

Linking Mathematical Models and Trap Data to Infer the Proliferation, Abundance, and Control of *Aedes aegypti*

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Aedes aegypti is one of the most dominant mosquito species in the urban areas of Miami-Dade County, Florida, and is responsible for the local arbovirus transmissions. Since August 2016, mosquito traps have been placed throughout the county to improve surveillance and guide mosquito control and arbovirus outbreak response. We develop a deterministic mosquito population model, estimate model parameters by using local entomological and temperature data, and use the model to calibrate the mosquito trap data from 2017 to 2019. We further use the model to compare the *Ae. aegypti* population and evaluate the impact of rainfall intensity in different urban built environments. Our results show that rainfall affects the breeding sites and the abundance of *Ae. aegypti* more significantly in tourist areas than in residential places. In addition, we apply the model to quantitatively assess the effectiveness of vector control strategies in Miami-Dade County.

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