



Streamlining Power Restoration After the Storm

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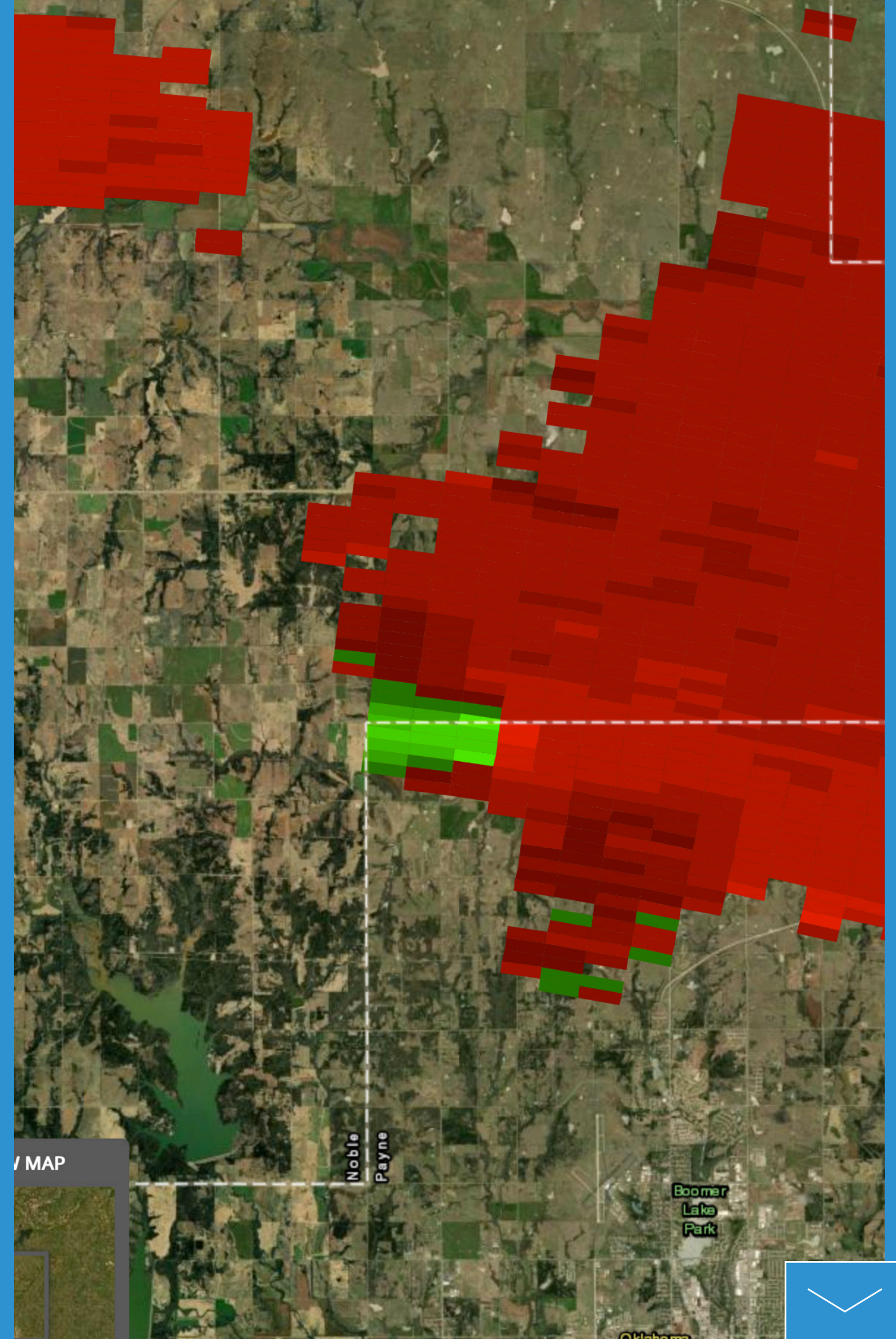
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Introduction

On May 9, 2016 severe weather impacted seven states, spawning a dozen tornadoes in Oklahoma alone. Two lives were lost, multiple storm-related injuries were reported, and utilities sustained significant damage to infrastructure. Widespread severe weather events threaten residents and property every spring on the plains and preparation for disruption of life and business is the new normal.

The image on the right is a base velocity product from the WSR-88D in Oklahoma City. The green represents lower level winds blowing toward the radar and red indicates winds blowing away from the radar.

On this day, Central Electric Cooperative (CEC) utilized TornadoTrax, a real-time model created by DTN to pinpoint service areas disrupted by a confirmed tornado. This is their story.

