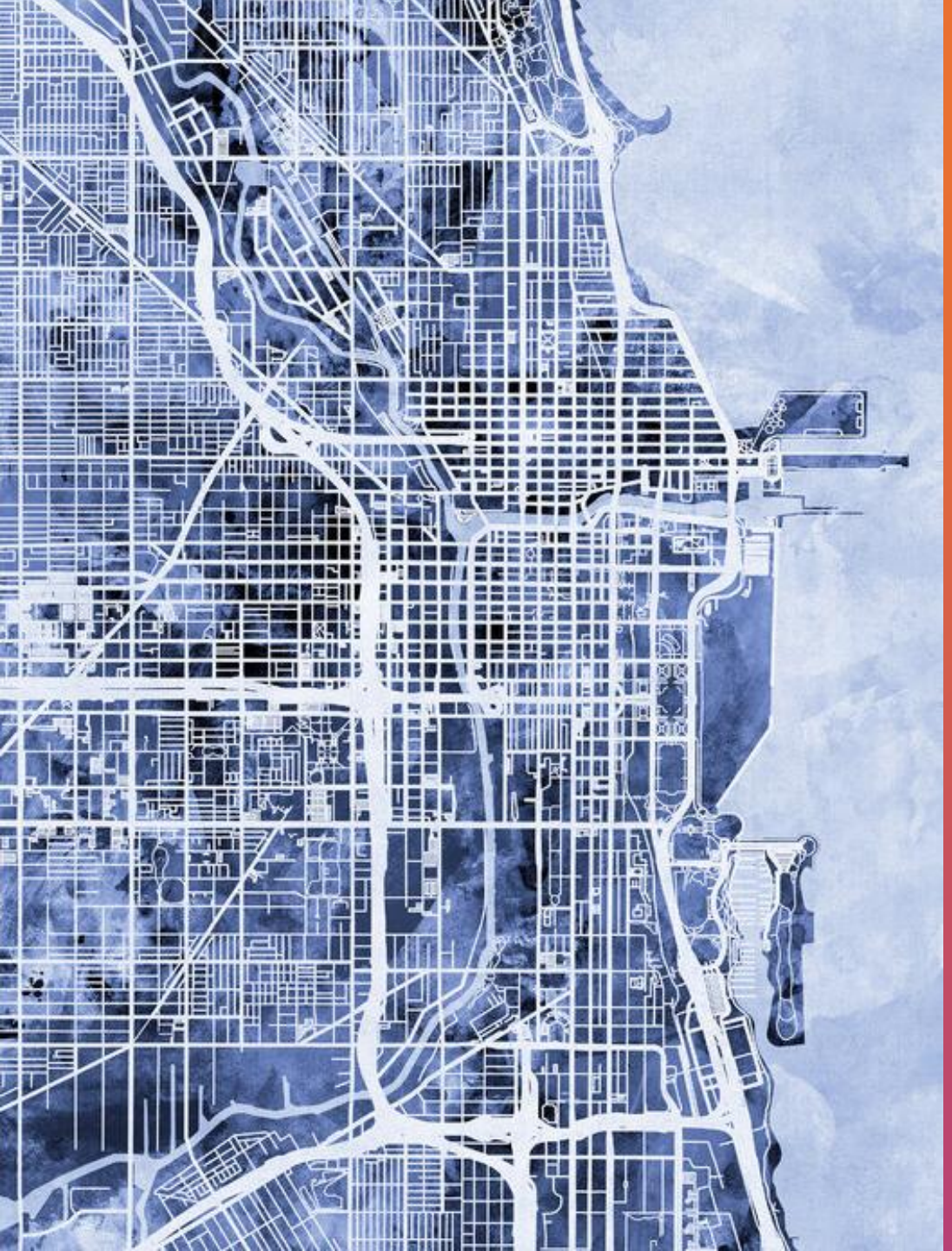
Neighborhood Restaurant Inspection Failure Early Warning System

