The background of the image features a complex network of electrical power lines and towers against a sunset sky. The sky is a vibrant gradient of orange, red, and blue. The power lines and towers are silhouetted against the bright sky, creating a sense of depth and industrial infrastructure.

Forecasting Power Outages in Central Hudson

Duc Vu

BREAKING NEWS

NEWS

Power outage affects hundreds in Lakeview



By ALEXANDRA CHACHKEVITCH

CHICAGO TRIBUNE | MAR 17, 2015 | 3:47 AM

BREAKING NEWS

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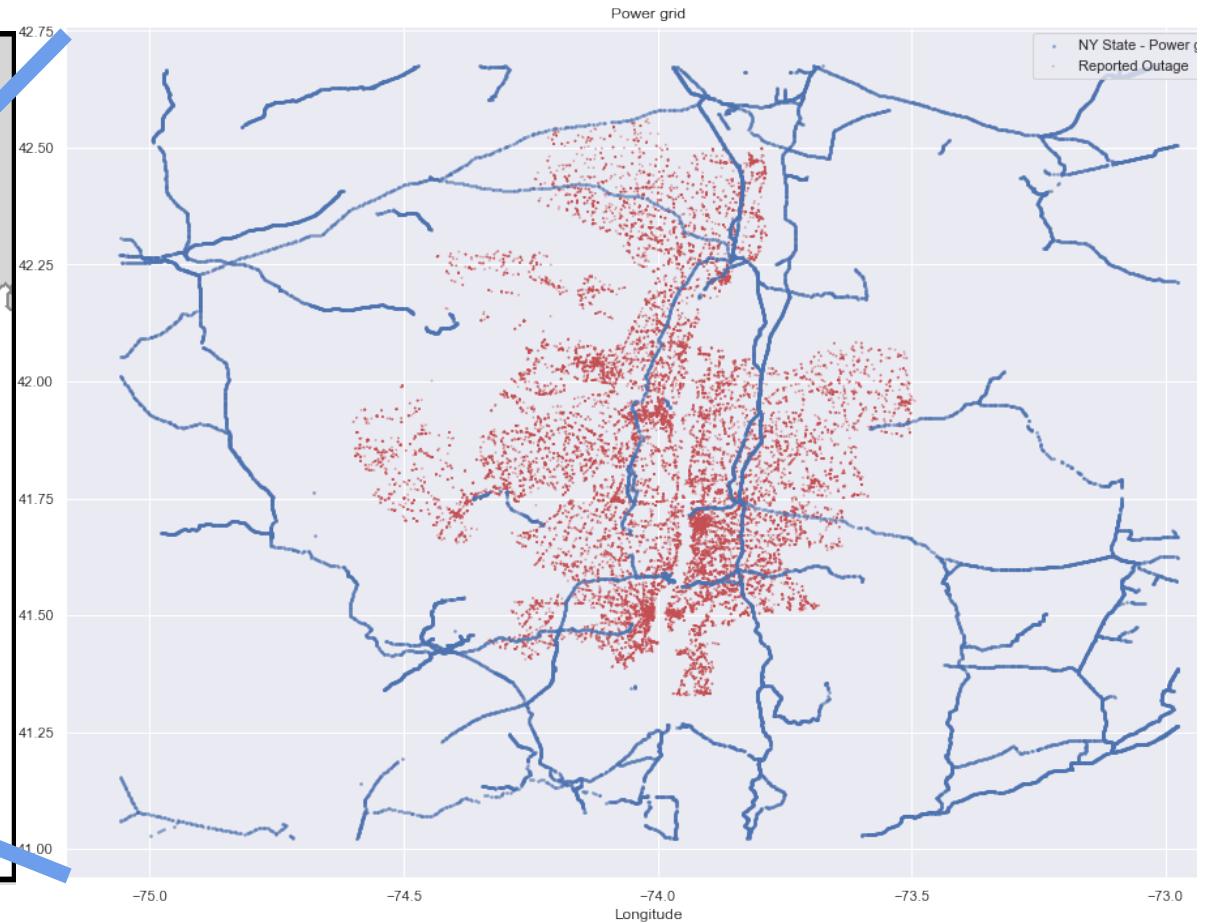
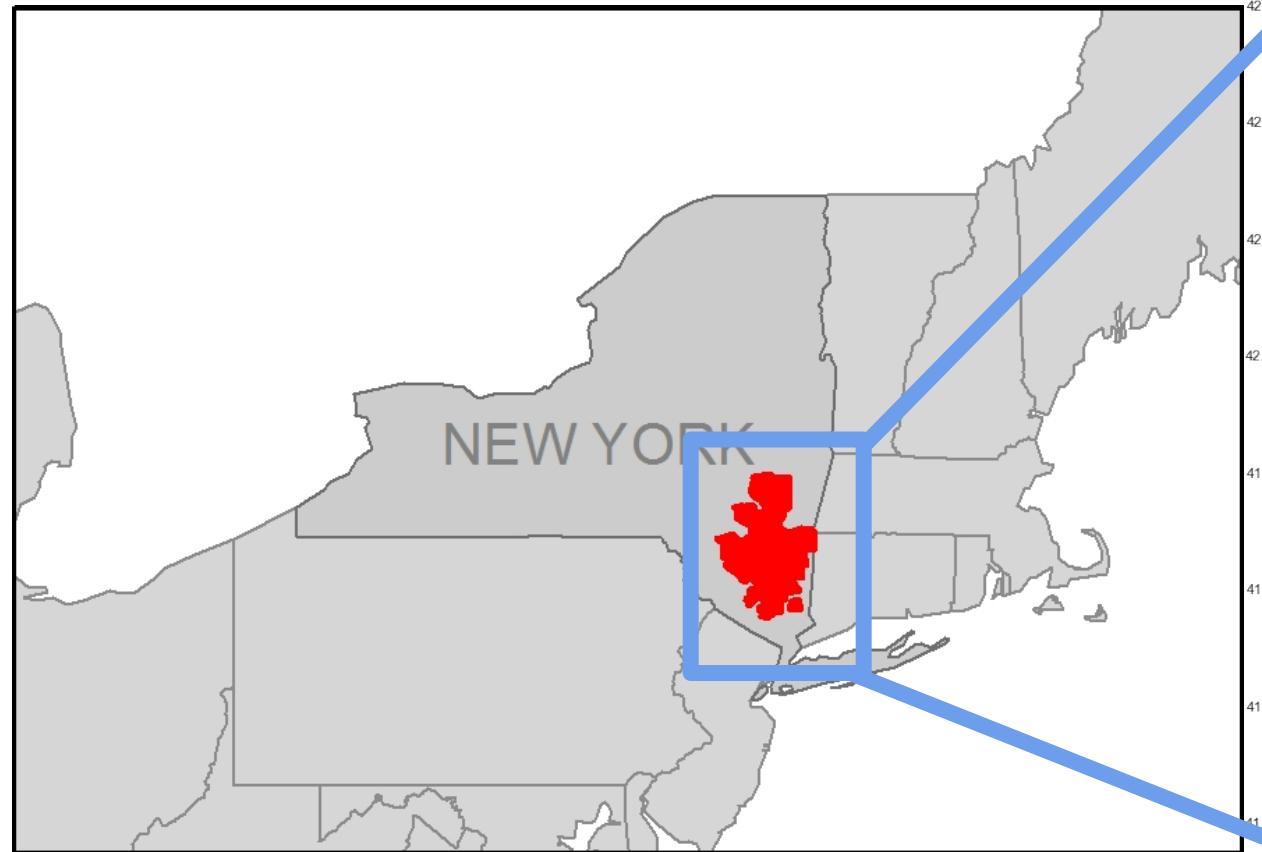


