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Did You Feel It?

August 24, 2011 | ***Anne Fredrickson***

It may come as little surprise that staffers at CHF love data. That's why I spent the morning playing –

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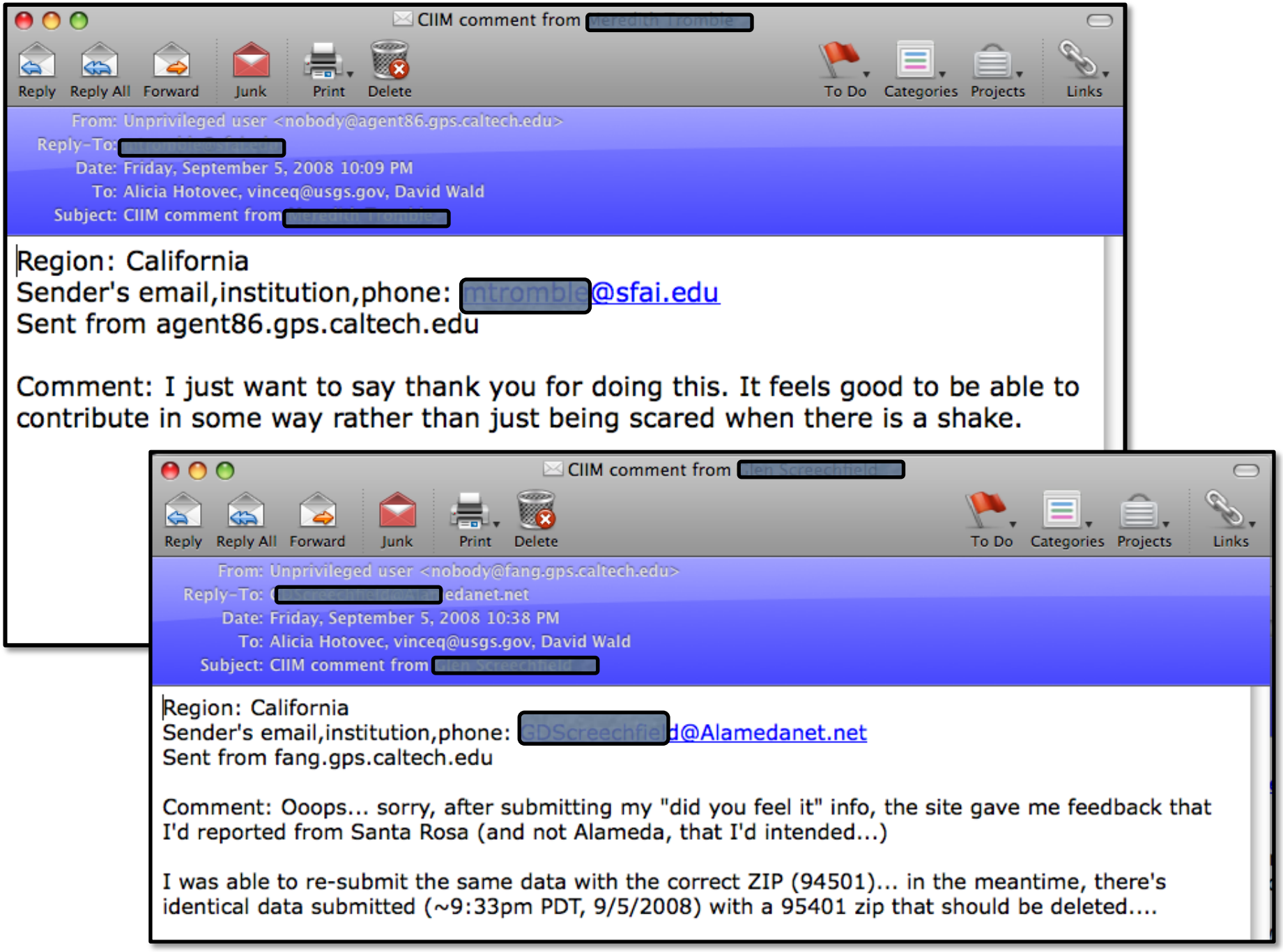
A Chemist's Laboratory Notebook
Adventures in Ethics and Science
ChemBark
Chemical Forums