Lex Brunett

4GEEKS

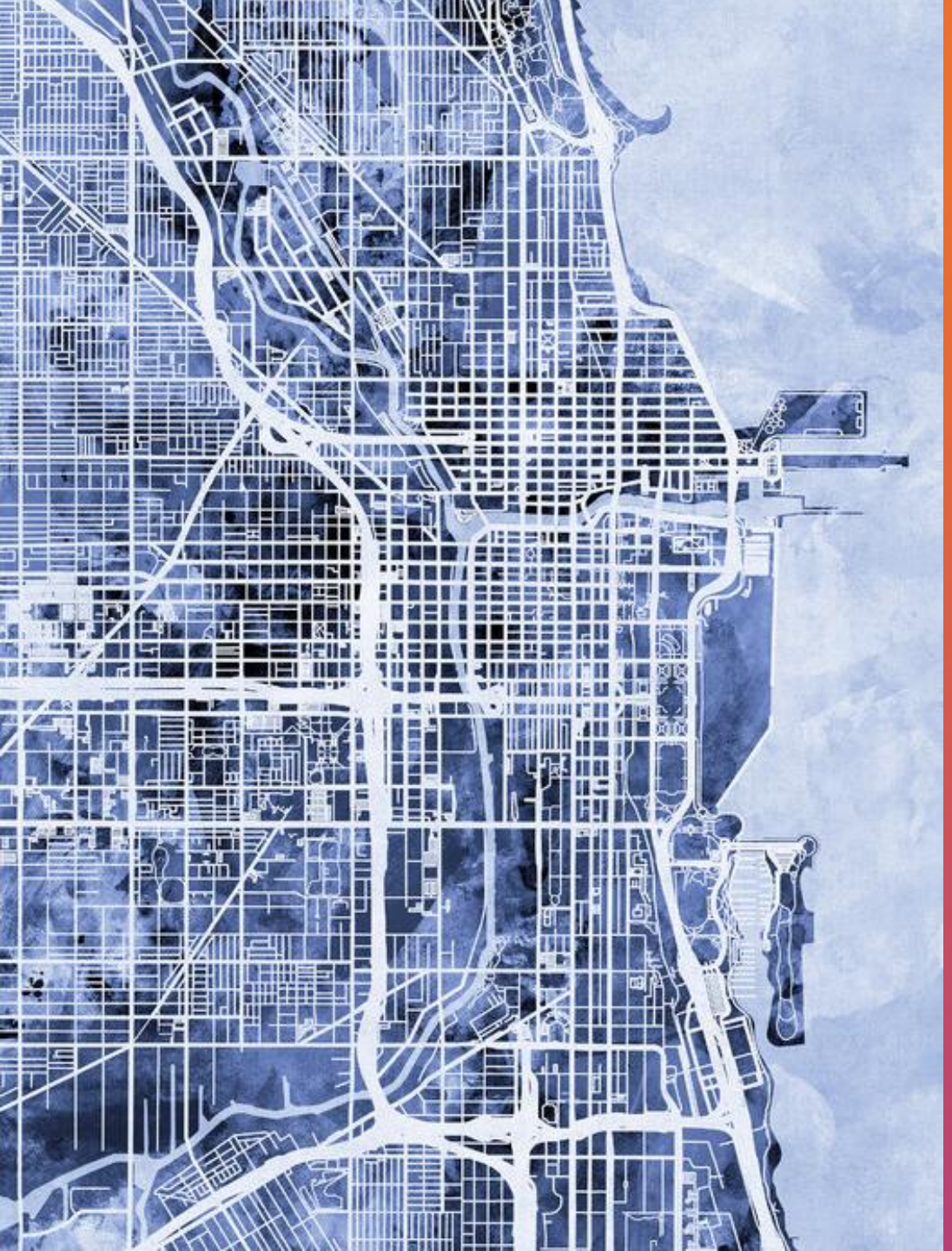


Introducction

Importance of Food Inspections

Ensure safety in eating establishments.

Contribute to neighborhood vibrancy and local economy.

