Social Media Analytics for Situational Awareness
Disaster Response: Hurricanes Harvey and Irma

S&T deployed social media analytics with the National Protection and Programs Directorate to monitor critical infrastructure during Hurricanes Harvey and Irma.

acquired August 25, 2017

On Aug. 25, 2017, Hurricane Harvey made landfall on the Texas coast as a Category 4 Hurricane. Southeast Texas took the brunt of the heavy rainfall, with some areas receiving more than 40 inches in less than 48 hours. One section of Houston received 51.88 inches of rainfall, a North American record. A peak gust of 132 mph was reported near Port Aransas, Texas. Many stranded flood victims were unable to get through to 911 due to the overwhelming call volume and because the storm wrecked more than a dozen emergency call centers in the region.

Just over two weeks later, Hurricane Irma struck Florida, also as a Category 4. Irma proceeded to move up the peninsula, turning streets into rivers across the state and plunging millions into darkness and many into peril.

S&T's Data Analytics Engine (DA-E) began monitoring social media posts within hours using geo-vernacular, hashtags, and key words for to find information on:

- Communications infrastructure
- Dams
- Electric
- Oil and Natural Gas
- Public Health
- Water

The team monitored social media for emergent threats and storm impacts for situational awareness on public health and critical infrastructure. The team searched key words and related words and terms, and their translations in different languages, such as Spanish, for increased social media discovery. The DA-E team leveraged AWS GovCloud services using different media "pulls" to do the collection in real time, so that relevant posts were captured within seconds. The results were compiled and the analysis conducted and hosted in the cloud.

S&T directly impacted rescue operations, delivering 370 help requests.

The results included identifying and monitoring the possible explosion of the Arkema Chemical Plant two days before the actual explosion. The team flagged results and reported them to the NPPD's National Infrastructure Coordinating Center (NICC) for distribution and action. Urgent help requests that appeared in the results were sent to Texas Division of Emergency Management, United States Coast Guard National Command Center, and Texas Task Force #1.

Social media can be a valuable source of information but very challenging and labor intensive to leverage effectively due to the high volume of data. Very importantly, social platforms have become de facto meeting places for stranded individuals as they reach out to their neighborhood groups and the outside universe for help.

Harvey: 32,643 docs collected; 1,436 (4.4%) potentially relevant.

Irma: 56,683 docs collected; 1,103 (1.9%) potentially relevant

S&T's social media analytics research aims to help analysts and first responders more effectively leverage social media to improve response and save lives. Research includes developing methodologies, efficient workflows, and working with industry to develop commercially available capabilities.