The 2003 fire season brought massive wildfires to the San Bernardino area of southern California. A resident of one of the evacuated mountainous areas, who came to be known as "Ranger Al," did not leave the area in spite of warnings—a dangerous problem fire personnel regularly face. While on the mountain, Ranger Al became a point of contact to neighbors who left. Al would drive from house to house to learn which were still standing, and his contacts developed a Web site with this information that soon received over one million hits a day. This site existed in addition to the official incident command-run information sources [10].

Avian Flu Preparation

Avian influenza, or influenza A (H5N1) is a highly lethal strain infectious to humans. The virus currently lacks the ability for sustained human-to-human transmission, but mutation could change this at any time. H5N1 is being compared to another avian strain, the agent of the "Spanish flu" of 1918–1919, which traversed the world in three months and caused an estimated 50 million deaths, including approximately 675,000 in the U.S. "The question is if we are ready for this type of pandemic, and the answer is probably no…It's time to get ready, and in the process be ready for bioterrorism, natural disasters, and epidemics of other infectious diseases" [1].

In spite of such warnings, the federal government appears to be depending on local governments to handle most of the planning and preparation. Even under the best of circumstances, much of the success of disaster preparedness lies in plans made by households; in the wake of the U.S. government's failure to deal adequately with Katrina, Americans have even more reason to prepare as though they are "on their own." This background partially explains the high level of activity on FluWiki (www.fluwikie.com), a grassroots online forum that began in June 2005, which describes itself as shown in Figure 2.

In addition to an encyclopedic collaboratively developed knowledge base on topics that include the science of influenza, national and international plans, personal and family preparedness, documentation of rumors, and so on, an active discussion space

Figure 3. Excerpts from a one-day discussion on FluWiki.

Who Here Has Lived Through Natural Disasters and What Lessons Did You Learn

13 July 2006

preparedness101 – at 12:33

I find it very worthwhile to learn from others that have gone through natural disasters and see what they have learned. For example, those that had lived through ice storms, learned that you need a big enough pot to melt snow, they never had enough soup…
Share your thoughts. Thanks

Kathy in FL – at 12: 47

Dealt with the results of multiple hurricanes and tropical storms. A couple of notes:

- You never have as much water as you think you do. Doesn't have to be because you are using it up … could be because you thought you had stored more, someone got into your preps so your inventory of preps was off, something fell off a counter and ruptured your plastic container, etc.
- Put duct tape over the toilet handles if your water goes out. Once you teach the kids to "flush" it is a hard habit to break…

ColdClimatePrepper – at 13:22

Not really a "disaster" but last winter we had no power for 4 days due to an ice storm. Temperatures were between 0 and 20 degrees F the whole time.
Lessons learned: - always fill your bathtub with water if you think there is the slightest chance you are about to lose power
- Have plenty of wood on hand at all times!
- Plan ahead and cook early and do other tasks that require light early…
- Keep flashlights, or candles and matches handy in every room…

Dusty – at 13: 49

Living in South Florida, we have "weathered" many hurricanes and tropical storms throughout the years … We have a generator that can run our refrigerator, a smaller refrig, lights, tv and window ac …We also have propane and butane grills and stoves. Our house is protected with shutters and reinforcements. We have supplies of food, water, OTC medication, paper goods etc. We truly have this hurricane thing (disaster) pretty organized if anyone has specific questions (same basics as for bf prepping)— there are so many things we've perfected, that I'd be glad to respond.

The Sarge – at 13: 55

Safety, safety, safety!!! - …Candles and kerosene lights are charming - but they are also lit Molotov cocktails in your house. Propane and 'Coleman' lanterns give off lots of light, but they are attached to a bomb. Battery-powered lights are far safer. You can't have too many batteries.

hosts many messages on surviving disasters from personal points of view (see Figure 3). The wiki has evolved a set of guidelines for behavior for participation, emphasizing the site's goals of non-partisanship and applicability to an international community, itself a regular topic of discussion.

