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Timothy D Comar* (tcomar@ben.edu), Department of Mathematics, Benedictine University, 5700 College RD, Lisle, IL 60532. *More Student Research Projects with Biological Models Using Impulsive Differential Equations.*

This talk focuses on undergraduate research projects using impulsive differential equations to model biological phenomena. 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 investigates the dynamics of an SEIRV epidemic model with impulsive vaccination. Conditions are found under which the disease-free periodic solution is stable and under which an endemic solution is stable. We will discuss the project work, which includes analysis of the dynamics of these systems, and the student preparation needed to engage in this work. We will also discuss other variations of the models that we have investigated. (Received September 11, 2012)