



DR^x WEATHER GUARD

ADVANCED WEATHER IMPACT
PREDICTION & STORM
RESPONSE READINESS



WEATHERGUARD[®]

Helping Utilities Predict Weather-driven Outages,
Optimize Response, and Restore Faster



DR^X Weather Guard

Application Overview





PREDICT. PREPARE. PERFORM.

DR^x WEATHER GUARD[®] OVERVIEW



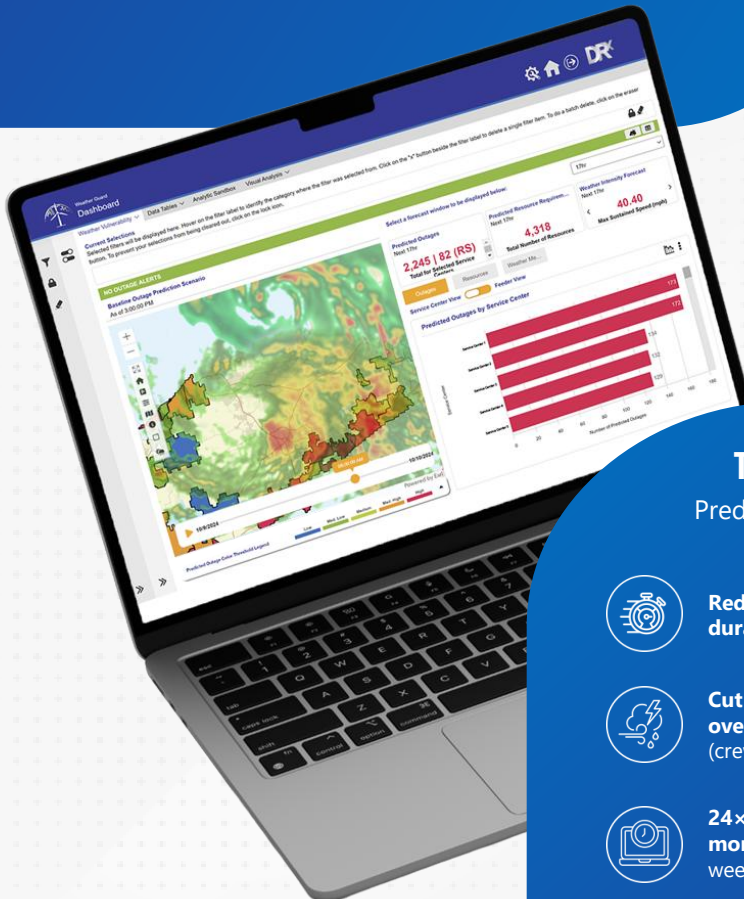
DR^x Weather Guard[®]: ML/AI-Driven Weather-Based Outage and Resource Prediction for Electric Utilities

DR^x Weather Guard[®] integrates real-time weather forecasts, historical outage and weather data, GIS asset information, vegetation data, and asset conditions to accurately predict outage and CI/CMI impacts from rapidly approaching extreme weather events.

Using advanced machine-learning models, it translates changing weather patterns into predicted outage volumes, CI/CMI, circuit-level vulnerability, and required field resources.

The application automatically generates alerts and reports showing forecasted damage and identifies circuits most likely to be affected, helping utilities act before storms arrive.

This enables faster restoration, reduced overtime, and improved efficiency in storm preparation and response.



*DR^x Weather Guard has taken the guesswork out of storm management, **reducing overtime, improving accuracy, and giving us confidence before every storm.***

Manager, Distribution Operations,
Large Southern Utility

The DR^x Weather Guard Advantage:

Predict outages and restoration needs before storms arrive



Reduce outage durations by 15–20%



Cut storm-related overtime by up to 35%
(crew holdover, callouts)



24x7 automated storm monitoring – off-hours, weekends, and holidays



Streamline storm-prep meetings and coordination time – reducing staff burden and increasing employee satisfaction



Enable proactive external communications
(customers, municipalities)



