1116-37-1990 **William Bench*** (wmbench@email.wm.edu). *Computational Dynamics of a Map with Multiple Stable States.*

I use an automated method to locate and prove the existence of fixed points and periodic points of a population model.

Predictions of behavior of a system are often difficult because of chaos, error, computational limits, and the interactions between them. Outer approximation and topology are two methods used to extract dynamics. They allow us to automate analysis of a system, be aware of the limitations of the analysis, and prove the existence and location of certain dynamics.

Models of how biological populations change over time are a type of dynamical system. I illustrate the use of outer approximation and topology in the analysis of a biological model. This process is almost entirely automated by a program written by William D. Kalies. I use his program to prove the existence of dynamics of the model. The model I analyze is mentioned in Robert May's paper *Thresholds and breakpoints in ecosystems with a multiplicity of stable states.* (Received September 21, 2015)