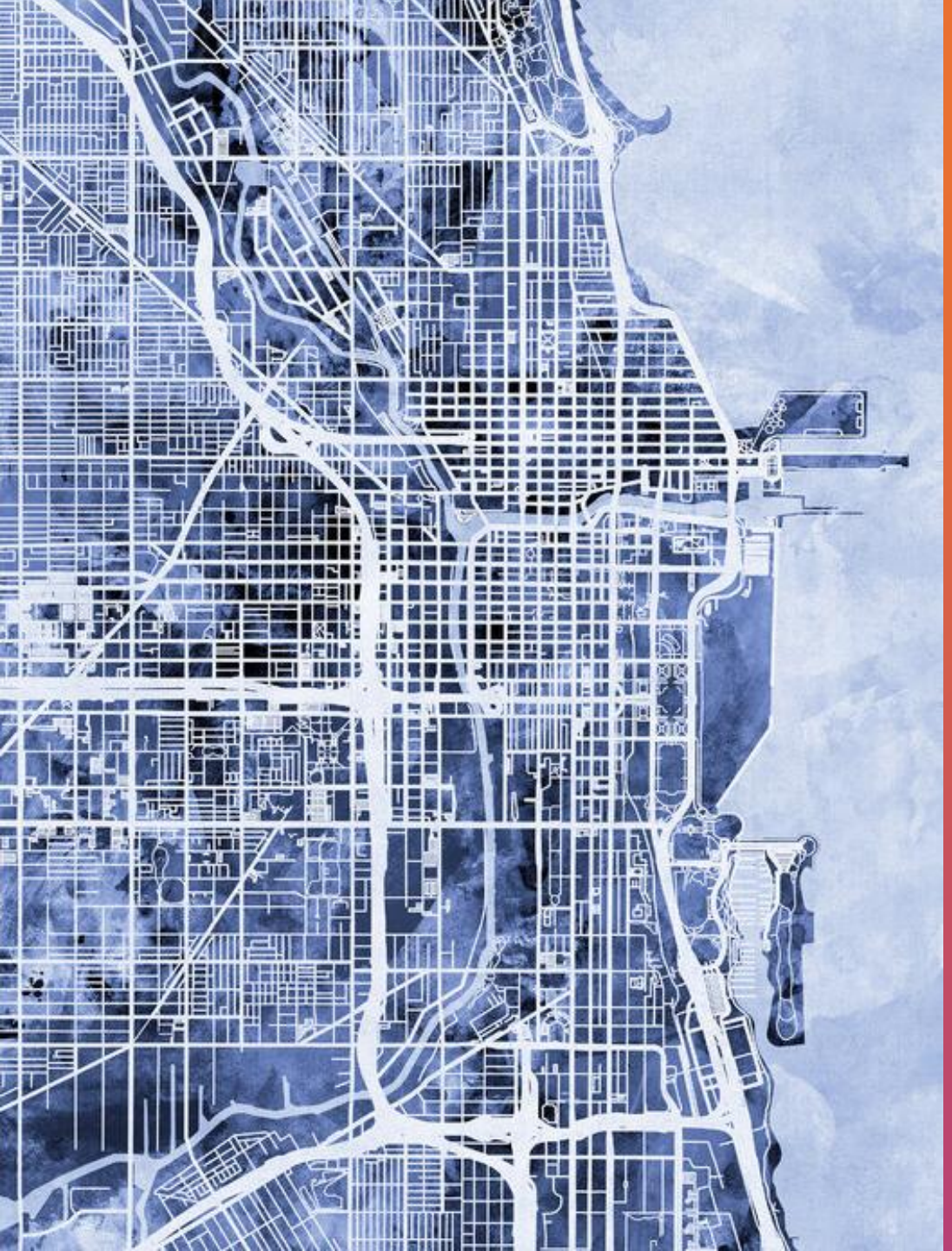


Problem

Traditional food inspection processes often identify violations after they have occurred, which may pose health risks to patrons and affect the reputation of local businesses.

Study Objective

Enhance	Enhance food inspection outcomes.
Implement	Implement proactive monitoring to identify risks early.
Offer	Offer resources for compliance with standards.