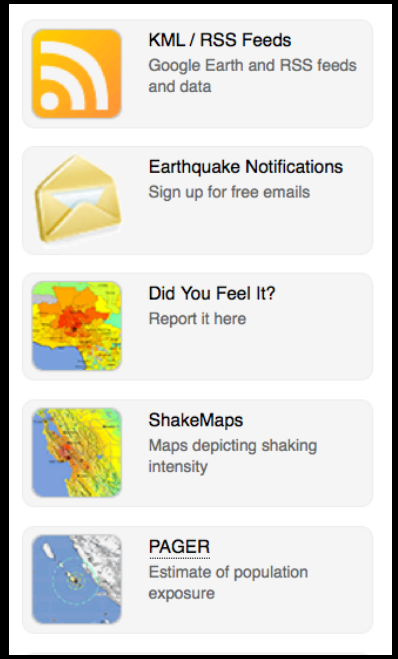
That's why I like the "**Did You Feel It?**" feature of USGS, which asks users to submit their experiences of the event. It echoes the question of every evacuee on the street – the need to confirm the extraordinary – and provides large, immediate quantities of data in an earthquake's aftermath. It's a nice, if limited, example of **citizen science** – a movement in informal science education for non-specialized volunteers to participate in substantive research. Before anyone raises the issue of citizen science vs. crowd sourcing, let me just tell you: I don't care. I've translated my excitement, fright, and wonder into a little data point for USGS, and it makes me want to do more. And don't worry, if you didn't feel the trembling yesterday, the project still wants to hear from you. (Did you feel it? …No.)


CIIM comment from [redacted]
Reply
Reply All
Forward
Junk
Print
Delete
To Do
Categories
Projects
Links
From: Unprivileged user <nobody@agent86.gps.caltech.edu>
Reply-To: [redacted]
Date: Friday, September 5, 2008 10:09 PM
To: Alicia Hotovec, vinceq@usgs.gov, David Wald
Subject: CIIM comment from [redacted]
Region: California
Sender's email,institution,phone: [redacted]@sfai.edu
Sent from agent86.gps.caltech.edu
Comment: I just want to say thank you for doing this. It feels good to be able to contribute in some way rather than just being scared when there is a shake.
CIIM comment from [redacted]
Reply
Reply All
Forward
Junk
Print
Delete
To Do
Categories
Projects
Links
From: Unprivileged user <nobody@fang.gps.caltech.edu>
Reply-To: [redacted]edanet.net
Date: Friday, September 5, 2008 10:38 PM
To: Alicia Hotovec, vinceq@usgs.gov, David Wald
Subject: CIIM comment from [redacted]
Region: California
Sender's email,institution,phone: [redacted]d@Alamedanet.net
Sent from fang.gps.caltech.edu
Comment: Ooops... sorry, after submitting my "did you feel it" info, the site gave me feedback that I'd reported from Santa Rosa (and not Alameda, that I'd intended...)
I was able to re-submit the same data with the correct ZIP (94501)... in the meantime, there's identical data submitted (~9:33pm PDT, 9/5/2008) with a 95401 zip that should be deleted....

USGS
science for a changing world

Some USGS uses of Social Media during initial earthquake response…

- **Event detection:**
  - TED – Twitter Earthquake Detector
- **Broadcast alerts:**
  - Twitter, Facebook
  - Primary: web & Eq. Notification Service (txt & email)
  - RSS Feeds
- **Communicate Information:**
  - Twitter, Facebook
  - Primary: still web
- **Event characterization:**
  - DYFI? (web, smart phone)
  - Inexpensive seismometers



M4.1 SE of San Francisco

Courtesy of Paul Earle, USGS

Summary:
REGION: CALIFORNIA
MAG: 4.1
Location: 37.477, -121.797 (9 km)
Tweets/min (10 min before): 0.0
Tweets/min (10 min after): 296.3
Search radius: 81.85 km

