

 REPORT

Geographic Information Systems

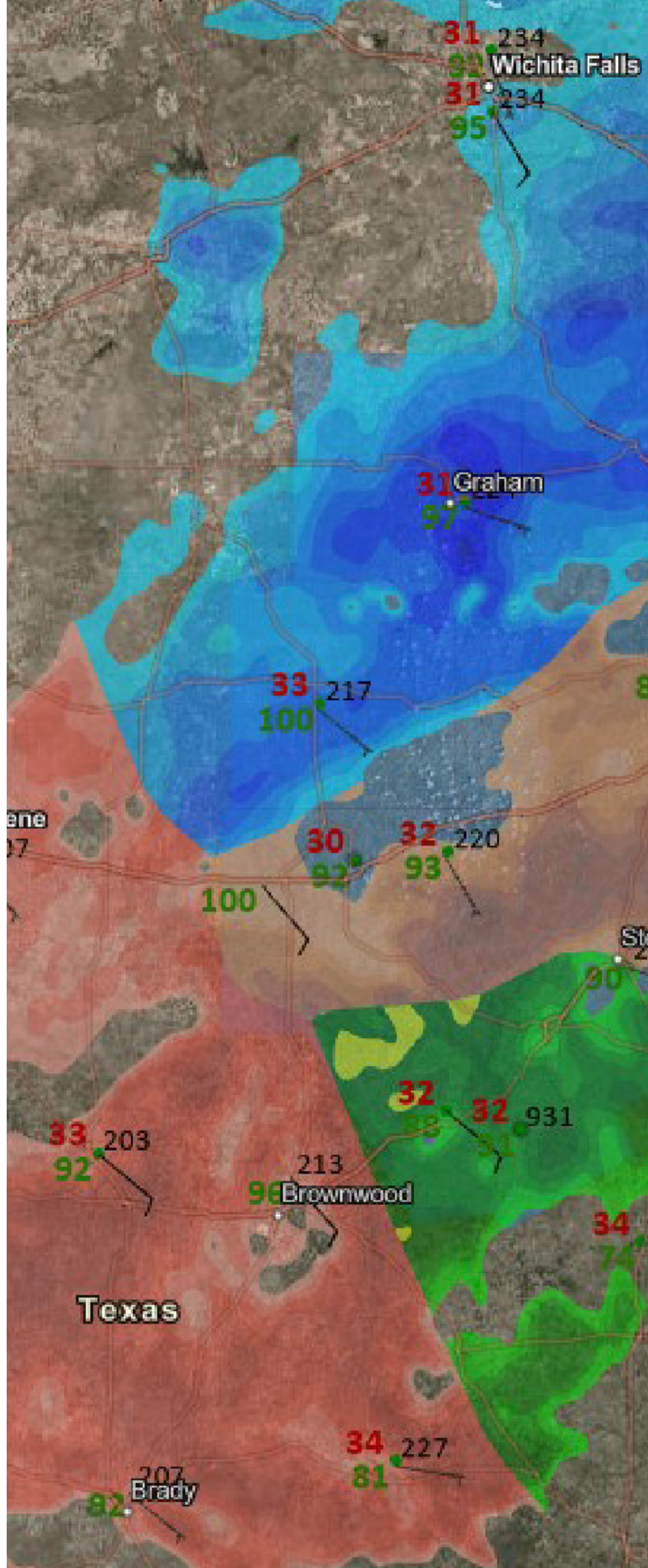
A holistic set of mapping information and data services from DTN.

September 2026

www.dtn.com

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DTN GIS solutions provide the largest selection of precision weather mapping in the market. DTN Map Services are exposed through ArcGIS Server REST endpoints to quickly add past, present, and future weather to any Esri maps or apps.



Radar Map Services

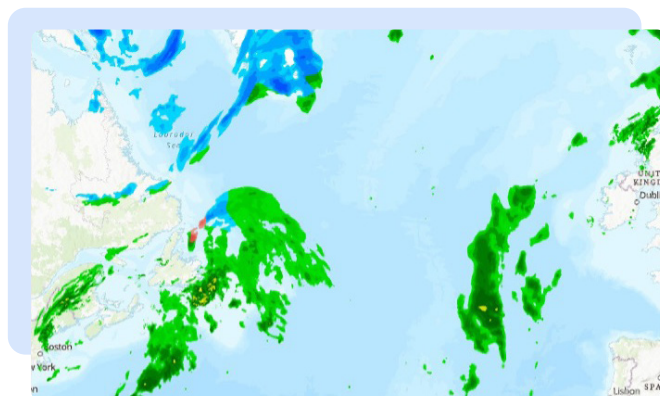
Radar and Radar Mosaics

DTN processes all raw, single-site radar data in the contiguous United States (CONUS), North America, Australia, Europe, and Japan. Once quality-controlled, the data is stitched into a single radar mosaic.