WEATHER GUARD® OVERVIEW

Enhanced Analytic Capabilities at Your Fingertips

APPLICATION HIGHLIGHTS

Accurate, Timely Weather-Based Outage Ticket Predictions at the Division/ Service Center Level – with both Shorter and Longer-term Views

Real-time weather forecasts, including wind speed and wind gusts, lightning, precipitation, temperature, humidity views, etc. feed into our proprietary ML model to generate hourly outage ticket predictions with up to 80%+ accuracy as well as CI/CMI. Predictions are made at the hourly level for up to 24 hours and in 8-hour increments up to 72 hours prior to a weather event.

Multiple Real-Time Weather Forecasts to Reduce Potential Forecasting Errors

We use 4 key weather forecast sources: Vaisala X-Weather, Weather.com, Weather.gov, and HRRR forecasting. Together, these forecasts are weighted and blended together at the Division / Service Center level, with relative weights changing hourly based on the past 24-hour historical performance of each weather forecast. We also bring in additional satellite forecasting, probabilistic severe weather forecasting, and National Weather Service alerts.

Storm Resource Requirement Projections and Circuit Level Probability of Failure for Optimized Resource Planning & Staging

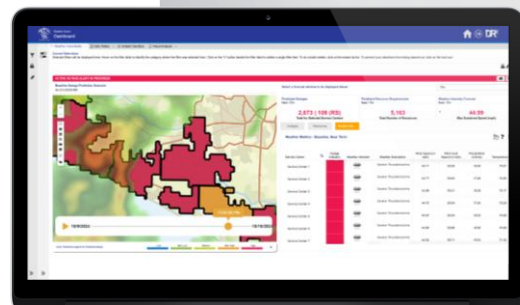
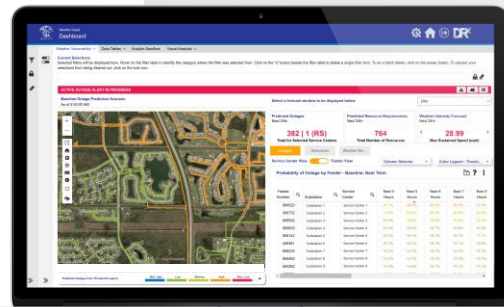
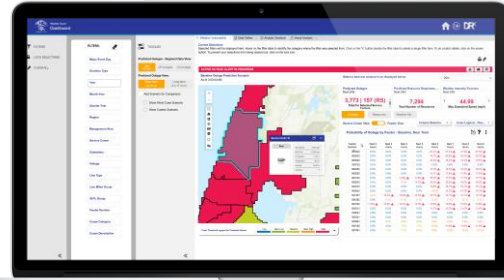
Efficiently stage crews and materials by predicting likely outage locations and identifying and visualizing circuits at-risk for incoming weather events, reducing both response time and overtime costs. Manage risk by allowing the user to adjust crews and see expected CMI impacts.

Real-Time Alerts and Emailed Reporting for Rapid Response

Automated outage prediction alerts (also including CI, CMI, and resource needs) for severe weather situations and evolving weather conditions with quantified outage risks to ensure immediate mobilization and minimize system disruptions. Comprehensive Outage Prediction Reports can be emailed multiple times daily at each user's scheduled preference.

Modeling Adaptability and Automation

Outage predictions use advanced, fine-tuned Machine-Learning models tailored to different weather conditions. This allows the application to choose the most appropriate model for each type of weather event, and it can easily be extended to include specific weather events by adding a new weather cluster/subcluster. Models are customized to each Service Center and retraining is automatically triggered with new data availability.