Methods

Machine Learning Models

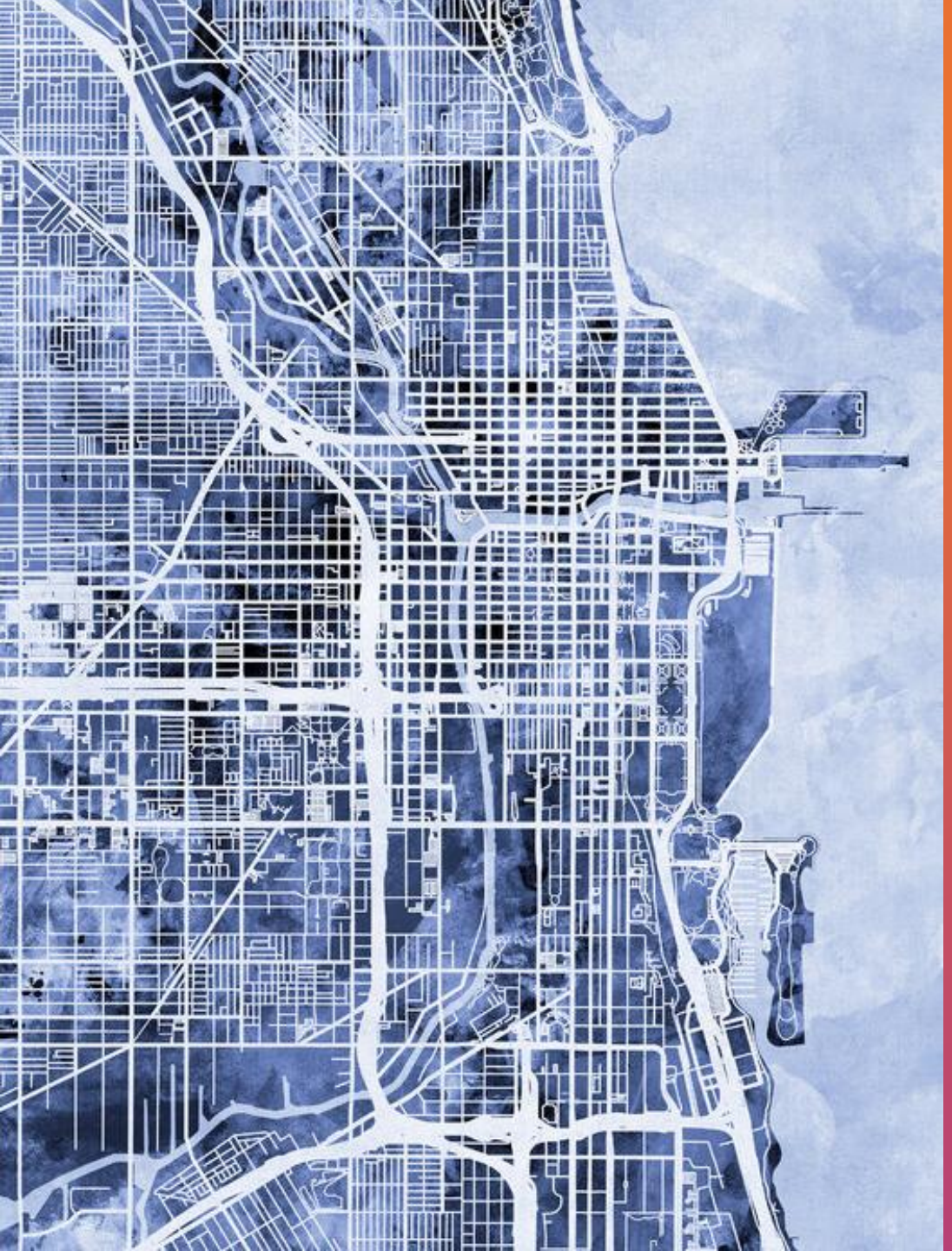
- Random Forests for feature importance.

Spatial Analysis

- Mapping to visualize inspection failure patterns.