Top tweet locations:

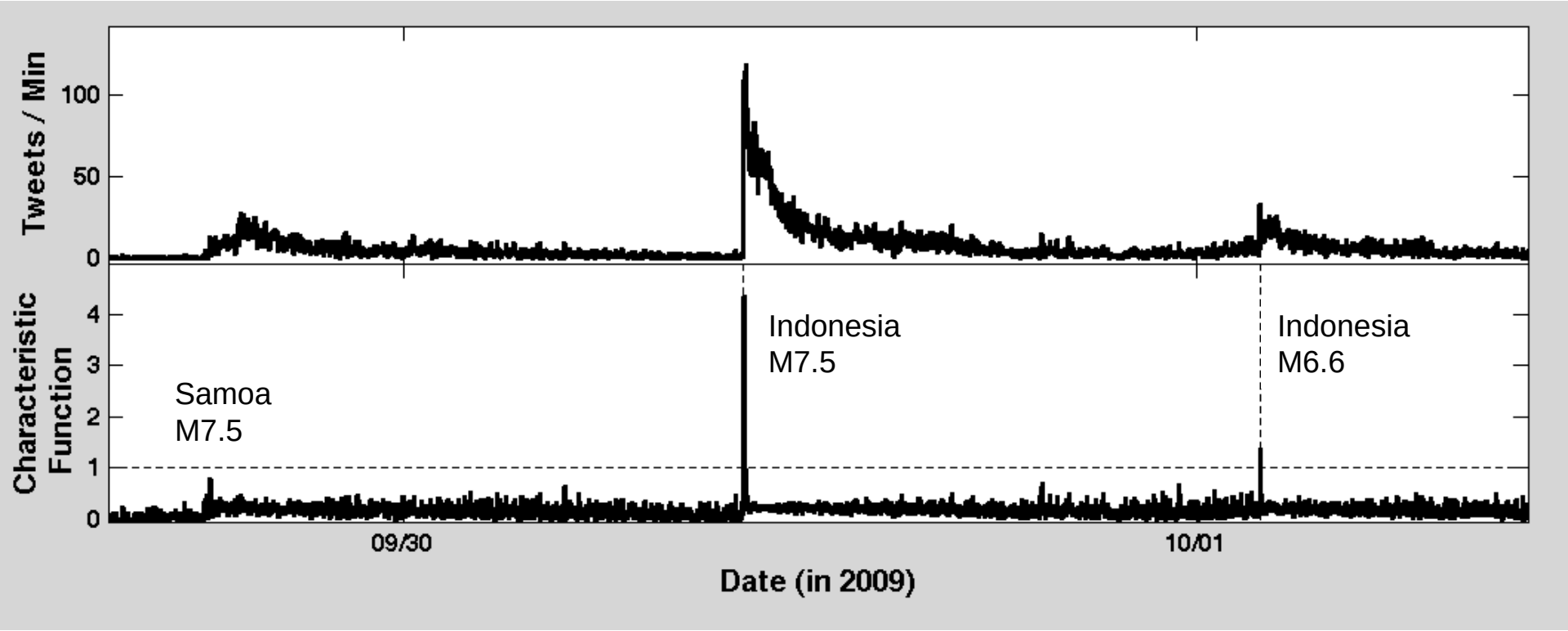
1200 :: San Francisco
371 :: San Jose
220 :: Silicon Valley
135 :: San Francisco Bay Area
89 :: Mountain View
84 :: Palo Alto
67 :: Sunnyvale

Tweet text:

->Hey! Little earthquake! :: San Francisco or thereabouts :: (+00:00:31)
->EARTHQUAKE!!!! :: iPhone: 37.573524,-122.071747 :: (+00:00:31)
->Holy craaaaaaaaap! Earthquake!!!!!!!!!! :: San Jose :: (+00:00:31)
->Earthquake jolt! :: iPhone: 37.393875,-122.077629 :: (+00:00:31)
->EARTHQUAKE!!!!!!!!!!!! :: SF Bay Area :: (+00:00:31)
->Earthquake?????? :: Stanford :: (+00:00:31)
->Earthquake! :: Bay Area, Ca :: (+00:00:31)
->earthquake!! :: Mountain View, CA :: (+00:00:32)
->I just felt an earthquake! :: santa clara, california :: (+00:00:32)
->F*ck! Earthquake! :: Fremont, CA :: (+00:00:32)
->was that another earthquake? or are my neighbors fighting? :: San Jose :: (+00:00:32)
->Earthquake :: San Francisco, CA :: (+00:00:32)
->Was that an earthquake I just felt? :: San Francisco, CA, USA :: (+00:00:32)
->just felt an earthquake, still kinda feeling it... :: iPhone: 37.518,-121.986 :: (+00:00:32)
->holy shit, earthquake. :: San Jose, CA :: (+00:00:32)

Event Detector

$$C(t) = STA/(m*LTA+b)$$



USGS twitter alerts (in development)

Twitter feeds to announce **web page content:**

USGS use of Social Media for Communication:

Facebook & Podcasts

USGS
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Other Citizen-aided science: Cheap seismic sensors

QuakeCatcher Network
(Stanford Univ.)

iShake
(U.C. Berkeley)

NetQuakes
(USGS)

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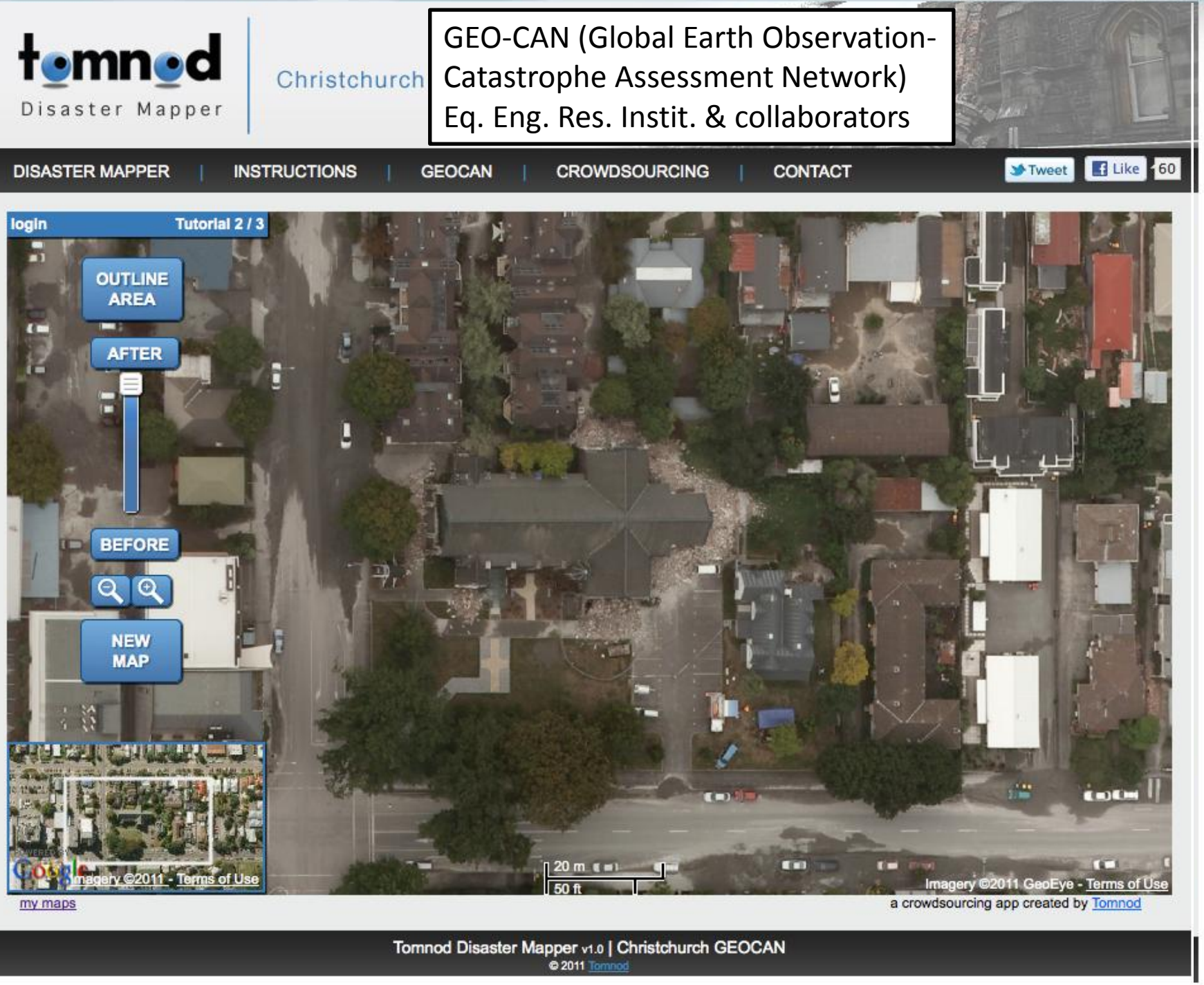
tomnod
Disaster Mapper
Christchurch
GEO-CAN (Global Earth Observation-Catastrophe Assessment Network)
Eq. Eng. Res. Instit. & collaborators
DISASTER MAPPER | INSTRUCTIONS | GEOCAN | CROWDSOURCING | CONTACT
Tweet
Like 60
login
Tutorial 2 / 3
OUTLINE AREA
AFTER
BEFORE
NEW MAP
Imagery ©2011 - Terms of Use
20 m
50 ft
Imagery ©2011 GeoEye - Terms of Use
my maps
a crowdsourcing app created by Tomnod
Tomnod Disaster Mapper v1.0 | Christchurch GEOCAN
© 2011 Tomnod

