

## Title

Using GIS/CAMA in Disaster Response

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## Abstract

This paper talks about how the Oklahoma County Assessor's office used GIS/CAMA (Computer Assisted Mass Appraisal) systems in response to the May 3rd, 1999, and May 8th and 9th, 2003, tornados in Oklahoma County. These tornados were some of the largest and most devastating tornados in history. GIS was crucial in identifying and assessing properties as well as assisting in recovery efforts in the wake of these tornados. GIS was also used to track the path of destruction and assist emergency teams and agencies.

## Background

On Monday evening May 3<sup>rd</sup> 1999, the most powerful tornados ever recorded, with wind speeds measuring up to 318 mph, ripped through central Oklahoma on a 38 mile path staying on the ground for over an hour and a half, destroying over 3,000 homes and businesses and damaging another 8,000 structures, causing over 750 million dollars in damages, 47 lives were lost and 795 people were injured. On May 8<sup>th</sup> and May 9<sup>th</sup> of 2003 another round of tornados hit our County, tracking almost the same path as the 1999 outbreak, 1500 homes were damaged or destroyed with 130 million in damages and more than 100 people injured, but thankfully no deaths. GIS was crucial in identifying property owners, providing maps and aerials to assist emergency personal, damage assessment crews and relief agencies.



Path of May 3rd 1999 tornado

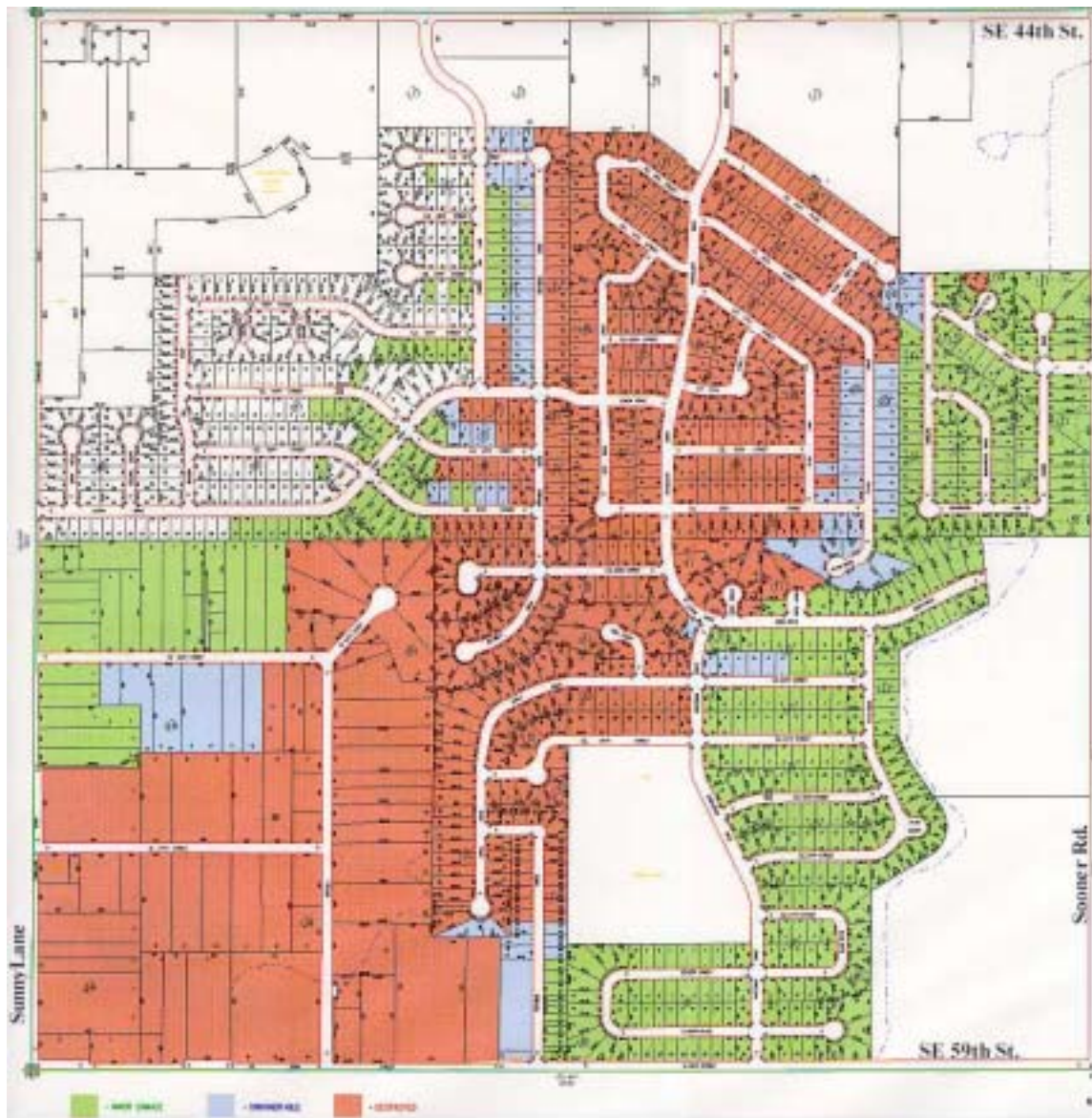


Aerial view of tornado path, May 3<sup>rd</sup> 2003

### **Assessors Contribution**

Immediately Following the May 3<sup>rd</sup> tornado the County Assessor took a helicopter ride with other officials to view the tornado path, he then made the arrangements with law enforcement and emergency personnel to have our appraisers in the field two days after the disaster, this was a difficult task with relief and emergency efforts still in progress. At the same time the GIS department was coordinating with a local company to do a fly over of the damaged area to create digital ortho photos to be used for damage assessments. These photos were crucial for this process, providing views to areas that in some cases could not be immediately reached. NOAA and FEMA data was also used to determine the preliminary path of the tornado. Assessor maps and aerial photos were taken to the field by our appraisers to assist them in the damage assessments, these maps and photos allowed the appraisers to identify properties by legal description and to in many cases pinpoint where a house once was. With whole neighborhoods wiped out there were no addresses or street signs to locate properties by. The data collected in the

field was entered into our CAMA system (computer assisted mass appraisal) to produce damage assessments on a per parcel basis. This information was then merged with our GIS maps to create damage paths and ownership lists of the effected areas. These maps were posted on our website so that all the various agencies had access to this information, hard copies were also provided to assist in the emergency response efforts by the National Guard, Red Cross, FEMA and law enforcement.



