1077-P1-561 **Timothy D Comar*** (tcomar@ben.edu), Dept of Mathematics, Benedictine University, 5700 College RD, Lisle, IL 60091. *Undergraduate Research Projects in Mathematical Biology: Modeling and Simulation in MATLAB.*

This presentation highlights two summer undergraduate research projects in mathematical biology on which students have worked with the presenter over the last few years. Both of these projects extensively used MATLAB to create simulations of the mathematical models.The first project is an investigation of a density-dependent one predator, two-prey model for integrated pest management using impulsive differential equations. In this investigation, students explored conditions under which both prey species would be eradicated, only one species would be eradicated, and both species would remain within controlled population levels. In addition to studying the long-term dynamics of the system, bifurcation behavior of the stroboscopic map of the system was also explored to reveal complex and varying dynamical behavior. The second project addresses the spread of the urban weed, Ailanthus altissima, which is an nonindigenous invasive species in the United States. We consider the spread of this species as disease and use versions of network SI and SIR epidemic models to model the spread of Ailanathus and suggest strategies for controlling the spread. We discuss the biology of the models, the mathematics involved in analyzing the models, and the MATLAB implementation. (Received September 07, 2011)