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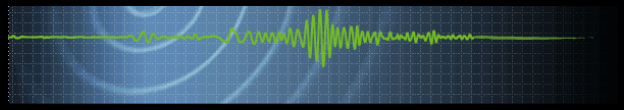

Some potential concerns/limitations of Social Media during initial earthquake response…

- Low “Signal-to-noise” ratio
- Privacy and “color” of content
- Curation, Quality Assurance = personnel time

USGS
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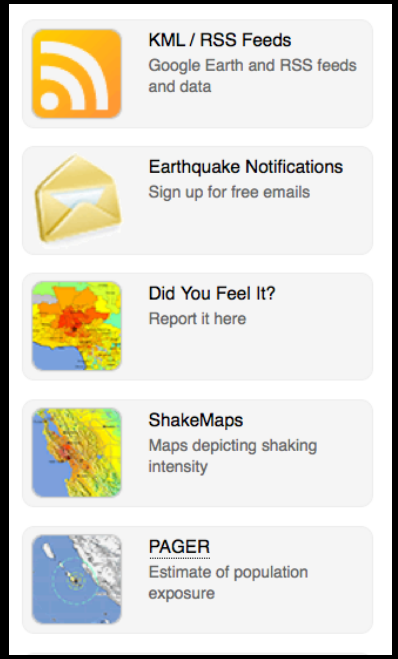

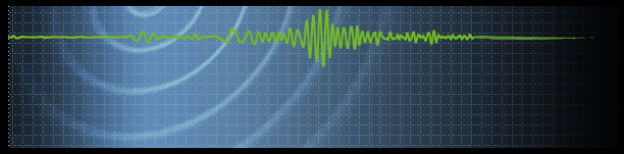

Thanks!

wald@usgs.gov

USGS science for a changing world

ANSS

Did You Feel It?
Citizens Contribute to Earthquake Science

Since the early 1990s, the magnitude and location of an earthquake have been available within minutes on the Internet. Now, as a result of work by the U.S. Geological Survey and with the cooperation of various regional seismic networks, people who experience an earthquake can go online and share information about its effects to help create a map of shaking intensities and damage. Such "Community Internet Intensity Maps" (CIIMs) contribute greatly toward the quick assessment of the scope of an earthquake emergency and provide valuable data for earthquake research.