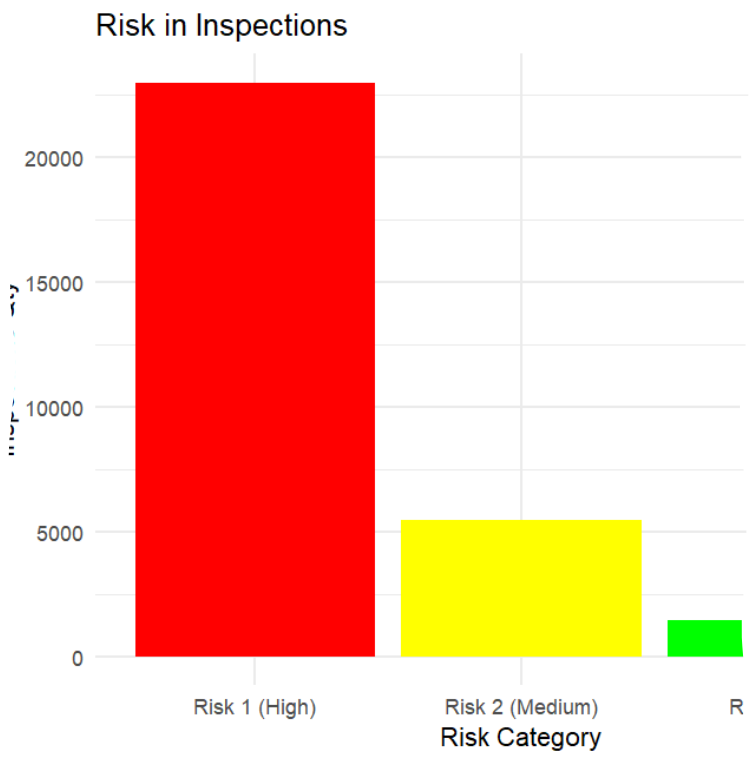
Time Series Analysis

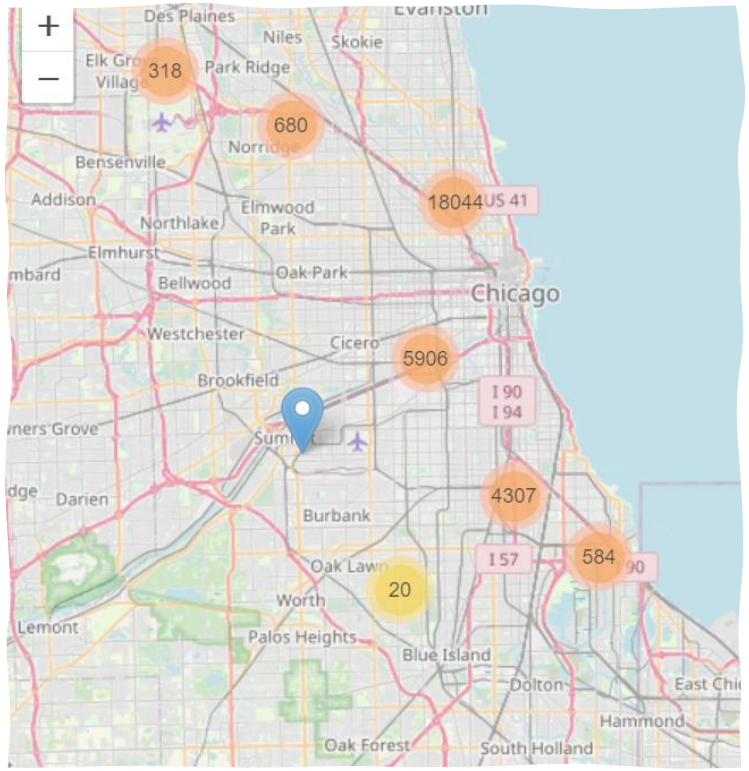
- Detection of inspection probability changes over time at restaurant and neighborhood levels.