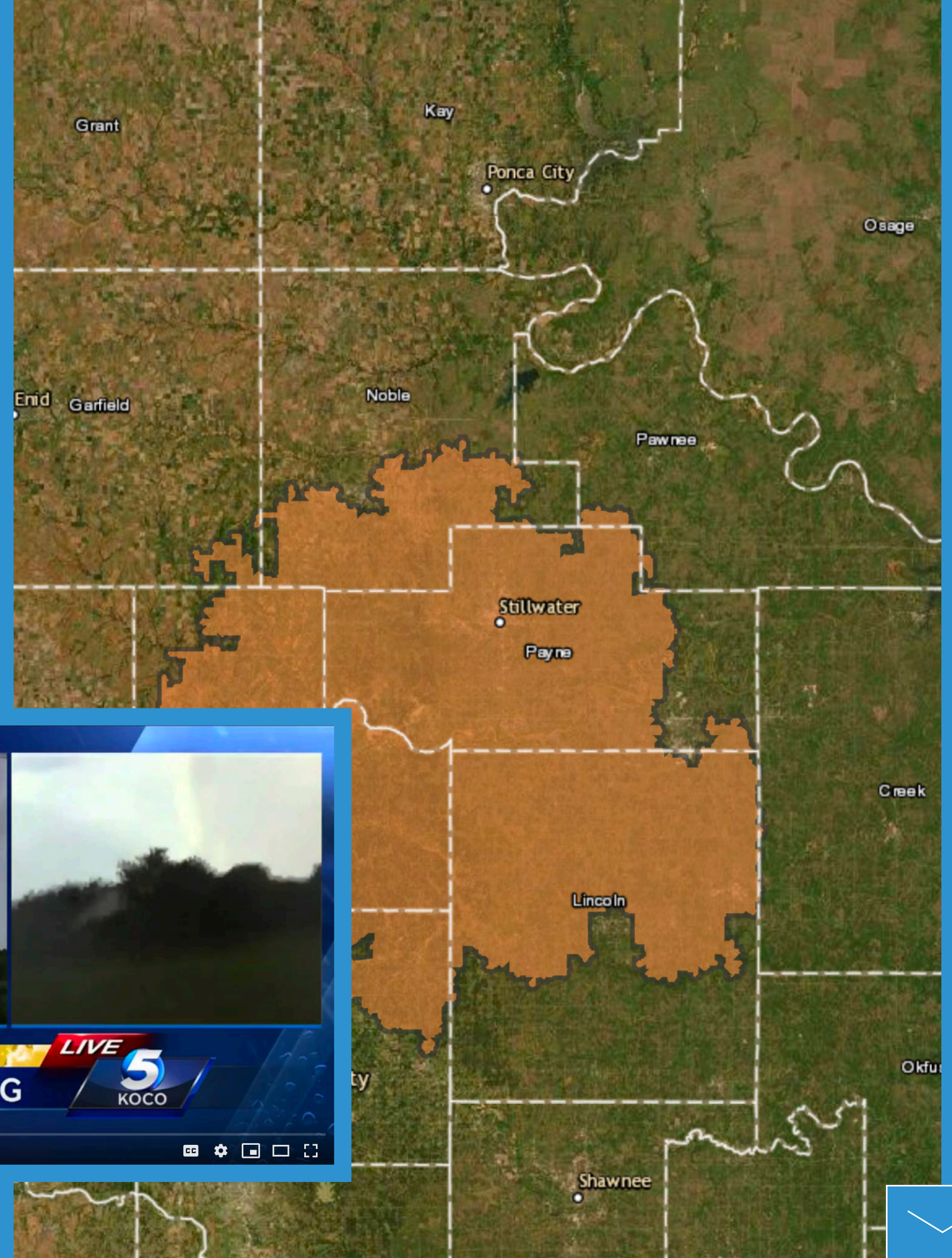




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A Large Service Area to Cover

CEC provides residential and commercial electrical service to approximately 24,000 customers via more than 4,000 miles of electrical line. The service area covers approximately 2,000 square miles and includes parts of Noble, Garfield, Lincoln, Logan, Oklahoma, Pawnee, and Payne counties. See the large coverage area in Oklahoma on the right.



