

The Scalable Reasoning System

Improving situational awareness for emergency responders

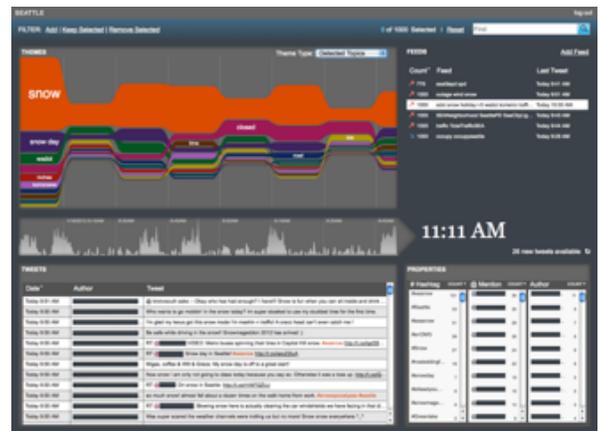
The City of Seattle's Emergency Operations Center (EOC) is activated about eight times a year, typically due to weather related events. During these crises, Police, Fire, City Light (Power), Utility, Transportation, Mayor's office, and Emergency Management personnel work to provide critical services and communicate with impacted citizens. Depending on the situation, the EOC may aim to restore power, address road closures or severe accidents, or even supply food water and shelter.

The City of Seattle actively uses Twitter today to communicate with the public. But they wanted to make better use of the information that the public shared on Twitter. Sponsored by the Department of Homeland Security's Science and Technology Directorate (DHS S&T), Pacific Northwest National Laboratory (PNNL) researched the city's social media use cases to create a custom

Social Media Analysis Tool. PNNL hosted a focus group with nine representatives from several City of Seattle departments to understand how Twitter and other social media data can improve the services the city provides. Primary use cases revealed the city was interested in understanding public perception of different city departments, monitoring the reach of critical messages and keeping a pulse on all the messages coming from different City of Seattle Departments. PNNL's challenge would be to support these use cases within a Twitter visualization tool.

From the focus group, use cases were prioritized and refined through four semi-structured, one-on-one interviews with key individuals of the City of Seattle. These use cases were then expressed and translated into initial designs prior to implementation.

The Scalable Reasoning System (SRS), a web-based visualization widget framework developed with DHS S&T funding, was chosen as an implementation platform. The SRS development team brought the customized City of Seattle social media prototype to life in less than two months. In early January 2012, SRS was provided to City of Seattle employees to begin testing. A major snowstorm occurred a week after the tool was initially delivered. Throughout the recent storm, we monitored the city's feeds and found some obvious and surprising trends. The team will follow-up to gage how SRS helped the City government during the winter storm and other events.



SRS Application on January 18, 2012:
Day 1 of the Snow Storm

POTENTIAL IMPACT

With SRS, emergency managers are enabled to spend less time analyzing local reporting; SRS gives them at-a-glance situation awareness so that they can determine what issues the public is talking about, and where.

Emergency managers desperately want to use social media as a source of “on the ground” intelligence, but the sheer volume of this data makes it hard to sift through to find useful indicators of disruption or public need. EOC personnel read social media sources manually — and in the Seattle region, there can be tens of thousands of Tweets per hour. With SRS, they will no longer have to comb through this data by hand; the system automatically aggregates streaming social media data into key themes and trends, which it presents visually. Now, when a few people on Twitter start buzzing about an issue, the event is no longer lost in the noise.

This deployment also represents a new way of delivering PNNL information analytics capabilities to customers; rather than ship software, tools are run on externally accessible PNNL servers, allowing users across

the country to access their data securely over the web without having to install special software (such as many people today use a web-based email client like Gmail instead of running a heavyweight standalone email client). The impact of this delivery approach is that PNNL can instantly and transparently roll out new analytic algorithms, providing a rapid deployment platform for the latest research. PNNL can also dramatically expand the typical user base, because there is no software to install and no wrestling with user organizations’ IT shops — delivering a service to a national user community at very low cost (in both money and time).

WHAT’S NEXT?

The Seattle EOC engagement is the first effort in a larger strategy to make this web-based social media analysis tool widely available across the nationwide emergency management community. The SRS team has already begun a second deployment with FEMA personnel in the Northwest region, with the goal of making the system part of the national FEMA toolkit. In the long term, the goal is to offer this capability nationally via

a managed hosting arrangement — users across the country will be able to rely on a PNNL-provided technology for continuous monitoring of live social media data. The team is also expanding its deployment activities into other domains.

ABOUT PNNL

Interdisciplinary teams at Pacific Northwest National Laboratory address many of America’s most pressing issues in energy, the environment and national security through advances in basic and applied science. PNNL employs 4,500 staff, has an annual budget of nearly \$1 billion, and has been managed for the U.S. Department of Energy by Ohio-based Battelle since the Laboratory’s inception in 1965.

For more information, contact:

Scott Dowson

Research Scientist

Pacific Northwest National Laboratory
(509) 372-6002

Scott.Dowson@pnnl.gov



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