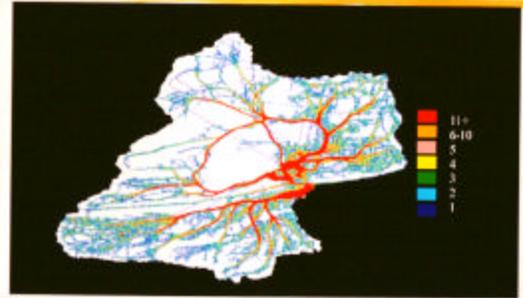


Assessing Soil Physical Changes in a Harvested Landscape

ISSUE: Machine traffic in the course of harvest operations can cause a number of changes in soil physical properties which vary in intensity and spatial distribution. The use of Global Positioning Systems (GPS) to monitor harvest traffic has the potential to compile information on the number of machine passes over the landscape and their location. Information on the relationship between the number of machine passes and soil physical response and its spatial variability are generated by linking GPS information to soil physical measurements. Areas of the harvest tract with the greatest impacts can be located and appropriate site preparation methods employed to assist in recovery of soil properties to promote adequate regeneration.

Traffic Density Patterns



Study Description: A grid point system was established in a harvested loblolly pine plantation. Each point was referenced by GPS and linked to the number of traffic passes by matching coordinates to a trafficking map in a Geographic Information System (GIS) database. Soil physical measurements related to soil strength, bulk density, aeration porosity, and hydraulic conductivity were collected at each grid point and linked to the number of traffic passes. The soil physical status of each grid point in combination with its geographic location can be used to assess the spatial relationships and construct contour maps depicting the intensity and distribution of soil physical properties.

Status: Soil physical measurements and data analysis were completed by Spring of 1999 to assess the relationship between soil physical response and machine trafficking and spatial variability in a harvest tract. A total of 4 presentations and two papers have resulted from this study to date. The recovery of soil physical properties through site preparation and an assessment of differences in recovery by traffic intensity are planned for the next phase of the study.

Benefits:

- *Assess machine trafficking and soil response in a harvested loblolly pine plantation*
- *Assess the spatial variability of soil properties to distinguish areas of high and low impacts*
- *Assess the response and recovery of soil properties to site preparation and examine differences by traffic intensity*

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