

Hurricane Florence Relief Research Project

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Title

Power Outage Based on Population Density in New Hanover County due to Natural Disaster

Background

Hurricane Florence made landfall of September of 2018, creating major flooding and damage to many homes. Our class studied many factors that go into hurricane relief after the hurricane. For my part of the project, I am looking at the effect of population density of an area on the length of power outages. We have partnered with Support the Port to try and help create a more researched plan for the next major hurricane, allocating resources to areas that are affected the most, and to the most vulnerable people of the community. Support the Port is a “a non-profit organization that helps the Wilmington community through arts and scholarship” (Support the Port).

Methods

Does the population density in a county affect the length of power outages experienced in the county? This is a quantitative study. We have used

power outage data for each zip code in New Hanover county, save 28411. This data is in hour increments. The data was provided to us by the North Carolina Department of Public Safety from Duke Energy. The variables used were, the independent variable of population density within a zip code, and the independent variable of the average power outage in each zip code.

Results

The zip code with the longest mean power outage was 28429 with 106.31 hours. The shortest mean power outage was for zip code 28428, with 45.59. Zip code 28429, also has the smallest population density with 210 per/mi². While the zip code 28403 has the highest population density of 2876 per/mi² and the mean power outage time of 65.19 hours. There is a moderately negative correlation between the population density and the mean of power outage per zip code. The correlation coefficient is $-.387$.

Discussion/Implications

We are missing all data for 28411, so there is no representation in our study of that zip code. This data is not applicable to all of New Hanover County as it leaves out a zip code. The use of zip code is a very large unit of analysis, the results that we found may have been different or more pronounced had there been a smaller unit of analysis. There may be other factors that affect the duration of power outage after a hurricane. The research does seem to support the idea that the power outage duration is affected by the population density

of an area. However, a study that could study power outage data to the household or neighborhood level is needed to say if there is a significant correlation between the population density and duration of power outages.

References

Support The Port. (n.d.). Retrieved from <http://www.supporttheport.com/>