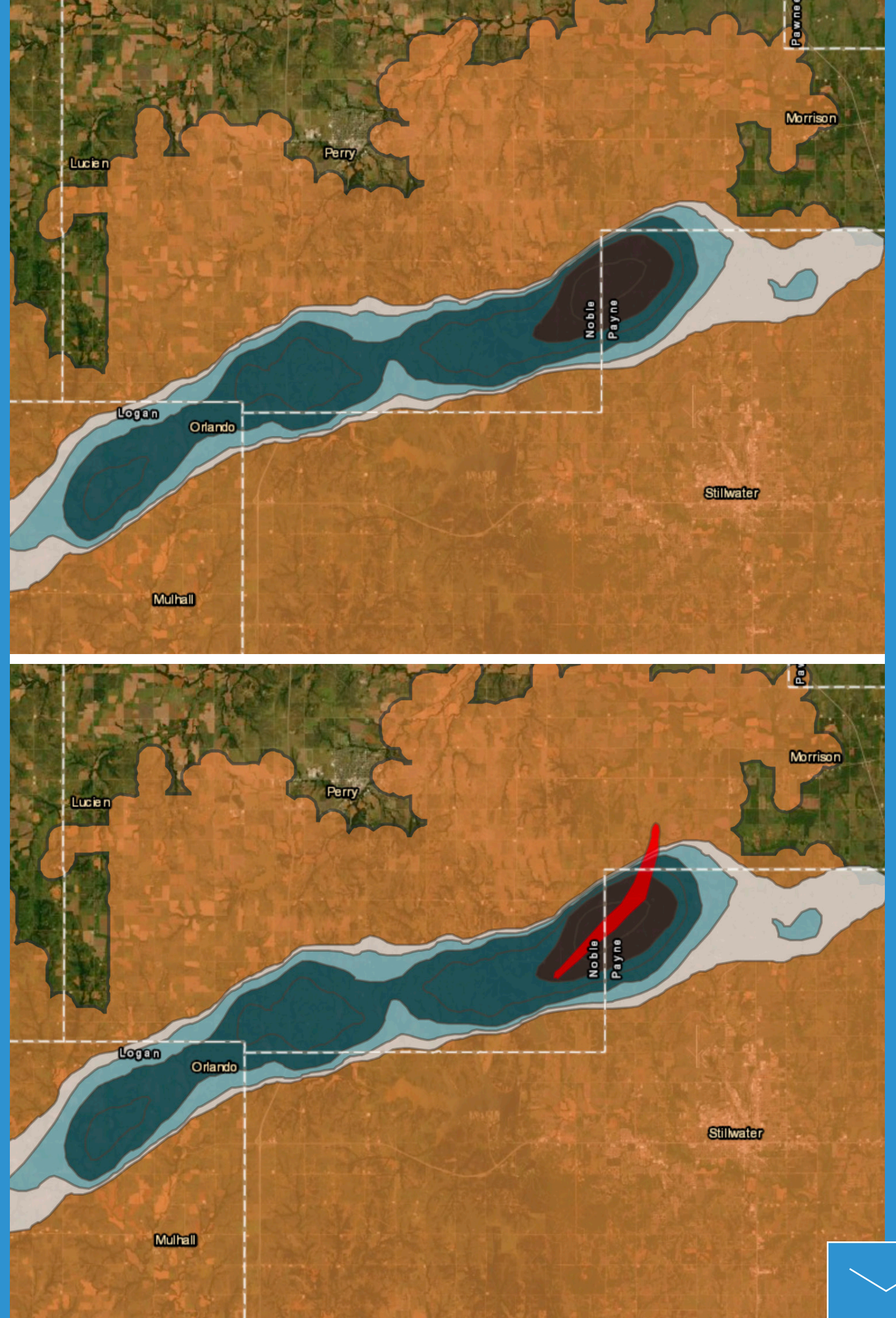
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TornadoTrax by DTN

TornadoTrax (blue contours) were created on May 9 in real time for Central Electric Cooperative. DTN proprietary algorithms analyze the intensity of rotation in storms as they occur. While this product cannot determine if a tornado is on the ground, strong areas of rotation (darker blue contours) often correlate with tornadic events and, ultimately, where wind damage would occur. The darkest blue represents winds reaching 140 mph.

A red swath outlines the preliminary damage path as assessed by the National Weather Service. These damage assessments come out days after a tornadic event. The bottom graphic shows the preliminary damage from the NWS. Having overlaid the TornadoTrax product with several post-storm damage surveys, this damage path is exactly what we would have expected. Analysis of the CEC data below further demonstrate the usefulness of TornadoTrax for determining where damage likely occurred in real time.

DTN customers in multiple industries utilize TornadoTrax data. For example, insurers can quickly identify areas with possible tornado damage, mobilize catastrophe teams, and estimate exposure/set-asides.



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A Collaborative Effort

CEC employees utilized Collector for ArcGIS while patrolling line for damages. Collector allows employees to gather all relevant information in the field, including photos, then input the data directly into the storm damage map. The storm damage map is then automatically updated in the office and field for all field crews, dispatchers, and administrators to view the extent of damage and determine the safest and quickest way to restore power.

