1145-91-1509 **Ben G Fitzpatrick*** (bfitzpatrick@lmu.edu), 1 LMU Drive, UH 2700, Los Angeles, CA 90045.
Optimization and Games for Environmental Federalism.

Federalism in economics is the study of regulatory hierarchies, usually involving local, state, and federal governments. When a single resource or population ranges over multiple political entities, regulation becomes a multi-player decision problem. Determining the "best" policy can be difficult when decision makers have competing objectives.

We examine problems of federal versus local policymaking with a simple 2-patch model of a biological pest species that regulators seek to control. Regulators can invest effort in either harvesting the species infesting the patch they control or preventing the species from entering from the neighboring patch. Federal control will seek to minimize total cost of controlling the species across both domains, but independent local regulators may choose a number of possible options. We apply dynamic programming and Markov chain approximation techniques to examine different control and game approaches to this pest control problem. (Received September 22, 2018)