INFM600: PROJECT SUMMARY

TORNADOES vs AGRICULTURAL EXPORTS

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TARGET AUDIENCE

The United States Department of Agriculture (USDA) would benefit the most from our analysis. USDA is a federal department responsible for laws related to farming, agriculture and food. They promote agricultural trade and production in the United States and also internationally.

IMPACT

Our project works as a regression model which USDA can use to determine the effect of tornadoes on agricultural exports, plant and animal products. They can use weather forecasting data from the National Weather Service agency and, with the help of our model, determine its impact on agricultural exports. Having this information beforehand also gives them the opportunity to take measures and minimize the economic damage.

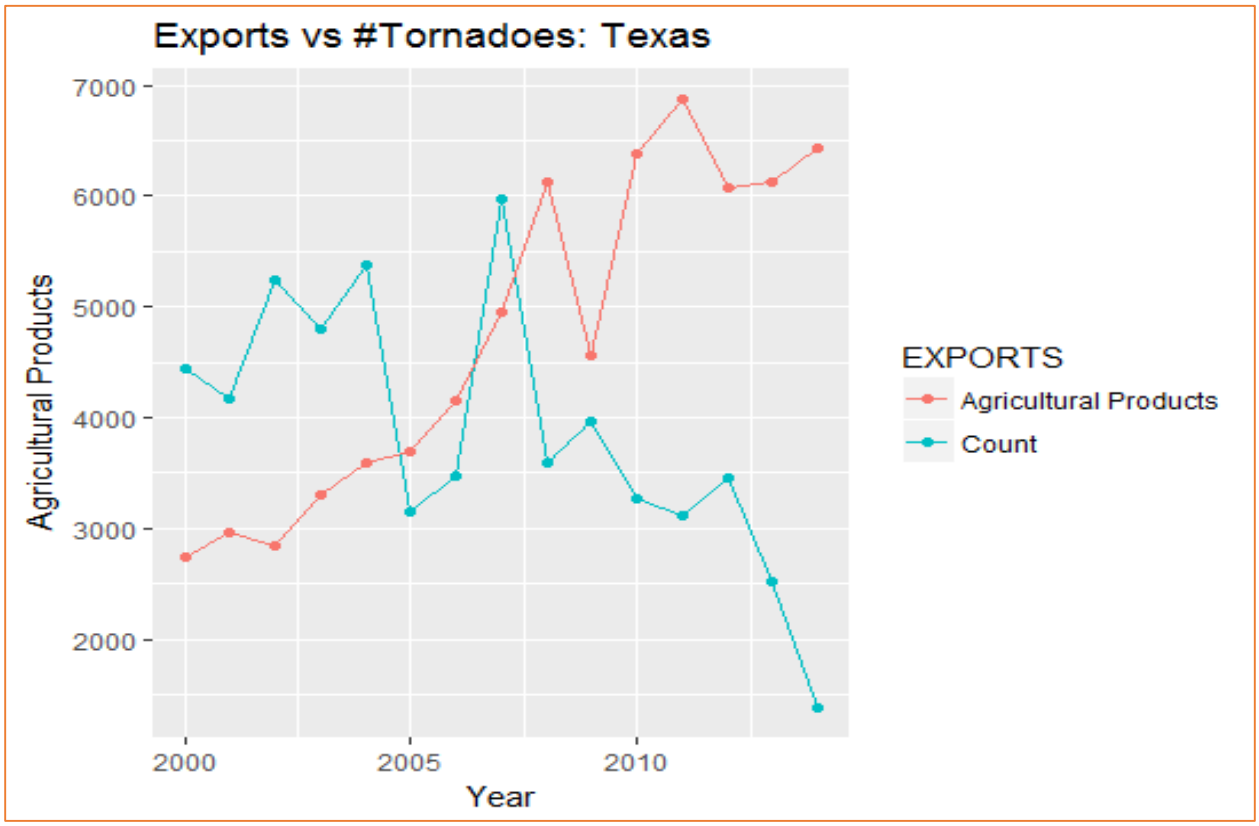
SOURCE DATA AND PROCESSING

We integrated two data sources: a data set of all tornadoes in the United States since 1950 (http://www.spc.noaa.gov/wcm/#jmc) and agricultural/crop export data from USDA (http://www.ers.usda.gov/data-products/state-export-data.aspx). The tornado data comes from the National Weather Service. It includes information on tornado incidence, F-scale, and the states a tornado passed through. The agricultural export data set breaks down the agricultural exports of each state, as well as the revenue generated per export.

We processed the data through Microsoft Excel and R. To efficiently address our research questions, we aligned each state with its appropriate region, removed irrelevant data, and merged the two data sets. Through a combination of excel pivot tables and the subset( ) function in R, we targeted only the tuples that would answer our research questions.

ANALYSIS PLOT

We examined how tornado occurrences impact agricultural exports from the United States. We chose the state of Texas to check whether there is correlation between tornado incidence and exports, because Texas has the maximum number of tornado occurrences. The following plot demonstrates the relationship between tornado occurrences and the agricultural product exports for the state of Texas.



INTERPRETATION

We used multiple regression for our statistical analysis, with the dependent variable being agricultural product exports and the two independent variables being the number of tornadoes and the average of F-scale. Based on the p-values obtained we determined that our result is significant and that there is a negative correlation between the count of tornadoes and the agricultural product exports. This relation is also seen in the plot shown above where the agricultural product exports decreases with an increase in the number of tornadoes for the state of Texas.

CONCLUSION

Our model states that when the tornado count increases by a factor of 1 in Texas, the revenue generated through agricultural exports reduces by a little over $23 million. No significant relationship was seen in any other state, which could imply that the relationship is only above a certain threshold value of tornado count, or there is a third variable factor in play. The median value for tornado count in Texas is 120. This value can be used as a reference to trigger red flags while studying tornado incidence and revenue loss through agricultural exports.

Word Count: 485