DR^x Weather Guard

Deeper Dive





WEATHER GUARD®

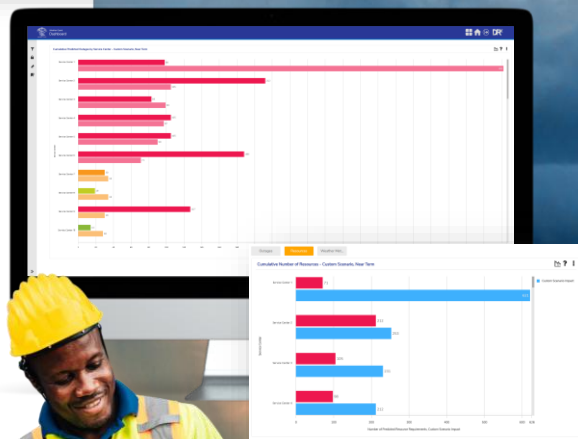
DR^x WEATHER GUARD® DEEPER DIVE HIGH-PRECISION FORECASTS, POWERED BY MACHINE LEARNING

DR^x Weather Guard transforms incoming weather data into accurate outage and resource predictions, turning what's coming into **what to do next**.



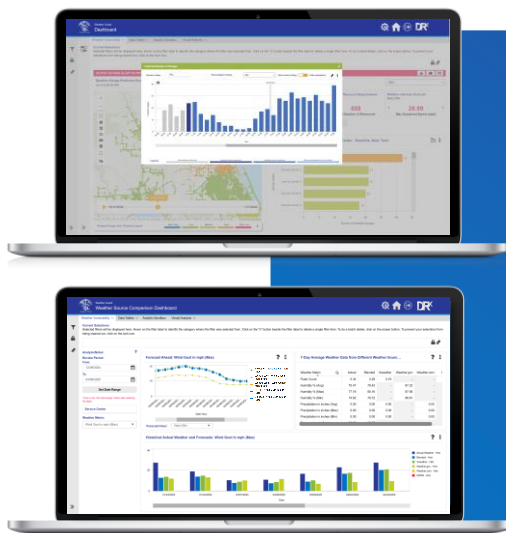
Forecasting Intelligence

- Predictions generated **hourly for 24 hours ahead** and in **8-hour increments out to 72 hours**
- **Hourly, cumulative, and rolling views** reveal how forecasted impacts build over time
- **Separate models for overhead and underground systems** enhance precision
- **Dynamic input [focus] and recalculation** every 15 minutes when weather inputs change significantly
- **Automated retraining** ensures the system improves with every new storm and season



Multi-Source Weather Optimization

DR^x Weather Guard leverages multiple independent weather feeds rather than relying on a single forecast source, because one source alone is never accurate enough. The platform continuously evaluates each input against recent actuals, then dynamically adjusts the weighting of those sources based on their performance. This adaptive blending approach produces more stable, region-specific forecasts and helps maintain high confidence in both short-term and long-range predictions.



Personalized Weather Expertise

- Incorporates **utility meteorology forecasts** alongside automated weather data, such as utility weather stations and internal expert probabilistic forecasts by division and interpretation of forecast text descriptors.
- Supports **custom weather scenarios**, allowing **users to** adjust inputs like wind, precipitation, or lightning intensity to test "what-if" situations.

