

TIMBER HARVESTING EFFECTS ON QUALITY AND SPATIAL VARIABILITY

Issue: The use of Geospatial Technologies including Global Positioning Systems (GPS) allows for improved evaluation of potentially environmentally destructive and productivity limiting timber harvesting practices. As inputs for timber production become increasingly site-specific, research emphasis has been placed on improving our assessment of the variability of both soil properties and harvesting impacts. This can lead to tailored site preparation strategies when equipment is navigated using GPS. For example, if GPS are used on both harvesting and forest tillage equipment, areas with soils susceptible to compaction that have been heavily trafficked can be targeted for tillage operations. The ability to use soil maps created by both the National Cooperative Soil Survey (NCSS) and the timber industry that relate soil properties to susceptibility to harvesting impacts is a tool that is needed by the timber industry. This study was designed to address these issues for improving the sustainability of Southeastern US pine production.

Changes in Bulk Density due to Timber Harvesting (0.73 ha)
Pre-Harvest **Post-Harvest**
 Darker Colors indicate Higher Bulk Density



Study Description: Grid sampling was conducted at three sites in the Alabama Piedmont. These sites were typical for loblolly pine stands for the region. Soils were described and mapped at each site according to NCSS standards. Soil strength, bulk density, soil organic matter, soil water content, and texture were measured at grid points both before and after whole-tree harvesting. Changes in these properties were measured and related to inherent soil properties and trafficking patterns.

Status: Sample collection was completed January of 2001, and analyses were completed by June of 2001. A total of one presentation and one manuscript (in review) have resulted from this study. An additional presentation and manuscript are planned for 02.

Benefits:

- *Timber harvesting creates more compaction on relatively less eroded soils of the Southeastern Piedmont, thus, these sites should be harvested during drier conditions.*
- *Harvesting operations tend to increase the spatial variability of soil properties.*
- *Further examination of the feasibility of establishing “zones” for forest tillage operations (separate of loading decks and skid trails) is planned*

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