# New Orleans Tire Survey

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**SUMMARY**

The last report (12/17/19) detailed the use of exploratory statistics and graphing to choose candidate models for the larval data and a Bayesian variable selection algorithm to choose 5 candidate predictors for each mosquito species.

Since then, I have conducted further exploratory work to determine whether each mosquito species was sufficiently represented in the data to create a reliable model, and plot the observations in space and created variogram plots to evaluate spatial dependency. I then used `R-INLA`, a Bayesian statistics package in R, to fit zero-altered (or hurdle) models that considered the zero-inflation of the data. For each species I fit a base model, a model with random intercepts by site to account for pseudoreplication, a model with spatial effects, a model with temporal effects, and a model with spatial and temporal effects (spatiotemporal model).

Models with spatial and temporal random effects are notorious for overfitting, so I evaluated each model for each species based on a combination of quantitative criteria (WAIC and log-likelihood for model fit, hyperparameter estimates for random effects) and qualitative examination of residual plots, observed vs. fit plots, and plots of spatial/temporal effects.

The effect of each selected variable for each species with sufficient representation to create a model is discussed. In brief, only Ae. albopictus and Cx. quinquefasciatus