Precipitation type is also represented to distinguish between rain, freezing rain, sleet, and snow. This radar mosaic is available via two REST endpoints per region from DTN ArcGIS Server.

Synthetic Radar Nowcast

Synthetic Radar Nowcast is a comprehensive precipitation dataset that provides global coverage of precipitation events (rain, snow, rain and snow mix, freezing rain, and sleet) with high spatial and temporal resolution. It fills critical gaps in traditional radar coverage by synthesizing multiple data sources into a cohesive and coherent global precipitation nowcast that is updated every five minutes.



Update frequency: Every 5 minutes

Coverage: Global

Radar Nowcast

See beyond current conditions with DTN Radar Nowcast. Forecast radar is provided in 15-minute time steps up to three hours ahead and updates every 15 minutes. By extrapolating storm motion over time, Radar Nowcast indicates where storms and precipitation are headed, including precipitation type and intensity. Because it uses observed radar data, it's best suited for short-term forecasts.

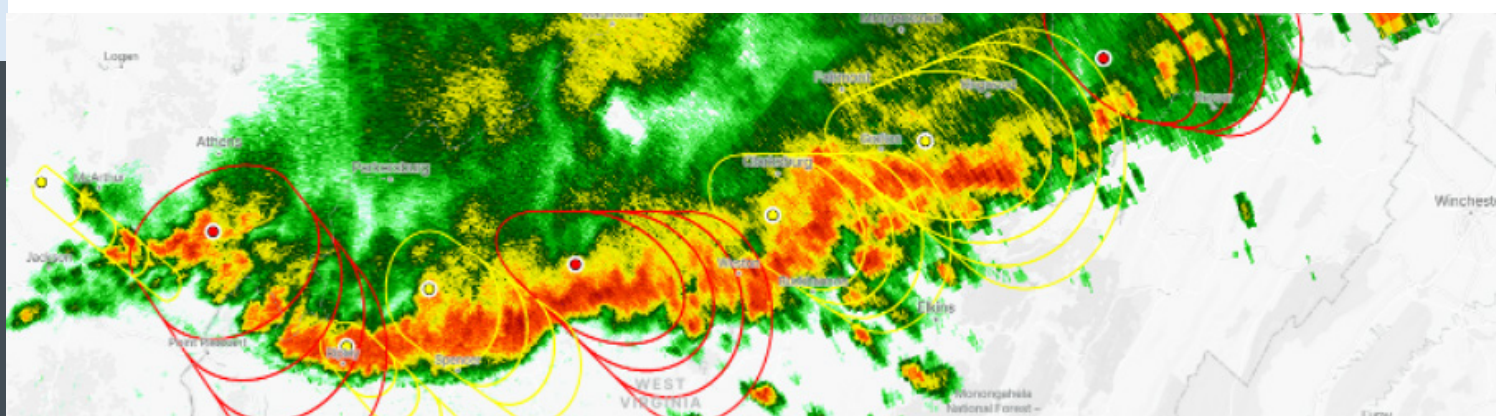
Available in: EU, AU, JP, US

Storm Risk Analytics

The DTN Storm Risk Analytics (SRA) Data Layers help organizations using Esri software to visualize and mitigate weather-related power outage risks. Using advanced machine learning algorithms, SRA provides a clear, map-based view of predicted utility outages up to seven days in advance, helping weather-sensitive businesses, particularly electric utilities, prepare for storm events and other weather-related incidents.

Data attributes:

- **Outage risk index:** Scale of 1 to 10 for assessing risk
- **Outage prediction:** Predicted outages vs. baseline outages on blue sky days
- **Update frequency:** Every 6 hours



Global Storm Nowcast

Storm polygon projections, detailed storm cell attributes, and risk levels are updated every five minutes. The data provides 60-minute forecast paths to track precise storm movements and monitor severe weather threats, including hail, wind, heavy rain, and lightning.

Whether you're managing emergency response, optimizing transportation logistics, protecting outdoor events, or developing weather-sensitive applications, high-resolution storm data helps you anticipate threats, mitigate risks, and make informed decisions.