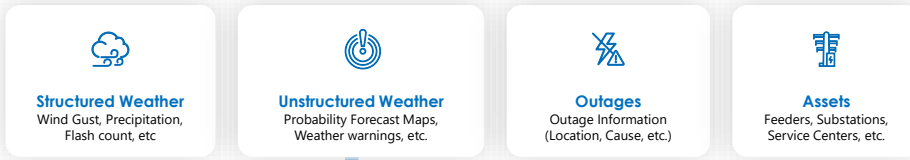


DR^x WEATHER GUARD[®] DEEPER DIVE

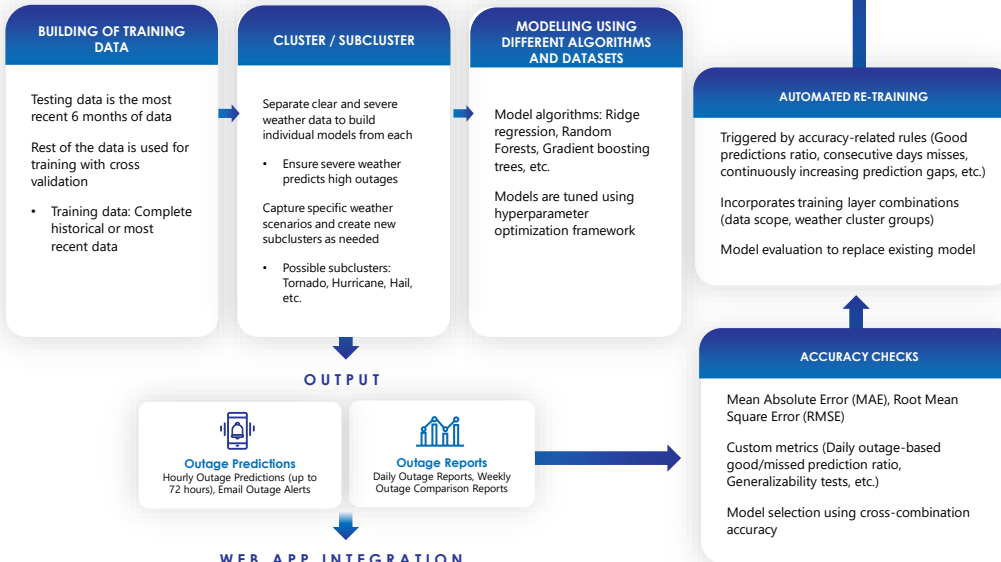
ACCURACY YOU CAN QUANTIFY

ML MODELING METHODOLOGY

INPUT



MACHINE LEARNING MODELING

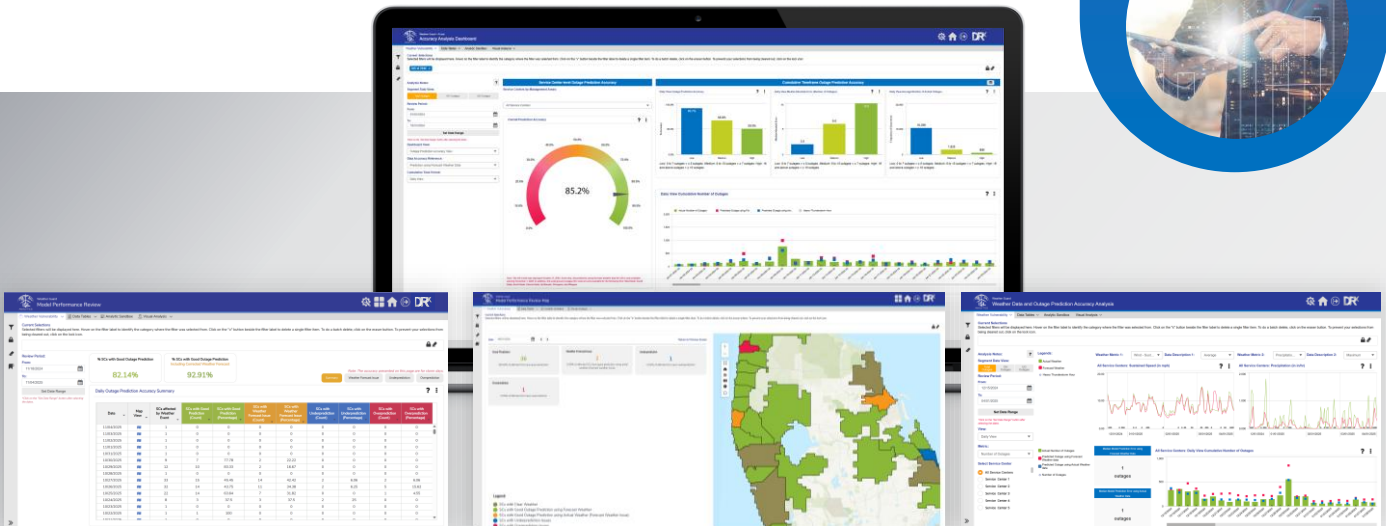


> 80%

Daily Outage Prediction Accuracy for Weather Driven Events

“Behind the Scenes” Modeling Methodology

Our Data Science team skilfully builds our models using advanced statistical analyses and machine learning techniques to evolve algorithms over time with better data...



