

CHARACTERIZING INCENTIVES: AN INVESTIGATION OF WILDFIRE RESPONSE AND ENVIRONMENTAL ENTRY POLICY

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Abstract: Policy makers face complex situations involving the analysis and weighting of multiple incentives that complicate the design of natural resource and environmental policy. The objective of this dissertation is to characterize policy makers' incentives, and to investigate the consequences of those incentives on environmental and economic outcomes in the context of wildfire management and environmental policy.

Wildfire management occurs in a dynamic uncertain environment and requires the coordination of multiple management levels throughout the course of a fire season. Over the course of a wildfire, management teams allocate response resources between suppression of fire growth and protection of valuable assets to mitigate damage with minimal regard for cost. I develop a model of wildfire resource allocation to show that 1) wildfire managers face the incentive to protect residential structures at the expense of larger and more costly fires, and 2) response resources are transferred to fires with more threatened structures constraining the set of resources available to manage other fires in the region. I find empirical evidence to support the predictions of this model with theoretically consistent regression models of wildfire duration, size, and cost using data from U.S. wildfires that occurred between 2001 and 2010. These results imply that continued housing development of wildland prone to wildfire will 1) further distort management incentives, 2) lead to larger and more expensive fires, and 3) provide support for fees on rural homeowners.

Governments facing political opposition to renewable energy subsidies may resort to augmenting the fixed cost of entry in order to induce environmental outcomes. In global markets, one government's entry policy creates either positive or negative pecuniary externalities in other regions. I develop a two-region model to investigate the behavior of rival governments setting strategic entry policy, and the subsequent impacts on welfare. The results indicate that competition between the rival governments prevents the social optimal level of entry and suggests a role for international environmental agreements.