HELP

Hurricane Effective Landfall Prediction

PROJECT QUESTION

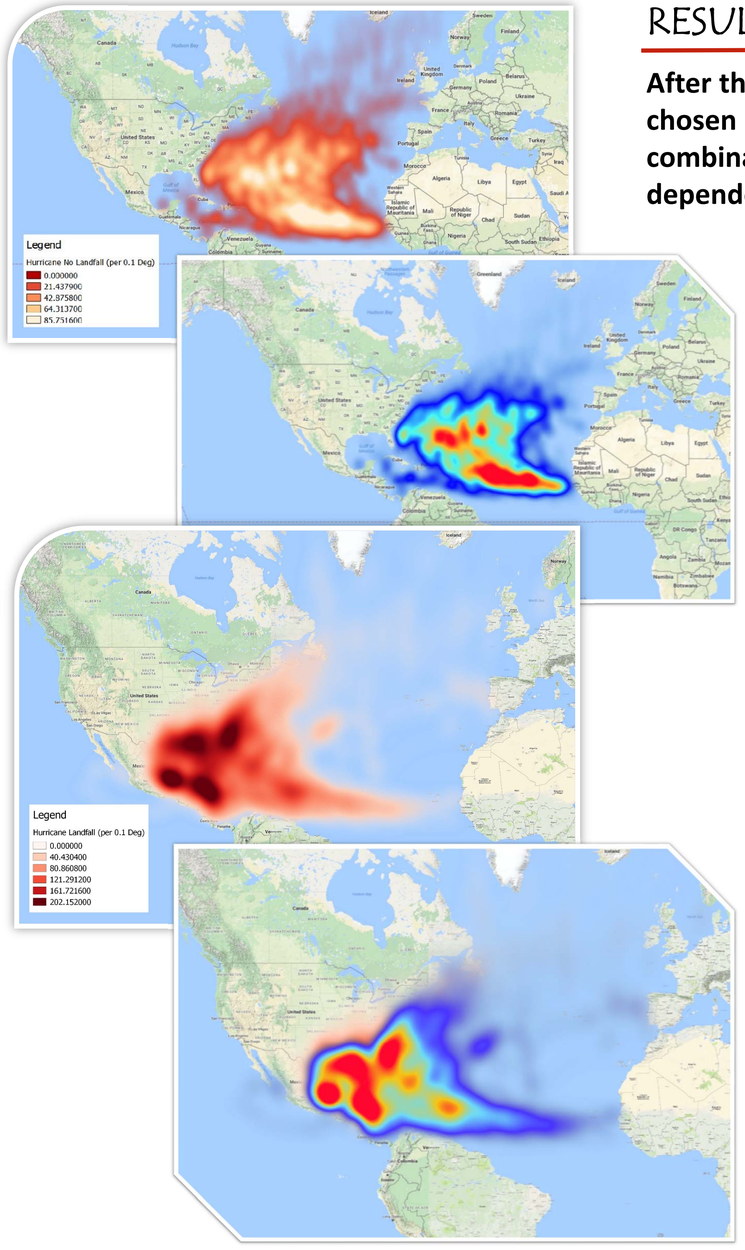
Predict landfall probability of a hurricane by analyzing; Wind, Pressure and Sea Surface Temperature data from last 3 decades.

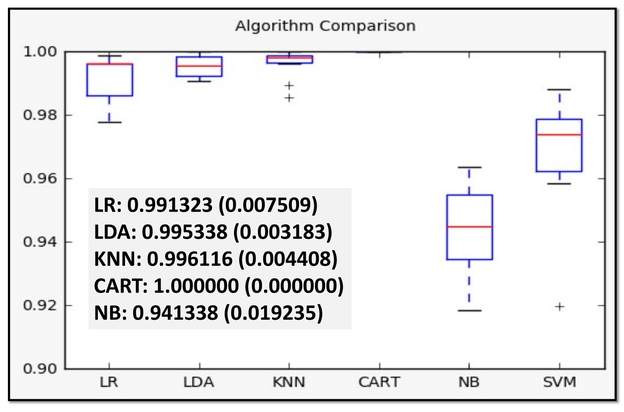
HYPOTHESIS

Sea Surface Temperature has a strong positive correlation with the probability of a hurricane to potentially make landfall.

PROJECT OVERVIEW

This project compares hurricane data from the North Atlantic basin. The basin was chosen because of its rigorous monitoring over the past decades, ensuring a dense availability of reliable data. Even with the advancement in technology associated with Earth observation, forecasting hurricane is still considered to be a multifaceted problem needing solution.

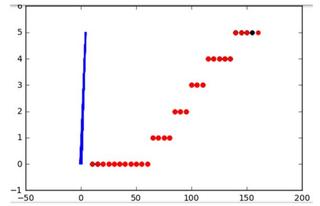


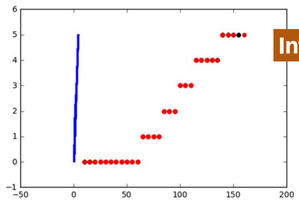


RESULTS & DISCUSSION

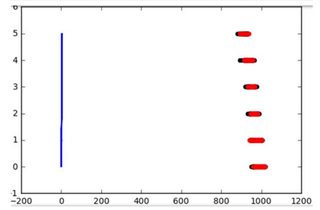
After the algorithm comparison, three methods (OLS, LR and LDA) were chosen to test the hypothesis. Algorithm constructed to apply a combination of independent variables. Hurricane intensity was the dependent variable.

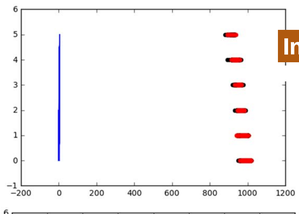
Dependent	Independent	OLS	LR Coefficient	LR MSE	LR Variance	LDA MSE	LR Variance
intensity	wind	0.0167	0.037	0.2	0.84	0.04	0.96
intensity	pressure	0.000587	-0.04726838	0.27	0.79	0.25	0.8
intensity	SST	0.02318	0.03943	1.3	0.03	1.71	0.7



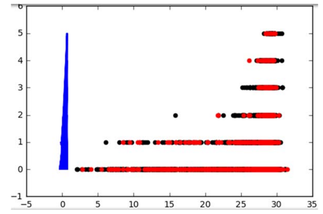


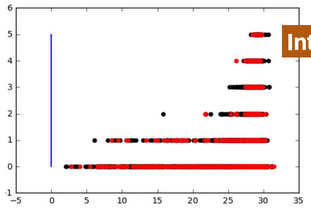
Intensity vs Wind





Intensity vs





Intensity vs SST

CONCLUSION

Statistical regression and machine learning certainly allows pattern extraction from data. It allows researchers to understand the effect of a variable on another and predict causality.

TERMS:

NA: North Atlantic Basin
SST: Sea Surface Temperature
LR: Linear Regression
LDA: Linear Discriminant Analysis
KNN: K-Nearest Neighbors
CART: Classification & Regression Trees
NB: Gaussian Naïve Bayes
SVM: Support Vector Machines
OLS: Ordinary Least Squares

PROJECT TEAM

Monika Pawar
Neelima Ellendula
Sohaib Khawaja

SYRACUSE UNIVERSITY