



Assessing *Aedes albopictus* Temporal Distribution and Dynamics in Suffolk County



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Introduction

Aedes albopictus mosquitoes or Asian tiger mosquitoes (ATMs), are a non-native species [1]

- Native in Southeast Asia and are believed to have been introduced to the United States in 1987 through international shipments of used tires that provided suitable habitats for larva [1]

ATMs are container breeding mosquitoes [3]

- Lay eggs in small water-filled containers including flowerpots, tires, or discarded items
- Densely populated areas make optimal breeding grounds

ATMs are epidemiologically important vectors of various viral pathogens including dengue fever, Zika, and chikungunya [4-7]

Materials and Methodology

Mosquitoes collected for 13 weeks using the John W. Hock Collection Bottle Rotator mosquito trap paired with a CDC light trap [2].

- Features 8 rotating collection bottles that collect over 3-hour time intervals
- Utilizes a programmable timer
- Carbon dioxide is used for bait

Collection was done at 3 sites were identified with historically high ATM counts using ArcGIS.

Aim

1. Identify the population and temporal activity patterns of Asian Tiger Mosquitoes
2. Contribute knowledge to Suffolk County's mosquito surveillance program and influence vector control measures



Figure 1: John W. Hock Collection Bottle Rotator

Data Analysis

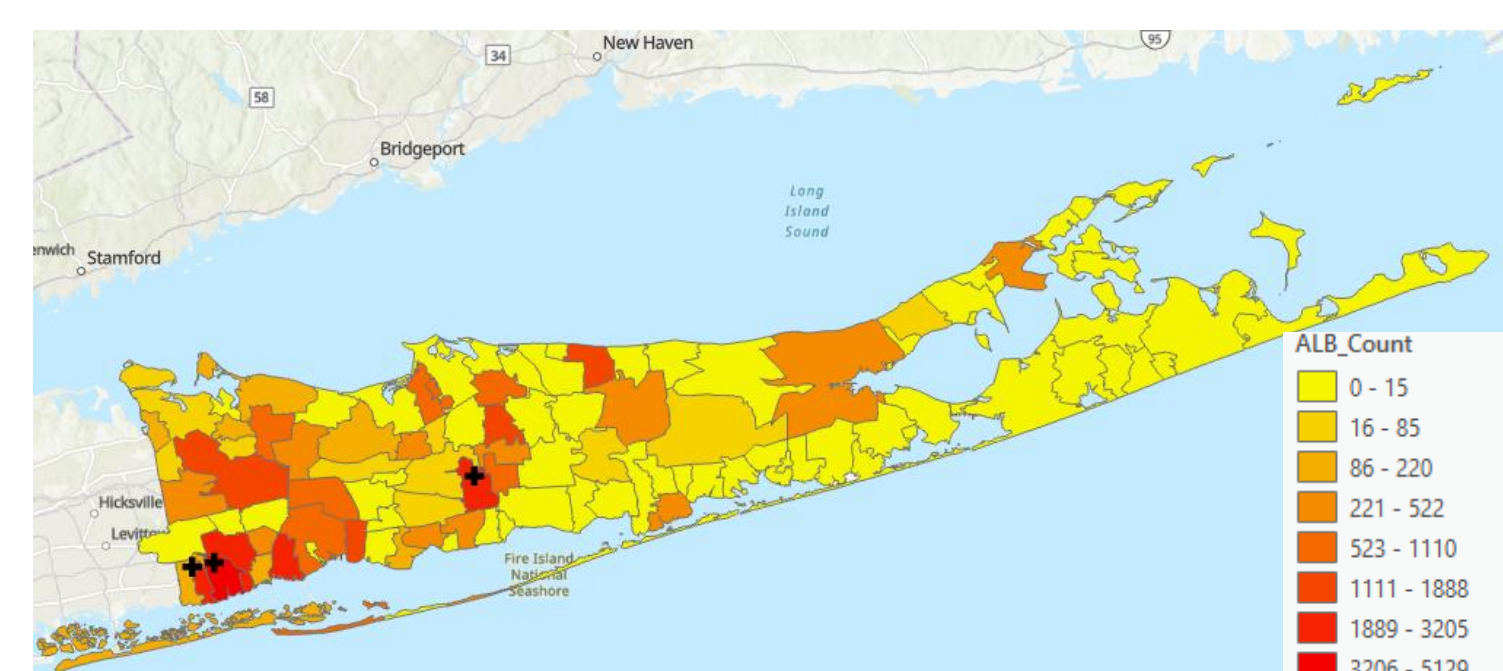
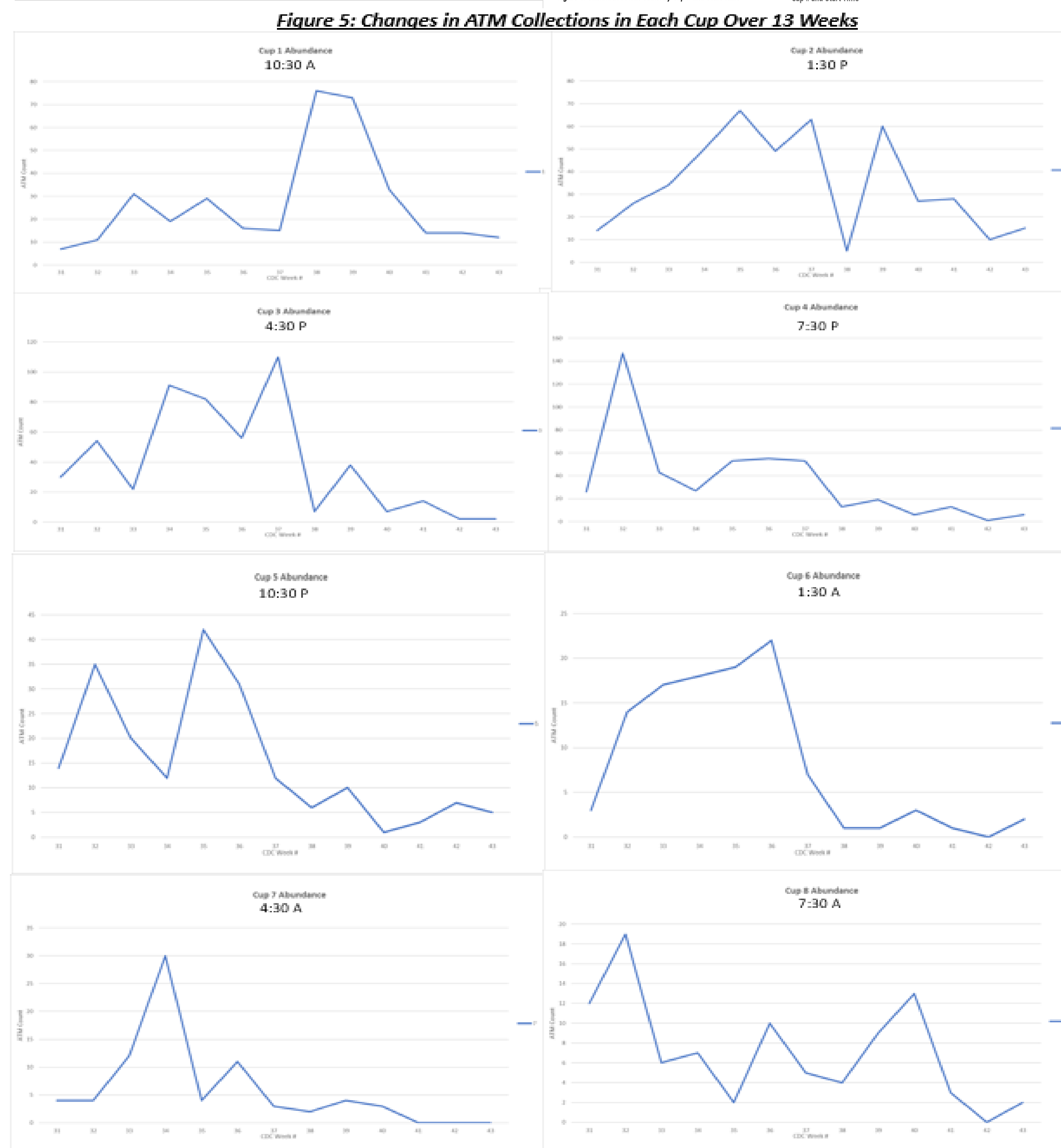
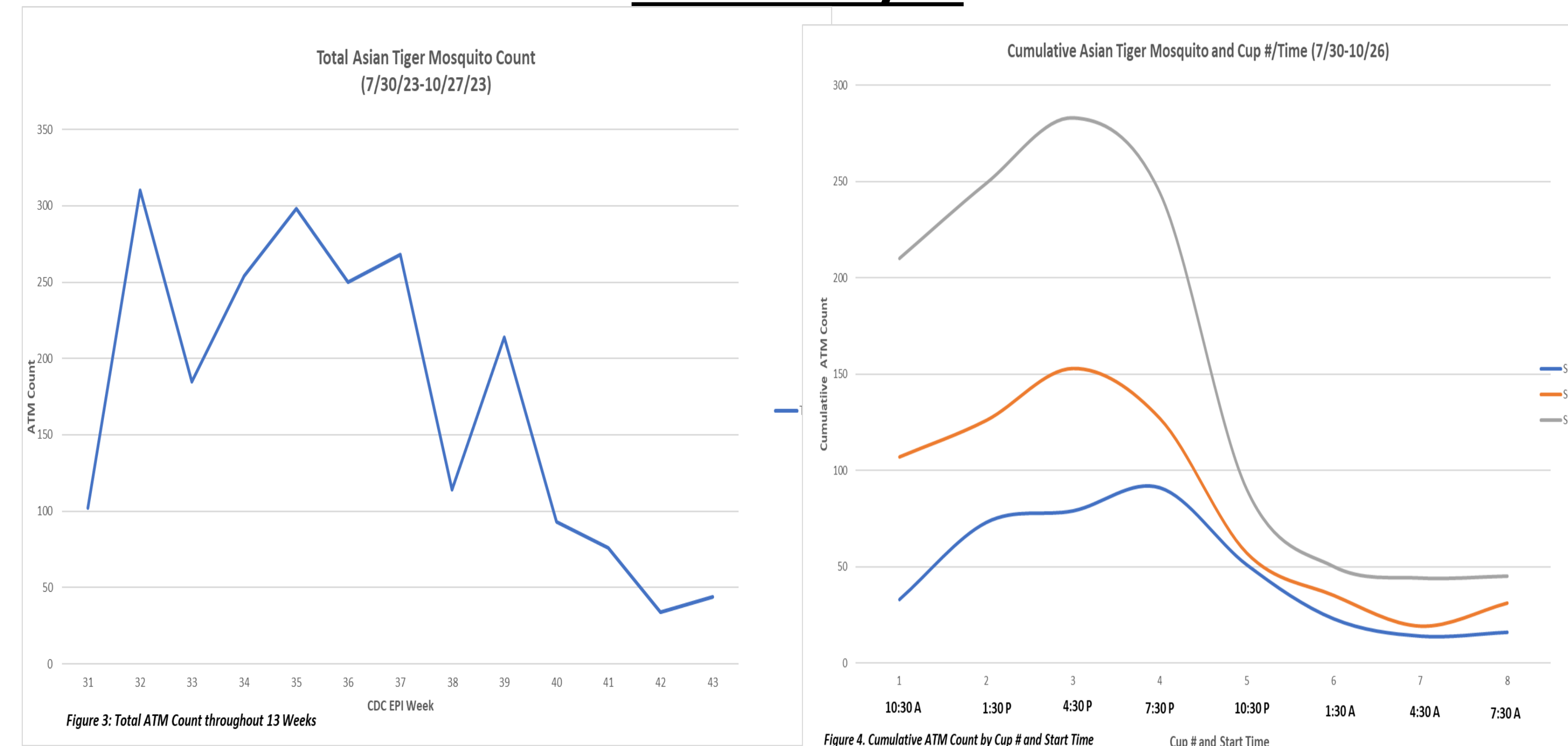