Hail Nowcast

The DTN Hail Nowcast represents a short-term forecast of the likely path of identified hailstorms. The corridor extends to 60 minutes into the future and is divided into 15-minute forecast increments.

Tornado History

This data set analyzes real-time radar data across the United States to identify areas of rotation. When rotation is detected, the algorithm classifies its strength and plots intensity in real time.

Tornado History is often used by first responders and emergency managers responsible for multiple assets. Utilities and pipeline operators rely on this information to help identify assets that may have been affected.

This can reduce the time and resources needed to scout for damage and restore services while expediting cleanup and containment efforts when hazardous materials may be involved.

Satellite and Tropical Map Services

Global Tropical Forecasts

Issued by the National Hurricane Center and Joint Typhoon Warning Center

This data service aggregates forecasts from the National Hurricane Center (NHC) and the Joint Typhoon Warning Center (JTWC) to provide global tropical storm and hurricane forecasts.

This REST endpoint from DTN ArcGIS Server includes:

- Observed locations (starting point where the storm achieves tropical storm criteria)
- Observed track
- Current location
- Forecast locations
- Forecast track (line)
- Forecast error cone
- Forecast wind radii (34 kt, 50 kt, and 64 kt)

Note: Data updates as new forecasts are issued from the NHC and JTWC.

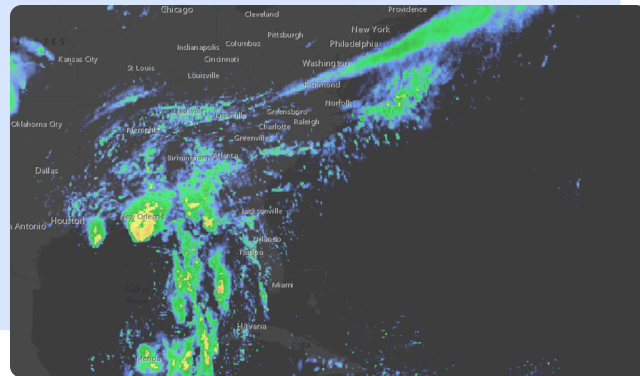
DTN Global Tropical Forecasts

Issued by DTN forecasters

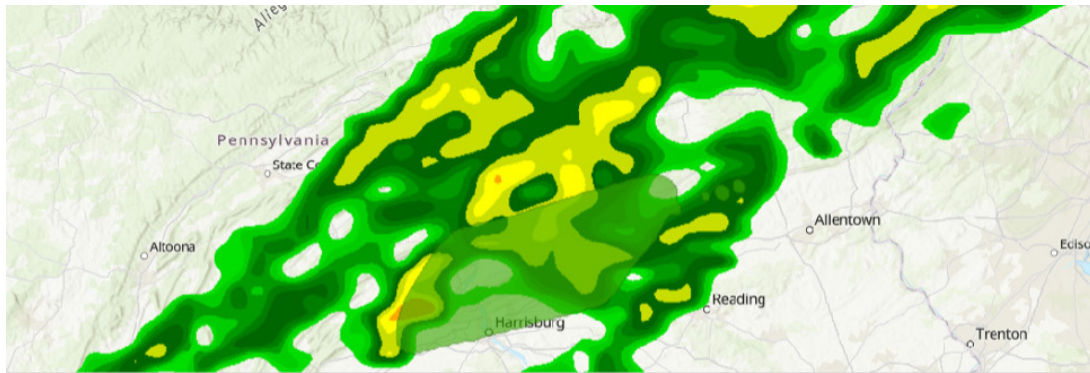
DTN has its own proprietary global forecasting system. It is unique in that the input models are statistically and mathematically blended using machine-learning techniques to constantly adjust and improve the forecast.

DTN forecasters produce forecasts for tropical storms around the globe using the same parameters as those issued by the NHC (forecast points, error fan, and wind swath out to five days).

DTN forecasts may deviate from the NHC/JTWC forecasts. DTN Global Tropical Forecasts update every six hours.



Models: Feature and Map Service



HPA

DTN Heavy Precipitation Algorithm (HPA) combines radar data and short-term weather forecast models to identify areas of heavy precipitation and forecast where it will move in the next 60 minutes.

The model takes radar mosaics over various time steps to determine the speed and direction of areas of heavy precipitation. DTN then uses the model to determine where heavy precipitation will move, with polygons indicating a moderate or high risk.

The forecast updates every five minutes.

LAPS Current Condition Analysis

The DTN linear assignment protocol/predictive-social (LAPS) algorithm combines weather observation point data and model data to output a grid of current weather conditions. This algorithm uses quality control routines and physics-based objective analysis schemes to provide conditions regardless of proximity to a weather observation station.

