Mosquito Mappers

Investigating the Relationship between Urbanization and Mosquito Hotspots

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Background

- Urbanization is growing throughout the United States
- Mosquito hotspots have had an impact on the spread of diseases and our overall lives.
- Citizen science is an important tool that is being used to track and combat mosquito hotspots

Goals

- Understanding the affect humans and mosquitos have on eachother
- Deciding if there's a correlation between urbanization and mosquitos
- Contributing to the awareness of citizen science.

Research Question

How does urban development in metropolitan areas affect both mosquito hotspots and awareness of citizen science.

Methodology

- Once we figured out our research question, we decided on using three cities to collect data from, we chose Los Angeles, Charlotte, and Atlanta.
- We decided on using population data to determine urbanization in said major metropolitan areas.
- In order to collect the data, we used US Census data to determine the difference in the population of our locations over a year basis. We also used US Weather data to find the average annual rainfall and humidity.
- After finding this data, we conducted two main regression analyses, one depicting the correlation between population and mosquito larvae count reported from our local data, and the other depicting precipitation levels (taken from GLOBE Visualization System) and mosquito larvae count.
- We conducted a survey in these three cities. This survey gave us a perspective on whether or not people are aware of citizen science and how many people have used the GLOBE explorers app.
- In order to see how many people in each location have reported mosquito habitats on the GLOBE Explorers app, we used both the globe data science visualization and ran the Mosquito habitat report csv file through Pandas and found the number of people who reported from each location.
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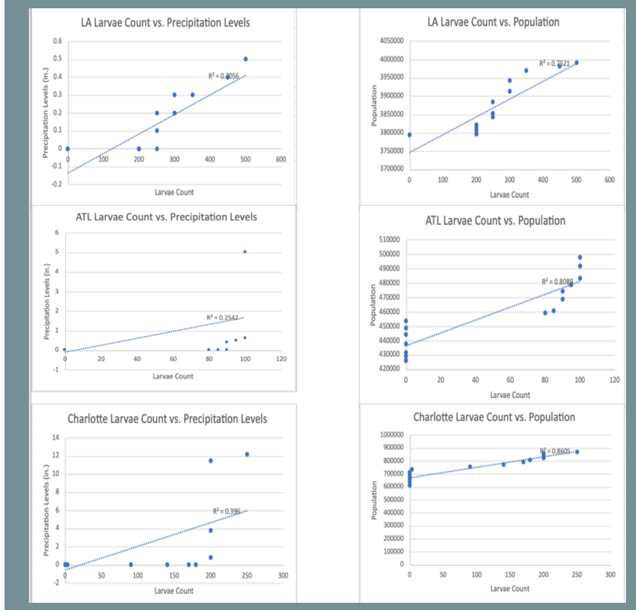
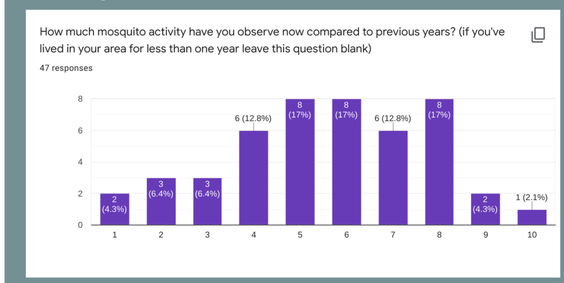
Results

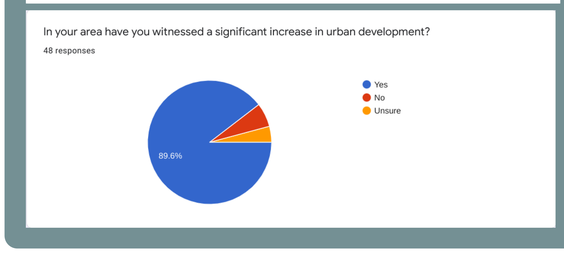
Regression Graph Analysis Results



Significant relationship between precipitation & mosquito larvae count for all three locations, but both Atlanta & Charlotte had low r^2 values -> inconsistent precipitation data. Significant relationship between population & mosquito larvae count for Charlotte only

Survey Results





Los Angeles, California:
Population
2010-3,795,370
2018-3,990,456
PPSM
2010 -7,544 ppsm
2020 - 8,564 ppsm
Climate
amount of annual precipitation- 379.0 mm
annual percent of humidity- 65%

Charlotte, North Carolina:
2010- 738,534
2018-872,498
2010 - 2,457 ppsm
2020 - 2,969 ppsm
Rainfall -1065.0 mm
humidity- 67%

Atlanta, Georgia:
2010- 429,193
2018-498,044
2010 - 3,070 ppsm
2020 - 3,861 ppsm
annual precipitation- 1277.0 mm (50.28 in)
Average annual percent of humidity- 68%

Conclusion

- Urbanization has an effect on Mosquito hotspots.
- According to survey data, positive correlation between urban development and mosquito activity.
- In places with a larger population -> more awareness of citizen science

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