Then and Now

Not so long ago, the first thing that most people did after feeling an earthquake was to turn on their radio for information. That practice is changing, however. After the 2003 San Simeon earthquake in central California, for example, many people logged onto the Internet, not only to get information, but also to share their own experience of the earthquake. After checking the U.S. Geological Survey (USGS) Web site for the location and magnitude of the earthquake, they went to a Web page called "Did You Feel It?" (at *http://earthquake.usgs.gov/*). They entered their ZIP Code and answered a list of questions such as "Did the earthquake wake you up?" and "Did objects fall off shelves?" In minutes a map began taking shape on the Internet, and in a few hours, with more than 14,000 responses for the central California event, a Community Internet Intensity Map (CIIM) showed where and how strongly the earthquake had been felt and where damage occurred.

Photographs represent effects of the 2003 San Simeon, Calif., earthquake. Following this event, over 18,000 responses to "Did You Feel It?" were shared with the USGS. The earthquake was Intensity VIII in Paso Robles (*left*) and Intensity VII near Atascadero (*right*).

Macroseismic Intensity

Macroseismic intensity describes the strength of shaking from an earthquake at a particular location, as determined from effects that people can readily observe without special instruments or special training. Such macroseismic effects include damage caused by the earthquake and the strength of shaking as perceived by people.

In general, the macroseismic intensity is highest near the earthquake source and decreases with distance from the source. However, a variety of factors—such as the direction in which the earthquake fault ruptures and variations in the soil conditions underlying different sites—may lead to complicated patterns of intensities that vary strongly from place to place.

Since 1931, the USGS has assigned macroscopic intensities to United States earthquakes on the basis of the Modified Mercalli Intensity (MMI) scale. Until recently, most of the macroseismic observations used to assign intensities were collected with questionnaires that were mailed to post offices in the earthquake region. The process of sending the questionnaires by standard mail, waiting for written responses, manually interpreting the responses, and preparing intensity maps could take months. In the late 1990s, the USGS began collecting data and publishing CIIMs on the "Did You Feel It?" Web page.

Community Internet Intensity Maps

In contrast to the intensity maps prepared from paper-copy questionnaires, CIIMs take advantage of the Internet to generate intensity maps almost instantly. Data are received through questionnaires on the Internet answered by people who experienced the earthquake. The Internet approach reduces the time for preparing and distributing a shaking-intensity map from months to minutes.

U.S. Department of the Interior
U.S. Geological Survey

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Special Issue: On the use of the Internet to collect earthquake information and crowdsourcing applications

USGS "Did You Feel It?" Internet-based Macroseismic Intensity Maps

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ABSTRACT

The U.S. Geological Survey (USGS) "Did You Feel It?" (DYFI) system is an automated ch for rapidly collecting macroseismic intensity data from internet users' shaking and reports and generating intensity maps immediately following earthquakes; it has been g for over a decade (1999-2011). DYFI-based intensity maps made rapidly available the DYFI system fundamentally depart from more traditional maps made available in the e maps are made more quickly, provide more complete coverage and higher resolution, or citizen input and interaction, and allow data collection at rates and quantities never nsidered. These aspects of internet data collection, in turn, allow for data analyses, and ways to communicate with the public, opportunities not possible with traditional tion approaches. Yet web-based contributions also pose considerable challenges, as erein. After a decade of operational experience with the DYFI system and users, we refinements to the processing and algorithmic procedures since DYFI was first We also describe a number of automatic post-processing tools, operations, and research directions, all of which utilize the extensive DYFI intensity data sets ed in near-real time. DYFI can be found online at the website ake.usgs.gov/dyfi/.

Wald et al. (2011)

For More Information…

iPhone App:

“iFeltIt”