

West Nile Virus in Colorado: Analytic and Geospatial Models of the Virus in Colorado

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Abstract

West Nile Virus found its way to North America in 1999, starting with the diagnosis of two cases of encephalitis in the Queens borough of New York City. WNV had found its way to Colorado by 2002. The main vector for West Nile Virus is the mosquito, primarily the *Culex* species. This research shows, from historical data along with qualitative, quantitative, and geospatial methods, that the primary variables behind West Nile Virus cases by county in Colorado are the county's urban/rural classification, water area in the county (in square miles), and if it is an El Niño year or not. Other variables, including population density in the county, and the average precipitation and temperature over the period July to October, are discussed and their merit in a model presented. Mapping tools are used to illustrate the presence of West Nile Virus as well as its spread, over time, through the counties in Colorado. The data set for this study covers 2005 to 2021 for the 64 counties of Colorado.

Keywords: West Nile Virus, analytic model, virus model, geospatial analysis

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