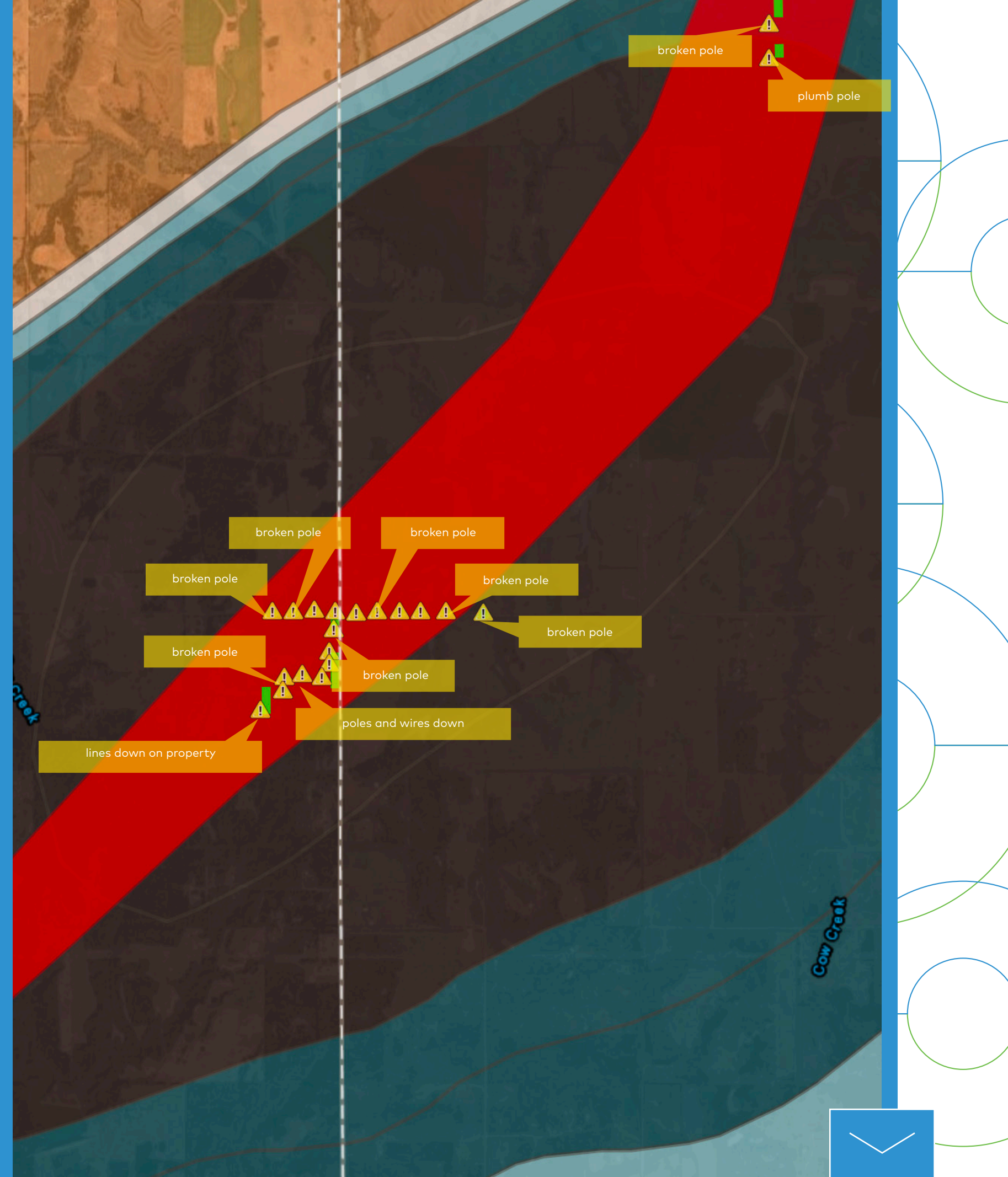
Utilizing GIS data and technology from ESRI and DTN, CEC was able to visually represent the storm tracks and outage information to more accurately predict damaged areas. The graphic on the right shows the damage overlaid atop TornadoTrax data and some specific damage types. This allowed for more focused and intentional damage assessments which, in turn, reduced labor for linemen searching for damage. The real time data of TornadoTrax allowed crews to travel directly to the affected areas, which considerably decreased the time necessary for power restoration.



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Streamlining Administrative Functions

Utilizing the weather data from DTN and the Storm Damage webapp together helps to create foolproof documentation and representation of data verifying expenses and damage for future reference. The more accurate damage predictions by county help to easily and quickly prepare work orders and associated pre-planning for beginning the FEMA submittal process. Damage assessments, restorations, and cost predictions that once took days to compile can now be completed in a matter of hours.



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Real-time Technology. Real-time Decisions.

- CEC has a large, rural service area. Real-time weather data helps identify areas with potential damage and focus restoration efforts more effectively.
- Real-time weather from DTN data made available through REST can be integrated across all of CEC ESRI maps and applications.
- Mobile applications, like Collector for ArcGIS, empower CEC to document damage and share that with the home office and others in the field in real-time to help restore power quickly.
- Real-time documentation of equipment replacements, expenditures, and labor streamline the FEMA submittal process.

Learn more: www.dtn.com/weather/utilities/gis/



