Rapid Assessment of Timber Damage after Hurricane Rita

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Abstract

This paper describes the details of the procedure, implementation, and results of a Rapid Damage Assessment Protocol (RDAP) that was used to assess timber damages from Hurricane Rita in 2005. The RDAP utilize the combination of weather data, historical hurricane damage information, aerial survey, ground plot survey, Forest Inventory and Analysis (FIA) data, and spatial interpolation technique to produce timber damage assessment. It is capable of producing high quality timber damage data in a short period of time, satisfying the urgent need for reliable data by government agencies as well as private entities on timber damage for disaster relief and salvage operations. Using the RDAP on East Texas, we were able to produce quality damage assessment within one week of the Hurricane. Two different approaches were used to estimate the total timber damage from the survey data. Using stratified sample average approach, the estimated total damaged timber volume was estimated to be 15.08 billion cubic meters, with an estimated damaged value of $462.04 million. Using Universal Krigin geostatistical analysis approach with first order detrending and arcsin transformation for ratio data, the estimated total damaged timber volume was estimated to be 16.67 billion cubic meters, with an estimated damaged value of $515.33 million. Comparing with stratified sample average approach, the geostatistical approach has the advantage of better accuracy with unique estimate damage rate for each FIA plot, and no need for artificial stratification for estimation. The RDAP have the potential to be adapted for evaluating future timber damages from hurricanes and other natural disasters.

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