

Climate and West Nile virus disease incidence in the U.S.

John M. Drake

May 23, 2022

West Nile virus (WNV) was introduced to North America in 1999 leading to a widespread epizootic among wild birds and subsequent spillover into human populations. In a small minority of human cases, WNV results in neuroinvasive disease, which may be fatal. WNV is spread by mosquitoes in the genus *Culex*, particularly *Culex pipiens*, *Culex quinquefasciatus* and *Culex tarsalis*. *Culex* species are highly sensitive to environmental fluctuations, particularly precipitation, which is key to creating the habitats necessary for larval development.

This leads to the hypothesis that early and wet summers may be associated with larger seasonal burdens of WNV disease. The CDC has published a [table](#) of annualized WNV disease cases by state from 1999-2020 at [this link](#). The R package [climate](#) allows for convenient downloading of meteorological and hydrological data. Your task is to create a visualization to investigate the relationship between the onset of summer weather, precipitation, and state level WNV cases in the U.S. from 1999 to 2020.