**Can data
science
predict the
influence of
weather on
power grid ?**

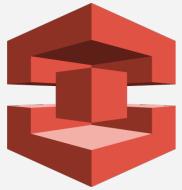




Power grid and outages



Data sources



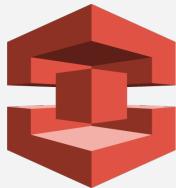
**AWS NEXRAD
S3**

MRLC
National Land
Cover Database



**33K outage reports
(2011-2016)**

Data sources



**AWS NEXRAD
S3**

MRLC
National Land
Cover Database

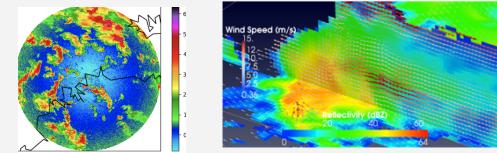
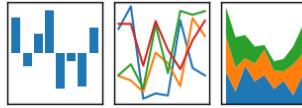


**33K outage reports
(2011-2016)**

Prepare

pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$



Py-ART

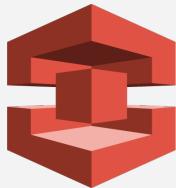


OpenStreetMap



OpenGridMap

Data sources



**AWS NEXRAD
S3**

MRLC
National Land
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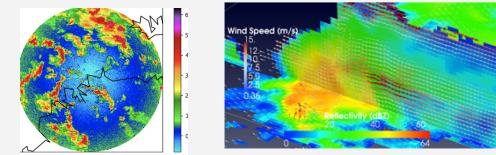
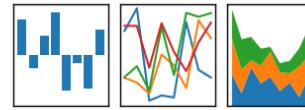


