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Modeling the Spread of West Nile Virus

West Nile virus was detected in New York State in 1999, and has spread rapidly across the continent causing bird, horse and human mortality. The aim of this lecture is to model this spread. Biological assumptions are summarized and lead to the development of a reaction-diffusion model for the spatial spread of West Nile virus with cross infection between birds and mosquitoes. For a simplified model, the existence of traveling waves is proved and the spatial spread of infection is calculated. Related models for West Nile virus spread are briefly discussed.