

Gaff-MSIS-Ledder: Agent-based modeling of tick population genetics

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Tick-borne diseases are on the rise worldwide, and there is a lot of interest to reduce the burden of these diseases. Ticks and tick-borne pathogens are not well studied partly owing to their challenging biology. Understanding the spatial movement of ticks and tick-borne pathogens is important to understand the changing risk of disease. Mathematical models provide an ideal tool to explore this type of complex system by implementing the dynamics that are known and exploring the potential additional components that are less understood. An agent-based model will be presented that investigate tick-borne disease geographic spread using population genetics to help identify movement patterns. This model is based on field and lab data, and the output helps to identify future experiments.