**33K outage reports
(2011-2016)**

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Py-ART



OpenStreetMap



OpenGridMap

Model

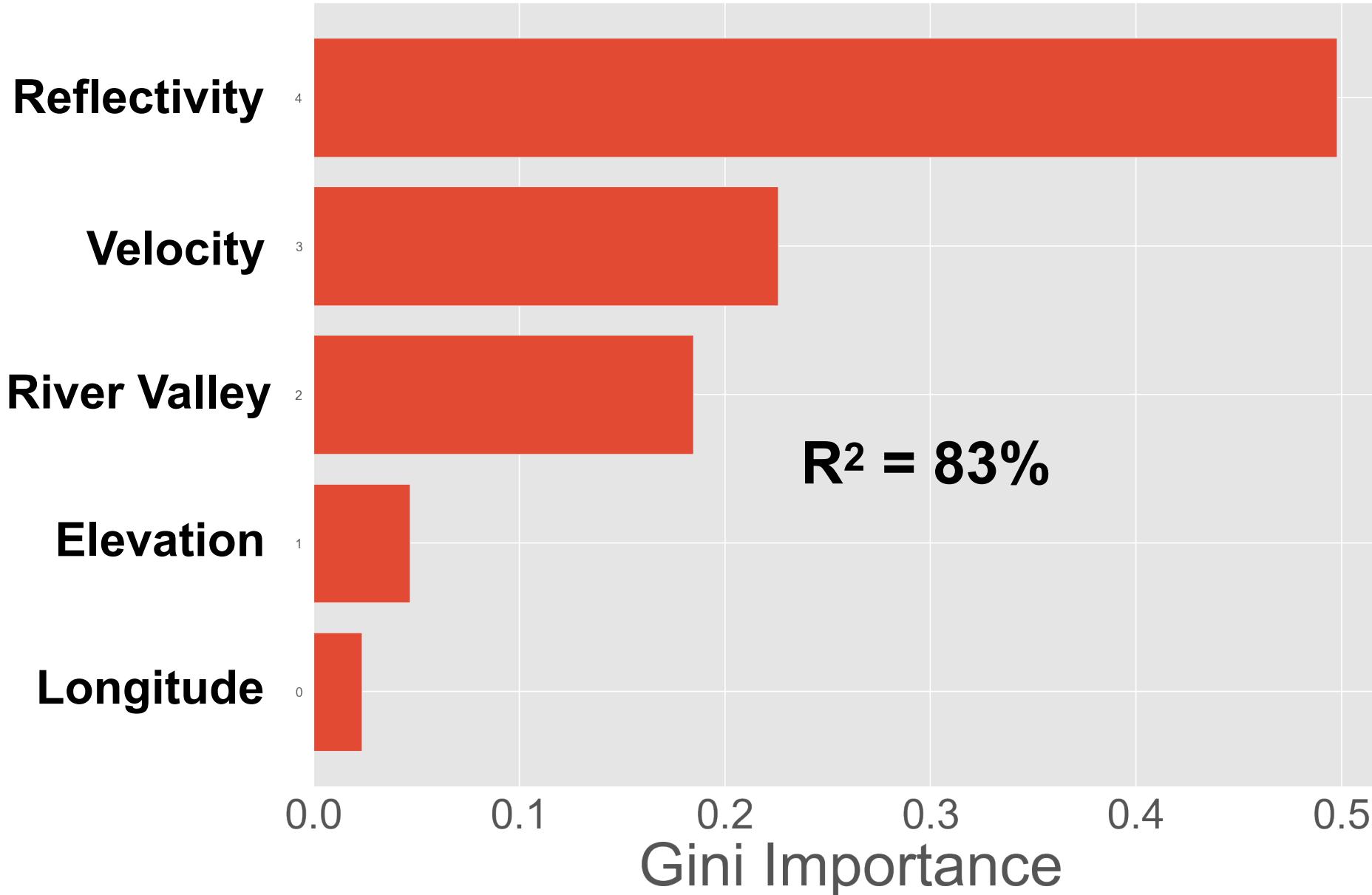


**Random Forest
Regression,
SVM Regression**