Model performance is continually validated through multiple accuracy measures, including Mean Absolute Error (MAE), daily outage threshold performance, and good/missed prediction ratios. The model is tested against actual outage data on an hourly basis, allowing the system to detect deviations, recalibrate, and refine predictions across regions in near real time, ensuring that every new prediction reflects the latest observed conditions.

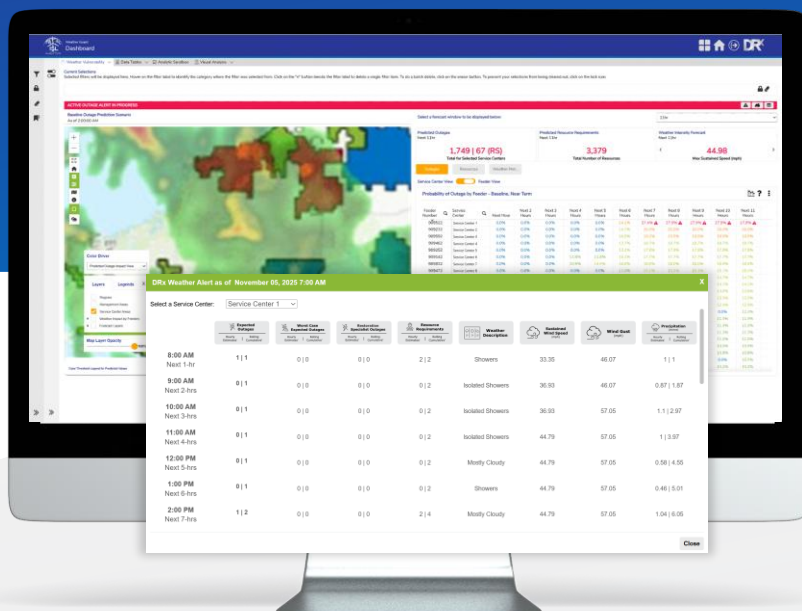


DR^x WEATHER GUARD[®] DEEPER DIVE

THE WEATHER GUARD DASHBOARD

Real-Time Insight at Every Level

The DR^x Weather Guard dashboard is your command center for storm and weather event intelligence, combining forecasts, outage predictions, expected CI/CMI impacts, and resource data into one powerful interface.



AT A GLANCE:

- Division / Service Center & Feeder-Level Views:**
 Drill down from territory-wide conditions to circuit-level predictions, with distinct overhead and underground layers.
- Hourly, Cumulative, and Rolling Forecasts:**
 Track how outage risk evolves over time, from the first weather bands through restoration.
- Integrated Resource Insights:**
 Visualize predicted crew needs for each division, automatically updated with every new model run.
- Custom Scenario Toggles:**
 Compare base forecasts, worst-case projections, and your own custom "what-if" setups in real time.
- Color-coded Outage Risk Maps:**
 Instantly see where storm conditions pose the highest threat and which circuits are most likely to be affected.
- Interactive Weather Filters:**
 Toggle between wind, gusts, precipitation, lightning, and more to reveal which conditions are driving projected impacts.

Together, these views give operators, planners, and leadership a shared, data-driven snapshot of every approaching weather event: clear, current, and actionable.

DR^x WEATHER GUARD[®] DEEPER DIVE

RESOURCE OPTIMIZATION & SCENARIO PLANNING

From Prediction to Preparedness

When every hour counts, DR^x Weather Guard helps utilities prepare smarter: translating predictive insight into actionable resource strategies.

