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**Marco V. Martinez\*** (mvmartinez@noctrl.edu). *Optimal Control for Management in Gypsy Moth Models.*

The gypsy moth, *Lymantria dispar* (L.), is probably the most destructive forest defoliator in North America. Gypsy moth outbreaks tend to be spatially synchronized over areas across hundreds of kilometers. Outbreaks can result in loss of timber and other traditional forestry products. Greater losses tend to occur to the ecosystem services that forests provide, such as wildlife habitat and nutrient cycling.

The United States can be divided in three different areas: A generally infested area (where gypsy moth populations are established), an uninfested area (populations are not established), or a transition zone between the two. There are different management programs matching these different areas. This work focuses in optimal control techniques for models of areas where the population is established or in the invasion front.

We design an objective functional to minimize the cost generated by the defoliation caused by the population of gypsy moth and the cost of controlling the population with an aerial spray. The objective was to develop an optimal control framework and perform numerical simulations for various scenarios, that seeks to minimize the total cost due to gypsy moth (damage plus control cost). (Received September 11, 2014)