

# GIS and GPS Help Allow Tornado Rescue To Go Smooth

I don't know who the person was who said, "Lightning never strikes twice in the same place" but I know that person is not correct. Besides being public works director for the city of Enterprise I also have an extensive background in emergency management and fire and rescue. I serve on the North-Central Incident Management Team as well.

Having attended several hundred hours of training to be prepared for major disasters, I know the chance that a person will actually be in charge of a disaster event is relatively small. Little did I know on the morning of June 11, 2008 that I would be asked to be in charge of the response and recovery of the city of Chapman after it was hit by an EF3 tornado. I served as incident commander of that event in twelve-

hour operating periods for three weeks. I had spent time in class with many who had responded to the Greenberg tornado in 2007; as a result I learned from them the many ways to improve the response and recovery at other incidents.

May 25, 2016 was just a normal day at work at the city of Enterprise – well as normal as can be for anyone working in the water and wastewater industry. There was only a slight chance of severe weather and besides I knew I had to be present at my granddaughter's birthday party that evening. I and my family are avid severe weather observers. While having supper at an Abilene restaurant I was continually checking weather sources on my phone. I told my wife Janette we needed to hurry as there was a storm that we

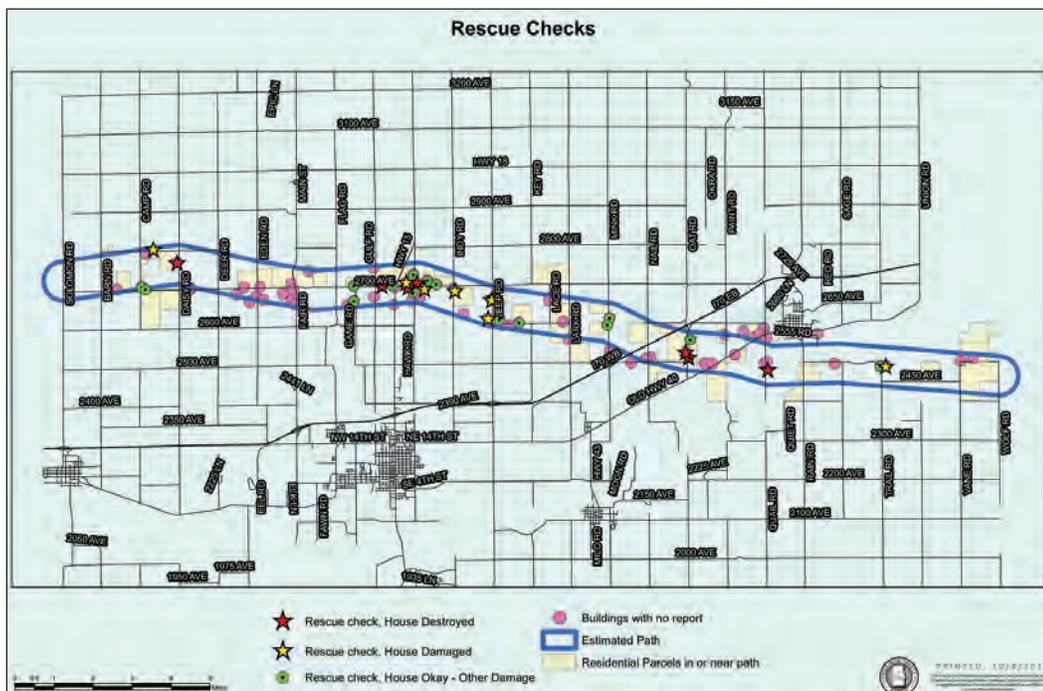
**There it was – the lowering of the wall cloud, the rotation and then – WHAM!**

should get out to watch. I did not like what radar was showing.

After dropping off family we traveled to the western side of Dickinson County about three miles south of Hwy. K-18. The storm presented itself just as the storms that the National Weather Service show in the spotter training classes. There it was – the lowering of the wall cloud, the rotation and then –WHAM!

Instantly there was a tornado. It did not move much at first but then it began to move slowly to the east.

As it moved, it grew. I figured it might last a few minutes but as we followed it continued to grow and trek eastward and slightly to the south. My first thought was that Dickinson RWD No. 1 had a standpipe in the path of the tornado, but it passed within 1.5 miles south of that location. Then my next worry was the community of Talmage but again, the tornado bypassed just to the south of the community. Next it appeared that the north edge of Abilene might be hit. But the tornado stayed north, missing a water storage tank Abilene has north of town.