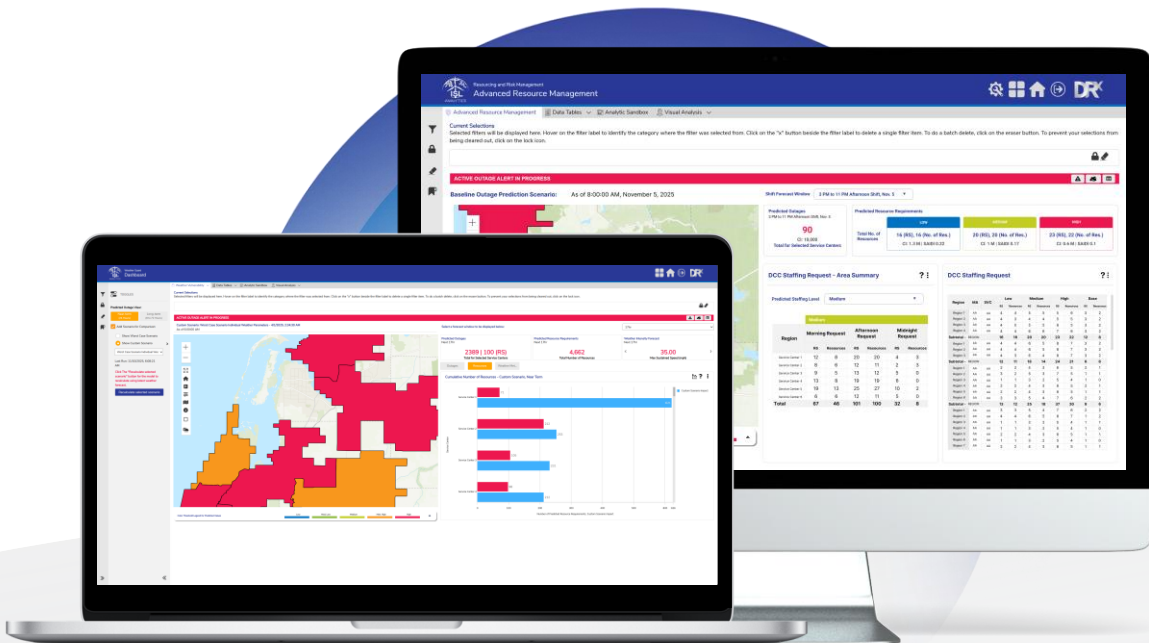


Key Capabilities:

- **Automatic Resource Requirement Projections:** Forecast required field crews by division based on predicted outage volumes and cause types.
- **High / Medium / Low Staffing Scenarios:** See potential CMI impacts at different staffing levels, then choose the right balance for cost and speed of restoration.
- **Worst-Case and Custom Scenarios:** Compare baseline predictions with extreme or modified weather assumptions to test readiness.
- **“What-If” Simulator:** Instantly adjust wind speed, rainfall, lightning count, or humidity to model alternate outcomes.
- **Enhanced Preparedness:** Efficiently stage crews and materials at safe locations ahead of time with detailed map views.
- **LiDAR Vegetation-encroachment Integration:** Optionally, incorporate high-resolution vegetation data to flag at-risk circuits in advance and enhance predictions.

OUTCOME:

Smarter resource planning that minimizes overtime, improves restoration performance, and increases operational confidence.





DR^x WEATHER GUARD[®]
DEEPER DIVE

ALERTS, AUTOMATION & CONTINUOUS IMPROVEMENT

**ALWAYS ON.
ALWAYS LEARNING.
ALWAYS READY.**

Weather forecasts can shift rapidly:
your predictions should too.

DR^x Weather Guard automates the
entire prediction cycle, keeping
emergency response teams
informed and ready.



Real-Time Intelligence:

- Constantly monitors weather forecast data (in 15-minute intervals) alongside actual outages hourly.
- Recalculates predictions automatically when inputs vary beyond set thresholds.
- Blended weather forecast sources adapt dynamically for accuracy across all regions.
- Automated retraining maintains model precision as grid and climate conditions evolve.



Configurable Text and Email Alerting:

- Define hourly or cumulative-hour custom thresholds for outage levels by division to trigger alerts, on an individual user or group basis.
- Receive email and text alerts showing expected outages, CI/CMI, resource/crew needs, key weather metrics, and most vulnerable circuits.



