1145-92-2825 **Devin Akman*** (akman2@illinois.edu), **Carlos Bustamante**, **Jordy Cevallos**, **Cui-Hua Wang**, **Jordan Bates**, **Viswanathan Arunachalam**, **Leon M. Arriola** and **Baojun Song**.

Modeling an Anthrax Plume: Prioritizing the Delivery of Antibiotics After an Anthrax Bioterrorism Event.

Anthrax is a potentially fatal pathogen and could be used as a biological weapon with devastating consequences. In the case of a hypothetical anthrax attack on Maricopa County, the current governmental response plan is inadequate. The standard plume model predicts an unrealistically high number of infections because it assumes that anthrax spores are uniformly distributed over a large area and that all who breathe the spores get infected. It is impossible to deliver the requisite number of antibiotics under that model before the infections progress to an untreatable stage. We develop a fine-grained plume model with GIS data. The model is based on the scalar transport equation and in-host modeling and assumes a drone attack. We obtain the diffusion and advection coefficients of the plume of anthrax spores and use the resultant concentrations along with census data to build a susceptibility model. This model predicts which areas will be the hardest hit and, therefore, what quantity of antibiotics should be delivered based on population density. Wind conditions play a significant role in shaping the plume. We conclude that state and local governments should modify their simplistic Gaussian plume models in order to better serve the people in harm's way. (Received September 25, 2018)