



An Earth Networks Weather Station (right) and HD Weather Camera (left) keep watch over downtown Atlanta.

Earth Networks Provides Fulton County, GA with a Flood of Real-Time Data for Severe Weather Alerts

Officials in Georgia’s Fulton County are always on the lookout for severe weather events like tornadoes and lightning storms. Networks of sensors and Intel-based servers turn real-time data into just-in-time alerts.

Fast-moving storms move through the Atlanta metropolitan area, generating hundreds of lightning strikes and causing fires. A deadly tornado outbreak sweeps across the southeastern U.S., causing extensive damage and injuries and forcing evacuations in downtown Atlanta.

These severe weather events took place in 2008, but they can occur frequently in a metropolitan county that’s home to more than a million people in an area spanning 534 square miles.

According to Matthew Kallmyer, Director of the Atlanta-Fulton County Emergency Management Agency (AFCEMA), weather varies dramatically across different parts of Fulton County, and very precise advance warning is critical.

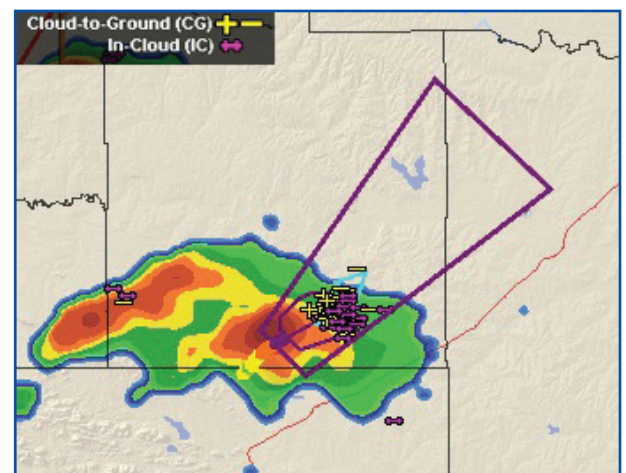
Neighborhood-Level Network

AFCEMA worked with Earth Networks to install 53 of the company’s automated weather stations, generating a flood of real-time data on wind velocity, barometric pressure, heat index, lightning strikes and other parameters.

Servers based on multi-core Intel® Xeon® processors use sophisticated modeling software to turn the raw data into weather alerts for schools, first responders and other subscribers. Fast processing performance adds up to shorter response times. And that can be critically important when lives and property are at stake.

The National Oceanic and Atmospheric Administration (NOAA) estimates that at least one-third of the U.S. gross domestic product is weather and climate sensitive, with a potential impact of \$4 trillion per year (source: NOAA Climate Services, 2012).

As AFCEMA’s Kallmyer says, “All disasters are local, which underscores the importance of having near real-time access to accurate localized alerts.”



Earth Networks automatically issues Dangerous Thunderstorm Alerts (purple polygon) when high rates of total lightning – the combination of in-cloud and cloud-to-ground – indicate the increased potential for severe weather including heavy rain, damaging winds and tornadoes.

Working in partnership with Earth Networks, AFCEMA relies on pervasive sensing and high-performance modeling in preparing for disasters. In an urban metroplex like Atlanta, the ability to calculate the touch-down point of a tornado before it occurs, or track fast-moving lightning storms, has enormous life-saving potential.

Advance Warning

Earth Networks provides state-of-the-art storm prediction to alert consumers via its popular WeatherBug desktop and mobile apps, as well as enterprises and government agencies around the world. The number of remote weather stations Earth Networks has deployed places Fulton County in the top one percent of counties in the U.S.

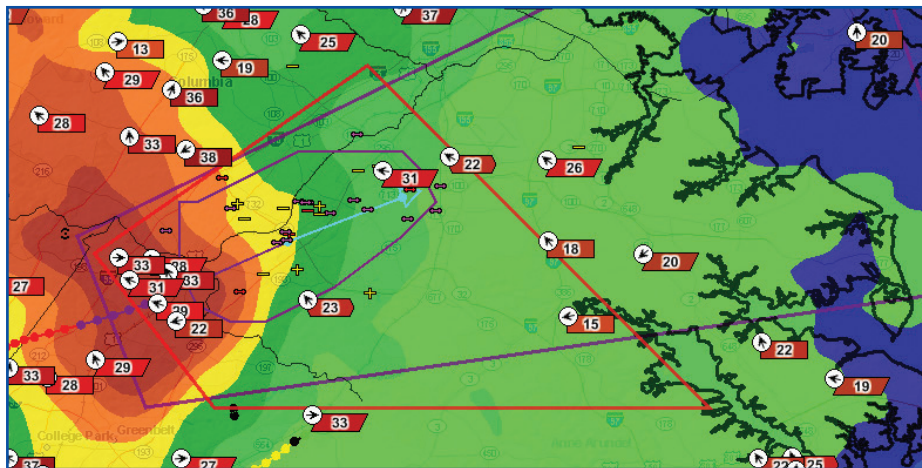
At the Earth Networks data processing center, a quartet of 48-core Intel Xeon processor-based servers run complex algorithms to crunch waveform data that constantly streams in over Ethernet links from remote weather sensing stations. The waveforms are correlated with GPS data to provide mapping updates and alerts to end users with astonishing speed.

The Earth Networks Dangerous Thunderstorm Alert is based upon an analysis, not only of lightning reaching the ground but also lightning that occurs within the storm cloud. This data is vital to predicting the behavior of dangerous storms.

“There is a fifth-power relationship between the in-cloud flash rate and the degree a thunderstorm cloud is rising, which means the storm is intensifying,” explains Earth Networks Chief Technology Officer Christopher Sloop.

“We can create a lightning density map in real time which allows us to track the center of the cell, creating alerts for lightning, tornadoes and severe hail. The system is one-hundred percent automated, and it provides alerts to users extremely rapidly and with a high degree of accuracy.”

Using sophisticated modeling applications and the power of multi-core Intel Xeon processors, Earth Networks is harnessing a flood of real-time data to keep Fulton County a vital step ahead of severe weather.



Earth Networks' neighborhood-level network of more than 10,000 weather stations and Total Lightning Network™ power real-time weather visualization and severe alerts. In the above image, an Earth Networks Dangerous Thunderstorm Alert (purple polygon) provides advance warning of dangerous weather for areas beyond the coverage of a National Weather Service Tornado Warning (red polygon). An analysis of severe weather outbreaks shows that Dangerous Thunderstorm Alerts provide an average lead time increase of 13 minutes over traditional warnings. Radar, wind gusts and lightning strikes are also shown.