

Can Twitter aid disaster response? New research examines how

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With over 500 million tweets sent every single day, new research from the Penn State College of Information Sciences and Technology (IST) is investigating innovative ways to use that data to help communities respond during unexpected catastrophes.

While local governments and relief organizations can measure a community's ability to respond to a disaster or measuring its impacts after, they've never been able to monitor the effects in real time.

IST researchers believe the answer may be found on [social media](#). Their case study, "Embracing human noise as a resilience indicator" published in *Sustainable and Resilient Infrastructure*, demonstrates the ability of social media to alert first responders. The researchers compared tweets sent out during Hurricane Sandy, one of the deadliest hurricanes to ever hit the United States, and the corresponding power outage information provided after the incident by utility companies in New York, New Jersey, and Pennsylvania. By comparing the information drawn from the power grid and the human chatter from over 10 million relevant posts on Twitter, the team was able to create a system for event detection.

Then, by isolating tweets with the terms "power," "outage," "electri," and "utility," the posts were organized by hour and compared to the outage reports in the same timeframe. The two data sets were found to have a moderate-to-strong correlation, and the team believes it's possible that Twitter was able to report power outages more quickly. Previous academic research in the domain has primarily been before and after

disastrous events.

"[We were able] to show these two data points actually relate to one another," explained Nick Lalone, doctoral student and the principal investigator of the study. "The goal [of this research] is to demonstrate that if the data stream changes, you can see what just happened. It would result in a real-time monitoring system."

Lalone is particularly interested in aiding first responders because his father and brother were both a firefighters and paramedics.

"I've always been around this," he said. "It's something that has always fascinated me, and when I got to IST [Andrea Tapia, assistant professor of IST] had two different grants to study crisis response. That's how I got started."

"We can count how many beds are in a hospital, or how many people can be injured," added Lalone. "But we know people are producing all of this noise and we know it can be useful. But we've never been able to correlate or demonstrate it in real-time."

Their efforts mirror a broader attempt by [government officials](#) to promote resiliency - a concept that has shifted in meaning after the events of 9/11.

"For a long time, [the United States] had this mentality of defense; we needed to be ready if we were invaded or for a nuclear war," Lalone said. "But when 9/11 came, we reorganized our resources around resiliency. So instead of responding to an attack, we're being prepared for it."

Lalone is hopeful that one day tools like theirs can be used on a larger scale to aid disaster recovery.

"The future is that we hope someone with ties to Homeland Security or the Red Cross will be able to put together this data when something happens and incorporate it into their official response," he said.

For example, during another hurricane, officials could use this tool to deploy their resources without waiting on official reports from utility companies. However, the team understands that there are additional challenges before the tool can be adopted. As social media information is controlled by private entities like Twitter and Facebook, issues of user privacy could arise if these companies allowed government officials an all-access pass to their data.

In addition, examining [social media networks](#) can potentially exclude those who don't use Twitter or even by using wording in their [tweets](#) that wasn't flagged in the tool's parameters. As the paper noted, "This becomes one of the most important barriers to engage, as every possible stakeholder of a given area should be given a voice."

But this study represents a crucial step in harnessing the power of social media to support communities when they need it most.

"This is why IST exists," Lalone said. "We take computer science and what the rest of the world is doing and get them to work together. We want to consolidate this data and make it useful for everyone."

Provided by Pennsylvania State University

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