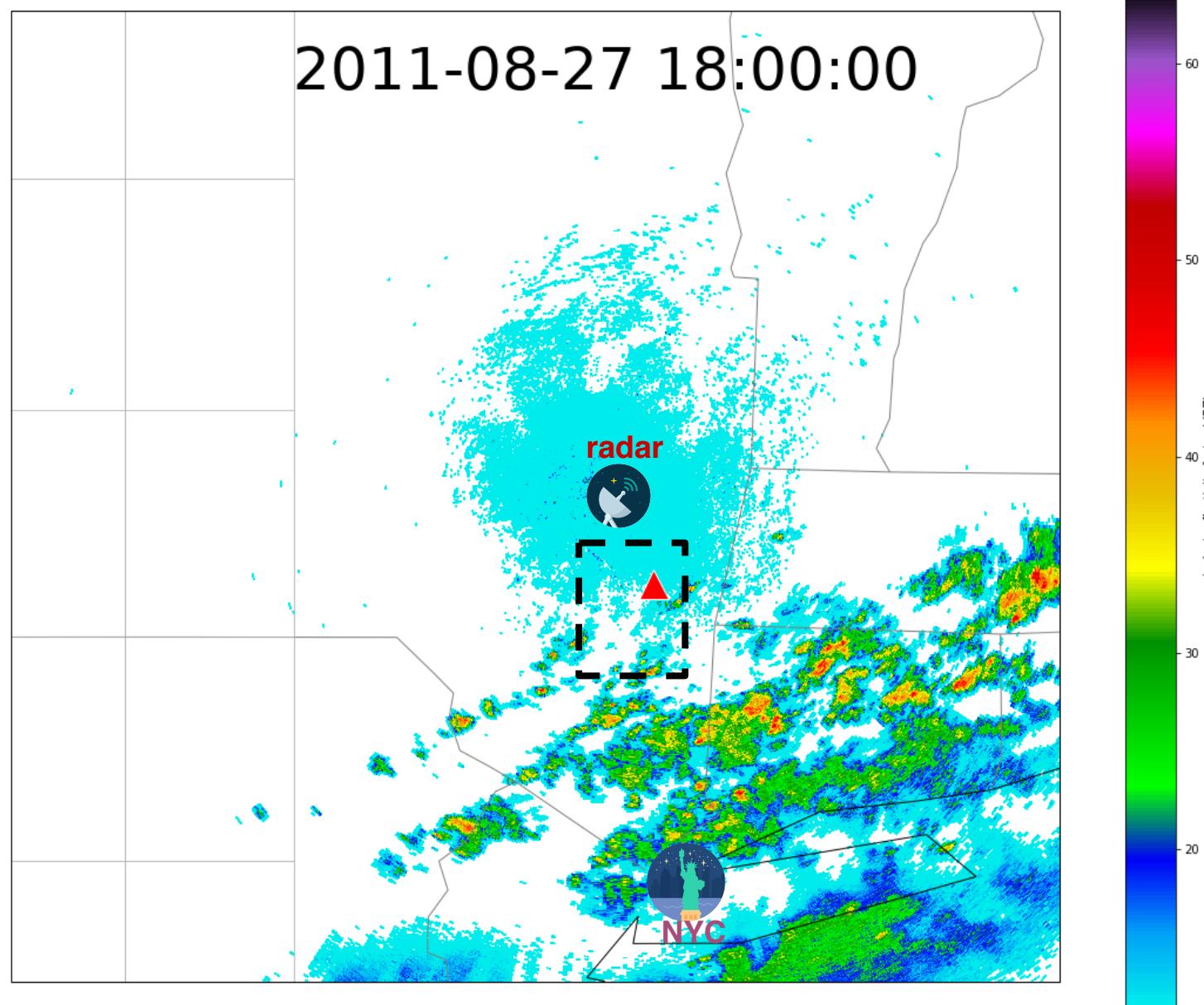
PROPHET

Time Series

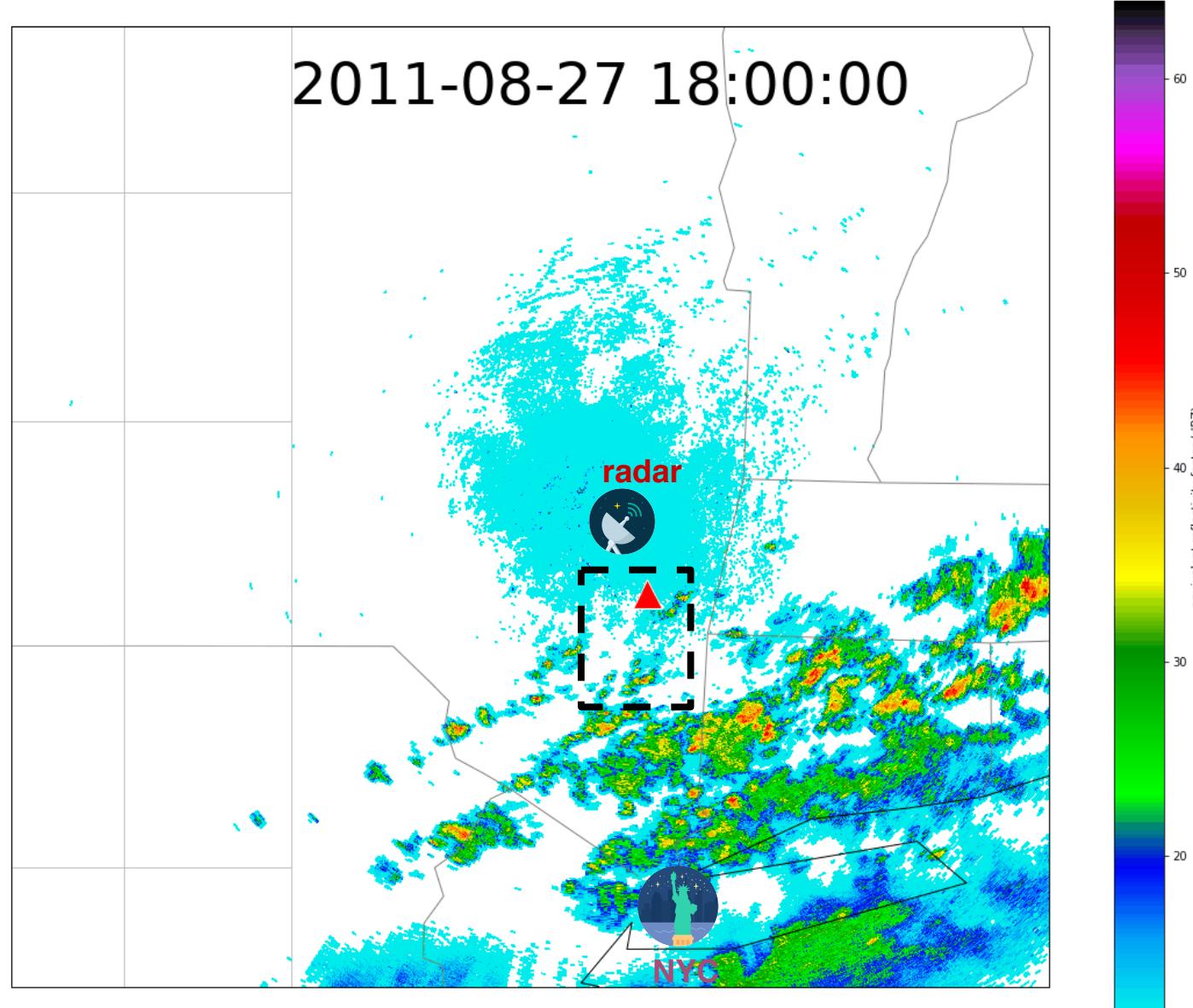
Weather and location are top predictors



Blackouts in River Valley Before the Storm

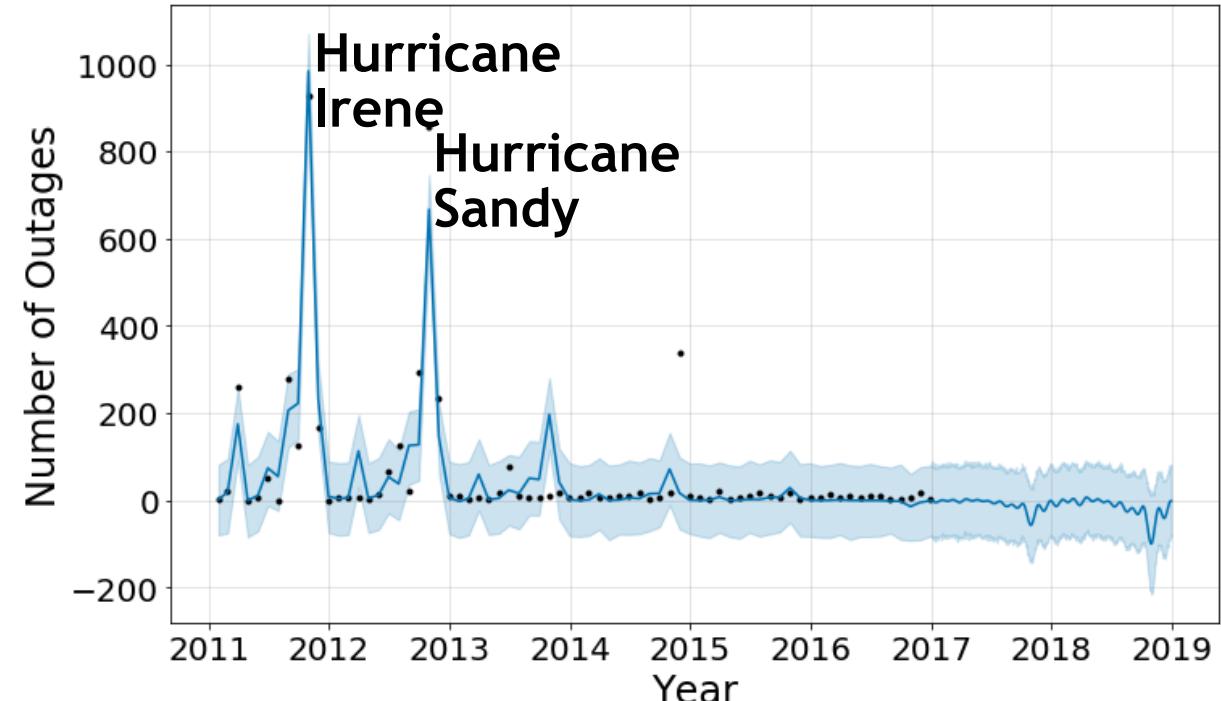