The final product is a contoured polygon dataset, available as an Esri Map Service and Feature Service.

For the Wind Speed and Direction product, data is provided as a point dataset. Wind vectors (arrows) indicate wind speed and direction, with each point representing the center of a grid cell.

- **Temperature** (polygon) in degrees Fahrenheit
- **Dew point** (polygon) in degrees Fahrenheit
- **Relative humidity** (polygon) in percentage
- **Visibility** (polygon) in miles
- **Wind speed** (polygon) in miles per hour
- **Wind speed and direction** (point) speed in miles per hour and direction in degrees from north

All LAPS Current Condition data updates every 30 minutes.

QPE CONUS

The SPIA Index is currently available as a time-enabled map and feature service showing three-day forecasts in six-hour increments.

SPIA Index

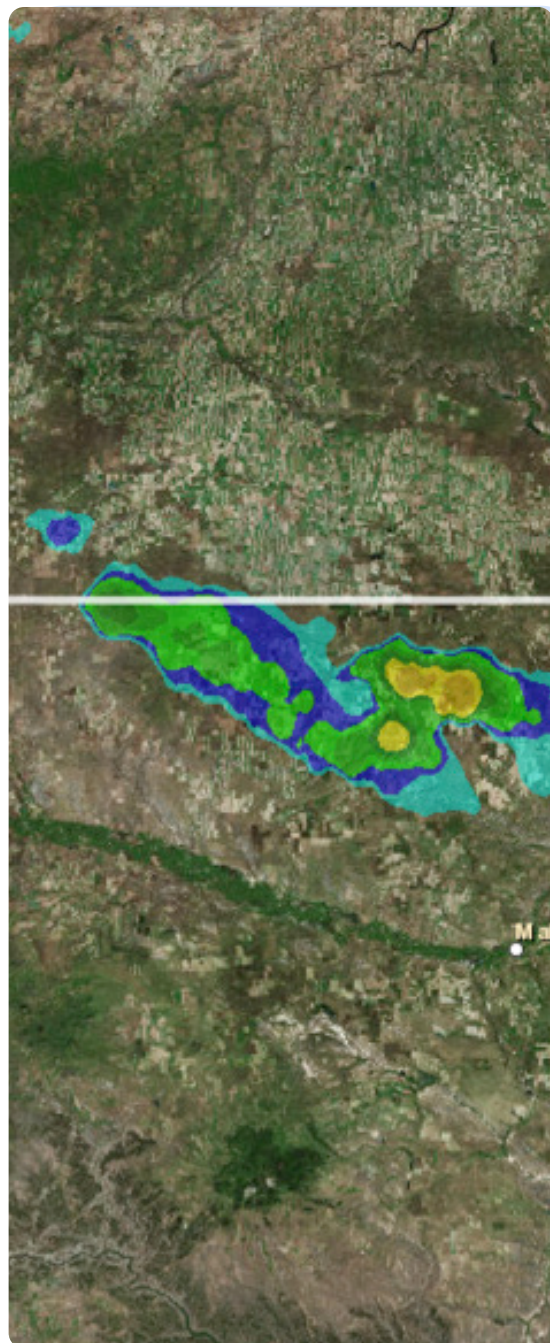
DTN SPIA Index (Sperry-Piltz Ice Accumulation) for CONUS is designed to help electric utilities, cooperatives, and transmission organizations forecast damage to their elevated infrastructure from ice storms.

SPIA's unique combination of forecast ice accumulation and wind creates an easy-to-understand index with values ranging from 1 to 5 (from isolated impacts to catastrophic damage and outages lasting more than a week).

The SPIA Index supports operational decisions regarding when and where to stage crews, whether to put contractors on retainer before other organizations, and whether it's necessary to contact mutual aid partners before an ice storm. It's built on a decade of data that includes both weather conditions and resulting damage.

The SPIA Index is currently available as a time-enabled map service and feature service showing three-day forecasts in six-hour increments.

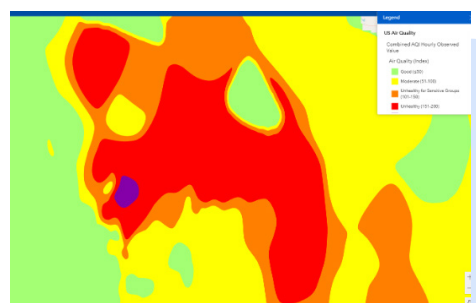
Whether for display in an operations room, executive briefings, or alerts using the GeoEvent Server, SPIA supports GIS professionals at electric utilities during the winter months.