Damage assessment map, May 3<sup>rd</sup> 1999



One of the hardest hit areas, May 3<sup>rd</sup> 1999



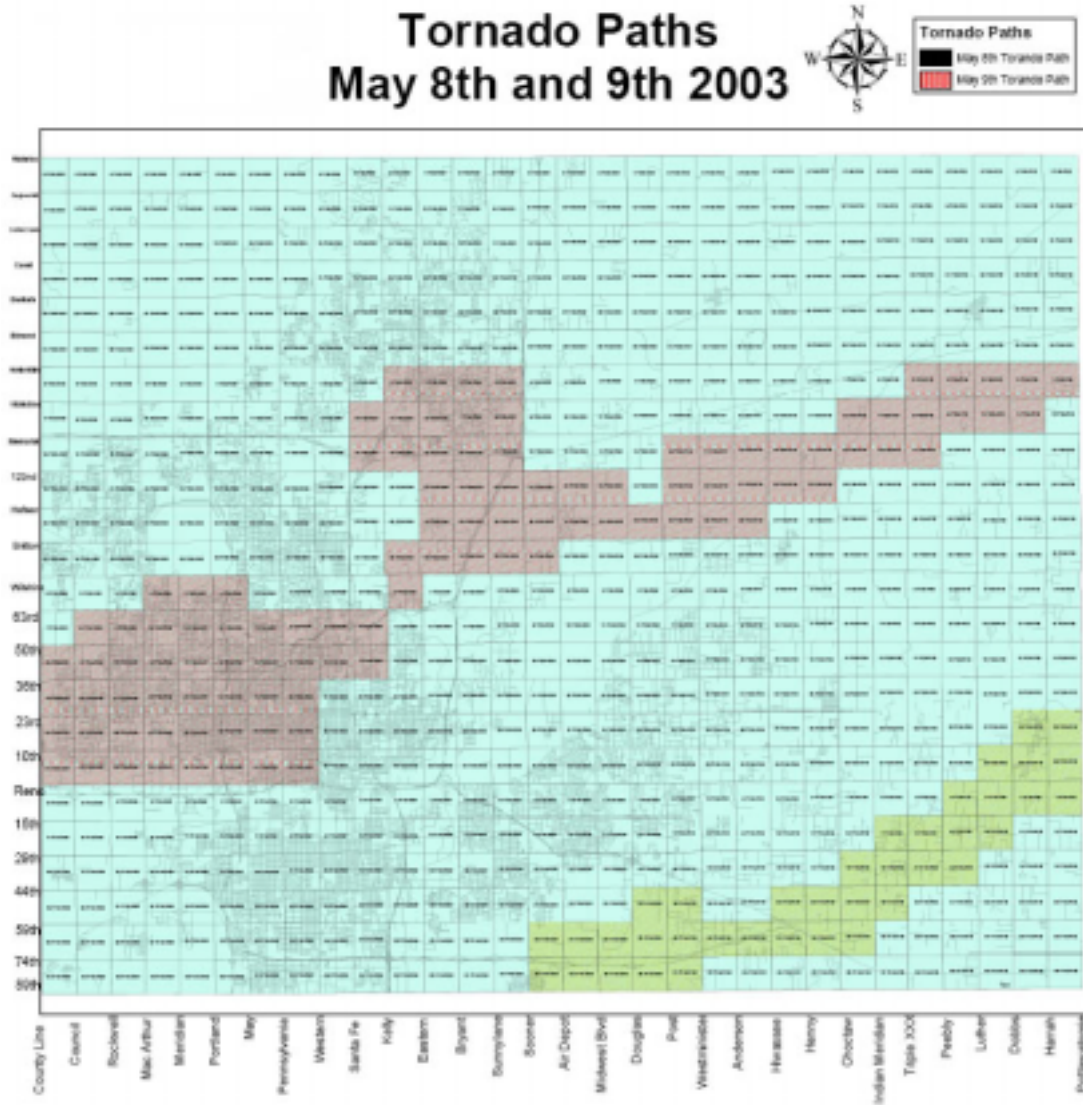
Coordination between departments in the Assessor's Office and with other agencies was important to obtaining the data needed and disseminating it to those who needed the information in the field. Our experience with the May 3<sup>rd</sup> 1999 tornado left us better prepared to handle the tornados that occurred in May of 2003, we were able to respond at a moments notice because we already had the procedures in place from the coordinated efforts of the May 3<sup>rd</sup> 1999 tornado. We were hit with a double whammy in May of 2003 with tornados striking on consecutive days, May 8<sup>th</sup> and 9<sup>th</sup>.



GIS Director James Mallory and GIS Specialist Jeremy Witzke work on tornado damage maps.

As with the May 1999 tornado our appraisers were quickly in the field to gather damage assessments from the May 8<sup>th</sup> tornado, a flight of the path was flown to collect the aerial photos. As recovery efforts and damage assessments were still being conducted on the south side of our County another tornado struck on the north side on May 9<sup>th</sup>, another flight was flown to collect the photos of the second tornado. With teams working on

opposite sides of town coordination was very important. The data was again input to our CAMA system to generate damage assessments and ownership lists. A special disaster assessment notice was prepared from this data to notify the property owners.



**Conclusion:**

Coordination we found is the key factor in disaster response. Also having procedures in place on how to respond to different types of disaster situations. Using GIS enables emergency crews to quickly identify the disaster area. Cama systems allow the Assessor's Offices to attach ownership and building attributes to the GIS maps. The Assessor's Office is an important source of needed data in disaster situations.

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