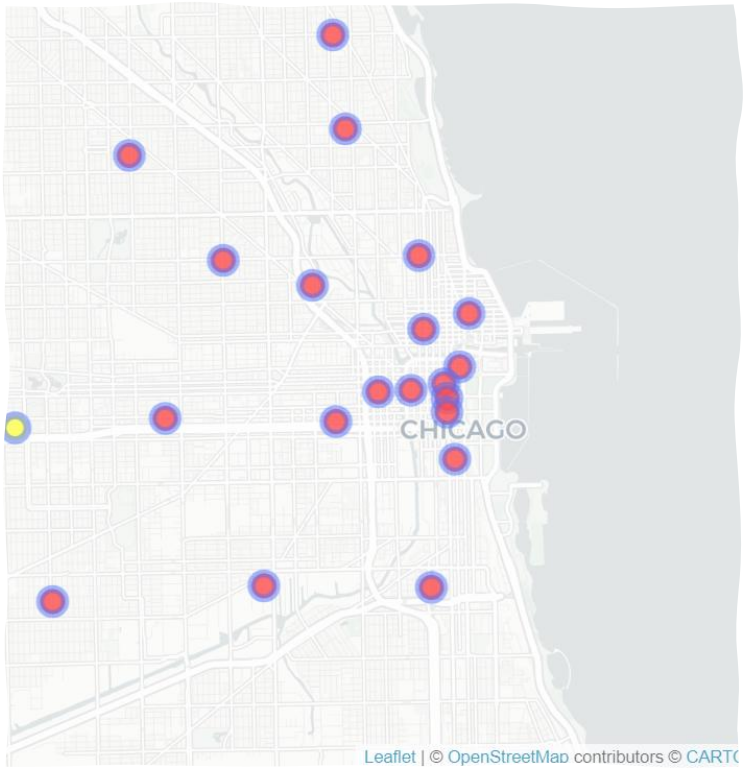


Results

Spatial Clusters

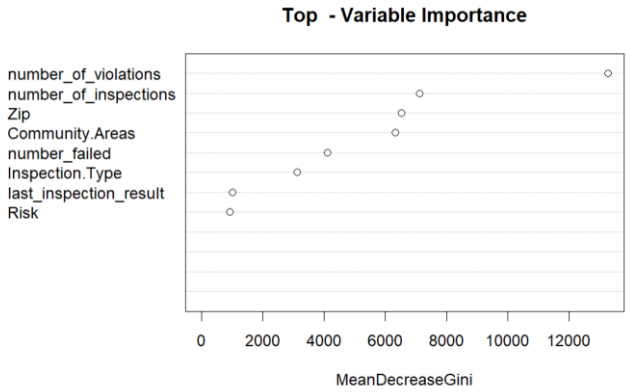


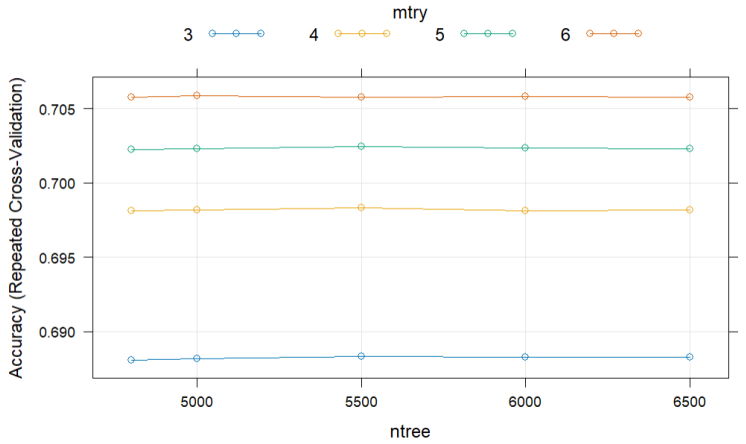


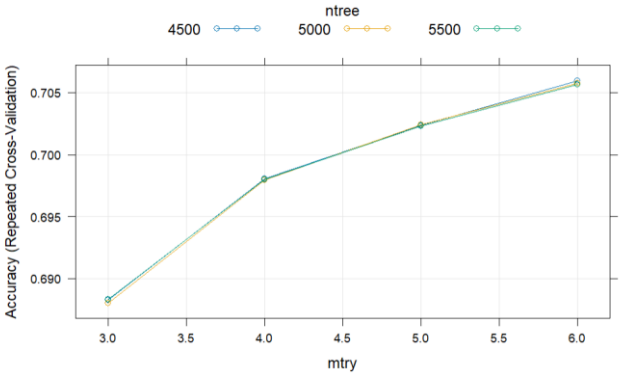


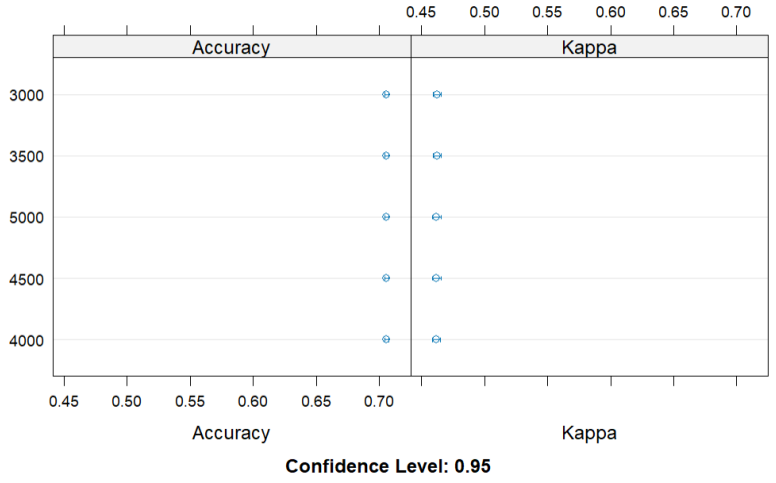
Random Forest

- Analyzing parameters will help our algorithm to improve accuracy to 75%
- Zipcode, numbers_failed, inspection_type are great predictors.
- There is no difference between using 5000 to 6500 ntrees



