A Review of Four Years of Research on Using Classified Satellite Imagery as the Basis for Stratification to Increase the Precision of Forest Inventory Estimates

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Abstract. In the late 1990s, the Forest Inventory and Analysis (FIA) program of the North Central Research Station, USDA Forest Service, demonstrated the utility of classified satellite imagery for use with stratified estimation to increase the precision of inventory estimates of forest area and volume. Stratifications derived from classified 30m x 30m Landsat TM imagery produced relative efficiencies ranging from approximately 2.0 to as great as 5.0 for estimates of proportion forest area, while relative efficiencies for estimates of volume typically were less than 2.0. Investigations to refine this approach to stratification focused on using coarser resolution but more frequently available MODIS imagery; change-based classifications to increase the precision of estimates of change in forest area, growth, removals, and mortality; aggregations of classifications to assure that inventory plots did not sample multiple strata; and new approaches to constructing strata. This presentation summarizes the findings of these investigations and updates results since the initial reports.