

1145-49-1134

**Christina Joy Edholm\*** (cedholm@utk.edu), **Chris Guiver**, **Brigitte Tenhumberg**, **Stuart Townley** and **Richard Rebarber**. *Comparison of adaptive and optimal control illustrated with pest management*. Preliminary report.

To determine effective management strategies for controlling invasive species, we compare implementing adaptive and optimal control. Both methods are used to determine how much control to apply at each time step. Adaptive control is a feedback control which uses observations of part of state to update the amount of control. In contrast, when using optimal control the choice of control minimizes a cost functional, assuming that the initial population state and the population dynamics are completely known. We model the invasive species with a stage structured discrete time linear population projection model, and assume that the control increases one of the mortality rates. As a case study we use the invasive insect species *Diaprepes abbreviatus*, and consider the robustness and resulting cost of each control scheme. (Received September 19, 2018)