Blackouts Occur in River Valley During Storm



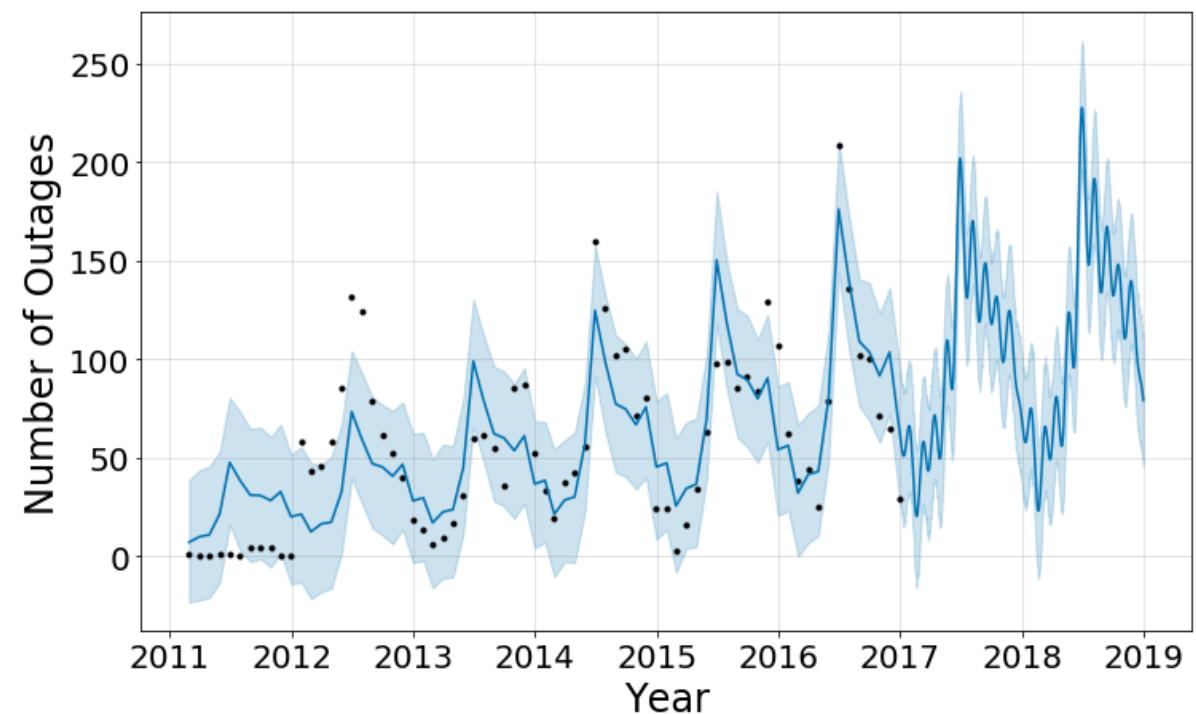
Weather-related blackout

- ❑ Time series is not doing good job on fitting the data points of outages caused by weather



Animal-related blackout

- ❑ Time series successfully catch the seasonality and holidays of outages caused by animal



Conclusion

- Outage prediction is helpful for restoration efforts
- Model can help insurance in price setting





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Duc Vu