Scheduled Daily Reports:

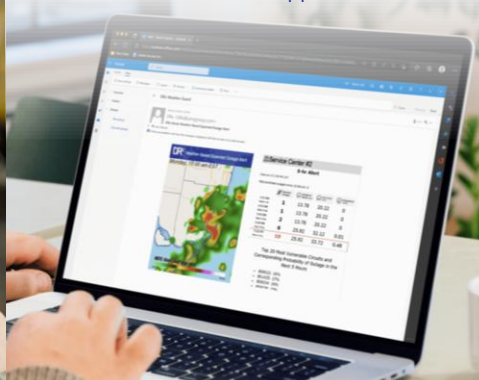
- Deliver hourly, cumulative, and rolling predictions plus required resources.
- Time of day and frequency is configurable per individual user or group.
- Instant synchronization between alert notifications and dashboard visuals ensures consistent, actionable awareness.

TEXT ALERTS

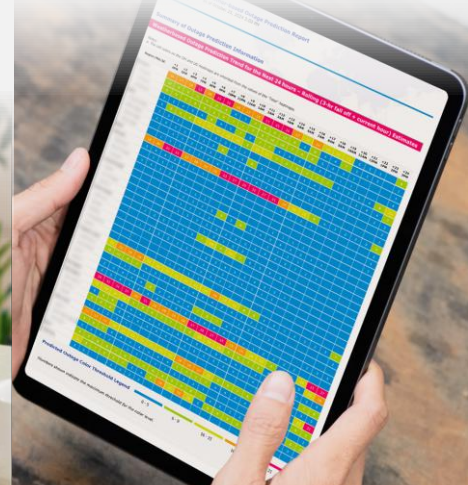


EMAIL ALERTS

Email Alerts provide real time weather mapping, expected outages per service center (office or region) and key weather metrics, a list of most vulnerable circuits, and a direct access link to the DR^x application.



