1077-90-1978 **Gwen Spencer*** (gwnspencer@gmail.com), 116 Oak Ave, Ithaca, NY 14850, and **David Shmoys**. *Optimally Fragmenting Graphs Against Stochastically-located Threats: Balancing Preventative and Real-time Actions in Wildfire Containment.*

Motivated by issues in allocating limited preventative resources to protect a landscape against the spread of a wildfire from a stochastic ignition point, we give approximation algorithms for a new family of stochastic optimization problems. We study several models in which we are given a graph with edge costs and node values, a budget, and a probabilistic distribution over ignition nodes: the goal is to find a budget-limited set of edges whose removal protects the largest expected value from being reachable from a stochastic ignition node. In particular, 2-stage stochastic models capture the tradeoffs between preventative treatment and real-time response. The resulting stochastic cut problems are interesting in their own right, and capture a number of related interdiction problems including other topics in sustainability.

We discuss a hierarchy of efficient techniques for successively more general variants. Some special cases can be solved to arbitrary precision via dynamic programming. In more general cases efficient provably-good bicriteria results are obtained by carefully rounding the solution of a natural LP relaxation (this exploits the special form of the linked Knapsack-type budget constraints). The techniques extend to 2-stage Maximum Coverage problems. (Received September 21, 2011)