Figure 6: Suffolk County ATM density 2014-2022

Results and Conclusions

- The analysis of the data was conducted using SAS® Studio.
 - Non-normal data → Kruskal-Wallis Test
 - P-value < 0.0001
 - Significant differences between collection cups
- Total *Aedes albopictus* activity was highest during a 6-week period between CDC weeks 32-36 (8/6-9/16). A dip in counts was observed during Week 38 and counts declined continuously after Week 39 (9/30). (Figure 3)
- Activity patterns at the 3 sites were very similar with an activity peak approximately between 4:30 P.M and 7:30 P.M. (Figure 4)
- Collection cup #3 (4:30 P.M.-7:30 P.M.) consistently trapped the highest number of mosquitoes. This finding implies that late-afternoon to dusk might be the peak activity window for *Aedes albopictus*.
- Collection amounts were lowest between 1:30 A.M. and 4:30 A.M (collection cups 6 & 7) suggesting that dawn may correspond to one of the least active time periods for ATMs in Suffolk County
- These findings align with previous studies demonstrating that ATMs are aggressive daytime biters and are most active in the late afternoon [8], however, the bi-modal activity patterns seen in previous studies was not observed in this study [9]
- Interestingly, following Week 38 (9/17-9/23), significantly more Asian Tiger mosquitoes were collected in Cup #1 than in the earlier weeks (Figure 5). Peak collections were observed 3 hours earlier during this transition. This shift in activity may be linked to the decrease in daylight hours and lower temperatures seen later in the summer and early fall.
- These findings underscore the importance of continued vector-control measures for mosquitoes well into late October.
- More research should be conducted to examine the many unmeasured ecological/environmental factors (i.e., climate change) that affect *Aedes albopictus* activity
- Understanding these population dynamics are key to prevent possible future mosquito-borne disease outbreaks



Figure 7: *Aedes albopictus* (Asian Tiger) mosquito [10]

References