Implications for the Relationship Between the Public and Formal Efforts

The idealized, linear depiction of information dissemination around crisis events from authority to news media to the public is clearly outmoded [7]. As we have briefly discussed here, the potential for public involvement in our "networked world" [5] via online forums is only just beginning to be realized. The reach of the Internet expands opportunities for public involvement, where those geographically removed from the disaster—and therefore with the critical resources of time, money, electrical power, and working computers and telephones in hand—can offer assistance. Online forums also create a means for sharing and learning from personal stories, experience, and knowledge in preparation for future events.

The Internet and online forums are just one part of this evolving communication phenomenon associated with crisis events. The availability of mobile, networked information communication technology (ICT) in the hands of ordinary people makes information exchange increasingly potent. For example, mobile phones—including camera phones coupled with Short Message Service (SMS) messaging and Multimedia Messaging (MMS)—enable people to quickly share information point-to-point. Increasingly inexpensive GPS will permit even more exacting location-specific information to be collected "in the field" and shared with others. Recent crises foreshadow what these technologically-supported citizen communications will come to look like: In the 2001 SARS epidemic in China, citizens used SMS text messaging to share information that they could not obtain from their government [6]. In the July 7, 2005 London subway system bombings, commuters used their camera phones to take images of the incident, which provided hundreds of eyewitness pictures that were soon incorporated into the recovery effort [3]. Society has frequently depended on the tourist who happens to be in the right place with a videocamera in hand for documentation of emergencies—the Sept. 11 terrorist attacks on the World Trade Center are a notable instance of this. In a future in which nearly everyone will have a GPS-enabled camera phone in their pockets, the creation of information and its easy dissemination requires conscious incorporation of citizens-as-participants in managing emergencies.

Certainly explicit attention to citizens-as-participants is also about managing incorrect information that could jeopardize public safety and the recovery

effort. We need to be concerned about problematic rumors; privacy protection of information and its source; difficulty of coordination with official civic agencies; and potential failure of Internet access. Furthermore, information generated from the "bottom-up" without known validation cannot be assured to be accurate nor timely nor appropriate for a particular audience. For example, on May 3, 2006, at 11:42 A.M. EDT, a Bulletin for the Pacific was issued by NOAA's Pacific Tsunami Warning Center Web site within 15 minutes of an undersea earthquake, declaring a Tsunami Warning for New Zealand and Fiji. People in Great Britain read the tsunami warning and called to waken their sleeping New Zealand friends and relatives, leading to middle-of-the-night evacuations. However, less than two hours later, a 1:36 P.M. EDT bulletin canceled the tsunami warning [12]. Such an example illustrates the need for design and social mechanisms to vet the validity of the data. In fact, we see emerging instances of such practices in the case of wildfire management in the U.S. West, where some public information officers who run official wildfire information Web sites are making an effort to align with citizen-led information sites to manage errant rumors and therefore compromises to public safety.

But conscious inclusion of public participation in the organizational management of disaster means much more than managing "misinformation." It means appreciating from the start that the public has always played a primary role in crisis response. ICT only reveals to a larger audience the kind of role the public already plays in their communities during and following such events. The current political trend in the U.S., which favors command-and-control-style crisis management and neglects to appreciate the role the public plays as "first responders" and ongoing participants in such situations, is in danger of failing to incorporate citizen activity and citizen-generated information in formal warning, response, and relief efforts. Our work in the scientific community needs to help produce socio-technical solutions that address the challenges of interoperability, authenticity, usability, and organizational applicability of citizen-generated information. Appropriate, flexible organizational structures that can incorporate information from and coordinate with multiple sources need to be in place. This is the basis for the inclusion of technical solutions for collecting, validating, and transmitting information. Failure to recognize that widely available ICT challenges conventional models and demands new informational relationships between official organizations and the public portends a future where crises are ineffectively managed. C

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The quote appearing on the first page is from [2].

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