The Dickinson County GIS Department provided excellent support and assistance to the storm search and recovery operations. This graphic shows the track of the storm and resulting damage survey results. The county department was plotting the storm and damage reports before the storm exited the eastern county line.



**This EF4 tornado on May 25, 2016 followed nearly the same path towards Chapman, Kan. as one on June 1, 2008, except it began much further north and when it crossed the river at Chapman it followed somewhat of a zig zag pattern. The 2016 tornado traveled the full width of Dickinson County, narrowly missing several small towns and Abilene.**

The tornado maintained an eastward track and as my wife and I continued to track it from the south we prayed that the track would change as it was tracking directly toward the city of Chapman. Less than one-half of a mile west of Chapman it turned south, crossing old Hwy. 40 destroying yet another farmstead, crossing the Smoky Hill River nearly in the same place the 2008 tornado crossed. It started to dissipate as it approached Geary County.

The County Emergency Manager asked that I take command of the search and rescue operations. A command post was established at our county trash transfer station located at Jeep RD and I-70, almost in the center of the county. However compared to the Chapman tornado of 2008 in which many additional lessons were learned, this tornado was different. Rather than being confined to the city limits of a small town this damage path spanned 26 miles of Dickinson County – the entire width west to east! Searching this large of area is a daunting task. A full incident management team was not requested as we had local members

adequate to fill the command level of a team. With mutual aid from Clay and Geary counties, we began to organize the search efforts. Here is where we flip the switch and change the way we have ever conducted a search before.

We are blessed to have commissioners who saw the value of a well-trained and equipped Geographical Information System department within our county. It is my personal opinion that we have the best GIS department in the state.

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Our GIS director Sherry Massey was in her office before the tornado exited the county. She was taking reports from our 911 center, both from fire units, law enforcement and actual 911 calls reporting where damage had occurred. Based on that information, Sherry created a base map with data from our county appraiser's office showing locations of occupied homes were that were in the damage path of the tornado. The boundaries of the path of destruction were expanded slightly in case flying debris had damaged homes that were not directly damaged. Having such a map for search teams had never been done like this before in the state of Kansas.

Copies of the map were sent to the command trailer, as we formed search teams from Kansas Rescue Task Force based out of Salina. Local law enforcement, Kansas Highway Patrol and local fire and EMS search units were provided the map which we broke down by sectors. Another tool used was the statewide interoperable 800 mhz radio system which allowed all units to clear the local communications for

normal traffic and all search traffic was conducted on an operational event channel. This proved to be a wise choice because in the middle of the search and rescue an armed robbery of an Abilene motel occurred and the normal radio channel was clear for their emergency traffic. As each taskforce unit went into their respective area they reported back on any injuries, amount of damage to occupied buildings and road blockages due to debris. It is amazing to me that in conducting a search of a 26 mile-wide area that at times was more than a mile-wide damage path, that within 2.5 hours all occupied buildings had been checked and all that sustained damage had all occupants accounted for and were found safe!

Another piece of technology that was used was an electronic accountability system that each IMT in the state has. All responders had an identification badge and as they checked in and out of the incident center, the command team was able to ensure we left no one in the field. In all we used 134 responders that night, not counting the local fire and rescue units that were following the

storm as it tracked through the county.

As I look back, the biggest lesson I want to pass on to all levels of government and water and sewer systems is this. Have good GPS mapping! Don't just use the pretty map books that are generated by the collection of your data. If you don't have a GIS system in your county, push for one. The most important thing to do with your data is to provide copies of your data with the GIS department as I have done with all our data from the city of Enterprise. In the event there is ever a disaster in Enterprise, all of the assets of the city's utilities would be readily available for mapping during such an emergency.

Remember too that you can have private firms collect your data, but KRWA offers a GPS mapping program that is very reasonable. And remember as Benjamin Franklin said "Failing to plan, is planning to fail".

### 2017 Conference

As President of the Kansas Rural Water Association board of directors, I take pleasure and pride in extending this invitation to everyone to attend the 2017 Annual KRWA Conference & Exhibition at the Century II Convention Center in Wichita, March 28 - 30. The KRWA conference offers nearly 60 training sessions. The EXPO has the widest display of products, services and equipment for water and wastewater utilities in the Mid-West. You will find the KRWA conference to be an enjoyable experience. Plan now to attend to learn – and to have some fun too. Remember it's "Knowledge, Experience & You – The Key to Good Service".

*Paul Froelich is City Superintendent at Enterprise, Kan. Since 1983, he has worked extensively in law enforcement, emergency management and municipal operations. He holds numerous accreditations in Emergency Management and Fire and is a certified water and wastewater operator.*



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