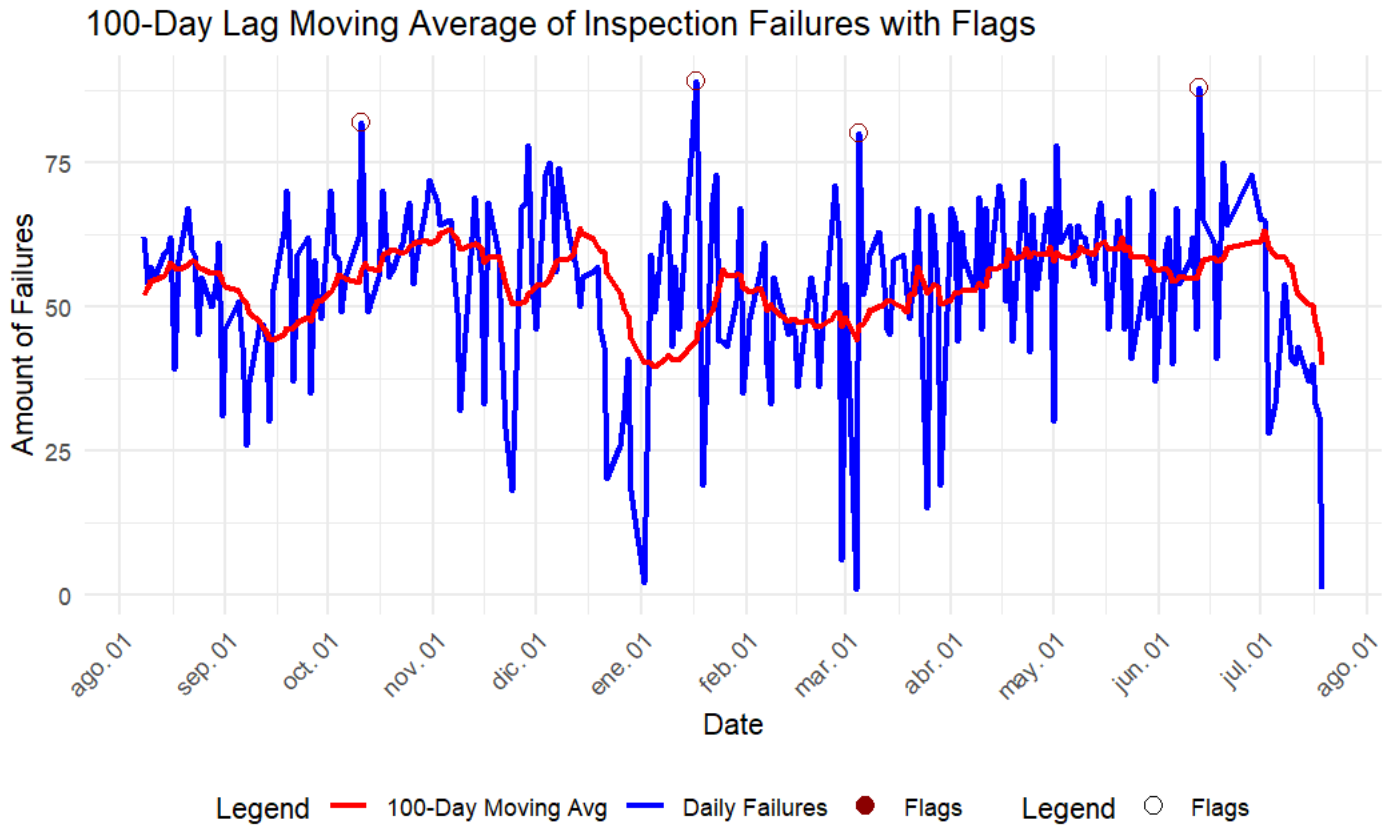


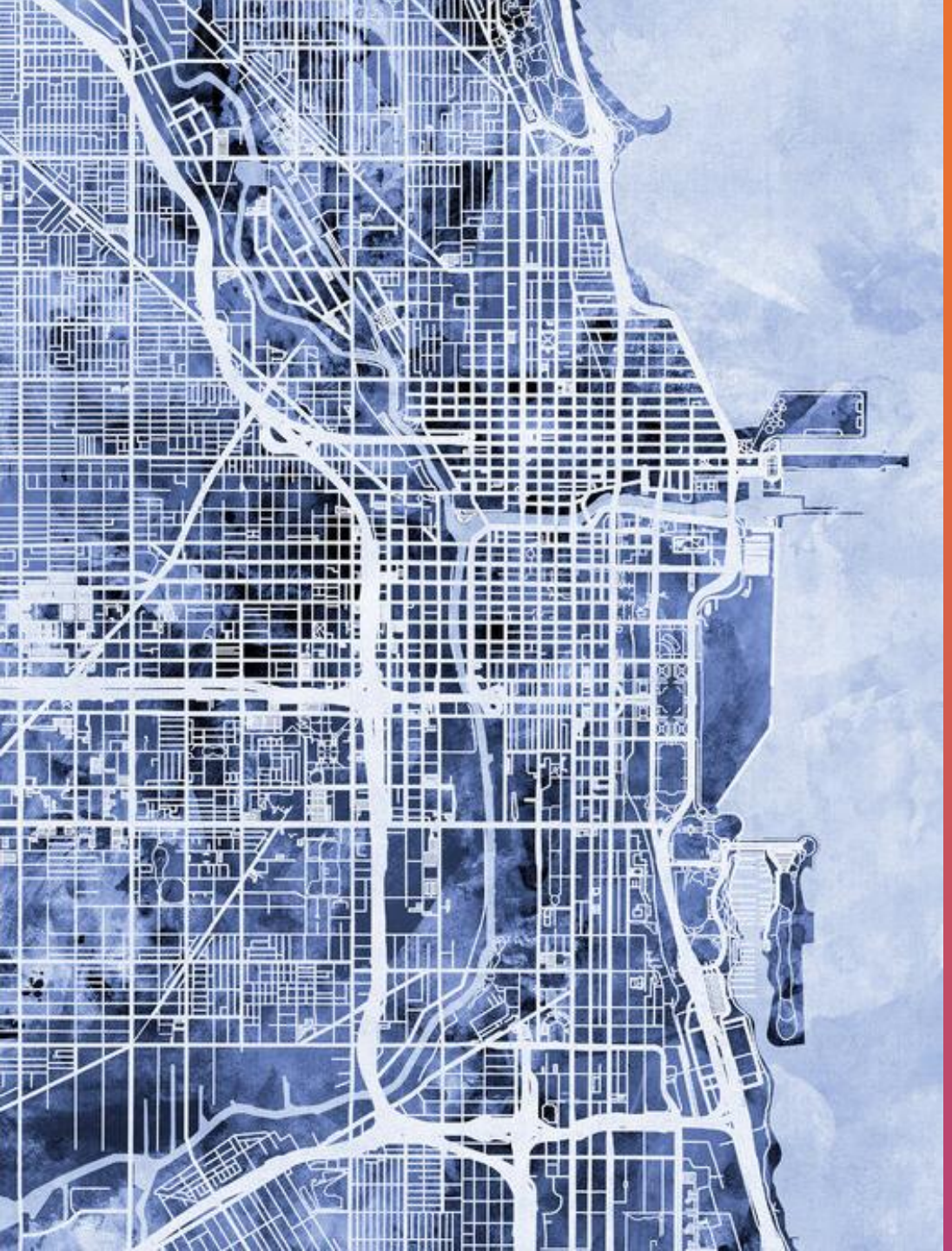




Surveillance Algorithm

- In 2023, there are 4 flags to analyze of 339 inspections to improve the next results.
- More of these business are not corporations (small businesses), which we can conclude lack of training in how to follow procedures for inspections.
- This algorithm can help to analyze not only inspections in Chicago, but It can also be used to understand flags in a time series.





Conclusions

Implications for Public Health

Proactive identification of high-risk establishments.

Supportive interventions to improve compliance.

Broader Impact

Enhanced neighborhood safety and public health.

Policy implications for urban food safety and community well-being.

References

1. Parkinson School of Health Science and Public Health, Loyola University Chicago, 2160 S 1st Ave, Maywood, IL 60153
2. 2. Center for Health Outcomes and Informatics Research (CHOIR), Parkinson School of Health Science and Public Health, Loyola University Chicago, 2160 S 1st Ave, Maywood, IL 60153
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