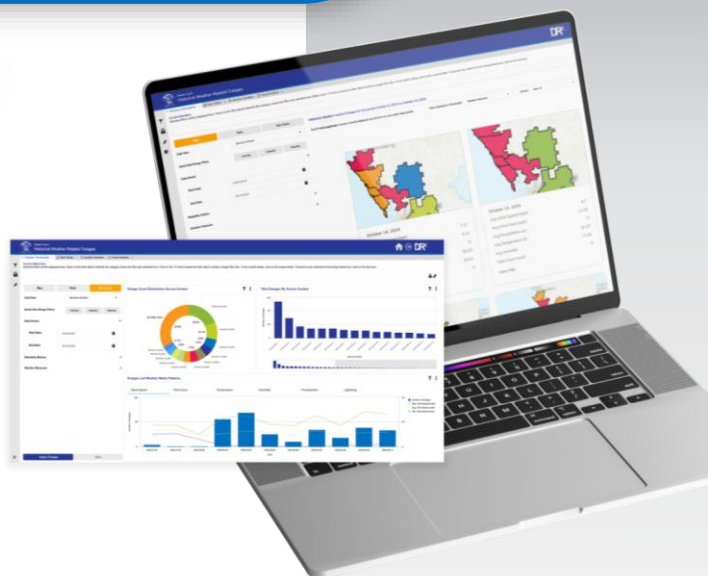
DAILY SCHEDULED EXPECTED OUTAGE REPORTS BY LOCATION



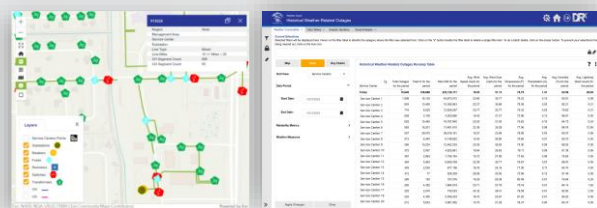
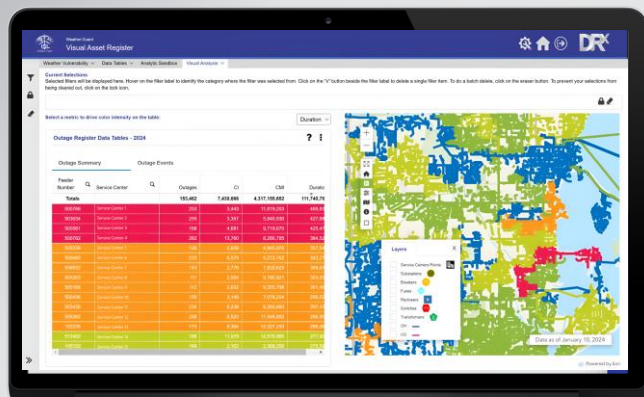


Historical & Resiliency Analysis

- Explore multi-view analyses (map, table, and chart) of weather-related outages over time
- Filter by wind speed, precipitation, lightning, CI/CMII, and outage count to reveal underlying drivers
- Identify seasonal trends and recurring vulnerabilities across divisions or regions
- Use long-term statistical forecasts and seasonality curves to project expected weather conditions and prepare for emerging climate patterns



Deep Visual & Custom Grid Analyses



The **Visual Asset Register (VAR)** provides a dynamic, ArcGIS map view of grid assets down to the street level and reliability metrics along with a side-by-side feeder comparison including reliability statistics.

The integrated **Analytic Sandbox** workspace lets users build custom visualizations (bar charts, scatterplots, heatmaps, and more) to explore relationships between outages, weather types, and equipment data. It enables users to quickly surface insights across divisions or cause categories for planning and reliability reviews, as well as easily export visuals for management or operational reporting.



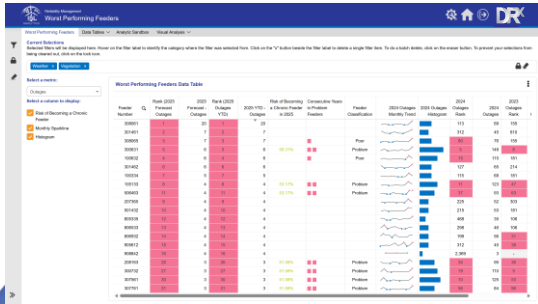


DR^x WEATHER GUARD[®] DEEPER DIVE

BEYOND STORM OUTAGE PREDICTIONS: INSIGHTS THAT STRENGTHEN THE GRID

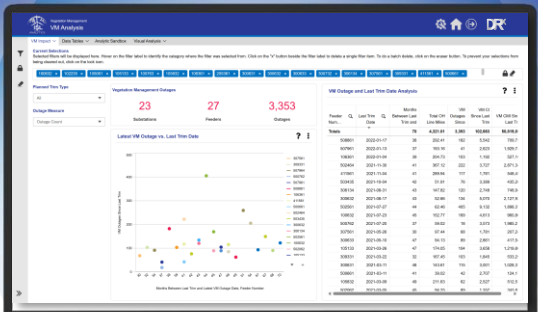
FROM PREDICTION TO CONTINUOUS IMPROVEMENT

DR^x Weather Guard doesn't stop at forecasting – it empowers utilities to learn from every storm, uncover patterns, and plan a stronger grid for tomorrow.



Chronic Worst-Performing Feeder Analysis & Vegetation Management

- Track worst-performing feeders using CI/CMI trends and “chronic feeder” indicator
- Analyze the link between trimming activities and vegetation-related outages
- Explore LiDAR vegetation-encroachment data to proactively target high-risk areas



DR^x Weather Guard[®] gives utilities the clarity to plan smarter, respond faster, and stay ahead of every storm.



About ISL Analytics

ISL Analytics combines decades of utility experience with cutting-edge AI and predictive modeling. Our software suite empowers electric, gas, and water utilities to improve reliability, resilience, and operational efficiency through data-driven intelligence.

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