JESSICA POFFENBERGER#, VASILE STADNITCHII, ZULFIYA MURADOVA, PETER HOPKINS, QING WANG, ZHIJUN WANG, and DAVID J. KLINKE, Department of Computer Science, Mathematics and Engineering, Shepherd University, Shepherdstown, WV, 25443, Department of Microbiology, Immunology & Cell Biology, West Virginia University, Morgantown, WV, 26506**. Mathematical modeling and analysis of West Nile Virus.**

West Nile Virus (WNV) is a widespread disease mainly transmitted by mosquitoes. While humans are considered dead-end hosts once infected, birds have been documented to produce high enough levels of the virus to spread WNV to mosquitoes. Thus, bird populations produce a significant impact upon the growth of the disease. Approximately 80% of cases in humans show no noticeable symptoms, and the infected recover on their own. Another 20% develop mild symptoms similar to a flu. A serious neurological illness occurs in less than 1% of the infected population. Currently, there is no cure or preventative shot for this disease. Preventative measures, including killing off mosquitoes and minimizing personal exposure to mosquitoes, are the most effective ways to combat WNV. The project proposes a revised ODE model based on the model developed by Bowman et al. (2005) to describe the spread of this virus and the impact of mosquito and bird populations on its outbreaks. Through numerical simulations, the impact of some control methods such as reducing the number of mosquitoes and/or possible human-mosquito contact rate on the WNV transmission outbreaks is discussed. The parameters in this model will be calibrated using genetic algorithms. This project was supported by the NIGMS of the NIH grant as part of the West Virginia INBRE (P20GM103434).