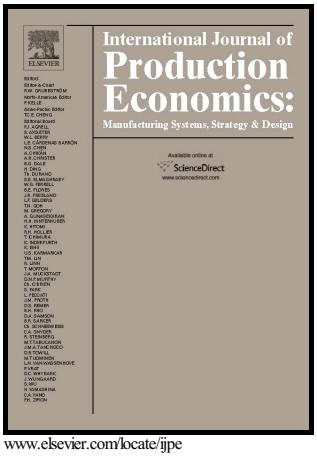

Optimal Location, Capacity and Timing of Stockpiles for Improved Hurricane Preparedness

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Optimal Location, Capacity and Timing of Stockpiles for Improved Hurricane Preparedness

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Abstract

Applying historical hurricane data to model storm related uncertainty, this paper develops a stochastic optimization model to determine the stockpile location and capacities of medical supplies for improved disaster preparedness in the event of a hurricane. Our models incorporate facility damage and casualty losses, based upon their severity levels and remaining survivability time, as a function of time variant changes in hurricane conditions. To determine the optimal deployment time, we use an optimal stopping time framework to model the trade-offs between increasing costs and reduced uncertainty as the hurricane approaches landfall. Finally, aided by an innovative mixed integer programming model, we develop an