DTN Fire Weather layers provide real-time information on ongoing fires and risk indicators that support wildfire prevention, mitigation, and response activities.

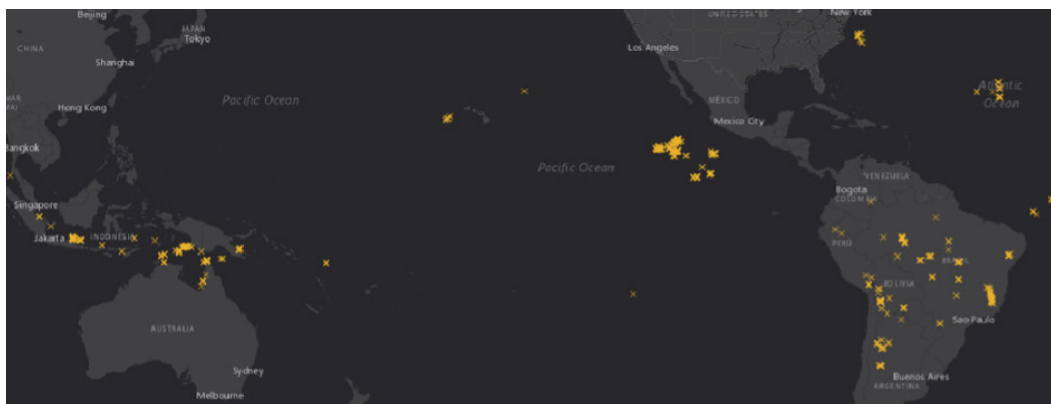
U.S. fire perimeters: Perimeters of all new, ongoing, and past wildfires for the current year. Time-enabled.

Global hot dry windy index: A modern fire weather guidance dataset designed to help predict days with extreme wildfire potential by combining temperature, humidity, and wind speed into a single metric.

[illegible]

The United States and Canada air quality index (AQI) provides information about outdoor air quality and health. The AQI includes six color-coded categories, each corresponding to a range of index values. The higher the AQI values, the greater the level of air pollution and the greater the health concern.

- **Three layers available:** Current and forecast values for combined AQI plus current PM2.5 concentrations
- **Current observations:** Combined AQI (updated hourly)
- **Current observations:** PM2.5 concentrations (updated hourly)
- **Today and tomorrow forecasts** (updated daily)



Global and CONUS Analysis

Surface observations update every hour and show the following current weather variables: temperature, relative humidity, and wind speed and direction indicated by wind barbs.

- Temperature – 24-hour high and low
- Dewpoint temperature
- Evapotranspiration short and tall
- Precipitation – one-hour and 24-hour
- Relative humidity
- Solar radiation – one-hour (Note: only one hour for CONUS)
- Wind direction and speed

Real-time Global Lightning: Map and Feature Service

DTN provides lightning data from the Earth Networks Total Lightning Network (ENTLN), a high-precision, reliable lightning detection network with global coverage.

DTN receives a real-time feed of lightning data and makes it available as an ArcGIS map and feature service.

The lightning data service updates every minute and contains the last five minutes of global cloud-to-ground lightning, including amplitude, polarity, and strike time to the millisecond.

Lightning Nowcast

DTN Lightning Nowcast categorically predicts the threat of lightning in the next 60 minutes using moderate and high threat levels. The polygons are derived and output from an algorithm that combines radar data and detected lightning.

Detected lightning is used to identify areas currently affected by lightning and those along the forecast path of a storm cell. Multiple time steps of radar mosaics are used to determine the direction and velocity of all storm cells in the gridded domain.

Updates every five minutes.

Alerting: Map and Feature Service

DTN forecasters issue alerts for a variety of weather threats. These alerts come from polygons drawn by DTN forecasters with attributes that describe the weather threat and timing.

National Weather Service Watches, Warnings, and Advisories (NWS WWA)

This REST endpoint from DTN ArcGIS Server is updated as products are issued by the NWS.

NWS WWA includes severe thunderstorm watches, tornado watches, severe thunderstorm warnings, tornado warnings, blizzard warnings, and many others.

Learn More

DTN GIS and Esri map services provide a way to integrate geographic and weather information into web and native applications.

DTN creates interactive weather maps and GIS applications to provide decision-making insights for the utilities, maritime transportation, and aviation.

To learn more about DTN GIS solutions, visit our website.

[Learn More](#)